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Contents

Editorial

Orissa Commerce Association is working consistently with a pious mission to serve the research community of India by publishing '*Orissa Journal of Commerce*', a quarterly peer-reviewed research journal for over four decades. The current Issue of the Journal contains thirteen research papers and articles from diverse fields of commerce, management and public policy.

The growing popularity of virtual reality among youth has attracted the top notch organizations to enter into the world of metaverse. The *first article* showcases the potential of the metaverse to enhance the operations of the firms in retail, hospitality & tourism, and entertainment industries. The study also posits that adoption of metaverse in these industries will alter the consumer decision-making journey, and their subsequent behavior. The *second paper* discovers relationship of investors' sentiment and market return. Using 30 market and macroeconomic variables as proxy to the investors' sentiment, an investors' sentiment index has been created by applying the principal component analysis. Results show that there is a significant positive relationship between investors' sentiment and market return.

The *third paper* studies the total factor productivity (TFP) of industrial sector in India at an aggregate level and finds the impact of technical inefficiency and other input variables on TFP. It is seen that material, labor and R&D are the prime drivers of TFP for industrial sector. The purpose of the *next paper* is to identify the dynamic relationship between the spot and futures of Nickel traded at MCX, India. The study confirms the existence of a long-run relationship between the markets. The *fifth paper* employs a quantitative analytic technique, using data obtained from 336 consumers of car automobile companies by non-probabilistic snowball sampling. The research indicates that five supporting after-sales services have been identified that support customers at the service-centre while availing after-sales services of their vehicles.

The *sixth paper* investigates the issues and challenges of homestays in the Sikkim and Darjeeling hills and their contribution to sustainable tourism development. According to the findings of the study, homestays face issues and challenges on TBL (triple bottom line) dimensions of sustainability. The *next paper* reviews the literature on behavioural supply chain management and firm performance. This research provides a detailed analysis of previous BSCM studies and provides mechanisms that promote the desired growth.

The *eighth paper* has been undertaken to ascertain the role of MSMEs in the start-up ecosystem for tribal youth of Rajasthan, India. It is found that MSMEs has a significant role in the start-up ecosystem development for tribal youth of Rajasthan. The *next paper* identifies the antecedents of the behavioural intention in using app-based services used for ride-sharing in an Indian context. The study concludes

that societal influence and ecological concern for the environment are the prime factors for people in making positive attitudes toward using ride-sharing apps.

A well-maintained work-life balance will lower stress and burnout levels and creates a greater sense of well-being among employees. The *tenth paper* provides information and a rich view of demographics based perceptions about work-life balance of employees working in Kolkata. The findings show that new generation workforce is not happy with the different aspects of WLB. The purpose of *eleventh paper* is to find out any notable variations in competence across the major demographic variables of the employees of private sector banks. The study revealed that demographic variables have a strong influence on the different variables of competencies.

The *twelfth paper* attempts to examine the corporate reporting reforms in 21st century, such as sustainability reporting, ESG reporting and integrated reporting which are followed by the companies recently for long-run value creation. The findings show that the clarity is missing on the information provided on the strategy formulation and governance. The *last paper* examines the link between the CSR attributes and ESG reporting quality. Using agency and stakeholders' theory and applying regression analysis on the sample of 225 Indian firms listed on stock exchanges in 2021, the results showed that the CSR committees' attributes such as independence, frequency of meetings, and size have positive and significant influence on the ESG reporting quality by companies.

The readers will find this Issue with superior quality and high intellectual diversity. Hope the readers will enjoy reading this Issue and encourage us to stride forward.

Dr. Malay Kumar Mohanty

(Managing Editor)

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Exploring Metaverse: A Virtual Ecosystem from Management Perspective

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Keywords

Metaverse, Value creation, Retail industry, Marketing, Hospitality industry

JEL Classification

D12, L83, L86, M15

Abstract: An interconnected digital ecosystem, seamlessly blending the virtual and physical worlds, is termed as 'metaverse'. The metaverse offers unlimited virtual space to participants such as corporates and individuals, to explore and design their experiences. The present study showcases the potential of the metaverse to enhance the operations in retail, hospitality & tourism, and entertainment industries etc. The study posits that adoption of metaverse in these industries will alter the consumer decision-making journey, and their subsequent behavior. Corporate leaders by mapping this virtual space, where consumers have their digital doppelganger or avatars representing their digital persona, can reach the consumer across geographies. The study highlights that immersive experiences offered by the metaverse will be the essence of higher customer involvement, leading to value co-creation and seamless exchange of value. The final section of the study provides a perspective on the emerging issues and challenges in the form of privacy, security, racism, and digital hatred in the metaverse world.

1. Introduction

The term metaverse combines 'meta' and 'verse'. It transcends the physical universe and takes the user on a virtual reality-based journey. The term 'metaverse' was first introduced in 1992 in Neal Stephenson's *Snow Crash*. In its first iteration, the metaverse was presented as a virtual reality (VR) dark planet approachable through the internet and augmented reality (AR) via virtual self or digital avatars. In simpler terms, Snow Crash posited that an alternative world exists in the digital realm, operating parallel to the real world.

The previously fictional concept of the metaverse has gradually become a legitimate consideration for different management domains, besides other applications. The trigger date for immersion of the virtual world in the physical world was 10 March 2021, when the sandbox gaming platform Roblox mentioned the concept of the '*metaverse*' in its prospectus. Roblox asserted the eight essential characteristics of the metaverse: Identity, friends, immersive, anywhere, low friction, variety, content economy, and safety.

As per certain estimates, the metaverse-driven market will be worth USD 814.2 billion in the next five years, with a CAGR of 43.8 percent during 2023-28. Simultaneously, the Google search and analysis of Google Tends showcase increasing searches for the word 'metaverse' (EuPortal, 2022). Taking advantage of the increasing popularity, on 28 October 2021, Facebook transitioned to Meta. The transition was a historical event and not merely a rebranding exercise. The transition to metaverse represents a paradigm shift from the traditional online experiences to interactive, virtual and augmented reality environments in the new age of customer experience design.

However, the metaverse concept is still shrouded in ambiguity in the public and corporates' perception. There have been different interpretations of the still-emerging phenomena. Firstly, it has been described as a single, universal virtual world with the 'residents' living their *second life* as digital avatars as part of a community. Secondly, popular virtual worlds and games like *Minecraft, and Fortnite*, Web3 variants: *Decentraland* and *Sandbox* are examples of the varied metaverse, each unique in its positioning, value proposition, and the 'residents'.

Contrarily, a few researchers and developers decouple the metaverse from VR and AR. Park and Kim (2022) posit that "the metaverse does not necessarily use AR and VR technologies. Even if the platform does not support VR and AR, it can be a metaverse application". However, this view contradicts the foundation of the immersive nature of the metaverse. In the absence of VR, AR & associated MR; the metaverse will lose the ability to merge physical and digital worlds, thus rendering it ineffective. As per the authors, this assertion ignores the primary USP of integration, immersion, and perceived presence by the user, which is fundamental to the concept of the metaverse.

The above contradictory conceptualizations have led the authors to assert that the metaverse is still an under-studied phenomenon lacking a universal conceptualization. Globally, there has been increasing interest in the metaverse due to an enhanced focus on developing community, socializing, new avenues of entertainment, showcasing creativity through various mediums, and the potential to amalgamate them into a financially viable business model. Accordingly, the study proposes to reflect on the emergence of the metaverse and its impact on marketing management for various industries.

2. Conceptualizing Metaverse

Gursoy *et al.,* (2022) well-defined metaverse as "a collective, persistent, and interactive parallel reality created by synthesizing all virtual worlds to form a universe that individuals can seamlessly traverse. People can inhabit the metaverse using their digital avatars and experience the virtual world in multiple forms, including augmented reality, VR, and mixed reality".

The metaverse can be envisaged as a series of inter-connected virtual worlds, a network of 3D worlds, where users interact with content, objects, environments, and each other through virtual and augmented reality interfaces. In this parallel universe to the real world, people live their digital lives (Figure 2). People can communicate with one another in this virtual environment using their avatars.

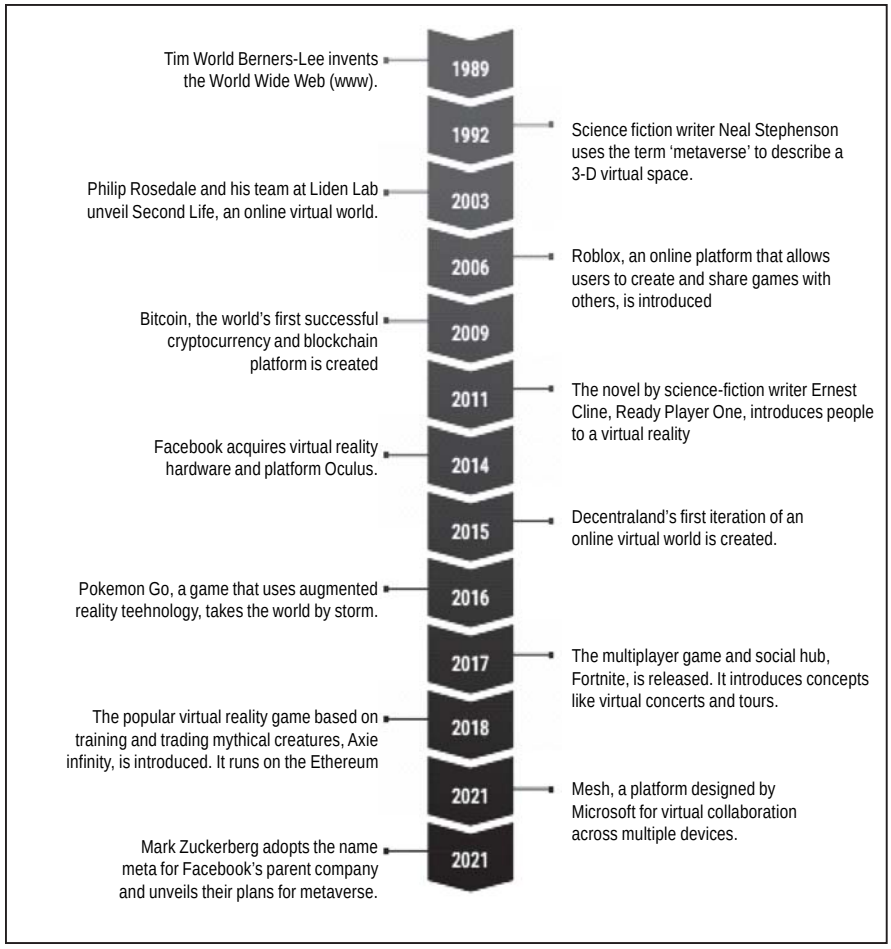

Figure 1: Evolution of Metaverse

Source: https://www.cnbctv18.com/technology/explained-the-history-of-metaverse-12015212.htm

Virtual reality (VR) and augmented reality (AR) are becoming ever more popular, and metaverses are swiftly advancing on the internet.

2.1. Value Co-creation in Metaverse

Organizations across industries, sectors, and domains are configuring and shaping the metaverse in conformity with their requirements. Initially, these organizations are exploring the new digital ecosystem to understand value creation opportunities, with the objective of creating a viable business model through the exchange of value.

The extant value co-creation literature showcased the importance of customer involvement and adapting the product, process, and communication as per their choices. The value co-creation concept

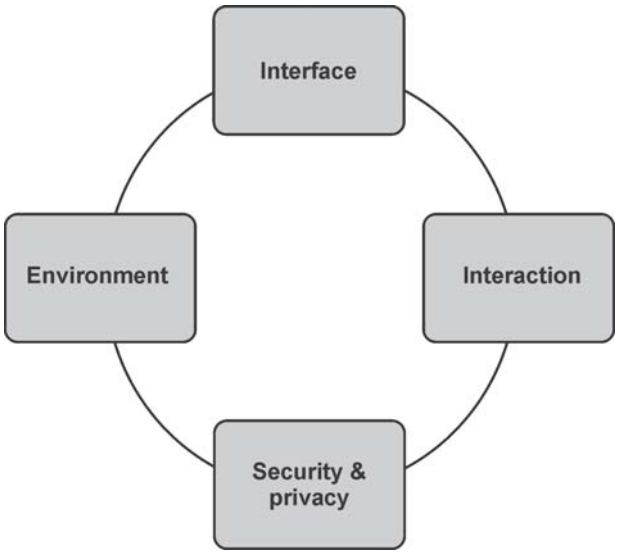

Figure 2: The Conceptualization of Metaverse

Source: Kim, 2021.

emphasizes the significance of immersive experiences for multiple stakeholders in the value-creation process (Rubio *et al*., 2020). Thus, in recognizing customers' specific needs and choices, organizations should involve the consumers in the co-creation process since they are important stakeholders (Buhalis and Foerste, 2015) of the organization. Replicating the assertion in the emerging metaverse ecosystem, the authors posit that in order to facilitate the encompassing experience and value creation in the digital ecosystem, necessary technologies - AR, VR, XR, and 3D-besides others must be developed, tested, and implemented, thereby enabling the multiple stakeholders to engage in the value co-creation process (Rubio *et al*., 2020). Hence, we posit that the advancement of technologies is an essential enabler for an immersive metaverse experience.

The aforesaid value creation opportunities are being explored by platform players; developers and creators that contribute resources, content, immersive layers, and the requisite hardware; companies and retail brands interacting with users in the virtual world, build destinations on virtual lands (e.g., Nova Scotia 360º), establish retail shops, education (e.g., Hermitage Museum) and training purpose, or even create their customized built worlds (e.g., Yas Island, Abu Dhabi); and infrastructure and services enterprises (e.g., South Korea) that set design standards, facilitate transactions through digital currencies, and enable blockchain-based smart contracts.

Businesses that already use the metaverse could gain enduring competitive advantages. Business leaders should take a strategic position by defining metaverse goals and the role they wish to perform; testing, learning, and adopting; and preparing to scale; by identifying critical capabilities and integrating the metaverse into their operational model. They ought to think about using the metaverse themselves. By becoming meta-users, they can understand the developments in customer experience.

In present times, customer experience (CX) is increasingly becoming technology-mediated. Organizations are deploying various technological tools for an enhanced CX (Anshu *et al.*, 2022). An example can be seen in the hospitality industry, where Buhalis (2022) states that hotels are using social media analytics in conjunction with AI to drive customer engagement and understanding of customer behavior across different market segments and in different decision-making stages. This allows hospitality organizations to customize their message and services to customers based on the customers' data (Tomczyk *et al.*, 2022).

2.2. Financial Aspects of Investing in Metaverse

The user adoption data on metaverse looks promising. However, these are early development stages of metaverse. The development of the metaverse ecosystem is in progress. While the gaming segment acted as a catalyst for adopting emerging metaverse, hyper-personalized, gamified learning and training, communal activities and UX-based interactions, and expansion of digital (remote) manufacturing and operations are likely domains to expand the metaverse adaption and acceptability in different consumer segments.

Meta (formerly Facebook) has spent billions of dollars on developing the mixed reality infrastructure. However, the company's Q3 2022 financials show that Meta's revenue was down 49% annually at US$ 285 million. Simultaneously, the expenses were US$ 4.0 billion - due to employee-related costs and technology development expenses. This has resulted in Reality Labs- the exclusive Metaverse division losing over US$ 9.4 billion in the first nine months of 2022. This excessive spending on the futuristic iteration of the internet has alarmed the financial stakeholders of the firm.

In comparison, a segment of analysts believes that Meta's investments are conducive to the more significant metaverse movement. Angel investors, market visionaries, private equity (PE), start-ups, renowned brands, and large technological businesses are all attempting to take advantage of the evolution of metaverse. In the first five months of 2022, the VC and PE funds had already spent more than US$ 120 billion in the metaverse. This invested amount is more than twice as much as the total of US$ 57 billion invested in 2021. Meanwhile, Microsoft has announced a plan to acquire Activision for US $69 billion (Table 1).

Table 1: The Top 3 Tech Investors in Metaverse

S. No.	*Company*	*Investment in US$ (approx.)*
1	Microsoft	68.7 billion
2	Meta	10 billion
3	Alphabet	1.1 billion

Source: Compiled by Authors

The data enumerates that technology companies are the most prominent advocates and investors in the metaverse ecosystem. The industries driving the adoption of the metaverse also want to commit a sizable portion of their digital investment budgets in this sector. There are numerous

reasons for investors growing interest in the metaverse. The initial reason was the technological progress enabling the conceptualization, ideation and creation of first versions of metaverse. Later on, the analysts realized the adoption of metaverse by gaming enthusiasts (with online games like Fortnite counting millions of active players on their platforms) will have a domino effect on other spheres of multiple industries too. Further, the growing Generation Z population provides demographic tailwinds to the adoption of metaverse. Further, the market leaders are confident that the metaverse offers them a unique platform to engage their stakeholders (including consumers) constructively.

The confidence of companies is derived from the fact that organizations in every domain willingly participate in developing the metaverse ecosystem. Instances in the form of Accenture creating a digital headquarter to stimulate team(s) collaboration, South Korea is planning a 'Metaverse Seoul' – a full-service virtual world where the residents could perform touristic and administrative city-related activities, media and entertainment organizations like Disney, food chains like Wendy's, Donald's, entertainers like Daler Mehendi and even professional teams like the Atlanta Braves are exploring metaverse to engage with their consumers and/or audience.

Similarly, the seamless experience metaverse offers have enticed brands like LVMH, Gucci, Prada, Nike to explore the metaverse for business opportunities. The fact that The Dematerialized, a virtual luxury showroom sold out its entire stock of 1212 digital sweaters (US$137 per piece) within three hours of its launch, highlights the evolving consumer behavior. The present-day consumer is equally conscious of his digital avatar personality and seeks to maintain equality between his physical and digital persona. Hence, it can be asserted that firms are increasingly considering metaverse for their brand positioning and marketing-related activities. Accordingly, they are planning their budgeting with additional emphasis on metaverse-related activities.

2.3. User-Consumer-Company Interactions for Metaverse Development

The previous research has unequivocally established that in order to transform users into consumers, companies need to connect with their consumers regularly. The latter is not just a recipient of one-way corporate communication but an active and vital participant in the entire communication cycle. The widespread adoption of social media has enabled consumers to transform from passive content receivers to active information seekers. The conventional consumer decision-making model has progressively made way for a technology-enabled-enhanced consumer decision-making model. Consumers are increasingly making purchase decisions based on online reviews, feedback, star ratings, and videos by past customers. They are influenced and, in turn, influence prospective consumers by sharing their opinions on different social media platforms. This e-WoM has a direct consequence for the businesses, either in a positive manner or detrimental to the businesses' interest. As Rihova *et al.*, (2018) asserted, the spread of interactive technology across market segments has engaged consumers as active participants in business operations.

Metaverse has been identified as the next level of immersive-disruptive technology (Gursoy *et al.*, 2022) after social media. The foundation of metaverse- seamlessly integrating the physical and virtual worlds can revolutionize the communication-interaction between organizations and consumers by enabling the co-creation of transformational experiences and values across industries (Buhalis and Karatay, 2022).

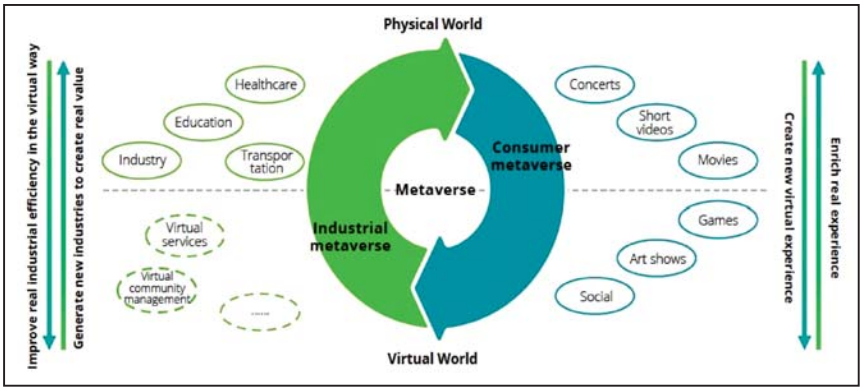

Figure 3: Consumer Interface in Metaverse

Source: Deloitte Research and Analysis

2.4. Metaverse Application in Industries

The success of metaverse is predicated on the businesses' ability to be available 24X7 to their clients. The absence of time zones and ability to seamlessly shift between the real and virtual worlds is an essential characteristic. If the participants could socialize in a uniform manner, irrespective of the medium, it will allow them to exchange value across digital platforms. The industries need to take cognizance of the changing consumer behaviour towards digitalization-led transactions. The organizations should encourage design and development of interoperable, customizable, and context-aware hyper connected virtual environments, wherein they can co-create customer satisfying experiences. Specific consumer-based industries require a constant consumer engagement. This is primarily true for the industries where service aspects outweigh the product utility. In the subsequent section, we analyze four such industries from the perspective of the metaverse (Figure 4).

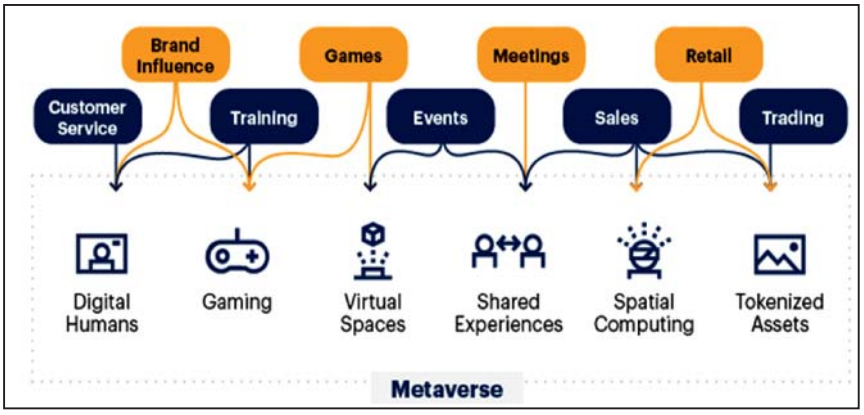

Figure 4: Opportunities in Metaverse

Source: Gartner (2022)

3. Metaverse in Select Industries

3.1. Retail Industry

Jennifer (2019) estimates that by 2025, 30% of global economic activity will be through digital platforms. A digital platform economy opens an opportunity for organizations to exchange value with their consumers without geographical boundaries. The essence of evolving retail industry is the utilitarian exchange of value due to purchasing products and/or services from peer-to-peer and/or professional sellers. In this endeavor, organizations can co-create value with their stakeholders (consumers) by performing economic activities facilitated by cryptocurrency and NFT.

3.2. Digital Marketing

In digital marketing, the metaverse ecosystem enhances the quality and nature of interactions with present and potential consumers. The consumers can virtually test drive the car, check the product characteristics before ordering, and experience its utility. Several retail brands have already incorporated metaverse in their marketing strategies. Nike recently launched virtual sneakers and apparel to be worn by digital avatars for the metaverse ecosystem (Sengupta, 2021). Through this offering, Nike earned US$3.1 million in sales in seven minutes.

3.3. Hospitality & Tourism Industry

In the post-pandemic 'new normal', the hospitality industry can mitigate certain negative narratives by implementing immersive technologies like MR. This will allow them to achieve "a very realistic augmentation of the real world, ideally so realistic that a user can no longer distinguish virtual content from physical objects. MR usually requires special hardware (i.e., smart glasses) where the lenses are replaced by transparent screens and contain multiple sensors to track the user's environment" (Rauschnabel, 2022). Hence, a technology-illusive implementation can lead to transformative experiences. The MR-based metaverse experience is being experimented with by a few of the leading museums, like Louvre.

Furthermore, the hospitality industry faces the constant challenge of meeting and exceeding burgeoning client expectations. The client expects a seamless booking process, unique experiences, and personalized attention. Today's travellers are majorly tech-savvy, and the implementation of metaverse by hospitality organizations could define the guest experience.

The accommodation search is the first step toward prospective clients' experience in the hospitality industry. Implementing a metaverse ecosystem can allow them to walk through the suggested room, enjoy the 360° perspective, and visualize the room amenities, décor, and other essentials. The potential clients in their digital avatars can have a first-hand immersive experience of hotel rooms, which conventional 2D images cannot provide. Thus, the hotel can transcend geographical boundaries and communicate directly with global travellers.

3.4. Entertainment Industry

The effectiveness of the metaverse can be understood by taking an example of a cinematic experience. Over the last few decades, the advancement of technology and the popularity of 3D versions of

movies like Avatar, Matrix, Avengers, etc., have encouraged cinema directors to increasingly incorporate 3D features in their films. Before the popularity of 3D movies and post that too, the viewers are passive participants only during the duration of the film. While the directors, scriptwriters, and actors try their best to communicate and stimulate audiences' emotions, the same is not at the live-theater levels. The performances at live theatre allow the audiences to enjoy a higher level of immersion since all their sensory faculties are in a closer relationship with the actors.

Live shows in the metaverse by performers like Ariana Grande, Justin Bieber, The Chain-smokers, besides others allow the audiences to become part of the experience from their gadgets because, in the metaverse, experiences of digital and physical nature are inseparable and undistinguishable from the environment in which they occur. Thus, the entertainment industry and media can benefit from the realistic augmentation of the natural world, allowing the performer to transcend the limitations of venue capacity, distances, permissions, and statutory licenses.

4. Technology and Innovation of Metaverse

As enumerated in the above section, metaverse is a virtual platform that enables its users (corporates and consumers) to interact mutually by using their digital avatars. The fundamental technology to achieve this is Mixed Reality (MR). However, metaverse integrates other technologies through ambient intelligence to bridge the digital and physical universes, thus, facilitating its 'residents' to combine resources and holistic experiences across different spectrums of reality (Buhalis, 2019). The rapid ICT advancement has allowed developers to ideate and seamlessly introduce digital realities in the physical world of the users. Metaverse provides three-dimensional (3D) illusive experiences allowing for social interaction in blended living (Buhalis and Karatay, 2022).

Metaverse is emerging as "a parallel reality where humans can work, play, and communicate" (Gursoy *et al.*, 2022). Metaverse ecosystem can be described as a platform integrating 3D projection technology with enhanced Augmented Reality (AR) and VR into MR (Rauschnabel *et al.*, 2022). Metaverse is designed to provide seamless experiences by transferring residents/visitors between the physical and digital environments. Virtual engagement provides several multisensory immersive experiences. Thereby enabling the organizations to transcend geographical limitations. Virtual Reality (VR) headsets allow users to experience virtual 3D environments from across the globe within the comfort of their homes or workplace. Through their self-created digital avatars, the users interact with other users in virtual surroundings. This virtual environment is conceptualized and designed on powerful technology platforms and enhanced computational capabilities available to today's developers. In addition to the VR experience, metaverse can provide a near-life-like experience by engaging multiple senses of the individual. Analyzing sensory feedback generated by sight, hearing, smell, taste, and touch is crucial for marketing firms.

5. Issues and Challenges in Metaverse Ecosystem Adoption

The digital ecosystem i.e. metaverse poses challenges for organizations, employees, business leaders, developers, UX designers, CX designers, content creators, marketers and even the consumers. The present employees lack the requisite technical skills to fully understand the contours of metaverse. The business leaders and their marketing teams too need to reorient their vision and strategies to

accommodate this emerging phenomenon. This will require an extensive reskilling on both executive and higher management levels.

The societal implications of an unregulated metaverse cannot be overlooked. A regulatory framework wherein the stakeholders including the statutory authorities should together define an actionable roadmap leading to an ethical, safe, and inclusive metaverse experience. This will require for regulations to be framed around data, security, laws of land, ethical behaviour, penalties in case of non-compliance, mental wellbeing, physical safety, equity and fairness among the participants.

Additionally, research has highlighted significant causes of concern relating to ethics, data security, regulation, and psychological impact on vulnerable community members. Already the metaverse users are complaining about offensive and undesirable behaviors in the form of data exploitation, sexualization of avatar interactions, addiction to simulated reality, and privacy issues. In their recent report, researchers of The Centre for Countering Digital Hate (CCDH) found that users were "exposed to abusive behavior every seven minutes and this included instances of bullying, presentation of graphical sexual content, racism, threats of violence, and grooming of minors".

6. Conclusion

The initial advantages of the metaverse are already accruing to the first-mover companies. As visible in earlier technological advancement stages, the early adopters gain a comprehensive competitive advantage which the other firms seek to mimic. The metaverse has the potential to impact all the domains of management-from HR to marketing, operations, and supply chain & logistics. Presently, business leaders should examine its potential applications, its effectiveness in domains, its boundaries, if any, and how the metaverse could be a precursor to the new world predicated on digitalization.

In its limited scope, the present study examined the evolving concept of the metaverse and its purported influence on management across industries. The authors posit that for the metaverse to gain acceptance, it is imperative that organizations have a clear strategy for all the domains of management. They should strategize and design the application of metaverse for each business vertical. As evidenced earlier in the study, businesses across a spectrum ranging from technology companies, private equity (PE) funds, established retail brands, hospitality industry venture capitalists, and start-ups are making efforts to capitalize on the opportunities offered by the advent of the metaverse.

Hence, we can conclude that the metaverse interconnects the virtual and real world and has the potential to disrupt the existing management principles across domains and industries. It offers immense opportunities in social, economic, and cultural spheres for organizations and facilitates value co-creation and higher order attainment.

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A Study on Investors' Sentiment and Market Return of Indian Stock Market

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Behavioral finance, Principal component analysis, Investor sentiment, Sentiment index, Sentiment proxies, Stock market return

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G11, G12, G17, G4, G41

Abstract: This paper discovers the relationship of investor sentiment and market return over a period of 10 years. Using 30 market and macroeconomic variables as proxy to the investors' sentiment an investors' sentiment index has been created by applying the principal component analysis. Further analysis has been done by employing weighted least squares method. Results show that there is a significant positive relationship between investor sentiment and market return. The results of the study are helpful for retail investors, fund managers and policy-makers for a better understanding of the Indian stock market and to enhance their earnings by combining investor sentiment in to their decision-making. Further, asset pricing models such as CAPM, Fama-French three and five factor model and Carhart factor model, need to incorporate the investor sentiment for better explanation of prices. The results have paved the way to spread the present work in the context of foreign markets such as BRICS countries.

1. Introduction

For a long time, there has been a debate among the researchers of behavioral and empirical finance regarding the sentiment-return relationship. Contrasting opinions have been found in the literature regarding the relationship of sentiment with market return. A study shows that share prices do not follow any pattern and are independent (Fama, 1965). According to the capital asset pricing model, prices of securities reflect all of the available information provided market is efficient. Rational investors in these markets always try to push the market price of shares towards the present value of projected cash flows and arbitrageurs are always there to offset the demands of irrational investors, if any. Random walk theory suggests that share prices follow a random walk and cannot be predicted (Malkiel, 1973). So, it seems that sentiment has no role to play in the share market.

For a very long time the market efficiency and the rationality of the investors were trusted by the market participants for making financial decisions. But the idea of the market efficiency and rationality

of the investors has been losing its importance with the passage of time as it failed to explain the Black Monday, dot com bubble and 2005 global financial crisis.

Modern and behavioral finance challenges the theory of rationality. Investors are not always rational, rather they follow the herd behavior and try to earn better returns when market is rising and once there is downfall they are kicked out of the market. The behavior of irrational investors is affected by their psychology. Behavioral finance helps in understanding the psychology of these investors and helps in understanding their decision-making process. Behavioral finance takes into consideration the heuristics and biases framework for the pricing of assets. Heuristics are the shortcuts one can use to find a quick solution, simplify the difficult procedures and jettison the requirement of extensive calculation. Thus, the decisions can be made quickly.

In India the work on sentiment-return relationship is in its embryonic stage. We shall add to the sentiment-return relationship by building a methodology wherein we would identify the proxies for the investor sentiment and measure it using sentiment index. One of the advantages of such an index is that it helps in understanding the sentiment-return relationship and if such a relationship exists then it can be concluded that sentiment is an important factor in the share market.

Present study attempts to identify proxies to the investor sentiment for the construction of a sentiment index which can represent the sentiment of Indian investors. Sentiment proxies have been identified after the extensive study of the literature and PCA has been applied to identify significant factors which have been used as final proxies to the sentiment. Some new proxies have also been proposed. Further, the sentiment-return relationship has been examined using multiple regression analysis (GLS).

2. Review of Literature

Since 1965, a lot of research has been done on how changes in investor behavior affect the stock prices. According to Fama (1965), share prices do not follow any pattern and are fully independent. Malkiel (1973) gave the random walk theory according to which share prices follow a random walk and cannot be predicted. According to Shiller (1981) investors are irrational and factors other than fundamentals affect the stock prices. Black (1986) termed these investors as noise traders as they act irrationally. Also, they have very limited access to the private information. According to Chen *et al.* (1986), macroeconomic factors are also responsible for the changes in the share market returns. De Long *et al.* (1990) reported that irrational noise traders influence the assets prices with their random confidence and trust, and earn high expected income. Shefrin and Statman (1984) gave a framework based on the self-control theory (Thaler and H., 1981) and choice under uncertainty theory (Tversky & Kahneman, 1981) and showed that sentiment is an important factor in the stock market.

Fisher and Statman (2000) considered three groups for the measurement of sentiment *viz.* large, medium and retail-investors and tried to show the relationship between sentiment of these groups and return of large and small cap stocks. It was found that combined sentiment can be used to predict the market return. Baker and Wurgler (2004b) tried to decode the investor sentiment and tested whether the catering view as proposed by Baker and Wurgler (2004a) can explain the tendency to pay dividends. The study reported a significant relationship between the view as proposed by Baker and Wurgler (2004a) and tendency to pay dividends. Investors prefer dividend paying shares at the time of negative sentiment and

prefer riskier shares at the time of positive sentiment. Brown and Cliff (2004) defined the sentiment as the biasness which speculators have in the valuation of assets and the excessive optimism and pessimism.

In a study conducted by Kumar *et al.* (2006), the data of individual (retail) traders was used to study the effect of trading (retail) on the share returns. Study reported that sentiment is an important factor which can explain the return co-movement. Wang *et al.* (2006) concluded that sentiment is caused by market return and volatility and vice versa is not possible. Further, they concluded that there is no linkage of sentiment with return and volatility.

Baker and Wurgler (2006, 2007) gave a conceptual framework for the explicit measurement of investor sentiment and development of a methodology for the creation of the sentiment index. The study established that market return can be explained using investor sentiment. Sehgal *et al.* (2009) conducted a survey using a structured questionnaire to identify the possible factors which decide the investor sentiment and it was defined as an understanding of investors' behavior that affects stock market activity. Sehgal *et al.* (2010) created sentiment index using Vector Autoregression Model and evaluated its association with the performance of the market. The study reported that sentiment and market performance both cause each other.

Dash and Mahakud (2013) analyzed the linkage of sentiment with cross-section of returns over fourteen industry groups. The implication of the study was that fund managers can use the stocks of those industries which are less sensitive to the sentiment. Naik and Padhi (2016) reconnoitered the sentiment-volatility relationship and concluded that aggregate sentiment index affects the excess market return. Jitmaneeroj (2017) analyzed the relationship between price earnings ratio and sentiment. It was concluded that instead of getting into the trap of using PER as a proxy to the sentiment as per the conventional analysis, it's better to explore whether PER affects the sentiment or not.

Pandey and Sehgal (2019) constructed different sentiment indices. Study reported that the FF5f model cannot explain the excess return of the small stock and low price to book value portfolio, but the model performs better if the sentiment factor is incorporated in it. The study concluded that investor sentiment is an important factor in the Indian stock market. Further, the indices created have more predictive power and lead others indices created so far.

Sentiment helps companies to make decision regarding the timing of issue of shares. The initial public offers take place when the sentiment is high in the market (Gupta and Maurya, 2021; Gupta *et al.,* 2020). Volatility index of India was used as proxy to the sentiment. Sharma (2021) reported that sentiment affects the sectoral return volatility. The study established that volatility is high at the time of high sentiment and vice versa. It was found that EGARCH model is the most suitable for modelling sectoral volatility in the context of NSE.

It has been observed that many researchers are analyzing the sentiment-return relationship, especially in the western economies. Although work has been done in India to analyze the sentiment return relationship but with limited time period and limited number of variables. To the best of our knowledge the empirical work on the aforesaid relationship is in its embryonic stage in India. The present work is an effort to contribute to the present body of literature on the aforesaid subject and tries to understand sentiment return relationship, so that retail investors, policy makers and fund managers in the Indian equity market can make better decisions.

3. Objectives and Hypotheses

3.1. Objectives of the Study

The major objectives are:

- To identify proxies for the investor sentiment.
- To build sentiment index for the Indian stock market.
- To examine the sentiment-return relationship.

3.2. Hypotheses of the Study

Following hypotheses have been tested:

H_{01}: There are no factors responsible for the high/low investors' sentiments.

H_{02}: There is no significant relationship between investor's sentiment and stock market return.

4. Research Methodology

4.1. Proxies to the Sentiment

There is no definite indicator available which can be used to measure the sentiment. Existing literature suggests that different variables can be used to measure the unobservable sentiment and an index (Lee *et al.*, 2002; Baker and Wurgler, 2006; Sehgal *et al.*, 2010) can be which can represent it. Though it can be also be measured through the survey method (Brown and Cliff, 2005; Sehgal *et al.*, 2009) but it suffers from various limitations such as error in the data collection, processing, delay in the receipt of data, *etc.* Most of the studies have used the market related proxies to the sentiment which can gauge the investor sentiment. The use of proxies to represent the sentiment has advantages over the survey method such as generalization, authentic sources of data and sentiment of the economy.

Different studies used different numbers of proxies. Behavioral finance suggests that the closed end fund discount is the best proxy to the sentiment (Lee, 1991; Baker and Wurgler, 2006; Sehgal *et al.*, 2010). However, there is no consensus among researchers on how many variables can be used as a proxy. Table 1 lists some of the previous studies and the measures of sentiment used.

Table 1: Studies and Proxies Used

Studies	*Measure of sentiment*
Loughran & Ritter (1995)	Number of IPOs and FPOs in a month (NIFPO)
Ludvigson & Sydney (2001)	Dividend yield (DIVYIELD)
Baker & Wurgler (2002, 2004)	Ratio of equity in the total issue (EQRATIO)
Brown & Cliff (2004)	Advance/decline ratio (ADR), High-low index (HLI), Put-Call ratio (PCR), and Ratio of equity in the total issue (EQRATIO)
Baker & Wurgler (2006, 2007)	Number of IPOs and FPOs in a month (NIFPO) and Ratio of equity in the total issue (EQRATIO)

contd. table 1

Studies	*Measure of sentiment*
Kumar & Lee (2006)	Buy-sell imbalance (BSI)
Wang *et al.* (2006)	Advance/decline ratio (ADR)
Welch & Goyal (2008)	Dividend yield (DIVYIELD)
Sehgal *et al.* (2009)	Price-earnings ratio (PER)
Finter *et al.* (2010)	Net equity investment by mutual funds (EQMF) and Number of IPOs and FPOs in a month (NIFPO)
Sehgal *et al.* (2010)	Inflation (INFLAT), Liquidity in the economy (LIQECO)
Bohra & Dutt (2011)	Foreign portfolio investment (FPI)
Ray (2012)	Foreign exchange reserves (FEXRES) Proposed
Raza *et al.* (2012)	Foreign direct investment (FDI) Proposed
Yoshinaga & Castro Junior (2012)	Number of IPOs and FPOs in a month (NIFPO) and Ratio of equity in the total issue (EQRATIO)
Dash & Mahakud (2013)	Advance/decline ratio (ADR)
Hui & Li (2014)	Market turnover/trading volume (MKTTURN)
Huang *et al.* (2015)	Dividend yield (DIVYIELD)
Shing So & Lei (2015)	30 days moving average of traded quantity of shares (TRADEQTY), Number of trades (NUMTRADE) and VIX™,
Abakah & Abakah (2016)	Foreign exchange reserves (FEXRES) Proposed
Du *et al.* (2016)	Oil prices (OILPRICE)
Haq (2016)	Foreign direct investment (FDI) Proposed
Hassan *et al.* (2016)	Foreign direct investment (FDI) Proposed
Kumari & Mahakud (2016)	Inflation (INFLAT) and Trading volume ratio (TVR)
Naik & Padhi (2016)	Advance/decline ratio (ADR), Inflation (INFLAT), Price-earnings ratio (PER) and Term-spread *i.e.*difference between 364 days T-bills and 91 days T-bills (TERMSPRE)
Qadan & Nama (2018)	Oil prices (OILPRICE)
Chelley-Steeley *et al.* (2019)	Buy-sell imbalance (BSI)
Pandey & Sehgal (2019)	Bank deposits to market capitalization (BDEPMCAP), Net investment in equity by mutual funds (EQMF), Number of IPOs and FPOs in a month (NIFPO) and Ratio of equity in the total issue (EQRATIO)
McClure, 2020	Price to book value ratio (PBR)
Proxies proposed in the present study	Economic risk premium (R_m–R_f) (ECORPREM) *i.e.* the difference between return on S&P BSE 500 and interest rate on 364 days T-bills, Exchange rate (EXRATE), Index of industrial production (IIP), Prime lending rate (PLR), Proportion of companies traded (COMPTRAD), GDP and Retail trading volume (RTVOL)

Source: Authors' Observations from the Review of Literature

Based on the study of literature and accessibility to the data, we have selected 30 variables as proxy to the investor sentiment. Some of these variables are theoretical proxies which will be validated

after analysis. We have applied principal component analysis on these 30 proxies and created sentiment sub-indices which are referred as final sentiment proxies throughout the paper.

4.2. Data Set

The monthly data on all the above proxies has been collected from various websites *viz.* CSO, BSE, CDSL, Department for Promotion of Industry and Internal Trade, IMF, indexmundi.com, NSE, Federal Reserve Bank of St. Louis, OFX, RBI and SEBI. Total 120 monthly observations of each proxy ranging from January 2010 to December 2019 have been collected. Due to the outbreak of pandemic, the data for the year 2020 and 2021 has not been used as the market has been very volatile at this time.

Chow-Lin method (Chow and Lin, 1971) has been used to disaggregate the quarterly series to monthly series. We have detected and removed the outliers from the data because the presence of these results in bad estimation of the model and bad prediction. We have applied ADF Test to check the stationarity of data series. 12 out of 30 series were found to be non-stationary and to make them stationary, first order difference was taken.

4.3. Measurement of Investors Sentiment

Our study does not differentiate between rational and irrational components and aims at measuring the sentiment at an aggregate level. We have applied principal component analysis to arrive at significant components and these components are then used to represent the investor sentiment. After extracting the factor loadings for original sentiment proxies and after procuring factor loadings for each orthogonal proxies, an index has been created using the formula given in equation 1.

$$SI = \alpha . \sum_{i=1}^{n} \beta_i . PC_i \tag{1}$$

Where,

SI = Generalized sentiment index

i = i^{th} principal component (i^{th} final proxy to the IS)

n = Total number of principal components (total number of final proxies)

α = Constant

β_i =Regression coefficient of i^{th} principal component

PC_i = i^{th} principal component

The data for some of the proxies takes some time to reveal the sentiment, accordingly the lagged data for such proxies has been used (Baker and Wurgler, 2006).

Total 11 principal components with eigen value more than 1 explain 75% of the total variance. The Kaiser-Meyer Olkin (KMO) came out to be 0.835 showing that principal component analysis of the variables is a good idea. We have obtained 11 series for these components and these are termed as final proxies to the sentiment. After the identification of maximum factor loadings, the proxies have been grouped based on their respective principal components in Table2, and these principal components have been named accordingly.

Table 2: Grouped Variables, Principal Components and Factor Loading

Principal Component	*Final Sentiment Proxy*	*Number of Proxies in the Given Principal Componen*	*Proxies*	*Factor Loading*
PC1	Market Performance Ratios	3	PBR	0.893
			DIVYIELD	-0.878
			BDEPMCAP	-0.757
			MKTTURN	0.947
PC2	Trading Indicators	3	NUMTRADE	0.955
			TRADEQTY	0.867
PC3	ADR, FPI, Economic Risk Premium and Equity Investment in MFs	4	ADR	0.602
			FPI	0.754
			ECORPREM	0.665
			EQMF	-0.812
PC4	BSI, FDI and Retail Trading Volume	3	BSI	0.862
			FDI	0.405
			RTVOL	0.861
PC5	Price Earning Ratio, Liquidity, Exchange Rate and Foreign Exchange Reserve	4	PER	0.524
			LIQECO	0.739
			EXRATE	0.600
			FEXRES	0.500
PC6	No. of Companies Traded, VIX and Oil Prices	3	COMPTRAD	0.622
			VIX	-0.466
			OILPRICE	0.811
PC7	Equity Ratio, Term Spread and GDP	3	EQRATIO	0.324
			TERMSPRE	0.827
			GDP	-0.674
PC8	PCR and High Low Index	2	PCR	-0.800
			HLI	0.545
PC9	Inflation	1	INFLAT	0.854
PC10	TVR, NIFPO and IIP	3	TVR	-0.453
			NIFPO	0.467
			IIP	0.792
PC11	Prime Lending Rate	1	PLR	0.836

Source: Authors' calculation based on PCA results obtained in IBM SPSS 20.

The equation 2 gives the generalized measure of sentiment index proposed by the present study.

$$SI = \alpha + \beta_1 PC_1 + \beta_2 PC_2 + \beta_3 PC_3 + \beta_4 PC_4 + \beta_5 PC_5 + \beta_6 PC_6 + \beta_7 PC_7 + \beta_8 PC_8 + \beta_9 PC_9 + \beta_{10} PC_{10} + \beta_{11} PC_{11} \quad (2)$$

Further, the coefficient of each principal component depends upon the regression analysis run and the type of the analysis.

4.4. Sentiment and Market Return Relationship

To examine the relationship of investors' sentiment with market return multiple regression analysis has been used taking final sentiment proxies as independent variables and market return as a dependent variable. To measure the market return we have used the percentage return of S&P BSE 500 Index. Following regression equation has been established (Equation 3) (generalized/weighted least squares) in the IBM SPSS 20 Statistics—

$$S\&P\ BSE\ 500\ Percentage\ Return = \alpha + \sum_{i=1}^{n} \beta_i PC_i \quad (3)$$

Where,

S&P BSE 500 Percentage Return = Market return

α = Constant

β_i = Regression coefficient of i^{th} principal component

PC_i = i^{th} principal component (final sentiment proxy)

5. Results and Data Analysis

5.1. Sentiment and Market Return

The results are in Table 3, 4 and Equation 4. The stepwise weighted regression gives 10 models and model 10 is found to be the best model and suggests that there is a relation of 10 PCs *viz.* PC1, PC2, PC3, PC4, PC5, PC6, PC8, PC9, PC10 and PC11, with the market return. The value of r^2 is 0.733 and adjusted r^2 is 0.701, which indicates that the relationship is strong and the model is worthy of attention. The p-values of the significant coefficients are less than 0.10, so we reject the null hypothesis that coefficients are zero.

Further, the variance inflation factor (VIF) is less than 10 for significant coefficients, which means that coefficients are not correlated to each other and multicollinearity is absent (Rawlings, Pantula and Dickey, 1998). Also, after looking at the p-value of F statistic and value of model number 10, which is less than 0.10, it can be concluded that the coefficients are not equal and independent of each other. The value of Durbin-Watson test statistic is near to 2, so it can be opined that the model is free from the autocorrelation (Durbin and Watson, 1971).

Table 3: Model Summary for the Relationship Between S&P BSE 500 Index Percentage Return and Sentiment

Model Number	*r*	r^2	*Adjusted* r^2	*Standard Error of the Estimate*
1	.534	.285	.277	.8502154
2	.690	.476	.464	.7320422
3	.748	.559	.545	.6748942
4	.791	.626	.610	.6246323
5	.814	.662	.643	.5972198
6	.825	.681	.659	.5836411
7	.836	.699	.674	.5705700
8	.845	.714	.688	.5589972
9	.851	.724	.695	.5524788
10	.856	.733	.701	.5466407

Source: Authors' calculation on the basis of Results Obtained in IBM SPSS 20.

Table 4: Multiple Regression Coefficients of Model 10

Dependent Variable: SPBSE500
Independent Variables: PC1, PC2, PC3, PC4, PC5, PC6, PC8, PC9, PC10 and PC11
Method: Weighted Least Squares

Variable	*Coefficient*	*Standard Error*	*t-Statistic*	*Probability*	*VIF*
PC1	.533689	.056382	9.465641	.0000	1.0000
PC2	.094769	.056382	1.680852	.0965	1.0000
PC3	.436683	.056382	7.745116	.0000	1.0000
PC4	-.124189	.056382	-2.202652	.0304	1.0000
PC5	.259582	.056382	4.604017	.0000	1.0000
PC6	.289030	.056382	5.126309	.0000	1.0000
PC8	-.099376	.056382	-1.762553	.0816	1.0000
PC9	.189376	.056382	3.358814	.0012	1.0000
PC10	.137133	.056382	2.432232	.0171	1.0000
PC11	-.132616	.056382	-2.352115	.0210	1.0000
C	-2.62E-08	.056084	-4.66E-07	1.0000	1.0000
r	.856138	F-Statistic		23.05745	
r^2	.732973	Probability of F-Statistic		.000000	
Adjusted r^2	.701184	Durbin-Watson Statistics		1.934096	

Source: Authors' Calculation on the basis of Results Obtained in IBM SPSS 20.

A multiple linear regression was calculated to predict the percentage return of S&P BSE 500 index based on 11 principal components *viz.* (PC1) Market Performance Ratios; (PC2) Trading Indicators; (PC3) ADR, FPI, Economic Risk Premium and Equity Investment in MFs; (PC4) BSI and Retail Trading Volume; (PC5) Price Earning Ratio, Liquidity, Exchange Rate and Foreign Exchange Reserve; (PC6) No. of Companies Traded, VIX and Oil Prices; (PC7) Equity Ratio, Term Spread and GDP; (PC8) PCR and High Low Index; (PC9) Inflation; (PC10) TVR, NIFPO and IIP; and (PC11) Prime Lending Rate. A significant regression equation was found ($F(8, 86) = 28.574, p < .100$), with an r^2 of 0.733 which implies that 73.3% variation in the market return is explained with the help of final proxies to the sentiment.

Participants' predicted return of S&P BSE 500 index is equal to 0.000(C) + 0.534 (PC1) + 0.095 (PC2) + 0.437 (PC3) - 0.124 (PC4) + 0.260 (PC5) + 0.289 (PC6) - 0.099 (PC8) + 0.189 (PC9) + 0.137 (PC10) – 0.137 (PC11). All the variables were significant predictors of percentage return of S&P BSE 500 Index.

As per the model number 10, there are 10 final sentiment proxies, the p-value of which is less than 0.10 *viz.* PC1, PC2, PC3, PC4, PC5, PC6, PC8, PC9, PC10 and PC11. So, we reject the secondary hypotheses H_{021}, H_{022}, H_{023}, H_{024}, H_{025}, H_{026}, H_{028}, H_{029}, H_{0210} and H_{0211} and conclude the significant sentiment return relationship. Further, the p-value of PC7 is more than 0.10, so there is no reason to reject the H_{0S7} which implies the insignificant relationship between market return and PC7. Hence this principal component is irrelevant in predicting the market return.

Most of the final sentiment proxies have a positive relationship with the market return, which suggest that investors are fearful when there is downfall in the market and market sentiment decreases.

Therefore, it can be conjectured that at the time of high (low) sentiment market return is also high (low). Thus, we have found that our calculated sentiment index is working well in the Indian stock market in the time period we have taken.

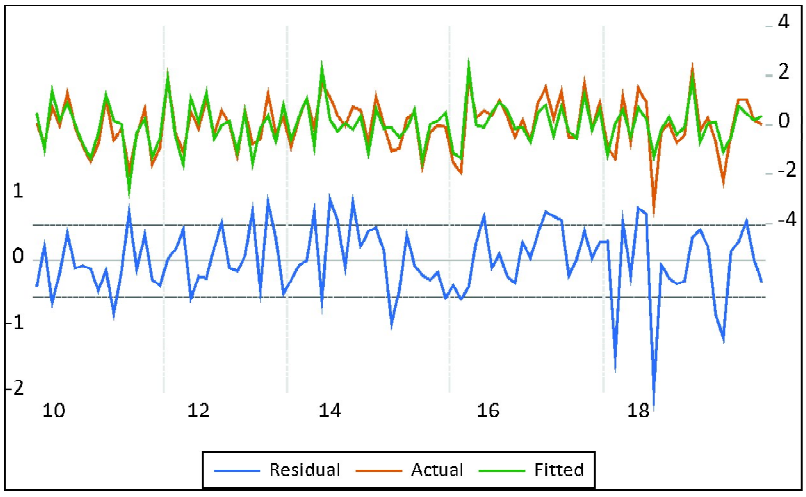

Figure 1: Actual, Fitted and Residual Graph

Source: Authors' Own Compilation

5.2. Testing the Model for Robustness

We have tested our weighted OLS model for robustness using different graphs and tests such as residuals graph, serial correlation test, heteroscedasticity test and CUSUM chart. Results and their interpretation are as follows:

The figure 1 shows that fitted values of the model are close to actual values. This implies that model fitting is good.

Table 6 gives the results of the Serial Correlation LM Test. The probability is 0.8750 which means that the null hypothesis of no serial correlation is accepted (at 10%). Thus, there is no serial correlation in our model. OLS estimators are not the best linear unbiased estimators when there is the presence of heteroskedasticity in the model.

Table 6: Breusch-Godfrey Serial Correlation LM Test

Null Hypothesis: No serial correlation at up to 2 lags			
F Statistic	.133747	Probability-F(2,82)	.8750
Observed r^2	.308894	Probability-Chi-Square(2)	.8569

Source: Authors' Own Compilation

We have checked our model for the presence of heteroscedasticity. Results given in table 7 show that the p-value is 0.9037 which means that null hypothesis of homoscedasticity is accepted. It means that our model is free from heteroscedasticity and regression coefficients are best unbiased linear estimators.

Table 7: ARCH Heteroskedasticity Test

F Statistic	.014729	Probability-F (1,92)	.9037
Observed r^2	.015047	Probability-Chi-Square (1)	.9024

Source: Authors' Own Compilation

We have used the CUSUM test to check the stability of regression coefficients of our model. Figure 2 shows that the model lies well within the 10% level of significance limits (V-mask) shown by the red lines. The analysis of the chart tells that the model is stable.

6. Conclusion

The current study examined whether sentiment of Indian investors can be measured and used to analyze its impact on the market return, by considering the S&P BSE 500 Index. PCA has been employed for the construction of investor sentiment index considering selected sentiment proxies which represent the sentiment of Indian investors. The analysis has been done using the weighted OLS method which

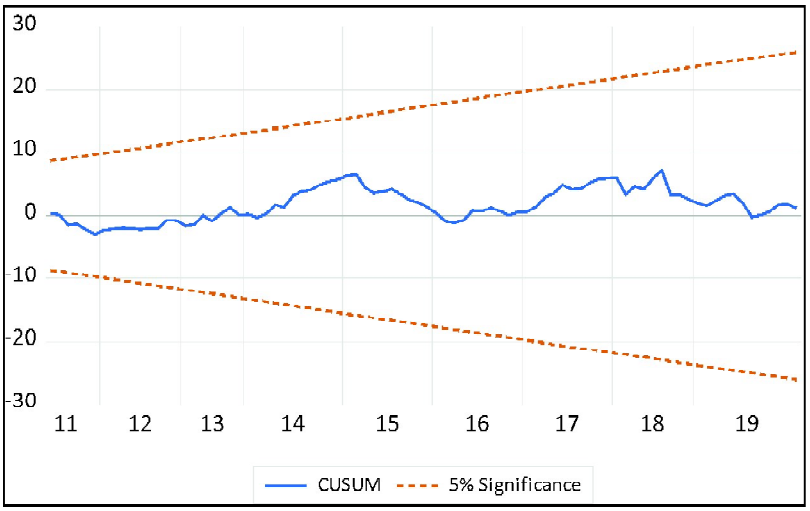

Figure 2: CUSUM Diagnostic Test Chart

Source: Authors' Own Compilation

gives more weight to the points near to the regression line and less weight to the points which are far away from the regression line. The weighted OLS improves the model fitting in the sense that it enhances the value of r and r^2.

Regression estimation results show that sentiment affects the market return significantly. Results imply that at the time of bullish sentiment investors earn higher returns and vice versa. Their money is lost when sentiment is bearish and it may turn into a snowball effect also.

On the basis of above findings, it can be concluded that the relationship of sentiment and market return is significant. We have established that market return can be predicted using some selected sentiment proxies *viz.* Market Performance Ratios; Trading Indicators; ADR, FPI, Economic Risk Premium and Equity Investment in MFs; BSI and Retail Trading Volume; Price Earning Ratio, Liquidity, Exchange Rate and Foreign Exchange Reserve; No. of Companies Traded, VIX and Oil Prices; PCR and High Low Index; Inflation; TVR, NIFPO and IIP; and Prime Lending Rate. These proxies were found to be significant predictors of the market return. Thus, the secondary hypotheses *viz.* H_{021}, H_{022}, H_{023}, H_{024}, H_{025}, H_{026}, H_{028}, H_{029}, $H_{0210}$and H_{0211} were rejected which implies the significant relation between the aforesaid final proxies and market return.

The final sentiment proxy "Equity Ratio, Term Spread and GDP" was found to be insignificant in predicting market return. Thus, the secondary hypothesis H_{027} is accepted which implies the insignificant relationship of "Equity Ratio, Term Spread and GDP" and market return. Our results are in conformity with Sehgal *et al.* (2010), Dash and Mahakud (2013b), Naik and Padhi (2016) & Pandey and Sehgal (2019) who also documented the significant impact of sentiment on market return.

Now the above findings posit questions like: can sentiment predict the portfolio return equally under different market conditions or different economic conditions or can sentiment be used to predict

the volatility or industrial return. We aim at answering these questions with further research in this area.

The results may help retail investors, policy makers and other decision. Researchers and market professionals need to pay more attention to sentiment as it has an important role to play in the Indian stock market. Further, an understanding of the sentiment may help firms to decide the timings for the securities issue. Asset pricing models and return models such as CAPM, Fama-French three and five factor models and Carhart four factor model need to incorporate the investor sentiment as one of the factors for better explanation of prices.

The data for the year 2020 and 2021 has not been used due to the pandemic and high volatility in the market during this period. Further, the findings are limited to the 30proxies selected and used for the present study. Use of survey methods or inclusion/exclusion of some proxies may expand the study.

We wish to conduct study taking data of pandemic period into consideration as this will help us in analyzing the effect of sentiment on return at the time of high volatility. Also, it will give us an idea whether this index works well in a situation of pandemic.

Also, we wish to analyze the effect of our index on market return in the context of developing foreign financial markets such as BRICS countries. However, in this process some elements of the index may have to be removed and some new elements may have to be added depending upon the non-availability or availability of the data.

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Examining the Productivity and Technical Efficiency of Industrial Sector using Stochastic Frontier Analysis in India

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Abstract: The purpose of this study is to measure the total factor productivity (TFP) of industrial sector in India at an aggregate level and find the impact of technical inefficiency and other input variables on TFP using stochastic frontier analysis approach. Based on the aggregated data for a period of 29 years, the output productivity is measured as net sales revenue of an industry in a particular year, whereas input is measured as the raw material cost, labor cost, capital employed and research and development (R&D) investment of an industry in a particular year. The TFP is measured based on the functional form of Cobb-Douglas model. The results of the study indicate that material, labor and R&D are the prime drivers of TFP for industrial sector and the industrial sector is suffering from poor productivity due to technical efficiency that is decreasing over time.

1. Introduction

Productivity has always remained a major concern for the economists. It is because with the "same amount of inputs, certain countries, sectors, and firms produce more and others produce less" (Kim and Loayza, 2019). Hence, productivity has always been related to the use and availability of resources (Pekuri *et al.*, 2011) and has remained a central theme for firms, sectors, and countries. The recent slowdown in the economies across the globe has led to more intense research on the sources of growth and productivity. Studies of Thye *et al.* (1997), Den and Papell (1998), Easterly (2001) and Jorgenson *et al.* (2008) are indications of that.

Off late, Indian industrial sector has also witnessed a steep decline in its contribution towards GVA. According to the data released by Ministry of Statistics and Programme Implementation (MOSPI, 2021), the contribution of industrial sector is 27.47% towards India's gross value added (GVA). If we examine individually, manufacturing contributes nearly 15.13%, construction 7.55%, mining 2.55%, electricity and water supply 2.65% towards GVA. The growth patterns of productivity in the

manufacturing sector of Indian firms were studied by several researchers post liberalization (Das *et al.*, 2017; Deb and Ray, 2013; Ghosh, 2010; Kathuria *et al.*, 2010; Virmani and Hashim, 2011; Sahoo and Narayan, 2018; Sahoo *et al.*, 2022). It was found that the sector was performing better pre-reforms. It was attributed to "technological obsolescence, gradual adoption of new technology and slow effect of learning by doing" (Das *et al.*, 2017; Virmani and Hashim, 2011).

Similarly, Indian industrial sector, despite being one of the major contributors towards economic growth has concerns about poor productivity. A large body of literature exists in the domain of productivity and factors driving productivity. However, those studies have focused on manufacturing and agricultural sector (Satpathy *et al.*, 2017; Das *et al.*, 2017; Deb and Ray, 2013; Ghosh, 2010; Kathuria *et al.*, 2010; Frija *et al.* 2015; Virmani and Hashim, 2011). Very recently, Kumar and Paul (2019) measured the total factor productivity using the Levinsohn–Petrin framework for 62 manufacturing firms using the data for the period of 2008-2015. However, authors in this study discovered a major research gap. Most of the studies in India have been carried out in manufacturing sector and that too at firm level and they use convention panel data regression models. Therefore, keeping in mind the above research gap, authors developed this study with an objective to measure the total factor productivity (TFP) of industrial sector in India at an aggregate level and find the impact of technical efficiency and other inputs on TFP using stochastic frontier analysis (parametric) approach. A few studies in the past have also compared the performance of panel data models using the same panel dataset (Kumbhakar and Heshmati, 1995; Greene, 2005a, 2005b; Emvalomatis, 2009; Wang and Ho, 2010; Kumbhakar *et al.*, 2014; Masoomeh *et al.* 2016). In this way the study contributes to the body of knowledge. The rest of the study is divided into five sections. The next section deals with systematic literature review followed by research methodology, data analysis, discussion on results and conclusion.

2. Review of Literature

2.1. Measure of Productivity

Measuring and comparing the productivity across firms, countries and sectors is not an easy task because there are no standard measures of productivity. O'Mahony and Timmer (2009) in their study quoted that "measuring productivity is a complex statistical process that includes numerous steps which aim at making data comparable over time and across enterprises and countries". Organization for Economic Cooperation and Development (OECD) defined productivity as "a ratio of a volume measure of output to a volume measure of input use" (OECD, 2001). Here, the output and input used for productivity calculation could be expressed in physical (quantities) or financial (value) terms (Frija *et al.*, 2015).

Chau and Walker (1998) defined and measured productivity through total factor productivity (TFP) and it measured the changes of aggregate real output. On the other hand, Ondrej *et al.* (2012), measured productivity by using labor costs, materials, and service value as measure of input and the total revenue of the project as a measure of output. Similarly, Tran and Tookey (2011) measured productivity in terms of capital, investment, labor, and other suitable inputs and outputs. Bankeret al. (1984) estimated the firm's productivity through a process that involves summing the cost of goods

sold, selling and general expenses, and capital expenditure and then dividing by output, which was operationalized as sales revenue. Similar approach was adopted by Balsam et al. (2011) and Bryan *et al.* (2013). However, these measures suffer from the problem of subjectivity of the evaluator that can lead to inaccurate and misleading results.

Amongst the measures that have been used by scholars in the past to derive productivity, the most popular one is total factor productivity (TFP). It uses the number of factor inputs in production and, therefore, is more suitable for performance measurement and comparisons across firms and sectors over time (Coelli *et al.*, 2005). There are several ways of measuring TFP, however, the statistical approach of stochastic frontier analysis(SFA) is the most popular (Coelli *et al.*, 2005; Greene, 2008; Johnes, 2004; Kumbhakar*et al.* 2015; Parmeter, 2014).

2.2. Technical Efficiency and Productivity

Variations in the ease of resource reallocation can explain the reasons behind higher productivity of certain countries compared to others. For instance, studies also point to the level of education, regulatory environment, innovation, and technology/research and development (Furman and Hayes, 2004; Griffith *et al.*, 2004; Comin *et al.*, 2008) as drivers of productivity.

Studies of various researchers (Sahuand Narayanan, 2011; Mendi, 2007; Hasan, 2002; Scott-Kemmis and Bell, 1988; Lall, 1987) found that embodied technological intensity helps improve productivity. It is through import of capital goods, which results in better technology infusion.

The Griffith *et al.* (2004) indicates that R&D is statistically and economically important in both technological catch up and innovation. According to them human capital also plays a significant role in productivity growth. Foreign competition drives inefficient domestic producers to exploit scale economies, eliminate waste, adopt best practice technologies, or shut down (James, 2000).

Many of the empirical studies have found the significant role of R&D activities in the determination of productivity (Doraszelski and Jaumandreu, 2013; Griffith *et al.*, 2004; Hall and Mairesse, 1995; Harhoff, 1998; Kafouros, 2005; Leachman *et al.*, 2005; Ray, 2014; Voutsinas and Tsamadias, 2014).

Kalaiand (2020) using the stochastic frontier production approach found the production factors have a significant effect on productivity and the total factor productivity. Overall, the average technical efficiency is decreasing internationally with wide intra-group industrial variability in some countries (Kim and Han, 2001; Quintero *et al.*, 2008; Baten *et al.*, 2009; Philips *et al.*, 2012). There have been few studies that have analysed the productivity trends of Indian manufacturing in the after years of the global crisis (Das *et al.*, 2017; Singh, 2017; Goldar *et al.*, 2017; Goldar, 2015) and suggested that overall, there is a decline in productivity. However, the literature has been majorly silent on the impact of technological efficiency on productivity in India barring few studies. For instance, Sahoo and Narayan (2018) revealed in their study that the TFP growth rates of automobile industry in India are driven by technical efficiency change not by technical progress. Further, in a recent study, Sahoo *et al.* (2022) examined the nexus between export, productivity, and competitiveness in the Indian manufacturing sector and tested the "learning by exporting" and "self-selection" hypotheses using firm-level data relating to Indian manufacturing firms relating to period from 1994 to 2017. The empirical analysis supported the "learning by exporting" hypothesis, but does not support the "self-selection" hypothesis.

They also investigated the impact of export on competitiveness, and the results indicated a positive relationship.

Overall, the literature review can be summed up as: (i) There are several ways to measure the TFP or TFPG, however, no standard procedure exist;(ii) Most of the studies in the past have been carried out at a firm level using the conventional panel regression despite its inherent weaknesses;(iii) Stochastic Frontier Econometric (SFE) modelling is more appropriate approach to model the productivity; however, it has not been used extensively by scholars so far, at least not in India; and (iv) The SFE models help us better understand the impact of technological efficiency on productivity and there is recent international evidence to suggest that average technical efficiency is decreasing across industries. Hence, keeping in mid the above, authors in the study developed an appropriate research methodology.

3. Research Methodology

Every productivity measure relates to a specific producer unit. The current study has taken industry as the producer unit. As in most frontier studies, the Cobb-Douglas model is evaluated as a technology representation (De la Fuente *et al*., 2009; Cysneiros *et al*., 2019).

The following is the general forms ofthe Cobb-Douglas modelafter linearization.

The Cobb-Douglas Model

$$\text{Ln}\,(Y_{i,t}) = \beta_0 + \Sigma\,\beta_m \ln(X_{m,i,t}) + v_{i,t} - u_{i,ts} \qquad \text{(Equation 1)}$$

Here, $Y_{i,t}$ is the output of an industry i during period t; $X_{m,i,t}$are the various inputs of industry i during period t; $v_{i,t}$ is the random disturbance assumed as normally distributed, with a zero mean and constant variance; and $ì_{i,t}$ is a non-observable and non-negative random error associated with the technical inefficiency. The functional forms of the equation have been discussed in the data analysis section.

The functional forms of the Cobb-Douglas Model (equation 1) and is shown below in equation 2.

$$\text{Ln}(S_{i,t}) = \beta_0 + \beta_1 \ln(M_{i,t}) + \beta_2 \ln(L_{i,t}) + \beta_3 \ln(K_{i,t}) + + \beta_4 \ln(R\&D_{i,t}) + v_{i,t} - u_{i,t} \qquad \text{(Equation 2)}$$

Here, in Cobb-Douglas Model, the error term is divided into two main components. These are the usual random noise component and the inefficiency component. The noise component is measuring measurement errors and other random errors which are beyond the industries' capacity. The other component, $ì_{i,t}$ is assumed to be independently and identically distributed, and it takes a value of 1 when the industry is fully efficient, and a value lower than 0 when the industry faces some technical inefficiencies. Thus, the value of u measures the firm efficiency level which is also expressing how far industries' given output is from its potential output compared other industries of the sample.

The current study uses the data of 10 non-financial industries at an aggregate level. Sales of the industry (Schmidt and Campión, 2004; Tran and Tsionas, 2009) is considered as output of the respective industry. The inputs considered are labor input andcapital input (De la Fuente *et al.,* 2009), material input and investment in R&D (Table 2). For the study, the data of these 10 industries for 29 years (1991-2019) is collected from center for monitoring of Indian economy (CMIE). The study period is long enough to conduct a times series analysis, as well as it consists of 10 panels. The list of industries for which the data is collected is provided in Table 1.

Table 1: List of Industries Included in the Sample

S. No.	*Industry*
1.	Electricity Generation
2.	Aluminum
3.	Cement
4.	Construction Equipment
5.	Construction
6.	Mining
7.	Paint
8.	Pharmaceutical
9.	Plastic Furniture Flooring
10.	Steel

Source: Authors' Own Compilation

Table 2: Variable Definition

Variable	*Definition*
Dependent Variable	
Aggregated Industry Sales (S)	Industrial output is measured as net sales revenue of an industry in a particular year.
Independent Variable	
Material (M)	Industrial input is measured as the raw material cost of an industry in a particular year.
Labor (L)	Industrial input is measured as labor cost of an industry in a particular year.
Capital (K)	Industrial input is measured as Capital employed of an industry in a particular year.
Research and Development (R&D)	Industrial input is measured as the amounts of money spend on R&D by an industry in a particular year.

Source: Authors' Own Compilation

4. Data Analysis

The data analysis here is divided into two sections. In section one, basic descriptive statistics of the data is presented. Table 3 shows the mean, standard deviation (SD), Skewness and kurtosis data of all 10 industries.

Table 3: Descriptive Analysis

Measure (IN Millions)	*Y*	*L*	*K*	*M*	*RD*
			Electricity Generation		
Mean	1499791.00	102404.80	5015019.00	747722.90	832.07
SD	1419073.00	90759.23	5194840.00	759968.70	1083.55
Skewness	0.80	0.61	0.92	0.78	1.39
kurtosis	2.25	1.92	2.34	2.09	3.34
			Aluminum		
Mean	183598.10	13258.97	245632.30	84780.72	281.21
SD	179055.70	12590.31	218134.70	105792.20	401.16
Skewness	2.52	1.78	1.60	2.55	3.72
kurtosis	10.65	6.41	5.36	10.61	17.63
			Cement		
Mean	599577.10	32785.10	695581.90	97295.83	512.41
SD	583759.40	33300.72	752753.90	97899.92	450.54
Skewness	0.77	1.01	1.06	0.79	0.79
kurtosis	2.07	2.59	2.65	2.11	2.58
			Construction Equipment		
Mean	159715.50	16281.10	94193.79	87760.03	766.38
SD	172563.30	16827.84	104408.80	97207.62	812.71
Skewness	1.10	1.13	0.92	1.28	0.88
kurtosis	3.18	2.89	2.11	3.96	2.28
			Construction		
Mean	1759591.00	117899.00	3113918.00	579433.20	1021.17
SD	2057497.00	133335.20	3869940.00	703014.70	1286.62
Skewness	0.80	0.85	0.82	0.83	1.00
kurtosis	2.13	2.27	1.98	2.16	2.58
			Mining		
Mean	1316733.00	239317.00	1731476.00	105104.30	2656.45
SD	1074429.00	199659.50	1514741.00	87515.76	2644.22
Skewness	0.50	0.73	0.71	0.74	1.07
kurtosis	1.83	2.22	1.81	2.38	3.20

Measure (IN Millions)	*Y*	*L*	*K*	*M*	*RD*
			Paint		
Mean	118966.70	6173.48	50861.45	51479.34	624.07
SD	121245.60	6534.82	57146.12	53398.29	666.44
Skewness	0.97	1.24	1.44	1.02	1.14
kurtosis	2.47	3.27	4.01	2.75	3.24
			Pharmaceutical		
Mean	851476.90	308689.10	1077871.00	308689.10	39887.14
SD	874474.30	310849.10	1258162.00	310849.10	46808.00
Skewness	0.98	0.91	1.11	0.91	1.05
kurtosis	2.54	2.40	2.82	2.40	2.76
			Plastic Furniture Flooring		
Mean	99143.38	5155.38	71311.79	58779.62	102.93
SD	103403.70	6320.90	68769.43	62771.71	208.39
Skewness	0.88	1.36	0.71	0.86	2.36
kurtosis	2.26	3.56	1.91	2.18	6.93
			Steel		
Mean	1687301.00	104110.40	1978962.00	913753.10	1966.00
SD	1539311.00	83052.00	1875064.00	908912.00	2007.68
Skewness	0.65	0.50	0.68	0.84	1.10
kurtosis	2.08	1.79	1.77	2.51	2.95
			Aggregate		
Mean	827589.50	94607.43	1407483.00	303479.80	4881.46
SD	1219913.00	163070.20	2686782.00	540790.90	18767.17
Skewness	1.97	2.83	3.01	2.58	5.59
kurtosis	6.33	11.94	12.78	9.38	35.60

Source: Authors' Own Compilation

Results of table 3 suggest that construction is the largest sector among the sample followed by steel, and electricity generation. The data show high Skewness and Kurtosis, which is a sign of non-normal data. Hence, all the study variables have been transformed innatural log function. Further, the data is also tested for heteroscedasticity to make sure that the assumption of normality is not violated.

Table 4: Correlation Matrix

	LnY	*LnL*	*LnCE*	*LnM*	*LnRD*	*Variance inflation factor (VIF)*
LnY	1					
LnL	0.9379*	1				8.18
LnCE	0.2707*	0.3311*	1			1.55
LnM	0.9337*	0.8456*	0.1591*	1		3.73
LnR&D	0.7652*	0.8410*	0.0309	0.7370*	1	4.47

*Significant at 1%
Source: Authors' Own Compilation

Table 4 shows the correlation and VIF of all the study variables. It is important to access Collinearity status of the data. It is a situation where two or more predictor variables in a statistical model are linearly related (Hair *et al*., 2010). It is recommended that an independent variable should be dropped from the study if it exhibits VIF >10 (Hair *et al.,* 2010). The results of Table 4 show that the correlation between material and labor (0.845) and between LnR&D and LnL (0.841) is high. However, the VIF values are <10; and the hence, all the variables were retained for further evaluation.

Table 5: Levin-Lin-Chu Unit-Root Test

Variable	*Adjusted t**	*p-value*
LnY	-12.2978	0.000*
LnL	-11.9751	0.000*
LnM	-12.6986	0.000*
LnK	-3.5691	0.0020*
LnR&D	-11.7735	0.000*

*Significant at 1%
Source: Authors' Own Compilation

Ho: Panels contain unit roots Ha: Panels are stationary

Now, the study variables are tested for Stationarity. Stationarity means that the statistical properties of a process generating a time series do not change over time. Levin-Lin-Chu unit-root test is used to identify the presence of unit root in the panel data. The results are presented in Table 5. The results of Levin-Lin-Chu unit-root test suggest that all the study variables are stationary.

Finally, the base ordinary least square (OLS) model was also tested for heteroskedasticity using Breusch-Pagan / Cook-Weisberg test for heteroscedasticity and the results show that the chi square value is 1.14 (p=0.2860). Hence, the null hypothesis of no heteroscedasticity is accepted and the authors can proceed with stochastic frontier analysis.

Finally, the equation 2 is estimated using Cobb-Douglas model. The results are presented in Table 6.

Table 6: Stochastic Frontier Analysis for Cobb-Douglas Production Function

Variable	*Time-invariant inefficiency model*			*Time-varying decay inefficiency model*		
	β	*Std. Err.*	*P>z*	*β*	*Std. Err.*	*P>z*
LnL	0.213*	0.036	0.000	0.213*	0.036	0.000
LnK	-0.008	0.005	0.131	-0.008	0.010	0.423
LnM	0.680*	0.029	0.000	0.680*	0.029	0.000
LnR&D	0.065*	0.010	0.000	0.065*	0.010	0.000
Intercept	3.202*	0.183	0.000	3.199*	0.221	0.000
Estimate u	0.831*	0.222	0.000	0.831*	0.221	0.000
Ln σ^2_S	-1.401	0.571	0.014	-1.400	0.572	0.014
Estimate γ	3.003*	0.606	0.000	3.004*	0.606	0.000
σ^2_u	0.235	0.141		0.235	0.141	
σ^2_v	0.012	0.001		0.012	0.001	
$\sigma^2_S = \sigma^2_v + \sigma^2_u$	0.246	0.141		0.247	0.141	
Gamma $\gamma = \sigma^2u/\sigma^2_S$	0.953	0.027		0.953	0.027	
H	NA			-0.00004	0.002	0.979
Wald Test	39341.400*			34316.640*		

*Significant at 1%

Source: Authors' Own Compilation

The Stochastic Frontier analysis for Cobb-Douglas production function is available in two variants, i.e., Time-invariant inefficiency model and Time-varying decay inefficiency model. In Time-invariant inefficiency model the assumption is that inefficiency is time invariant. The results suggest that material, labor, and R&D investment is a positive driver of the industrial productivity in India. Moreover, it can be observed that, 95.3% of the deviation in productivity is due to technical inefficiency ($\gamma = 0.953$), in addition to a technical efficiency that decreases over time ($\eta<0$), with a variance in the distribution of technical efficiency (σ^2_S) estimated in 0.246. To measure and rank the TFP of different sectors, authors used the β coefficient weights and estimated the P score. According to the P score, results in Table 7 and figure 1 show that steel sector have the highest productivity followed by electricity generation and pharmaceutical.

Table 7: Analysis of Productivity Across Sectors

S.No.	*Industry*	*P Score*	*Rank*
1	Electricity Generation	14.51	2
2	Aluminum	12.69	8
3	Cement	12.94	6
4	Construction Equipment	12.72	7
5	Construction	13.73	4
6	Mining	13.67	5
7	Paint	12.18	9
8	Pharmaceutical	14.46	3
9	Plastic Furniture Flooring	11.93	10
10	Steel	14.79	1
	Total	13.36	

Source: Authors' Own Compilation

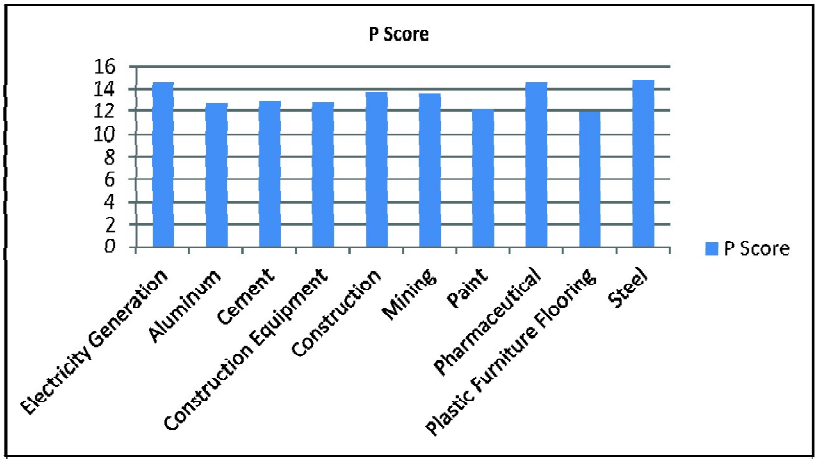

Figure 1: Analysis of Productivity across Sectors

Source: Authors' Own Compilation

To understand how change in technical efficiency has resulted in the change in p score, authors divided the study period into two parts (1991-2005 and 2006-2019). This division was done on the basis that the impact of economic reforms, which were initiated in 1991-92 must be visible post 2005-06. However, the results in Table 8 indicate no major change.

Table 8: Stochastic Frontier Analysis for Cobb-Douglas Production Function

Variable	*Time-invariant inefficiency model (Pre-2005)*			*Time-invariant inefficiency model (Post-2005)*		
	β	*Std. Err.*	*P>z*	*β*	*Std. Err.*	*P>z*
LnL	0.267*	0.047	0.000	0.253*	0.056	0.000
LnK	0.009	0.014	0.523	-0.022	0.015	0.156
LnM	0.641*	0.037	0.000	0.660*	0.046	0.000
LnRD	0.048*	0.017	0.004	0.063*	0.012	0.000
Intercept	2.878*	0.305	0.000	3.194*	0.309	0.000
Estimate u	0.689*	0.245	0.005	0.776*	0.277	0.005
Ln σ^2_S	-1.564	0.611	0.011	-1.339	0.609	0.028
Estimate γ	3.033*	0.653	0.000	3.058*	0.651	0.000
σ^2_u	0.200	0.128		0.250	0.160	
σ^2_v	0.010	0.001		0.012	0.001	
$\sigma^2_S = \sigma^2_v + \sigma^2_u$	0.209	0.128		0.262	0.160	
Gamma $\gamma = \sigma 2u/\sigma 2S$	0.954	0.029		0.955	0.028	

*Significant at 1%

Source: Authors' Own Compilation

Based on the coefficient values, the revised P scores are calculated pre-2005 and post 2005. Though, there is no major deviation, it can be observed that the overall productivity has declined post 2005 in most of the sectors except for electricity generation and aluminum and construction equipment (Table 9 and figure 2).

Table 9: Productivity Scores before and after 2005

S. No.	*Industry*	*P Score (Pre-2005)*	*P Score (Post 2005)*
1	Electricity Generation	14.75	14.84
2	Aluminum	12.96	13.02
3	Cement	13.25	13.18
4	Construction Equipment	12.94	13.11
5	Construction	14.05	13.79
6	Mining	13.98	13.96
7	Paint	12.26	13.12
8	Pharmaceutical	14.66	13.34
9	Plastic Furniture Flooring	12.09	13.56
10	Steel	14.96	13.13
	Average	13.59	13.50

Source: Authors' Own Compilation

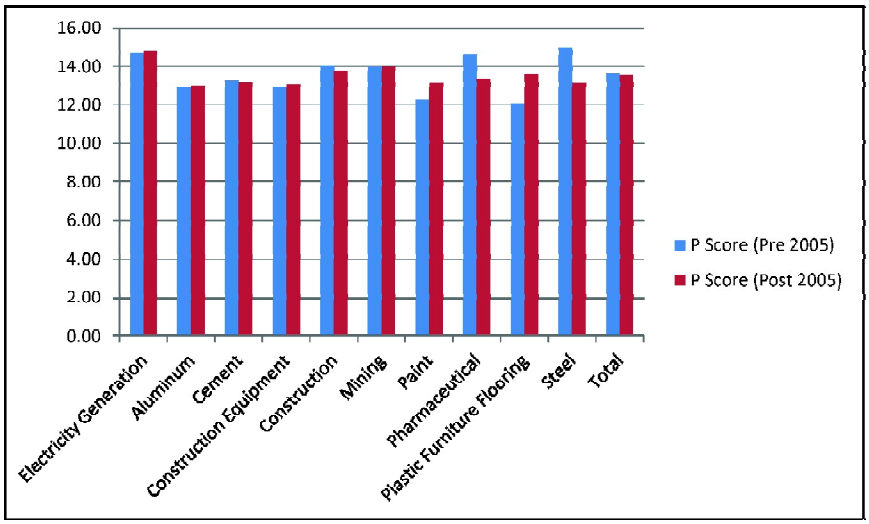

Figure 2: Comparative P Score

Source: Authors' Own Compilation

A comparison of the P scores across years with growth in gross domestic product (GDP) is presented in Table 10 and figure 3. These results highlight that there is a consistent pattern between GGDP and P Score. In fact, GGDP is a leading indicator of the P Score.

Table 10: P Score and Growth in GDP

Year	*P Score*	*GGDP*
1991	14.89	7.41
1992	14.96	8.26
1993	15.02	6.80
1994	13.35	8.85
1995	12.86	3.80
1996	12.86	4.82
1997	13.85	7.86
1998	14.87	6.53
1999	13.24	4.05
2000	13.21	7.92
2001	12.54	7.55
2002	13.51	7.66
2003	14.52	6.39

contd. table 10

Year	*P Score*	*GGDP*
2004	13.59	7.86
2005	12.61	6.18
2006	13.10	7.92
2007	13.52	8.06
2008	14.37	5.46
2009	13.23	3.84
2010	12.27	7.57
2011	13.62	3.09
2012	12.32	4.75
2013	13.81	5.24
2014	14.43	8.50
2015	12.04	5.53
2016	11.48	5.48
2017	11.83	6.66
2018	11.58	1.06
2019	13.96	8.00

Source: Authors' Own Compilation

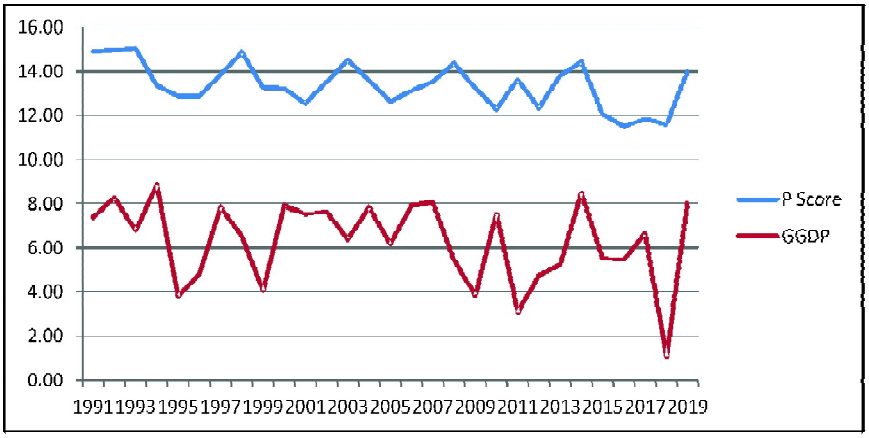

Figure 3: P Score and Growth in GDP

Source: Authors' Own Compilation

5. Discussion and Conclusion

The paper started with the objective to measure the total factor productivity (TFP) of industrial sector in India at an aggregate level finds the impact of technical efficiency and other inputs on TFP using

stochastic frontier (parametric) approach. The results of the study indicated that material, labor, and R&D are the prime drivers of productivity in industrial sector in India. Apart from this, the results of stochastic frontier analysis using Cobb-Douglas production function clearly indicated that industrial sector in India is suffering from poor productivity due to technical efficiency that is decreasing over time. To confirm these findings, authors further divided the data into two parts, i.e., pre-2005 and post 2005. The results did not change drastically. In fact, it further strengthens the view that productivity is on a continuous decline. According to the results 95% of this decline can be attributed to technical efficiency, which is huge. The results are in line with Kim and Han (2001), Quintero *et al.* (2008), Baten *et al.* (2009), Philips *et al.* (2012) and Fuente-Mella *et al.* (2020). These scholars in their respective studies have also concluded that productivity in their respective country is on a decline due to technical efficiency which is declining over time. While examining the productivity of manufacturing sector in India, Kumar, and Paul (2019) also came to a similar conclusion, however, they attributed this poor productivity to imperfections in labor and product market.

6. Recommendations

The study contributes to the body of knowledge as to the best of author's knowledge, this the first study in India that measures and examines the productivity of industrial sector using stochastic frontier analysis approach. The industrial sector of India may be benefited from studies as that are presented by us in the literature review as well as benefit from the findings of the current study. Technical inefficiency, which is declining over time, is a major reason for the poor productivity. Thus, like what Fuente-Mella *et al.* (2020) concluded, incorporating information technologies with data analytics platforms can help develop the industrial sector improve its performance. The states and the central government are recommended to have a look at this problem and help industrial sector improve technical inefficiency. They may provide incentives for modernization and upgradation of machines and equipment to help industry. In addition, material, labor, and R&D (innovation) are found to be key drivers of the industrial output. Hence, the sector must focus on improving material and labor productivity as well as use R&D investments to generate additional value and technical efficiency. All this is not going to be easy without government intervention. Hence, the respective governments need to help the sector. A complete digital transformation and data science, and the concept of "Industry 4.0,"can bring the industrial sector of India at par with USA, Germany, and China.

7. Limitations and Scope

Despite best efforts, there are a few limitations of the study. The first and the foremost is the limited sample size. The study is restricted to only 10 industries within industrial sector. Second, the study is using the data at an aggregate industry level rather than the firm level. However, despite these limitations, the study does make important contribution to the body of knowledge.

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Price Synergy in Spot and Future Market: A Study on Nickel Trade at MCX, India

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JEL Classification

C01, D53, G13, G14.

Abstract: The paper is an attempt to identify the dynamic relationship between the spot and futures of nickel traded at MCX, India. The study is based on secondary data for a period ranging from 2013 to 2020. Augmented Dicky-fuller test and Phillip Perron test, Cointegration test, Granger causality test and variance decomposition are the empirical methods used in the study. The study confirms the existence of a long run relationship between the markets. In long run, the unidirectional causal effect is found between the cash and futures market of nickel whereas in the short run bidirectional causality is observed. In the long run futures market of nickel influences, the price discovery of the cash market whereas in the short run both markets influence each other for price discovery. The futures market of nickel traded at MCX, India reflects weak exogeneity in its cash market whereas the cash market of nickel reflects exogeneity in its futures market.

1. Introduction

After lifting restrictions on commodity trading the futures market has been consistently showing strong and steady growth. Producers, consumers, importers, exporters, speculators, and others are actively participating for the advantage of hedging, price discovery, price risk management etc. MCX (Multi Commodity Exchange) of India accounts for about 94 percent of the total market share. Besides hedging, price discovery, and price risk management speculators also participate for profit (Eswaran and Ramasundaram, 2008). Hence futures market reflects the expectations of all the market participants (Park and Lim, 2018). Among other commodities, base metals are considered the backbone of industrial production as it is used for manufacturing capital goods. Among other base metals nickel is the main alloying metal used for the production of stainless steel. It is also used in electro-plating, coins, chemicals,

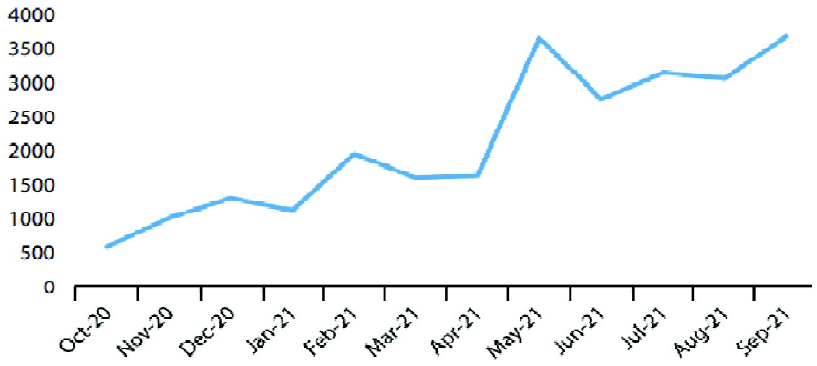

Figure 1: MCX METAL Futures Monthly Trade Value (Rs. Crore)

Source: CIYB 2021, MCX, India.

Figure 2: Average Daily Turnover in Base Metal Futures on MCX, India (Rs. Crore)

Source: CIYB 2021, MCX, India

aerospace industries, electronic gadgets etc. India is completely dependent on nickel imports and major import sources for India are Japan, Norway, China, USA, Netherlands etc.

The monthly trade value of the metal index traded at MCX, India has been showing a significant increase since its introduction. The nickel constitutes about 25.21 per cent share of the index. In the year 2022, the share of nickel ranks second after copper in the metal index. The average daily turnover in the base metal futures has been showing robust growth since the year 2006. In the year 2013 Government imposed Commodity Transaction Tax, therefore the growth declined sharply which is visible from the above figure. The average daily turnover in base metal futures traded on MCX has been constantly increasing since 2014.

Keeping the growth momentum of the metal futures into consideration, the present study empirically evaluates the dynamic relationship between cash and futures series of nickel for price discovery. In the present study, the unit root test (ADF and PP test) is used for checking the unit root properties of the price series and then the existence of the long-run relationship is verified. The

influential direction of price discovery between two markets of nickel is examined through causality checks. The variance decomposition test is employed to identify the endogeneity and exogeneity between the cash and futures market of nickel traded at MCX, India.

2. Review of Literature

Since the evolution of the commodity futures market extensive studies have been conducted to understand market efficiency, hedging, price risk management etc. By supporting Antoniou and Ergul (1997), Bakaert and Harvey (1997) found that emerging countries' commodity markets show poor information process capability as compared to developed economies. According to Sahadevan (2002), commodity cash and futures markets are not integrated. His study is based on six commodities that are traded in twelve regional commodity exchanges. This is further supported by Naik and Jain (2002). Unlike developed markets, the Indian futures market does not dominate the price discovery process (Kumar and Pandey 2011). Bose (2008) used the daily cash and futures indices from 2005 to 2007 and rejected the null of cointegration between the cash and futures market. By extending Bose's (2008) work Ali and Jabir (2011) employed the same methodology on selected twelve commodities and found the mixed directions of causality between the cash and futures market. By employing the vector error correction (VEC) model over a span of five years Srinivasan (2011) concluded that the cash market dominates futures for effective price discovery. His study was on futures indices. Panda and Dey (2022) in their study accepted the randomness of the futures market.

David and Shaun (2011) examined the price discovery process of futures by considering ten commodities as their sample and concluded that futures price doesn't contribute to the price discovery process of cash. Sehgal *et al.* (2012) found that except for turmeric futures other futures market effectively discovers the prices of their cash market. By supporting Sehgal *et al.*, (2012), Edward and Rao (2013) found causality from futures to cash markets. In contrast, Arora and Chandar (2017) supported the existence of bidirectional causality between the cash and futures markets. Clark (2021) supports the presence of the bidirectional causality between the cash and futures series of aluminium.

Raza *et al.* (2018) studies the different hedging strategies by considering the real estate and commodity index of the US and supported that the commodity index can be used for hedging real estate stocks. Olson *et al.* (2019) studied the energy market and concluded that the cross-hedging strategy is not effective for managing price risk. In contrast, Chen and Tongurai (2021) used a cross-hedging strategy and found that zinc and nickel contracts can be effectively used for managing the lead and tin cash exposure respectively. Their study is focused on the Chinese base metal market. Pani *et al.* (2022) reject the presence of a lead-lag relationship between cash and the futures market.

2.1. Research Gap

Indian commodity futures market has been growing exponentially (Pani *et al.*, 2022). By considering the growth momentum of the commodity futures segment of India, the present study is undertaken. Even though there has been extensive research conducted in commodities futures markets, their results are inconclusive and the studies relating to base metal futures of India are very less and the time horizons are also different. Moreover, research undertaken prior to 2013 completely ignored the growth

momentum of the Indian commodity market. There are divergent views regarding the price discovery mechanism between the two markets. In light of the above fact, the present study evaluates the influential direction of price discovery between the cash and futures market of nickel. For the said purpose, the study uses vector error correction methodology, causality checks and variance decomposition test.

3. Objectives of the study

The broad objectives of the study are as follows:

- To identify the influential direction of price discovery between the cash and futures market of nickel.
- To evaluate the hedging efficiency of the nickel futures market.

4. Research Methodology

Nickel cash and futures closing prices are downloaded from the official website of MCX, India for a period of seven years. Cash Price indicates cash price (₹ / Kg.) of nickel prevails in Mumbai, India while futures price refers to near month futures contracts (24 MT contract) of nickel traded at MCX, India. The historical daily price series are transposed first into their natural logarithm form and then econometric tools are used.

4.1. Unit Root Test

The unit root properties of cash and futures price series are checked through unit root tests. The present study uses ADF as well as the Phillip Perron unit root test to check the unit root properties of the cash and futures prices of nickel. The random walk-based regression equation with a drift can be stated as:

$$\Delta y_t = \varphi + \partial y_{t-1} + \Sigma\theta\Delta y_{t-j} + u_t \quad (1.1)$$

4.2. Co-integration Test

TheJohansen's cointegration test (Johansen, 1995) is used to identify the existence of a long-run relationship between the cash and futures price nickel. For the said purpose Johansen's cointegration (intercept in the cointegrating equation, no deterministic trend) can be stated as (Johansen, 1995):

$$H_1(r): P_{y_{t-1}} + Bx_t = \alpha(\beta' y_{t-1} + P_0) + \alpha_\perp \gamma_0 \quad (1.2)$$

The null hypothesis is tested against the existence of a cointegrating vector. The study considers both trace (λ_{trace}) as well as maximum eigenvalue (λ_{max}) test criteria.

4.3. Vector Error Correction Model (VECM)

The vector error correction model is designed for non-stationary series that are stationary at I(1). It restricts the long-run behaviour of the endogenous variable to converge to their co-integrating relationship while allowing for short-run adjustments. Vector error correction model can be specified as follows:

$$\Delta \ln S_t = a + \Sigma_{i=1}^{k-1} \beta_i \Delta \ln S_{t-i} + \Sigma_{j=1}^{k-1} \phi_J \Delta \ln f_{t-J} + \lambda_1 ECT_{t-1} + u_{1t} \quad (1.3)$$

$$\Delta \ln f_t = a + \Sigma_{i=1}^{k-1} \beta_i \Delta \ln S_{t-i} + \Sigma_{j=1}^{k-1} \phi_J \Delta \ln f_{t-J} + \lambda_2 ECT_{t-1} + u_{2t} \quad (1.4)$$

Where S_t represents cash price and F_t refers to the futures price. λ_i Represents the speed of adjustment and ECT_{t-1} stands for the error correction term. Akaike information criteria is used for selecting the lag length of the price series.

4.4. Minimum Variance Hedge Ratio

By following (Swain and Samal, 2017) to evaluate the hedging effectiveness of aluminium futures minimum variance hedge ratio technique is used. To identify the minimum variance hedge ratio, the following methodology has been used:

By considering Eq. (1.9) the minimum variance hedge ratio (h) can be written as

$$h = \rho\ (\sigma \Delta S)/(\sigma\ \Delta F) \quad (1.5)$$

Where *h* presents minimum variance hedge ratio. ΔS and ΔF refer to changes in the cash and futures prices during the life of the hedge respectively. The correlation coefficient between ΔS and ΔF is denoted with 'ρ'.

5. Data Analysis

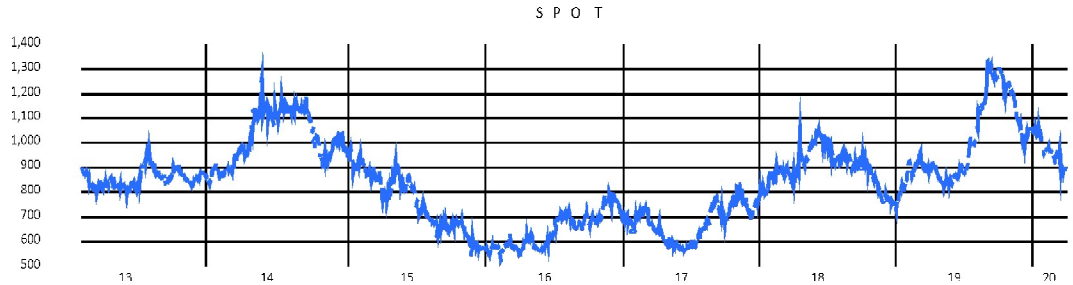

Figure 3: Trend of Spot Prices of Nickel

Source: Authors' Own Compilation

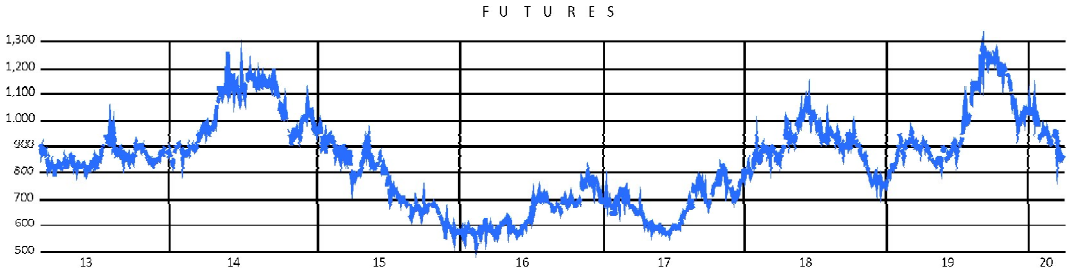

Figure 4: Trend of Futures Prices of Nickel

Source: Authors' Own Compilation

Table 1: Descriptive Statistics

Descriptive Stat	*Nickel*	
	Cash	*Futures*
Mean	841.25	842.78
Median	852.10	854.80
Maximum	1331.60	1284.80
Minimum	524.10	522.60
Std. Dev.	169.41	165.85
Skewness	0.34	0.25
Kurtosis	2.77	2.58
Jarque-Bera	40.63	33.77
Probability	0.00	0.00
Sum	1558005	1560841
Sum Sq. dev.	53125803	50914541
Observations	1852	1852

Source: Authors' Own Compilation

Both the cash and futures prices of nickel have shown a similar trend over the period chosen for the study. Nickel has been witnessing a bumpy ride from 2013 to 2020. There has been a sharp decline in the prices of nickel from 2013 to 2017. Indonesia and the Philippines account for about 30 per cent of global mined nickel production. In 2014 the ban imposed by Indonesia on the shipment of unprocessed nickel ore pressurised the nickel prices. On May 2017 Philippines parliament rejected the appointment of its environment minister thereby sending cheer to the mining arena. Because the decision by the minister affected about 10 per cent of the global nickel supply. These two events worsen the nickel prices.

Starting the financial year 2018 nickel prices move upward and touched all time high i.e. more than Rs. 1300 per kg in the mid of 2020 and thereafter starts consolidating by the end of the financial year 2020. After this sluggish run, there has been an upward movement in the prices of nickel at the onset of 2018 because of increasing steel prices and electric car demand. From the beginning of 2018 supply softness pushed the nickel prices upward and the further commitment of china to reduce its steel production capacity by 150 million tonnes from 2016 to 2020 pushed it further. Moreover declining stocks at the London Metal Exchange (LME) and Shanghai warehouses added fuel to it. Because of cyclone Ava, Sumitomo Corporation of Japan stopped its nickel mining at Ambatovy nickel mines further worsening the issue. The above table presents the summary statistics of the historical cash and futures closing prices of nickel traded at MCX, India. The mean and median prices of futures are marginally higher than the cash of nickel over the study period. The Jarque-Bera 'p' value rejects the presence of normality in both cash and futures pieces.

Table 2: Unit Root Test for Cash and Futures Prices of Nickel

Test	*Variable*	*Specifications*	*Test Statistics*	*Prob.*
Augmented Dickey-Fuller **(ADF)**	lncash	C	-1.792	0.384
		C and T	-1.831	0.689
		None	-0.066	0.660
	lnfutures	C	-1.822	0.370
		C and T	-1.847	0.681
		None	-0.131	0.638
	Δ lncash	C	-43.791	0.000**
	(First differenced)	C and T	-43.782	0.000**
		None	-43.803	0.000**
	Δ lnfutures	C	-43.977	0.000**
	(First differenced)	C and T	-43.967	0.000**
		None	-43.989	0.000**
Phillips-Perron **(PP)**	lncash	C	-1.730	0.416
		C and T	-1.769	0.719
		None	-0.064	0.661
	lnfutures	C	-1.762	0.399
		C and T	-1.787	0.710
		None	-0.132	0.638
	Δ lncash	C	-43.814	0.000**
	(First differenced)	C and T	-43.805	0.000**
		None	-43.826	0.000**
	Δ lnfutures	C	-44.007	0.000**
	(First differenced)	C and T	-43.991	0.000**
		None	-44.019	0.000**

Source: Authors' Own Compilation

**Indicates rejection of null hypothesis at 1 per cent significance level.

The raw data of cash and futures prices are transposed into their natural logarithm form. To evaluate the unit root properties of the cash and futures price series of nickel the study uses ADF as well as the PP unit root test. Both tests are carried out by using all three specifications viz. intercept, trend and intercept and none. The unit root test tabulated in the above table indicates the presence of unit root in both the price series of nickel at level but it is absent at I (1).

Table 3: Co-integration Test Results

Metal	*Test*	*Null Hypothesis*	*Test Statistic*	*Critical Value (0.05)*	*p-Value*
Nickel	Trace test	R=0	401.133	15.495	0.000**
		R=1	3.023	3.841	0.082
	Maximum	R=0	398.109	14.265	0.000**
	eigenvalue test	R=1	3.023	3.841	0.082

Source: Authors' Own Compilation

Note: 'R' refers to the number of cointegrating vectors under the null hypothesis.

*Indicates rejection of null hypothesis at 1per cent significance level.

Cash and futures price series are non-stationary at level but found stationary at the first difference, therefore it indicates the same order of integration. Long run relationship is identified by using the co-integration test (Johansen, 1988). Both λ_{trace}) and $\lambda_{max}$is considered for examining the null of no cointegrating relationship.

Table 3 presents the results of Johansen's cointegration between the cash and futures market of nickel where the null of no cointegration is rejected at a 1 per cent significant level.As there exists a long run relationship between the markets, therefore it is essential to examine the influential direction of price discovery between the two markets by using the vector error correction methodology. The study uses Akaike Information Criterion (AIC) for considering the lag length.

Table 4: Results of VECM

Commodity	*Null Hypothesis (H_0)*	*t-statistics*	*Prob.*	*Decision*
Nickel	Cash does not cause futures in long run	-1.931	0.053	Unidirectional
	Future does not cause cash in long run	-15.182	0.000*	

Source: Authors' Own Compilation

*indicates rejection of null hypothesis at a 5 per cent significant level

In the price discovery mechanism, the influential direction between the cash and futures market is an important phenomenon. Table 4 presents causality results between the cash and futures market of nickel. The null hypothesis of cash does not cause futures in long run is accepted as the adjustment coefficient is not significant at the 5 per cent level. Whereas the null hypothesis of futures does not cause cash in long run is rejected as t- statistics of the error correction term and its corresponding 'p' value is significant at a 1 per cent statistical level.

The study examines the short run influential direction of price discovery by using the Granger causality test. The results tabulated above evidence the existence of bidirectional causality between the cash and futures market in nickel. Unlike the long run, both markets of nickel influence each other for price discovery in the short run.

Table 5: Results of Granger Causality Test

Granger Causality between Futures Prices and Cash Prices				
Commodity	*Null Hypothesis (H_0)*	*F- Statistics*	*Prob.*	*Decision*
Nickel	Cash does not Granger cause futures	4.654	0.031*	Bidirectional
	Future does not Granger cause cash	794.610	0.000*	

Source: Authors' Own Compilation

* indicates rejection of null hypothesis at 5 per cent significant level

Table 6: Results of Variance Decomposition

Variance decomposition of lncash			*Variance decomposition of lnfutures*		
Period	*lncash*	*Lnfutures*	*Period*	*lncash*	*lnfutures*
1	100.000	0.000	1	38.894	61.105
2	79.846	25.154	2	40.776	59.223
3	74.326	25.674	3	42.076	57.924
4	69.514	30.486	4	43.051	56.949

Source: Authors' Own Compilation

At the initial period, a hundred per cent of the forecasted error variance in the cash market of nickel is explained by the variable itself in the short run. Unlike the cash market near about 39 of forecasted error variance in the futures market of nickel is explained by its cash market for the first period. The cash market of nickel reflects exogeneity in its futures market.

Table 7: Minimum Variance Hedge Ratio (Nickel)

Year	*Correlation Coefficient Between Δ Cash and Δ Futures Prices of Nickel*	*σ of Δ Cash Prices of Nickel*	*σ of Δ Futures Prices of Nickel*	*Ratio Between σ of Δ Cash and Δ Futures Prices of Nickel*	*Minimum Variance Hedge Ratio (h)*
2013-14	0.41	10.2	10.36	0.98	0.40
2014-15	0.68	19.37	18.66	1.04	0.71
2015-16	0.5	14.13	13.5	1.05	0.52
2016-17	0.39	11.91	12.09	0.99	0.39
2017-18	0.44	13.14	13.26	0.99	0.44
2018-19	0.44	15.4	14.14	1.09	0.48
2019-20	0.4	16.24	16.29	1.00	0.40
2013 to 2020	0.49	14.43	14.14	1.02	0.50

Source: Authors' Own Compilation

Results presented in table 7 show the minimum variance hedge ratio of nickel. It indicates that for the sample period 2013-14 0.4 units of futures position is required to hedge 1 unit of cash exposure of nickel. This has been increased to 0.71 for the sample period 2014-15 because the correlation between change in cash and futures has increased and secondly the ratio of variation between change in cash and futures prices of nickel is almost one. For the full sample period, the minimum variance hedge ratio stands at 0.5units.

6. Result and Discussion

Cash market witnesses a higher level of fluctuation than the futures market of nickel. Over the period chosen for the study, the cash market touched all time high i.e. Rs.1331.60 per Kg. whereas the futures market touched a maximum of Rs.1284.80 per Kg. there is not much difference in the minimum values of cash and futures prices of nickel. From the table, it is evident that both price series are positively skewed and platy kurtic.

The study considers both ADF and PP unit root tests. The results presented in table 2 indicate the presence of unit root at the level in all three specifications. But after the first difference i.e. at I (1) unit root is found to be absent in both the series. Both ADF and PP test rejects the null of the presence of unit root at I (1) for all specifications at a 1 per cent significance level. Cash and futures price series are non-stationary at level but found stationary at the first difference, therefore it indicates the same order of integration. Therefore, the Long run relationship is identified by using the co-integration test (Johansen, 1988). The study rejects null of no cointegration at a 1 per cent significant level by considering both λ_{trace} as well as λ_{max} criteria. It is evident that there might be short run disturbances but the cash and futures market is integrated in long rum.

The causality of price discovery is unidirectional between the markets in the long run. In long run, there is an influential direction from futures to the cash market of nickel for price discovery. Hence, the futures market of nickel influences the price discovery of the cash market whereas the cash market of nickel fails to influence the price discovery of the futures market in long run. There can be three possibilities of causality viz. unidirectional, bidirectional and independent. When there is 'unidirectional' indicates one way causality the other market conversely, in bidirectional causality both the market influences each other. Unlike the long run, both markets of nickel influence each other for price discovery in the short run.

For the first period futures market of nickel does not influence the cash. For the second period about 25.15 per cent of forecasted error variance in cash is explained by the futures market. For the fourth period, the cash market of nickel also implies endogeneity. Hence, the futures market of nickel reflects weak exogeneity in its cash market. Unlike the cash market near about 39 of forecasted error variance in the futures market of nickel is explained by its cash market for the first period. The influence of cash on futures increases gradually for the third and fourth periods. In the fourth period 43 per cent of forecasted error variance in the futures market of nickel is explained by its cash market. Therefore cash market of nickel reflects exogeneity in its futures market.

The hedge ratio of nickel is highest for the sample period 2014-15. After the financial year, 2014-15 decreasing trend has been found in the hedge ratio of nickel. The hedge ratio was lowest in the

sample period 2016-17 because of the lack of association between the movement of change in cash and futures prices of nickel. For the full sample period, the minimum variance hedge ratio stands at 0.5units. It is found that there is less hedging efficiency of nickel futures contact.

7. Conclusion

7.1. Research Outcome

Nickel is the main alloying metal used for the production of stainless steel and is also used in electro-plating, coins, chemicals, aerospace industries, electronic gadgets etc. Cash and futures series of nickel are stationary at I (1), hence there is the same order of integration. Johansen's cointegration result confirms the existence of a long run relationship between the markets. In long run, there is an influential direction from futures to the cash market of nickel for price discovery. Hence, the futures market of nickel influences the price discovery of the cash market whereas the cash market of nickel fails to influence the price discovery of the futures market in long run. There exist bidirectional causality between the cash and futures market of nickel. Unlike the long run, both markets of nickel influence each other for price discovery in the short run.

The futures market of nickel reflects weak exogeneity in its cash market whereas the cash market of nickel reflects exogeneity in its futures market. Moreover nickel futures market indicates a lack of hedging efficiency.

7.2. Implication, Limitation and Future Scope of Research

The study will help the hedgers to identify the number of futures positions they should take in order to manage their cash exposure. It will help the regulators to frame policies for increasing participation and liquidity in the market. The study will also provide information to the investors and speculators of the commodity futures market for designing hedging strategies. The present study has used only seven years of data which can be extended for further research. The study has considered only one base metal hence, the future study can include other base metals for analyzing cash and futures dynamics. Moreover, nonlinear causality, cross hedging strategies, cross country comparisons are the aspects left for future study.

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Impact of Supportive After-Sales Services on Customer Satisfaction in Automobile Industry

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Abstract: The key to the success of the automobile industry is not only dependent upon selling great vehicles to customers, but also on giving excellent after-sales services. Hence, this paper is an attempt to explore the supportive after-sales services for customer satisfaction in the automobile industry. This study employs a quantitative analytic technique, using data obtained from 336 consumers of car automobile companies by non-probabilistic snowball sampling. Exploratory Factor Analysis and Cronbach's internal consistency has been used to explore the association among variables. The findings of the research indicate that five supporting after-sales services have been identified that support customers at the service centre while availing after-sales services of their vehicles and these supporting after-sales services are staff Support Service, Customer Lounge Service, Billing & Payment Service, Telephonic & Feedback Service and Complaint Handling Service which exhibit strong internal consistency.

1. Introduction

A well-developed transportation system plays the most important role in the economic growth and development of any country. Now a days, the automobile sector is a major contributor to economic growth worldwide, particularly in developing nations like India. As of now, it contributes over 7% to India's GDP, 49% to the country's manufacturing GDP & 26% to the industrial GDP and a large number of individuals are working in this sector. The key to the success of the automobile industry right now is not only based on offering great vehicles to consumers, but also in providing a large number of after-sales services. After-sales services (ASS) are the services rendered to the customer after the product is sold, to smoothen the product usage during its life cycle (Gaiardelli *et al.*, 2007). Different researchers approached ASS with different viewpoints. For example, Rigopoulou *et al.* (2008)

approached ASS as the total of all actions undertaken to facilitate the sale transaction. Kurata and Nam, (2010) also defined after-sales service as a customer, technical, and product support. Notably, the prominence of after-sales services has been widely documented by the manufacturers of durable products. It occupies an even more important role in a developing country as it stimulates the growth of the company by offering a competitive advantage, and brand positioning, and also leads to profit generation. Moreover, these days consumers are becoming very subtle in taking their purchase decision (Ahmed and Sanatullah, 2011) as they are well aware of the kind of services they receive. This ultimately causes a rise in expectations from the service providers (Gupta and Raman, 2022). A review of past literature reveals that considering the importance of after-sales services, a number of researchers have conducted studies pertaining to different areas i.e international marketing (Asugman *et al*., 1997), manufacturing (Xiangmin *et al*., 1997), electric appliances (Alshare, 2020), retailing (Gagliano and Hathcote, 1994; Chiguvi, 2020), clothing (Othman, 2021), etc. Taking specifically the case of the automobile industry it can be said that after-sales services are crucial as it directly affects the profit. There are a number of players in the market and to remain ahead, the service centres need to focus on satisfying the customers by delivering them the best after-sales services. Customers do not always visit the authorized service centres after availing of the free services provided by the manufacturers. The reason can be either nearness of the location or cost-effectiveness. This results in hampering the brand image besides loss of revenue. This situation can be avoided if excellent after-sales services are provided to customers at the service centre. This leads to the formation of a research question i.e. which services support the customers at the service centre while availing after-sales services in the automobile industry? Considering the case of the automobile industry it can be said that most of the earlier studies have stressed the role of customer satisfaction either in general (Chu and Desai, 1995) or relating to after-sales services, but none of the studies have covered very important aspect relating to customer satisfaction with respect to after-sales services at the service centre. The current research makes an effort to focus on the services which support the customers while availing after-sales services at a service centre.

Although several researchers have defined the concept of after-sales service considering different contexts all through the value chain, the definitions specified possess one characteristic in common it is a customer-oriented procedure that aims to satisfy the customer's needs and retain them for the long term. In recent times, companies consider after-sales services as one of the profit-center (Mishra *et al*, 2021). Furthermore, due to the high cost of customer acquisition, companies focus extensively on satisfying existing customers (Opata *et al*, 2021). In search of comfortable and delightful services, customers have moved beyond the fundamental functioning and features of service/goods and want the supplier to provide the highest quality. Therefore, it has become a prerequisite for every company to understand their customer's needs and the services which support customers at the time of availing after-sales services for delighting their customers and gaining a competitive advantage as well. Also, bestowing supporting services helps an organization to create loyalty among its customers, which further becomes a strong base for its continual growth and development. Intense competition in the automobile industry has forced companies to bring cars with advanced features, so as to provide luxury products to their customers. This has augmented the product prices and in return, the customer

expects beyond the advanced functionality of the product. Soothing ambiance, clean washrooms, fresh drinking water, waiting lounge, etc., are a few examples of the services that support the customers at the time of availing after-sale service.

2. Review of Literature

Customers who are really happy are more inclined to be engaged, which further results in inflated sales and profitability (González, 2015). This relationship between satisfaction, service quality, and loyalty seem to be apparent but in reality, it is much more intricate as opposed to what it seems as it gets affected by various determinants. These determinants may differ region-wise, economy-wise, and even group-wise. This section will outline the numerous research on these issues in connection to the automobile industry to assist readers in better grasping this relationship.

2.1. Service Quality

Zeithaml and Bitner (1996) characterized services with attributes such as heterogeneity, intangibility, production-consumption simultaneity, and direct interaction. With the increasing complexity of measuring service quality, researchers developed various approaches to assess service quality. For instance, Parasuraman *et al.* (1985) introduced a service quality assessment model having ten dimensions in total. Vast studies have adopted the SERQUAL model for measuring service quality in different contexts (Tumsekcali *et al.*, 2021; Azhagan *et al.*, 2021). However, SERQUAL effectiveness in assessing service quality was questioned by Cronin and Taylor (1992) stating the inefficiency of the model in evaluating the attitude toward the services which takes a long time to develop. Furthermore, Cronin and Taylor (1992) developed an instrument for measuring service quality named "SERVERE", which was accepted by many researchers and their results outperformed the SERQUAL model. This shows that assessing customer's models differ in their explanatory strength when applied in different contexts.

2.2. Customer Satisfaction

Customer satisfaction refers to customers' post-purchase evaluation of a product or service offering (Hunt, 1977). A deep understanding of consumers' beliefs and attitudes is a prerequisite for truly understanding customer satisfaction (Mohanty and Das, 2022). Every person compares his perceived expectations with the actual quality of products/services. If the actual results exceed the perceived results, it results in satisfaction, and vice-versa results in dissatisfaction (Oliver, 1980). The same service can be assessed differently by different users depending on the consumer's perceived expectations and their level of tolerance (Nerdinger and Neumann, 2007). A satisfied customer often tends to share a positive word of mouth and also recommends using the product to others.

2.3. Customer Loyalty

Researchers often define customer loyalty as the situation when customers repeatedly purchase the product, but it may be caused by technical reasons, lack of alternatives, switching costs, or habit (Homburg and Koschate, 2007). Schreiber (2010) also talked about two types of consumer loyalty: retention and compromise. "Retention" is classified as the situation when the customer is not able to

switch to any other seller and "Compromise" is defined as the situation when the buyer restrains to switch for the reason they feel psychologically linked to the seller. Some researchers also considered these affective levels while describing customer loyalty (Nerdinger and Neumann, 2007). Some of the researchers also defined customer loyalty as future behaviour in the form of repurchase intention (Homburg and Koschate, 2007). Considering the above definitions, it is clear that researchers have expressed customer loyalty as behavioural or attitudinal commitment, however, there is no single accepted definition.

2.4. After-Sales Service and Customer Satisfaction

After-sales service has more impact on customer satisfaction. Customer satisfaction is a metric that evaluates how well a company's products and services satisfy customer expectations. Customer satisfaction is heavily influenced by after-sale service. After-sales service has a favourable association with customer satisfaction (Giri and Thapa, 2016). Product characteristics, pricing, and aftermarket all have a role in customer happiness. Customer satisfaction was substantially predicted by product delivery, installation, and warranty combined. Customer contentment is influenced by several factors, including product quality and social responsibility, and satisfaction rises as service quality improves. In the research conducted by Menon and Raj (2012), on the topic Model Development and Validation for studying consumers' preferences of car owners, the results indicate that in the passenger automobile market, the buyer was a primary determiner who sought individualised attention for his after-sale service with the manufacturers. Car washing, phone service, maintenance, spare part supply, and warranty service are all proven to be highly connected to consumer satisfaction with after-sales service. Customer satisfaction toward after-sales service was investigated by Amonkar (2016), who looked at numerous components of after-sales service. It was revealed in this research that the quality of after-sales service has a great influence on customer satisfaction.Customer satisfaction was shown to be impacted not only by the quality of products and services but also by the quality of after-sales support.

So far as the previous literature is concerned, researchers have majorly focused intensely on identifying the relationships between service quality, customer satisfaction, and loyalty with after-sales services in the automobile industry. No one study was conducted on the services which support customers while availing after-sales services at the service centre. After-sales service and the services supporting these services have become vital point of consideration for strategy formulation and satisfaction (Li *et al.*, 2014). Automobile companies often make the senior manager accountable for administering the supporting after-sales services. As a result, managers need meticulous attention to understand the customer's needs and provide them with supporting services. Accordingly, managers will be able to make efficient and precise decisions regarding effective strategy formulation, if they know which supportive services impact the quality of after-sales services. To the best of our knowledge, this is the first work to explore supportive after-sales services in the automobile industry which fills the gap in this area and these services play a significant role in customer satisfaction and loyalty. Therefore, it is worthwhile to explore the services that support customer at the time of availing after-sales services at automobile service centres.

3. Objective of the Study

The main objective of this study is:

- To explore the services that support the customers at service centres while availing after-sales services in the automobile industry.

4. Research Methodology

The sample has been collected from the customers of car automobile companies namely; Maruti Suzuki, Hyundai Motor, Honda Motor, and Tata Motors based on the highest market share or sale data. Data has been collected from the five districts of Punjab namely; Amritsar, Jalandhar, Ludhiana, Mohali, and Patiala based on the highest numbers of authorized service centres of respective companies. For data collection, a mixed sample strategy was utilised, with 400 respondents targeted using snowball sampling and was approached using questionnaire which consists of questions related to basic information which defines the consumer as experienced or non-experienced as per the study. 365 respondents were found to be experienced and matched the criteria for purposive sampling. Out of these, 29 questionnaire were not received and finally, 336 responses were taken for the detailed analysis.

A total of 400 respondents were chosen through snowball sampling, and they were contacted using a questionnaire that asked them about the fundamentals that, according to the study, categorize consumers as experienced or inexperienced. The study used a chain referral approach to recruit participants, in which current participants suggested potential participants to them among their social networks. It was discovered that 365 respondents met the requirements for purposive sampling and were experienced. However, 29 respondents' responses were disregarded due to inaccuracies and inconsistencies. As a result of the necessary fill-out checks in the online Google form, there were no missing values in the data. As a result, the responses of 336 respondents—representing an 84% response rate were utilised for data evaluation and interpretation. Software G*power v3.1.9.7 was used to determine the minimal sample size necessary centered on statistical power (Sharma et al., 2021). A sample of 316 is needed to obtain statistical power of 0.95 with an effect size of 0.05. Consequently, we obtained a large enough sample size to do a statistical analysis.

The statistical analyses were performed using exploratory factor analysis using SPSS v. 22 to relate the related variables and find the underlying major factors impacting the services that consumers receive at the service centre while availing after-sales services. Because exploratory factor analysis is a statistical approach that can shed light on the link between several correlated but seemingly unrelated variables in terms of only a few underlying factors, it was used in this study (Overall and Klett, 1972). The principal component analysis approach was chosen to extract the factors since the goal was to reduce the majority of the original data (variances) into a small number of factors for forecasting. Furthermore, when there are more than 30 items in the factor analysis, the principal component analysis method is regarded as the most appropriate method (Goel *et al.*, 2021).

5. Data Analysis and Discussion

Exploratory factor analysis is a statistical tool for reducing data into a significant subset of summary factors is carried out to investigate the phenomenon's conceptual framework. Factor analysis is grounded

on the notion that measured and observed components may be constrained to reduced latent constructs with a shared variance that are non-observable, a procedure known as dimension reduction (Bartholomew *et al.*, 2011). EFA, an approach for analysing the properties of interconnections across a diverse set of variables, is outlined in a tiny subset of the group of highly interrelated variables known as factors. The other two key steps in EFA are selecting a technique for factor extraction and factor rotation. Principal Component Analysis (PCA) was utilized for factor extraction in the research because it accounts for the entire variation in the available dataset. Statements with Eigenvalues greater than one have been retained (Hair *et al.*, 2010; Chhabra and Mehrotra, 2022). Moreover, identifying the factor rotation techniques was yet another significant stage in implementing EFA. Of the several possible factor rotation techniques, Varimax is the most commonly used. The present research used EFA with PCA and Varimax rotation.

5.1. Sample Adequacy Test

The Kaiser-Meyer-Olkin (KMO) analysis is used to assess the adequacy of data samples. KMO aids in determining sample adequacy for every variable in the study as well as for the entire model. Barlett's Test of Sphericity (BTS) was used to test a hypothesis that the measurements are mutually independent.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.756
Bartlett's Test of Sphericity	Approx. Chi-Square	8121.543
	Df	351
	Sig.	0.000

Source: Authors' Own Compilation

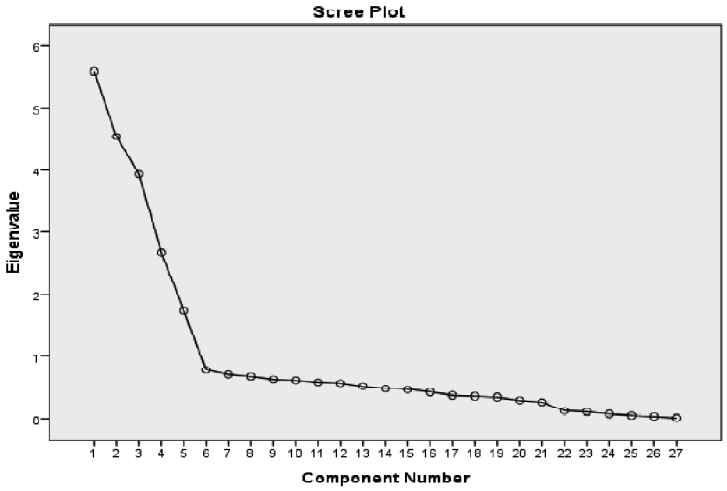

Figure 1: Screen Plot of Factors that Indicates Supportive Services

Source: Authors' Own Compilation

According to Table 1, the KMO value is 0.797, which is greater than the minimum recommended limit of 0.7, and the score of Bartlett's Test of Sphericity is substantial. As a result, both of the prerequisites for doing factor analysis were satisfied. The study then moved on to elicit the supportive after-sales services used through EFA (Table 2).

Table 2: Rotated Component Matrix Factors that Indicates Supportive Services

Rotated Component Matrix[a]

	Component				
	1	*2*	*3*	*4*	*5*
SS26	.754				
SS25	.746				
SS7	.745				
SS18	.732				
SS10	.728				
SS12	.727				
SS17	.718				
SS6	.703				
SS23	.682				
SS2		.899			
SS13		.897			
SS27		.891			
SS11		.881			
SS15		.799			
SS16		.752			
SS9			.960		
SS24			.946		
SS5			.938		
SS19			.934		
SS8			.929		
SS14				.886	
SS21				.869	
SS1				.732	
SS22				.710	
SS20					.842
SS4					.840
SS3					.721

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.
Source: Authors' Own Compilation

Figure 1 and Table 2 show the eigenvalues of all the retrieved statements and factors, respectively. Eight factors were retrieved from the dataset in totality, all of which had factor loadings greater than 0.6. The factors extricated besides their factor loadings, communalities, eigenvalues, variance explicated, and Cronbach's alpha is specified underneath.

Table 3: Staff Support Service (Factor 1)

		Loadings	*H2*	*EV*	*VE (%)*	*A*
	Factor 1: Staff Support Service			20.692	17.828	0.783
SS26	Service staff are always available at service center to attending you	.754	.575			
SS25	Service staff are always polite during customer interaction	.746	.559			
SS7	Service staff are competent to understand the problems of customers	0.745	0.559			
SS18	Service staff have good communication skill at service center	0.732	0.563			
SS10	Service staff are professional and knowledgeable about the advice they give	0.728	0.553			
SS12	Service staff give clear and accurate information regarding services problems	0.727	0.53			
SS17	Service staff inform you about the estimated time & cost of services	0.718	0.52			
SS6	Service staff deliver the vehicle at promised time	0.703	0.517			
SS23	Service staff explain to customers about the work which has done on the vehicle	0.682	0.47			

Notes: H2= Communalities; EV= Eigen Values; VE= Variance explained; α= Cronbach's alpha

Source: Authors' Own Compilation

The "Staff Support Services" was the first factor identified from the study. Table 3 certainly illustrates that all factor loadings were above the minimum specified threshold of 0.6. All of the items' communalities were greater than 0.5. The factor explains 17.828 % of the overall variance, exhibiting strong internal consistency (Cronbach's alpha= 0.783 > 0.7).

The "Customer Lounge Service" was the second factor identified from the study. Table 4 certainly illustrates that all factor loadings were above the minimum specified threshold of 0.6. All the items' communalities were greater than 0.5. The factor explains 16.624% of the overall variance, exhibiting strong internal consistency (Cronbach's alpha= 0.894 > 0.7).

Table 4: Customer Lounge Service (Factor 2)

		Loadings	*H2*	*EV*	*VE (%)*	*A*
	Factor 2: Customer Lounge Service			16.821	16.624	0.894
SS2	Service center has display facility in waiting area for customers to supervise their vehicles	.899	.829			
SS13	Waiting room with proper sitting arrangements and facilities is available for customers	.897	.847			
SS27	Ambiance of waiting room in service center is clean and comfortable	.891	.816			
SS11	Fresh drinking water and refreshment facility is available at the service center	.881	.789			
SS15	Clean and hygienic washroom facility is available for the customers	.799	.656			
SS16	Food and beverages are available at service center	.752	.582			

Notes: H2= Communalities; EV= Eigen Values; VE= Variance explained; α= Cronbach's alpha

Source: Authors' Own Compilation

Table 5: Billing & Payment Service (Factor 3)

		Loadings	*H2*	*EV*	*VE (%)*	*Á*
	Factor 3: Billing & Payment Service			14.575	16.599	0.916
SS9	Service center provides complete and fair bills to customers.	.960	.924			
SS24	Final bills as per the cost estimate(s) provided to you	.946	.899			
SS5	There is minimal waiting time for the billing transactions at service station.	.938	.887			
SS19	All bill charges applied are clearly explained to the customers	.934	.873			
SS8	Payment facility through debit/credit card or online transaction for billing is available at service station.	.929	.866			

Notes: H2= Communalities; EV= Eigen Values; VE= Variance explained; α= Cronbach's alpha

Source: Authors' Own Compilation

The "Billing & Payment Service" was the third factor identified from the study. Table 5 certainly illustrates that all factor loadings were above the minimum specified threshold of 0.6. All the items' communalities were greater than 0.5. The factor explains 16.599 % of the overall variance, exhibiting strong internal consistency (Cronbach's alpha = 0.916 > 0.7).

Table 6: Telephonic & Feedback Service (Factor 4)

		Loadings	*H2*	*EV*	*VE (%)*	*Á*
	Factor 4: Telephonic & Feedback Service			9.934	9.913	0.874
SS14	Accuracy to solve the problem through telephone	.886	.824			
SS21	Inform to customers about updated and due services through telephone	.869	.773			
SS1	On time feedback is taken through telephone	.732	.539			
SS22	The telephone answered promptly to customers	.710	.520			

Notes: H2= Communalities; EV= Eigen Values; VE= Variance explained; α= Cronbach's alpha

Source: Authors' Own Compilation

The "Telephonic & Feedback Service" was the fourth factor identified from the study. Table 6 certainly illustrates that all factor loadings were above the minimum specified threshold of 0.6. All the items' communalities were greater than 0.5. The factor explains 9.913 % of the overall variance, exhibiting strong internal consistency (Cronbach's alpha= 0.874 > 0.7).

Table 7: Complaint Handling Service (Factor 5)

		Loadings	*H2*	*EV*	*VE (%)*	*Á*
	Factor 5: Complaint Handling Service			6.450	7.507	0.908
SS20	Servicecenter has proper complaint handling system to handle the customer's complaints	.842	.735			
SS4	Supervisors at service center make a fair judgment on complaints	.840	.717			
SS3	Complaints are sort out quickly	.721	.595			

Notes: H2= Communalities; EV= Eigen Values; VE= Variance explained; α = Cronbach's alpha

Source: Authors' Own Compilation

The "Complaint Handling Service" was the fifth factor identified from the study. Table 7 certainly illustrates that all factor loadings were above the minimum specified threshold of 0.6. All the items' communalities were greater than 0.5. The factor explains 7.507% of the overall variance, exhibiting strong internal consistency (Cronbach's alpha= 0.908 > 0.7).

From this analysis, five factors were identified, and all these factors are considered as supportive after sales services in this study by the researcher;

- Factor 1 was identified as Staff Support Service.
- Factor 2 was identified as Customer Lounge Service.
- Factor 3 was identified as Billing & Payment Service.

- Factor 4 was identified as Telephonic & Feedback Service.
- Factor 5 was identified as Complaint Handling Service.

After-sales services are those services provided by the business to their customers after selling the products which ensure that an organization's services and goods satisfy its consumers. Satisfaction of the customers of the automobile depends upon two things first one is what type of services are provided by the company to their customers called major after-sales services and another one is which type of support provided by the company to their customers at the time of availing these major after-sales services at service centers called supporting after-sales services. Supporting after-sales services support the customers when they come to service center for getting servicing of their vehicles by providing various services to them. Customer may be dissatisfied due to poor supporting after-sales services even though satisfied with the major after-sales services like no availability of waiting area, poor staff behavior, poor complaint handling system, poor billing and payment system, etc.Here, the researcher has identified the above five supportive after-sales services through EFA which highly affect customer satisfaction and loyalty in the automobile industry.

5.2. Reliability Statistics

Reliability is defined as the extent to which a survey can provide consistent results and free random error (Hair *et al.,* 2010). Cronbach's alpha was used to determine the internal consistency between the set of variables and measure a specific construct. A score of 0.7 is considered the minimal level of acceptability to show robust reliability (Hair *et al*., 2010).

Table 8: Cronbach's Alpha of the Identified Supportive After-Sales Services

Cronbach's alpha	*Perception*
Staff Support Service	0.783
Customer Lounge Service	0.894
Billing & Payment Service	0.916
Telephonic & Feedback Service.	0.874
Complaint Handling Service	0.908

Source: Authors' Own Compilation

Table 8 shows consistent results exhibiting strong internal consistency that also have been found in other studies (Herbst & Berndt, 2006), showing the comparative reliability of these findings.

5.3. Implications

The present study uncovers some of the important factors leading to customer satisfaction with respect to after-sales services in the automobile industry. A novel attempt has been made to study the impact of these factors at the service centre. The results of a study can be useful for the service providers as it can help them to elevate the level of their services which are considered important by the customers.

This can prove profitable for them, as customer satisfaction leads to customer loyalty also (Rahim *et al.*, 2012). Moreover, it helps to gain a competitive advantage also. Additionally, an understanding of these factors can be beneficial for the customers also as the service providers will put their best efforts to satisfy the customers by concentrating on the factors.

6. Conclusion

Customer satisfaction is the key to the success of any business as it can help to attain a competitive advantage. Considering the fact that the automobile sector plays a crucial role in the development of an economy, it becomes imperative to know the factors which satisfy the customers. Prior literature has thrown light on the after-sales services provided by the manufacturers of automobiles. The present study makes an incremental contribution to the existing literature by exploring the services which support customers at service centres of an automobile while availing major after-sales services. Five factors are identified through EFA, considered as supportive after-sales services which indirectly effect major after-sales services and play significant role to satisfy the customers.

It can be concluded from the findings of the study that in order to satisfy the customers and make them loyal, it is essential to make certain that long-term relationship should be developed with customers and it is possible only if the management of service centers provide supportive after-sales services to their customers. This is especially significant in the automobile business, as supporting services play a critical role in consumer happiness and loyalty.

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Analyzing the Issues and Challenges of Homestays for Sustainable Tourism Development in Sikkim and Darjeeling Hills

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Abstract: Homestays are an essential component of community-based ecotourism and rural tourism initiatives aimed at promoting sustainable tourism development. It envisages the sustainability principle contributing to the triple bottom line (TBL) framework for increasing tourism benefits to the local community towards poverty alleviation and conservation efforts. Several studies have focused on homestays as a sustainable product of ecotourism and rural tourism development. The purpose of the study is to investigate the issues and challenges of homestays in the Sikkim and Darjeeling hills and their contribution to sustainable tourism development. The study was conducted in selected towns and villages using mixed research methods for data collection and analysis. Percentage and thematic analysis were used in analyzing data. According to the study's findings, homestays face issues and challenges on TBL dimensions of sustainability such as a lack of financial assistance, marketing and promotion, limited local employment, sustainability training, education, and capacity building, cross-cultural conflicts, land degradation, green certification, and inefficient solid waste management, that have hindered their contribution to sustainable tourism development in the region.

1. Introduction

Homestays are a core component of Community-based Ecotourism (CBET) and Rural Tourism initiatives which envisage the threefold principles of economic, social, and ecological sustainability with involvement and ownership of communities in decision-making, improved cross-cultural interaction zones that enhance mutual respect between host-tourists (Reimer and Walter, 2013), provide livelihood opportunities, and encourage sustainable resource use in destinations that would benefit disadvantaged local communities (Pasanchay and Schott, 2021). Rural homestays and community-based ecotourism must be viewed and operated in the context of a broader sustainability framework (Higgins-Desbiolles, 2018).

Sustainable tourism development provides a Triple Bottom Line (TBL) framework that emphasizes the importance of integrating economic development goals with environmental conservation and socio-cultural preservation, potentially leading to tourism stakeholders identifying their roles in implementing responsible practices in their day-to-day operations for destination sustainability (Kokkranikal, 2012).

Homestays in support of CBET initiatives can encourage economic incentives and local guardianship towards conservation efforts and access to sustainable use of natural resources (Bhalla *et al.*, 2016).This involves the encouragement of indigenous entrepreneurship, often in the forms of self-employment and small-scale enterprises in the developing world through the effective engagement of local communities (Kokkranikal and Morrison, 2002).

Local governments of Sikkim and Darjeeling hills are leveraging ecotourism initiatives by using rural homestays as an alternative livelihood option for communities, protecting cultural heritage, and funding environmental conservation in adjacent protected and corridor areas of the Kanchenjunga landscape (Green, 2009). Homestays in collaboration with Ngo's have supported community-based ecotourism initiatives and rural tourism development in villages throughout the region through the implementation of responsible tourism practices such as community participation and ownership to disadvantaged indigenous communities in planning and management of tourism activities (Leh and Hamzah, 2012), showcasing the experience of authentic cultural components such as ethnic foods, promotion of handicrafts, organic farming techniques, cultural dance and music etc., capacity building programs for homestay owners and community members, local entrepreneurial development, use of energy saving lights, donations for environmental conservation and solid waste management practices (Peaty, 2009)enhanced direct and indirect livelihood options which have assisted in alleviating poverty and community empowerment in the region (Cajee, 2014).

Previous studies stress that Homestays are an attractive sustainable rural tourism product (Acharya and Halpenny, 2013) but tourism businesses concentrate more on economic dimension. It contradicts the triple bottom line framework (Wise, 2016)as businesses tend to focus more on economic outcomes over social and environmental dimensions. There are various reasons with factors such as cost, lack of government support, and the seasonal nature of business that contribute to difficulties in implementing responsible practices in homestays, which hinder destination sustainability (Frey and George, 2010). Several research focus on homestays as a sustainable product of ecotourism and rural tourism development; moreover, research on homestays' contribution to destination sustainability in the context of the region still needs to be completed. To contribute to the knowledge gap and to capture critical insights into the growing sustainability agenda with the emerging role of the Homestay as a sustainable rural tourism product, the purpose of this research is to identify the issues and challenges of homestays and their contribution to the triple bottom line dimensions for sustainable tourism development in Sikkim and Darjeeling hills.

2. Review of Literature

UN General Assembly agreed to 17 sets of goals with 169 comprehensive targets to be completed by 2030 as part of the sustainable development agenda (UN, 2015). Responsible tourism initiatives implemented through the development of rural sustainable homestays and CBET seeks to further

improve destination sustainability dimensions encouraging responsibility of stakeholders for alleviating poverty and conservation efforts (Mathew and Sreejesh, 2017). Homestays are associated with community-based ecotourism and rural tourism, tourism initiatives indulging in responsible tourism practices and is often used as a development strategy for destination sustainability and quality of life of local communities in the Himalayan region (Acharya and Halpenny, 2013). Homestays are typically small family-owned businesses that cater to tourists interested in traditional and cultural holidays relating to local lifestyles. Homestay programs are typically serviced by local communities who own homes, particularly in rural areas that offer visitors with traditional indigenous cultural experiences and a homely environment (Salleh *et al.*, 2014).

West Bengal Homestay tourism policy and rural tourism development initiatives in Darjeeling hills (Tourism Department, 2017) have impacted the capacity to preserve traditional values and beliefs, conserve the environment, create sustainable livelihood options, promote local handicrafts, enhance stakeholders' and local people's income and capital, and accelerate the production of organic food contributing to sustainable rural tourism development (Rawat, 2019).

The Sikkim Registration of Homestay Establishment Rules 2013, initiated the construction of over 700 homestays in various villages throughout Sikkim, fostering the growth of Sustainable Rural Tourism and CBET in the State (Government of Sikkim, 2018). Sikkim Himalayan Homestays in collaboration with Ecotourism society of Sikkim (ECCOSS) an NGO, have conceptualised the potential, characteristics and cultural components of homestays and developed operation modalities and capacity building programs for local communities (Yadav *et al.*, 2018).

Some research have highlighted the importance of community-based homestays and its contribution to sustainable rural development to gain long term socio-cultural, environmental and economic benefits using a systematic literature review (Janjua *et al.*, 2021) but somehow research on issues and challenges of homestays in Sikkim and Darjeeling Hills for destination sustainability needs to be addressed. Exceeding carrying capacity of village and commercialisation of culture (Ranasinghe, 2015), lack of awareness and marketing knowledge, insufficient capital for entrepreneurial opportunities, high dependency of government support, language problems, substandard facilities were some issues and challenges faced by homestays operators (Lim and Lee, 2020).

Therefore, this research will help address the issues and challenges faced by homestays and their increasingly crucial role towards fulfilling the objectives of sustainable tourism development in Sikkim and Darjeeling hills.

3. Objectives of the Study

This study has the following objectives:

- To analyse the contribution of Homestays to Triple Bottom Line sphere for sustainable destination management.
- To assess the trends and range of sustainable homestay-based activities in Sikkim and Darjeeling Hills.
- To identify the issues and challenges faced by Homestays towards fulfilling the objectives of sustainable tourism development in Sikkim and Darjeeling hills.

4. Methodology

Mixed research methods were used to understand the research issues better to be investigated. A qualitative approach was used to comprehensively understand the Issues and Challenges of Homestays (Pusiran and Xiao, 2013) and in-depth semi-structured face-to-face interviews (Khadka *et al.*,2020). A quantitative approach was used to determine the socio-economic impacts of such initiatives on the local community to measure a large sampling frame.

Purposive sampling was used for data collection, with 151 homestay owners interviewed as respondents from March to December 2021 in selected villages and towns in Sikkim and Darjeeling Hills. The study area has been selected based on sustainable initiatives implemented by the government in these selected villages and towns. The sample size was selected according to the need for the mixed research method; the data sufficiency has been achieved in 150 homestay owners.

Data were collected with the assistance of eighteen semi-structured questions about the research objectives of this study being asked during the interviews across the study area. Items for the semi-structured questionnaires were extracted from various studies (Ranasinghe, 2015; Lim and Lee, 2020; Janjua *et al.*, 2021; Sood *et al.*, 2017; Peaty, 2009) on issues and challenges of homestays. Data analysis was administered using percentage and thematic analysis.

5. Results

Table 1 infers that the local community in East Sikkim is highly aware and involved in homestay programs, with higher levels of active community participation in decision-making, ownership, local control, empowerment, awareness, and education as a sustainable community-based tourism product as compared to the district of North Sikkim. The table illustrates that there are 4300 homestays in East district of Sikkim, with 2032 rooms available for occupancy, comprising 2083 double rooms and 134 single rooms. North Sikkim comprises of 60 homestays with 225 rooms, 223 double and 4 single rooms with an occupancy capacity of 450. In contrast, 742 local and 143 non-local employees are involved in the homestay business, indicating solid levels of sustainable livelihood opportunities and tourism benefits received particularly by communities of East Sikkim. Homestays have contributed to poverty alleviation through employment and income opportunities and resulted in the empowerment of local communities in Sikkim, which has resulted in the growth of Sustainable rural tourism and community-based ecotourism. Even though most districts in Sikkim have high occupancy capacities, there is a lack of marketing and promotion of sustainable homestays, as well as lower levels of awareness and education imparted to local communities in North Sikkim concerning local ownership, sustainable livelihood opportunities and bottom-to-top active participation in tourism policy planning and decision making, which would contribute to sustainable tourism development.

Table 2 indicates that there are 59 homestays with 1090 rooms, comprising 917 double rooms and 143 single rooms, with a total capacity of 2150 in the Rangli-Rangloit block and Takdah Cantonment rural villages of Darjeeling. The villages of Kalimpong block comprise 41 homestays with 730 rooms, 424 double and 65 single, for an occupancy capacity of 1219. Further, the total number of local employees in the entire rural village of Darjeeling hills comprises 1098 employees and 205 non-local

Table 1: Capacity of Homestays in Sikkim (Registered & Non-Registered, 2019)

Capacity of Homestays in Sikkim (Registered & Non-Registered, 2019)

Sl. No	*Area (District)*	*Total no. of homestay*	*Total no. of rooms*	*Total no. of beds*		*Total*	*No. of employees capacity*	
				Double	*Single*		*Local*	*Non-local*
1	East	545	2032	2083	134	4300	478	119
2	West	289	857	803	100	1706	130	22
3	North	60	225	223	4	450	45	0
4	South	334	873	858	24	1740	89	2
Total Homestay		1228	3987	3967	262	8196	742	143

Source: Department of Tourism and Civil Aviation, Govt of Sikkim

Table 2: Capacity of Homestays in Darjeeling Hills (Registered & Non-Registered, 2021)

SL. No	*Area (Block)*	*Total no of Homestay*	*Total no of Rooms*	*Total no of Beds*		*Total Capacity*	*No of employees*	
				Double	*Single*		*local*	*Non-Local*
1.	Rangli-Rangloit Block & Takdah Cantonment	59	1090	917	143	2150	479	97
2	Sittong G.P.C	51	957	632	78	1667	389	63
3	Kalimpong Block	41	730	424	65	1219	230	45
	Total Homestay	151	2777	1973	286	5036	1098	205

Source: Primary Data Collected through Field Survey

employees. This indicates intense levels of local community ownership, active participation in decision-making, and sustainable livelihood opportunities provided particularly to rural communities in the region. Homestays have contributed to poverty alleviation and empowerment of local communities, which has resulted in the growth of Sustainable rural tourism and community-based ecotourism development in Darjeeling hills. Though the table indicates high carrying capacity levels of homestays, there needs to be quantitative data that measures the contribution of homestays to TBL dimensions of destination sustainability.

Table 3: Trends and Range of Sustainable Homestay based Activities in Sikkim & Darjeeling Hills

SL. No	*State/ District / Block*	*Name of Villages*	*Name of Homestays (Surveyed)*	*Homestay based Activities*
1	North Sikkim	Lachung, Lachen, Passingdong, Lingthem, Mangan, Mangshilla, kabi, Tingvong, Hee-Gyathang, Yumthang Valley	Lazomla Homestay, Soenamla Homestay, Our Guest Camp, Lingthemlyang Homestay, Lachung Khim Homestay, Lachung Sikkim Homestay, Our guest camp Lachung, Bayul Homestay, Keerong Cottages, Delight Royal Lachung, Our Guest Lhakhim homestay, Khenkhim regency, Tenzing's Homestay, Mayalyang Homestay, Suhor Lee Homestay, Rum Lyang Homestay & Others.	Cultural Songs and Dances, Tribal Music and literary Arts, Festive celebrations, local folklores and storytelling, Traditional method of making local butter and cheese. Milking yaks, Paddy Cultivation and Harvesting, Traditional games sports, Collecting and cooking wild edibles, Meeting Traditional healers, learning tribal language, kitchen gardening
2	West Sikkim	Darap, Pelling, Dentam, Yuksom, Rinchenpong, Kaluk, Uttarey, Shreebadam, Okhrey, Hee-Bermoik, Khecheopalri, Kanchendzonga National Park (KNP),	Yuksom Village homestay, Azing model Farmhouse, Chungda Hidden Homestay, Sukhim Homestay, Adhikari Homestay, Daragaon Retreat Gurung Homestay, Cherry village Homestay Resort, Rinchenpong Homestay, Yangsum Heritage Farm, Mandarin village Resort, Ghonday Village Resort, Kaluk Village Resort, Eshab Homestay, Okhrey Village homestay, Royal Barsey Homestay, Step away Chayatal Heritage Homestay, Lalliguras Village Homestay & Others.	Cardamon weeding and harvesting, Kiwi Plantation and plucking, local Tribal cuisine, Star Gazing, ploughing organic fields, Processing Traditional Organic Wine making, Sheep rearing. Evening traditional limboo cultural programme called Chabrung & Dhaan Naach

3	South Sikkim	Kewzing, Ravangla, Kitam Wildlife Sanctuary, Maniram Village, Assangthang, Yangang, Chalamthang, Temi, Turuk, Namchi,	Nolina Boutique Homestay, Chalamthang Homestay, Bon Farmhouse, Dhuni Homestay, Tungna Homestay, Selep Homestay, Chefung Khim Homestay, Green Magpie Homestay, Barbet Homestay, Great Cormorant Homestay, Iora Homestay, Kewzing Village Homestay, Sosing Homestay & Others.	Orchid nursery visit and Flower plantation techniques, Dotho (Sikkimese Hot stone herbal bath) Bird watching, Local Bamboo arts and crafts, Nature Interpretation & Birding Tutoring, Homemade Millet based beverages, Traditional organic wine making, Yoga & Spiritual discourse.
4	East Sikkim	Rumtek, Reymindu Assam linzey, Aritar, Pastanga, Yakten, Phadamchen, Dzuluk, Gnathang Valley, Rongli, Lossing Village Rangpo (Rangpo Khola)	Assamlinzey Homestay, Gnathang Valley Homestay, Rolep Homestay, Woodstock Inn Homestay, Kenjongla Homestay, Rangpo Khola Homestay, Malinggo Homestay, Teen Talley Village Homestay, Pinasha Homestay, Waterfall Homestay & Others.	Cooking traditional Cuisine, Nature Photography, Fishing, Orchid Cultivation & flower show Cultural Dance and Music, Milking cows, Shopping, and education on local handmade souvenirs from the villages
5	Rangli-Rangloit Block & Takdah Cantonment	Bara Mungwa, Chhota Mungwa, Chegra Khasmahal, Kolbung Khasmahal, Rayak Khasmahal, Soriang Khasmahal, Takling Khasmahal, Takdah, Tinchulay	Manjushree Homestay, Bara Mungwa Priya Homestay, Camp five Homestay, Theeng's Homestay, Sherpa Homestay, Go Green Homestay, Camp Inn Rai cottages, Tinchulay Gurung Homestay, RS Homestay, Tinchulay Himalayan Homestay, Kusom Homestay, Tinchuley Dunzom Homestay & Others.	Permaculture Farming, Organic farming using Mulching method, Ethno-medicinal traditions and practices engaged by homestay owners of indigenous groups, Beekeeping, Orange cultivation and plucking,

6	Sittong II & III G.C.P Block	Latpanchar Forest, Toryak Khasmahal, Upper Mamring Khasmahal, Lower Mamring Khasmahal, Ahal Dara, Lanku Khasmahal, Rolak Khasmahal, Selphu Khasmahal	Sittong Homestay, Heritage Homestay, Avacado Homestay, Nature lover Homestay, Latpanchar Hornbillnest Homestay, Latpanachar Gurung Homestay, Smile Homes latpanchar homestay, Orange Tree Homestay, Ahal Homestay, Hamro home Siwalik Homestay and Others.	Nature Photography, Beekeeping & Honey Making, Orange Orchard Walks, Butterfly watching, learning traditional methods of Organic farming, Night Tent Camping.
7	Kalimpong Block I & II	Kaffir Khasmahal, Kankebong Khasmahal, Mazeok Forest, Samalbong Khasmahal, Sillery Gaon, Loleygaon, Samthar Khasmahal, Lava Forest & Bazaar, Pedong Khasmahal	Sinchula Homestay, Lava Feathers India Homestay, Misty Mons homestay & Café, Mansovar Homestay, Mayalyang Homestays, Denzong Homestay, Kagay Honeycomb Homestay, Green Valley Homestay, Mount View Nomad Village Homestay Kaffer Homestays, Samthar Homestay, Ammihud Homestay and Others.	Cactus & Orchid Nursery, Nature Photography, Village Walk around the property, Beekeeping & Honey Making, Cooking lessons on traditional food, Night Tent Camping. Cultural Dance and Music

Source: Authors' Own Compilation

Community members of Lingthem, Tingvong, Dentam, Rinchenpong, Toryak, Bara Mungwa, Reymindu, Kewzing, Turuk and Samthar villages of Sikkim and Darjeeling hills are involved in the implementation of various sustainable tourism practices in their homestays such as the traditional method of making local butter and cheese, organic farming, orchid plantations, cardamon cultivation, beekeeping, organic wine and honey making. In the group discussion with local people, they highlighted that they were concerned regarding seasonality, lack of financial support from government and human resources and high risk of operating costs associated with sustainable practices in homestays.

Discussions with homestay owners of Sinchula homestay, Hornbill Nest homestay, Samthar homestay, and Rangpo Khola homestay from various rural villages in the region indicate a lack of effective marketing and promotions on the experiential concept and responsible practices of homestays, as well as low levels of online marketing by destination management organizations in the region.

According to the local self-governing village bodies and tourism associations of Rangli-Rangloitblock, Sitting GPC, Kalimpong block, Rinchenpong, Tingvong, Lingthem, Lachung, and Lachen villages, Covid 19 pandemic has had a significant impact on the tourism industry. Imposed restrictions and stringent health regulations have resulted in a limited tourist inflow that has led to numerous closures of rural homestays, unemployment and income loss, financial difficulties, and operational challenges. Further discussions suggest numerous issues concerning seasonality, lack of training and support for the informal sector, limited employment, free riding and freeloading problems, and a lack of education on sustainability imparted to homestay owners and community members.

In an interview, Mr Rajan Chettri of Nolina Homestay and Mrs Pema Bhutia of Rinchenpong Homestay stated, "We face challenges such as limited employment for locals, problems of pricing caused by leased out homestays by some owners, and cross-cultural conflicts with tourists in terms of misinterpretation of indigenous language, prejudices, and stereotyping of traditional food habits, dance forms, and music."

Mr KarthokLepcha, an environmental volunteer and homestay owner of Lingthem, stated that "There is a lack of proper signages, environmentally friendly dustbins, shortage of water refilling points in some homestays, improper vigilance by villages bodies with strict penalties must be imposed on polluters". Mrs. Deena Gurung, a resident and owner of Gurung homestay in Latpanchar ecotourism village stated that "Rural homestays in Latpanchar village lack awareness on solid waste management, there is lack of infrastructure support like dustbins, collection vehicles, waste collectors. There is also a problem regarding burning solid waste in the landfills". She further suggests the need to implement green certification programs for homestays as an indicator to encourage environmental and social responsibility, particularly in practices around the periphery of ecotourism zones in the region.

6. Discussions

6.1. Homestays Contribution to Triple Bottom Line (TBL) Sphere for Sustainable Destination Management

Homestays as a component of CBET have been popularized in Sikkim to provide authentic, transformative, and educational experiences to tourists on the indigenous landscape's natural and cultural

heritage. The principles of CBET in Sikkim are based on high-value and low environmental impact tourism, encouraging community participation for sustainable destination management. Homestays contribute to the fulfilment of sustainable tourism criteria's encompassing environmental, sociocultural, and economic dimensions (Khamsavay and Christian, 2021).

- Homestays, as a component of CBET, inculcate environmentally friendly practices in actions such as recycling, renewable sources of energy, safe disposal of wastes, environment-friendly structures, and regulating and maintaining carrying capacity. Implementing energy conservation practices and renewable energy use in local homestays is a basis for environmental sustainability (Porwal *et al.*, 2019).
- Homestays enhance prospects for economic multipliers by improving economic linkages, such as sourcing local products and services. It aids as a sustainable livelihood occupation for disadvantaged communities, encouraging community empowerment through business ownership of micro-enterprises, generation of local employment, encouraging social equity by including women and youth, and community participation for economic sustainability (Janjua *et al.*, 2021).
- Homestays showcase traditional aesthetics linked to local architectural and cultural values. It helps in Guest-Host interaction and cross-cultural understanding, cultivating respect among tourists for local culture through the promotion of local handicrafts, ethnic cuisine, weaving, handlooms, and cultural performances while revitalizing community motivation for the protection of indigenous knowledge and preservation of cultural heritage for sociocultural sustainability (Janjua *et al.*, 2021).

6.2. Issues and Challenges of Homestays

6.2.1. Issues and Challenges of Homestays for Economic Sustainability in Sikkim and Darjeeling Hills

- **Lack and delayed financial and monetary assistance to Homestays for sustainable development:** Tourism Businesses in Sikkim and Darjeeling Hills are vulnerable to seasonality and high risk of costs associated with sustainable practices in homestays. Community members in numerous rural villages of Sikkim(e.g., Lingthem, Tingvong, KabiandYangang villages) lack financial requirements to provide financial assistance from banks/cooperatives for loans. The Skilled Youth Start Up Scheme initiative implemented by the commerce and industries department, Government of Sikkim, intended to generate employment in rural areas; providing a 50% subsidy to below-poverty-line families remains a challenge for most rural community members unwilling or unable to repay the loan amount as per the stipulated period assigned by the Department due to lack of working capital.

  The Government of West Bengal has provided incentives with a sum of 1.5 lakhs as financial assistance to eligible homestays for promoting homestay tourism and sustainable occupation of rural communities in the state. The initial capital provided is not sufficient for poor communities in building homestays (e.g., Samalbong, Lanku, Rolak, Toryak and Samthar Villages in Darjeeling hills) based on standards prescribed in the West Bengal homestay tourism policy, 2017. This

indicates issues regarding the effective implementation of financial and monetary assistance from such initiatives.

- **Marketing and promotion of Homestays for Destination Sustainability:** Promoting rural tourism Homestays in Sikkim and Darjeeling hills are marketed by the Department of Tourism, Govt of Sikkim and Department of Tourism, Govt of West Bengal. There are issues with effective Homestay branding and marketing with limited information about Homestays and inaccurate descriptions of facilities and lacking the experiential concept of Homestays (e.g., Sinchula Homestay, Manjushree Homestay, Samthar Homestay, RangpoKhola Homestay). Most rural Homestays lack an online marketing strategy (e.g., Website, online booking) in comparison to other destinations having gold category Homestays marketed by the State Tourism Boards and Third-Party online travel (OTA) and local companies (e.g., Airbnb, Booking.com, Make my trip.com, Our guest.in) operating in Sikkim and Darjeeling Hills.
- **Covid-19 Pandemic and its impact on destination Sustainability:** The ongoing Covid-19 Pandemic has limited the inflow of tourists to Sikkim with stringent health and safety protocols and operational guidelines imposed on the industry by the state. The pandemic has crippled the highly dependent tourism economy with a revenue loss and the shutdown of numerous rural homestays. This has also resulted in widespread unemployment and loss of income to vulnerable rural communities in Sikkim despite concessions offered by the tourism department to registered homestay providers. The challenge for the sustainability of tourism in Sikkim is the responsibility of all stakeholders to manage tourism growth and implement continuous operational training and monitoring strategies for Homestays that creates a safe destination image for tourist. During the pandemic survey, homestays in Darjeeling hills are confronted with financial problems and operational challenges. Several homestays had closed operations due to prolonged shutdowns in the state for more than 15 months. It has resulted in the loss of revenues and incomes to homestay owners belonging to vulnerable rural communities residing in many villages of Darjeeling hills.
- **Seasonality nature of tourism in Sikkim and Darjeeling Hills:** The peak tourist season in Sikkim and Darjeeling hills occurs approximately for three months (e.g., Spring season from March to May) and a week-long lean season during (Autumn season from October to November) every year. Tourism seasonality affects Homestays and ecotourism, which remain closed or operate in a minor way for the rest of the year. The nature of seasonality completely breaks the consistent income and employment required for the sustainability of rural people. The state Government developed a sustainable tourism policy in 2018, integrating new tourism products (e.g., nature-based tourism, adventure tourism, culture-based tourism & village homestays) to tackle seasonality. The policy implementation requires inter-department coordination and convergence, which remains a current challenge in the state.
- **Free Loading and Free Riding:** The cost of externalities related to maintaining natural and cultural tourism attractions are a concern to several indigenous local communities residing especially in protected areas and remote rural villages (e.g., Tingvong, Lingthem, Takdah, Loleygaon, Khanchendzonga National Park, Kitam wildlife sanctuary etc..). Attractions add value to the Homestay experience but are slowly losing visitor attractiveness and value due to several factors

(e.g., Free riding of homestay owners selling their homestays merely as an alternative accommodation at a heap price for economic profits at the cost of community benefits, irresponsible and hedonistic tourists freeloading on community utilities, upsurge in the growth of Homestay and Village tourists in Sikkim and Darjeeling Hills). The challenge for policymakers is the level of intervention required in the marketplace while taking responsibility for sustainable destination management through regulatory coercion tools such as laws and guidelines (e.g., Code of Conduct, fines on the polluter pays principle, community ownership, international partnerships etc.) for sustainable development.

- **Lack of Support from Homestays to Informal Sector:** There is a lack of support from homestays to the rural informal sector such as local guides, youth & women drivers, local artisans making Indigenous cultural souvenir products such as Handicrafts (e.g., Bamboo Handicrafts & Toys (Fruit & Vegetable baskets, Mugs, Traditional Wooden Hammers, Scissors etc.), Wooden Mask, Choose (folding table), Bagschok (Centre table), Lepcha Hat, Lepcha Handloom weaving products Lepcha Dress, Shoulder bags, cushions, table cloths, Doko (Hand weaved Conical V-shaped Bamboo Basket etc.). Most Rural Homestays lack marketing or management skills in understanding the process of creating quality handicraft products and generating end value. The challenge for most homestays is providing direct access to consumers (e.g., local guided services, sale of Handicrafts etc.) while assuring consistent quality standard products for creating end value and enhancing revenue generation for sustainable livelihood opportunities to socio-economic weaker members of the local community. The informal sector also contributes to the natural and cultural protection of resourcesinSikkim and Darjeeling Hills.

6.3. Issues and Challenges of Homestays for Social Sustainability in Sikkim and Darjeeling Hills

- **Lack of education on sustainability:** The field study on homestays revealed that most rural homestay owners needed to gain knowledge on the concept of sustainable homestays or had ambiguous perceptions of sustainable practices. The community members and homestay owners in rural villages (e.g., Samalbong, Tackling, Royak, Dentam, Turuk, HeeBermoik etc.) lacked prior education on the responsibilities as per the sustainable tourism criteria and indicators, certification programs recognized by Global sustainable tourism council of India for effective, sustainable management of homestays. The challenge for sustainable tourism education, awareness and mobilization to rural communities from Government and International funding agencies is imperative for sustainable tourism development in Sikkim and Darjeeling hills.
- **Training and Capacity Building:** There are issues such as lack of continuity, gaps in existing training modules and short duration of training and capacity building programs on hospitality management (e.g., ethnic and traditional cuisine, housekeeping, Food & beverage services etc.) to homestay owners and community service providers. Sikkim tourism department and Ministry of tourism, through the Institute of hotel management (IHM) and the Homestay Association of Sikkim (HAS), are responsible for providing insights on the latest market trends and modules for managing homestays sustainability as a sustainable livelihood option for rural communities. The

gaps in existing training modules pose a challenge to training and building capacities programs imparted to Homestay service providers in Sikkim and Darjeeling's rural communities. These hills are crucial for sustainable development.

- **Cross Cultural conflicts between Guests and Homestay Owners:** There are cross-cultural conflicts between several homestay owners and guests arising due to cultural indifferences. There are inter-racial prejudices and inferior-superior relationships between host and guest, resulting in conflicts and a lack of respect for cultural values, traditions and food habits showcased by rural homestays in Sikkim and Darjeeling hills. The challenge of sensitizing travellers on respect for local culture and heritage is crucial for sustainable tourism development in Sikkim and Darjeeling hills.
- **Limited employment to locals in Homestays:** The rural indigenous local community members, especially unemployed youth and women, should be encouraged and expected to be employed in Homestays to ensure equitable distribution of benefits from tourism. There is a lack of local employment in Homestays in Sikkim and Darjeeling hills due to several reasons, such as costs incurred in paying salaries and maintenance, capacities of local people not being adequately strengthened, socio-economic inequality, especially to weakest members of the community, rural to urban migration, leasing out of some homestays to people outside the state. The challenge for government and tourism boards is to stress and ensure regulations on local employment and build capacities, especially for indigenous women and youth, for destination sustainability.

6.4. Issues and Challenges of Homestays for Environmental Sustainability in Sikkim and Darjeeling Hills

- **Land degradation:** land degradation is an issue for several homestays located in isolated eco-sensitive fragile, and protected areas in the region. Land degradation has caused various issues of Food & water security, loss of cultivated land, human-wildlife conflicts and loss of Bio-diversity, resulting in low occupancy rates within homestays in the region.
- **Green Certification for Homestays:** There needs to be more conceptual clarity in implementing a green certification scheme for Homestays incentivized for reducing environmental impact and making it a socially responsible business in Sikkim and Darjeeling hills. The challenge for state tourism boards in collaboration with recognized certification agencies is to address the components of green certification in the scheme for homestays, such as green building design, reduction in the use of plastics, and energy efficiency mechanisms.
- **Impropersustainable waste management of Homestays:** Solid waste generation in homestays is a critical issue evident across the region. However, there are rules and regulations imposed by the Sikkim government in convergence with the Swachh Bharat mission of the Central Government, such as the Solid waste management rule and the plastic waste management rule, 2016. There needs to be proper signage, a shortage of water refilling points in some Homestays and improper vigilance with strict penalties imposed on polluters in several rural village areas of Sikkim. Homestays in rural villages of Darjeeling hills lack adequate infrastructure support such as dustbins, resource recovery centres, collection vehicles, waste collectors etc. and burning of solid waste in their landfills.

7. Conclusion

Homestays are micro-scale enterprises predominantly owned by community members belonging to rural areas. Homestays lack initial capital for investment with delays in incentives and subsidies from Government homestay programs. The funding agencies should acknowledge the adversities faced by homestay owners to review provisions in the policy and schemes. Homestay programs in Sikkim and Darjeeling hills lack extensive community participation, especially among women and unemployed youth, for community decision-making. There are issues regarding deprived community structure, incompetent community leadership, and poor planning in various stages of community-based homestay tourism. Community-oriented programs using bottom to top approach in tourism planning and development involving all rural community members with inclusivity to women and youth are recommended as an effective mechanism for poverty alleviation and community empowerment. Responsible marketing is required with accurate homestay information from state tourism boards and third-party agencies. The classification of homestays (e.g., Gold, Silver) based on the category prescribed by governing agencies on the products and services offered remains a challenge for several rural homestays needing more proper infrastructure facilities for their sustainability.

However, the Ministry of Tourism and State Tourism Boards hold capacity-building programs for Homestay owners (e.g., housekeeping, Food, and beverage training). There is a need for concrete and continuous training programs with the establishment of institutes (e.g., vocational colleges, universities, and capacity-building institutes) imparting knowledge on sustainable management of homestays (e.g., sustainable solid waste management, zero-waste policy in operations, homestay entrepreneurship, etc.), especially to women and youth in rural areas. Education and awareness programs to community members on the importance of tourism linkages and economic multipliers connected to homestays are imperative for local economic development in Sikkim and Darjeeling hills. The state tourism boards have imposed protocols and standard operating procedure (SOP) guidelines on homestays for the safety and security of tourists.

The sustainability of homestay tourism in Sikkim and Darjeeling hill remains the responsibility of all stakeholders to manage tourism growth through continuous strategy implementation for homestays that promote a safe destination image. The study finds issues with training and capacity programs for service providers. There is scope for future research in this area to know the gaps in existing training modules concerning women and youth and to develop a tourism training framework to consider the sustainable development program due to its importance in correlation with visitor satisfaction. The study also finds a gap concerning implementing green certification programs for homestays. There is a scope for future research to study the components of the green certificate scheme for homestays, such as green building design, reduction in the use of plastics, energy efficiency mechanism in Sikkim and Darjeeling Hills, and how well it can be implemented in line with the sustainable development for the region.

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Behavioral Supply Chain Management and Firm Performance: Systematic Literature Review and Conceptual Framework

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Supply chain management, Behavioral SCM, SCM strategy, SCM integration, Firm performance

JEL Classification

D21, D22, D23, E71

Abstract: Supply Chain Management (SCM) has a significant contribution to the performance of the firm. The adoption of the behavioral approach is still relatively novel in the domain of the supply chain. Failure to account for behavioral components such as interaction, commitment, and like may lead to biased models. The current literature review's objectives are to (a) recognize and revisit the guiding theories underpinning behavioral SCM (BSCM); (b) identifying behavioral dimensions of SCM; (c) create a comprehensive conceptual framework based on aspects with empirical support and their relationships (d) presenting propositions justifying the relationship between the factors and the firm performance. The findings of the integrative literature review of 73 empirical and conceptual studies on the behavioral aspect of SCM suggest that the proposed model is unique since it inter-relates three constructs simultaneously, showing the effect on firm performance. This paradigm establishes a new basis in BSCM by identifying potential research directions and enabling practitioners and academics to conduct more research.

1. Introduction

In the present competitive global business scenario, the effective supply chain is the core of any business and is one of the most critical thrust areas to attain competitive advantage. The factors can be measured both in qualitative and quantitative terms. Studies on quantitative aspects have been studied extensively to comprehend supply chain management (SCM) dynamics and their effects on firm performance. But there is a dearth of literature for qualitative parameters of SCM related to behavioral aspects. There is a disconnect between theory and practice in SCM because "human and behavioral components (the soft-wiring)" are at least as significant as its "hard facts," such as processes, technology, and measurement

tools. Comparatively speaking, Behavioral Supply Chain Management (BSCM) is "still in its infancy" (Donohue and Siemsen, 2010) and only partial research has been conducted in this field.

Hence, this study aims to explore and review qualitative internal and external factors of behavioral dimensions of SCM. The elements were identified by a review of various theoretical and empirical studies in the field of the supply chain. In this respect, a total of 70 articles were reviewed to comprehend the BSCM concept and its underlying dimensions through various theories and models to generate a conceptual framework. The primary qualitative internal and external factors identified three constructs of BSCM, namely SCM Strategy, Commitment, Integration. The optimum selection of dimensions improves the supply chain performance overall affecting firm performance. Hence, the overarching goal of this study is to strengthen the role of BSCM within the broader discipline of SCM studies.

2. Purpose Statement

The new institutional economic theory, transaction cost economics, and neoclassical economic theory have all been tested in the SCM sector (McNally and Griffin, 2004; Halldo'rsson and Skjott-Larsen, 2007). The grounded and a theoretical framework developed in this area have been significantly improved by the incorporation of these concepts. However, these theories and the current SCM research have mainly concentrated on the effective configuration of processes or the allocation of resources, relying on the Simons' "Concept of Rationality," which holds that people can make rational decisions and are motivated by self-interest to achieve the best results of predetermined goals (Simon, 1955; Simon, 1957; Barros, 2010). However, a wealth of data demonstrates that people regularly deviate from the rationality. These rationality assumption failures can be systematic, especially in uncertain situations (Julmi, 2019). However, this topic emerged as a field of study in the 1960s, research on behavioral and non-rational components of SCM has been virtually nonexistent (Gao *et al.,* 2005).

There is an attempt to fill the above information void by reviewing existing research on BSCM while offering a conceptual framework and generating relationships between the underlying dimensions of BSCM with firm performance. Hence, Systematic Literature Review in Stead (SLR) is conducted to assess the studies conducted previously in the parallel field (Gaba and Kumar, 2021). The primary research question guiding this article is how behavioral aspects of SCM add value to attain competitive advantage? The hunt for literature and the resulting philosophical structure to answer the research question was motivated by two sub-questions:

(a) What are the underlying dimensions of BSCM?

(b) How are behavioral dimensions of SCM related to firm performance?

To address these questions, this study looks at analytical and philosophical research that identifies the dimensions of BSCM from various behavioral theories of SCM and studies its relationship with firm performance.

3. Methodology

The SLR approach, which has been recommended for completely summarizing the status of research around SCM, was utilized to accomplish the study's objectives (Durach *et al*., 2017) and to find out the gap in existing literature (Singh and Gour, 2022). Searching, assessing, and synthesizing submissions

were done according to a specific process (Pilbeam *et al.*, 2012). This approach ensures a transparent and unbiased analysis process everywhere.

Torraco's (2005) structure served as a guidance as we initially chose pertinent literature. The literature discovery method considers several variables, including (a) the location of the articles' discovery, (b) the timing of the search, (c) the searcher, (d) the method used to find the articles, (e) the number of articles that initially appeared and the number of articles that were ultimately chosen, (f) and the reasons for the selection of the articles.

To extract the most pertinent papers, this study searched numerous databases, including Scopus, JSTOR, Ebsco Host, and Google Scholar. Using the databases, the initial search was done first by the author in April 2021. The connection between BSCM and firm performance is the main topic of this study as it relates to keyword combinations. As a result, the terms (a) Behavioral Supply Chain Management and (b) Firm Performance were chosen as the search keywords. This study concentrated on peer-reviewed English-language articles where any of the exact keywords occurred in the abstract, title, or full text to define the scope of review. Between January 2000 and December 2020, documents published for this study were considered. When the titles of each article were individually examined for the keywords, the initial search utilizing the keyword combinations produced 1310 articles from the databases. After reviewing the abstract and the complete papers as being relevant to the topic, it was further limited to 302 articles, and then to 119 articles. The overall number of articles to be considered for this study came to 73, as shown in Table 1. Duplicate articles that were available in various sources were also decreased by a direct search, and 14 additional articles were added through forward and backward search.

Table 1: Number of Articles Search

	Keyword Search	*Title Search*	*Abstract Search*	*Full Paper Search*	*Final Papers Selected*
Scopus	515	253	112	43	29
JSTOR	649	124	84	21	18
EBSCOhost	29	14	9	9	2
Scholar	117	45	28	22	15
INFORMS PubsOnLine	1558	251	69	24	9
Total	1310	687	302	119	73

Source: Authors' Own Compilation

The 687 articles that were found through the search were then examined using the systematic review method, a method for studying the literature that involves first conducting an initial evaluation of abstracts and then finishing an in-depth analysis of articles (Torraco, 2005). The main consideration during the tiered evaluation was whether a publication explored and addressed the BSCM and company performance conceptually or experimentally. The articles were removed if an abstract just briefly or

imprecisely defined the relationship without providing any context or pertinent commentary. Additionally, duplicate articles were eliminated. The use of backward and forward searches also assisted in the discovery of 14 additional pertinent articles. 73 publications were ultimately chosen for this study because of this method, as indicated in figure 1.

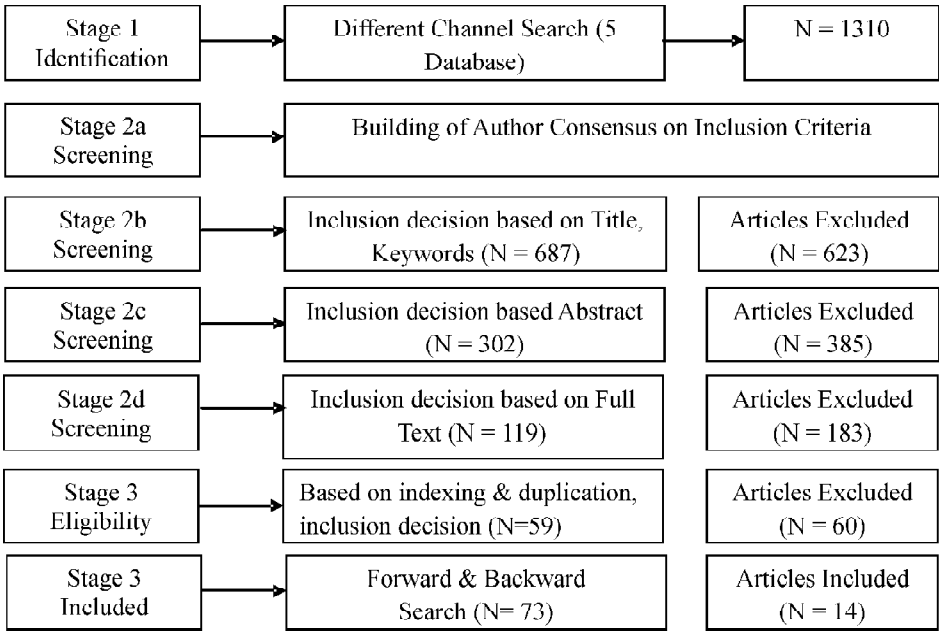

Figure 1: The outcomes of the systematic literature search are shown in a PRISMA flow diagram (Liberati *et al.,* 2009), along with the reasons why records were omitted at each stage of the procedure

Source: Authors' Own Compilation

The frequency of publications demonstrates that in 2005–2006, BSCM research started to pick up steam. The symposium on behavioral operations, which began in 2006, and subsequent review articles by Carter *et al.* (2007), Tsanos and Zografos (2016), Perera *et al.* (2018), and Fahimnia *et al.* (2019) have all made significant contributions to understand the concept of BSCM and its underlying dimensions that have assisted in identifying some of the crucial research opportunities. Figure 2 shows the frequency of publications since 2006, highlighting that the subject took prominence between years 2017 to 2019 which more studies compared to another time- period, which declined in 2020. Overall, not many studies have been conducted so far in BSCM in general and identifying its underlying dimensions specifically.

4. Analysis and Synthesis of Literature

This section articulates the literature from the identified articles to understand the underlying concepts and extract the theories and models to identify the dimensions of BSCM and generate the relationship with firm performance to propose a conceptual framework and present the propositions.

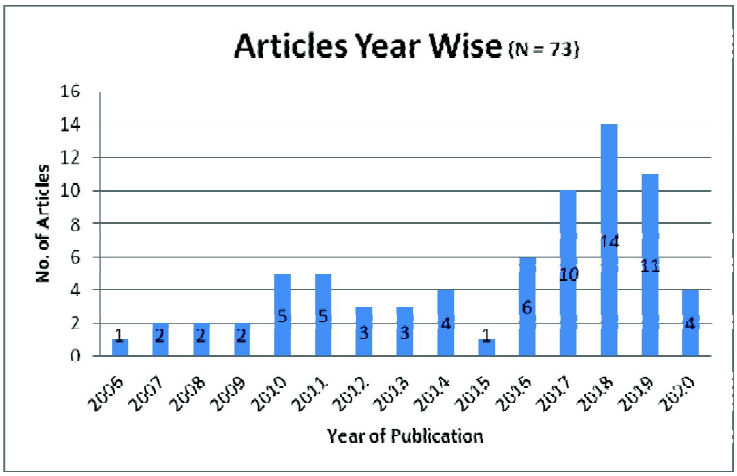

Figure 2: Frequency of BSCM Articles Year wise

Source: Authors' Own Compilation

BSCM must be properly defined in terms of both the behavioral component and SCM as a starting point. According to the definition of BSCM by Croson *et al.* (2013), behavioral research can be viewed by people in at least one of three ways: (1) people have motivations other than financial gain; (2) people's behavior is influenced by unconscious or unintentional mechanisms; and (3) people's behavior does not always lead to the best course of action (i.e., the rational equilibrium in the given context). In addition, the analysis needs to be based on SCM meaning. The literature is dominated by SCM models that address the behavioral complexities of inter-organizational relationships (Danese and Romano, 2011; Emberson and Storey, 2006; Fawcett, Magnan and McCarter, 2008). In supply chain relationships, opportunistic and competitive attitudes are often portrayed as opposing ends of a continuum (Das and Teng, 1998; Hoyt and Huq, 2000; Wilson, 2006). Various behavioral models for controlling and managing procedures, systems, and operations around the supply chain have been formulated in this respect. Lambert, *et al.* (1996), for example, created one of the first SCM relationship models. The model clarifies the logic behind collaboration formation and can be used as a driving method to establish and sustain mutual partnerships.

5. Theories and Models of BSCM

The behavioral model was made possible by Herbert A. The behavioral model of rational choice proposed by Simon in 1955. The presumption of neoclassical economists was that businesses had perfect information. Herbert Simon created the idea of "bounded rationality," which is where this idea originated. Bounded rationality refers to making wise decisions in a particular set of conditions.

Hence, theories for BSCM developed under the premises of 'Bounded Rationality" have a broader application on explaining, describing, and predicting complex behavioral aspects in the explanation of supply chain as evident from the studies of various researchers (Halldórsson *et al.*, 2007; Shook *et al.*,

2009). Few behavioral theories recommend managing and controlling the supply chain's practices, processes, and activities as a result.

5.1. Partnership Model (PM) of SCM

Lambert *et al.* (1996) suggested a simple view of the reasoning underpinning collaboration growth, which can be seen as a driving mechanism to establish and sustain mutual partnerships, as shown in figure 3.

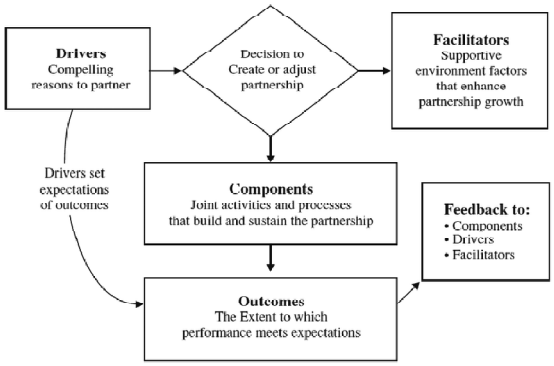

Figure 3: The Partnership Model

Source: Lambert *et al.* (1996)

5.2. Collaborative Model (CM) of SCM

Barratt (2004) proposes that ideology and policy play significant roles in handling supply chain cooperation. The cultivation of a collaborative culture among supply chain participants is attributed as the basis for collaboration, which may include factors such as trust, mutuality, knowledge sharing, and communication, as seen in figure 4.

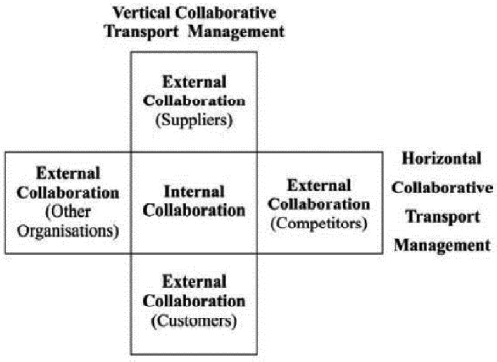

Figure 4: Collaborative Model

Source: Barratt (2004)

5.3. Relationship Maturity Model (RMM)

The Relationship Maturity Model (RMM) of SCM, as proposed by Spekman *et al.* (1998), suggested a classification of behavioral elements across member's relationships in the supply chain. This model emphasizes the participants' self-maximization behavior during transactions. As shown in Figure 5, teamwork pervades partnerships, resource sharing and shared coordination are the key priorities for supply chain stakeholders.

The behavioral aspect of SCM can be addressed using other theories regarding BSCM, such as Relational Exchange Theory (Ring and van de Ven, 1992) and Social Exchange Theory (Emerson, 1976).

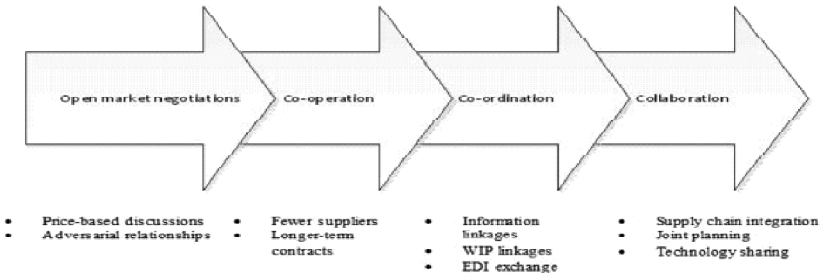

Figure 5: Supply Chain Relationships Maturity Model

Source: Spekman *et al.* (1998)

5.4. Relational Exchange Theory (RET)

It is predicated on the notion that the trade's outcomes are better than those that could be obtained either through more exchanges or the trade with a different partner, which is mutually acknowledged by the parties to the exchange. This encourages the trade parties to value the connection and invest resources in its growth and maintenance (Goles and Chin 2002).

According to RET, which serves as the primary theoretical framework for this study, relational norms including cooperation, adaptability, and information sharing are components of a replacement for the current governing framework of formal agreements as the sole approach of an exchange (Vijayasarathy, 2010). Through internalization and moral strength, these rules present an internal means of controlling the behavior of trading partners (Joshi and Stump, 1999).

5.5. Social Exchange Theory (SET)

The significance of agreements that are "two-sided, mutually contingent, and mutually rewarding" (Emerson, 1976), where internal control systems ensure the reinforcement of positive behavior. Behavioral characteristics including trust, commitment, mutuality, and reciprocity are seen in figure 7 as being significant antecedents of collaborative supply chain partnerships because they can increase internal control and reinforce partners' positive behavior.

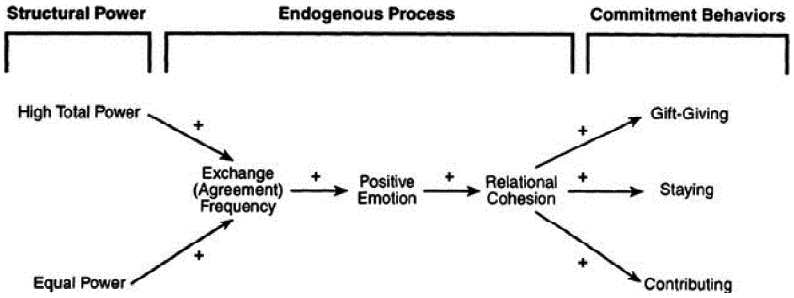

Figure 6: Theory of Relational Cohesion

Source: Adapted from Lawler and Yoon (1996)

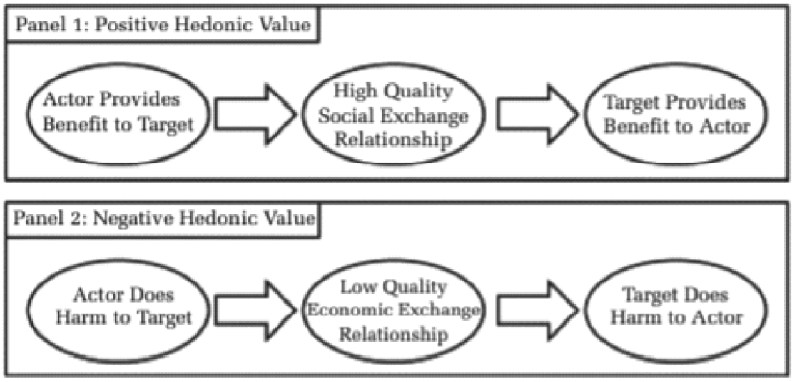

Figure 7: Generic Model of Social Exchange

Source: Cropanzano *et al.* (2017)

6. Discussion

A review of SCM extant literature and behavioral theories helps identify various behavioral dimensions, as mentioned in table 2. It further helps generate a theoretical framework for this study to fulfill the purpose of this article, i.e., to conceptualize and hypothesize the behavioral dimensions and the relationships with firm performance.

Hence, after critically reviewing all the theories and models discussed above, we have identified three factors for BSCM related to the focus on the theories, i.e., strategy, relationship, and commitment that encompasses the behavioral aspect essential to have a practical intangible resource for successful SCM. It can be understood that an effective strategy will lead to a harmonious relationship that will further lead to commitment among members

Therefore, this study is based on various behavioral theories of SCM to identify the underlying dimensions of BSCM to generate relationships between the dimensions and firm performance. The

Table 2: Behavioural Theories & Models of SCM

Theory/Model	*Authors*	*Representative Research*	*Focus Area*	*Factors of BSCM*	*Dimension of BSCM*
PM	Lambert *et al.* (1996)	Emberson and Storey (2006)	collaborative relationships	commitment	trust, mutuality, information exchange, and communication.
CM	Barratt (2004)	Kimmich and Fischbacher (2016); Fahimnia *et al.* (2019)	collaborative culture	strategy	management methods, power, and leadership structure
RMM	Spekman *et al.* (1998)	Durach and Machuca (2018)	self-maximization behavior	integration	collaboration, resource sharing, and mutual planning
RET	Ring and van de Ven (1992)	Vijayasarathy (2010); Yang (2016)	governance mechanism	relational norms	cooperation, flexibility, and information sharing
SET	Homans (1958); Thibault and Kelly (1959); Emerson (1976)	Griffith *et al.* (2006); Dania *et al.* (2018)	internal forms of control	collaborative relationships	trust, mutuality, and reciprocity
RBV	Barney (1991)	Hafeez *et al.* (2010); Davis-Sramek *et al.* (2018)	strategy	relational exchanges	information integration and coordination, risk and reward

Source: Authors' Own Compilation

underlying dimensions of BSCM recognized, i.e., SCM Strategy, Integration, and Commitment, are discussed below.

Strategy: Specifically defined strategic behavior entails anticipatory behavior. Strategic customer, effects the strategic behaviour (Liang *et al.*, 2018, Zhang, Mantin and Wu, 2019). Green Jr., McGaughey, and Casey (2006) discovered that The SCM strategy is inextricably linked to firm results. According to Zelbst *et al.* (2010), firm success is dependent on the ability of the supply chain to satisfy the needs of the ultimate customers. To improve efficiency, a company should devise and execute an effective SCM strategy in terms of the behavioral aspect of SCM.

Integration/Relationships: Supply chain integration refers to how closely a company works with its suppliers and customers. (Frohlich and Westbrook, 2001). Issues of bullwhip impact and disputes among supplier chain members occur if integration is not appropriately achieved (Shah, 2009). This emphasizes the importance of integration in supply chain management. Strategic alliances with suppliers and interactions with customers are crucial elements of supply chain management activities. (Li *et al.*, 2005), and they lead to knowledge exchange, one of the five pillars of building a strong supply chain relationship (Lalonde, 1998). The similar research approach was used by Fynes, Voss *et al.* (2005) as they examined the relationship between suppliers' four dimensions (communication, commitment, cooperation, and adaptation) and the effects they had on operational performance in traditional competitive priorities (quality, costs, delivery, and flexibility).

Relationships with Suppliers: Companies have a disposition to partner with various vendors in a variety of ways. The arrangement with manufacturers must meet the needs of the business. Hines (2004) stated that it is typical to see an adversarial partnership between buyer and seller in commodity goods that is primarily focused on price. This form of supplier arrangement would not allow for cost savings in the supply chain. It could be advantageous to network with the provider to form relationships and collaborations that support both parties. This may be focused on manufacturing, personal, or symbolic networking and would turn on strategic partnerships (Hines, 2004), allowing for knowledge exchange, risk sharing, shared gains, and organizing strategies, allowing for supply chain development.

Relationships with Customers: The variety of products available in the international marketplaces range in price and quality. The result is companies are continually in trouble and trying to raise prices while increasing productivity. More options, greater service, better quality, and quicker delivery are what customers apparently want (Burguess, 1998). Relationships with customers have changed over time to become a competitive issue for organizations today. Strong connections between internal and external parts of the supply chain, from vendors to consumers, should be built on mutual trust and knowledge sharing (Sheridan, 1998).

Commitment: A commitment in supply chain partnerships is a pledge or duty to do something in the future. It is described as each party's ability to maintain and strengthen a business relationship (Morgan and Hunt, 1994). It refers to relationship-driven behavioral issues (Gligor and Holcomb, 2012), competitive behavior (Nagurney *et al.*, 2015), and the bullwhip effect (Narayanan and Moritz, 2015).

Firm Performance: All SCM practices can eventually result in firm performance. In the current analysis, one of the constructs considered as an outcome of BSCM is firm efficiency. According to Altekar (2005), a value chain is mapped out to evaluate all steps from beginning to end and redesign them to ensure that they contribute value to the result. BSCM considers firm success to be an outcome.

7. Conceptual Framework and Propositions

Based on the identified dimension of BSCM, a conceptual framework has been created by generating the relationships between the dimensions with the firm performance, and propositions is presented.

7.1. Integration and Firm Performance

Supply chain integration improves the efficiency of the company (Leuschner *et al.,* 2013). Collaboration is a vital opportunity for businesses looking to save prices, maximize agility, and satisfy customers

(Spekman *et al.*, 1994). Strategic relationships have a significant positive impact on company growth in small and medium-sized companies, (Eyaa and Ntayi, 2010). Moreover, Gimenez and Ventura (2005) also noted that external integration has a significant positive impact on organizational outcomes.

P1: SCM Integration positively affects firm performance.

7.2. Integration and Commitment

Understanding the significance of dedication to a strategic partnership's long-term sustainability is key to understanding organizational performance. (Andaleeb, 1996). According to Chen *et al.* (2012), there is a good connection between SCM Commitment and. Integration. Salam (2011) demonstrated that supply chain commitment is directly linked to supply chain integration. These two studies explicitly show a favorable association between SCM dedication and SCM integration.

P2: SCM Integration positively affects SCM Commitment

7.3. Strategy and Firm Performance

Green *et al.* (2006) discovered that the SCM approach is closely related to firm success. According to Zelbst *et al.* (2010), firm success depends on the supply chain's willingness to meet the demands of the supply chain's ultimate consumers. To improve efficiency, a company should devise and execute an effective supply chain management plan. However, no research till date has tested the interrelationships between SCM strategy and organizational success, according to (Green et. al.2006).

P3: SCM strategy positively affects firm performance

7.4. Strategy and Integration

The problem is figuring out how to do this integration effectively (Lambert and Cooper, 2000). Via the partnership, integration aims to achieve organizational efficiencies and competitive efficacy in the supply chain. Organizations with a comprehensive internal integration plan obtain the highest levels of external integration, while companies with a bad internal integration strategy only achieve modest levels of external integration (Gimenez and Ventura, 2005). There is proof of this that the correct integration approach would have "complete integration" (Kannan and Tan, 2010).

P4: SCM strategy positively affects SCM Integration

7.5. Strategy and Commitment

Strategic agility results in operational and economic performance (Fartash and Davoudi, 2012). Strategic agility has a great impact on overall performance of small and medium companies (Kiprotich (2017).

P5: SCM Strategy positively affects SCM Commitment

7.6. Commitment and Firm Performance

A common metric for assessing dyadic supply chain connections is relationship commitment. Many times, buying companies can only achieve the performance improvements they need if they commit to a long-term partnership with their major suppliers (Krause, 2007). The level of operations, the process

of planning and controlling them, and the operational performance are all determined by behavioral antecedents like commitment (Tsanos and Zografos, 2016).

P6: SCM Commitment positively affects firm performance

Based on the above discussion, a conceptual model is proposed, as shown in figure 8, based on the thorough literature review based on behavioral theories of the firm.

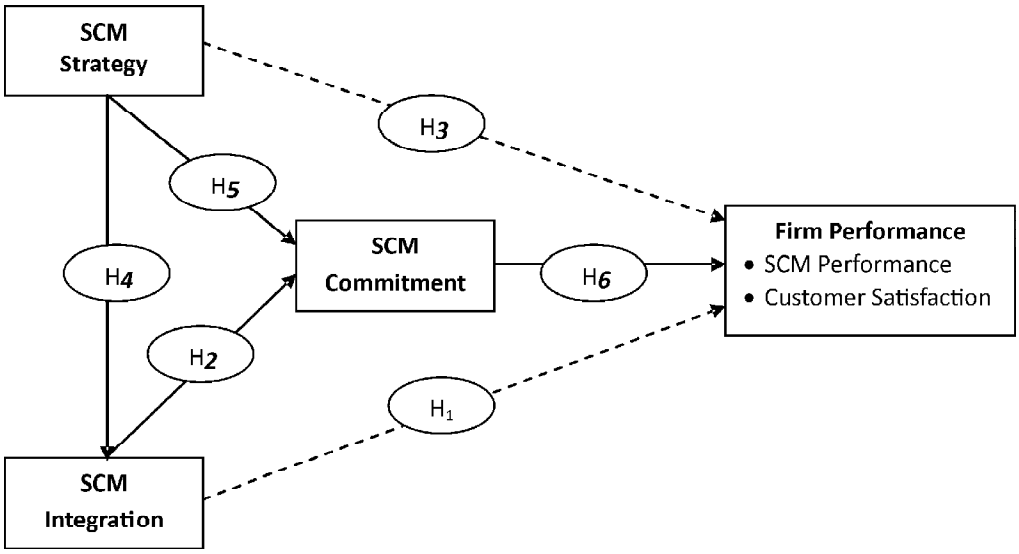

Figure 8: Conceptual Framework for BSCM

Source: Authors' Own Compilation

The behavioral dimensions of SCM are identified through Lambert and Cooper (2000). The SCM architecture has several behavioral elements that can influence how operations are handled, and thus networks are organized within supply chains. The behavioral management elements are intangible, soft instruments that allow the organization's physical resources to be used efficiently and effectively.

8. Findings

These findings show that while academicians and practitioners understand the impact of SCM's behavioral dimensions generating relationships between integration, commitment, and strategy, existing research on business performance is hampered by a lack of comprehensible conceptualizations and a limited exploration of behavioral variables. The BSCM association with performance results from the development of collaborative partnerships cannot be determined because of these gaps. These findings led us to create a conceptual framework and put forth hypotheses for it to be empirically tested using supply chain managers' perspectives to respond to the following research question, i.e., how significant is the relationship between BSCM and firm performance?

9. Practical Implications

The discussion presented throughout the paper, especially in the previous part, has several significant implications for specialists working in various supply chain functions. The course first enhances professionals' understanding of the behavioral elements that comprise the SCM. This is significant because the silo mindset often prevents functional managers from understanding how their actions can affect the preceding or succeeding role, mechanism, operation, or mission.

Second, professionals may better understand how management theories justify, forecast, or any of their supplier chain choices in contradiction. This allows these professionals to focus on their actions, whether they were based on predisposition or evidence. Finally, the concept discussed here helps professionals better understand the relationships between their supply chain techniques (e.g., performance, risk-hedging, resilience, agility) and internal and external activities, processes, and networks. This is a two-way relationship that explains how strategies affect attitudes, operations, and networks and how behaviors, procedures, and networks can be designed to facilitate strategy execution.

10. Future Research Agenda

Numerous research gaps were identified in the based-on intuition, the state of BSCM research at this time. Some of these differences were more apparent and have already been mentioned. However, to offer an even more significant catalyst for growth, the following potential research prospects are highlighted in this article as the most relevant and groundbreaking.

- To empirically test the conceptual foundation of the research and test the hypotheses.
- How should a business start fostering behavioral traits to forge closer working connections with its suppliers and clients?
- Is a better perceived level of supply chain performance, as supported by cooperative partnerships, positively connected with a higher perceived level of supply chain integration?
- Which BSCM dimension affect the most on supply chain performance, and why?

11. Conclusion

It is undeniable that BSCM has achieved traction. Nonetheless, relative to the broader SCM discipline's vast theoretical and analytical breadth, BSCM recently with fewer publications each year represents a narrow niche. Traditional SCM study clearly does not state behavioral assumptions and claims directly. Therefore, more work is needed to assist BSCM in being more relevant. This research provides a detailed analysis of previous BSCM studies and provides mechanisms that promote this desired growth. The descriptive overview of the study area, comparisons of behavioral hypotheses, and the established research opportunities aid in defining research holes and presenting answers to open questions in this important field. Furthermore, It is intended that the innovative strategy utilized in writing this essay would assist the BSCM sector in opening new insights by participating in unique and essential dialogues to expand and flourish.

This study examines whether enhanced integration and efficiency are a result of the reciprocal activity of partners in the supply chain who interact on a personal level. The partners' belief that

cooperation can lead to greater supply chain output benefits is what motivates them to form these partnerships, according to the behavioral patterns examined. Because of this, a theoretical strategy that examines the connection between relational structures and integration is adequate.

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Role of MSMEs in the Start-up Ecosystem With Reference to the Tribal Youth of Rajasthan

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Keywords

MSME, Youth, Tribal, Start-up, Ecosystem

JEL Classification
A11, G28, L53, R11

Abstract: As a major government programme, Start-up India is designed to foster an entrepreneurial culture in India that will lead to long-term economic development and large-scale job prospects. The government's goal with this programme is to help small businesses flourish by encouraging them to innovate and create. Small and medium-sized businesses in India have grown to be an essential part of the country's economy during the last half-century. Micro, small, and medium-sized enterprises (MSMEs) play a significant role in eliminating regional imbalances. It also helps in the industrialization of rural and tribal areas. MSMEs has a huge impact on the country's socioeconomic growth since it serves as an accessory unit to larger enterprises. Our country's economic development and job creation have been bolstered by a variety of programmes aimed at developing this industry. This study has been undertaken to ascertain the role of MSMEs in the start-up ecosystem for tribal youth of Rajasthan, India.

1. Introduction

The MSME sector has arisen in the last fifty years as an extremely flexible and competitive industry in the Indian economy. MSMEs play a significant role in creating broad openings for employment at comparatively lower capital expenses than large factories and helping to grow and develop rural, tribal, and backward regions, thus reducing regional imperfections. MSMEs supplement broad factories as auxiliary units, and this makes a significant contribution to the socio-economic development of the nation's rural and tribal areas. MSME has a strategically leading function in the structure market of the Indian economy. It contributes about 8% of the country's GDP and employs over 8 million people, accounting for 45% of the country's production output, 40% of

total exports, and manufacturing over 8,000 value-added goods ranging from traditional to high-tech.

1.1. Micro, Small and Medium-sized Enterprises (MSMEs)

Micro, small and medium-sized enterprises (MSMEs), internationally, have been recognised as a development driver in every nation's economy. MSMEs have now become a very interesting issue in India. In addition to its development and consolidation, there are many financial entities that supply different kinds of services and facilities for MSMEs. MSMEs in India are an essential component of their economic development and growth. Despite this reality, the issues of lack of adequate and prompt financial provision, scarcity of working capital, education, lack of innovation and insufficient technology are still serious issues for MSMEs.

India has vibrant and responsive MSMEs that play an important, effective, and creative entrepreneurial position in every country's economic growth and development, in kind of growing trade and generating highest prospects for jobs and creating the new innovative skills built in India. MSMEs are the pillars of every community and the guiding factor for global prosperity. The 2006 MSME Act, offers numerous forms of incentives, plans, and triggers to this sector by the "Government of India, through the Ministry of Micro, Small and Medium Enterprises (MSMED)", which aims to solve some major MSME problems, such as shortage of finance, management skills, etc.

1.2. MSMEs Classification Based on Investment Slabs

Micro Enterprises in the manufacturing and service sectors must invest no more than Rs. 1 crore in plant and machinery or equipment and have an annual turnover of no more than Rs. 5 crore. Small businesses must invest no more than Rs.10 crore in plant and machinery or equipment, and their annual turnover must not exceed Rs.50 crore. Medium-sized businesses must invest no more than Rs. 50 crore in plant, machinery, or equipment and have an annual revenue of no more than Rs. 250 crore.

The importance and future engagement of micro, medium, and small firms is backed by both theoretical and empirical statements. SMEs are frequently viewed as more successful and egalitarian in their allocation of national, state, tribal, and rural revenue. Furthermore, this sector contributes to the economy by promoting sustainable industrial development in all tribal and rural areas. The MSME firm fosters economic activity by generating jobs for people who are averse to working in large corporations. Using local services and knowledge to their full potential is made easier with the help of MSME.

As a result, "Micro, Small and medium-sized businesses (MSMEs)" are more likely to have the necessary abilities to create new commodities or develop new strategies for existing ideas.

Several major corporations depend on small businesses in the same area to perform various business functions via externalisation, which is beneficial to both large and small businesses. Additionally, tiny businesses aren't always small. They often change over time. When Nike and Microsoft first started out as modest businesses, they were major participants in the overseas market. When a small business grows into a large one, it always stays in the same neighbourhood where it started, boosting the local economy and creating employment. Additionally, by broadening and diversifying the country's economy,

a strong MSME sector helps tribal youth be more resilient in the face of economic crises (UNDP 2013). MSMEs' reduced reliance on a few large businesses or specific sectors protects a wide range of workers against sector-specific shocks and changes in overseas markets (Dalberg 2011). MSMEs are critical for development because they can ensure the achievement of the country's key economic objectives and enable the efficient use of natural and human capital resources for prescribed purposes.

1.3. In Tribal Youth MSME's Are More Acceptable

Small and medium-sized businesses (SMEs) make up the bulk of the Indian economy and are referred to as Micro, Small and Medium Enterprises (MSMEs) for their size. The importance of micro, small, and medium-sized enterprises (MSMEs)in rural, tribal, and rural communities' economic and social development is well-known. The importance of micro, small, and medium-sized enterprises (MSMEs) in tribal youth communities' economic and social development is well accepted and the life cycle of MSMEs is explained (see below model, Fig. 1).

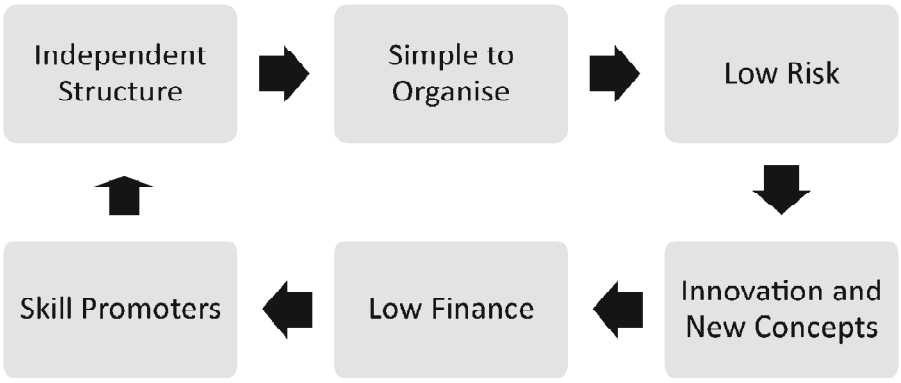

Figure 1: MSMEs Life Cycle

Source: Authors' Own Compilation

2. Literature Review

Srinivasan (2015) states that MSMEs are critical for balanced and sustainable economic growth, job creation, entrepreneurial skills development, and export revenues. Most "small and medium-sized firms (SMEs)" cannot tackle globalization's difficulties, mainly due to financial restrictions. The liberalization of the Indian economy requires discussion of measures to increase credit flow to this sector. SMEs are vital to the economy because they contribute to balanced and sustainable growth, job creation, the development of entrepreneurial skills, and a significant percentage of foreign export income. Despite this, they are highly effective. Due to financial restrictions; the majority of "small and medium-sized firms (SMEs)" are unable to satisfy globalisation's demands. SMEs rarely receive the respect they deserve when it comes to the economy. The government is taking steps to give SMEs pride of place, including reducing red tape and using a provision to eliminate the need for multiple levels of approval.

According to the MSME Development Act (2006), this sector accounts for more than 800,000 businesses throughout the country. In addition, these companies are entrepreneurship nurseries which also incorporate innovation and will be critical to India's future development. It is also recognised that this sector will lead to achieving the goal of the National Manufacturing Program, to growing output share of GDP to 25 per cent and to creating 100 million new jobs by the end of the year 2022, and to fostering development and growth. The sector is also facing a set of obstacles considering its deep optimism and intrinsic growth capacities.

According to Garg (2020), MSMEs in India are in several sectors –industry, agriculture and service, it adds worth, build jobs, and use entrepreneurial skills and resources productively. But there are several problems in this field, i.e., failure to provide sufficient and timely financing, lack of innovation, raw material sourcing, high credit rates, failure to enter foreign markets, shortage of qualified labour, small-scale manufacturing capability, infrastructure issues etc. These issues ruin this company and place it on the sick industry list. The financial structure of this sector is poorer and the credit ranking is lower.

Dey (2014) explained for a small business, every dollar invested is critical. Over or under-provisioning due to seasonal peaks is a common problem for businesses. Losses and idle resources may happen as a consequence of this. At some time, every firm undergoes a shift. This is a vital phase in the life cycle of your corporation whether you are running a full-fledged enterprise or simply a medium-sized company. When it comes to a company's evolution, it's not uncommon to see numerous stages. In contrast to large corporations, which have the manpower and funding to carry out such reforms with ease, small and medium-sized businesses (SMEs) confront substantial obstacles. Maheshwari (2014), to break things up a little, an investment banker is spending time with a small company owner. Small and medium businesses, or SMEs, are becoming more attractive to i-bankers, who formerly focused on large-scale transactions. Boutique and high-street banks alike are looking at the potential of this market. For example, Indusland, a private bank, has just formed an investment banking division for MSMEs. In addition to that, there are niche players like Keynote, who specialise in small-cap stocks. Also becoming involved in this market area are Edelweiss Capital, Yes Bank, and Ernst & Young.

The Article (Enterprises with Udyog Aadhaar Number, 2015) suggests that start-ups are finding lending to "small and medium-sized businesses (SMEs)" to be an appealing entrepreneurial opportunity. The search for finance in India has long been a difficult for the country's millions of small enterprises. These people symbolise the 'missing middle' of the pyramid, which financial lenders choose to ignore in favour of either the top or bottom. However, the midsection is a lot bigger. About 57.7 million Indian businesses are sole proprietorships, the majority of which are microenterprises. There are a slew of new start-ups currently offering debt finance and working capital loans to these businesses in the market. Venture and private equity funds are also contributing to the development of this ecosystem.

The government plans to enlist the cooperation of public sector undertakings (PSUs) to resuscitate the state's closed MSMEs. The government's 'Make in India' initiative mandates domestic production of defence and other ancillaries instead of relying on imports. It is also possible that units that were forced to be shut down for a variety of reasons might contribute to the programme (Chamber of Commerce and Industry, 2018).

3. Objectives and Hypothesis of the Study

3.1. Objectives of the Study

The following objectives have been taken;

- To know the role and functions of MSMEs in the start-up ecosystem for tribal youth of Rajasthan.
- To examine how MSMEs and start-ups can help development of tribal youth.
- To research the financial crunch and clusters in funding SMEs and start-ups, as well as the primary sources of financing and the challenges they encounter, as well as the firms those tribal young entrepreneurs wish to establish and the activities they wish to pursue.
- To know the start-up ecosystem schemes for rural and tribal youth entrepreneurs.

3.2. Hypothesis of the Study

H1: MSMEs has a significant role in the start-up ecosystem development for tribal youth of Rajasthan.
Variables taken:

- Competence and human resources development
- Enterprising culture, financing and employment
- Networks, Education and Research

4. Methodology

4.1. Methods for Obtaining Data

For this study, both primary and secondary data was used. For the survey method questionnaire is used to obtain primary data. Data from journals, the internet, and magazine companies is gathered as secondary data.

4.2. Sample Size

Probability/random sampling is used with a sample size of 100 as the sampling approach in this study. Using simple random sampling, every member of the population has an equal chance of being picked as a sample. When the study's primary goal is to be able to generalise the results to the whole population, this sampling method is ideal.

5. Data Analysis

The data was coded and useful information was extracted from the obtained data. The acquired data was edited, coded, and tabulated.

5.1. The Rural and Tribal Entrepreneurship Start-up Ecosystem

For youth and women in India, the Indian government has implemented entrepreneurship development schemes and programs through the "Ministry of Skill Development and Entrepreneurship," including entrepreneurship education, handholding, mentorship, and essential ties to market institutions.

An initiative led by the "Ministry of Skill Development and Entrepreneurship (MSDE)" is aimed at helping first-generation business owners, unemployed youth, dropouts from high school and college, and women and youth from underserved communities to realize their entrepreneurial potential in six temple towns in India: Puri, Varanasi, Haridwar, Kollur, Pandharpur, and Bodh Gaya.

According to the "Ministry of Skill Development and Entrepreneurship (MSDE)," to promote women's business ownership, GIZ Germany is executing a project called "Economic Empowerment of Women Entrepreneurs." Incubation and acceleration programs for women micro-entrepreneurs in Assam, Rajasthan, and Telangana are being piloted as part of the initiative. The project aims to drive the incubation and acceleration programs with 250 women. After the first cohort finished in April-May 2020, the second one began in July 2020.

Entrepreneurship learning and training support and easy access to the entrepreneurship network are the primary goals of the PM YUVA (PM YuvaUdyamita Vikas Abhiyan) pilot program, which is aimed at students and graduates of the skilling environment, such as the Industrial Training Institute (ITI), Pradhan Mantri Kaushal Kendra, Jan ShikshanSansthan, etc.

The Indian government is also undertaking skill development training programs via "Rural Self Employment and Training Institutes (RSETIs)," which provide bank credit for the establishment of micro-firms by skill trainees through the "Ministry of Rural Development." Increasing the employability of impoverished rural kids, whether for paid work or self-employment, is the goal of this program. With 585 RSETIs, 23 leading banks (public and private sector and a few Gramin banks) are now implementing the RSETI program in 33 States/UTs, spanning 566 districts. Odisha has 30 RSETIs in the state, including three RSETIs in the Kalahandi-Balangir-Koraputarea, which provide free training in different skill entrepreneurship development activities to the rural poor to help them establish their businesses.

Intending to assist the rural poor to escape poverty by helping them establish businesses and providing support until those businesses are stable, the Ministry of Rural Development has been implementing the Startup Village Entrepreneurship Program (SVEP), which focuses on delivering self-employment opportunities with financial assistance and training as a businessman. In 23 states, including Odisha, SVEP has provided business support services and cash infusions, developed by the Ministry of Tribal Affairs, "Pradhan Mantri Van Dhan Yojana (PMVDY)" aims to help tribal self-help groups grow into Tribal Producer Corporations.

Under the Stand-up India Scheme, sponsored by the "Department of Financial Services of the Government of India," at least one borrower from a Scheduled Caste or Scheduled Tribe and at least one-woman borrower must be able to get a loan from a Scheduled Commercial Bank between Rs. 10 lakh and Rs. 1 crore.

In addition, the Indian government is implementing the Prime Minister's Employment Generation Program (PMEGP) through its "Ministry of Micro, Small and Medium Enterprises (MSME)," which aims to create self-employment opportunities through the establishment of micro-enterprises in the non-farm sector. Manufacturing projects might cost as much as Rs. 25 lakh, while service industry projects could cost as much as Rs. 10 lakh. The PMEGP incentive is only available to newly constructed residences.

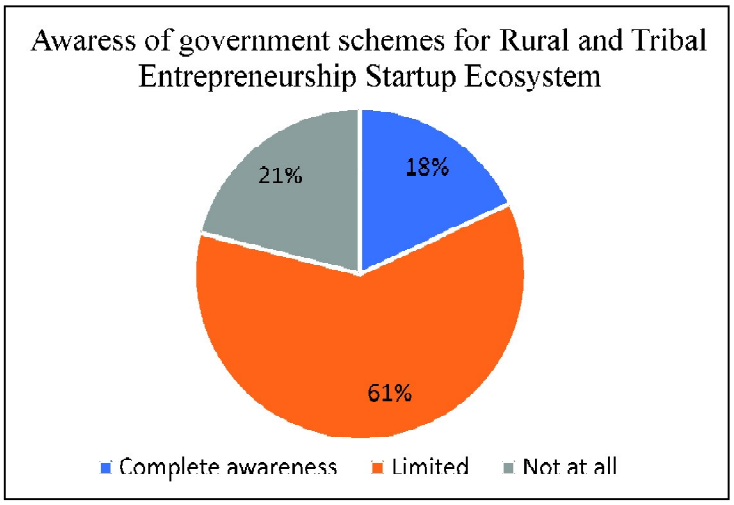

Figure 2: Awareness of Government Schemes (in percentage)

Source: Authors' Own Compilation

Majority of the respondents have limited awareness and very few have complete awareness of government schemes for Rural and Tribal Entrepreneurship Start-up Ecosystem.

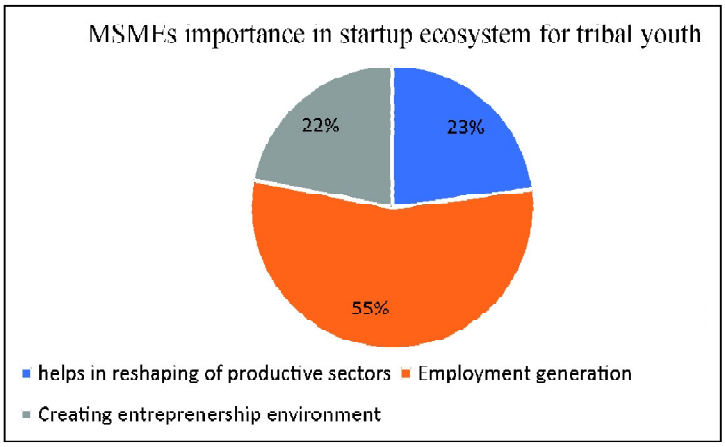

Figure 3: Importance of MSME Start-ups Ecosystem (in percentage)

Source: Authors' Own Compilation

5.2. Entrepreneurs' Willingness to form a Business

According to our study, the majority of respondents wanted to create a medium-sized firm, while the remainder wanted to start a small or large-sized business.

5.2.1. Sector

The manufacturing industry was picked by the majority of those who took the survey, although the service sector was also represented.

5.2.2. Nature of Operation

During our survey, we observed that the majority of respondents desired to engage in long-term and seasonal activities, while a small number preferred to engage in more informal commercial activities.

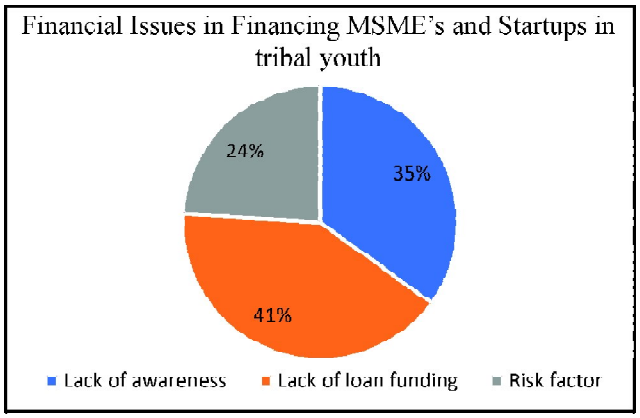

Figure 4: Financial Issues for Start-ups in Tribal Youth (in percentage)

Source: Authors' Own Compilation

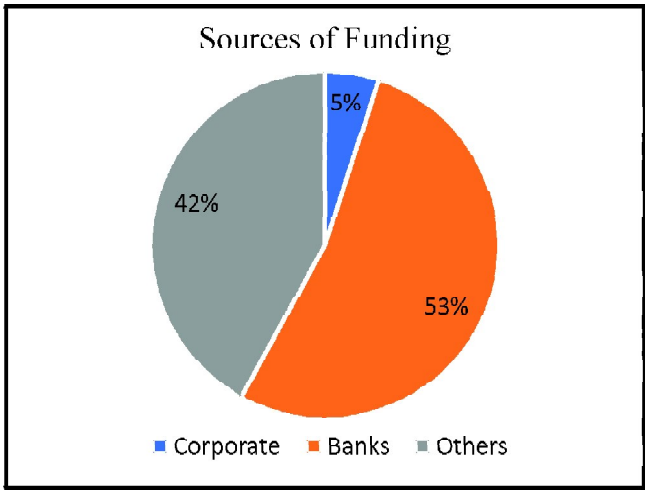

Figure 5: Sources of Funding (in percentage)

Source: Authors' Own Compilation

As per results the tribal youth mainly depend on banks for their funding for MSME.

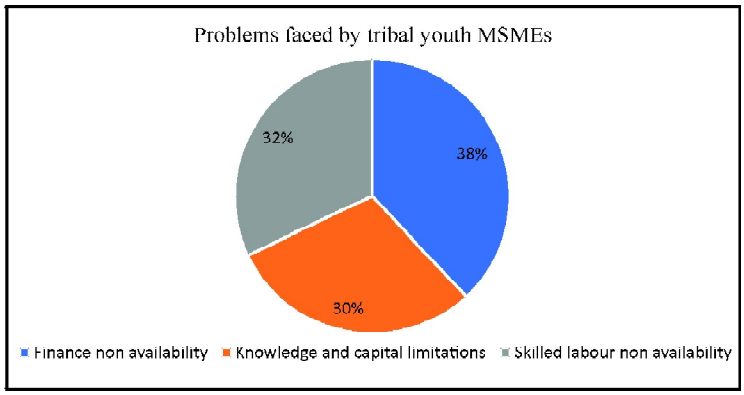

Figure 6: Different Problems faced by Tribal Youth (in percentage)

Source: Authors' Own Compilation

The key challenges that tribal youth MSMEs confront include a lack of access to finance, a lack of technically skilled labour, and a lack of expertise and capital.

H_1: MSMEs has a significant role in the start-up ecosystem development for tribal youth of Rajasthan.

Table 1: Model Summary

Model	*R*	*R Sq.*	*Ad. R Sq.*	*Std. Err. of the Est.*
1	.746[a]	.503	.527	.41431

a. Predictors: (Constant), REC, TnD, LR
Source: Authors' Own Compilation

The R value denotes the predictability of the dependent variable. The closer the independent variables are to the dependent variable, the greater the value of R. According to the model summary table above, the R value was found to be 74.6%, indicating an F-value of 107 with a p-value of .01, indicating the overall importance of the model, as shown in Table below.

Table 2: ANOVAa

Model		*Sum of Sq.*	*Df*	*Mean Sq.*	*F*	*Sig.*
1	Regression	54.581	1	17.860	107.647	.000[b]
	Residual	34.326	99	.177		
	Total	83.907	100			

a. Dependent Variable: FP
b. Predictors: (Constant), REC, TnD, LR
Source: Authors' Own Compilation

The independent factors were shown to be statistically significant in predicting firm performance in the ANOVA table above, with F (107.647, p 0.01).

The hypothesis is accepted, since the p-value for the regression coefficient is.000, which is less than the significance level of 0.05. Therefore, the hypothesis is relevant and accepted which means MSMEs has a significant role in the startup ecosystem development for tribal youth of Rajasthan.

5.3. MSME an Area of Business with the Potential for Rapid Expansion

A well-known benefit of MSMEs is their role in boosting an economy's overall development, including the creation of new jobs, increased exports, and increased output. Tribal at the micro level, the average turnover and profit growth rate for the was solicited from youth small business owners.

5.3.1. Small and Medium-Sized Enterprises

Profit is the primary goal of every firm; hence select elements that have a direct impact on profitability have been sampled. These aspects are also taken into account by bankers while evaluating the loan requests of the recipients. Qualitative responses from tribal youth entrepreneurs are gathered in order to acquire a sense of the respondents' perceptions of certain profitability metrics in four categories, such as growth, decline, stagnation, and not relevant.

Many small- and medium-sized businesses (MSMEs) across the Rajasthan have seen a rise in the cost of raw materials and labour and staff costs, as well as an increase in interest expenses and other operating expenses with the exception of 16 percent and 3 percent of MSME firms, respectively. MSMEs are adaptable and creative enough to swiftly embrace another successful business model. From the perspective of tribal youth, diversity in business should be continuously controlled via handholding operations since otherwise the number of opportunities for money laundering might expand.

When looking at the past years of sales data, it is clear that MSME were less affected by the global meltdown from 2013 to 2016, even if the globe was still experiencing a downturn. India's economy was able to recover quickly from the recessionary period because to its MSMEs-dominated economy, which usually shows steady development. For MSMEs, it is recommended that the effect of a raised global interest rate scenario be subsidised for all tribal youth MSMEs covered under the MSMED Act 2006 by establishing interest subvention measures. This would allow tribal youth entrepreneurs to build their capacity so that they may utilise global competitive advantages.

6. Findings

- MSMEs has a significant role in the start-up ecosystem development for tribal youth of Rajasthan.
- There has been a rise in the number of MSMEs and Start-ups in the tribal market, which has provided an ideal atmosphere for tribal young entrepreneurs to launch their own businesses. They show the significance of various industrial and service industries to the economy at different levels.
- Based on financial difficulties experienced by tribal youth MSMEs in the Rajasthan area, distinct MSME regions have been noticed.

- The Indian government's start-up programmes have made it easier for young tribal entrepreneurs to start businesses in the service and manufacturing industry.
- The Prime Minister Employment Generation Programme would enable young tribal entrepreneurs start businesses employing labour-intensive technologies if they pick the right resources.
- MSME's in tribal areas are experiencing comparable financial difficulties owing to a lack of knowledge and a lack of capital.
- Because they create jobs and reshape the productive sectors, MSMEs are critical to the growth of any economy. They confront obstacles, however, due to a shortage of capital and a scarcity of skilled labour at reasonable pricing.

7. Suggestions

- Tribal youth should be made aware of the different government initiatives available to MSMEs and SME clusters by the Indian and state governments, respectively.
- Banks and other financial institutions should lend to MSMEs in a cost-effective way and tailored to the specific demands or needs of the different sectors within the MSME sector.
- To ensure that tribal young entrepreneurs have the opportunity to apply their ideas in their own communities, the Indian Government should offer internet access to all of India's remotest regions.

8. Conclusion

It is true that MSMEs have a higher rate of growth and provide more job opportunities for tribal youth, but they face challenges when it comes to securing funding from public sources (such as government departments, banks and other financial institutions) as well as financial planning, limited knowledge and a lack of skilled labour. The government's start-up Scheme is terrific way to help tribal young entrepreneurs who have creative company ideas but lack the resources to get their businesses off the ground.

As a result of these new rules, the number of "small and medium-sized companies (SMEs)" and micro enterprises in tribal regions has increased, allowing them to graduate more quickly. Self-employment is the only way to provide work for the vast majority of tribal adolescents who are economically engaged, and therefore achieving this aim would accomplish the goal of job realisation via self-employment. The flagship programmes of the Skill India Mission will expedite this process by making it easier for businesses to find workers with the appropriate skillsets to fill open positions, since this is a common complaint among business owners. Governments must ensure that the tribal start-ups are given the proper policy framework at both the national and state levels.

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App-based Ride-Sharing Adoption Behaviour of Commuters: Evaluating through TAM Approach

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Keywords

App-based ride-sharing, TAM, Attitude, Behavioural intention, Sustainable transport

JEL Classification

L9, L91, M13, N7, O1, R4

Abstract: The purpose of the present study is to identify the antecedents of the behavioural intention in using app-based services used for ride-sharing in an Indian context. The basic TAM model in extended form has been examined for studying the impact of the various factors on attitude formation and behavioural intention to use app-based ride-sharing. The constructs used in the structural model were tested by using software SPSS & AMOS. A total sample of 351 respondents was collected from the Indian capital region who have behavioural intentions in using app-based ride-sharing. The study established that societal influence and ecological concern for the environment are the prime factors for people in making positive attitudes toward using ride-sharing apps. App based ride-sharing providers can provide social media interface to increase the usage of such apps among the masses. This study proposes three additional factors; societal influence, ecological concern, and economical benefits along with existing perceived ease of use and perceived usefulness as an antecedent of app-based ride-sharing service adoption behaviour.

1. Introduction

Sharing is emerging as a basic principle of sustainability in a society with limited resources. More recently app-based ride-sharing is developing as a new concept in the sustainable economy, experiencing a significant boom. The fundamental idea of ride-sharing is traveling more than two persons together in the same car (Ferrero *et al.*, 2018). The success of app-based ride-sharing service is determined by the participation patterns of prospective users and resource suppliers (John, 2013). However, this raises the issue of why and under what conditions a person would accept the concept of sharing services. The literature on the sharing economy explains the forces and motivations behind commuters' adoption and participation in car sharing. Lamberton and Randall (2012) characterized these forces as

a complex collection of social, environmental, and economical incentives that have not yet been completely understood. Lee *et al.* (2021) investigated ride-sharing and technology's impact on the behavioural intention of Uber users, in specific and suggested practical implications for policymakers and researchers.

Along with food and energy, mobility is emerging as one of the priority areas for sustainable consumption and production patterns. The usage of ride-sharing apps for commuting purposes started in 2011 in San Francisco, and is expanding gradually today with approximately 600 different real-time ride-sharing providers across the globe (Cohen and Kietzmann, 2014). Ridesharing not only widens the mobility options but also shows the possibility of fewer vehicles on the road, reducing carbon emissions, light on the pocket of self-owned car travellers, and increasing the mobility of the carless (Zhou, 2012). Car producers such as BMW, Daimler, and the FCA group have also started showing interest in ride-sharing operations, recognizing it as a new business opportunity (Vibhanshu, 2018; Shaheen *et al.*, 2006). Ridesharing helps increase individual mobility and inculcates sustainable mobility behaviour among the masses but still, it is challenging to expand successfully consumer acceptance of app-based ride-sharing service (Burkhardt and Millard-Ball, 1986).

In India, app-based ride-sharing is showing an upward trend due to various reasons. The growing number of smart phone users and decentralization of the Indian cities are the main reasons for this scenario (Shirgaokar, 2014). In Indian cities, one-third of the working people commute on foot, 26 percent use bicycles or public transport and the rest commute through either two-wheelers or four-wheelers. However, due to changing dynamics in emerging countries, private vehicles (two-wheelers and cars) have emerged as the primary means of commuting for the aspirational working class (Baviskar and Ray, 2011; Chhabra and Mehrotra, 2021). Therefore, insights are required to understand what other motives are behind the behavioural intention of using app-based ride-sharing for commuting to the workplace. Also, a comprehensive review of 49 articles by Chalermpong (2022) related to the application of app-sharing rides in South East Asia highlights how the behaviour of commuters influences the transport operators and impacts the environment.

2. Review of Literature

2.1. Theoretical Framework

Numerous research investigations related to technology adoption were done using concepts from the field of social psychology. Chang *et al.* (2018) found fifteen psychological theories related to the car use behaviour used in transportation research. Out of the 32 studies reviewed by them, approximately fifty percent adopted TAM i.e., the technology acceptance model as their basic theory for understanding car-sharing adoption behaviour. The present study selected TAM (Davis, 1989), as a theoretical foundation because of its parsimonious character (Morosan, 2014; Chang *et al.*, 2018) and it is capable of using for various technological and business contexts such as Internet banking services (Patel and Patel, 2018), hotel tablet apps (Kim *et al.*, 2017), fantasy sports league websites (Kwak and McDaniel, 2011) and so forth. Further, some of the studies based on TAM also included additional constructs to capture the intention to use the respective technology. TAM has retained theoretical support over the

years, therefore it was deemed the most appropriate theoretical base for the present study. Also, the additional constructs which are contextually relevant to the study have been discussed further. In a recent study, Elnadi and Gheith (2022) investigated the attitude of Egyptian consumers toward ride-hailing apps using TAM and theory of innovation diffusion to explore the needs of consumers based on their expectations.

2.2. Ride-Sharing Apps

In simple words, an app can be understood as a type of software that allows users to perform a specific task. An app can be for mobile as well as non-mobile devices i.e. desktop apps. The App market is the major and growing part of the smart phone market. The app enables the online search of content related to that particular app without involving any browser (Tak and Panwar, 2017). Every taxi service provider uses various apps like Uber, Ola, Meru, etc., and also there are car-pooling apps such as in Driver, sRide, Bla Bla Car, etc. These apps can be easily downloaded and are available in various app stores. Yu *et al.* (2018) have also found that the increased use of smart phones has enabled companies to connect with their customers on a real-time basis and provide alternate platforms to deliver their services.

2.3. Research Gap in the Adoption of Ride-Sharing App Services in India

Ridesharing has the prospective to considerably affect the personal transportation sector. Earlier studies on ride-sharing have been categorized broadly into two groups: research about the technical and modelling characteristics (Zhou *et al.*, 2017; Jorge and Correia, 2013) and survey-based research with business perspectives on ride-sharing (Verhagen *et al.,* 2012). Although the economic benefits and environmental benefits have been studied by many researchers (Firnkorn and Muller, 2011; Shaheen *et al.*, 2010) there is rarely any study that has sought within the perspective of the TAM's original framework. Second, most of the transportation studies have been conducted in developed regions of the world (North American and European regions) which offer a partial understanding of the towns in developing economies like India. (Chang *et al.*, 2018; Kim *et al.*, 2017; Shirgaokar, 2014). It has been observed that shared-use vehicle systems have also started evolving in Asia, primarily in Japan and Singapore (Chang *et al.*, 2018). Also, liberalization of the economy, better education opportunities and growth in income of the Indian urban working class have made it possible for them to choose those better travel options which were not available earlier (Reddy and Balachandra, 2012; Goel and Halder, 2020 a). Several campaigns have been run by the government to discourage solo driving, but the results are not very encouraging.

Given this, this study is an initial attempt to determine the factors influencing customers' intentions and behaviour to adopt app-based services for ride-sharing to the workplace in the Indian context. It aims to measure intention instead of actual behaviour because app-based ride-sharing is majorly confined to Indian megacities. As a result, the choice of behavioural intention tends to be more relevant in the Indian setting (Reddy and Balachandra, 2012).

3. Research Model and Hypotheses

Davis (1989) has proposed the TAM model of technology acceptance grounded on reasoned action theory initiated by Ajzen and Fishbein (1980). TAM explains the causal relationship between internal

beliefs related to Perceived ease of use, attitude, intentions, and technology/computer actual usage. In the last 30 years, it has developed as a steady model for understanding consumer acceptance of technology (Yousafzai *et al.*, 2007). Figure 1 illustrates the proposed research model used in this study. Five factors that form an attitude towards use that further influence behavioural intention to use app-based services for ride-sharing among the working class of Delhi-NCR has been tested.

3.1. Perceived Usefulness (PU)

Perceived usefulness (PU) is the extent to which a commuter considers how much he can be assisted by using a ride-sharing service to reach his workplace. Ridesharing is primarily useful in areas that are not pedestrian or transit-friendly (Zhou and Kockelman, 2011). Gokenheimer (1999) defined numerous problems such as congestion, radial transit network, non-avoidance of cross-town congestion, inadequate service, and less/ no periphery service which a commuter faces while commuting through public transportation. Gargiulo *et al.* (2015), posited that ride-sharing helps the commuter to select the date, time, place to reach, and car type in the app features. For finding the best interface between the demand and supply sides of ride-sharing, mobile apps have been hailed globally (Nysveen *et al.*, 2005).

Therefore, it is postulated:

H_{01}: Perceived Usefulness (PU) has a significant positive influence on the attitude of the customers to use app-based ride-sharing services.

3.2. Perceived Ease of Use

The perceived ease of use (PEOU) is a crucial attitude component in the TAM framework in adopting any new behaviour (Bailey *et al.*, 2017; Kumar and Mathur, 2021). It is regarded as the extent to which a person believes about the ease with which a given system can be used (Davis,1989). Various studies suggested PEOU as a significant factor influencing customers' willingness to use ride-sharing apps if they consider it to be effortless, easily available, can help them in obtaining relaxation, and safe (Passafaro *et al.*, 2014; Verhagen *et al.*, 2012). Since these ride-sharing apps are a contemporary phenomenon, they must be designed in a consumer-friendly manner (Roy, 2017). Hence, it is postulated that:

H_{02}: Perceived Ease of Use (PEOU) has a significant positive influence on the attitude of the customers to use app-based ride-sharing services.

3.3. Attitude and Behavioural Intention toward Using App-Based Ride-Sharing

Attitude is defined as a person's perspective on adopting the desired action (Davis, 1989). Various studies suggested an association between attitude to use and intended behaviour (Bailey *et al.*, 2017; Moon and Kim, 2001). Ajzen (1991) proposed that attitude influences the behavioural intention of users. Most of the durables like cars are used for shorter periods and hence have spare capacity. By using the technology-enabled market space these durable goods can be utilized from an economic perspective (Vibhanshu, 2018; Goel and Halder, 2020 b). Hence, we propose that:

H_{03}: Positive attitude toward app-based ride-sharing is positively related to behavioural intention to use the ride-sharing services.

3.4. Ecological Concerns

A substantial body of research provides evidence for the environmental advantages of ridesharing (Shaheen *et al.*, 2006). Research studies show that ride-sharing impacts the environment in a positive way, including a reduction in CO2 emission (Firnkorn and Muller, 2011), a reduction in noise pollution (Rodier and Shaheen, 2003), reduction in vehicle kilometres travelled (Shaheen *et al.*, 2006). Studies further suggest that commuters consider environmental benefits as altruistic (Schaefers, 2013) and lead to an improvement in the quality of life (Burkhardt and Millard-Ball, 1986). Ciari *et al.* (2009) found that ride-sharing participants reported an increased level of ecological concern after joining the ride-sharing program. Hence, we propose that:

H_{04}: Ecological concern positively influences the attitude of consumers to use app-based ride-sharing services.

3.5. Economical Benefits

Ridesharing services are commonly seen as cost-effective, with users opting for lower-cost alternatives to single-car ownership (Hamari *et al.*, 2016). The commuter's choice to use a car on a shared basis is based on the relative time and cost of all the modes available for the trip (Rodier and Shaheen, 2003). Ridesharing provides significant value to the members since rideshare customers pay either for the duration of vehicle operation or the total distance travelled (Cohen and Kietzmann, 2014). Lately, most people have started using specific apps for their purchases and perceive these as economically beneficial (Tak and Panwar, 2017). Monsuwe *et al.* (2004) suggested that users have cost considerations in mind while shopping on a real-time basis. Hence, we propose that:

H_{05}: Economical benefits significantly influence the attitude of consumers to use the app-based ride-sharing services.

3.6. Societal Influence (SI)

SI is the relevance of social context in influencing attitudes and behavioural intentions (Ajzen and Fishbein, 1980). Social influence evaluates an individual's perception that others have about him/ her attitude and behaviour intentions toward new technology (Kwak and McDaniel, 2011). Recent studies recognized that social influence is a noteworthy reason to make purchases using advanced mobile services (Kim *et al.*, 2017). Since app-based ride-sharing services is at an early stage of implementation in India, this study hypothesizes that ride-share service users will be influenced by others' opinions towards app-based ride-sharing services. Hence, it is postulated that:

H_{06}: Societal influence significantly influences the attitude of consumers to use services of app-based ride-sharing services.

4. Research Methodology

4.1. Instrument Design

The structured questionnaire method has been used for data collection, comprising two sections. Section one of the questionnaire was intended to gather demographic data namely age, gender,

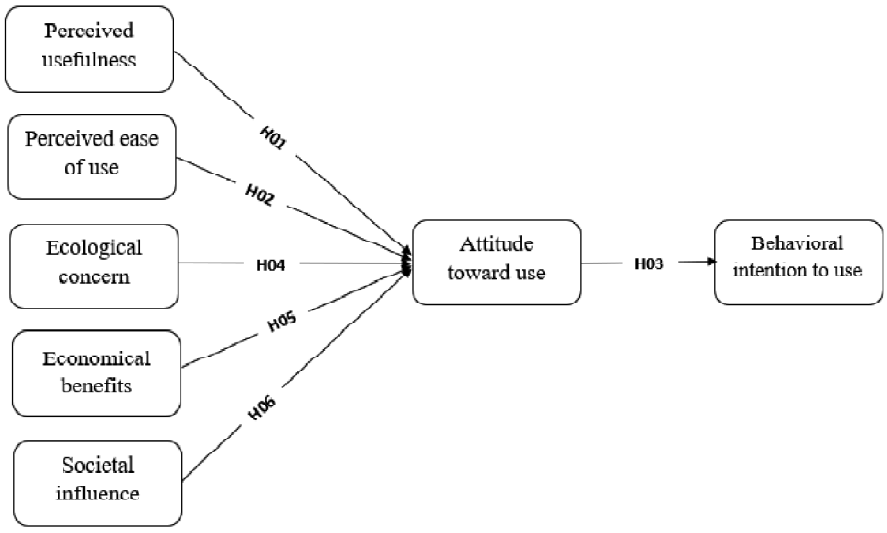

Figure 1: Proposed Research Model

Source: Authors' Deliberation

educational qualification, duration of usage of ride-sharing apps, and the number of times ride-sharing apps services are used by the respondents. The second part of the research study was developed following a comprehensive review of literature related to urban transport and technology adoption models and their extension in the app-based ride-sharing services in particular. The conceptual research model comprised seven constructs: PU, PEOU, ecological concern, economic benefit, societal influence, attitude, and intention to use app-based ride-sharing services.

A three-item scale was used to measure the PU of an app-based ride-sharing service based on (Gargiulo *et al.*, 2015; Nysveen *et al.*, 2005) study. A four items scale was used to measure PEOU based on Verhagen *et al.* (2012) and Passafaro *et al.* (2014) study. To measure the economic benefits of app-based ride-sharing services, three statements were adapted from Firnkorn and Muller (2011) & Tak and Panwar (2017) study. The four statements from Haefeli *et al.* (2006) & Firnkorn and Muller (2011) were used to measure ecological concern. The SI was measured using a three-item scale by Tak and Panwar (2017). The attitude towards use was measured with three statements revised by (Hamari *et al.*, 2016). Finally, all three items of behavioural intentions of using app-based ride-sharing services for reaching the workplace were tailored from three studies (Moon and Kim 2001; Bailey *et al.*, 2017; Zhou *et al.*, 2017). A five-point Likert scale was used to evaluate statements ranging from (1 = strongly disagree) to (5 = strongly agree). To examine the face validity, input was obtained from academic staff engaged in the area of sustainable transportation, and recommended changes were implemented further into the questionnaire.

The pre-testing of the questionnaire was done with respondents using app-based ride-sharing services in a pilot study. The first twenty respondents' submissions were integrated with regard to the structure and word choice of the scale items.

4.2. Data Collection

The research was conducted around the Delhi and NCR region to examine commuters' behavioural intentions toward app-based ride-sharing services for reaching their respective workplaces. The target population of the study was either active app-based ride-sharing services users aged 20 or above, or at least have an intention to use such app-based services for ride-sharing within the foreseeable future. In the absence of any list available of the commuters availing these app-based ride-sharing services for going to their offices, respondents were selected through the convenience cum snowball sampling method. 351 responses were utilized for the data analysis obtained using online and physical modes of the survey.

The demographic profile of the respondents is displayed in Table 1. The majority of the sample study (83.3 percent) are users of app-based services for ride-sharing. The male app-based users are 63.6 percent and 65.2 percent are below the age of 30 years. More than two third are car owners who either use ride-sharing through apps or showed the intent to use it for commuting to their work.

Table 1: Sample Profile

Demographics	*Frequency*	*percentage*
Use of App based ride sharing		
User	300	83.3
Non-user	51	16.7
Total	351	100
Age		
Less than 30 years	226	65.2
30 years- 40 years	115	33.3
More than 40 years	10	1.5
Total	351	100
Gender		
Female	129	36.4
Male	222	63.6
Total	351	100
Annual Income (in Rs.)		
Less than Rs. 10,00,000	212	60.6
Rs.10,00,000 - Rs. 20,00,000	111	31.8
More than Rs. 20,00,000	28	7.6
Total	351	100
Since when use of ride share apps		
Less than 1 year	91	25.80

contd. table 1

Demographics	*Frequency*	*percentage*
1 year- 3 year	168	48.41
More than 3 year	32	8.9
Never	59	16.81
Total	351	100
Frequency of using app- based ride sharing		
More than 5 days a week	20	5.3
3-5 (days per week)	79	22.6
1-2 (days per week)	45	12.7
0-1 (days a week)	149	42.9
Not used	59	16.5
Total	351	100

Source: Authors' Own Compilation

5. Data Analysis and Results

5.1. Structural model Measurement

The measured constructs were evaluated on the opinions of the respondents. The validity along with the reliability of the model was computed by Amos 21 using confirmatory factor analysis to understand relationships among the constructs. Table 2 shows the outcomes of the extended model for the scale items, reliability, standardized parameter estimates (beta values), and average variance extracted (AVE).

Table 2: Results of Extended Model for Scale Items

Construct and item	*Std. Loading*	*Beta Values*	*CR*	*AVE*
Perceived Usefulness		.714	.763	.533
App-based ride-sharing services saves my time in booking a cab	.794			
Booking is convenient through app	.869			
Overall, I find app-based ride- sharing services useful.	.462			
Perceived ease of use		.835	.842	.571
It is easy to use app-based ride-sharing services.	.804			
I feel that it is easy to understand and interpret messages shared by vendors of app-based ride-sharing service providers.	.756			

contd. table 2

Construct and item	*Std. Loading*	*Beta Values*	*CR*	*AVE*
Payments can be made easily while using app-based ride-sharing services.	.758			
I feel that bookings can be easily made through my phone for app-based ride-sharing services.	.701			
Ecological Concern		.823	.825	.543
App-based ride-sharing services help in protecting environment	.695			
App-based ride-sharing services help in promoting sustainable transportation	.757			
App-based ride-sharing services result in reduction of fuel consumption energy	.824			
App-based ride-sharing services is environmental friendly	.661			
Economical Benefits		.789	.819	.571
App-based ride-sharing services are more economical than individual ride	.698			
App-based ride-sharing services help in reducing individual mobility cost.	.989			
App-based ride-sharing services give good value for money	.609			
Societal Influence		.760	.767	.524
Peer group influence to use app-based ride-sharing services.	.724			
Many people around me are using app-based ride-sharing services.	.649			
People related to me think that app-based ride-sharing services should be utilized by me.	.792			
Attitude towards using		.896	.902	.754
I find it as a wise option	.805			
I think it is a correct approach	.950			
I think it is a good habit	.844			
Behavioural Intention		.830	.848	.654
I would use it in the future	.848			
I recommend others about it	.895			
I would myself prefer to use app based	.665			

Note: [a]All factors loadings are significant at $p < 0.01$

Source: Authors' Own Compilation

The various items load significantly, ranging from 0.469 to 0.950 on their respective dimensions. Also, the computed AVE values are above 0.50, signifying convergent validity for the measured construct (Hair *et al.*, 2006). Cronbach's alpha values for each item are above 0.70 (Hair *et al.*, 2006), which shows the composite reliability. The correlation matrix in Table 3 shows maximum shared variances (MSV) and average squared variances (ASV) values.

Table 3: Correlation Matrix, MSV Values, ASV Values

Constructs	*MSV*	*ASV*	*ATT*	*Eco*	*Econol*	*SI*	*PEOU*	*PU*	*BI*
ATT	.566	.192	**.868**						
Env.	.300	.134	.512	**.737**					
Economic	.300	.128	.471	.548	**.782**				
SI	.206	.086	.312	.056	-.085	**.724**			
PEOU	.484	.093	-.076	-.064	.049	.206	**.756**		
PU	.484	.122	-.023	.123	.069	.454	.696	**.730**	
BI	.566	.203	.752	.469	.480	.401	.135	.148	**.809**

Note: 1. Diagonals represent the square root of the average variance extracted, while off-diagonal values represent the correlation.

2. Att- Attitude of use, Eco-ecological concern, Econo- Economic benefits, SI- Societal influence, PEOU- Perceived ease of use, PU- Perceived usefulness, BI- Behavioural intention

Source: Authors' Own Compilation

The computed measurement model fit values with χ^2 = 372.110 and 209 degrees of freedom, χ^2/d.f. = 1.780 depict a sufficient fit to the data (Hair *et al.,* 2015). Table IV shows other values measured namely, the goodness-of-fit index (GFI) and comparative fit index (CFI).

Table 4: Measurement Model Estimates

Model	χ^2	*d.f.*	χ^2/*d.f.*	*GFI*	*TLI*	*CFI*	*REMSEA*
	372.110	209	1.780	.705	.860	.806	.078

Source: Authors' Own Compilation

5.2. Assessment of the Structural Model

Various indices such as GFI, TLI, CFI, and REMSEA of the structural model are towards a good model fit as shown in Table V. For the structural model, the chi-square value is χ^2 = 23.315 (at 5 d.f.) and CMIN (χ^2/d.f.) value is 4.663.

Table 5: Structural Model Estimates

Model	χ^2	*d.f.*	χ^2/*d.f.*	*GFI*	*TLI*	*CFI*	*REMSEA*
	23.315	5	4.663	.921	.915	.928	.023

Source: Authors' Own Compilation

The path estimates and beta values depicted in Table 6 suggest that except PEOU, all other measured variables significantly and positively influence the ATT towards the use of app-based ride-sharing services. The estimates further indicate that attitude to use significantly influences behavioural intention towards app-based ride-sharing services. It was further found that SI was the most important predicting factor with (β = .59, p< 0.01), while PEOU was a non-significant factor (β = .22) in adopting the attitude to use the service, therefore H_{02} is rejected. All other hypotheses other than H_{02}, are accepted at the p < 0.01 level of significance. Figure 2 shows the beta values of the research model.

Table 6: Path Estimates

Hypothesis	*Estimates*	*Results*
H_{01}. Perceived Usefulness ——> Attitude to Use	.59***	Accepted
H_{02}. Perceived ease of use —— >Attitude to Use	.31 N.S.	Not- accepted
H_{03}. Attitude to Use ——— > Behavioural Intention	.87***	Accepted
H_{04}. Ecological Concern —— > Attitude to Use	.57***	Accepted
H_{05}. Economic Benefits —— > Attitude to Use	.39***	Accepted
H_{06}. Societal Influence ———— > Attitude to Use	.52***	Accepted

*** Significant at the 0.01 level; N.S. – Not significant

Source: Authors' Own Compilation

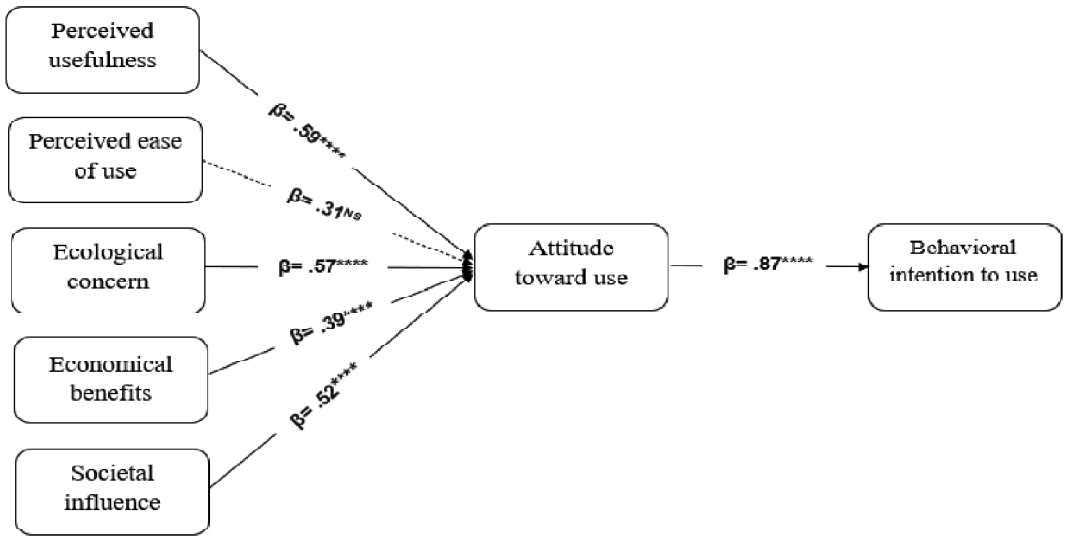

Figure 2: Research Model

Source: Authors' Own Compilation

6. Discussion

The TAM model approach was used to determine the factors influencing people's intentions to use ride-sharing apps for work travel as shown in the proposed framework (Figure III). The empirical results indicate that perceived usefulness is a significant antecedent for the formation of attitude to use app-based ride-sharing services (β = .58). The results support previous studies on the usefulness of app-based ride-sharing services (Chen and Lu, 2015; Yu *et al.*, 2018). The results of the study are that PEOU has non-significant associations with attitude to the use of app-based ride-sharing services. PEOU was found to have a non-significant influence on the attitude to use in one-third of the studies reviewed in a meta-analysis (Yousafzai *et al.*, 2007).

Though attitude to use has a direct effect on PEOU (Yu *et al.*, 2018), some other studies (Eriksson *et al.*, 2005) showed that involuntary setting PEOU is important at the initial stages of the decision process only for determining the use of a system. The model developed in this study also included three more antecedents that have never been theorized and empirically tested together for app-based ride-sharing services. The results show that people view app-based ride-sharing services as a sustainable model for work-related mobility. Results show that these factors (concern for the environment, SI, and economic benefits) were significantly impacting the attitude to use the app-based ride-sharing services for commuting purposes. Agatz *et al.* (2012) found that consumers are concerned about rising fuel prices and air pollution on both global (in terms of climate change) and local scales (vehicle emissions effects on health).

Sharing goods and services in general sounds not only logical but also economical. The result highlighted the economic benefits as a significant predictor. These economic benefits while participating in ride-sharing are rational and understandable motivators wherein the user sometimes substitutes exclusive rides with lower-cost app-based ride-sharing services (Lamberton and Rose, 2012). Also, among all the antecedents studied for the present study, social influence is the strongest predictor of attitude to use with the highest beta value (0.59). Most of the respondents (98.5 percent) are up to the age of 40 years, therefore they are more prone to social influence (Patel and Patel, 2018). Also, the behaviour of users is largely influenced not only by family and friends but also by their peer group (Tak and Panwar, 2017). In sum, this study reveals that PU, SI, ecological concern, and economic benefits are decisive factors to understand the attitude and behavioural intention toward the usage of the ride-sharing app services. Therefore, the contribution of this paper is to enhance existing theoretical frameworks used for app-based ride-sharing services adoption studies and categorize the existing antecedents that impact the behavioural intention of customers to use app-based ride-sharing services.

7. Conclusion and Way Forward

There has been no comprehensive research done in the Delhi-NCR region to assess the behavioural intention to use app-based ride-sharing of the working class for commuting to their workplaces. Thus, the determinants of attitude to use app-based ride-sharing services are likely to build up a new framework in this context. These findings will aid in the development of promotional strategic plans for app-based ride-sharing services providers in particular. Chaudhuri *et al.* (2022) used cluster analysis to evaluate car sharing implications on consumer's attitudes in the light of Sustainability Goals defined by

United Nations (2019). The pioneering study conducted in an objective manner highlights the potential of the car subscription business model in India. They can also use social media platforms which may further help in instilling confidence regarding ride-sharing apps among the public. Furthermore, because ride-sharing is emerging as a new service, it will help the economy grow by providing people with job opportunities.

It also provides insight to the government in terms of developing transportation initiatives that encourage urban areas to embrace sustainable modes of transportation by commending people who choose sustainable modes of transportation. In summary, the study's findings indicate that users have a favourable behavioural intention to use app-based ride-sharing services which will benefit all stakeholders, including customers, businesses, policymakers, and society as a whole. An important implication of the findings is the need to construct a study model to explore how people evaluate the flexibility of public transportation networks and direct future research for consumer research on flexible mobility.

The present study has several limitations that must be mentioned. First, the study's generalizability is limited due to the non-random sampling approach used to obtain data from only Delhi-NCR. Second, several demographic variables such as gender, age and kind of vehicle owned can be used as moderators to assess the behaviour intention to use ride-sharing apps. Longitudinal research may give further information regarding the behavioural responses of prospective customers especially taking into consideration the security and privacy concerns of commuters.

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Work-Life Balance of Private Sector Employees: A Demographic Analysis

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Abstract: Irrespective of age, gender, and job profile employee's life is a combination of work, family responsibilities, hobbies, or social activities and aspirations. Activities other than work can be termed as life activities and in general, work takes precedence over other things in every employee's life. This precedence of work creates disequilibrium in maintaining a harmonious work-life balance. A well-maintained work-life balance will lower stress and burnout levels and creates a greater sense of well-being among employees. There is a general perception that private-sector employers expect more productivity from their employees which consequently leads to prolonged work hours and negative work-life balance. To understand the above phenomenon employees working in private sector organizations in the city of Kolkata were considered for this study. Using the data collected from 150 respondents working in private sector companies, this study provides information and a rich view of demographics-based perceptions about work-life balance among the private sector employees working with various firms and industries in the city of Kolkata.

1. Introduction

The modern economy and technological advancements have not only brought better job opportunities but also have bought up issues related to the management of employees' time between personal and professional life. Advancements in areas like Information Technology created new job avenues and new ways of working. These new ways of working demanded greater quality, agility, and speed in terms of response. This technology adoption in a way demands constant availability which in turn is resulting in demand for more time. During the last decade, the average number of work hours an employee is spending on work in a workweek has gone beyond 48 hours. This demand for more time is becoming a source of constant pressure. Apart from spending more numbers of hours at work, today's employees are also grappling with demands related to working i.e., working with very

high speed and against tight deadlines. These work demands started dominating the life aspects leading to work-life imbalances.

Unlike in the 1970's managing the right balance between work and family, aspects are no more confined to female workers. The pressures created due to high-speed working environments clubbed with long working hours, and tight schedules are resulting in the increased evening as well as weekend work, more exhaustion with no time for family and socialization. Today's organizations realized that the problems related to work-life balance are equally affecting both male and female workers and in the current context, it is no more gender-specific.

The concepts and issues related to work-life balance are no more confined to western countries. More and more Indian workforce, as well as organizations, started considering work-life balance as an important aspect and as a concern. Employees started caring about work-life balance more than money. To adapt to the new trends and to keep their talent energized and motivated, Human Resource Departments moved away from the concept of looking at family-friendly work norms and started looking at work-life balance from a much wider perspective. Current day human resource departments are more focused on enabling better employee experience and are trying to provide various avenues to the employees for effectively managing their professional and family aspects (White *et al.*, 2003).

Work-life balance is affecting the employees' productivity (Haralayya, 2021).Work-life balance depends upon several factors like how long (duration), when (time), and from where (place) people work (Caroline *et al.*, 2004). Due to technology interventions, current-day work environments are very competitive and an employee who tries to put their best effort into everything finds WLB always as an uphill task to accomplish (Devi, 2016).

The private sector was considered for the research as it is a sector where employees work in very competitive, high-speed, and stressful environments (Hasan *et al.*, 2021).This study is conducted in Kolkata city. Most of the private business houses got their presence through their branches in this city and hence can provide good insights.

2. Review of Literature

Work-life balance is a permutation and combination of various interactions in one's life. The role conflicts related to personal and professional domains result in work-life imbalance. Work-life balance is all about the amount of time an individual spends performing work activities as against the time he is spending with family or for activities that he or she loves (Pattu *et al.*, 2013).

Work-life balance is about adjustments related to working patterns and finding a rhythm that combines work and other responsibilities (Maxwell and McDougall, 2007). Work-life balance also involves factors such as time balance, involvement balance, and satisfaction balance (McDonald and Bradley, 2005)Time balancing is about distributing the available time between work and family activities. Balance related to involvement is to do with the level of psychological involvement in work and family-related non-work aspects. On the other hand, satisfaction balance deals with the perceived satisfaction an individual gets from work and family-related non-work.

Balancing of work and day-to-day life activities also emerged as a growing concern due to demographic developments happening in the gender and age of the workforce. The prolonged working

culture beyond work hours (Dean, 2002) (Hyman *et al*., 2003) is raising concerns and is affecting the health and fitness levels of employees. Long working hours also resulted in increased occupational stress along with difficulties in combing work and family care.

The 2021 annual study on employer branding conducted with two lakhs, respondents representing over 34 countries covering 80% of the global economy revealed that Indian job seekers(65%) are preferring work-life balance as an important driver over attractive salary (62%) while choosing the employer (The Economic Times, 2021).

Attempts to operationalize the work-life balance concepts were made through subjective and objective approaches. Companies preferred taking a subjective approach and researchers naturally tilted more towards the objective approach (Hyman *et al*., 2003).

Under the Factories Act of India 1948, the maximum working hours for an adult worker is fixed at 48 hours for a workweek and not exceeding 9 hours on any single workday. Section 51 of the act emphasizes a weekly holiday either on the first day of the week or any other day as approved by factories chief inspector. Rule 20-25 of the minimum wages act, 1948 specified that maximum working hours for an adult worker should not be more than 9 hours. It is implied from both factories and the minimum wages act that a worker who works regularly for more than 48 hours is prone to work-life imbalances.

The work-life balance consists of aspects like how long, when, and where people work (Caroline *et al*., 2004). WLB-related needs can be mapped into three different yet connected life areas (Williams, 2001). First is related to personal time and personal space which is essentially required for taking care of self and for the fulfilment of various physical, mental, and religious or philosophical aspects. The second is time for caring giving activities to others or in a way performing the role of a caretaker/ caregiver and the third is work time and workspace which enables economic self-sufficiency. Work-life balance can only be achieved if all the above aspects are addressed or balanced (Williams, 2010).

Researchers analysedWLB from various aspects and published several theories related to the same. From the segmentation theory point of view, work and family are independent and have no related entities. According to this theory, an employee can hold back his thoughts related to work and vice versa. This holding back of thoughts by an employee helps in maintaining a healthy strike-through between work and non-work environments. The segmentation theory due to its weakest empirical support is considered as the theory with only theoretical potential (Bulger *et al*., 2007).

According to enrichment theory, experiences in work roles will help in improving family roles, and experiences in family roles enhance work roles. This theory relies on the aspect that experiences such as skills, abilities, etc., gained in one area will improve the quality of another area (Morris and Madsen, 2003).

Facilitation theory deals with how experiences gained, skills obtained, and opportunities created in one area of life (either work or non-work) will act as good resources and will produce experiences in other areas(Frone, 2004) enabling two-way facilitation.

The spillover theory argues that the expertise obtained by an individual in one of his performing roles influences expertise in the other roles performed by him. According to spillover theory work and family life are associated not only vertically and horizontally but also positively and negatively (Morris

and Madsen, 2003). The negative aspects of one area are associated with negative aspects of another area, and satisfaction and achievement in one area spill to another area and vice versa (Xu, 2009).

According to spillover theory, what happens at home influences the work area events (Young and Kleiner, 1992).Behaviours, skills, etc., formed in family roles reflect in the work roles of the individual and vice versa (Kelly and Voydanoff, 1985).

The four dimensions of work-life balance (Fisher *et al.*, 2009), emerged from the above theories. First, work-life- personal life interference, i.e., the extent of work aspects interference with personal life aspects, second, personal life - work-life interference, i.e., the extent of personal life aspects interfering with work aspects. Third, personal life-enhancing the work-life i.e., the extent to which enhancement happening in personal life is helping the work-life, and the four this work-life enhancing the personal life i.e., the extent to which enhancement happening in work-life is helping personal life.

While both male and female workers face issues with work-life balance, the way those are being handled by them is different (Williams, 2010). While high levels of performance and punctuality got displayed by women workers who are also mothers than women workers who are without children, the same does not hold ground in the case of male workers who are also playing the father role (Cuddy *et al.*, 2004).

The private sector is all about competition. Public and semi-public sector organizations are inspired and obsessed with private sector enhanced employee performance (Ch and Bouckaert, 2011). The intense competition clubbed with increasing workload and job pressures are forcing to display employees work commitment in a palpable manner*(*Ishaya *et al.*, 2008)A large part of employees started sacrificing their family time for their extended work demands, on top of this technology, advancements enabled organizations to stay in touch with their employees all the time(Morgan, 2003). This trend has further increased the work pressures thereby increasing the demands related to work on the employees. These increased demands consequently resulted in increased stress levels and work-life imbalances.

The social structure of the family has also changed. Extended family structure is becoming a thing of the past (Patel, 2005) and nuclear families with both husband and wife going to work for making both ends meet became the norm. Single parents are also becoming prevalent due to increased divorce rates (Amato *et al.*, 2003). While women's engagement in income-generating economic activities continue to increase there has been little change in their involvement in domestic responsibilities (Singh, 2004). The simultaneous changes both at work and family calls for continuous attempts for balancing the acts related to work and family.

At times work intercepts and intrudes into the social and family life of the employee. Family responsibilities and pressures intrude into work and affect the employee's job performance (Fu and Shaffer, 2001) Job or organizational pressures clubbed with no work centrality, lack of respect for personal space and time result in work encroachment into employees'non-work areas (Hayman, 2005a) and manifest differently based on the factors like work type, the extent of work autonomy and support provided by the organization (Atkinson and Meager, 1986).

Regardless of their job status, male workers tend to have more work-life balance as they clearly demarcate work and family aspects. Generally, women hold the responsibilities related to household chores, due to which most of them face work-life balance-related challenges. Literature studies suggested

that female workers in managerial positions have work-life balance-related difficulties (Connell, 2015). Male workers prioritize work for family reasons whereas their female counterparts give equal importance to both work and family. Women workers also try and address both work and family aspects simultaneously.

Any mismatch between the work and family roles is an area of concern to both employees and employers as they affect productivity and well-being leading to long terms impacts on both. Workers are generally inclined to work for organizations or employers that sustain work-life balance (Fapohunda and Fapohunda, 2014).

Work-life balance is also studied using three distinct measures one, the amount of free time available to the employee, two overlap of work with non-work activities three the amount of time an employee spends with other people or in social activities(Fisher and Layte, 2002).Various reviews also highlighted work-life issues in relation to the employee's age, his gender, the stage of work life-cycle he is passing through, his other factors such as ethnicity, country of residence or citizenship, and facilities available for childcare, etc.,(Fisher and Layte, 2002; Jager, 2002; Wallace and C, 2004).

The literature made it evident that the work-life balance is a global phenomenon that needs to be addressed (Humphreys *et al.*, 2000). Organizations across the globe have kept in place several measures for effectively addressing WLB-related issues (Todd, 2004) however, their approaches for addressing the same are different(Lewis *et al.*, 2007). The literature study reflected that there are gender differentiators in perceiving the aspects related to work-life balance (Connell, 2005; Duxbury and Higgins, 1991; Smithson and Stokoe, 2005).

Work-life balance is serious among all categories of employees who might normally be expecting a high level of control both on their work and also on their working hours. The literature review also revealed that there is scope to study demographic aspects of work-life balance among the employees who are engaged in highly demanding and pressurized jobs. Private sector employees due to their nature of employment which demands long working hours are exposed to high-stress levels and are prone to issues related to work-life balance. Accordingly, the employees working in private sector organizations in the city of Kolkata were considered for this study. This study provides information and a rich view of demographics-based perceptions about WLB among the employees working in private sector firms and industries in the city of Kolkata.

3. Objectives and Hypotheses of the Study

3.1. Objectives of the Study

- To measure the work-life balance of private-sector employees working in the city of Kolkata.
- To explore the respondent's perceptions on work-life balance using the demographic data collected.

3.2. Hypotheses of the Study

H_{01}: There is no correlation between various dimensions of WLB.
H_{02}: There is not much deviation found in WLB dimensions perceptions among age groups
H_{03}: There are not many differences in WLB dimensions between genders.

H_{04}: There are not many differences between the job types and dimensions of WLB

H_{05}: There are not many differences between the job experiences and dimensions of WLB

4. Research Methodology

4.1. Research Design

Based on the study objectives a structured research instrument was administered. The instrument consists of two sections a section related to demographics-related questions and the other related to questions on work-life balance aspects. Work-life balance-related questions are based on Hayman's instrument. Hayman's work-life balance instrument consists of 15 items covering all three dimensions, Work Interference with Personal Life (WIPL), Personal Life Interference with Work (PLIW), and Work or Personal Life Enhancement (WPLE)(Hayman, 2005b).A pre-test of the instruments was done with 20 participants before proceeding to final data collection.

4.2. Sample Design

The respondents for this study were 150 randomly selected private sector employees working in Kolkata metropolitan city. 200 questionnaires were distributed and 175 responses were received. 25 responses that are incomplete with more than 10% values were not considered for analysis (Hair, 2009). Out of 150 valid respondents' men and women constitute 45% and 55% respectively. Out of the total respondents, 39% are performing managerial jobs, and 27% are non-managers. Employees working in services or another type of jobs constitute 13% and 21% respectively. 10% of the respondents are from the 20 to 30 years age bracket. 21 % are from 30 to 40 age group 40 to 50 and 50 to 60 age groups constituted 56% and 13% respectively.

4.3. Techniques and Tools Used

IBM SPSS Software and MS-Excel were used for data analysis. The descriptive analysis of the items got done and presented in tabular format.

5. Data Analysis and Results

Scale dimensionality got analyzed using factor analysis. Two reverse coded items related to struggle between work and non-work, and time availability for non-work activities were excluded from the scale.

Table 1: KMO & Bartlett's Test

The measure of Sampling Adequacy (KMO)		0.712
Bartlett's Test Chi-Square		913.138
	df	78
	Sig.	0

Source: Authors' Own Compilation

KMO value of 0.712 indicated an acceptable level of correlation among the items or questions.

Table 1a: Rotated Component Matrix

Q.No.	*Dimension Code*	*Description*	*Component*		
			1	*2*	*3*
1	WIPL	Personal life is suffering due to work			
2	WIPL	Job is making personal life difficult	0.865		
3	WIPL	Personal needs are getting neglected due to work	0.948		
4	WIPL	Put personal life on hold due to work	0.961		
5	WIPL	Unable to attend personal activities due to work	0.956		
8	PLIW	Personal life is draining off energy for work		0.927	
9	PLIW	Feeling tired to work effectively		0.927	
10	PLIW	Work suffers due to personal activities		0.787	
11	PLIW	find it hard to work due to personal matters		0.735	
12	WPLE	Get energy from personal life for doing the job			0.761
13	WPLE	Get energy from job for pursuing personal activities			0.828
14	WPLE	Better work mood is due to my personal life			0.833
15	WPLE	I'm in a better mood due to my job			0.837

Source: Authors' Own Compilation

The method adopted for extraction is the principal component analysis and for varimax with Kaiser normalization rotation method is adopted.

The component matrix analysis gave three factors. Factor one comprises the items related to question two to question five, which represented the WIPL aspect. Questions 12-15 comprised factor two which represented the WPLE aspect. Questions 8 to11 which are a part of factor three which represented the PLIW aspect. 69.85% of the variation (overall) is explained by the three factors together. The dimensionality suggested by (Fisher-McAuley *et al.*, 2003) corresponded with the component's dimensionality.

5.1. Subscale Reliability

Table 2: Reliability Test – Work-life Balance Subscales

Subscale	*Cronbach's Alpha*
WIPL Scale	0.83
PLIW Scale	0.865
WPLE Scale	0.831

Source: Authors' Own Compilation

Cronbach alpha test got conducted on all the item variables for measuring the adopted scale's internal consistency. As depicted in Table 2 the alpha value of all factors is found to be greater than 0.6 which can be considered a highly reliable and acceptable index (Hair *et al.,* 2010).

5.2. Analysis of Respondents' Demographics

Table 3: Respondents' Profile

Respondent Type	*Number*	*%*
Men	68	45
Women	82	55
Total	150	100

Source: Authors' Own Compilation

Table 4: Respondents' Profiles based on Age

Age in years	*Count*	*Percentage*
20-30	15	10
30-40	31	21
40-50	84	56
50-60	20	13
Total	150	100

Source: Authors' Own Compilation

Table 5: Respondents' Profiles based on Job Type

Job Type	*Frequency*	*Percentage*
Managerial	59	39
Non-Managerial	41	27
Service	19	13
Others	31	21
Total	150	100

Source: Authors' Own Compilation

It is evident from the above tabular analysis that more than 48 hours are being spent by workers of both genders at work in a work week. Comparatively women workers are spending more amount time at work than their counterparts. Hence women workers face more issues in maintaining work-life balance.

Table 6: Respondents' Profiles based on Job Experience

Years of experience	*Frequency*	*Percentage*
< 5	6	4
5 – 10	19	13
42278	21	14
15 - 20	55	37
20 – 25	34	23
> 25	15	10
Total	150	100

Source: Authors' Own Compilation

Table 7: Respondents' Profiles based on Weekly Work Hours

Weekly work hours	*Frequency*	*Percentage*
40-45 hours	46	30.7
45-50 hours	26	17.3
50-55 hours	46	30.7
>55 hours	32	21.3
Total	150	100

Source: Authors' Own Compilation

Table 8:Gender-Wise Respondents' Weekly Work Hours Distribution

	Weekly Work hours				
Gender	*<40*	*40 - 45*	*45 - 50*	*50 - 55*	*>55*
Men	0	28	8	24	8
Women	0	18	18	22	24

Source:Authors' Own Compilation

Table 9: Job Type Wise Respondents' Weekly Work Hours Distribution

	Weekly Work hours				
Job Type	*<40*	*40-45*	*45-50*	*50-55*	*>55*
Managerial	0	31	8	20	0
Non-Managerial	0	6	8	10	17
Service	0	2	1	10	6
Others	0	7	9	6	9

Source: Authors' Own Compilation

It is evident from the above tabular analysis that all workers across job types spend more than 48 hours at work in a workweek. Hence it is evident that workers across job types face more issues in maintaining work-life balance as they spend more time at work.

Table 10: Job Experience-Wise Respondents' Weekly Work Hours Distribution

	Weekly Work hours				
Job Experience	*<40*	*40-45*	*45-50*	*50-55*	*>55*
<5	0	0	0	6	0
5 to 10 years	0	6	7	0	6
10 to 15 years	0	2	4	15	0
15 to 20 years	0	16	15	9	15
20 to 25 years	0	7	0	16	11
> 25 years	0	15	0	0	0

Source: Authors' Own Compilation

It is evident from the above tabular analysis that all workers irrespective of their job experience spend more than 48 hours at work in a workweek. Hence, it is evident that workers irrespective of their job experience are spending more time at their workplace and are facing work-life imbalances.

Table 11: Work-Life Balance Dimensions Analysis

Dimensional Aspect	*Mean*	*Standard Deviation*
Work Interference with Personal Life Dimension (WIPL)	4.03	0.59
Personal Life Interference with Work Dimension (PILW)	3.1	0.81
Work Personal Life Enhancement Dimension (WPLE)	3.19	0.86
Negative Work-Life Balance Dimension (NWLB)	2.89	1.38
Positive Work-Life Balance Dimension (PWLB)	3.23	1.37

Source: Authors' Own Compilation

While the average levels of WIPL and PLIW are on the higher side and NWLB is on the lower side. The average levels of PWLB and WPLE are on the higher side compared with NWLB.

It is clear from the results that work-life balance is maintained even with high levels of interference in both directions i.e., work aspects with personal life aspects and personal life aspects with work aspects. This can be attributed to the healthy work culture, cordial work environment, employee-friendly HR policies, and work-life practices followed by organizations

5.3. Correlation Matrix

The correlation matrix of subscales is depicted in the below table.

H_{01}: There is no correlation between various dimensions of WLB.

Table 12: Correlation among the Various Dimensions of WLB

Dimensions of WLB (Positive and Negative)	*WIPL*	*PLIW*	*WPLE*	*NWLB*	*PWLB*
WIPL	1	-0.09	0	-0.14	0.15
PLIW	-0.09	1	-0.04	0.1	-0.12
WPLE	0	-0.04	1	0	0.01
NWLB	-0.14	0.1	0	1	-.855**
PWLB	0.15	-0.12	0.01	-.855**	1

Source: Authors' Own Compilation

** at 0.01 level correlation is significant (2-tailed).

Negative correlation is found between PLIW and WIPL, which means that if PLIW increases, WIPL decreases. However, the coefficient is very less (-0.09), and the variation would be very low. WPLE and PLIW are negatively correlated. This shows that if WPLE increases, PLIW decreases. NWLB and WIPL are positively related at (0.10). This shows that if one increases, the other also increases. PWLB and WIPL are negatively correlated at (-0.12). This also indicates that if PWLB increases, WIPL decreases. There is no correlation between NWLB and WPLE. But there is a high correlation (-0.855) between PWLB and NWLB. That means that if one increases the other drastically decreases.

H_{02}: There is not much deviation found in the perceptions in relation to WLB dimensions among age groups

5.4. Comparison across Demographic Variables

Table 13: Perception Differences among WLB Dimensions among Age Groups

	Mean				*Std Deviation*					
Age	*20-30*	*30-40*	*40-50*	*50-60*	*20-30*	*30-40*	*40-50*	*50-60*	*F*	*Sig.*
WIPL	3.75	4.12	4.02	4.2	0.61	0.64	0.58	0.49	1.94	0.13
PLIW	3.08	2.97	3.15	3.13	0.65	0.87	0.85	0.69	0.39	0.76
WPLE	3.03	3.27	3.18	3.16	0.76	0.9	0.82	1.03	0.27	0.85
NWLB	3.53	2.97	2.81	2.65	1.36	1.47	1.36	1.31	1.43	0.24
PWLB	2.6	3.16	3.29	3.55	1.4	1.46	1.34	1.23	1.52	0.21

Source: Authors' Own Compilation

From the tabular analysis, it is clearly evident that work interference with personal life (WIPL) is higher in comparison to personal life interference with work (PLIW) across age groups. This indicates spillover of work aspects on to a person's life which resulted in work-life balance issues. Negative work-life balance is more in the age group of 20-30 when compared to other age groups. This indicates that the new generation workforce is not happy with the various aspects of work-life balance.

H_{03}: There are not many differences in WLB dimensions between genders.

Table 14: Differences Across Gender

	Man		*Women*			
Gender	*Mean*	*Std Deviation*	*Mean*	*Std Deviation*	*F*	*Sig.*
WIPL	4.05	0.58	4.03	0.61	0.02	0.88
PLIW	3.02	0.85	3.17	0.78	1.24	0.27
WPLE	3.22	0.88	3.16	0.83	0.21	0.64
NWLB	2.54	1.38	3.18	1.33	8.34	0
PWLB	3.51	1.35	2.99	1.34	5.7	0.02

Source: Authors' Own Compilation

No differences were observed between genders in WIPL and PLIW areas, however, the negative WLB of women is higher when compared to men. This indicates that women as a gender are facing more issues in balancing both work and life.

H_{04}: There are not many differences between the Job types and dimensions of WLB

Table 15: Differences Across Job Types

	Mean				*Std Deviation*					
Job type	*Mana-gerial*	*Non-Mana-gerial*	*Service*	*Others*	*Mana-gerial*	*Non-Mana-gerial*	*Service*	*Others*	*F*	*Sig.*
WIPL	4.04	4.11	3.8	4.1	0.62	0.51	0.71	0.55	1.32	0.27
PLIW	3.12	3.05	2.99	3.2	0.74	0.92	0.69	0.89	0.34	0.8
WPLE	3.17	3.24	3.43	2.99	0.87	0.75	0.84	0.96	1.13	0.34
NWLB	2.8	3	3.26	2.71	1.41	1.32	1.48	1.35	0.81	0.49
PWLB	3.41	3	2.84	3.42	1.37	1.32	1.5	1.31	1.44	0.23

Source: Authors' Own Compilation

It is evident from the above tabular analysis that the employees who are into providing services such as teachers, lawyers, etc. experience more NWLB when compared with employees working in

other job types despite having low WIPL and PLIW which is contrary to the belief of WIPL and PLIW are the main reasons for NWLB.

H_{05}: There are not many differences between the Job Experiences and dimensions of work life balance

Table 16: Differences across Job Experiences

	Mean						*Std. Deviation*							
Job Exp in years ==>	*<5*	*5 to 10*	*10 to 15*	*15 to 20*	*20 to 25*	*> 25*	*<5*	*5 to 10*	*10 to 15*	*15 to 20*	*20 to 25*	*> 25*	*F*	*Sig.*
WIPL	3.77	3.8	4.24	4.03	4.06	4.15	0.46	0.58	0.69	0.63	0.49	0.51	1.48	0.2
PLIW	3.46	3.01	2.87	3.25	3.03	3.03	0.4	0.66	0.96	0.8	0.89	0.72	1.06	0.39
WPLE	3.42	3.29	3.05	3.21	3.12	3.22	0.68	0.9	0.87	0.81	0.86	1.06	0.3	0.91
NWLB	3.5	3.32	2.9	2.98	2.53	2.6	1.05	1.53	1.48	1.35	1.28	1.4	1.25	0.29
PWLB	3.17	2.79	3.1	3.09	3.59	3.67	1.17	1.55	1.48	1.35	1.23	1.29	1.34	0.25

Source: Authors' Own Compilation

From the above tabular analysis, it is interesting to note that WIPL increased with increasing job experience while WIPL remained more or less constant, however a decreasing trend of NWLB appeared with increasing job experience. This trend of reducing NWLB is because as the employee gains experience and expertise he would be able to balance between the jobs and the time available to him and prioritize the jobs effectively which would have enabled a reduction in NWLB levels.

6. Conclusion and Directions for Future Studies

The twin objectives of this research are to measure the WLB of employees working in private-sector companies in the city of Kolkata and to explore the respondent's perceptions related to work-life balance using the demographic data collected. The dimensionality and reliability of all subscales got established through this study. The analysis of demographics showed perception-related differences in work-life balance among demographic groups. Women workers are spending more time at work than their man counterparts. The new generation workforce is not happy with the different aspects of WLB. Healthy working culture, cordial working environment, employee-friendly HR policies, and work-life practices that are being followed by organizations are helping employees in maintaining a healthy work-life balance. Researchers can take cues from these perceptional differences among demographic groups and can conduct further research for getting deeper insights.

While this study is confined to Kolkata city and the private sector, researchers can further explore bigger demographics and perform cross-sectorial comparative research to find the contrasts.

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Relationship between Competencies and Demographic Variables of the Employees: Competency Mapping of Private Sector Bank

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Abstract: It is well acknowledged that skilled labour is essential to the success of every organisation. For bank personnel to continue to be competent the bank needs employees with a wide variety of knowledge, skills, and talents. Additionally, the socioeconomic background of the employees has a big impact on employee competencies. The main purpose of the study is to find out any notable variations in competence across the major demographic variables of the employees. The study also aims to determine the discrepancy between the actual and expected levels of competencies. The study was limited only to Dakshinakannada and Udupi district of Karnataka. The study revealed that demographic variables have a strong influence on the different variables of competencies. Among the four dimensions of competences selected for the study viz; personal competencies, selling competencies, communication skill and customer relationship management, selling competencies shows highest gap. The study has practical implications and useful suggestions to fill the discrepancies between actual and expected level of competencies.

1. Introduction

Human Resource Management is the process of selecting the best applicant for the right position, training them in that position so that they can be creative asset to the organisation. HRM is a strategy for identifying and developing employees so that they become more lucrative (Noe, 2006). However, the role of HR goes much farther than simply locating qualified applicants: it also requires that one grasp the employability skills required for a given job profile.Identifying the competencies will enable the HR team to have a better performance management system. The privatisation and globalisation has further expanded the role of HRD and the fast changing economy demands only for competent man power.

Competency mapping analyses human capital's strengths and weaknesses to aid understanding and highlight areas where career advancement activities should be coordinated (Yuvaraj, 2011). Every

organisation must control demographic factors at work since employee attitudes are crucial to the management of the organisation. Each employee possesses socioeconomic factors naturally, and they are one of the factors that indicate an employee's competency (Hendrawijiya, 2019). Therefore, demographic factors create employees that have a proactive attitude and high levels of responsiveness, initiative, and adaptability, all of which can be used to boost employee capabilities.

One of the major contributors to the Indian economy is the banking sector. This industry has undergone a significant shift in recent years. The Indian banking industry is likewise affected by the force of the global banking environment. Hence, India's banks are expanding both in both public and private sector. By 2025, it could overtake the second-largest industry (IBEF, 2015). Most public and commercial banks have made the decision to implement competency-based human resource management (Kumar *et al.*, 2012; Patil and Masthan, 2014).

Being a service-based company, the banking sector's key strength is having intelligent and competent employees. Private sector banks frequently use some sort of competency mapping to determine how to use employees' skills and abilities most effectively. Additionally, banks must map the competencies of their human resources and create development plans for the people who will lead the firm forward. Based on their skills for managing new challenges and developing business prospects, banks should identify internal candidates and develop a specific pool of personnel. For such employees, banks should design a career path that is focused on their position and train them for the upcoming senior management roles that will become available.

2. Review of Literature

Although White (1959) introduced the idea of competence in his seminal paper for Psychological Review, he also introduced the idea of reflectance motivation. It was characterised as having the capacity to communicate successfully with the Environment. Even so, the concept of competence only became prominent after the McClelland's (1973) paper; he expected that only experience and education are not enough to measure the job performance, competence is more trustworthy and methodical evaluation of productive performance in work.

Competence is a fundamental quality of a person's abilities, motivations, qualities, and knowledge (Boyatziz, 1982; 2022). The term competency has been defined in two different ways by Strebler *et al.* (1997). Competencies are behaviours that a person must demonstrate or as the basic criteria of performance. Competency has also been used to describe the meaning conveyed by behaviours. There are three categories of competencies: cognitive, such as system thinking and pattern identification; such as self- awareness and self- management; and social, such as social awareness and relationship management. (Bray *et al.*, 1974: Crawford; 2001; Kotter, 1982).

Competency-based recruitment is the most efficient approach to choosing and keeping the best employees for the company. Candidates are judged according to the skills they must possess to be accepted into the organisation (Robert, 2012). People with the appropriate skills can perform better. And also to assess the candidates' potential for future roles, it is imperative to create a competency-based selection process that includes both current employees and new hires. Competence is a valid metric for identifying exceptional performers from average ones. Additionally, competency can be

defined as a behaviour pattern that a person must possess in order to fulfill their duties and contribute to the achievement of desired objective or outcome (Bartram *et al*., 2002; Woodruffe, 1992). The concept of competency deals with productivity and career advancement. Despite having highly skilled human resources, a corporation could not be able to use them in the right jobs. Competency mapping and appraisal techniques are utilised in this situation to help HR professionals decide who should fill each role. Every organisation requires clearly defined positions and a list of competencies required to successfully perform each role. This information aids in both finding people with the necessary talents for the job as well as those whose abilities will help the job be done successfully. An organisation can use competency mapping to determine how closely a job's requirements match a candidate's potential (Chouhan and Shrivastava 2013).

Most of the organisations view the requirement to map and track competency as a way to raise the value of their most important resources areas (Nigam *et al*., 2009). Competency mapping is one of the most accurate approaches for identifying a person's work and behavioural capabilities in an organisation (Anisha, 2012). An organisation needs to identify the competencies possessed by the employees and the competencies expected by the employer. The identified gap will enable the staff to concentrate on the competencies that are lacking through which an organisation can meet its goals (Maria *et. al*, 2013). In 2010, a survey of the country's banking, financial services, and insurance industries was conducted to rigorously determine whether there are discrepancies between recent MBA hires' performance and expectations in Indian Banking, Financial Services, and Insurance (BFSI) sector. According to the Skills Gap Survey, there are gaps in knowledge, attitudes, and capabilities, particularly in the areas of listening, teamwork, and collaboration, as well as in organisation and process knowledge, product and service knowledge, and consumer behaviour knowledge. These gaps are most noticeable in the skills category.

A study was conducted to objectively assess the personnel's capabilities and to discover the gap between the employees' current competencies and anticipated competences at HCL Technologies. In addition to demonstrating a good correlation between the qualifications of the three groups and each of the fifteen characteristics examined in the study, the study persuasively proved the favourable link between male and female employees in all competency mapping components. The result of the t- test analysis also showed that there is a noteworthy distinction between the individual performances of the two staff groups. Between the married and unmarried employees, there were found to be significant disparities in terms of functional competence, innovation, customer service, analytical thinking, and motivation (Velayudhan and Maran, 2009). According to a Systematic Review, regardless of performance background, employees operating in crisis scenario should get education focused on the acquisition of task related, profession specific, and cross- disciplinary abilities. For disaster response, a workforce with a range of professional disciplines, subspecialty categories, and levels of professional experience and cultural expertise is needed (Gallardo *et al*., 2015). Core organisations should apply more contemporary training approaches and give practical training to the employees and provide participants with focused learning assignments or projects to close any competency gaps (Saikumari, 2021).

The security and regulations implied in the employment contract in the banking sector have evolved as a result of deregulation, market entry by non-traditional suppliers, and the introduction of cutting-edge technology. Employees now need to develop new competencies, including relationship-handling

and sales skills, as a result of new structures and technologies, exacting customer service standards, and new competitors (Sparrow, 2004). Banking industry must determine the skills needed by employees in order to perform the current and subsequent positions. Bank employees required to possess technical competencies, managerial competencies, interpersonal competencies and personal competencies (Mankidy, 1996). The key competencies required for the bank employees are identified based on assessing their current level of competencies (Patil *et al.*, 2014). The use of competencies in the banking sector and its effects were thoroughly examined by (Prastacos and Gregory, 2012). The study highlighted interpersonal skill, communication skill, sales management, people management etc., are needed for the banking industry. The study came to the conclusion that the competences foster a culture of openness, greatly inspiring the bank's human capital. The performance of the banking sector depends on how well its employees can deliver first-rate customer service. The success of the company ultimately rests on the type of alliance that bank personnel retain with their customers because they are regularly in contact face-to-face with them. The banking sector can give better service to customers only if it determines proper career advancement for each and every employee and frequently assesses employee competencies.

Modern economic globalisation demands creative methods for managing the workforce. The rapid changes in social systems and demography have created room for a variety of HR approaches that boost worker growth and productivity. And competency mapping for employee development is one of the most popular HR practices. In order to improve performance management, mechanism for rewarding and recognising achievement, and career and succession planning programs, organisations must identify and build their skills. Competency mapping is also a premeditated HR framework for performance appraisal (Bhuvaneswary, 2015). Employee development can help a business to accomplish its goals of high production, efficiency, and effectiveness. Enhancing an employee's abilities can help with employee development. Competency mapping is necessary for the development of necessary staff abilities. Employee growth and development is positively and significantly correlated with competency mapping (Shraddha *et al.*, 2016).

Depending on the demographics variables of the workforce, there are variations in managerial skills. (Akhtar, 2018). Monthly income, previous experience, residential status, etc., will influence not only the competency of employees but also their behaviour (Najafi *et al.*, 2015). Age, gender, academic year, and university have a modest to significant impact on students studying in healthcare sector in terms of knowledge, attitude and preparedness to practice (Gillani *et al.*, 2020). From the above review of the literature, it has been determined that demographics are one of the key elements influencing the competence of employees. It is crucial to determine how demographic parameters like age, marital status, income, educational qualification and experience on job affect the competencies of banking professional. More research is needed to fully understand this topic, even if studies have shown the influence of demography on competencies.

2.1. Research Gap

Numerous studies have shown that competency management is crucial nowadays for an organization's competitive advantage. India's banking system is currently positioned for significant reforms. Merchant banking, mutual funds, special investment, analysis, factoring, working capital, and maybe expert

consultation and research services are non-traditional areas that would be included in banks' developing business profiles. In order to meet the challenges posed by these changes, training systems will need to adapt to new knowledge, skills, and attitudes. Reading through the examination of the literature revealed that one of the main issues for the survival of the banks is the competency mapping of their employees. It is clear from a review of the literature that demographics are one of the key elements influencing professionals' skills. Although studies have shown the influence of demography on competences, additional research is needed to fully understand this problem. On the other hand, it is yet unknown how certain demographic factors affect the competencies of banking professionals. The impact(s) of demographic variables such as age, sex, annual income, marital status, education qualification and length of experience on banking professionals' competencies must thus be determined.

Additionally, the literature that has been studied so far indicates that there is a lack of credible studies on the relationship between demographic variablesand competencies in the banking sector. Because of this, it was deemed necessary to conduct new research to map the competences and analyse the relationship between them and the demographic factors of private sector banks.

3. Objectives and Hypotheses of the Study

3.1. Objectives of the Study

- To find the difference in the competencies based on demographical variables
- To determine the gap among actual and expected level of competencies.

3.2. Hypotheses of the Study

Based on the study objective following hypothesis is drafted.

H1: The degree of competences varies significantly between various income levels.

H2: The degree of competences varies significantly amongst the different age groups.

H3: The degree of competencies among various educational groupings varies significantly.

H4: The level of competencies among various experience groups varies significantly.

4. Research Methodology

4.1. Sampling and Collection of Data

A systematic questionnaire was created to capture the primary data in accordance with the study's goals. The convenience method of non-probability sampling was employed for this study. As a result, a questionnaire was given to the employees of private banks (including HDFC Bank, ICICI Bank, Yes Ban, and AXIS Bank) in the coastal Karnataka region. Mangalore and Udupi were chosen as the study's two major cities. To collect the data bank, employees were approached on-site and a few responses were received through Google form. Respondents were requested to be precise in their responses. A whole of 100 questionnaires were spread, out of which 27 were incomplete and 8 were not returned by the respondents. Hence, the sample size is determined as 65.

4.1.1. Measures

There are two sections to the questionnaire. The first division consists of demographic aspects and the second division consists of competency aspects. The demographic aspects are considered as independent variables, and the competency aspects are considered as dependent variables. Basedon the review of literature, the study identified the four dimensions of competencies that are personal competencies, selling competencies, communication skills, and customer relationship management. All these competencies were associated with a total of 22 objects. Afive point Likert's scale was used to measure each point. More than 9 years of experience are reported by 41.5% of respondents.

4.1.2. Data Analysis and Interpretation

The objective of the study is to find out the significant differences in the competencies based on demographic variables. Hence, the ANOVA test was used to analyse and interpret the data.

Table 1 depicts, the demographic outline of the respondents, which shows that the major portion of the respondents are in the age group of 31–40 (30.7%), followed by the age group of 21–30 (29.3%). The education criteria of the respondents are undergraduate (60%) and postgraduates (40%), indicating that the sample of the study has more undergraduates. More than 9 years of experience are reported by 41.5% of respondents. The annual income of the respondents is recorded as highest in the category of 5-8 years (35.5%).

Table 1: Demographic Outline of the Respondents

Variable	*Respondents (N)*	*Percentage (%)*
Age		
21- 30 years	19	29.3
31- 40 years	20	30.7
41-50 years	14	21.5
Above 50 years	12	18.5
Educational Qualification		
Under Graduate	39	60
Post Graduate	26	40
Experience		
Below 2 years	6	9.2
2-5 years	13	20
6-9 years	19	29.3
Above 9 years	27	41.5
Income		
Below 3 lakh p.a	20	30.7
3-5 lakh p.a	22	33.8
5-8 lakh p.a	23	35.5
Above 8 lakh p.a	0	0

Source: Author's own compilation from primary data

H1: The degree of competences varies significantly between various income levels.

Table 2: Anova for Different Income Groups

	Sum of square	*Df.*	*Mean square*	*F*	*sig*
between groups	386.008	2	193.004	4.717	.012
within group	2577.522	63	40.913		
Total	2963.530	65			

Source: Author's own compilation

The above table reveals the output of the ANOVA analysis. The criteria for accepting the hypothesis is that p value should be less than 0.05. There is statistically significant difference in the employee competencies belonging to different income groups because the significance threshold is 0.012, which is below 0.05. Employees from different income groups frequently display observable differences in their competencies. Thus, H1 is accepted at a 95% level of confidence.

H2: The degree of competences varies significantly amongst the different age groups

Table 3: Anova for Different Age Groups

	Sum of squares	*Df.*	*Mean square*	*f*	*sig*
between groups	382.026	3	127.342	3.058	.035
within group	2581.504	62	41.637		
Total	2963.530	65			

Source: Author's own compilation

The significance level for the acceptance of a hypothesis is 5%. There is a statistically significant difference in the competencies of the employees in the various age groups since the p value is 0.035, which is below 0.05. As a result, there is a clear variation in the competencies of the employees from different age groups. H2 is therefore accepted with 95% level of confidence.

H3: The degree of competencies among various educational groupings varies significantly.

Table 4: Anova for Different Education Groups

	Sum of squares	*Df*	*Mean square*	*f*	*sig*
between group	2.401	1	2.401	.052	.821
within group	2961.129	64	46.268		
Total	2963.530	65			

Source: Author's own compilation

Hypothesis H3, i.e., education has a major difference in the competencies of the employees, is rejected as the p-value is 0.821, which is not within the significance level of 5%. Analyses show that there are no appreciable differences in the competencies of bank employees across different education background.

H4: The level of competencies among various experience groups varies significantly.

Table 5: Anova for Different Experience Groups

	Sum of squares	*Df*	*Mean square*	*f*	*sig*
between groups	600.790	3	200.263	5.255	.003
within group	2362.740	62	38.109		
Total	2963.530	65			

Source: Author's own compilation

The significance threshold is 0.003 (p=0.003), which is less than 0.05, and as a result, there is a statistically significant difference in the competencies of bank employees belonging to various experience groups. Therefore, at 95% level of confidence, H4 is accepted. It is analysed that bank employees' competencies vary significantly depending on their level of experience.

5. Gap between Actual and Expected Level of Competencies

The study's second goal is to find the difference between the actual and predicted levels of competence. The actual score on the different competencies held by the respondents is displayed in table 6 below. Taking into account the values strongly agree as 2, agree as 1, neutral as 0 disagree as -1 and strongly disagree as -2. The anticipated replies for each competency item all strongly agree (2). The greatest possible score that can be predicted from the 65 responders for each of the 22 competencies is 2,860 (65 * 2 * 22). Responses from 65 respondents are assessed using 2860 as the expected competency score.

First six statements of questionnaire are related to personal competencies; next six statements are related to selling competencies, next six statements are related to communication skill and the last four statements are related to customer relationship management competencies.

Table 6: Actual level of Competencies of the Respondents

Items of Competencies considered for the study	*SA(2)*	*A(1)*	*N(0)*	*D(-1)*	*SD(-2)*	*Score*
Well organised in terms of behaviour and appearance	36	29	0	0	0	101
While interacting with customer, I keep proper eye contact	17	48	0	0	0	82
I am confident in all my work	16	43	6	0	0	75
I am energetic and always presentable	17	47	1	0	0	81

contd. table 6

Items of Competencies considered for the study	*SA(2)*	*A(1)*	*N(0)*	*D(-1)*	*SD(-2)*	*Score*
I am flexible to adjust as per the needs of customers	10	47	8	0	0	67
I am patient and calm	14	41	10	0	0	69
I seek an opinion of customers before selling the product	19	46	0	0	0	84
I maintain good relationship with customer to increase the sale of financial products.	11	51	2	1	0	72
I have great network for channelling sales.	8	41	13	3	0	54
I keep the necessary management information system for generating future sales	7	43	13	2	0	55
I have one to one relationship with customers	8	51	5	1	0	66
I offer a range of options to fulfil client's needs.	9	55	1	0	0	73
I have the ability to start and carry the conversations in English language.	24	40	0	1	0	87
I am able to communicate with customers in the local language fluently	31	27	3	4	0	85
I am capable to establish a welcoming environment that stimulates communication with customers.	22	38	5	0	0	82
Communicates effectively what is intended	22	41	2	0	0	85
Clears the customers doubts effectively and satisfactorily	21	43	1	0	0	85
I am an active and good listener	26	38	1	0	0	90
I believe that customer are backbone of the bank	31	34	0	0	0	96
I understand the requirements of the customer	14	50	1	0	0	78
I build a good rapport with the customer	15	50	0	0	0	80
I provide premier customer services and excellent helpdesk management	12	53	0	0	0	77
Actual level of competencies(Total score)						1,724 (60.3%)
Expected level of competencies(Ideal score)						2,860

Source: Author's own compilation

The table above demonstrates the total competency difference. The actual competency level was 1724, whereas the expected competency level was supposed to be 2860. Every company naturally expects its employees to be completely competent. The study, therefore, assumes that all responders must have the required competence at 100 percent. However, the actual competency level was 60.3%. The competency-wise gap analysis identifies areas for improvement for staff members.

6. Findings of the Study

The banking industry needs to place more emphasis on the tools that set them apart from its rivals. Customers choose the services rationally because they have options available to them. To create and

sustain loyal customers, banks should concentrate on their competence and socio-economic factors. Hence,the current study seeks to analyse the impact of demographic variables (income, age, education, and years of service) on the different levels of competencies (personal competencies, selling competencies, communication skills, and customer relationship management skills) possessed by bank employees. The framed hypotheses were tested using ANOVA.

The study measures the significant differences in competence among the major demographic factors. The study found that the degree of competence varied significantly across different income, age, and experience groups. The significance level of the income group is p = 0.012, indicating that H1 is accepted at a 5% level of significance. Regardless of their income, respondents were thought to possess the same degree of competence across all competency groups. The significance level of the age group is p 0.035. Hence, H2 is accepted at a 5% level of significance. Regardless of age group, all respondents had comparable expertise in all four competencies. The significance level of the education group is p = 0.821, which is more than the significance level of 5%, hence H3 is rejected. Between the competences possessed by employees with undergraduate and post graduate degrees, there is no discernible difference. The p-value of the experience group is 0.003; hence H4 is accepted at a 1% level of significance. According to the study, respondents had comparable proficiency across a range of competencies regardless of their years of experience.

Finding the competency gap is another objective. The study reveals the actual competency score is 60.3% and the expected competency score is 100%. This shows the difference between the actual and projected level of competencies is 40%. Communication skills rank first among the four competencies examined, with a lower percentage gap of 34.11 percent (here the ideal score is 65*2*6=780 and the actual score is 514 =87+85+82+85+85+90), followed by the customer relationship management skills gap of 36.35 percent (here the ideal score is 65*2*4=520 and the actual score is 331 =96+78+80+77). The selling competencies have the largest gap of all four competencies, at 48.21 percent (here, the ideal score is 65*2*6 = 780 and the actual score is 404 = 84+72+54+55+66+73).

In order for any organisation to thrive in the fierce competition of today, it needs to value the contributions and socio-economic factors of its staff members in order to grow its work line. An excellent competency map gives employees a more comprehensive understanding of who they are and what competencies set them apart. After participating in various developmental courses, employeescan multitask and become more competitive once they have acquired the necessary competencies.

7. Recommendation and Conclusion

Employees play a crucial role in every company's success. Therefore, the most crucial factor is their contentment, which can only be attained if HRD is of a high standard. The practice of managing human resources involves bringing together individuals and organisations to achieve their shared objectives. Over time, jobs requiring high levels of skill and knowledge have grown, and this calls for effective competency mapping via pertinent HRD activities.An organisations ability to operate successfully depends upon having competent employee. Competency mapping will determine whether the right employee is in the right place. The socio-economic factors influence the employees' level of competencies. Age, income and experience are all relevant demographic variables impact on the various

levels of competency. The experience of the employees makes a great difference in the level of competence. The bank might benefit from using periodic skill tests to help staff members keep track of their progress and, as a result, provide more accurate ratings when asked. As specialists are identified as a result of this skill test, publishing the results would also provide the staff with information on whom to contact in the event of certain expertise. Therefore, this would enhance staff cohesion, cooperation, and cross-education. As a result, the relationships between the workers would be strengthened, enhancing the organization's overall human resource value.

Measures to be taken to enhance the bank staff's selling competencies To help employees become more proficient in selling competencies, reward systems, recognition programmes, and financial incentives should be used. Private sector banks realised they needed to increase their sales force if they wanted to grow. It required an immediate rise in the number of sales representatives. The sales force was required not only to market the new product but also to deal with field offices' high turnover rate and officers' widely disparate levels of sales effectiveness. To fill the gap between actual and expected competencies, organisations should organise training sessions and refresher courses to update the employees with the latest skills and competencies. Hence, a competency model can be developed for the recruitment of employees, thereby reducing the gap. The result of the study reveals practical implications for private bank employees' competencies and their recruitment in the future.

8. Limitations of the Study

The biggest constraint is time. Due to time constraints, only the employee self-ratings could be collected. If the employee ratings for other employees had also been taken into account, the study would have been of a far higher calibre and more genuine as a result. The study concentrated only on private sector bank employees, and the sample size was restricted to 65 only.

9. Scope for Future Research

The review of the literature provides in-depth information on competency mapping and its related fields. The socio-economic factors and employee competencies are closely related. Competencies change with changes in the employees' socioeconomic conditions. Recent developments in the banking sector look for competent manpower, and there are a lot of studies taking place in the area of competency mapping and the banking sector. Further studies can be done to know the relationship between socio-economic factors and competency mapping.

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Corporate Reporting Reforms in 21st Century and Value Creation: A Study of Select Companies in India

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Abstract: Most of the companies in the world laid emphasis on the disclosure of financial information. Research studies have shown that the non-financial information combined with the financial information is vital for the value creation and long-run sustainability of the business organisation. On perusing the corporate reports, one finds that a number of non-financial information having tremendous potential for value creation have not been accounted for in many of the corporate reports. Sustainability reporting gained its importance after global financial crisis, 2008. Integrated reporting (IR), a new corporate reporting development adopted after 2013, integrates both the non-financial as well as financial information of the companies through six capitals. Here an attempt has been made to examine the corporate reporting reforms in 21st century, such as sustainability reporting, ESG reporting and integrated reporting which are followed by the companies recently for long-run value creation. The content analysis of corporate reports of select Indian companies has been done in this article. The innovative corporate reporting reforms will create value for the organization which will benefit the stakeholders.

1. Introduction

Corporate reporting, over several years is evolving continuously to meet the information needs of the stakeholders of business entity. Its main objective is to provide a comprehensive picture of the business organisation to interested external parties. It's an important source of information for its users. It includes financial statements, annual reports, interim reports and other non-financial reports. It helps the business organisation in raising financial resources and attracting human resources. It can also affect firm's goodwill and share price. There are many frameworks for corporate reporting which describe the qualitative characteristics of good reporting. Relevance, materiality, comparability, timeliness, reliability, completeness, future orientation, concise, connectivity, entity specific focus, strategic focus, verifiability, understandability, etc. are various qualitative characteristics of a good corporate report. A good corporate reporting is essential for having good relationship with the stakeholders. Corporate

reporting is the responsibility of an organization to indicate the impacts of an organisation's decisions and activities on society and the environment through the conduct of transparent and ethical behaviour (Blowfield and Murray, 2011; Jonikas, 2013). The demand of the stakeholders for more relevant information has led to many innovative corporate reporting reforms over the period.

The traditional corporate reporting disclose only the financial aspects and the important stakeholders who use the financial data are investors, debt providers, creditors, public, Government and other Government agencies. The ICAI has formulated many accounting standards and guidance notes for corporate reporting. The Ministry of Corporate Affairs, Government of India, has issued the standards to ensure uniformity in reporting across companies in India. But most of the companies in India are not giving importance to non-financial information and not adopting the reforms which have happened in 21st century. A good corporate reporting system with both financial and non-financial information develops healthy competition, increases the capital inflow and enriches the wealth of the enterprise.

The present study is expected to throw light on the following questions:

- What are the innovative reforms in the corporate reporting practices which have happened during last two decades in India?
- How can corporate reporting facilitate the value creation through the mobilisation of six capitals for better decision making and wealth maximisation?

This article is divided into seven parts. Besides introduction and conclusion, the article presents literature review, research gap, objectives, research methodology, corporate reporting reforms, results and discussion, findings and implications.

2. Review of Literature

The existing literatures have been structurally examined to identify the existing gaps and to assess the requirement of future research.

Presentation of information and transformation of business decisions are considered to be two prime functions of corporate reporting (Eccles and Serafeim, 2014). The conventional financial reporting concentrates more on information function and off late the sustainability reporting focuses on transformational function. But the two necessary functions could be combined only through integrated reporting. The authors have extensively worked on constituents of a valuable integrated report by clinically exploring various case studies. They have also thrown light on effectiveness of regulations on integrated reporting.

In the context of South Africa, Clayton *et al.* (2015) conducted their study on corporate responsibility as a citizen of civil society by comparing integrated reporting with sustainability reporting. Non-financial information disclosures, materiality risk disclosure, investor-oriented disclosure and inclination towards quantification of data clearly states the transition from sustainability report to integrated report. Through the content analysis of various corporate reports, the authors found that external factors like regulatory requirements, nature of industry, pressure groups and public perception have been the driving factor for integrated reporting. The researchers also concluded that the drivers of producing either sustainable or integrated reports are more or less same.

Saggi (2016) explored the emerging trends in corporate reporting practices in India. The recent changes made by the regulatory bodies regarding corporate reporting and the issues in corporate reporting in Indian companies were examined in this research study.It was inferred that corporate reporting is at center stage of reforms and regulatory bodies are quite busy in developing a model of corporate reporting that may suit the needs of the users and the corporate entities simultaneously. It was suggested that there should be voluntary efforts to disclose varied information in the annual report instead of always looking towards the regulatory bodies for reforms.

Lai *et al.* (2018) studied the important role of preparers of integrated reports in strengthening corporate accountability. They inferred that integrated reporting would improve transparency and accountability by the participation of all stakeholders including investors and other financial stakeholders. According to them the integrated reporting enhances narrative based reporting and augments calculative form of accountability. The elements that are not covered by financial reporting (business model, strategies) but are helpful in future value creation are addressed by integrated reporting.

Esch *et al.* (2019), in their research paper, stated that integrated report provides quality information to investors as they have a wholesome picture of the companies' strategies. According to them integrated reporting must not only be used because of external factors but also for internal benefits. It will divide the processes into sub processes and each such sub process can be further analysed and evaluated. Integrated reporting helps in better internal decision making as it considers the internal managerial processes, sub-processes and strategies and the results associated with it.

Athma and Rajyalaxmi (2019) analysed integrated reporting practices of BSE 30 companies, both company-wise and item-wise. The mean disclosure of different parameters of integrated reporting ofselected companies indicated a good trend of integrated reporting practice as the awareness level of companies has increased. They suggested that instead of showing integrated reporting aspects in different reports such as annual report, business responsibility report, governance report, it is essential to have one report to save time and money.

Caglio *et al.* (2019) studied the relationship between economic benefits and integrated reporting textual attributes, and the significance of external assurance of integrated reporting. Their results suggested that the users appreciated the integrated reports that were focused and precise. They suggested that for enhancing credibility for external users of integrated reporting, the audit and assurance is essential. They inferred that the credibility of the information can be increased by outside assurance.

Buallay (2019) investigated when disclosing ESG costs a firm and when it benefits a firm. For this they examined the relationship between ESG and the firm performance. After the literature review the researcher observed two perspectives: cost reduction perspective and value creation perspective. The results of regression supported the value creation theory which stated that ESG positively affects market performance. However, ESG negatively impacts the operational and financial performance, which upholds the cost-of-capital reduction theory.

Paul Druckman, former CEO of IIRC suggested the following steps in his article "The stepping stones towards more forward-looking corporate reporting". A stakeholder mapping exercise is to be conducted which allows the organisation to understand its principal stakeholders, their present and future expectations from the organization.The views of the principal stakeholders should be taken for

making changes in the business model and strategy, and to take into consideration the resources required for implementing the changes. The organisation has to communicate its strategy clearly and concisely to its stakeholders. These steps will empower the business enterprise for preparing itself to face the future risks and challenges.

Buallay (2021) studied the association between the sustainability reporting and the food industry's operational, financial and market performance. As per this empirical research, there exists a significant relationship between the sustainability reporting and the financial performance (ROE). The results also stated that there is no significant relation between the ESG report and the operational performance (ROA) and the market performance(TQ). The author suggested the food sector should move towards strategic methods that will add value to the positive performance.

Sharma *et al.* (2022) studied the role of ESG in profitable investments for sustainable future. They culled information of 1415 publicly traded companies from around the globe. From the mean of return on equity and return on assets of top 10 percent companies they found that return on equity was around 14% greater. Thereafter they applied machine learning to predict the values of profit margin and return on assets. They also revealed that the companies with the lowest ESG scores have higher positive profit margins. They concluded the research stating a promising relationship between ESG data and financial growth parameters.

Kahlout *et al.* (2022) examined the impact of the CSR reporting on the financial performance of French companies and the moderating role of gender diversity in the same relationship. Financial performance is measured by using Tobin's Q, with the ROA as a supplemental measure of performance. The research revealed that the presence of women in the board positively impacts the CSR and financial performance relationship. They suggested that CSR strategies along with proper board structure will help in enhancing the profitability and performance.

Buallay (2022) studied the impact of sustainability on the retail sector performance. Considering the contribution of retail sector towards the world GDP, it holds an important international economic position. The firm operational performance, financial performance and market performance are measured by ROA, ROE and Tobin's Q respectively. After analysis of the regression models it was found that the slope coefficients of ESG for ROA, ROE and TQ indicatedpositively significant impact of sustainability disclosure.

Buallay (2022) examined the relationship between sustainability reporting and sector's operational, financial and market performance in Middle East and North African(MENA) countries. The various sectors considered here are agriculture and food industry, manufacture,retail,banking and financial services,energy,telecommunication and information technology, and tourism. The firm operational performance, financial performance and market performance is measured by ROA, ROE and Tobin's Q respectively. The regression results indicate that there are differences in the impact of sustainability reporting, ROA, ROE and TQ across the seven sectors. They recommended their managers to disclose more nonfinancial issues like ESG to enhance the firm value.

The present research study has made an attempt to address a few gaps in research studies conducted so far, based on content analysis of selected companies in India. We have selected two leading companies in India for benchmarking purposes by other companies.

3. Objectives of the Study

The specific objectives of this research article are as follows:

- To examine the innovative corporate reporting reforms and the reporting practices during last two decades in India
- To study the corporate reporting practices of select companies in India and their value creation

4. Research Methodology

This research work is dependent mainly on secondary data taken from various internet sources including the websites of the GRI, IIRC, SEBI and some companies. The current research delves with innovative reporting practices and specifically with integrated reporting that combines financial (economic) and non-financial (social and environmental) information, external and internal information. Mixed method of research has been preferred here. The content analysis of select companies in India has been undertaken to examine the integrated reporting practices followed by the companies.

Content analysis, as a method of research, is frequently used in the field of social and environmental reporting in which various reports and explanations are analyzed objectively and systematically (Guthrie and Abeysekera, 2006). An attempt has been made to analyse the contents of the six capitals of integrated reporting, i.e., natural capital, financial capital, intellectual capital, manufactured capital, human capital, and social and relationship capital.

5. Corporate Reporting Reforms in 21st Century

Over the years, the corporate disclosure has seen a paradigm shift in its reports from numbers to narratives. The innovative corporate reporting reforms are expected to satisfy the information needs of the stakeholders and create value for the organization and the stakeholders. Non-financial reporting is a form of transparent reporting system followed by companies all over the world where the entity discloses non-financial information. This reporting gives the stakeholders of the organization an understanding of the essential areas of value creation in the business that goes way beyond the financial statements. Some intangible assets and importance on sustainability have their origins in a whole variety of non-financial performance indicators which are followed by the companies.

After the financial crisis of 2007-08, there was a search to integrate ethics in accounting to prevent the unethical accounting practices of companies in future (Maniora, 2017). Due to many corporate failures in 2001-02 and 2007-08, the importance of sustainability reporting has gained momentum. During 1994, the term "Triple Bottom Line" was coined by John Elkington. Now it is argued that the companies should focus on three different bottom lines and not just profit. The three bottom lines are profit (economic), people (social) and planet (environment) (Elkington, 2004; Buhr, 2007; Crane, Matten, 2010).

Sustainability reporting is also known as corporate social responsibility reporting, citizenship reporting, triple bottom line reporting or environmental, social and governance (ESG) reporting. A sustainability report should provide a balanced and reasonable representation of the sustainability performance of the reporting organization including both positive and negative contributions (GRI,

2011:3). To meet the increasing needs of stakeholders and to improve the quality of disclosure, the business organisations prepared sustainability reports. Most of the companies adopt the GRI framework on sustainability reporting. This reporting brings transparency and further helps in decision making of the stakeholders. It leads to more trust between the company and the stakeholders and also brings better reputation. It helps to mitigate negative environmental, social and governance impacts for better brand image." Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development. While ESG reporting is becoming mandatory for the bigger firms in India from 2022-23, regulators are cautious to put pressure on investors" (Lenhard and Leach, 2022).

Another innovative reporting practice known as integrated reporting (IR), merged financial and sustainability reports into one report. It represents both the financial and non-financial performance of a business organisation. It presents a holistic view of the performance of the business organisation. IR communicates the strategy and identifies the gaps and helps building trust amongst stakeholders which further leads to brand value and customer loyalty. It leads to integrated thinking and enhances accountability in decision making.Integrated reporting is expected to contribute to a more sustainable society with better internal decision making and financial stability of an organisation. A strong leadership and corporate governance lead to good integrated report combining financial and non-financial information in a single report.

IR induces new ways of working and thinking process for generating new information for decision making.It shows the importance of the value of non-financial assets. It also lists out strengths, weaknesses, risks and opportunities for better decision making. IR is a more comprehensive transition from sustainability reporting. It provides a broader perspective of the six 'capitals' used in the value creation process by an organisation.The main focus of IR is value creation in the business organisation. It refers to any change in the value attributable to an organisation's financial performance. The value in IR is not just restricted to financial value but extends to include all value that an enterprise creates from transformation of the six capitals. So the aim of an IR is not just to measure the financial value of an organization but also bring to light relevant information that informs the stakeholders the ability of the company to create value in the long term. IR value creation focuses on tangible and intangible assets and liabilities. The IR framework has provided six interrelated capitals- financial capital, manufactured capital, intellectual capital, human capital, social and relationship capital, and natural capital. Financial capital includes economic resources, measured in terms of money. It refers to the financing resources that are obtained through debt, equity or grants. Manufactured capital covers collection of material, physical and technological objects of the organisation. It also refers to physical objects manufactured by the organisation that are different from natural physical objects of the organisation. Intellectual capital includes intangibles of the organisation that are based on knowledge. It provides competitive advantages and includes intellectual property, tacit knowledge, protocols, procedures and intangibles associated with the reputation and brand which have been developed by the business organisation.

Human capital covers capabilities and experience, people's competencies and their motivations to innovate. It also includes employees involvement with risk management approach, ethical values and

governance framework of the organisation. Social and Relationship capital covers the relationships within and between groups of stakeholders, communities, and other networks. It also covers common values, shared norms, behaviours, key stakeholders relationship, the willingness and trust, and individual and collective wellbeing to protect the customers, suppliers, business partners and other external stakeholders. Natural capital covers renewable and non-renewable resources which are used by the organisation for producing goods and services.

The relationship and interaction between the above six 'capitals' are shown below:

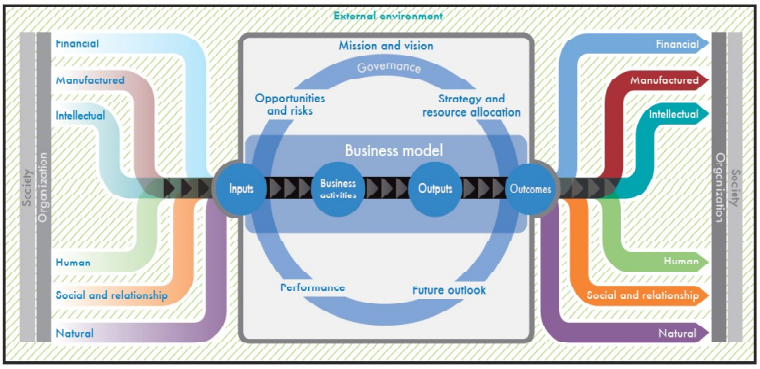

Figure 1: Six Capitals of IR Framework and their Interrelationship

Source: R.G. Eccles and George Serafeim, (2014), Harvard Business School

The business model, referred in the IR, covers a thorough understanding of the value creation process including creation and preservation of values. This is essential for managerial planning and decision making. 'Inputs' refer to various resources and relationships which are used for creating value. These inputs are converted into outputs through various activities of the business organisation which include planning, designing and manufacturing of products and providing services. 'Outputs' include products, services and other products like by-products, emission and waste. 'Outcomes' refers to the external and internal consequences due to the activities and outputs of the organisation. It includes positive and negative outcomes.

6. Results and Discussion

The content analysis of two selected companies in India has been undertaken to examine the integrated reporting practices and the six capitals used for value creation.

Indian Oil Corporation Limited (IOCL) is India's flagship Maharatna national oil company. It has the largest share in the market among downstream companies in India, alongside of maintaining the largest petroleum pipeline networks in the world. Integrated report outlines Indian Oil's value creation process for stakeholders and its strategic response to various issues that matters the organisation, action taken and the outcomes achieved with respect to the six capitals, such as: Financial, Manufactured, Human, Intellectual, Social and Relationship, and Natural.

Natural Capital of IOCL involves creating value through environmental sustainability with various measures like carbon management, water management and waste management. Various company outlets have installed capacity of 111.5 MW and an annual energy generating potential of 118 million units of solar power. The Company has committed to achieve net zero emissions while continuing the efforts towards environment management and conservation. It follows reduce, reuse and recycle process for its waste management.

In order to promote and enrich the human capital, IOCL has taken strong leadership team with a high performance culture. It has conducted more than 7.79 lakh hours of training for total workforce of 31,000 plus employees. It's structured technology that has been added in e-learning platform caters to the functional learning and development of the various needs of the employees.

As regards to the manufactured capital, IOCL has 28% of India's refining capacity. Seven new crude oil grades were included in the basket increasing its size to 210 crude variants. Crude oil pipelines achieved throughput of 48.53 MMT which is around 10% higher than last year It is the second largest player of petrochemical and natural gas industry in India.

The intellectual capital of IOCL has been nurtured and developed for years and is driven by technologies and innovations. The company filed for 1519 patents and has 1410 effective patents as of March 31, 2022. The R&D expenditure during the year is Rs. 577 crore.

With its focus fixed on creating and managing the value for the stakeholders', it has been excellent in allocation and use of financial resources. In 2021-22, the company increased its capital expenditure to Rs. 30,391 crore to ensure future growth and value creation. It has been contributing to the national and state exchequers in various forms like duties and taxes, and dividends. During the year, the company had paid Rs.2,64,436 crore towards the same. There has been 41% YoY growth over revenue from operations. The EBITDA stands at Rs. 47,568 crore. The return on capital employed is 15.44% and EPS is Rs 26.34.

It is seen that the social and relationship capital of IOCL has been used for the benefit of the various stakeholders. It has taken up a large number of initiatives that aims at the welfare of the unprivileged, marginalized sections within the vicinity of its establishments across the country. Two hospitals have been set up to treat cancer patients in Purvanchal and adjoining areas.

The company follows the sustainability reporting practices by considering principles of 3P's - People, Planet and Profit. These Ps outline the challenges and opportunities faced by the company in meeting the expectations of its stakeholders. It can be said that the company is maintaining a balance between the profit, society (people) and planet (environment) for its sustainable growth and development. However more clear information is required on strategy and resulting outcomes involving the six capitals.

HDFC Bank Ltd., India's leading private sector bank, has been taken as another case study. In the financial year 2021-22, HDFC Bank presented its integrated report to give a holistic view of the performance of the bank keeping in mind its various stakeholders, such that, they will be able to better appreciate its contribution to value creation through this report.

In regards to the bank's financial capital, it has focused on improving the net revenue, net profit, capital adequacy ratio, gross advances and dividend per equity share. During the financial year 2021-22,

the net revenue increased to Rs.1,01,519 crore. The net profit also increased by 18.8 percent to Rs. 36,961crore. The capital adequacy ratio stands at 18.9 percent. The dividend per equity share is Rs. 15.5. The total deposits increased by 16.8 percent to Rs.15,59,217 crore. Total advances stood at Rs. 13,68,821 crore in 2021-22.

Regarding manufactured capital of the bank, its number of credit cards and debit cards have increased to 1.65 crore and 4.3 crore respectively in the study period. It is among the largest facilitator of cashless payments in the country. The number of banking outlets and branches are 21,683 and 6,342 respectively. The number of ATMs of the bank today stands at more than 18,100.

To enrich the human capital, the bank has spent Rs. 1262 lakh on training and development. The number of employees has increased to 1,41,579 and 144 lakh person hours of training has been given. There is a net addition of 21,486 employees. It is using artificial intelligence in many activities to develop productivity.

In regards to the intellectual capital, the bank followed digital 2.0 strategy whose key elements are re-imagined digital marketing, net and mobile banking experience, digital innovations, analytics and digital orientation, API(a software intermediary code) and virtual relationship manager. In the next few quarters the bank will be launching virtual solutions for customers and merchants. As per 'Kantar BrandZ Most Valuable Global Brands 2022' ranking, the brand value of the bank is $ 35.6 Billion.

Regarding social and relationship capital, the bank has 7.1 crore strong customer base with a addition of 92 lakh customer in the said period. The bank has adopted many innovative approaches for improving customer experience and ensuring good service delivery. It regularly reviews service levels and captures feedback from customers. Through its social initiatives, more than 5 crore lives have been impacted. The bank has spent Rs. 736 crore in CSR activities and 9.6 crore people have been benefited from it.

To conserve natural capital, the bank has taken many initiatives. As a result, 4.8+ million kWh energy is saved during FY 22 on account of EnMS implementation. The bank has pledged to become carbon neutral by FY 2032. The 212 MT e-waste generated by the bank has been disposed through authorised recyclers. So far 17.6 lakh trees have been planted and 10,500 water conservation structures have been developed by the bank. The bank measures and discloses its greenhouse gas emissions with full transparency.

The bank presented its key risks such as compliance risk, liquidity risk, operational risk, reputation risk, digital transaction risk, market risk, central policy risk, credit risk, cyber risk, geopolitical risk, fluctuating socio economic condition, natural calamities, ESG reporting obligations and disruption due to technological advancement. The bank has taken a number of initiatives to mitigate the risks and avail the opportunities. Critical examination of the report shows that the bank has presented the facts and the future value creation narrative. However, the clarity is missing on the information provided on the strategy formulation and governance of its six capitals.

7. Findings, Implications and Conclusion

Content analysis has been undertaken for identifying the contents through case studies of two large cap firms, such as Indian Oil Corporation Limited (IOCL) and HDFC Bank that are constituents of Nifty stock index.The content elements are fundamentally linked to one or many value creating processes

and are not mutually exclusive. Rather, information shown in integrated reports help in bridging the gap by interlinking the elements that are apparent in the contents. Further, the quality and adequacy of the contents appearing in the integrated reports depend on the individual circumstances and prevalent business environment of the time.The findings show that the clarity is missing on the information provided on the strategy formulation and governance of its six capitals. However, the organisations taken for the study have nicely presented the financial and non-financial information and also the future value creation narrative.

Corporate disclosures help various stakeholders to take better decisions and also to create value for the organisation. International best practices and guidelines of GRI and IIRC will guide the companies in the preparation of innovative reports. It is observed that the voluntary disclosures have created uneven playing field, with some companies fully disclosing the information to its stakeholders and some other companies are resorting to under-reporting or over-reporting. Therefore, sincere efforts are required to standardize the innovative reports for popularizing them in India.

As new reports can bring drastic change in a company, the industry professionals, policy makers, pressure groups, academic fraternity must play their role and enrich the sustainability and integrated reporting. Through the content analysis, an attempt was made to identify the reported, partially disclosed and undisclosed elements of value creation in the integrated report. To gain the trust of the stakeholders and be useful to them, the new reports must be understandable, comparable, coherent and reliable which will quench their information needs. The Securities and Exchange Board of India, professional bodies, related ministries, and also the Government have to play a proactive role in regulating the corporate disclosures which will further help the stakeholders of any entity. When all the stakeholders will do their part, we can safely say that the new reporting practices will support many pathbreaking research studies in future days to come.

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Impact of CSR Committee on ESG Reporting Quality: Evidence from India

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JEL Classification

C12, Q01, E01, F65

Abstract: A corporate social responsibility (CSR) committee plays a vital role in supervising, managing and controlling Environmental, Social, and Governance (ESG) disclosure practices of an organization.Therefore, this paper examines the link between the CSR attributes and ESG reporting quality. Using agency and stakeholders' theory and applying regression analysis on the sample of 225 Indian firms listed on stock exchanges in 2021, the results showed that the CSR committees' attributes such as independence, frequency of meetings, and size have positive and significant influence on the ESG reporting quality by companies. However, the financial expertise of the members of CSR committee does not influence the ESG reporting quality. This research contributes to the current literature and supports the relevance of management control systems in enhancing ESG reporting quality. This study is also valuable for regulators and policy makers to encourage the formation of CSR committees with larger memberships and greater proportions of independent members.

1. Introduction

Over the years, there has been an increase in the level of scrutiny that is placed on the social along with environmental commitments of corporations (Kolk, 2008). Some of these expectations come from the company's owner; customers; the government; suppliers; social and environmental groups; media; creditors; as well as other stakeholders (Hoang, 2018). Organizations must also make long-term judgements in order to make key organisational choices in the face of chaotic market conditions (Camilleri, 2015; Singh *et al.,* 2022). The uncertain economic environment and higher stakeholder expectations have necessitated proactive organisations to work on their business plans and performance reports to meet the requirements of their shareholders (Elgergeni *et al.*, 2018).

Organizations have been under growing pressure to be more environmentally and socially responsible in recent years. Shareholders, consumers, regulators, workers, creditors, suppliers and the media are just a few of the stakeholders who make these requests (Hoang, 2018). Furthermore, unstable market situations like the current global economic crisis, forces businesses to make long-term judgments when making critical managerial choices (Elgergeni *et al.*, 2018). Therefore, proactive firms are attempting to strengthen their business strategies and progress report in order to meet increased stakeholder demands and overcome the challenges posed by an uncertain economic environment (Steger *et al.*, 2007).

Maintaining credibility and reducing the stigma associated with "*sensitive industries*," such as power generation, oil and gas requires them to report advanced and better ESG information (Garcia *et al.*, 2017). Even yet, ESG disclosures are frequently inaccurate and optional due to the lack of recognised norms (Goel, 2018). ESG reporting has been questioned as a result, raising concerns about its objectivity and credibility (Olson, 2010). Underscoring the agency issue with ESG disclosures, corporate executives may use ESG claims as a marketing tool (Ball *et al.*, 2000). The absence of high reporting criteria in the context of ESG reporting necessitates the development of a complete and accurate reporting system. There must be a structure in place to ensure the objectivity and interest of shareholders while simultaneously increasing the quality and volume of ESG disclosure.

Sustainability committees have been studied in academic literature in connection to corporate governance, particularly their position on the board of directors and their interaction with other factors such as diversity and independence (Matta *et al.*, 2022). CSR committees are often utilised as a corporate governance component in bigger models, especially in relation to the disclosure of CSR or ESG information (Walls *et al.*, 2013). Thus, CSR committees have shown their capacity to act and make decisions on sustainability reporting by influencing both the number and quality of CSR information released by the firm.The main features of CSR committee include the "committee members' experience and knowledge in this field, the responsibility of proposing to the board the CSR policies and strategies to be followed, guaranteeing the proper functioning of CSR information and control systems, and supervision of the annual report" (Eberhardt-Toth, 2017).

Corporate governance and CSR performance have been studied in relation to external and internal oversight mechanisms such as institutional ownership, board diversity and board independence, separation of the chairperson and CEO roles, and presence of a board level CSR committee (Garcia *et al.*, 2020; Orazalin, 2020). CSR committee characteristics that potentially influence CSR performance or ESG reporting were not examined in these research. As a result, this research sought to close the knowledge gap by focusing on the role played by CSR committee features in driving CSR outcomes. Considering this, this research adds to the current literature about the influence of CSR committee features on the ESG reporting quality of 225 Indian publicly listed companies.

2. Literature Review

The different sustainability reporting methods provide varying outcomes throughout the world, making it difficult to accept their findings as reliable (Buallay *et al.*, 2018). This is due to the fact that there isn't a uniform framework for reporting on sustainability.

In addition, it is difficult to combine sustainability frameworks from various sources (Kriva_ci_c, 2017). According to the Cadbury code, financial records should be regularly audited to ensure that there are no errors or frauds. A study of audit documents in six European nations indicated that sustainability reports were of poor quality (H¹bek and Wolniak, 2016). As there is no standard review mechanism in place for ESG disclosures, there is a debate over their relevance, completeness, and transparency.

Non-financial companies have paid special attention to ESG reporting and its accuracy during the last decade (Hammami and Hendijani, 2019). Additionally, independent directors have diverse backgrounds, are more focused on environmental concerns, and are more employee-oriented. (Wang and Dewhirst, 1992). To safeguard the professional reputation, independent directors support corporations' disclosure of social and environmental actions to communicate to its stakeholders that the company understands its society and environmental responsibility. This voluntary disclosure enhances the firm's openness and social profile, which aids in obtaining investments both locally and abroad (Li *et al.*, 2008).

Top-level management's support for social and stakeholder concerns is shown by the development of a CSR committee and the deployment of board-level human resources to enhance CSR performance (Velte, 2016). There is a new role for modern firms and their boards in CSR management (Burke *et al.*, 2019). Since CSR committee features may enhance ESG reporting, it would be worthwhile to study this. To improve both the external and internal operations of firms, CSR committees play a critical role in setting up and addressing the demands of many stakeholders. Furthermore, CSR committees guarantee that social and environmental responsibilities are upheld and that ESG reporting standards are not compromised. Corporate governance and CSR performance have been studied in relation to external and internal oversight mechanisms such as institutional ownership, board diversity and board independence, separation of the chairperson and CEO roles, and presence of a board level CSR committee (Garcia *et al.*, 2020).

This research sought to close the knowledge gap by focusing on the role played by CSR committee features in driving CSR outcomes as the above extant of literature do not describe it properly.

3. Theoretical Framework

3.1. Agency Theory

Corporation governance is a key part of agency theory since the presence of non-executive directors ensures that management activities are supervised and demonstrates the preservation of shareholders' interests. According to agency theory, the agent-principal link may provide a moral problem that might lead to agency costs (Jensen and Meckling, 1976; Singh *et al.*, 2019).

Corporate philanthropy is seen by shareholders as a misuse of corporate resources, which diminishes the company's value (Masulis and Reza, 2015). A successful ESG performance on the social and environmental aspects leads to lower agency expenses, which in turn lowers the financing cost for reporting organisations (Cheng *et al.*, 2014). Integrating financial information into one report reduces information asymmetry, which helps lenders better estimate the risk of failure and decreases

borrowing costs (Gerwanski, 2020). Female representation in CSR committee and ESG disclosure accuracy have been shown to be positively correlated in research, reducing the agency concern within companies.

3.2. Stakeholders Theory

Today's business is a "knot of contracts," as the agency theory puts it, made up of many different parts. They are defined as stakeholders by the stakeholder theory as those who may have an effect on or consequences for the outcomes of the company (Freeman, 2010). Consequently, the company maintains ties with a broad spectrum of stakeholders, such as government, environmentalists, and workers, in addition to its shareholders. It is not enough for managers to protect and grow the money of shareholders; they must also ensure that strategic decisions benefit all stakeholders. Companies are dependent on stakeholders for their survival to the degree that they supply physical and intangible resources essential for an organization's development (Hill *et al.*, 1992). Shareholders provide funds, while workers contribute their knowledge, abilities, and efforts to the company.

4. Formulation of Hypotheses

Three members are required for membership on a CSR committee under the Indian Companies Act, 2013, which went into effect in 2014. A large committee has a better chance of providing the resources and capabilities required to carry out its responsibilities effectively (Musallam, 2018). The efficacy of a big CSR committee may be improved by the inclusion of qualified and experienced members. Therefore, based on abovediscussion, following hypothesis is formulated:

H_{01}: ESG reporting quality is positively influenced by CSR committees' size.

One independent member is required by the Companies Act of 2013 for a CSR committee in India. In order to counteract the manager's opportunistic conduct, an independent committee may improve the monitoring process (Appuhami *et al.*, 2017). Independent directors, according to Finkelstein *et al.* (2009), are essential for preventing management from adopting a "transient trend" when it comes to corporate social responsibility (CSR). These directors contribute to create a morally and ethically sound environment in the company (Frankel *et al.*, 2011). Peters *et al.*(2015) demonstrate in the CSR literature that the presence of an independent CSR committee has no impact on whether or not a company chooses to use sustainability certification and what sort of assurance provider is used. Firm financial performance may be affected by the composition of the firm's audit committee, according to previous studies (Talapatra *et al.*, 2019). Since the CSR committee's responsibilities are similar to those of the audit committee, independent directors may be able to assist corporations in improving their sustainability performance (Garcia-Sanchez *et al.*, 2019).Therefore, based on above discussion, following hypothesis is formulated:

H_{02}: ESG reporting quality is positively influenced by CSR committees' independence.

The board of directors of a company is provided with a platform that enables them to carry out their duties, which may include boosting the performance of the firm or ensuring that the quality of the financial reporting is adequate. In principle, having a CSR committee that is more actively involved should lead to greater outcomes for long-term sustainability. In the CSR literature, it is proven that CSR committee meetings have no relevant connection to either the corporate sustainability report

assurance services or the choice of assurance provider. According to the findings of research, the number of times a CSR committee convenes to discuss issues of sustainability is related to the chance of acquiring information about these issues, especially when a Big-4 company provides these services (Martnez-Ferrero *et al*, 2017).Therefore, based on above discussion, following hypotheses is formulated:

H_{03}: *ESG reporting quality is positively influenced by CSR committees' meetings.*

For example, a company's worth is increased when its board of directors and audit committee have greater levels of knowledge. In addition, having members of the audit committee with previous expertise makes for better monitoring (Talapatra *et al*., 2019). According to legislation in India, CSR committee members are not necessary to have a background in sustainability to join the committee. Members of CSR committees are only as good as their sustainability knowledge allows them to be (Peters *et al*., 2014). CSR committee members need to have sustainable knowledge in order to carry out their responsibilities. The financial Expertise in the CSR committee positively impacts the substance of assurance statements (Rossi *et al*., 2017). Therefore, based on above discussion, following hypotheses is formulated:

H_{04}: *ESG reporting quality is positively influenced by CSR committees' financial expertise.*

5. Research Methodology

5.1. Sample

The sample for this study consisted of 225 Indian firms that are traded on stock exchanges in 2021. We used the Bloomberg ESG database's ESG Score, which is a combined ESG and environmental disclosure score. ESG indicators like as GHG emissions, water and energy conservation as well as shareholder rights are covered in this database. If a company's annual report or website discloses more ESG features, the higher its ESG disclosure score. ESG scores vary from 0 to 100, with 100 being the best. Table 1 describes the industry breakdown of the sample.20% of the sample is from financial industry, followed by pharmaceutical industry (12%) and FMCG industry (11%).

5.2. Dependent Variable

ESG reporting quality is the dependent variable (ESGQ). The Bloomberg ESG database was used to analyse the ESG performance of organisations in India.

5.3. Independent Variables

The drivers of ESG performance are diverse, so we used control variables similar to those used in other studies (Baraibar-Diez *et al*., 2019). There are a number of independent factors that may be used to ascertain the size (CSR-SIZE), independence (CSR-IND) as well as the frequency with which the CSR committee meets (CSR-MEET). CSR-SIZE is represented by the total number of members of the CSR committee. Independent members are counted as a percentage of the whole CSR committee. It is assumed that at least one CSR committee member has financial knowledge and competence in order for CSR-EXP to provide a score of 1. When calculating CSR-MEET, the total number of CSR committee meetings that occurred in a particular year.

Regression models may be improved by including more control variables. Firm profitability (F-PROF), firm size (F-SIZE), firm age (F-AGE), board independence (B-IND), board diversity (B-

Table 1: Describes the Industry Breakdown of the Sample

Sectors	*Number*	*Percentage*
Auto Ancillary	10	4%
Auto OEM	9	4%
Cement	12	5%
Diversified	3	1%
Financial	45	20%
FMCG	25	11%
Healthcare	4	2%
Internet	4	2%
IT	11	5%
Lubricants	1	0%
Metals	10	4%
Mining	2	1%
Paints	4	2%
Pharmaceuticals	26	12%
Power	11	5%
Real estate	5	2%
Telecom	2	1%
Engineering and capital goods	15	7%
Chemical	15	7%
Oil and gas	11	5%
Total	**225**	**100%**

Source: Authors' Own Compilation

DIV), CSR committee, and environmental sensitivity (ESEN) were all included in the list of control variables for the study. B-SIZE is computed as the total number of directors within the board. The proportion of independent directors to the total number of directors is used to compute the B-IND. B-DIV is calculated by dividing the number of female directors by the total number of directors. If AC-COM obtains a score of 1, the organisation has an AC committee in place, otherwise 0. F-PROF is represented by return on equity. F-SIZE is calculated by taking the natural logarithm of the total assets. In order to calculate F-AGE, it is how long an organization has been in existence. It is possible to use ESEN as a dummy variable that gives a score of 1 if the company operates in a sensitive industry and a score of 0, otherwise.

Using a regression model, this paper determines the link between CSR committee features and ESG reporting:

$$ESGQ = \beta_0 + \beta_1 CSR\text{-}SIZE + \beta_2 CSR\text{-}IND + \beta_3 CSR\text{-}EXP + \beta_4 CSR\text{-}MEET + \beta_5 B\text{-}SIZE + \beta_6 B\text{-}IND + \beta_7 B\text{-}DIV + \beta_8 AC\text{-}COM + \beta_9 F\text{-}PROF + \beta_{10} F\text{-}SIZE + \beta_{11} F\text{-}AGE + \beta_{12} E\text{-}SEN + e$$

Where, ESGQ = ESG reporting quality, β_0 = intercept, CSR-SIZE = number of member in CSR committee, CSR-IND = number of independent members in CSR committee, CSR-EXP = number of members with financial expertise, CSR-MEET = meeting frequency, B-SIZE = number of members

Table 2 : Means, Standard Deviations and Correlations

Variable	*Mean*	*SD*	*ESGQ*	*CSR-SIZE*	*CSR-IND*	*CSR-EXP*	*CSR-MEET*	*B-SIZE*	*B-IND*	*B-DIV*	*AC-COM*	*F-PROF*	*F-SIZE*	*F-AGE*	*ESEN*
ESGQ	61.04	7.07	1												
CSR-SIZE	4.02	1.12	0.412***	1											
CSR-IND	58.96	19.11	0.366***	0.252***	1										
CSR-EXP	0.43	0.36	0.126	0.306***	0.227*	1									
CSR-MEET	4.15	2.50	0.358***	0.356***	0.285***	0.291***	1								
B-SIZE	12.34	4.70	0.423***	0.312***	0.110	0.002	0.229**	1							
B-IND	60.58	23.40	0.442***	0.201***	0.401***	0.188**	0.285***	0.265***	1						
B-DIV	24.89	12.41	0.287***	0.121	0.111	0.010	0.101	0.162*	0.221**	1					
AC-COM	0.93	0.47	0.276***	0.053	0.302***	0.062	0.021	0.164*	0.203**	0.060	1				
F-PROF	18.06	16.98	0.085	0.007	0.033	0.157	0.003	0.054	0.174**	0.001	0.044	1			
F-SIZE	17.11	2.68	0.349***	0.164*	0.095	0.134	0.171*	0.330***	0.198**	0.047	0.156	0.064	1		
F-AGE	58.32	42.92	0.021	0.055	0.037	0.102	0.033	0.097	0.022	0.075	0.002	0.656	0.065	1	
ESEN	0.55	0.51	0.065	0.121	0.051	0.108	0.051	0.021	0.045	0.053	0.033	0.046	0.045	0.078	1
n=225															

***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

Source: Authors' Own Compilation

on board, B-IND = number of independent members on board, B-DIV = board diversity, AC-COM = existence of audit committee, F-PROF = firm profitability, F-SIZE = firm size, F-AGE = firm age, E-SEN = environmental sensitivity and e = standard error.

Table 3: Multiple Regression Results

Variable	*Coefficient*	*SE*	*p value*	*Sign.*
Cons	20.752	4.183	0	***
CSR-SIZE	1.417	0.424	0.042	***
CSR-IND	0.061	0.022	0.043	**
CSR-EXP	1.113	1.223	0.348	
CSR-MEET	0.394	0.197	0.048	*
B-SIZE	0.226	0.162	0.044	*
B-IND	0.056	0.022	0.046	**
B-DIV	0.109	0.046	0.016	**
AC-COM	2.319	1.462	0.047	*
F-PROF	0.042	0.035	0.219	
F-SIZE	0.516	0.017	0.037	**
F-AGE	0.005	1.014	0.596	
ESEN	1.515	1.401	0.125	
N	225			
Adjusted R^2	0.396			

***Significant at the 1% level
**Significant at the 5% level
*Significant at the 10% level
Source: Authors' Own Compilation

Table 4: Variance Inflation Factor (VIF) Analysis

Variable	*VIF*
CSR-SIZE	3.27
CSR-IND	2.35
CSR-EXP	1.47
CSR-MEET	2.25
B-SIZE	2.46
B-IND	2.48
B-DIV	2.19
AC-COM	1.24
F-PROF	1.48
F-SIZE	2.97
F-AGE	2.67
ESEN	2.69

Source: Authors' Own Compilation

6. Results and Findings

Table 2 shows the correlation analysis. The dependent variable is ESG reporting quality (ESGQ). As a whole, the ESG performance of companies may be considered strong, and their annual reports give great ESG disclosures. The CSR committee had an average of four members, as shown by the descriptive statistic for the independent variable. The financial experts make up to 43 percent of CSR committee members, and on average, 59 percent of members are independent. Finally, the CSR committee meets four times a year.

In terms of the control variables, descriptive statistics show that boards of directors generally have 12 members and a high degree of independence of around 61%. Audit committees are also present in the organisations that were selected, as well as an average female director ratio of 25%. Firms had an average age of 58 years and a profit margin more than 18%.

Multicollinearity is not an issue, as seen in Table 1's correlation analysis. B-IND and ESGQ had a correlation coefficient of 0.442. A study of the variance inflation factor (VIF) was calculated to reduce the probability of multicollinearity issues. Because the VIFs range from a low of 1.24 to a high of 3.27, there are not any issues with multicollinearity, as seen in Table 2. If all the VIFs are less than 10, there are no multicollinearity issues, according to Myers (1990).

Table 3 summarises the results of the multi-regression analysis. According to an adjusted R^2 of 0.396, the regression model can explain 39.6 percent of the dependent variable's variation. The results support all the hypotheses except H_{03}.

In relation to H_{01}, the results show positive and significant relationship between CSR-SIZE and ESGQ at p = 0.042. According to the findings of this research, larger CSR committees have a better likelihood of providing ESG reports of a higher quality.

In reference to H_{02}, the results show positive and significant relationship between CSR-IND and ESGQ at p = 0.043. This shows that CSR committee independence favours the issuing of qualitative ESG reports.

Further, the findings for H_{03} show that CSR-EXP and ESGQ do not have a positive and statistically significant relationship at p = 0.348. This implies that the financial knowledge and capability of the members of CSR committee do not favour in issuance of high-quality ESG reports. Finally, the findings for H_{04} show that CSR-MEET and ESGQ have a positive and statistically significant relationship at p = 0.048.

Control variables are positively influenced by board features. B-SIZE, B-IND, and B-DIV had a favourable influence on the ESGQ at p-value =0.044, p-value =0.046, and p-value =0.016. ESGQ is favourably influenced by AC-COM (p = 0.047). Also, the company size (F-SIZE) has a positive influence on the ESGQ, with a p-value of 0.037.

7. Discussion

In this study, results shown that meeting size and frequency, as well as independence, all favour the publishing of higher-quality ESG disclosures. However, the financial expertise of the members of CSR committee does not influence the ESG reporting quality. When analysing the data, it is important

to keep in mind the agency hypothesis. By providing the CSR committee with oversight and monitoring, shareholders and management are better able to understand each other's positions. As a result, the reporting procedures and the quality of the company's reports are supported by a number of elements of this organisation.

Firstly, expansion of the CSR committee's membership may help the company improve its ESG reporting, according to the findings. With more persons on the CSR committee, there is a greater chance that the group will have a varied range of ideas, perspectives and talents. When the CSR committee is better equipped to supervise and manage the information gathering and representation procedures, the quality of the company's ESG reports also improves.

Second, the results show that the CSR committee's independence may improve the quality of the company's ESG reports. Independent members may perform their duties more objectively since they have no links to the organization's leadership. It allows them to more effectively carry out their responsibilities of evaluating and managing the information collection process, as well as to detect or reduce illegal or unethical behaviour.

Thirdly, better ESG reports come from a company with a well-functioning CSR committee. The CSR committee's capacity to monitor the information gathering and representation processes is strengthened when the committee meets more often each year. This leads to stronger ESG reports.

Finally, the results indicate that the financial expertise of the members of CSR committeedoes not improve the quality of the company's ESG reports. It might be that financial knowledge is only useful for financial disclosure, and that it has no substantial impact on non-financial documents.

8. Conclusion

The CSR committee's role in the company's ESG disclosure was examined in this research. Using the agency theory to examine how the CSR committee's size, independence and financial knowledge influenced the quality of ESG reporting. The CSR committees' composition, independence, and frequency of meetings, all had a positive influence on the ESGQ in a sample of 225 Indian publicly listed companies. However, the financial expertise of the members of CSR committee does not influence the ESG reporting quality. Researchers found that certain CSR committee features may boost firm transparency, increase the flow of higher-quality information, and reduce the information imbalance between management and shareholders. Further, the results are in line with regulatory requirements and rules made under the Companies Act, 2013 and its rules. This shows that the companies adhere to the legislative requirements strictly.

There are important policy implications to the study's conclusions. Adequate laws should be put in place by policymakers to encourage the formation of CSR committees with larger memberships and greater proportions of independent members. A strict yearly meeting schedule for the CSR committee is also required. Corporate transparency and ESG report quality would both be improved by these actions, which aim to increase the supervision and monitoring roles of CSR committees.

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26.	2006	Rayagada College, Raygada	Prof. Tahalu Sahu, Principal Belpahar College, Belpahar	Prof. Ranjan Kumar Bal, Utkal University	Prof. Jagannath Panda, Berhampur University	One Issue
27.	2007	P.G. Department of Commerce Utkal University, Bhubaneswar	Prof (Dr) Samson Moharana, Professor Utkal University, Bhubaneswar	Prof. Kishore Ch. Rout, Berhampur University	Prof. Jagannath Panda, Berhampur University	One Issue
28.	2008	Fakir Mohan Autonomous College, Balasore	Dr. Arun Kumar Barik, Head, Department of Commerce, Vyasanagar College, Jajpur Road	Prof. Kishore Ch. Rout, Berhampur University	Prof. Ranjan Kumar Bal, Utkal University	One Issue
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30.	2010	Department of Commerce, Ravenshaw University	Shri Baladev Kar, Principal, Govt. College (Auto), Angul	Dr. Kshiti Bhusan Das, Utkal University	Prof. Ranjan Kumar Bal, Utkal University	One Issue
31.	2011	P. G. Department of Commerce, Berhampur University	Prof. Malay Kumar Mohanty, Former Registrar, Ravenshaw University, Professor G. M. College, Dean Sambalpur University	Dr. Kshiti Bhusan Das, Utkal University	Prof. Ranjan Kumar Bal, Utkal University	Two Issues
32.	2012	P. G. Department of Commerce, Utkal University	Prof. P. K. Biswasray, Professor , Berhampur University	Dr. Kshiti Bhusan Das, Utkal University	Prof. Ranjan Kumar Bal, Utkal University	One Issue
33.	2013	Choudwar College, Choudwar	Prof. Prasant Kumar Sahu, Vice- Chancellor, Utkal University	Prof. Kshiti Bhusan Das, Utkal University	Prof. Malay Kumar Mohanty	One Issue
34.	2014	P. N. (Auto) College, Khurda	Prof. Ranjan Kumar Bal, Professor, Utkal University	Prof. Kshiti Bhusan Das, Utkal University	Prof. Malay Kumar Mohanty	Two Issue
35.	2014-15	Kendrapada (Auto) College	Prof. Kshiti Bhusan Das, Professor, Utkal University	Dr. G. K. Panigrahi	Prof. Malay Kumar Mohanty	Two Issues
36.	2016	Belpahar College, Belpahar	Prof. Girish Ku. Patra, Kendrapada (Auto) College	Dr. G. K. Panigrahi	Prof. Malay Kumar Mohanty	Two Issues
37.	2017	F. M. University, Balasore	Prof. Jayanta Kumar Parida, Professor, Utkal University	Dr. G. K. Panigrahi	Prof. Malay Kumar Mohanty	Three Issues
38.	2018	Ravenshaw University, Cuttack	Prof. Bhagaban Das, Professor, F. M. University	Major (Dr) S. A. Taher	Prof. Malay Kumar Mohanty	Four Issues
39.	2019	P. G. Department of Commerce, Utkal University	Prof. Sanjay Kumar Satapathy, Professor, Ravenshaw University	Major (Dr) S. A. Taher	Prof. Malay Kumar Mohanty	Four Issues+One Special Issue
40.	2020	KIIT, Deemed to be University,	Prof. P. K. Hota,	Major (Dr) S. A.Taher	Prof. Malay Kumar Mohanty	Four Issues+One Special Issue
41	2021	L.N.College, Jharsuguda	Prof. Sasmita Samanta, Pro-Vice Chancellor, KIIT University, Bhubaneswar	Major (Dr) S. A.Taher	Prof. Malay Kumar Mohanty	Four Issues

* **Information not available:** People concerned are requested to provide the above missing information with proper references. If any error has crept in the above incumbency chart inadvertently, persons are requested to intimate the correction with the required documentation.

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