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THE BUSINESS REVIEW

The Business Review is devoted to the promotion and dissemination of scientific and interdisciplinary knowledge in the field of Commerce, Management, Economics, Tourism and other related areas.

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Contact editortbr.sbs@uok.edu.in & deansbs@uok.edu.in

Message From the Editor-in-Chief

The nature of economic growth and business sustainability is undergoing profound shifts, driven by digital transformation, evolving consumer behaviours, and the imperative of financial resilience. The Volume 28, No 2 (2024) of our journal is dedicated to exploring these shifts by presenting research that spans marketing, consumer psychology, financial sustainability, and international trade.

This volume opens with a critical examination of brand image, customer engagement, and service excellence in the airline industry, a sector that remains a vital link in the global economy. Understanding the factors that shape consumer perceptions in service industries is essential for companies aiming to thrive in an increasingly competitive landscape. This theme is extended in the research on CSR and Brand Equity in the Indian Pharmaceutical Industry, highlighting how ethical business practices influence consumer trust and corporate reputation.

In the broader economic context, the studies on Energy-Growth Nexus in India under Economic Policy Uncertainty and India's Services Sector in Global Trade provides empirical insights into the country's macroeconomic performance in selected domains of extreme importance, particularly in today's globalized economy. Further, in context of sustainability, consumer behavior intention for sustainable clothing in a dyad setting is elaborated upon in the study "Sustainable Apparel and Microfiber Pollution: A Multi-Group Analysis of Consumers within India and Japan Using the Norm Activation Model" These studies underscore the need for resilient policies that balance economic growth with environmental imperatives at both the national and the international contexts.

The paper on retirement planning behaviour among salaried employees explores the intersection of financial literacy, psychology, and long-term economic security—an essential consideration for an aging workforce.

Together, these studies contribute to a holistic understanding of market dynamics, financial sustainability, and international trade, reaffirming our journal's commitment to publishing research that bridges academia and practice.

We extend our gratitude to the scholars, reviewers, and editorial team whose contributions have made this issue possible. We hope this volume serves as a catalyst for future research and policy advancements in these critical domains.

Prof. Mushtaq Ahmad Darzi Editor-in-Chief

A Message to Our Readers

In a world marked by rapid economic changes, groundbreaking technological advancements, and ever-shifting consumer expectations, the importance of deep, thoughtful exploration into Economics, business and management has never been greater. The Business Review is more than just a journal—it's a space for meaningful dialogue, where scholars, industry leaders, and policymakers come together to tackle today's challenges and seize tomorrow's opportunities.

With every issue, we aim to deliver research that not only enriches academic understanding but also provides actionable insights for realworld application. From uncovering the secrets of workplace innovation to navigating the complexities of corporate responsibility, and from dissecting the forces driving financial stability to reimagining economic paradigms, we are dedicated to expanding the horizons of knowledge.

As we move forward on this journey of discovery, we invite you—our readers—to join us. Engage with the ideas presented, question the status quo, and contribute to shaping the future of business and management. It is your curiosity, critical thinking, and passion for learning that breathe life into this publication and make it a truly impactful endeavour.

We would also like to take a moment to express our heartfelt thanks to our authors, reviewers, and editorial team. Your dedication and expertise are the backbone of The Business Review, and it is through your collective efforts that we continue to uphold our commitment to scholarly excellence.

Thank you for being a part of this journey. Together, let's explore, innovate, and inspire.

Warm regards,

Prof. Mushtaq Ahmad Darzi *Editor-in-Chief The Business Review*



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Flying High: How Brand Image and Customer Engagement Shape Service Excellence in the Indian Airline Industry

¹Dr Hardeep Chahal ²Chandeep Kour

<u>Abstract</u>

This research examines the impact of brand image and customer engagement on service excellence within the Indian airline industry. As highlighted in service marketing theory, service excellence is a vital yet challenging component of organisational success. Using the purposive sampling technique, data was collected from the faculty members of higher educational institutions in Jammu City, North India, using both online and offline approaches. The data was analysed using the Smart PLS 3 software. The results identified both brand image and customer engagement as crucial drivers of service excellence, with a significant impact on customer delight as an ensuing effect. This study contributes novel insights into customer experiences, particularly within the airline industry. It stands out for examining the mediating role of service excellence in the relationship between brand image, customer engagement, and the achievement of customer delight in the service quality of Indian airlines.

Keywords: Service Excellence, Customer Delight, Customer Engagement, Brand Image, Indian Airlines Sector

1. Introduction

The burgeoning forces of globalization and intensified competition have increasingly led organizations to prioritize service excellence as a strategic imperative, as observed by Gouthier et al. (2012). Defined as the art of exceeding customer expectations to induce delight (Asif, 2014), service excellence has evolved from a mere operational goal to a strategic organizational commitment aimed at generating high levels of customer satisfaction, as articulated by Wirtz and Zeithaml (2018, p. 61). This shift from initial efforts to please customers towards striving for customer delight has been underscored by evidence suggesting that delighted customers exhibit greater loyalty than merely satisfied ones (Schneider & Bowen, 1999). The competitive landscape of today places a premium on customer delight as a critical outcome of service excellence, deemed essential for organizational survival (Torres and Kline, 2006; Asif, 2015). Despite its acknowledged importance, organizations often fall short in achieving service excellence, primarily due to a lack of deep understanding of its determinants (Abdul et al., 2010; Gouthier et al., 2012). The academic discourse around service excellence is notably sparse, with a distinct absence of clarity regarding its consequences and the empirical evidence needed to substantiate its role as a competitive lever for enhancing both customer and employee experiences. The existing body of literature on service excellence primarily adopts a conceptual stance, with empirical investigations into its antecedents and consequences being notably rare. Studies by Abdul Aziz and Wahiddin (2010), Sekhon et al. (2015), and Padma and Wagenseil

¹ Professor, Department of Commerce, University of Jammu, Jammu, J&K; email:hardeepchahal@jammuuniversity.ac.in

² Research Scholar, Department of Commerce, University of Jammu, Jammu, J&K; email:chandeeprainal5@gmail.com

(2018) represent some of the few attempts to conceptualize the drivers and outcomes of service excellence empirically. Abdul Aziz and Wahiddin (2010) have made strides in identifying customer participation as a key driver of service excellence in the hotel industry, with customer satisfaction highlighted as a significant outcome. However, they neglect the more critical measure of customer delight. Sekhon et al. (2015) identified crucial antecedents of service excellence in retail banking but did not explore their impacts on subsequent outcomes. Similarly, while Padma and Wagenseil (2018) recognized brand image and customer engagement as essential drivers of retail service excellence, pinpointing customer delight as a key outcome, the empirical validation of these findings remains outstanding. Moreover, Ziyad et al. (2020) provided empirical evidence of customer satisfaction due to service excellence. Still, they did not address its influence on customer delight, a key element for attaining a sustainable competitive advantage. Furthermore, discussions on service excellence have mainly been confined to a select few sectors, leaving areas like the airline industry, which is characterized by intense competition and significant buyer power due to low service differentiation and high availability of alternatives, relatively unexplored. This study seeks to bridge this gap by examining the influence of brand image and customer engagement as pivotal antecedents to service excellence in the airline sector, focusing on customer delight as a primary outcome. Thus, our study on service excellence within the airline industry aims to enhance the current understanding and provide empirical support for the significance of service excellence as a competitive strategy, thereby offering organizations a more straightforward path towards achieving and sustaining service excellence. It contributes significantly to the extant literature by offering a deeper understanding of its dynamics and validating theoretical propositions with empirical evidence, thereby facilitating strategic advantages for organizations striving to achieve service excellence.

Our approach involves a comprehensive review of the literature on service excellence, its influencers—brand image and customer engagement—and its impact on customer delight. We will then outline a theoretical framework to assess how customer engagement and brand image influence service excellence and, in turn, how service excellence affects customer delight. Following this, the methodology employed will be discussed, culminating in examining the results, managerial implications, limitations, and directions for future research.

2. Literature Review and Hypotheses Development

2.1 Brand Image and Service Excellence

Research indicates that a robust brand image is instrumental in crafting a compelling brand narrative, as Hsieh and Li (2008) noted. Furthermore, the perceived quality of a product, and consequently customer behaviour, is significantly influenced by the brand's image, suggesting that products associated with a higher brand image are considered superior quality (Richardson et al., 1994; Burmann et al., 2008). This perspective is reinforced by Hariandja et al. (2014), who argue that a formidable brand image, as a valuable asset for an organisation, is key to providing outstanding services. Additionally, Park et al. (1986) and Kim & Chao (2019) posit that brand image, as an initial phase in brand development, endows an organisation with a competitive edge by shaping consumer purchasing behaviours. Nevertheless, achieving service excellence extends beyond merely influencing consumer purchases; it encompasses fostering enduring customer relationships through continuous engagement in various business operations, as advocated by Vivek et al. (2012) and Padma and Wagenseil (2018). Engagement of customers in service delivery as co-producers mitigates costs and enhances service provision quality, as delineated by Heskett et al. (1997). This principle is especially pertinent in the service sector, including the airline industry, which is highly dependent on understanding and fulfilling the needs of its clientele to deliver exceptional service. Attaining service excellence,

in turn, equips an organisation with a sustainable competitive advantage by ensuring customer satisfaction and delight (Oliver et al., 1997; Johnston, 2004).

A brand is characterised as a design, symbol, name, or a blend of these elements (Kun, 2012), representing an intangible asset that is challenging to replicate and crucial for gaining a competitive advantage (Chao, 2011). Brand building is a long-term commitment that, when carefully cultivated, secures a lasting competitive edge (Syahfudin & Ruswanti, 2015). Brand image, as perceived by customers, is formulated through associations stored in memory (Keller, 1993), playing a vital role in service evaluation and marketing strategy formulation based on customer perceptions (Wijaya et al., 2020). Brand image is pivotal in assessing service quality, where a positive organizational image correlates with higher service quality (Darden & Schwinghammer, 1985; Andreassen & Lindestad, 1999; Bloemer et al., 1998), thus establishing a brand image as a crucial determinant of service quality (Wu, 2011). Empirical evidence from Mattila (1999) suggests that visible indicators of service excellence, rather than pricing information, significantly enhance a company's brand reputation. Similarly, Hariandja et al. (2014) emphasise that a strong brand image, as an organisational asset, is fundamental in delivering superior services. Thus,

H1: Brand Image has a significant impact on Service Excellence.

2.2 Customer Engagement and Service Excellence

Customer engagement represents how customers interact with a brand or company, extending well beyond mere purchasing actions (Van Doorn et al., 2010). It is crucial to cement a robust bond between customers and companies by promoting customer involvement in company initiatives (Braun et al., 2017; Khan et al., 2016; Kumar et al., 2010; Liao et al. 2024). In the contemporary competitive landscape, comprehending and addressing customer needs and preferences is vital for any firm's survival and growth, underpinning the delivery of superior service quality (Diamantopoulos & Hart, 1993; Brady et al., 2006). Furthermore, given the active participation of customers in the service delivery process, engaging them becomes imperative to ensure the provision of high-quality services (Hau et al., 2017; Chang et al., 2019). Vargo & Lusch (2006) highlight that service delivery is a continuous interaction of social and economic activities that benefit from learning and collaborating with customers, who are now seen as partners in value creation. Therefore, fostering customer engagement is key to shaping their service experience and perceptions of service quality (Chang et al., 2019). Moreover, customer engagement aids firms in maintaining a customer-centric approach, providing ongoing insights into their evolving preferences (Padma & Wagenesil, 2018). A company highly attuned to its customers encourages feedback, which is instrumental in refining service excellence (Nwokah & Maclayton, 2006). This argument supports the work of Lytle et al. (1998) and Padma and Wagenesil (2018), who assert that customer engagement is a critical component in achieving service excellence. Therefore, it is hypothesized that

H2: Customer Engagement has a positive impact on service excellence.

2.3 Service Excellence and Customer Delight

Asif (2014) characterised service excellence as providing services that go beyond customer expectations, leading to customer delight. This concept of customer delight emerges when the service provided surpasses what customers anticipate, leaving them with a gratifying experience (Oliver et al., 1997). In the current competitive landscape, companies can secure a sustainable competitive edge by focusing on creating customer delight (Aziz & Wahiddin, 2010). This notion of delight is distinct from mere satisfaction, as it involves surpassing rather than merely meeting customer expectations (Asif, 2015). Barnes et al. (2016) noted that the extent customers are delighted is contingent upon a service organisation's capability to fulfil

these expectations. The greater the level of service excellence an organisation achieves, the higher the level of customer delight. Oliver et al. (1997), Gauthier et al. (2012), and Padma Wagenesil (2018) have all recognised that customer delight is a direct result of service excellence, describing it as an emotional response triggered by services that exceed expectations and leave customers with a joyful experience. Therefore, it is proposed that:



Figure 1: Research Framework



3. Research Method

An exploratory research design was used to test the research model. The scales employed in the study were taken from the existing studies. The constructs of customer engagement, brand image, service excellence, and customer delight were assessed using a 5-point Likert scale, with responses ranging from 5 (strongly agree) to 1 (strongly disagree). This study conceptualised service excellence as having two key dimensions: personalisation and going above and beyond. The personalisation dimension was evaluated using a scale devised by Parasuraman et al. (1988), while the aspect of going above and beyond was assessed through a scale developed by Johnston (2007). The brand image was measured employing a scale by Shafiee et al. (2014), capturing three facets: functional, experiential, and social image. To gauge customer engagement, scale items from Hapsari et al. (2017) were modified, viewing customer engagement as encompassing three dimensions: interaction, absorption, and attention. Lastly, customer delight was assessed with a 12-item scale derived from the works of Finn (2005), Liu and Keh (2015), and Coetzee & Coetzee (2019).

The instrument's pre-testing was done in two stages. Five marketing experts' responses were sought regarding the content, readability, and suitability of the items for measuring the constructs. Their suggestions were considered and incorporated. In the next stage, the revised instrument was tested on twenty regular flyers with respect to readability and suggestions were also incorporated for better clarity.

As we could not identify the dedicated database of domestic flyers, snowball sampling was used to collect data from the regular and frequent flyers. Further, Indian airline customers who have travelled at least 3-5 times in the last year were contacted. Thus, based on the purposive sampling technique, we distributed questionnaires to 150 faculty members of higher educational institutions operating in Jammu City, North India, using both online and offline approaches. After 3-4 reminders to each, 123 questionnaires were found to be fully filled. However effective response rate was 66.7% (100 completed questionnaires), as 23 questionnaires were excluded because of incomplete responses. The sample size was adequate for the exploratory research design and the PLS-SEM data analysis.

3.3 Data Analysis and Results

The present study has used Smart PLS 3 to develop the structural equation model and to evaluate the paths of the latent variables and their associations. PLS-SEM is the best alternative to covariance-based-structural equation modelling (CB-SEM) when predictive accuracy is paramount and the sample size of a population is small (Hair et al. 2019: Shmueli et al. 2019). PLS-SEM is the preferred approach in exploratory research, as it can handle measurement errors associated with small samples (Ringle,2011) and exhibit optimal predictive power (Zhang, 2007). Since the present study is exploratory and had a sample size of 100, the data is analysed on Smart PLS 3 (Hair et al., 2017, 2019). The partial least squares-structural equation modelling (PLS-SEM) results were assessed in two stages. The first stage involves the assessment of the measurement model, whereas the second involves structural model assessment. The detailed analysis related to the measurement model and structural model is discussed as under:

3.3.1 Measurement Model

The measurement model evaluates the relationship between observed items (latent variable) and exogenous/endogenous latent variable by examining the factor loading on each construct (Hulland,1999). The assessment of the measurement models for reflective constructs in PLS-SEM

3.0 is based on reflective indicator reliability, internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). The detailed analysis related to the measurement model is discussed as under:

A. Reflective Indicator Reliability

Reflective indicator reliability is concerned with examining the factor loadings. According to Hair et al. 2019, reflective indicator reliability is considered adequate when the indicator has a loading equal to or greater than 0.708 on its construct. All the indicators have factor loadings above 0.708, establishing reliability.

B. Internal Consistency Reliability

Internal consistency reliability is assessed by checking the composite reliability and Cronbach's alpha. According to Hair et al. (2019), composite reliability values between 0.60-.70 in exploratory research and 0.70-.0.90 in more advanced research are considered satisfactory. In contrast, Cronbach's value above 0.70 is acceptable for demonstrating internal consistency reliability. The study's reliability results are mentioned in Table 1.

Constructs	Items	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance
					Extracted
Brand Image	Functional Image	0.852	0.040	0.007	0.7(1
	Experiential Image	0.918	0.842	0.905	0.761
	Social Image	0.844			
Customer	Interaction	0.812			
Engagement	Absorption	0.932	0.772	0.866	0.685
	Attention	0.727			
Service	Personalization	0.913	0.785	0.903	0.835
Excellence	Going the extra mile	0.901	-		
Customer	Affective	0.934	0.804	0.910	0.823
Delight	Disconformative	0.893			

Table 1: Reliability and Validity of the Data

C. Convergent Validity

Convergent validity, the third step, is the correlation among the items used to measure the same construct. AVE (Average Variance Extracted), the mean of squared loadings of each item on its construct, is used to measure convergent validity (Malhotra& Dash, 2010; Hair et al., 2019). Convergent validity is established when AVE values exceed 0.50.

D. Discriminant Validity

The fourth and last step of the reflective measurement model is assessing the discriminant validity. Discriminant validity measures the extent to which each latent variable is empirically different from others (Hair et al., 2019). The Fornell-Larker criterion and the Heterotrait-Monotrait ratio (HTMT) are the methods used to assess discriminant validity (Hair et al., 2017). The Fornell- Larker method involves that the AVE of each latent construct should be higher than the construct's highest squared correlation from any other latent construct (Fornell & Larcker, 1981; Hamid et al., 2017; Henseler & Ringle, 2015). In contrast, the HTMT criterion involves comparing the correlations of the latent constructs to a predefined threshold of 0.85 (Kline et al., 2011) and 0.90 (Gold et al., 2001). The present study has used both methods to assess discriminant validity. Table 2 exhibits values greater than correlations among the variables, thus satisfying the Fronell-Larker criterion. Table 2 depicts that the HTMT ratio results of the study are lower than the threshold limit of 0.90, hence showing that the model has excellent discriminant validity.

	Brand Image	Customer Delight	Customer Engagement	Service Excellence
Brand Image	(.872)			
Customer Delight	0.870 (.715)	(.914)		
Customer Engagement	0.626(.511)	0.761(.612)	(.828)	
Service Excellence	0.806 (.660)	0.825(.663)	(.593)	(.907)

Table 2: Fronell-Larker and Heterotrait-Monotrait Ratio (HTMT) Values

(Note: Values within brackets are HTMT values)

3.3.2 Structural Model

After fulfilling the measurement model assessment criteria, the next step in PLS-SEM is assessing the structural model. The structural model examines the relationship between exogenous and endogenous latent variables by analysing their path coefficients (Goswami & Dsilva, 2019). According to Hair et al. 2019, the central criteria used in assessing the structural model are R2 (coefficient of determination), Q2 (cross-validated redundancy measure), relevance and the statistical significance of the path coefficients. The detailed analysis related to the structural model is discussed as under:

(i) R Square

Before measuring R^2 , the initial step in the structural model is the collinearity assessment. Collinearity is checked to ensure that structural model coefficients do not influence regression results, as the latter are derived from regression equations. For this purpose, the VIF values should be less than 3 (Hair et al., 2019). If the VIF values are less than 3, then the next step in the analysis would be the determination of R^2 . The coefficient of determination (R^2) indicates the cumulative influence of the exogenous variable over the endogenous variable (Al-Maroof et al., 2021). The R2 values range from 0 to 1, so values of 0.25, 0.50, and 0.75 are considered weak, moderate and substantial (Henseler et al., 2009; Hair et al., 2019). This study found that 52.4% of the variance in service excellence is explained by brand image and customer engagement 42.4% of the variance in customer delight was explained by brand image, customer engagement, and service excellence, thus providing conclusive evidence of model predictive ability.

(ii) ₀2

 Q^2 , measured through blindfolding, is another method to examine the PLS path model's predictive accuracy (Geisser, 1974; Stone, 1974). Q^2 value is the difference predicted and the original values; the smaller the difference, the higher the value. According to Chin (2010), Q^2 values higher than 0, 0.25 and 0.50 represent the PLS-path model's small, medium and large predictive relevance, respectively. Table 6 shows that Q^2 values for service excellence (0.410) and customer delight (0.352) have medium predictive relevance. Thus, the present study model's predictive relevance is confirmed as all endogenous constructs have Q^2 values more than zero.

(iii) Hypothesis Testing

Hypothesis testing in the Smart PLS 3 involves a significance test for direct and indirect effects and a measurement of the magnitude of the influence of the exogenous variable on the endogenous variable (Hair et al., 2012). An analysis of the direct test is required to determine the effect of brand image and customer engagement on service excellence and service excellence customer delight. The effect test in the present study was performed using the tstatistic test in the PLS software 3.0 using the bootstrapping technique (Hair et al., 2019). With 100 cases, 500 subsamples, and no sign change option, the p-value and t-value are shown in Table 4. The values show that brand image positively impacts service excellence with a p-value (0.000) and t-value (5.612). Hence, supporting hypothesis 1. Similarly, the hypothesis that customer engagement positively impacts service excellence (H2) is also supported with a pvalue (0.000) and a t-value (3.791).

The service excellence positively impacts service excellence with p-value (0.000) and t-value (12.733) indicate acceptance of H3.



EI-Emotional Image, FI-Functional Image, SI-Social Image, AT-Attention, ID-Identification, IT-Interaction, GM- Going the extra mile, PS-Personalisation, DC-Disconformative, AF-Affective

Hypothesis	Relationship	Path	T-value	P-value	Results
H1	Brand Image – Service Excellence (BI- SE)	0.483	5.612	0.000	Accepted
H2	Customer Engagement - Service Excellence (CE-SE)	0.346	3.791	0.000	Accepted
НЗ	Service Excellence- Customer Delight (SE- CD)	0.663	12.733	0.000	Accepted

Table 3: Hypothesis Testing Results

4. Discussion

The primary aim of this investigation is to delve into the influence of brand image and customer engagement on fostering service excellence and how service excellence, in turn, enhances customer delight within the Indian airline sector. This research underscores brand image and customer engagement as pivotal elements that drive service excellence, with customer delight emerging as a significant outcome of such excellence. The findings offer profound insights with substantial implications for the industry. Customer loyalty is paramount in the highly competitive service sector, including the airline industry. Modern consumers are discerning, seeking not just satisfaction but experiences that resonate on a personal level. To cultivate such loyalty, airlines must extend their efforts beyond achieving mere customer satisfaction to delivering memorable and personalised experiences. Excelling in service delivery becomes a crucial strategy in this context. The study brings to light the critical role of an organisation's brand image in attaining service excellence. Constructing a robust brand image is a longterm endeavour, requiring consistent excellence across all operational facets. For Indian airlines, this means excelling in customer service, punctuality, in-flight services, and more to solidify a positive image in the consumer's psyche. Moreover, the research highlights the significance of customer engagement in realising service excellence. Airlines can enhance the service delivery process by involving customers in the service process or treating them as cocontributors. Such engagement elevates the customer's experience and fosters a sense of belonging and loyalty towards the airline. For instance, introducing interactive platforms for feedback or involving frequent flyers in service improvement discussions can be instrumental. Airlines like IndiGo and Vistara have leveraged social media and customer feedback mechanisms to refine their services, reflecting an understanding of the critical role customer engagement plays in service excellence. Furthermore, personalised services, such as custom meal plans based on customer preferences or offering tailored travel solutions, exemplify how airlines can exceed customer expectations, transitioning from satisfaction to delight. These practices reinforce the brand image and significantly enhance customer engagement and loyalty. This investigation is particularly relevant for stakeholders including airline managers, employees and policymakers, especially in a burgeoning aviation market like India. With India poised to become the world's third-largest aviation market by 2024, understanding and implementing strategies that hinge on brand image and customer engagement to achieve service excellence could be pivotal in navigating the competitive landscape and ensuring sustainable growth.

5. Limitations and Future Research

Exploring brand image and customer engagement's impact on achieving service excellence within the Indian airline industry opens avenues for further scholarly inquiry. While shedding light on pivotal factors contributing to service excellence, this study also delineates areas that require a more nuanced understanding. Firstly, the research context is confined to the airline sector, suggesting that the applicability of the findings might be limited across different industries. The unique dynamics of the airline industry, such as the critical importance of safety, timeliness, and customer service, might not directly translate to sectors with different operational pressures and customer expectations. For example, the retail industry's emphasis on product variety and shopping ambiance presents a contrast to the airline industry's focus areas. Secondly, the investigation centers predominantly on the customer's viewpoint concerning the determinants of airline service excellence. However, achieving a comprehensive understanding of service excellence necessitates examining it from multiple perspectives, including those of employees and the organization itself. Employees, for instance, play a crucial role in delivering service excellence, and their insights could reveal internal processes and challenges that influence service outcomes. Likewise, organizational strategies and policies could significantly impact how service excellence is pursued and achieved. Thirdly, this study posits service excellence as a construct with two main dimensions: personalisation and going the extra mile. However, the literature identifies other essential facets, such as reliability, responsiveness, and servicescapes, as crucial to service excellence. The concept of reliability in the airline context could relate to on-time performance and baggage handling efficiency, while responsiveness might pertain to the speed and quality of service recovery efforts. Servicescapes, referring to the physical and virtual environments where services are delivered, could encompass everything from the design and comfort of the aircraft to the user-friendliness of the airline's website. Hence, future research endeavours could explore service excellence as a more comprehensive multi-dimensional construct that includes these additional dimensions within the airline industry. For example, a study could examine how the physical layout and ambience of an airline's lounges or the efficiency of its online booking system contribute to overall service excellence, alongside personalisation and efforts to exceed customer expectations. By addressing these gaps, future research can significantly enrich our understanding of service excellence, providing a more holistic view that encompasses diverse industry contexts, stakeholder perspectives, and the multifaceted nature of service excellence itself. Such endeavours would contribute to the academic discourse and offer practical insights for the airline industry to enhance its service delivery and competitive positioning.

References:

- Ab Hamid, M. R., Sami, W., & Sidek, M. M. (2017, September). Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion. In Journal of Physics: Conference Series , 890(1), 1-5. DOI :10.1088/1742-6596/890/1/012163
- Abdul Aziz, Y., & Wahiddin, K. (2010). Conceptualising the service excellence and its antecedents: The development of the structural equation model. Journal of Tourism, Hospitality & Culinary Arts, 2(1), 1-14.
- Al-Maroof, R. S., Alhumaid, K., Alhamad, A. Q., Aburayya, A., & Salloum, S. (2021). User acceptance of smart watch for medical purposes: an empirical study. Future Internet, 13(5), 127. DOI:10.3390/fi13050127
- Andreassen, T. W., & Lindestad, B. (1998). Customer loyalty and complex services: The impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise. International Journal of Service Industry Management, 9(1), 7-23. DOI: 10.1108/09564239810199923
- Asif, M. (2015). A critical review of service excellence models: Towards developing an integrated framework. Quality and Quantity, 49(2), 763-783.
- Asif, M., & Gouthier, M. H. (2014). What service excellence can learn from business excellence models. Total Quality Management and Business Excellence, 25(5-6), 511-531 DOI:10.1080/14783363.2013.839348
- Barnes, D. C., Meyer, T., & Kinard, B. R. (2016). Implementing a delight strategy in a restaurant setting: The power of unsolicited recommendations. Cornell Hospitality Quarterly, 57(3), 329-
- 342. DOI: 10.1177/1938965515626296
- Bitner, M. J. (1991). The evolution of the services marketing mix and its relationship to service quality. Brown, S., Gummesson, E., Edvardsson, B. and Gustavsson, B., Service Quality: A Multidisciplinary and Multinational Perspective, Lexington Books, New York, NY, 23, 37.
- Bloemer, J., De Ruyter, K., & Peeters, P. (1998). Investigating drivers of bank loyalty: The complex relationship between image, service quality and satisfaction. International Journal of Bank Marketing, 16(7), 276-286.DOI: 10.1108/02652329810245984
- Brady, M. K., Voorhees, C. M., Cronin Jr, J. J., & Bourdeau, B. L. (2006). The good guys don't always win: The effect of valence on service perceptions and consequences. Journal of Services Marketing, 20(2), 83-91.DOI: 10.1108/08876040610657011
- Braun, C., Hadwich, K., & Bruhn, M. (2017). How do different types of customer engagement affect important relationship marketing outcomes? An empirical analysis. Journal

of Customer Behaviour, 16(2), 111-144.DOI: 10.1362/147539217X14909732699525

- Chang, C. W., Huang, H. C., Wang, S. J., & Lee, H. (2021). Relational bonds, customer engagement, and service quality. The Service Industries Journal, 41(5-6), 330-354, DOI: 10.1080/02642069.2019.1611784
- Chin, W. W. (2009). How to write up and report PLS analyses. In Handbook of partial least squares: Concepts, methods and applications (pp. 655-690). Berlin, Heidelberg: Springer Berlin Heidelberg.
- Coetzee, A., & Coetzee, J. (2019). Service quality and attitudinal loyalty: The mediating effect of delight on retail banking relationships. Global Business and Economics Review, 21(1), 120-138.
- Darden, W. R., & Schwinghammer, J. K. L. (1985). The Influence of Social Characteristics on Perceived Quality in PatronageChoiceBehavior, InJacoby, J., Olson, J.(Eds.), Perceived Quality.
- Diamantopoulos, A., & Hart, S. (1993). Linking market orientation and company performance: Preliminary evidence on Kohli and Jaworski's framework. Journal of Strategic Marketing, 1(2), 93-121. DOI:10.1080/09652549300000007
- Finn, A. (2005). Reassessing the foundations of customer delight. Journal of Service Research, 8(2), 103-116.DOI: 10.1177/1094670505279340
- Fisk, R. (2002). Presentation to the 1st international symposium on service engineering and management. Stuttgart, November.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 18(1), 39-50.DOI: 10.1177/002224378101800104
- Geisser, S. (1974). A predictive approach to the random effect model. Biometrika, 61(1), 101-
- 107.DOI: 10.1093/biomet/61.1.101
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. Journal of Management Information Systems, 18(1), 185-214. DOI:10.1080/07421222.2001.11045669
- Goswami, I., & Dsilva, N. R. (2019). Impact of job satisfaction and job stress on employees' life in Mumbai's hospitality sector: An empirical study using SEM. Journal of Strategy and Management, 12(3), 330-346.DOI 10.1108/JSMA-01-2019-0012
- Gouthier, M., Giese, A., & Bartl, C. (2012). Service excellence models: A critical discussion and comparison. Managing Service Quality: An International Journal, 22(5), 447-464. DOI:10.1108/09604521211281378
- Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). Advanced Issues in Partial Least Squares Structural Equation Modeling.saGe publications
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European business review, 31(1), 2-24. DOI:10.1108/EBR-11-2018-0203
- Hapsari, R., Clemes, M. D., & Dean, D. (2017). The impact of service quality, customer engagement and selected marketing constructs on airline passenger loyalty.

International Journal of Quality and Service Sciences, 9(1), 21-40.DOI: 10.1108/IJQSS-07-2016-0048

- Hariandja, E. S., Simatupang, T. M., Nasution, R. A., & Larso, D. (2014). Dynamic marketing and service innovation for service excellence. Gadjah Mada International Journal of Business, 16(2), 143-166.
- Hau, L. N., Tram Anh, P. N., & Thuy, P. N. (2017). The effects of interaction behaviors of service frontliners on customer participation in the value co-creation: A study of health care service. Service Business, 11, 253-277.DOI: 10.1007/s11628-016-0307-4
- Hau, L. N., Tram Anh, P. N., & Thuy, P. N. (2017). The effects of interaction behaviors of service frontliners on customer participation in the value co-creation: A study of health care service. Service Business, 11, 253-277.DOI:10.1007/s11628-016-0307-4.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In New challenges to international marketing, 20 (277-319).
- Heskett, J. L., Sasser, Jr. W.E, and Schlesinger, L. A. (1997). The service profit chain: How leading companies link profit and growth to loyalty, satisfaction, and value. New York: Free Press.
- Hsieh, A. T., & Li, C. K. (2008). The moderating effect of brand image on public relations perception and customer loyalty. Marketing Intelligence & Planning, 26(1), 26-42.DOI: 10.1108/02634500810847138
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. Strategic Management Journal, 20(2), 195-204.
- Johnson, D. S. (2007). Achieving customer value from electronic channels through identity commitment, calculative commitment, and trust in technology. Journal of Interactive Marketing, 21(4), 2-22.
- Johnston, R. (2004). Towards a better understanding of service excellence. Managing Service Quality:An International Journal, 14(2-3), 129-133.DOI:10.1108/09604520410528554
- Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. Journal of Marketing, 57(1), 1-22. DOI:10.1177/002224299305700101
- Khan, I., Rahman, Z., & Fatma, M. (2016). The role of customer brand engagement and brand experience in online banking. International Journal of Bank Marketing, 34(7), 1025-1041. DOI:10.1108/IJBM-07-2015-0110
- Kline, R.B. (2010). Principles and Practice of Structural Equation Modeling. New York, NY: The Guilford Press
- Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., & Tillmanns, S. (2010). Undervalued or overvalued customers: Capturing total customer engagement value. Journal of Service Research, 13(3), 297-310.DOI: 10.1177/1094670510375602

- Liao, K. H. (2012). The casual effects of service quality, brand image, customer satisfaction on customer loyalty in the leisure resort enterprise. China-USA Business Review, 11(5), 631-642.
- Liao, S. H., Hu, D. C., & Hou, S. Y. (2024). Re-patronage on chain stores: mediating and moderating role of customer engagement and experiential value. Total Quality Management & Business Excellence, 1-22.
- Liu, M. W., & Keh, H. T. (2015). Consumer delight and outrage: Scale development and validation. Journal of Service Theory and Practice, 25(6), 680-699. DOI:10.1108/JSTP-08-2014-0178
- Lytle, R. S., Hom, P. W., & Mokwa, M. P. (1998). SERV* OR: A managerial measure of organizational service-orientation. Journal of Retailing, 74(4), 455-489.DOI:10.1016/S0022-4359(99)80104-3
- Malhotra, N. K., & Dash, S. J. M. R. (2010). An Applied Orientation. Marketing Research, 2.
- Mattila, A. S. (1999). Do emotional appeals work for services?. International Journal of Service Industry Management, 10(3), 292-307.DOI: 10.1108/09564239910276890
- Oliver, R. L., Rust, R. T., & Varki, S. (1997). Customer delight: Foundations, findings, and managerial insight. Journal of Retailing, 73(3), 311-336.DOI: 10.1016/S0022-4359(97)90021-X
- Padma, P., & Wagenseil, U. (2018). Retail service excellence: Antecedents and consequences. International Journal of Retail & Distribution Management, 46(5), 422-441.DOI: 10.1108/IJRDM-09-2017-0189
- Parasuraman, A. B. L. L., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. 1988, 64(1), 12-40.
- Park, C. W., Jaworski, B. J., & MacInnis, D. J. (1986). Strategic brand concept-image management. Journal of Marketing, 50(4), 135-145.
- Richardson, P. S., Dick, A. S., & Jain, A. K. (1994). Extrinsic and intrinsic cue effects on perceptions of store brand quality. Journal of Marketing, 58(4), 28-36.DOI: 10.1177/002224299405800403
- Schneider, B., & Bowen, D. E. (1999). Understanding customer delight and outrage. Sloan Management Review, 41(1), 35-45.
- Sekhon, H. S., Al-Eisawi, D., Roy, S. K., & Pritchard, A. (2015). Service excellence in UK retail banking: Customers' perspectives of the important antecedents. International Journal of Bank Marketing, 33(7), 904-921. DOI:10.1108/IJBM-10-2014-0136
- Shafiee, M. M., Sanayei, A., Shahin, A., & Dolatabadi, H. R. (2014). The role of brand image informing airlines passengers' purchase intention: Study of Iran aviation industry. International Journal of Services and Operations Management, 19(3), 360-376.DOI: 10.1504/IJSOM.2014.065370
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. European journal of marketing, 53(11), 2322-2347.DOI: 10.1108/EJM-02-2019-0189
- Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. Journal of the Royal Statistical Society, 36(2), 111-147. DOI:10.1111/j.2517-6161.1974.tb00994.x

- Syahfudin, E., & Ruswanti, E. (2015). The impact of service quality and brand image on customer loyalty mediated by customer satisfaction: In Indonesia banking industry. Journal Faculty of Economic, Esa Unggul University, Jakarta, (1-12)
- Torres, E. N., & Kline, S. (2006). From satisfaction to delight: A model for the hotel industry. International Journal of Contemporary Hospitality Management, 18(4), 290-301. DOI:10.1108/09596110610665302
- Van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., & Verhoef, P. C. (2010). Customer engagement behavior: Theoretical foundations and research directions. Journal of Service Research, 13(3), 253-266.DOI: 10.1177/1094670510375599
- Vargo, S. L., & Lusch, R. F. (2014). Service-dominant logic: What it is, what it is not, what it might be. In The Service-Dominant Logic of Marketing (pp. 43-56). Routledge.
- Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer engagement: Exploring customer relationships beyond purchase. Journal of Marketing Theory and Practice, 20(2), 122-146.DOI:10.2753/MTP1069-6679200201
- Wijaya, A. F. B., Surachman, S., & Mugiono, M. (2020). The effect of service quality, perceived value and mediating effect of brand image on brand trust. Jurnal Manajemen Dan Kewirausahaan, 22(1), 45-56. DOI:10.9744/jmk.22.1.45-56
- Wirtz, Jochen and Zeithaml, V. (2018). Cost-effectiveness service excellence. Journal of the Academic Marketing Science, 46, 59–80
- Wu, C. C. (2011). The impact of hospital brand image on service quality, patient satisfaction and loyalty. African Journal of Business Management, 5(12), 4873.DOI: 10.5897/AJBM10.1347
- Ziyad, A., Rehman, Z. U., Batool, Z., & Khan, A. H. (2020). Influence of service excellence on consumer satisfaction of ridesharing industry. International Journal for Traffic and Transport Engineering, 10(4), 468-481.DOI: 10.7708/ijtte.2020.10(4).06

Constructs Dimensions Scale Items		Factor loading	Items Retained	Alpha	CR	AVE	
			0	/ Deleted			
	Functional Image	This airline is regarded as a good choice for air trips.	0.449				
		I have positive perceptions and beliefs about the features of this airline.					
		This airline is exciting and attractive					
Brand	Emotional Image	I have positive feelings towards this airline.	0.549		0.842	0.905	0.761
Image		This airline is luxurious and smooth.			0.042		
		This airline has a personality that distinguishes itself from others.					
	Social Image	This airline creates a positive image of me in the sight of others.	0.341				
		This airline fits my personality and self-image.					
		This airline makes me leave a good impression on other people.					
		This airline is suitable to my class and social status.					
	Identification	I am proud of this airline's success.	0.730		0.772	0.866	0.685
Customer		When someone criticises this airline, it feels like a personal insult.					
Engagemen t		I often participate in the activities of this airline					
	Interaction	I enjoy interacting with like- minded people that fly with this airline.	0.320				
		In general, I thoroughly enjoy exchanging ideas with other people that fly with this airline					

Appendix: Scale Items.

	Attention	I pay a lot of attention to any information about this airline	0.540			
	Personalisati on	Airline's operating hours are convenient to their customers.	0.700			
Service Excellence		Airline has customers' best interest at heart.				
		Airline's employees give customers individual attention		0.785	0.903	0.823
	Going the extra mile	Airline's employees do things beyond what might be expected from them to do.	0.730			
		Airline's anticipate the needs of their customers.				
		Airline's employees are always eager to serve their customers				
	Affective	I felt delighted by the service of this airline.	0.586			
Customer Delight		I felt gleeful by the service of this airline		0.804	0.910	0.835
0		I felt elated by the service of this airline				
		I was pleased with the services of this airline.				
	Disconformat ive	The service I received was much more than generally necessary.	0.648			
		Services of this airline exceed my expectations.				

Economic Policy Uncertainty and the Energy Growth Nexus in India : A Reassessment

¹Shahida Rasheed ²S. M. Shafi ³Iqra Yaseen ⁴Syed Farhat Bashir

<u>Abstract</u>

This study analyzes the intricate relationship between economic policy uncertainty (EPU) and India's energy-growth nexus (1997-2022) using ARDL and machine learning (ML) techniques.

ARDL results confirm the positive influence of energy consumption on economic growth in both the short and long run, while EPU exerts a negative impact. Notably, the interaction between EPU and energy consumption fosters economic growth. Toda & Yamamoto causality tests further corroborate EPU's impact on energy consumption and economic growth. ML models (MLR, RFR, GBR), employing F1-score feature significance, identify carbon emissions, EPU, and energy use as key GDP predictors, underscoring India's challenges in achieving SDGs related to environmental sustainability (SDG 13), economic stability (SDG 8), and energy efficiency (SDG 7). These findings emphasize the need for coordinated macroeconomic policies to mitigate uncertainty, particularly in the context of energy transition and regulatory frameworks, to promote sustainable and inclusive development

Keywords: Economic policy uncertainty (EPU), economic growth (EG), energy consumption (EC), GDP prediction, Machine learning (ML).

1. Introduction

Energy resources are significant catalysts for fostering economic development. Over the past two decades, numerous studies have evidenced that growth-energy nexus (Belloumi, 2015; Odugbesan & Rjoub, 2020; Pejović et al., 2021; Shahbaz et al., 2020; Usman et al., 2022; Waleed et al., 2018; Zhi-Guo et al., 2018). Several theories and empirical studies have investigated the mechanism and relationship among different spheres of energy-growth nexus (Ahmad et al., 2016; Shahbaz et al., 2020; Zhi-Guo et al., 2018). The incessant debate over the growth-energy nexus has led to the development of four hypotheses: the neutrality hypothesis, where there is no relationship between economic growth and energy demand (Ahmed, 2019; Omri, 2017; Ssebabi et al., 2021); feedback hypothesis, where there is interlinkage between energy-growth nexus (Bildirici & Bakirtas, 2014; Hussain et al., 2019; Phukon & Konwar, 2019), conservation hypothesis, where economic growth leads to energy consumption (Apergis & Foon, 2013; Behera, 2015; Rani & Kumar, 2019) and growth hypothesis, where high level of energy demand increases economic growth (Alshehry & Belloumi, 2015; Odugbesan & Rjoub, 2020; Victor & Asumadu, 2019). Recent empirical studies on economic growth and energy consumption nexus have focused on multivariate and empirical econometric approaches. These studies have used additional variables like CO2 (Danish et al., 2018),

 $^{^1}$ Department of Commerce, University of Kashmir ; email:shahidarasheed626@gmail.com

² Department of Commerce, University of Kashmir ; email:shahidarasheed626@gmail.com

³ Department of Commerce, University of Kashmir ; email:shahidarasheed626@gmail.com

⁴ Department of Commerce, University of Kashmir; email:syedfarhatb@gmail.com

urbanization (Wang & Cao, 2021) financial development (Khan et al., 2021), international trade (Kongkuah et al., 2021), energy prices (Carfora et al., 2019), human capital (Fang, 2016), FDI (Udi et al., 2020), globalization (Acheampong et al., 2021) to identify the causal relationship between energy-growth nexus.

However, in the last few years, the global economy has come across major events that have highlighted climate change concerns and political and policy uncertainty. Noticeably, every uncertainty, such as political, social trade, or conflict, considerably affects economic activity (Adams et al., 2020; Jiang, 2018; Marion, 1991). The major global uncertainties like the Global financial crises of 2008 (Bordo & Meissner, 2009; Countries, 2009) Covid 19 pandemic (Apergis et al., 2021; Chaudhary et al., 2020) have witnessed considerable fluctuations in the economic environment policies, and structures around the globe, which results in lower economic growth, impacts the economic decision making of entities and eventually affects governments, corporations and individuals (Anser et al., 2021; Doğan & Güler, 2020). In other words, under an economic uncertainty period, people and firms act more conservatively, i.e., postpone their future consumption and investments, leading to an overall fall in economic growth (Bloom, 2009; Caggiano et al., 2017; Wen et al., 2022). Similarly, economic policy uncertainty can reduce both production of energy and consumption of energy-intense products, which subsequently reduces the energy demands (Wang et al., 2020; Wei et al., 2021). This tendency stimulates economic risk, impacting individuals' and businesses' spending and investing activities (Al-thaqeb & Ghanim, 2019). Extensive literature (Chukwudi & Edwin, 2022; Erzurumlu & Gozgor, 2022; Gu et al., 2021; Khanh et al., 2022; Sharma & Paramati, 2021; Su et al., 2021) exists on assessing the effects of (EPU) in both developing and developed countries. However, there is limited research on how economic Policy Uncertainty (EPU) impacts India's economic growth and energy relationship.

Examining patterns in GDP/capita and primary energy use/capita for a developing nation like India (Fig.1 and 2), real GDP per capita underwent a significant surge from 1997 to 2008, exhibiting a gain of roughly 50% over this timeframe. The real GDP/capita increase is linked to an upsurge in energy consumption. From 1997 to 2008, energy usage rose from approximately 10 to 20 units, doubling primary energy consumption. Furthermore, India had swings in its real GDP per capita, particularly in 2004-2005 because of political turmoil, in 2008-2009 during the Global Financial Crisis, and in 2012 when the economy encountered obstacles in infrastructure investment and development. In addition, the emergence of the COVID-19 epidemic in 2019 significantly impeded India's economic recovery, resulting in unparalleled levels of economic policy uncertainty (EPU). In developing countries like India, primary energy consumption increased during periods of uncertainty. To counter the economic challenges, industries and business often intensify their operations, leading to heightened energy demands for manufacturing and production processes. Moreover, the government implements measures during economic downturns, inadvertently driving up energy consumption via increased construction, transportation, and energy-intensive projects. However, energy consumption for 2020 was low, which marked a notable departure from the trend, indicating a decline in primary energy consumption and a distinct role towards prioritizing environmental considerations.



Fig 1 Gross Domestic Product per capita





Source: WDI

Given this backdrop, the main motive of this paper is to evaluate the role of economic policy uncertainty on the energy-growth nexus. This paper highlights the literature gaps: Firstly, instead of focusing solely on the energy-growth nexus, this study incorporates the EPU in the energy-growth relationship in India to better comprehend the relationship. India is one of the largest and fastest-developing countries in South Asia, and it is projected to grow significantly, with an increase in growth rate from 5.53%-8.95% between 1990 and 2021. However, since 2004, due to immediate policy uncertainty and the absence of satisfactory economic reforms, the Indian economy has faced structural glitches that inescapably affect macroeconomic and corporate decisions. Further, limited research is done on the impact and consequences of economic uncertainty on the Indian economy. Secondly, the sample period is considered an important economic policy uncertainty period, like the Indian demonetization in 2016 and the

Covid-19 pandemic in 2020, which significantly aids in mirroring the impacts of economic policy uncertainty.

Subsequently, the paper is structured as follows: Section 2 extensively discusses the existing related work. Section 3 presents the details of the data used and the econometric methods applied. The empirical results, conclusion and future directions are discussed in sections 4&5.

2. Literature Review

Previous studies have investigated the effect of EPU on economic activities worldwide. This study considers three streams of literature, i.e., the Energy-Growth Nexus, the impact of EPU on macro-economic variables and the impact of EPU in India.

2.1 Theoretical Background

The energy-growth nexus theoretical underpinning is based on four hypotheses. (i) Firstly, the growth hypothesis argues that energy consumption stimulates economic growth directly and indirectly by complementing labour and capital in the production process. (ii) Secondly, the conservation hypothesis suggests that implementing measures such as reducing carbon emissions, improving efficiency, and managing demand to decrease energy consumption and waste does not negatively affect economic growth. (iii) Thirdly, the feedback hypothesis accentuates that energy consumption and economic growth complement each other. Thus, energy conservation policies should be formulated in a manner that is not destructive to economic growth. (iv) Fourth, the neutrality hypothesis concludes that energy usage is a relatively small part of total output. Therefore, it has little or no impact on economic output (Alper & Oguz, 2016; Salisu & Ogbonna, 2019; Ssebabi et al., 2021).

During an uncertain period, economic agents change their behaviour, delaying their irreversible decision-making until there are improvements in economic circumstances. According to real option or adjustment cost effect, those investment decisions withdrawn by managers during the uncertainty are inherited by the charges of reorganizing the labour, financial assets, and infrastructure (Čižmešija et al.,2017). Furthermore, uncertainty impacts the selling price, where sellers must accept a reduced price to make their selling decisions. (Gilchrist et al., 2014).Decision makers, both consumers and managers, become risk averse, focusing on saving rather than investing during the uncertainty period. According to the precautionary view, Ren et al. (2020) establish that an uncertain period puts a stake in external financing, ultimately reducing investment, research and development. Furthermore, that increase in credit spread is an outcome of uncertainty also impacts the financial markets by increasing costs, ultimately making it problematic for companies to acquire loans and advances from financial institutions. Furthermore, it increases the volatility in the stock market's returns. To summarize, this type of behaviour will ultimately negatively impact economic growth.

2.2 Energy -Growth Nexus

Various studies have been directed on this nexus (Omri, 2017; Ssebabi et al., 2021) provided the literature review on energy-growth nexus, resulting in mixed results. Further, some studies have shown that energy causes economic growth. (Foon et al., 2016) confirmed the long-term connection in Vietnam. Also, (2019) confirmed the hypothesis of energy-led growth in Pakistan. Further, NARDL estimation discloses asymmetric cointegration among variables. Similarly, (Adebayo, 2021; Bhattacharya et al., 2015) confirm South Korea's and China's growth hypothesis. While other studies argue that economic growth induces energy consumption, for instance, Rahman & Velayutham (2020), by applying the Dumitrescu-Hurlin panel causality test to examine the link between the energy-growth nexus in five South Asian nations from 1990 to 2014, revealed a one-way link from growth -energy usage. Also, Destek

(2016) supports the conservation hypothesis in newly industrialized countries from 1971-2011 through the asymmetric causality approach. Similarly, Vo et al. (2019) confirm a unidirectional link between GDP and non-fossil fuel energy usage in Indonesia.

Studies like Li and Leung (2012) reveal bi-directional causality between coal consumption and GDP in coastal and central regions of China. A one-way relationship between GDP -and coal consumption is confirmed for the western region. Further,(Hussain et al., 2019; Park & Yoo, 2014) also confirms a bi-directional relationship between oil usage, energy usage and GDP in Malaysia from 1965-2011 and 1978-2016. In contrast with the above three literature strands, some studies contend that there is no relationship between energy. Shaari et al. (2013) confirm no causality between economic growth and (oil and coal consumption in Malaysia from 1980-2010. Similarly, Ozcan & Ozturk (2019) confirm the neutrality hypothesis with the help of a bootstrap panel test between energy-growth relationships in 16 emerging economies from 1990-2016.

To the best of our knowledge, the empirical papers (Al-mulali & Che Sab, 2018; Behera, 2015; Bildirici & Bakirtas, 2014; Chandran Govindaraju & Tang, 2013; Ghosh & Kanjilal, 2014; Lin et al., 2018; Ohlan, 2016; Shastri et al., 2020). Based on the multivariate model Lin et al., (2018) investigated the nexus between CO2 emission and economic -growth using Bootstrap ARDL from 1969-2015. The results support the growth hypothesis. Similarly, Ghosh & Kanjilal (2014) reveal a long-run connection between energy use and GDP using ARDL bound test and the Johansen procedure for cointegration over 1971-2008-further, a unidirectional relationship from energy-economic growth indicated by Todae Yamamoto causality estimation. Similarly, Shastri et al. (2020) examine the GDP, fossil, and non-fossil energy relationship from 1971-2017 using NARDL and asymmetric causality tests. The results show an asymmetric impact of energy use for both long /short run. Correspondingly, indicates a unidirectional causality from non-renewable and renewable consumption to economic growth. Further, Ohlan (2016) found evidence of a two-way relationship between non-fossil energy consumption and economic growth in both the long and short term. Additionally, there is only a one-way relationship between renewable energy consumption and economic growth in the short term. Similarly, Bildirici & Bakirtas, (2014) confirms a bi-directional casualty between coal usage and economic growth. Moreover, Behera, (2015) confirms the long-run relationship between GDP and energy use, further confirming the one-way relationship between economic expansion and energy use. Similarly, Chandran Govindaraju & Tang (2013) confirmed a oneway relationship where economic growth influences coal use. Furthermore, (Al-mulali & Che Sab, 2018; Carfora et al., 2019; Lei et al., 2014) advocate no relationship between energy use, coal and economic growth in India.

2.3 Energy consumption, economic growth, and EPU

Economic policy uncertainty refers to ambiguity in government- policies (Fiscal/monetary policies) (Abbasi & Adedoyin, 2021; Baker et al., 2016). EPU induces political uncertainty and weak economic and financial structures, negatively impacting Pakistan's GDP in both the short and long run (Wen et al., 2022). Similarly, Bhowmik et al. (2022) examine the impact of fiscal, monetary, and trade policy uncertainties on the US environmental Phillips curve. The results disclose that uncertainty in fiscal policies reduces energy usage and growth, decreasing CO2. Uncertainty in monetary policy decreases investments in clean energy, research and development, and technology, resulting in elevated carbon emissions. However, uncertainty in trade policy has no impact on carbon emissions. Another study by Chukwudi & Edwin, (2022) inspects the moderating effect of EPU on the energy environment, implying that EPU encourages fossil energy consumption, resulting in corrosion of environmental quality. Therefore, EPU has an ameliorating impact on energy usage, thus accelerating carbon

emissions. Similarly, Zakari et al., (2021) discovered that economic policy uncertainty impacted the environments in OECD countries from 1985-2017, and PMG -ARDL results reveal that EPU positively impacts carbon emission. Also, Adedoyin,(2021), confirms the positive impact of EPU on environmental degradation in the top ten tourism-based countries. This confirms that EPU impacts the environment through its economic activities, such as investment, stock market, and trade. Further, Qamruzzaman, (2022) found that EPU reduces the institutional quality in both countries (India &Pakistan) over a period of (2003:Q1 – 2019Q4).

Moreover, the literature has highlighted the impact of EPU on the firm level. For instance; (Phan et al., 2019) investigates the impact of EPU on cash holdings of US public companies from 1986-2015. During the uncertainty period, high-growth firms take precautionary measures by limiting their investments, which certainly leads to excess cash reserves. Similarly, Demir & Ersan, (2017), also found a positive impact of EPU on cash holdings in BRIC nations. Bonaime et al. (2018) investigated the relationship between EPU and mergers/acquisitions from 1985 to 2014. Policy uncertainty strongly impacts mergers and acquisitions at the country and firm levels. In addition, Jin et al., (2019) confirm the positive impact of EPU on stock price crash risk. Subsequently, firms have information asymmetry, and firms have disagreements with investors. Managers conceal bad news during economic uncertainty from investors, and thus, these firms are more prone to stock crashes. Gupta (2022) explores the impact of EPU on investment cash flow sensitivity in Indian firms; the study discloses that EPU has a positive effect on investment cash flow sensitivity and a negative impact on firm investment. Further, the CEO's educational background contributes to mitigating the negative impact of EPU on investment cash flow sensitivity. Since EPU makes external financing costly, it left internal cash flow as the only option.

3. Data & Methodology

3.1 Methods

The conventional theoretical framework of the energy-growth nexus encompasses variables such as FDI, trade openness, carbon emission and urbanization (Menon et al., 2023; Rehman & Rehman, 2022; Zameer et al., 2020) in India. However, this empirical study fails to consider the EPU cannel when analyzing the energy-growth relationship. This study employed the ARDL method to explore the influence of EPU on energy-growth nexus. The Autoregressive Distributed Lag (ARDL) methodology provides numerous methodological benefits in econometric analysis. Significantly, its adaptability is a crucial advantage as it can proficiently manage models consisting of both on-order 1(0) or (1) variables (Qamruzzaman, 2022). One of the crucial advantages of this approach is that it removes the requirement for pre-testing for unit roots or cointegration. This simplifies the modelling process and avoids potential problems in testing numerous hypotheses (Adedoyin & Zakari, 2020). Furthermore, ARDL exhibits strong and reliable performance despite scarce data, making it well-suited for analyzing economic research with a small sample size. Also, the capacity to capture both short and long-term correlations between variables enables a thorough comprehension of the complex dynamics that drive economic processes (Sharma & Paramati, 2021).

Following the Adedoyin, & Zakari, (2020), this study employs a single regression model to analyze the nexus among energy usage, economic policy uncertainty, and economic growth. The generalized empirical models can be expressed as follows.

$$lnGDP_t = \beta_0 + \beta_1 lnEU_t + \beta_2 lnMVA_t + \beta_3 TO_t + \varepsilon t$$
(1)

$$lnGDP_t = \beta_0 + \beta_1 lnEU_t + \beta_2 lnEPU_t + \beta_3 lnMVA_t + \beta_4 TO_t + \varepsilon t$$
(2)

$$lnGDP_t = \beta_0 + \beta_1 lnEU_t + \beta_2 lnEPU_t + \beta_3 lnEU * EPU_t + \beta_4 lnMVA_t + \beta_5 TO_t + \varepsilon t$$
(3)

Where, β 's are output elasticity energy consumption, economic policy uncertainty, interaction term (EPU*energy consumption), and supplementary potential variables. While subscripts t is the period and μ_t is the error term, respectively.



Figure 3. India News-Based Policy Uncertainty Index

Source: Economic Policy Uncertainty Index 3.2 Data and Descriptive Analysis

This paper's main aim is to discover the impact of EPU on energy-growth relationship, employing annual data for the empirical study from 1997 to 2022 for India. The selected time frame for this study depends on the data's availability, particularly the economic policy uncertainty index. The description of the data is provided in Table 1. GDP (constant 2010US\$), energy use (EU) is proxied by primary energy consumption (kg of oil equivalent per capita), EPU proxied as economic policy uncertainty index, converted into annual frequency. Manufacturing, value added proxied as manufacturing, value added (% of GDP), and trade openness proxied as the ratio of imports plus exports to GDP (% of GDP). The pattern of EPU data for India (see Fig.3).

The description of the descriptive analysis (see Table 2) reports that economic growth (GDP), energy use (EU), EPU, renewable consumption (RC), non-renewable consumption (NRC), trade -openness (TO) and manufacturing value-added (MVA) are positively trending on average of 27.585,3.059, 6.951, 3.673, 8.587, 3.159 and 2.748 respectively. The skewness analysis reveals a negative skewness for all variables except for EPU and renewable usage. Conversely, the kurtosis values indicate that the variables under study exhibit a positive leptokurtic distribution.

Variable	Notation	Definition	Source
Gross domestic product	GDP	GDP (constant 2010 US\$)	World Development Indicator (WDI)
Energy use	EU	Energy use (kg of oil equivalent per capita)	World Development Indicator (WDI)
Economic policy uncertainty	EPU	Economic Policy Uncertainty Index	Economic Policy Uncertainty Index
Non- Renewable consumption	NRE	Fossil fuel energy consumption (% of total)	BP Statistical Review
Renewable consumption	RC	Renewable energy consumption (% of total final energy consumption)	BP Statistical Review
Manufacturing value added	MVA	Manufacturing, value added (% of GDP)	World Development Indicator
Trade Openness	ТО	The ratio of imports plus exports to GDP (% of GDP)	World Development Indicator

Table 1: Variable Description

*Author calculation

Table 2: Descriptive Statistics

	GDP	EU	EPU	RC	NRC	ТО	MVA
Mean	27.858	3.059	6.951	3.673	8.587	3.159	2.748
Median	28.036	3.095	6.842	3.660	8.641	3.178	2.746
Minimum	26.754	2.460	6.387	3.483	8.010	3.068	2.648
Maximum	28.850	3.655	7.708	3.870	9.100	3.247	2.839
Standard Deviation	0.716	0.381	0.366	0.142	0.361	0.057	0.059
Skewness	-0.286	-0.088	0.329	0.074	-0.151	-0.235	-0.017
Kurtosis	1.612	1.603	2.197	1.419	1.572	1.656	2.229
Observations	26	26	26	26	26	26	26

4. Results and Discussion

4.1 Unit root

Prior to ARDL (Autoregressive Distributed Lag) method estimation, checking the stationarity of variables is essential, ensuring that selected variables must be either integrated at I (1) or both I (0), and I (1), respectively. Table 3 displays the unit-root test outcomes, crucial for verifying the data series' suitability for ARDL analysis. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests confirmed the presence of unit root except for energy use and EPU. However, the analysis based on the I (1) reject the null- hypothesis at a 1% level of significance, supporting the acceptance of the alternative hypotheses.

	ADF	Phillips-Perron
@ level		
GDP	3.23	4.90
EU	1.19***	1.60**
EPU	2.02**	1.95**
ТО	1.71	1.82
MVA		
@ First Difference		
GDP	5.68***	6.89***
EU	9.39***	15.10**
EPU	2.33***	6.60***
ТО	7.72**	6.34***
MVA	4.00***	8.89***

 Table 3: Unit Root Results

Note: 1%, 5% and 100% levels are indicated respectively by ***, ** and *

4.2 Bound test

Table 4 displays the results of the bound -test, indicating the existence of long-term equilibrium throughout the models. The F-statistic values surpass the upper thresholds of the t-statistic at (10%, /5%, and / 1%) levels of significance, confirming the long-term cointegration of the data series.

Table 4: Bon	d test results
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GDP=f(EU, TO, MVA)					
F-bounds test statistics		Null Hypothesis: No levels of relationships			
		Significance I (0)			
F-statistic	9.601	10%	2.45	3.52	
K	4	5%	2.86	4.01	
		1%	3.74	5.06	

GDP=f (EU, EPU, TO, MVA)

F-bounds test statistics		Null Hypothesis: No levels of relationships		
		Significance	I (0)	I (1)
F-statistic	8.454	10%	2.26	3.35
K	5	5%	2.62	3.79
		1%	3.41	4.68

		·		
F-bounds test statistics		Null Hypothesis: No levels of relationships		
		Significance	I (0)	I (1)
F-statistic	6.923	10%	2.12	3.23
K	6	5%	2.45	3.61
		1%	3.15	4.43

GDP=f (EU, TO, EPU, EU*EPU, MVA)

4.3 ARDL results

The autoregressive distributed lag (ARDL) results documented in Table 5 confirmed that average energy usage (1.868%) positively impacts economic growth (GDP). Since energy is a significant factor in economic activity, the need for energy activities escalates as economies expand. Energy growth engenders a surge in energy consumption as industries proliferate, and the need for energy-intensive activities acts as a fundamental catalyst for industrial activities that enhance productivity and contribute to increased industrial output (Raza et al., 2021; Salari et al., 2020). Similarly,1% increments in trade openness and manufacturing value-added led to increases of 0.290% and 0.190 % in economic growth in India. Furthermore, trade openness and manufacturing value-added enhance growth by facilitating efficient specialization and encouraging competitive advantages. Moreover, a country's manufacturing sector catalyzes technological progress and innovation (Vo et al., 2019).

Regarding the short-term analysis, the ECM coefficient aligns with expectations, exhibiting a negative value of -0.851. Short-term estimation reveals that previous GDP values positively impact GDP, leading to a reduction of 0.340% in this variable. Conversely, current energy use values strongly influence GDP, contributing to a growth increase of 0.103%. The results for model 2 confirm that energy consumption, trade openness, and manufacturing value-added significantly influence GDP by 1.499%, 0.541%, and 0.220% per year, respectively.

By contrast, in the long run, economic policy uncertainty adversely influences GDP, resulting in a 0.275% decrease in GDP. Similar results are discovered from past research (Ayad et al., 2022; Farooq et al., 2022; Wang et al., 2014).EPU often discourage businesses from committing to long-term investments. Thus, it impedes innovation research and development. Firms opt to postpone or scale back capital expenditure due to concerns about unpredictable government policies, uncertain regulatory environments, or unpredictable economic conditions. In addition, economic policy uncertainty contributes to increased fluctuations in financial markets, which heightened instability and makes investors and businesses more riskaverse, fostering a reluctance to engage in economic activities (Adams et al., 2020; Bhagat et al., 2016; Wang et al., 2020). Short-term stability is indicated by a negative Error Correction Term (ECT) score of -0.425, significant with a confidence level of 99%. The results further verify that the previous GDP value impacts its growth, leading to an annual increase of 0.453%. Energy usage and trade openness positively contributed to economic growth, with an average impact of 0.125% and 1.295%.

Furthermore, model 3 in Table 5 shows that energy use, trade openness, and manufacturing value-added positively impact GDP by 17.510%, 0.620%, and 0.362%, respectively. However, the coefficient of EPU negatively impacted GDP (0.0822%). Additionally, EPU moderates (12.28%) the relationship between energy-growth nexus. As EPU rises, policymakers may shift their focus towards promoting economic growth at the expense of environmental protection by utilizing less expensive fossil fuels, reflecting a prioritization of economic consideration (Farooq et al., 2022). Moreover, short-term results show that previous GDP values lead to a

0.560% growth in GDP. Similarly, economic policy uncertainty significantly reduces GDP levels by 0.285% annually. In addition, both energy use and interaction term EPU*EU positively affect economic growth, with 0.349% and 9.265%, respectively.

Variables	Model -1	Model -2	Model- 3
Long run results			
EU	1.868***	1.499**	17.510**
	0.187	0.475	7.690
EPU		-0.275**	-8.032***
		0.247	11.410
EU*EPU			12.28**
			74.61
ТО	0.290**	0.541**	0.620***
	1.163	3.245	17.68
MVA	0.192**	0.220**	0.392**
	-0.35	-1.064	-3.694
Short Run results			
ECT	-0.851**	-0.425***	-0.229***
	0.251	0.280	0.295
D.GDP	0.340**	0.453*	0.560**
	0.190	0.245	0.345
D. EU	0.103**	0.125***	0.349***
	0.557	0.492	2.195
D. TO	0.539**	1.298***	1.069
	1.026	0.984	1.117
D. MVA	0.448***	0.463	0.491***
	-0.39	0.358	0.361
D.EPU		-0.130***	-0.285**
		0.037	0.966
D.EU*EPU			9.265**
			6.669
Constant	13.51*	3.449**	13.101**
	4.869	5.83	9.143
Observations	25s	25	25
R-square	0.581	0.720	0.809
CUSM	Stable	Stable	Stable
CUSM Square	Stable	Stable	Stable

Table 5: ARDL results

Standard errors in parentheses **p*<0.05, ***p*<0.01, ****p*<0.001

In the last analysis, we conducted the Toda and Yamamoto causality test (see Table 6). The results disclose heterogeneous results for India. Energy use has one- way link with economic

growth, i.e. supporting the growth hypothesis in India. However, Economic policy uncertainty exhibits a uni-directional link between economic growth and energy use. Accordingly, regression results are supported by the causality that energy usage is crucial for economic growth in a developing country like India. Furthermore, the one-way causality from EPU to both energy use and economic growth supports that EPU in India induces cheap energy use to boost economic growth, which can offset the cascading effect of EPU in the long run.

Variables	Toda & Yamamoto test	Causality
Economic growth- Energy use	5.690 (0.231)	Not exist
Energy use - Economic growth	17.890(0.032) ***	Exist
EPU-Energy use	5.456(0.001) ***	Exist
Energy use - EPU	6.786 (0.234)	Not exist
EPU -Economic growth	1.234(0.037) **	Exist
Economic growth-EPU	3.234 (0.134)	Not exist

Table -6: Granger Causality

4.4 Robustness analysis

As a first robustness, this study utilized the alternative proxies to support the creditability of baseline results. Following (Fatai et al., 2021; K. Khan & Su, 2022; Korkut et al., 2023), energy use is re-estimated using renewable and non-renewable energy usage as a substitute for energy usage, which indicated that the estimated values for both energy proxies remained significant and displayed the same patterns as those reported in the baseline regression results (See table 7). This consistency of alternative proxy results supports the validity and robustness of the baseline regression, thereby strengthening the study's findings.

TADIC 7. ANDL ICSUITS	Table	7:	ARDL	results
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	Model -1	Model -2
Long-run results		
Non-Renewable Consumption	0.597**	
	3.496	
Non-Renewable cons.*EPU	0.698***	
	0.449	
Renewable Consumption		17.820*
		-7.001
Renewable Consumption *EPU		-2.702*
		0.975
Economic Policy Uncertainty	-0.403**	0.346
	3.982	3.501
Trade Openness	0.581**	10.49***
	3.224	-1.950
MVA	0.581**	0.696**
	0.709	1.608

Short run results		
ECT	-3.848	-0.347*
	-0.235	-0.161
D. Fossil cons.	0.491***	
	1.003	
D. fossil cons.*EPU	-0.269**	
	0.149	
D. renewable Cons.		0.602**
		2.973
D. renewable *	0.587***	
		0.391
D.TO	0.387**	0.423***
	0.981	1.091
D. Mva	0.439*	0.507*
	-0.352	-0.390
Constant	23.17	-23.76*
	-10.73	-9.375
Observation	25	25
R-square	0.792	0.771
CUSM	Stable	Stable
CUSM Square	Stable	Stable

Note: Standard errors in parentheses p < 0.05, p < 0.01, p < 0.01

4.4.1 Predictive Analytics Using Machine Learning Techniques

Past studies have used traditional methods to determine the relevant antecedents for prediction purposes. However, machine learning techniques are widely used in various domains, including finance, healthcare, marketing, economics, and so on, to solve real-life problem statements. In this work, we have used machine learning techniques, including multiple linear regression (MLR), random forest regressor (RFR), and gradient boost regressor (GBR) to predict the GDP based on the predicate variables. The dataset was used to train and test the considered models with hyperparameters to achieve better prediction results. We considered the following three machine-learning algorithms:

a) MLR is a statistical/machine learning method used to identify the relationship among the dataset's variables, particularly between two or more independent variables (predictors) and a dependent variable. The general form of multiple linear regression can be expressed mathematically by Eq. (4).

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \dots + \beta_n x_n + \varepsilon$$
(4)

where *Y* is the dependent variable, β is the intercept, and $\beta_1, \beta_2, \beta_3, \dots, \beta_n$ are the coefficients. Also, $x_1, x_2, x_3, \dots, x_n$ are independent variables, and ε is the error term between the actual and predicted value of *Y*.

b) RFR Model: The Random Forest algorithm is used for classification and regression tasks in machine learning. It consists of numerous decision trees, pooling and synthesizing

outcomes from various trees to produce the final prediction. One of its key strengths lies in its ability to mitigate overfitting by employing grid search to identify optimal hyperparameters, ensuring the construction of robust models. The prediction of the RFR model is presented mathematically by Eq. 5.

$$Y(x) = \frac{1}{\tau} \sum_{t=1}^{T} f_t(x)$$
 (5)

Here, Y(x) is the predicted output for input x, T denotes the number of decision trees, and $f_t(x)$ is the prediction of the *t*-th decision tree.

c) GBR: This approach involves training weak learners sequentially, gradually incorporating each estimator by adjusting their weights. The gradient boosting algorithm primarily predicts the residual errors of preceding estimators and endeavours to minimize the disparity between predicted and actual values. The objective function for the gradient boosting algorithm is expressed by Eq. 6.

$$L(\theta) = \min_{F} \sum_{i=1}^{N} l(y_i, Fmathbf(x_i))$$
(6)

where F is the ensemble model, n is the number of training examples, y_i is the true label of the i^{th} sample, l denotes the loss function, and $Fmathbf(x_i)$ is the output of the ensemble model on example $mathbf(x_i)$.

Histograms serve as a tool for visualizing and understanding the distribution of data samples. They can exhibit patterns such as uniform, normal, left-skewed, or right-skewed distributions. Figure 4 usually presents distributed histograms, organizing all attributes within their respective value ranges. The x-axis denotes the nature of the attribute, while the y-axis illustrates the attribute's values.



Fig 4: Distribution of the variables using histogram.

The training and testing accuracy of the considered models are shown in Figure 5. Among all the models, RFR achieved the highest accuracy rate of 100% and 98.80% for training and
testing, respectively. It also attained the lowest error metrics (MAE, MSE, RMSE), indicating the best predictive models for GDP prediction. While the GBR model achieved the lowest accuracy rate of 95. 10% and 94.10% for training and testing, respectively.



Fig 5: Training and testing accuracies of the considered model.

To calculate the predicate variables' contribution towards the GDP prediction, we employed the Feature Significance Score (F1-score). Figure 6 illustrates the contributions of each predictor variable to GDP prediction. Notably, carbon emissions (CO2), economic policy uncertainty (EPU), and energy use (EU) emerge as the most influential factors. In contrast, other factors, such as renewable consumption (RC) and trade openness (TO), are the least contributors to GDP prediction. Notably, none of the variables exhibits zero contribution across all algorithms. Hence, no feature elimination was made.



Fig 6: Contribution of predicate variables towards the prediction of GDP

5. Discussion and Conclusion

Examining the connection between EPU, energy usage, and economic growth in India provides new perspectives on environmental policy for developing economies. This paper studies how economic policy uncertainty impacts the energy-growth relationship, using ARDL methodology from 1997-2022 to ascertain the long-run relationship and ECT for the short-run

relationship. Furthermore, this study employs machine learning (ML) techniques, Multiple linear regression (MLR), Radom Forest Regressor (RFR), and Gradient Boosting Regressor (GBR) to predict GDP based on various predictor variables. These results support that EPU is negatively related to GDP growth in both the short /long run. The reluctance of investors and businesses to make substantial commitments amidst uncertain policy environments led to delayed investments and decreased consumer confidence.

Additionally, energy usage primarily induces Indian economic growth, indicative of its role in fostering industrial activities and productivity. Moreover, EPU moderated the relationship energy-growth nexus, suggesting that using affordable fossil energy as a strategic way to lift economic growth via enhancing productivity and industrial operations can offset the adverse impact of EPU. Additionally, the results from the causality test confirm that energy use induces economic growth in India and further confirm the one-way causality from EPU to economic growth and energy use. Moreover, Feature significance (F1-score) is used to assess the contribution of predictor variables to GDP prediction. The results demonstrate that only carbon emission, economic policy uncertainty and energy use emerge as influential factors. Considering these findings, Indian policymakers can boost energy security and mitigate the adverse effects by aggressively encouraging and shifting towards clean energy sources. This strategic energy transition can help accomplish SDG7, promote an environmentally friendly business environment, and attract foreign investments, reinforcing India's standing in the worldwide shift towards clean energy. Additionally, policymakers should actively work towards minimizing uncertainty by anticipating potential changes in the regulatory policy, e.g., environment, fiscal and monetary policies towards promoting sustainable development SDG-8.

This study, while providing valuable insights into the EPU-energy-growth nexus in India, is subject to certain limitations. The reliance on aggregate national-level data may mask regional heterogeneities and variations in energy consumption patterns. Furthermore, the study's scope, focusing primarily on linear relationships, may not fully capture the complexities of the interplay between these variables. Future research could explore these dynamics at a disaggregated level, potentially incorporating nonlinear modeling techniques and considering the role of specific policy interventions. Investigating the impact of different types of EPU (e.g., related to trade, fiscal policy, or environmental regulations) on the energy-growth nexus would also be a valuable extension. Finally, comparative studies with other developing economies could offer broader perspectives and identify best practices for navigating the challenges of EPU and achieving sustainable development goals.

References:

- Abbasi, K. R., & Adedoyin, F. F. (2021). Do energy use and economic policy uncertainty affect CO 2 emissions in China ? Empirical evidence from the dynamic ARDL simulation approach. 23323–23335.
- Acheampong, A. O., Boateng, E., Amponsah, M., & Dzator, J. (2021). Revisiting the economic
growth–energy consumption nexus: Does globalization matter? Energy
Economics, 102(December 2020), 105472.
https://doi.org/10.1016/j.eneco.2021.105472
- Adams, S., Adedoyin, F., Olaniran, E., & Victor, F. (2020). Energy consumption, economic policy uncertainty and carbon emissions; causality evidence from resource rich economies. Economic Analysis and Policy, 68, 179–190. https://doi.org/10.1016/j.eap.2020.09.012
- Adebayo, T. S. (2021). Can CO 2 emissions and energy consumption determine the economic performance of South Korea ? A time series analysis. 38969–38984.

- Adedoyin, F. F., & Zakari, A. (2020). Energy Consumption, Economic Expansion, and CO2 Emission in the UK: The Role of Economic Policy Uncertainty. Science of the Total Environment, 738, 14001, 1–45.
- Adedoyin, F. F. (2021). An investigation into the anthropogenic nexus among consumption of energy, tourism, and economic growth: do economic policy uncertainties matter? 2835–2847.
- Ahmad, A., Zhao, Y., Shahbaz, M., Bano, S., Zhang, Z., Wang, S., & Liu, Y. (2016). Carbon emissions, energy consumption and economic growth: An aggregate and disaggregate analysis of the Indian economy. Energy Policy, 96(March 2019), 131–143. https://doi.org/10.1016/j.enpol.2016.05.032
- Ahmed, Z. (2019). Investigating the impact of human capital on the ecological footprint in India : An empirical analysis. 26782–26796.
- Al-mulali, U., & Che Sab, C. N. B. (2018). The impact of coal consumption and CO2emission on economic growth. Energy Sources, Part B: Economics, Planning and Policy, 13(4), 218–223. https://doi.org/10.1080/15567249.2012.661027
- Al-thaqeb, S. A., & Ghanim, B. (2019). The Journal of Economic Asymmetries Economic policy uncertainty : A literature review. The Journal of Economic Asymmetries, 20(July), e00133. https://doi.org/10.1016/j.jeca.2019.e00133
- Alper, A., & Oguz, O. (2016). The role of renewable energy consumption in economic growth : Evidence from asymmetric causality. Renewable and Sustainable Energy Reviews, 60, 953–959. https://doi.org/10.1016/j.rser.2016.01.123
- Alshehry, A. S., & Belloumi, M. (2015). Energy consumption, carbon dioxide emissions and economic growth: The case of Saudi Arabia. Renewable and Sustainable Energy Reviews, 41, 237–247. https://doi.org/10.1016/j.rser.2014.08.004
- Anser, M. K., Syed, Q. R., Lean, H. H., Alola, A. A., & Ahmad, M. (2021). Do Economic Policy Uncertainty and Geopolitical Risk Lead to Environmental Degradation? Evidence from Emerging Economies.
- Apergis, E., Apergis, N., & Apergis, E. (2021). The impact of COVID-19 on economic growth : evidence from a Bayesian Panel Vector Autoregressive (BPVAR) model ABSTRACT. Applied Economics, 53(58), 6739–6751. https://doi.org/10.1080/00036846.2021.1946479
- Apergis, N., & Foon, C. (2013). Is the energy-led growth hypothesis valid? New evidence from a sam- ple of 85 countries. Energy Economics, 38, 24–31. https://doi.org/10.1016/j.eneco.2013.02.007
- Ayad, H., Eddin, S., Hassoun, S., Usman, M., & Ahmad, P. (2022). The impact of economic uncertainty, economic growth and energy consumption on environmental degradation in MENA countries : Fresh insights from multiple thresholds NARDL approach. 0123456789. https://doi.org/10.1007/s11356-022-22256-w
- Baker, S. R., Bloom, N., Davis, S. J., Boehnke, J., Dashkeyev, V., Deriy, O., Dinh, E., Ezure, Y., Gong, R., Kim, R., Klosin, S., Koh, J., Lajewski, P., Nebiyu, D., Sachs, R., Shibata, I., Stephenson, C., Takeda, N., Tan, M., ... Kashyap, A. (2016). Measuring Economic Policy Uncertainty. March.
- Baker, S. R., Bloom, N., Davis, S. J., Dashkeyev, V., Deriy, O., Dinh, E., Ezure, Y., Gong, R., Jindal, S., Kim, R., Klosin, S., Koh, J., Lajewski, P., Sachs, R., Shibata, I., Stephenson, C., & Takeda, N. (2016). OF ECONOMICS. 131(November), 1593– 1636. https://doi.org/10.1093/qje/qjw024.Advance
- Baz, K., Xu, D., Minua, G., Ampofo, K., Ali, I., Khan, I., Cheng, J., & Ali, H. (2019). Energy consumption and economic growth nexus : New evidence from Pakistan using asymmetric analysis. xxxx.
- Behera, J. (2015). Examined the energy-led growth evidence from time series analysis

hypothesis in India: Contribution / Originality. 2(4), 46–65. https://doi.org/10.18488/journal.82/2015.2.4/82.4.46.65

- Belloumi, M. (2015). Investigating the causal relationship between transport infrastructure, transport energy consumption and economic growth in Tunisia. October. https://doi.org/10.13140/RG.2.1.2310.7040
- Bhagat, S., Ghosh, P., & Rangan, S. (2016). Economic Policy Uncertainty and Growth in India. 51(35), 72–81.
- Bhattacharya, S., Bhattacharya, M., & Rafi, S. (2015). The role of technology on the dynamics of coal consumption economic growth: New evidence from China Related papers.
- Bhowmik, R., Syed, Q. R., & Apergis, N. (2022). Applying a dynamic ARDL approach to the Environmental Phillips Curve (EPC) hypothesis amid monetary, fiscal, and trade policy uncertainty in the USA. 14914–14928.
- Bildirici, M. E., & Bakirtas, T. (2014). The relationship among oil, natural gas and coal consumption and economic growth in BRICTS (Brazil, Russian, India, China, Turkey and South Africa) countries. Energy, 65, 134–144. https://doi.org/10.1016/j.energy.2013.12.006
- Bloom, N. (2009). THE IMPACT OF UNCERTAINTY SHOCKS.
- Bonaime, A., Gulen, H., & Ion, M. (2018). Does policy uncertainty affect mergers and acquisitions? Journal of Financial Economics, 129(3), 531–558. https://doi.org/10.1016/j.jfineco.2018.05.007
- Bordo, M. D., & Meissner, C. M. (2009). FOREIGN CURRENCY DEBT, FINANCIAL CRISES AND ECONOMIC GROWTH: A LONG RUN VIEW.
- Caggiano, G., Castelnuovo, E., & Manuel, J. (2017). Economic policy uncertainty and unemployment in the United States : A nonlinear approach. Economics Letters, 151, 31–34. https://doi.org/10.1016/j.econlet.2016.12.002
- Carfora, A., Pansini, R. V., & Scandurra, G. (2019). The causal relationship between energy consumption, energy prices and economic growth in Asian developing countries: A replication. Energy Strategy Reviews, 23(December 2018), 81–85. https://doi.org/10.1016/j.esr.2018.12.004
- Chandran Govindaraju, V. G. R., & Tang, C. F. (2013). The dynamic links between CO2 emissions, economic growth and coal consumption in China and India. Applied Energy, 104, 310–318. https://doi.org/10.1016/j.apenergy.2012.10.042
- Chaudhary, M., Sodani, P. R., & Das, S. (2020). Effect of COVID-19 on Economy in India: Some Reflections for Policy and Programme. https://doi.org/10.1177/0972063420935541
- Chukwudi, M., & Edwin, U. (2022). Investigating the moderating role of economic policy uncertainty in environmental Kuznets curve for South Africa : Evidence from the novel dynamic ARDL simulations approach. In Environmental Science and Pollution Research. Springer Berlin Heidelberg. https://doi.org/10.1007/s11356-022-21107-y
- Čižmešija, M., Lolić, I., & Sorić, P. (2017). Economic policy uncertainty index and economic activity: What causes what? Croatian Operational Research Review, 8(2), 563–575. https://doi.org/10.17535/crorr.2017.0036
- Countries, S. A. (2009). FDI, Growth and the Asian Financial Crisis: The Experience of. February 2007, 22–23. https://doi.org/10.1111/j.1467-9701.2009.01202.x
- Danish, Zhang, B., Wang, Z., & Wang, B. (2018). Energy production, economic growth and CO2 emission: evidence from Pakistan. Natural Hazards, 90(1), 27–50. https://doi.org/10.1007/s11069-017-3031-z
- Demir, E., & Ersan, O. (2017). Economic policy uncertainty and cash holdings: Evidence from

BRIC countries. Emerging Markets Review, 33, 189–200. https://doi.org/10.1016/j.ememar.2017.08.001

- Destek, M. A. (2016). Renewable energy consumption and economic growth in newly industrialized countries: Evidence from asymmetric causality test. Renewable Energy, 95, 478–484. https://doi.org/10.1016/j.renene.2016.04.049
- Doğan, E., & Güler, C. (2021). How economic policy uncertainty affect carbon emissions: A case of G-7 countries. Journal of Economics and Business Issues, 1(1), 33-38.
- Erzurumlu, Y. O., & Gozgor, G. (2022). Effects of economic policy uncertainty on energy demand : evidence from 72 countries. Journal of Chinese Economic and Business Studies, 20(1), 23–38. https://doi.org/10.1080/14765284.2021.2009999
- Fang, Z., & Chang, Y. (2016). Energy, human capital and economic growth in Asia Pacific countries—Evidence from a panel cointegration and causality analysis. Energy Economics, 56, 177-184.
- Farooq, U., Gillani, S., Haider, B., Muhammad, S., & Shafiq, N. (2022). Economic policy uncertainty and environmental degradation: the moderating role of political stability. Environmental Science and Pollution Research, 0123456789. https://doi.org/10.1007/s11356-022-23479-7
- Fatai, F., Ozturk, I., Oluwatoyin, M., Agboola, P. O., & Victor, F. (2021). The implications of renewable and non-renewable energy generating in Sub-Saharan Africa : The role of economic policy uncertainties. Energy Policy, 150(December 2020), 112115. https://doi.org/10.1016/j.enpol.2020.112115
- Foon, C., Wah, B., & Ozturk, I. (2016). Energy consumption and economic growth in Vietnam. Renewable and Sustainable Energy Reviews, 54, 1506–1514. https://doi.org/10.1016/j.rser.2015.10.083
- Ghosh, S., & Kanjilal, K. (2014). Long-term equilibrium relationship between urbanization, energy consumption and economic activity: Empirical evidence from India. Energy, 66, 324–331. https://doi.org/10.1016/j.energy.2013.12.052
- Gilchrist, S., Sim, J. W., & Zakrajšek, E. (2014). Uncertainty, financial frictions, and investment dynamics (No. w20038). National Bureau of Economic Research.
- Gu, X., Cheng, X., Zhu, Z., & Deng, X. (2021). Economic policy uncertainty and China's growth-at-risk. Economic Analysis and Policy, 70(16), 452–467. https://doi.org/10.1016/j.eap.2021.03.006
- Gupta, G. (2022). CEO's educational background, economic policy uncertainty and investment-cash flow sensitivity: evidence from India. Applied Economics, 54(5), 568–579. https://doi.org/10.1080/00036846.2021.1967279
- Hussain, H. I., Salem, M. A., Rashid, A. Z. A., & Kamarudin, F. (2019). Environmental impact of sectoral energy consumption on economic growth in malaysia: Evidence from ARDL bound testing approach. Ekoloji, 28(107), 199–210.
- Jiang, Y. (2018). visiting the economic policy uncertainty shocks economic growth relationship: wavelet- based granger-causality in quantiles approach. 2, 80–94.
- Jin, X., Chen, Z., & Yang, X. (2019). Economic policy uncertainty and stock price crash risk. Accounting and Finance, 58(5), 1291–1318. https://doi.org/10.1111/acfi.12455
- Khan, I., Hou, F., Irfan, M., Zakari, A., & Phong, H. (2021). Does energy trilemma a driver of economic growth? The roles of energy use, population growth, and financial development. Renewable and Sustainable Energy Reviews, 146(April), 111157. https://doi.org/10.1016/j.rser.2021.111157
- Khan, K., & Su, C. W. (2022). Does policy uncertainty threaten renewable energy? Evidence from G7 countries. Environmental Science and Pollution Research, 29(23), 34813-34829.
- Khanh, L., Buhari, C., Emmanuel, D., Aikins, J., Sudeshna, A., & Mesut, G. (2022). Impact of

economic policy uncertainty, geopolitical risk, and economic complexity on carbon emissions and ecological footprint: an investigation of the E7 countries. Environmental Science and Pollution Research, 0123456789. https://doi.org/10.1007/s11356-022-24682-2

- Kongkuah, M., Yao, H., & Yilanci, V. (2021). The relationship between energy consumption, economic growth, and - CO 2 emissions in China: the role of urbanization and international trade. Environment, Development and Sustainability, 0123456789. https://doi.org/10.1007/s10668-021-01628-1
- Korkut, U., Adewale, A., Erdogan, S., & Kartal, T. (2023). The influence of income, economic policy uncertainty, geopolitical risk, and urbanization on renewable energy investments in G7 countries United States of America. Energy Economics, 128(October), 107172. https://doi.org/10.1016/j.eneco.2023.107172
- Lei, Y., Li, L., & Pan, D. (2014). Study on the relationships between coal consumption and economic growth of the six biggest coal consumption countries : with coal price as a third variable. 61, 624–634. https://doi.org/10.1016/j.egypro.2014.11.1185
- Li, R., & Leung, G. C. K. (2012). Coal consumption and economic growth in China. Energy Policy, 40(1), 438–443. https://doi.org/10.1016/j.enpol.2011.10.034
- Lin, F. L., Inglesi-Lotz, R., & Chang, T. (2018). Revisit coal consumption, CO2 emissions and economic growth nexus in China and India using a newly developed bootstrap ARDL bound test. Energy Exploration and Exploitation, 36(3), 450–463. https://doi.org/10.1177/0144598717741031
- Marion, J. A. N. (1991). POLICY UNCERTAINTY, PERSISTENCE AND GROWTH.
- Menon, B. G., Sahadev, S., & Mahanty, A. (2023). Trivariate causality between economic growth, energy consumption, and carbon emissions: empirical evidence from India. Energy Efficiency. https://doi.org/10.1007/s12053-023-10118-4
- Odugbesan, J. A., & Rjoub, H. (2020). Relationship Among Economic Growth, Energy Consumption, CO2 Emission, and Urbanization: Evidence From MINT Countries. SAGE Open, 10(2). https://doi.org/10.1177/2158244020914648
- Ohlan, R. (2016). Renewable and nonrenewable energy consumption and economic growth in India. Energy Sources, Part B: Economics, Planning and Policy, 11(11), 1050– 1054. https://doi.org/10.1080/15567249.2016.1190801
- Omri, A. (2017). An international literature survey on energy-economic growth nexus : Evidence from country-specific studies An international literature survey on energy-economic growth nexus : Evidence from country-specific studies. 82452, 0– 23.
- Ozcan, B., & Ozturk, I. (2019). Renewable energy consumption-economic growth nexus in emerging countries: A bootstrap panel causality test. Renewable and Sustainable Energy Reviews, 104(January), 30–37. https://doi.org/10.1016/j.rser.2019.01.020
- Park, S. Y., & Yoo, S. H. (2014). The dynamics of oil consumption and economic growth in Malaysia. Energy Policy, 66, 218–223. https://doi.org/10.1016/j.enpol.2013.10.059
- Pejović, B., Karadžić, V., Dragašević, Z., & Backović, T. (2021). Economic growth, energy consumption and CO 2 emissions in the countries of the European Union and the Western Balkans. Energy Reports, 7, 2775–2783. https://doi.org/10.1016/j.egyr.2021.05.011
- Phan, H. V., Nguyen, N. H., Nguyen, H. T., & Hegde, S. (2019). Policy uncertainty and firm cash holdings. Journal of Business Research, 95(September 2018), 71–82. https://doi.org/10.1016/j.jbusres.2018.10.001
- Phukon, M. A., & Konwar, M. M. (2019). An Empirical Investigation of the Causal Relationship amongst Energy Consumption, Net Fixed Capital Stock and

Economic Growth in India. The International Journal of Social Sciences and Humanities Invention, 6(5), 5449–5454. https://doi.org/10.18535/ijsshi/v6i5.08

- Qamruzzaman, M. (2022). Nexus between Economic Policy Uncertainty and Institutional Quality: Evidence from Indian and Pakistan. Macroeconomics and Finance in Emerging Market Economies, 00(00), 1–20. https://doi.org/10.1080/17520843.2022.2026035
- Rahman, M., & Velayutham, E. (2020). Renewable and non-renewable energy consumptioneconomic growth nexus: New evidence from South Asia. Renewable Energy, 147(2020), 399–408. https://doi.org/10.1016/j.renene.2019.09.007
- Rani, R., & Kumar, N. (2019). Investigating the Presence of Environmental Kuznets Curve Hypothesis in India and China: An Autoregressive Distributive Lag Approach. Jindal Journal of Business Research, 8(2), 194–210. https://doi.org/10.1177/2278682119880510
- Raza, K., Shahbaz, M., Jiao, Z., & Tufail, M. (2021). How Energy Consumption, Industrial Growth, Urbanization, and CO2 Emissions Affect Economic Growth in Pakistan? A Novel Dynamic ARDL Simulations Approach How energy consumption, industrial growth, urbanization, and CO2 emissions affect economic gro. Energy, 221(January), 119793. https://doi.org/10.1016/j.energy.2021.119793
- Rehman, E., & Rehman, S. (2022). Modeling the nexus between carbon emissions, urbanization, population growth, energy consumption, and economic development in Asia: Evidence from grey relational analysis. Energy Reports, 8, 5430–5442. https://doi.org/10.1016/j.egyr.2022.03.179
- Ren, Y., Guo, Q., Zhu, H., & Ying, W. (2020). The effects of economic policy uncertainty on China's economy: evidence from time-varying parameter FAVAR. Applied Economics, 52(29), 3167–3185. https://doi.org/10.1080/00036846.2019.1707475
- Salari, M., Javid, R. J., & Noghanibehambari, H. (2020). The nexus between CO2 emissions, energy consumption, and economic growth in thUS Economic Analysis and Policy. https://doi.org/10.1016/j.eap.2020.12.007
- Salisu, A. A., & Ogbonna, A. E. (2019). Another look at the energy-growth nexus: New insights from MIDAS regressions. Energy, 174, 69-84.
- Shaari, M. S., Hussain, N. E., & Ismail, M. S. (2013). Relationship between Energy Consumption and Economic Growth : Empirical Evidence for Malaysia. Business System Review, 2(1). https://doi.org/10.7350/BSR.B02.2013
- Shahbaz, M., Raghutla, C., Chittedi, K. R., Jiao, Z., & Vo, X. V. (2020). The effect of renewable energy consumption on economic growth: Evidence from the renewable energy country attractive index. Energy, 207, 118162. https://doi.org/10.1016/J.ENERGY.2020.118162
- Sharma, C., & Paramati, S. R. (2021). Does economic policy uncertainty dampen imports? Commodity-level evidence from India. Economic Modelling, 94(September 2020), 139–149. https://doi.org/10.1016/j.econmod.2020.09.019
- Shastri, S., Mohapatra, G., & Giri, A. K. (2020). Economic growth, renewable and nonrenewable energy consumption nexus in India: Evidences from nonlinear ARDL approach and asymmetric causality analysis. International Journal of Energy Sector Management, 14(4), 777–792. https://doi.org/10.1108/IJESM-06-2019-0016
- Ssebabi, G., Odongo, T., & Francis, N. (2021). A survey of literature on energy consumption and economic growth. Energy Reports, 7, 9150–9239. https://doi.org/10.1016/j.egyr.2021.10.107
- Su, C., Huang, S., Qin, M., & Umar, M. (2021). Does crude oil price stimulate economic policy uncertainty in BRICS? Pacific-Basin Finance Journal, 66(September 2020),

101519. https://doi.org/10.1016/j.pacfin.2021.101519

- Udi, J., Bekun, F. V., & Adedoyin, F. F. (2020). Modeling the nexus between coal consumption, FDI inflow and economic expansion: does industrialization matter in South Africa? Environmental Science and Pollution Research, 27(10), 10553–10564. https://doi.org/10.1007/s11356-020-07691-x
- Usman, M., Kousar, R., Makhdum, M. S. A., Yaseen, M. R., & Nadeem, A. M. (2022). Do financial development, economic growth, energy consumption, and trade openness contribute to increase carbon emission in Pakistan? An insight based on ARDL bound testing approach. Environment, Development and Sustainability, 0123456789. https://doi.org/10.1007/s10668-021-02062-z
- Victor, F., & Asumadu, S. (2019). Science of the Total Environment Another look at the relationship between energy consumption, carbon dioxide emissions, and economic growth in South Africa. 655, 759–765. https://doi.org/10.1016/j.scitotenv.2018.11.271
- Vo, Vo, & Le. (2019). CO2 Emissions, Energy Consumption, and Economic Growth: New Evidence in the ASEAN Countries. Journal of Risk and Financial Management, 12(3), 145. https://doi.org/10.3390/jrfm12030145
- Waleed, A., Akhtar, A., & Pasha, A. T. (2018). Oil consumption and economic growth: Evidence from Pakistan. Energy Sources, Part B: Economics, Planning and Policy, 13(2), 103–108. https://doi.org/10.1080/15567249.2017.1354100
- Wang, C., & Cao, Y. (2021). Forecasting Chinese economic growth, energy consumption, and urbanization using two novel grey multivariable forecasting models *. Journal of Cleaner Production, 299, 126863. https://doi.org/10.1016/j.jclepro.2021.126863
- Wang, Q., Xiao, K., & Lu, Z. (2020). Does economic policy uncertainty affect CO2 emissions? Empirical evidence from the United States. Sustainability, 12(21), 9108.
- Wang, Y., Chen, C. R., & Sophie, Y. (2014). Economic policy uncertainty and corporate investment : Evidence from China ★. Pacific-Basin Finance Journal, 26, 227–243. https://doi.org/10.1016/j.pacfin.2013.12.008
- Wei, W., Hu, H., & Chang, C. P. (2021). Economic policy uncertainty and energy production in China. Environmental Science and Pollution Research, 28(38), 53544-53567.
- Wen, J., Khalid, S., Mahmood, H., & Yang, X. (2022). Economic policy uncertainty and growth nexus in Pakistan: a new evidence using NARDL model. Economic Change and Restructuring, 55(3), 1701–1715. https://doi.org/10.1007/s10644-021-09364-2
- Yu, J., Shi, X., Guo, D., & Yang, L. (2021). Economic policy uncertainty (EPU) and firms' carbon emissions: Evidence using a China provincial EPU index. Energy Economics, 105071. https://doi.org/10.1016/j.eneco.2020.105071
- Zakari, A., Adedoyin, F. F., & Bekun, F. V. (2021). The effect of energy consumption on the environment in the OECD countries : economic policy uncertainty perspectives. 52295–52305.
- Zameer, H., Yasmeen, H., Zafar, M. W., Waheed, A., & Sinha, A. (2020). Analyzing the association between innovation, economic growth, and environment: divulging the importance of FDI and trade openness in India. 29539–29553.
- Zhi-Guo, L., Cheng, H., & Dong-Ming, W. (2018). Empirical research on the relationship between natural gas consumption and economic growth in the Northeast Asia. Energy and Environment, 29(2), 216–231. https://doi.org/10.1177/0958305X17745273

Mind Over Money: The Influence of Psychological Dynamics in Shaping Retirement Planning Behaviour among Salaried Employees

¹Dr. Tarsem Lal

<u>Abstract</u>

This study explores how psychological factors, including attitude, future time perspective, locus of control, risk tolerance, and goal clarity, influence retirement planning behaviour among salaried employees. Using structured questionnaires, primary data was collected from 306 salaried employees across three universities in the Jammu region of the Union Territory and Jammu and Kashmir. The data were analyzed using Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), One-way Analysis of Variance (ANOVA), and t-tests. The findings reveal that psychological factors significantly and directly impact retirement planning behaviour. However, the study is limited to three universities due to time and resource constraints. Future research could expand to universities across Jammu and Kashmir and other sectors such as banking and insurance. This research offers novel insights into retirement planning by highlighting the crucial role of psychological factors in shaping salaried employees' behaviour. The findings have implications for employers, government agencies, researchers, practitioners, and policymakers, providing valuable guidance for initiatives aimed at improving retirement planning awareness and effectiveness.

Keywords: *Retirement, salaried employees, goal clarity, attitude, psychological factors*

Introduction and Review of Literature:

The career journey of employees, whether in the government or private sector, concludes with the inevitable event known as retirement. Retirement planning is when an individual withdraws from their occupational position (Kim & Feldman, 2000). Ideally, this planning is a life-long endeavour and is most effective when initiated at a younger age (Robison & Moen, 2000). Retirement is complex, necessitating a broad perspective for comprehensive understanding. Thorp et al. (2013) argue that while retirement is a future event, its planning must occur in the present to ensure sufficient savings for the future. Retirement planning involves financial strategies such as saving, investing, and distributing money to sustain oneself during retirement (Kilty and Behling, 1986). It can encompass various schemes like pension funds, medical insurance, and real estate investments (Batra, 2013; Lal & Singh, 2022).

The attitude of employees towards retirement significantly influences their decisions and preparedness for this phase. Retirement must be perceived as a personal experience, a process involving withdrawal from work, and a societal institution that shapes the perception that older employees should make way for younger counterparts due to the perception that older individuals are less competent and efficient. Employees who neglect retirement saving plans are often unaware of post-retirement economic and financial aspects, while some individuals commence retirement planning at a younger age. The attitude towards retirement is substantially influenced by economic factors, such as having pensions, Medicare plans, and social security programs, contributing to a more positive attitude and better retirement

¹ Professor, Department of Commerce, University of Jammu, Jammu-180006

preparedness. Employees with significant savings during their old age view retirement more positively, as they are shielded from economic challenges in their post-retirement life. Financial literacy enhances the efficiency of employees in planning for their future.

Several forces, including taxation policies, life expectancy, income levels, and savings, influence an employee's ability to accumulate wealth for retirement. Additionally, age and gender significantly affect retirement planning behaviour. Research by Lusardi and Mitchell (2007) indicates that employees who actively plan for retirement tend to accumulate more wealth compared to those who do not plan. Encouraging individuals to plan for their post-retirement life is crucial for ensuring a content and fulfilling retirement. Thus, retirement planning is pivotal to every employee's life journey.

Research Gap

In this study, a review of existing research reveals diverse areas researchers explored in retirement planning. Financial literacy and retirement planning have been subjects of investigation by Almenberg & Save-Soderbergh (2011), Lusardi et al. (2011), Agnew & Thorp (2012), Lusardi & Mitchell (2007), and Mullock & Turcotte (2012). Some researchers have delved into the determinants of retirement planning and employee attitudes towards it, such as Grable & Lytton (1997), Heenkenda (2016), Loibl et al. (2009), Joo & Pauwels (2002), Bett et al. (2015), and Mustafa et al. (2017). Gender differences in preferences related to retirement planning have been explored by Croson & Gneezy (2009), Doda (2014), Kissau et al. (2012), and Richardson (1999). Studies on the psychological foundations of financial planning for retirement and psychosocial factors in retirement intentions and adjustment have been conducted by Hershey et al. (2007) and Topa & Alcover (2015), while late-career decisionmaking has been examined by Furunes et al. (2015).

Conceptual studies have touched on various aspects, including the perception of individuals towards retirement planning (Soni et al., 2017), the perception of tax concessions in retirement savings decisions (Jordan & Treisch, 2010), the influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviours (Jacobs-Lawson & Hershey, 2005; Moorthy et al., 2012). Few empirical studies based on secondary data have been conducted by Natoli (2018), Hershey et al. (2010), Kock & Yoong (2011), Power & Hira (2004), Stromback et al. (2017), Turner et al. (2005), and Zappala et al. (2008). However, these studies exhibit limited geographical coverage and focus on specific retirement planning aspects among salaried employees.

The literature indicates a noticeable shift in employee preferences towards saving for the future, driven by factors such as tax savings, fund safety, and improved living standards post-retirement (Jordan & Treisch, 2010). This changing attitude necessitates a thorough exploration of demographic and socio-economic variables influencing employee behaviour regarding life after retirement. Furthermore, understanding the psychological factors contributing to this shift in saving patterns worldwide is crucial. Importantly, there is a gap in empirically tested relationships between psychological factors and retirement planning. Therefore, there is a compelling need for a systematic and comprehensive study to evaluate the impact of psychological factors on the retirement planning behaviour of salaried employees, addressing the gaps identified in the existing literature.

The objectives of this study are:

• **Impact of Psychological Factors:** Explore and analyze the influence of psychological factors on the retirement planning behaviour of salaried employees, focusing on how attitudes, beliefs, and cognitive processes shape decisions and actions related to retirement planning.

• **Perception Differences:** Examine significant differences in the perception of retirement planning among salaried employees by understanding variations in perspectives, attitudes, and awareness regarding its importance and approaches within the employee population.

Hypotheses Formulation:

Psychological factors that influence the retirement planning behaviour of salaried employees are attitude toward retirement, future time perspective, locus of control, financial risk tolerance, and clarity of retirement goals. In a narrow sense, attitude refers to one's perception of any object, person, or idea. It means outlook toward life and many other aspects of life. It also influences an individual's retirement planning behaviour. Studies by Moorthy et al., 2012 Tomar et al. 2021; Turner et al., 1994; Noone et al., 2010 Lal & Singh, 2022 and Gordon (1994) concluded that perception towards retirement is directly and positively associated with planning regarding retirement. Future time perspective is another psychological factor that affects planning regarding retirement. It identifies the extent to which a person can visualize the future period. Hershey et al. (2010) and Griffin et al. (2012) observed that some people are less involved in future planning activities because they are more focused on getting the current reward than saving for the future. Locus of control is another psychological factor influencing retirement planning. It is a characteristic of an individual by which he/she associates his/her success or failure to either himself/or some external factor. Depending on the nature of the association, there could be internal locus of control as well as external locus of control. People with an external locus of control believe fate, luck, and destiny govern their lives.

In contrast, people with an internal locus of control perceive their lives positive and negative events as consequences of their own actions. Glass and Kilpatrick (1998) concluded that women show more external locus of control. Stawski et al. (2007) and Hershey et al. (2007) found that goal clarity is another psychological factor affecting employees' retirement planning behaviour. Thus, it is hypothesized that:

- H1: Psychological factors like attitude, future time perspective, locus of control, risk tolerance, and goal clarity have a direct and significant impact on the retirement planning of salaried employees.
- H2: Significant variations exist among salaried employees in their approach to retirement planning.

Research Design and Methodology:

Objective: The primary objective of this study is to assess the impact of psychological factors on the retirement planning behaviour of salaried employees, specifically focusing on those working in the higher education sector in the Jammu region.

Sampling and Sector Selection:

- Pilot Survey: Initially, a pilot survey was conducted in three sectors: higher education, banking, and insurance. Due to a low response rate in the banking and insurance sectors, the higher education sector in Jammu was selected for the main study.
- Final Sample: The study focuses on Assistant Professors, Associate Professors, Professors, and Librarians in three universities: the University of Jammu, Cluster University of Jammu, and Central University of Jammu. The final sample comprises 306 respondents, with an effective response rate of 79.27%.

Data Collection:

- Primary Data: Data was collected through a structured questionnaire, which was distributed to employees in the higher education sector.
 - Sampling Technique: Purposive sampling was employed to select participants.
 - Response Rate: Out of 386 distributed questionnaires, 311 responses were received. After rejecting five incomplete responses, the final sample size was 306 respondents.
- Secondary Data: Data obtained from a thorough literature review contributing to the generation of scale items related to retirement planning.
 - Scale Items: The scale comprises 45 items, with 10 items related to general information, 15 items focusing on retirement planning, and 20 items associated with psychological factors. Relevant literature sources were consulted to create the scale items.

Literature Review for Scale Items:

- General Information (10 items): Referenced from studies by Robinson et al. (2017), Sigler (1989), Masran and Hassan (2017), Heenkenda (2016), Jain (2017), Whitehouse (2009), Wata et al. (2015), Williamson & Shaffer (2001), Groth-Marnat (1999), Friedman & Schnurr (1997), and Menon (2010).
- Retirement Planning (15 items): Derived from studies by Robison & Moen (2000), Mutran et al. (1997), Bengtson (2001), Kim & Feldman (2000), Kumar et al. (2019), and Murari et al. (2021).
- Psychological Factors (20 items): Informed by studies by Moorthy et al. (2012), Singh and Kumar (2014), Gabriela and Alcover (2015), Sarchielli et al. (2008), Wata et al. (2015), Robison & Moen (2000), Mutran et al. (1997), Bengtson (2001), Kim & Feldman (2000), Kumar et al. (2019), and Murari et al. (2021).

This comprehensive research design and methodology aim to provide a detailed understanding of the psychological factors influencing retirement planning behaviour among salaried employees in the higher education sector of the Jammu region.

Statistical Techniques Used:

1. Exploratory Factor Analysis (EFA):

Purpose: To identify the underlying factors and patterns within the collected data.

Application: Used in the initial phase of data analysis to explore the relationships among variables and identify latent constructs.

2. Confirmatory Factor Analysis (CFA):

Purpose: To confirm the structure and relationships among factors identified through EFA. Application: Applied to validate the factor structure obtained in EFA and assess how well the chosen model fits the observed data.

3. Structural Equation Modeling (SEM):

Purpose: To examine and model complex relationships between observed and latent variables.

Application: Used to test hypotheses and explore psychological factors' direct and indirect effects on retirement planning behaviour among salaried employees.

4. One-Way Analysis of Variance (ANOVA):

Purpose: To assess whether there are any statistically significant differences in means

among different groups.

Application: Employed to analyze variations in retirement planning perceptions among different salaried employees, such as job positions or demographic categories.

5. Independent Sample t-test:

Purpose: To compare means between two independent groups.

Application: Utilized to assess if there are significant differences in retirement planning between distinct groups of salaried employees based on variables like gender or other relevant categories.

These statistical techniques collectively provide a robust framework for analyzing the collected data, purifying the scales, and testing the relationships and differences identified in the study. The combination of EFA and CFA ensures a rigorous examination of underlying factors. At the same time, SEM allows for a more comprehensive understanding of the interplay between psychological factors and retirement planning behaviour. Additionally, ANOVA and t-tests help uncover group differences, contributing to a nuanced interpretation of the study findings.

Normality Assessment:

Graphical Analysis: Quantile-Quantile (Q-Q) Plot:

Purpose: To visually assess whether the data follows a normal distribution.

Application: Q-Q plot provides a graphical representation by comparing the observed quantiles of the data with the expected quantiles of a normal distribution. A straight line in the plot suggests normality.

Numeric Methods: Skewness and Kurtosis:

Purpose: To quantitatively measure the asymmetry and the tailedness of the distribution.

Application:

- Skewness: A measure of the asymmetry in the data distribution.
- Kurtosis: A measure of the tailedness or thickness of the distribution's tails.

Results:

i. Skewness Value: -0.301

Interpretation: The skewness value falls within the acceptable range of ± 1 , indicating a reasonably symmetrical distribution.

ii. Kurtosis Value: 0.530

Interpretation: The kurtosis value is within the acceptable range of ± 3 , suggesting that the distribution has a moderate level of tailedness.

Conclusion: Both graphical and numeric assessments of normality indicate that the data in this study approximates a normal distribution. The Q-Q plot shows a straight line, and the Skewness and Kurtosis values fall within acceptable ranges. These results suggest that the assumption of normality is reasonable for the statistical analyses conducted in this study, ensuring the reliability of subsequent inferential statistics.

Data Analysis and Discussion:

The data analysis for this study was conducted under five main sub-heads, focusing on different statistical techniques:

(i) Exploratory Factor Analysis (EFA) for Scale Purification:

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Objective: To summarize the total data into a minimum number of factors.

Methodology: EFA was conducted using Principal Component Analysis with Varimax Rotation.

(ii) Confirmatory Factor Analysis (CFA):

Objective: To confirm the factor structure obtained through EFA.

Methodology: CFA validated the factor structure and assessed model fit.

(iii) Structural Equation Modelling (SEM):

Objective: To explore and model the complex relationships between observed and latent variables.

Methodology: SEM was utilized to test hypotheses and understand psychological factors' direct and indirect effects on retirement planning behaviour.

(iv) One-Way-ANOVA:

Objective: To analyze variations in retirement planning perceptions among different groups.

Methodology: Employed to assess if there are significant differences in retirement planning based on factors such as job positions or demographics.

(v) Independent Sample t-test:

Objective: To compare means between two independent groups.

Methodology: Utilized to assess if there are significant differences in retirement planning between distinct groups of salaried employees based on variables like gender or other relevant categories.

Utilizing a comprehensive set of statistical techniques allows for a thorough examination of the data, ensuring both reliability and validity in understanding the impact of psychological factors on retirement planning behaviour among salaried employees.

(i) Exploratory Factor Analysis (EFA) for Scale Purification:

To summarise the total data into a minimum number of factors, Exploratory Factor Analysis was employed (EFA). EFA was conducted using Principal Component Analysis with Varimax Rotation.

A criterion for Retention: Statements with factor loadings less than 0.5 and Eigenvalues less than one were excluded.

Psychological Factors: The suitability of raw data for psychological factors was assessed using the Kaiser-Meyer-Olkin (KMO) value, Bartlett test of sphericity, and p-value (Field, 2000).

Data Processing: Five rounds of data processing resulted in the deletion of seven items due to factor loadings below 0.5.

Outcome: Six factors were identified, comprising 13 statements out of the original 20 in the domain of psychological factors. The variance explained was 77.215%, with a KMO value above 0.836 and a Bartlett value of 1260.442. Factor loadings ranged from .601 to 0.857.

A brief description of factors that emerged is as follows:

Factor Analysis Results:

Factor 1: Perception

Items:

- 1. Satisfaction of employees from the efforts done by the organization in planning the retirement of the employees
- 2. Employees' perception plays an important role in planning retirement.

Mean Values: Ranged from 2.50 to 3.72

Factor Loadings: Ranged from .743 to .816

Communalities: Ranged from .651 to .747

Interpretation: Employee satisfaction and perception significantly influence retirement planning.

Factor 2: Risk and Uncertainty

Items:

- 1. Risk has a relation with retirement planning
- 2. Investment uncertainty negatively affects retirement decisions.

Mean Values: Ranged from 3.51 to 3.67

Factor Loadings: Ranged from .602 to .928

Communalities: Ranged from .806 to .880

Interpretation: Risk and uncertainty significantly affect retirement planning.

Factor 3: Future Perspective

Items:

- 1. Employees considering retirement a threat to economic freedom are more likely to plan for retirement.
- 2. Future time perspective, i.e., how far into the future one can visualize, impacts planning.

Mean Values: Ranged from 3.32 to 3.84

Factor Loadings: Ranged from .805 to .717

Communalities: Ranged from .755 to .876

Interpretation: Employees who perceive retirement as threatening economic freedom are more likely to plan.

Factor 4: External Influence

Items:

- 1. People with an external locus of control are more likely to plan for retirement than others.
- 2. External influence from coworkers affects retirement planning.

Mean Values: Ranged from 3.32 to 3.82

Factor Loadings: Ranged from .807 to .875

Communalities: Ranged from .806 to .853

Interpretation: External influence, especially from coworkers, significantly affects retirement planning.

Factor 5: Goal Clarity

Items:

- 1. Individual goals have an impact on retirement planning.
- 2. Goal clarity is a significant determinant while planning for retirement.
- 3. Persons with risk-taking abilities are less likely to plan for retirement.

Mean Values: Ranged from 2.86 to 4.39

Factor Loadings: Ranged from .610 to .709

Communalities: Ranged from .523 to .786

Interpretation: Goal clarity is a significant determinant in retirement planning.

Factor 6: Attitude

Items:

- 1. Employees' attitude towards retirement impacts retirement planning.
- 2. Employees develop a negative attitude as they come near retirement age.

Mean Values: Ranged from 2.68 to 3.42

Factor Loadings: Ranged from .726 to .897

Communalities: Ranged from .769 to .854

Interpretation: An employee's attitude, especially as retirement age approaches, plays a crucial role in planning.

Reliability:

- Cronbach's reliability coefficients for all 13 items across six factors ranged from .557 to .935.
- Alpha reliability coefficients for Factor 4 (External Influence) were .789, surpassing the recommended limit of .77.
- Alpha reliability for other factors ranged from .539 to .738, indicating acceptable internal consistency.

Conclusion: The factor analysis results provide a detailed understanding of the impact of psychological factors on retirement planning behaviour. Each factor highlights specific aspects, such as perception, risk, future perspective, external influence, goal clarity, and attitude, contributing to the overall comprehension of the relationship between psychological factors and retirement planning among salaried employees. The reliability analysis further ensures the internal consistency of the factors identified in the study.

Validity Assessment:

The six factors obtained alpha reliability exceeding 0.50 and a satisfactory KMO value of 0.836, indicating significant construct validity of the psychological factors on retirement planning behaviour (Heir et al., 1995).

(ii) Confirmatory Factor Analysis (CFA):

To confirm the factor structure obtained through EFA. CFA was employed to validate the factor structure and assess model fit.

- EFA identified six factors: perception, risk and uncertainty, future perspective, external influence, goal clarity, and attitude.
- Three factors (future perspective, goal clarity, and attitude) were dropped due to regression weights below 0.50.
- Second-order CFA was performed on three remaining factors: perception (F1), risk and uncertainty (F2), and external influence (F4).

CFA Results:

The model was deemed reliable and valid after eliminating factors with regression weights below 0.50.

- ➢ Fit indices: CMIN/DF = 4.15, GFI = .938, AGFI = .922, TLI = .908, CFI = .984, RMR = .035, and RMSEA = .089.
- > The model was found to be valid and reliable, with an alpha value of .830.
- Composite reliability was 0.86, indicating the reliability of all items.
- > The model demonstrated validity with an AVE of 0.61.

Conclusion: The construct validity of the psychological factors on retirement planning behaviour was established through alpha reliability and KMO value. The CFA results further confirmed the reliability and validity of the model, ensuring that the retained factors (perception, risk and uncertainty, external influence) accurately represent the underlying psychological dimensions impacting retirement planning among salaried employees. The model's fitness indices and reliability metrics support its applicability in understanding the relationship between psychological factors and retirement planning behaviour.



Figure 1: CFA MODEL FOR PSYCHOLOGICAL FACTORS*

*Source: Data analysis

Note:-F1= Perception, F2= Risk and uncertainty, F4= External influence, PF11= Satisfaction of employees from retirement planning, PF13= Employees perception plays important role in planning, PF5= Risk has relation with retirement planning, PF7= Investment uncertainty negatively affects retirement planning, PF12= People with external locus of control are more likely to plan for retirement planning, PF2= External influence from coworkers affects retirement planning, and e1-e17 are error terms.

(iii). Structural Equation Modeling (SEM):

In order to explore and model the complex relationships between observed and latent variables. SEM was utilized, employing AMOS 16.0 as the primary tool to test hypotheses and understand psychological factors' direct and indirect effects on retirement planning behaviour. The final structural model comprises 11 indicators linked to an underlying theoretical construct reflectively. The structural model examined paths from psychological factors to retirement

planning. Upon testing the research model, the SEM results revealed a well-fitted model (refer to Figure 2), which was subsequently adopted as the final model for hypothesis testing. The goodness-of-fit indices for this model were as follows: CMIN/DF = 4.11, GFI = .931, AGFI = .906, NFI = .909, TLI = .915, CFI = .927, RMR = .035, and RMSEA = .089.





*Source: Data analysis

Hypotheses Testing Results:

H1: Psychological factors like attitude, future time perspective, locus of control, risk tolerance, and goal clarity have a direct and significant impact on the retirement planning behaviour of salaried employees.

Hypothesis H1 posited that psychological factors, such as attitude, future time perspective, locus of control, risk tolerance, and goal clarity, exert a direct and significant influence on the retirement planning behaviour of salaried employees. The SEM analysis supported Hypothesis H1, demonstrating a significant relationship between these psychological factors and retirement planning behaviour ($\beta = 0.66$, p = 0.000). Thus, based on the findings derived from the tested model (see Figure 2), H1 is accepted, affirming the impact of psychological factors on retirement planning behaviour among salaried employees. This validation underscores the pivotal role of psychological factors in shaping individuals' approach to retirement planning within the salaried workforce. Understanding these influences can inform targeted interventions and strategies to promote more effective retirement preparedness among employees. Future research may delve deeper into the nuanced interplay of these psychological factors to refine interventions and enhance retirement planning outcomes.

(iv) One-way Analysis of Variance (ANOVA):

One-way ANOVA was applied to assess the factor-wise significant mean differences among the perceptions of employees regarding retirement planning based on various demographic variables (age, occupation, qualification, religion, and monthly income).

The ANOVA results indicate that there is a significant mean difference among the perceptions of employees based on age (F = 0.769, Sig. = 0.022), occupation (F = 0.132, Sig. = 0.041), religion (F = 3.011, Sig. = 0.030), and monthly income (F = 0.933, Sig. = 0.025). However, for qualification, the p-value is more than 0.05 (F = 1.861, Sig. = 0.227), indicating an insignificant

mean difference among the perceptions of employees regarding retirement planning based on qualification.

(5) Independent Sample t-test:

The results of the independent sample t-test reveal an insignificant mean difference in the perception of male and female respondents regarding retirement planning to psychological factors. With a p-value exceeding 0.05, insufficient statistical evidence supports a significant difference between the mean scores of male and female respondents. Thus, the null hypothesis, suggesting no disparity in mean scores between genders, cannot be convincingly rejected based on the collected data. Consequently, these findings suggest no substantial gender-based divergence in the study participants' perception of psychological factors pertaining to retirement planning. Further, the independent sample t-test results indicate a lack of significant mean difference in the perception of retirement planning between married and unmarried employees, with a p-value exceeding 0.05. Although married respondents exhibit slightly higher Satisfaction, reflected in their mean score of 3.48 compared to unmarried respondents' mean score of 3.45, this discrepancy does not reach statistical significance. Consequently, the t-test results suggest that marital status does not significantly influence the perception of psychological factors associated with retirement planning among the study participants.

Hypothesis Testing:

The One-Way ANOVA and Independent Sample t-test results confirm that the hypothesis " Significant variations exist among salaried employees in their approach to retirement planning" is accepted for age, occupation, religion, and monthly income. However, it is rejected for qualification, gender, and marital status. Hence, the H2 is partially accepted.

Findings of the Study:

- 1. Structural Equation Modeling (SEM) results indicate that psychological factors like attitude, future time perspective, locus of control, risk tolerance, and goal clarity directly and significantly impact retirement planning behaviour among salaried employees.
- 2. ANOVA results highlight significant mean differences in the perception of retirement planning based on age, occupation, religion, and monthly income. However, qualification does not show a significant mean difference.
- 3. The results of the independent sample t-test suggest that marital status does not significantly influence the perception of psychological factors associated with retirement planning among salaried employees.
- 4. Specific items in the survey reveal a lack of Satisfaction among employees regarding the efforts made by the organization in planning for retirement.
- 5. The study suggests that individuals with an external locus of control are more likely to plan for retirement than others.
- 6. Employee attitude and goal clarity are identified as significant factors influencing retirement planning.
- 7. There is no significant mean difference between male and female employees or married and unmarried employees regarding retirement planning.
- 8. Knowledge about investment schemes is found to have a significant relationship with retirement planning behaviour.
- 9. The higher education sector is criticized for failing to organize employee awareness programs.

10. Different demographic characteristics lead to varying perceptions of retirement planning.

Strategic Implications:

- 1. The higher education sector should enhance efforts to create financial awareness among employees, utilizing print and electronic media to disseminate retirement planning information.
- 2. The government should consider introducing more tax concessions for the salaried class to encourage investments.
- 3. Special attention should be given to the financial planning of female and unmarried employees, including education on constructing a balanced investment portfolio.
- 4. Employees are advised to maintain contingency funds equivalent to 3-6 months of expenses to handle unforeseen situations.
- 5. Regular monitoring of investment plans is recommended for optimal performance.
- 6. Employee education on the benefits of diversification as a risk management tool is essential.
- 7. Working individuals should set clear and achievable goals for retirement planning, and professional advice should be sought when needed.
- 8. Knowledgeable individuals should share their retirement planning expertise with colleagues for mutual benefit.
- 9. Life and health insurance plans are strongly recommended for financial security.
- 10. Inflation should be considered when planning for retirement, and investment strategies should be adjusted accordingly.
- 11. Risky investments should be approached with caution, considering the employee's age.
- 12. Addressing minor issues is crucial to avoid more significant financial problems.

These recommendations aim to improve financial literacy, enhance retirement planning, and ensure the well-being of salaried employees.

Limitations and Directions for Future Research:

Limitations:

- 1. Geographical constraint: The study's focus on three universities in the Jammu division may limit the applicability of findings to other regions within Jammu and Kashmir or the broader country context due to potential regional variations.
- 2. Occupational focus: By solely examining the perceptions of university teachers and librarians, the study may overlook valuable insights from other employee categories within universities or from different professional sectors.

Directions for Future Research:

- 1. Expand geographically: Including universities from diverse regions within Jammu and Kashmir and beyond would offer a more representative sample, enhancing the generalisability of findings.
- 2. Diversify occupations: Incorporating perspectives from various professional sectors beyond academia could provide a broader understanding of retirement planning attitudes and behaviours.

- 3. Conduct comparative analysis: Comparing retirement planning perceptions between public and private sector employees may uncover nuances influenced by employment nature and benefits.
- 4. Include additional demographics: Exploring perceptions across organizational hierarchies and job roles could offer insights into how retirement planning varies among diverse employee groups.
- 5. Utilize qualitative methods: Integrating qualitative approaches like interviews or focus groups alongside quantitative data can provide deeper insights into the underlying factors shaping retirement planning decisions.
- 6. Longitudinal studies: Tracking changes in retirement planning perceptions over time through longitudinal research can capture evolving trends and responses to socio-economic factors.
- 7. Intervention studies: Evaluating the effectiveness of financial education interventions on retirement planning awareness and behaviour among employees can inform targeted interventions to improve retirement preparedness.

By addressing these suggestions in future research, the researchers can enhance the scope and depth of understanding related to retirement planning perceptions, contributing valuable insights to academia and practical applications.

References:

- Agnew, J. R., Bateman, H., & Thorp, S. (2012). Financial literacy and retirement planning in Australian. UNSW Australian School of Business Research Paper, (2012ACTL16).
- Alcover, C. M., & Topa, G. (2018). Work characteristics, motivational orientations, psychological work ability and job mobility intentions of older workers. PLoS One, 13(4), e0195973.
- Almenberg, J., & Säve-Söderbergh, J. (2011). Financial literacy and retirement planning in Sweden. Journal of Pension Economics & Finance, 10(4), 585-598.
- Bahrami, B. (2001). Factors affecting faculty retirement decisions. The Social Science Journal, 38(2), 297-305.
- Batra, G. (2013). Study of investment advice to retirement plan partakers in India. Journal of Business Management & Social Sciences Research (JBM&SSR) ISSN, (2319-5614).
- Bengtson, V. L. (2001). Beyond the nuclear family: the increasing importance of multigenerational bonds: the burgess award lecture. Journal of marriage and family, 63(1), 1-16.
- Coile, C. C. (2015). Economic determinants of workers retirement decisions. Journal of Economic Surveys, 29(4), 830-853.
- Croson, R., & Gneezy, U. (2009). Gender differences in preferences. Journal of Economic literature, 47(2), 448-474.
- Doda, S. (2014). Personal finance management among gender. Mediterranean Journal of Social Sciences, 5(3), 170.
- Furunes, T., Mykletun, R. J., Solem, P. E., de Lange, A. H., Syse, A., Schaufeli, W. B., Ilmarinen, J. (2015). Late career decision-making: a qualitative panel study. Work, Aging and Retirement, 1(3), 284-295.
- Glass Jr, J. C., & Kilpatrick, B. B. (1998). Gender comparisons of baby boomers and financial preparation for retirement. Educational Gerontology: An International Quarterly, 24(8), 719-745.

- Gordon, E. B. (1994). The relationship of attitudes toward work and toward retirement: A *female perspective. Affilia*, 9(3), 269-287.
- Grable, J. E., & Lytton, R. H. (1997). Determinants of retirement savings plan participation: A discriminant analysis. Personal Finances and Worker Productivity, 1(1), 184-189.
- Griffin, B., Hesketh, B., & Loh, V. (2012). The influence of subjective life expectancy on retirement transition and planning: a longitudinal study. Journal of Vocational Behaviour, 81(2), 129-137.
- Groth-Marnat, G. (1999). Financial efficacy of clinical assessment: Rational guidelines and issues for future research. Journal of Clinical Psychology, 55(7), 813-824.
- Hair, J. F., Anderson, R. E., Tathom, R. L. & Black, W. (2009). Multivariate Data Analysis. Upper Saddle River, New Jersy: Prentice-Hall.
- Heenkenda, S. (2016). Readiness to retirement planning of estate sector employees in Sri Lanka.
- Hershey, D. A., Henkens, K., & van Dalen, H. P. (2010). What drives retirement income worries in Europe? A multilevel analysis. European journal of Ageing, 7(4), 301-311.
- Hershey, D. A., Jacobs-Lawson, J. M., & Austin, J. T. (2013). Effective financial planning for retirement.
- Hershey, D. A., Jacobs-Lawson, J. M., McArdle, J. J., & Hamagami, F. (2007). Psychological foundations of financial planning for retirement. Journal of Adult Development, 14(1-2), 26-36.
- Hira, T. K., Rock, W. L., & Loibl, C. (2009). Determinants of retirement planning behaviour and differences by age. International Journal of Consumer Studies, 33(3), 293-301.
- Hulley, H., Mckibbin, R., Pedersen, A., & Thorp, S. (2013). Means-Tested Public Pensions, Portfolio Choice and Decumulation in Retirement. Economic Record, 89(284), 31-51.
- Jacobs-Lawson, J. M., & Hershey, D. A. (2005). Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviours. Financial Services Review-Greenwich-, 14(4), 331.
- Joo, S. H., & Pauwels, V. (2002). Factors affecting workers' retirement confidence: A gender perspective. Journal of Financial Counseling and Planning, 13(2).
- Jordan, S., & Treisch, C. (2010). The perception of tax concessions in retirement savings decisions. Qualitative research in financial markets.
- Kilty, K. M., & Behling, J. H. (1986). Retirement financial planning among professional workers. The Gerontologist, 26(5), 525-530.
- Kim, S., & Feldman, D. C. (2000). Working in retirement: The antecedents of bridge employment and its consequences for quality of life in retirement. Academy of management Journal, 43(6), 1195-1210.
- Kissau, K., Lutz, G., & Rosset, J. (2012). Unequal representation of age groups in Switzerland. Representation, 48(1), 63-81.
- Kock, T. H., & Yoong, F. J. (2011). Knowing when to retire: The first step towards financial planning in Malaysia. Educational Gerontology, 37(10), 854-884.
- Kritzman, M. (1994). What practitioners need to know... about time diversification (corrected). Financial Analysts Journal, 50(1), 14-18.

- Kumar, S., Tomar, S. & Verma, D. (2019). Women's financial planning for retirement: Systematic literature review and future research agenda. International Journal of Bank Marketing, 37(1), 120-141.
- Lal, T., & Singh, V. (2022). Examining the impact of economic factors on retirement planning behaviour of salaried employees. Asian Journal of Economics and Finance, 4(1), 117-136.
- Lusardi, A. (2003). Planning and saving for retirement. Working paper. Dartmouth College.
- Lusardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement planning: New evidence from the Rand American Life Panel. Michigan Retirement Research Center Research Paper No. WP, 157.
- Lusardi, A., & Mitchell, O. S. (2018). 6. Older Women's Labor Market Attachment, Retirement Planning, and Household Debt (pp. 185-216). University of Chicago Press.
- Masran, M. A., & Hassan, H. H (2010). Factors affecting retirement planning of Gen-Y workers in Klang Valley private sectors, Malaysia.
- Menon, R. K. (2010). U.S. Patent No. 7,685,056. Washington, DC: U.S. Patent and Trademark Office.
- Mitchell, O. S., & Moore, J. F. (1998). Can Americans afford to retire? New evidence on retirement saving adequacy. Journal of Risk and Insurance, 371-400.
- Moorthy, M. K., Durai, T., Chelliah, L., Sien, C. S., Leong, L. C., Kai, N. Z., & Teng, W. Y. (2012). A Study on the retirement planning behaviour of working individuals in Malaysia. International Journal of Academic Research in Economics and Management Sciences, 1(2), 54-62.
- Mullock, K., & Turcotte, J. (2012). Financial literacy and retirement saving. Department of *Finance*.
- Murari, K., Shukla, S., & Adhikari, B. (2021). Do psychological social and financial perceptions of post-retirement life and demography influence the retirement planning behaviour? International Journal of Social Economics, 48(11), 1545-1566.
- Mustafa, A., Yusof, S. K., Silim, A., Adiman, R., & Hassan, N. L. (2017). Factors influencing retirement planning behaviour of lecturers in Polytechnics. Advanced Journal of Technical and Vocational Education, 1(4), 9-13.
- Mutran, E. J., Reitzes, D. C., & Fernandez, M. E. (1997). Factors that influence attitudes toward retirement. Research on aging, 19(3), 251-273.
- Natoli, R. (2018). Factors contributing to financial literacy levels among a migrant group. International Journal of Social Economics, 3(4), 11-25.
- Noone, J. H., Stephens, C., & Alpass, F. M. (2009). Preretirement planning and well-being in later life: A prospective study. Research on Aging, 31(3), 295-317.
- Power, M. L., & Hira, T. K. (2004). University-provided retirement planning support and retiree financial satisfaction during retirement: Differences by gender, job classification, and planning behaviour. Risk Management and Insurance Review, 7(2), 121-149.
- Richardson, V. E. (1999). Women and retirement. Journal of Women & Aging, 11(2-3), 49-66.
- Robison, J. T., & Moen, P. (2000). Future housing expectations in late midlife. The role of retirement, gender, and social integration. Social Integration in the Second Half of Life, 3(13), 158-189.
- Samuelson, P. A. (1994). The long-term case for equities. Journal of Portfolio Management, 21(1), 15-24.

- Sigler, K. J. (1989). Executive compensation--cost control and investment incentives. Doctoral dissertation, The University of Nebraska-Lincoln.
- Singh, S., & Kumar, N. (2014). A review on pension system. International Journal of Advanced Research in Management and Social Sciences, 3(12), 179-196.
- Stawski, R. S., Hershey, D. A., & Jacobs-Lawson, J. M. (2007). Goal clarity and financial planning activities as determinants of retirement savings contributions. The International Journal of Aging and Human Development, 64(1), 13-32
- Stromback, C., Lind, T., Skagerlund, K., Västfjäll, D., & Tinghög, G. (2017). Does self-control predict financial behaviour and financial well-being?. Journal of Behavioural and Experimental Finance, 14(1), 30-38.
- Thakur, S. S., Jain, S. C., & Soni, R. (2017). A study on perception of individuals towards retirement planning. International Journal of Applied Research, 3(2), 154-157.
- Tomar, S., Baker, H. K., Kumar, S., & Hoffmann, A. O. (2021). Psychological determinants of retirement financial planning behaviour. Journal of Business Research, 133 (1), 432-449.
- Topa, G., & Alcover, C. M. (2015). Psychosocial factors in retirement intentions and adjustment: A multi-sample study. Career Development International.
- Turner, J. A., Ersek, M., & Kemp, C. (2005). Self-efficacy for managing pain is associated with disability, depression, and pain coping among retirement community residents with chronic pain. The Journal of pain, 6(7), 471-479.
- Turner, M. J., Bailey, W. C., & Scott, J. P. (1994). Factors influencing attitude toward retirement and retirement planning among midlife university employees. Journal of Applied Gerontology, 13(2), 143-156.
- Wata, L., Kamau, C., & Bett, B. (2015). Determinants of Employees Attitude towards Retirement in the Energy Sector in Kenya; a Case of Kenya Pipeline Company. International Journal of Scientific and Research Publications, 5(10), 1-6.
- Whitehouse, E. (2009). Pensions during the crisis: Impact on retirement income systems and policy responses. The Geneva Papers on Risk and Insurance-Issues and Practice, 34(4), 536-547.
- Williamson, G. M., & Shaffer, D. R. (2001). Relationship quality and potentially harmful behaviours by spousal caregivers: How we were then, how we are now. Psychology and aging, 16(2), 217-232.
- Zappala, S., Depolo, M., Fraccaroli, F., Guglielmi, D., & Sarchielli, G. (2008). Postponing job retirement?: Psychosocial influences on the preference for early or late retirement. Career development international, 13(2), 150-167.

Sustainable Apparel and Microfiber Pollution: A Multi-Group Analysis of Consumers within India and Japan Using the Norm Activation Model

¹Mehvish Riyaz ²Anisa Jan

<u>Abstract</u>

Microfiber contamination is largely caused by the textile industry, especially fast fashion. Commonly utilized in the manufacturing of garments, synthetic fibers are strong and reasonably priced, but they also greatly worsen the environment. In the textile sector, sustainable clothing is essential for preventing microfiber pollution and encouraging environmental stewardship. There is not enough empirical evidence to assume that consumer behavior intention for sustainable clothing is applicable in Indian market environments when compared to other developed markets. The purpose of this study is to better understand the psychological factors that influence Indian consumers when compared to consumers from another developed nation(Japan) using the norm activation model. Data for this study was gathered through an online survey. Convenience sampling was used to gather the 382 responses (180 from Japan and 202 from India). The bootstrapping technique and structural equation modeling were used to test the proposed hypothesized relationships. To assess each of the Japanese and Indian cohort's strengths and identify any notable variations between them, a multi-group analysis was employed using Smart Pls version 4. The results reveal that the drivers of purchase intention for sustainable apparel were more or less equal within both cohorts. In addition to providing insightful information to marketers and regulators to help them develop strategies and legislation to achieve sustainability in the apparel sector, the study reaffirms the importance of the Norm Activation Model in promoting the desire to purchase green clothing.

Keyword: Apparel, Market Environment, Pollution, Psychological Factors.

Introduction

The manufacture of plastics increased rapidly in the latter part of the 20th century, and there are now many different types of plastics with various properties that appeal to different industries(Galvão et al., 2020). The requirement for plastic products and synthetic polymers has grown rapidly; approximately 391 million metric tons (MMT) of these substances have been manufactured worldwide in 2021(Statista, 2022). Moreover, by 2050, this amount is expected to rise to 589 MMT. Plastic particles, both micro and macroplastic, have started to build up in the atmosphere and on the surface of the Earth due to their massive rates of manufacture and use (Periyasamy, 2023). A variety of materials can produce microplastics, including tires, artificial turf, road signs, water-resistant materials, cosmetic and personal care items, and plastic pellets that have been manufactured(Cole et al., 2011).

¹ Research Scholar, Dept. of Management Studies, Islamic University of Science and Technology, Awantipora, Pulwama; email:mehvishriyaz.59@gmail.com

² Associate professor, Dept. of Management Studies, Islamic University of Science and Technology, Awantipora, Pulwama; email:anisa.jan@islamicuniversity.edu.in

Nowadays, it's thought that microplastics are present everywhere in aquatic settings(Prata, 2018). Apart from plastic fibers derived from petroleum, synthetic cellulose fibers such as viscose rayon have also been found in various ecosystems of deep-sea sediment and macroinvertebrate fish. This has led to a rise in the scientific community's attention to this type of plastic pollution, which is typically disregarded(Collard et al., 2015; Remy et al., 2015; Woodall et al., 2014). Synthetic textiles such as polyester, nylon, and acrylic shed microscopic synthetic fibers called microfibers, which are less than 5 mm. Microfibers are very difficult to remove from the environment once they are discharged. Because of this, scientists have recently concentrated on learning about the mechanisms by which microfibers are shed, their sources and routes into the environment, and the methods available for capturing microfibers at the point of emission(Erdle et al., 2021). The home washing of clothes has the greatest likelihood of producing microplastics among these sources(O'Brien et al., 2020).

The second most polluting business in the world, falling behind agriculture, is the apparel and textiles sector, which is responsible for 20% of global water pollution,(World Bank, 2019). Textiles are treated with dyes, finishing agents, and specialty chemicals in water bath Fabrics undergo mechanical and chemical treatments during dyeing, finishing, and coating procedures, which can weaken the fibers and increase the likelihood that they will shed microfibers(Gam & Banning, 2011). Eventually, the water is recycled back into the environment, typically with little effort made to eliminate the chemicals and micro-fibersutilized during manufacturing(H. J. Jung et al., 2021). As a result, the lengthy processes involved in the creation of clothing have a detrimental effect on the environment(Nayak et al., 2020). Furthermore, developing nations generate 50% of global textile exports and 75% of global apparel exports(Belzagui & Gutiérrez-Bouzán, 2022). There are few water treatment facilities and environmental controls are not typically a top priority for the governments of some of these nations(Mara, 2013).

As the Western nations became aware of the environmental impacts of unsustainable production facilities (H. J. Jung et al., 2021), the majority of textile production in wealthy nations (such as the United States, Canada, Germany, and the United Kingdom) has moved abroad to developing nations. Wealthy nations typically have purification plants with stronger filtration and infrastructure, which allows them to catch more microfibers before they get into water bodies. Nevertheless, a sizable quantity of microfibers manages to get past filtration devices and into rivers. When customers in these nations conceived how clothing production affected the environment in the 1960s, they forced the clothing business to rethink and alter its unsustainable methods (Tey et al., 2018). This led to the creation of sustainable apparel and fashion (Cataldi et al., 2010; S. Jung & Jin, 2014). Several factors go into making sustainable clothing, such as the use of sustainable and pro-environmental materials in its development over the years (Henninger et al., 2016; Vehmas et al., 2018).

Environmentally conscious apparel is in demand, and manufacturers are looking for ways to satisfy this need without sacrificing profitability(Gam & Banning, 2011). Fashion illustrators and sellers are driven to implement sustainable design and production practices in response to these trends. Organic fabrics and eco-friendly dyes are two examples of sustainable solutions. By giving preference to natural fibers like hemp and organic cotton, which shed fewer microfibers than synthetic materials, sustainable clothing can help minimize the pollution caused by microfibers. For example, organic cotton is used by Coop Switzerland, Levi Strauss & Co., Marks & Spencer, Nike, and Noir (Black & Anderson, 2010; DeLong, 2009; Exchange, 2007). Additionally, producers are selling textiles created from regenerated or recycled fibers which reduces the need for new plastics, and concentrate on making long-lasting apparel that requires fewer washes. (Gam & Banning, 2011).One such product is Mart Ex's "eco2cotton," a cloth created from about wasted yards (Marks, 2007).

In the meantime, a wide range of theoretical frameworks have been used by several researches conducted in different countries to examine sustainable clothing purchasing practices. Furthermore, the Norm Activation Model (NAM) (Schwartz, 1977), has been utilized in contemporary research to enhance the capacity to explain pro-environmental actions(Le & Nguyen, 2022). The study will also enable a more sophisticated understanding of consumer behaviorusing the Norm Activation Model and will allow us to compare the buying intentions of consumers in industrialized and developing countries concerning green apparel. Additionally, by providing new theoretical insights into related environmental behavior theories, this study will aid in the successful promotion of sustainability in a variety of situations, thereby promoting the global push towards eco-friendly clothing. Lastly, by comprehending the variations in purchasing intents between two different destinations stakeholders and policymakers can more effectively establish scenarios that foster sustainable fashion.

2. Literature Review and Hypothesis Development

2.1 Norm Activation Model

A method for integrating a moral standard into environmental actions is suggested by the norm activation model (NAM)(Schwartz, 1977). The paradigm has found widespread application in the context of socially conscious conduct, encompassing pro-environmental behaviors(Duong, 2023; Duong et al., 2022; Elhoushy & Ribeiro, 2024). The NAM contains three cardinal variables, namely personal norms, awareness of consequences, and ascription of responsibility. Personal norms are described as a "moral duty to carry out or abstain from particular activities" (Hosta & Zabkar, 2021a). A key component of the NAM is the personal norm, which is utilized to instantly predict pro-social behavior(He & Zhan, 2018). The ability to recognize the repercussions of one's actions, whether they be positive or harmful, for others or other values, is an indicator of awareness of consequences. In terms of the ascription of responsibility, it is defined as "perceived accountability for the adverse outcomes resulting from non-prosocial behavior"(De Groot & Steg, 2009). NAM may be tailored to various cultural and social contexts(Duong, 2023; Fang et al., 2019; Sethuraman et al., 2023), which makes it appropriate for researching a wide range of populations, including those in developed and developing countries. In conclusion, the Norm Activation Model enables a thorough knowledge of the variables influencing consumers' intentions to purchase sustainable clothing.

a) Awareness of consequences

Awareness of the consequences determines if people are aware of the negative effects of their non-environmentally friendly actions and can encourage them to act in a pro-social manner by activating personal norms(He & Zhan, 2018).Additionally, prior studies have demonstrated that awareness of the consequences favors personal norms related to pro-environmental behaviors, like recycling e-waste (Echegaray & Hansstein, 2017)and using second-hand goods(Borusiak et al., 2020).This research characterises consumer awareness of consequences as knowing that wearing non-sustainable apparel has some drawbacks, like water and environmental quality, which influences them to act in ways that are ecologically friendly or to disapprove of traditional behaviors that degrade the environment. Customers would therefore feel obligated to purchase sustainable clothing if they were aware of the detrimental effects of textile industry. Therefore, we assume that;

Hypothesis 1: Awareness of consequences positively affects consumers' personal norms

b) Ascription of responsibility

The ascription of responsibility is described as a sense of accountability for the

unfavorable outcomes of acting in a non-pro-social way(De Groot & Steg, 2009). Norm Activation Theory states that an individual's obligation to act in a way that benefits others is contingent upon at least two factors: the individual's sense of personal responsibility and their comprehension of the consequences of a particular action(Vining & Ebreo, 1992).The ascription of responsibility is another factor that activates the personal norm in addition to awareness of the consequences(Setiawan et al., 2021).As a result, when someone understands the detrimental effects of not acting in an ecologically conscious manner, they would rather blame themselves as consumers for these negative effects and take responsibility for their lack of environmental awareness.This argument offers a solid basis for the claim that accepting ownership of the adverse consequences of wearing non-sustainable clothing is positively correlated with personal norms. Thus, we propose;

Hypothesis 2: Ascription of responsibility positively affects consumers' personal norms

c) Personal Norm

A fundamental element of the Norm Activation model is the personal norm, which is described as the sense of moral duty to carry out or abstain from a certain activity(Schwartz, 1977). The phrase "personal norm" refers to self-expectations for certain actions in specific circumstances that are created by individuals as a sense of moral obligation to behave. These expectations are based on internalized values, personalities, and habits(Setiawan et al., 2021).As a result, the personal norm differs from subjective norms that emphasize the normative effect of other significant individuals and organizations(Hameed et al., 2019).Prior research has consistently shown that the propensity to buy green products is positively influenced by personal norms(Fang et al., 2019; Hosta & Zabkar, 2021). The findings of the research synthesis further demonstrate that personal norms are a significant intrinsic component that promotes the behavioral intention of buying sustainable clothing. We propose;

Hypothesis 3: Personal norm has a positive impact on intention.

2.2 Cross-National Perspectives on Green Apparel Consumption (Japan Vs India)

It is anticipated that Japan, a highly industrialized nation with the greatest GDP per person in North-East Asia and a reputation for leading the way in environmental innovation within the region, is going to direct reforms related to sustainable consumption and development throughout the Asia-Pacific region(ESCAP, 2017). It is anticipated that developed nations will be pivotal in advancing sustainability in subregions; Japan, of course, is a major player in value chains utilizing resource-efficient production techniques(Lim et al., 2019). However, compared to rich nations, India has significantly less infrastructure for sustainable conduct because it is still a developing nation. Prior research on consumers' green purchase intentions and behaviors has primarily been conducted in developed countries, which reveals their attitudes and perspectives toward buying green items(Khare, 2015). This is why the current study compares the industrialized economy of Japan with that of India in order to better understand how consumers behave while purchasing green items in developing countries.

Research findings in marketing and consumer behavior that purport to be universally valid have been sharply criticized, particularly when those conclusions originate from a highly skewed sample of the population in Western developed nations(Guarín & Knorringa, 2014).The researchers contend that factors related to culture, society, politics, and the physical world all have a major role in shaping the context in which decisions are made and how people behave when it comes to consuming(Agrawal & Gupta, 2018).Studies undertaken in the developed world may not accurately reflect the behavior of customers in the developing world, necessitating further research to better understand consumer behavior in these regions. Studying consumer Behavior in emerging nations is crucial since these nations appear destined to play a bigger role in the global arena, in addition to having various environments that affect behavior(Scott & Vigar-Ellis, 2014).

An examination of environmentally conscious consumer behavior regarding sustainable apparel in both developed and developing countries would enhance and complement the body of existing literature, as there is a deficiency in the former's proper, comprehensive, and focused examination of these behaviors (Agrawal & Gupta, 2018). The bulk of the world's population, who reside predominantly in low-income or economically disadvantaged nations, must also be dedicated to sustainability for the planet to be saved, even if exposure to the sustainability movement is probably restricted in these areas(Scott & Vigar-Ellis, 2014). In a novel endeavor, the study attempts to undertake a cross-cultural study on consumers from the developing nation India and the developed nation Japan to learn how consumers in the two nations establish their desire to buy eco-friendly clothing. Therefore, the goal of the current study was to determine the degree of awareness, attitudes, and conduct about ecologically friendly apparel in both developed and developing countries. Thus, the study proposes the following hypotheses;

Hypothesis 4: The strength of the relationship between awareness of consequences and personal norms will be significantly different between Japanese and Indians

Hypothesis 5: The strength of the relationship between ascription of responsibility and personal norms will be significantly different between Japanese and Indians

Hypothesis 6: The strength of the relationship between personal norms and purchasing intentions of sustainable apparel will be significantly different between Japanese and Indians

3. Proposed Research Model



4. Data collection and measurement development

A self-reported online questionnaire was employed in the empirical investigation, and it was directed at the general public in India and Japan who were above the age of 18. This method worked well enough to obtain a large enough sample size for an analysis using structural equation modeling (SEM). Data for this study was gathered through an online survey. The invitation messages and links were delivered by email or posted on well-known discussion

forums like Quora and Redditto boost the number of responses. Additionally, an advertisement offering recognition to those who answered every question was put. The snowball and convenient sampling methods were applied. Every response was kept private and utilized exclusively for scholarly research.

After removing those who failed to complete every aspect of the self-administered questionnaire, 382 of the 489 responses (180 from Japan and 202 from India) were used. A presurvey was conducted to fine-tune the questionnaires before the commencement of the largescale survey. Multiple questions and a 5-point Likert-type scale were used to measure the study's components. Every measurement item was borrowed and slightly altered to be suitable for the current investigation after being validated in earlier research. Scores varied from 1 (strongly disagree) to 5 (strongly agree) for every measurement item across all categories. The demographic profile of respondents for the study is presented in Table 1.

We developed our measure scale using a back-to-back translation technique because the adopted items were in English. First, a researcher whose mother tongue is Japanese translated the original materials into Japanese. Another researcher then translated these Japanese items back into English. Additionally, the two researchers verified the Japanese version of the questionnaire by comparing the two English versions. Three statements regarding personal norms were chosen from Hopper & Nielsen (1991)to be incorporated into the survey questionnaire. Four statements on awareness of consequences and four statements for ascription of responsibility were adopted from a study byZhang et al. (2013). Four items were selected from Barbarossa et al. (2015) and Trivedi et al. (2018) to measure purchase intentions for sustainable apparel.

	Japa	in	Ind	ia
	Number	%	Number	%
Gender				
Female	109	60.55	86	42.57
Male	71	39.45	116	57.43
Education				
High school or less	19	10.56	39	19.32
Graduate	72	40	56	27.72
Postgraduate	60	33.33	89	44.05
Doctorate	29	16.11	18	8.91
Age				
18–27	33	18.33	65	32.17
28-42	58	32.22	78	38.61
42–54	71	39.45	40	19.80
55 and above	18	10	19	9.42

Source: The current study

5. Results and Discussion

5.1. Assessment of measurement Model

We performed confirmatory factor analysis (CFA) because the scales had been modified and taken from earlier research. Several measurements, such as Cronbach's alpha,Composite reliability (CR), and item loadings, were used to assess the measurement reliability in SmartPLS version 4. The Average Variance Extracted (AVE) was used to assess the convergent validity of the measurements. Table 2 demonstrates the good reliability of the measurement scales in the research framework, with Cron-bach's alpha values, composite reliability(Fornell & Larcker, 1981), and item loadings of more than 0.70 (Hair et al., 2017)with the exception of loadings for AC3, AC4, and AR1. All three loadings of concern were retained using Hair et al (2017) criteria for deletion or retention of reflective indicators. The discriminant validity of each reflective scale included in the framework was assessed using the Heterotrait-Monotrait Ratio (HTMT) matrix criteria (Table 4).Positive assessments were given to the HTMT ratio, which was less than 0.85in all the cases(Henseler et al., 2015).The HTMT matrix over the Fornell and Larker criteria has been retained in the paper because of its strong capacity to evaluate discriminate validity(Riyaz et al., 2024).

Constructs	Items	Loadings	Cronbach's	Composite	Average Variance	
			Alpha	Reliability (CR)	Extracted (AVE)	
Awareness of	AC1	0.904				
Consequences	AC2	0.763				
	AC3	0.665*	0.710	0.805	0.519	
	AC4	0.486*				
Ascription of	AR1	0.558*				
Responsibility	AR2	0.810				
	AR3	0.828	0.765	0.854	0.599	
	AR4	0.863				
Personal norm	PN1	0.841				
	PN2	0.895	0.763	0.864	0.681	
	PN3	0.731				
Purchase	PI1	0.839				
intention	PI2	0.859				
	PI3	0.805	0.836	0.890	0.670	
	PI4	0.769	1			

 Table 2. Reliability of measurements. Items

Table 3. Discriminant validity of measurements.

	PI	AR	AC	PN
PI				
AR	0.626			
AC	0.056	0.059		
PN	0.465	0.479	0.129	

5.2 Structural Equation Modeling Analysis

To assess the statistical significance of the variables in the structural model, we performed a bootstrapping study using 5000 samples and a 0.05 significant level. All hypotheses with p-values less than 0.05 were accepted, as indicated in Table 4.The findings indicate a positive correlation between awareness of the consequences and personal norms for selecting sustainable clothing ($\beta = 0.112$, p < 0.05). Further, the ascription of responsibility is positively correlated with personal norms ($\beta = 0.363$, p < 0.001). We also found out that personal norms positively affect purchase intention for sustainable apparel ($\beta = 0.222$, p < 0.001). H1, H2, and H3 were therefore supported.

Hypothesis	Path	Path Coefficient	Sample Mean	Standard Deviation	T Statistics [O/STDEV	p Values	Result
H1	AC→PN	0.112	0.120	0.051	2.183	0.029	Accepted
H2	AR→PN	0.363	0.364	0.055	6.581	0.000	Accepted
H3	PN→PI	0.222	0.222	0.050	4.410	0.000	Accepted

 Table 4: Hypothesis—path coefficients.

5.3 Multi-group Analysis

Before conducting multigroup analyses to ascertain the moderating effects of country of origin (India vs. Japan), the MICOM approach was used to evaluate the model's measurement invariance.Because the groups' PLS models, data treatment, and algorithm parameters were all the same, configural invariance was established(MICOM Step 1).The model's compositional invariance (MICOM Step 2) was evaluated using the SmartPLS Permutation process; the outcomes are shown in Table 5.Multigroup analyses were made possible by the establishment of partial measurement invariance, which was made possible by the fulfillment of the requirements for Steps 1 and 2 of the three-step MICOM technique.

Step 1		Step 2				Step 3			
Constructs	Conf. Inv	Original correlation	5.0%	Permu- tation p-value	Comp Inv	Original difference	95.0%	Permutation p-value	Measur. Invar. Estab
Awareness of Consequences	Yes	0.956	0.337	0.774	Yes	-0.073	(-0.149; 0.159)	0.215	Yes
Ascription of Responsibility	Yes	0.999	0.990	0.804	Yes	0.022	(-0.148; 0.143)	0.396	Yes
Personal Norms	Yes	0.998	0.991	0.509	Yes	-0.117	(-0.151; 0.149)	0.110	Yes
purchase intention	Yes	1.000	0.997	0.730	Yes	-0.032	(-0.158; 0.158)	0.351	Yes

Table 5: Results of invariance measurement testing

The permutation test verifies the constructs' means and variances (step 3), suggesting that there are variations in the structural model between the two groups. This indicates that complete

measurement invariance has been demonstrated, hence validating the MGA's performance (Henseler et al., 2015). Testing for substantial changes in parameter estimates between previously designated data groups is made possible by the MGA(Bordian et al., 2023). At the 5% likelihood of error level, the results will be significant if the p-value is less than 0.05 or higher than 0.95(Dorce et al., 2021). It can be said that the country-specific group has a moderating effect if the gap is substantial. As a result, H4, H5, H6are not supported. The results for measurement invariance testing are reported in Table 5 and Multi-group analysis is presented in Table 6.

Hypothesis	Relationships	Beta Coeff. India	Beta Coeff. Japan	Beta. Diff.	Henseler's MGA p-value	Result
H4	AC→PN	0.076	0.150	- 0.074	0.545	Not- accepted
H5	AR→PN	0.391	0.342	0.049	0.650	Not- accepted
H6	PN→PI	0.287	0.157	0.130	0.199	Not- accepted

 Table 6:
 Henseler's MGA Results

6. Discussion

This study adopted the aforementioned NAM theoretical framework to investigate how personal norms, awareness of consequences, and ascription of responsibility impact people green buying behavior for green clothing within the people of India and Japan. The findings of this study are consistent with previous research conducted in other countries. The personal norm has a greater impact because consumers in Japan and India are naturally concerned about the environment and have a favorable opinion about it, which motivates them to purchase green clothing as it is thought to be safer and more environmentally friendly. Since there are environmental problems with garments throughout their entire life cycle (Belzagui & Gutiérrez-Bouzán, 2022), determining and bolstering the factors that encourage the adoption of eco-friendly clothing can ultimately reduce the problems associated with the production of microfibers. Therefore, by examining the factors that influence consumers in both developed and developing nations' intentions to buy this new category of items, the current study contributes to our understanding of green buying behavior.

6.1 Theoretical implications

By investigating consumers' acceptance of the newest category of environmentally conscious clothes, the current study adds to the body of knowledge on green consumption behavior from a theoretical standpoint. After determining the large-scale demand for these items in both developed and developing countries, the textile sector, which can significantly reduce the generation of microfibers by upgrading their processes or products(Belzagui & Gutiérrez-Bouzán, 2022), can expand their production levels. The findings of this research show that encouraging people's personal norms can increase their desire to wear eco-friendly apparel. This study aimed to investigate whether and to what extent consumers who purchase environmentally friendly apparel from two distinct countries (developed and developing) have diverse interests and preferences. The present investigation examines how well the NAM model applies to purchasing environmentally friendly clothing in India and Japan. The findings indicate similarities between the two countries in terms of comparable consumption levels and a greater inclination for eco-friendly apparel. This emphasizes significant

ramifications for both academics and professionals in the green apparel industry. Also, according to research on the norm activation model, which has been employed in previous studies on green consumer behavior, personal norms, and green purchasing intentions are highly correlated(Duong et al., 2022; Khare, 2015; Li et al., 2021).By performing a multi-group analysis, the results of the current study lend credence to the notion that consumers' personal norms (a key component of the norm activation model) do influence their intentions to purchase eco-friendly products for the category of sustainable apparel, particularly among those in the developed and developing economies of Japan and India.

6.2 Practical implications

The results have theoretical significance, but they can also assist marketers in creating captivating strategies globally. Given the crucial roles that personal norms, responsibility attributes, and consequence awareness play in predicting green purchasing behavior, marketers should develop communication messages that provide background information on environmental issues that are pertinent to the product and describe how the product can help reduce ecological issues. Customers may be better able to comprehend the environmental issue at hand and make more informed purchasing decisions using this method. To highlight the negative effects of environmental abuse, green marketers could use factual information to create a negative motive appeal, such as problem avoidance or problem eradication, aimed at green consumers. This strategy might persuade green consumers to look for further information in order to alleviate their sense of dissonance and then adopt the desired action. Furthermore, emotional advertising appeals may heighten ecological concern by making consumers more anxious about a deteriorating environment. Thus, in the present study's conclusions, marketers cannot just say that their products would alter the world. They ought to back up this assertion with references to environmental difficulties (i.e., information) and challenges that the product has addressed.

6.3 Limitations and further research

The study's limitations indicate areas that require further investigation. Firstly, instead of predicting actual behaviors, the current study forecasts consumers' intentions. There will always be a discrepancy between purchasing intention and actual behavior, which calls for a longitudinal study design to highlight the main drivers of the demand for environmentally friendly clothing. Secondarily, the study's data was gathered using convenience sampling from easily accessible locations. It is therefore essential to investigate whether the results also apply to other geographical regions as the application of convenience sampling may limit how far the results of this study may be applied. Lastly, the results of this empirical study, which was carried out in Japan and India, cannot be extrapolated to other nations or political structures. To compare India with other nations and identify any relevant parallels or differences, more research is needed.

References:

- Agrawal, R., & Gupta, S. (2018). Consuming Responsibly: Exploring Environmentally Responsible Consumption Behaviors. Journal of Global Marketing, 31(4), 231– 245. https://doi.org/10.1080/08911762.2017.1415402
- Barbarossa, C., Beckmann, S. C., De Pelsmacker, P., Moons, I., & Gwozdz, W. (2015). A self-identity based model of electric car adoption intention: A cross-cultural comparative study. Journal of Environmental Psychology, 42, 149–160.
- Belzagui, F., & Gutiérrez-Bouzán, C. (2022). Review on alternatives for the reduction of textile microfibers emission to water. Journal of Environmental Management, 317(March). https://doi.org/10.1016/j.jenvman.2022.115347

- Black, S., & Anderson, S. (2010). Making sustainability fashionable: Profile of the Danish fashion company Noir. Fashion Practice, 2(1), 121–127.
- Bordian, M., Gil-Saura, I., & Šerić, M. (2023). The impact of value co-creation in sustainable services: understanding generational differences. Journal of Services Marketing, 37(2), 155–167. https://doi.org/10.1108/JSM-06-2021-0234
- Borusiak, B., Szymkowiak, A., Horska, E., Raszka, N., & Zelichowska, E. (2020). Towards building sustainable consumption: A study of second-hand buying intentions. Sustainability (Switzerland), 12(3), 1–15. https://doi.org/10.3390/su12030875
- Cataldi, C., Dickson, M., & Grover, C. (2010). Slow fashion: Tailoring a strategic approach towards sustainability.
- Cole, M., Lindeque, P., Halsband, C., & Galloway, T. S. (2011). Microplastics as contaminants in the marine environment: a review. Marine Pollution Bulletin, 62(12), 2588–2597.
- Collard, F., Gilbert, B., Eppe, G., Parmentier, E., & Das, K. (2015). Detection of anthropogenic particles in fish stomachs: an isolation method adapted to identification by Raman spectroscopy. Archives of Environmental Contamination and Toxicology, 69, 331–339.
- De Groot, J. I. M., & Steg, L. (2009). Morality and prosocial behavior: The role of awareness, responsibility, and norms in the norm activation model. The Journal of Social Psychology, 149(4), 425–449.
- DeLong, M. (2009). Innovation and sustainability at Nike. Fashion Practice, 1(1), 109–113.
- Dorce, L. C., da Silva, M. C., Mauad, J. R. C., de Faria Domingues, C. H., & Borges, J. A. R. (2021). Extending the theory of planned behavior to understand consumer purchase behavior for organic vegetables in Brazil: The role of perceived health benefits, perceived sustainability benefits and perceived price. Food Quality and Preference, 91(December 2020). https://doi.org/10.1016/j.foodqual.2021.104191
- Duong, C. D. (2023). "What goes around comes around": Activating sustainable consumption with curvilinear effects of karma determinants. Journal of Retailing and Consumer Services, 73, 103351. https://doi.org/https://doi.org/10.1016/j.jretconser.2023.103351
- Duong, C. D., Doan, X. H., Vu, D. M., Ha, N. T., & Dam, K. Van. (2022). The Role of Perceived Environmental Responsibility and Environmental Concern on Shaping Green Purchase Intention. Vision, 1–15. https://doi.org/10.1177/09722629221092117
- Echegaray, F., & Hansstein, F. V. (2017). Assessing the intention-behavior gap in electronic waste recycling: the case of Brazil. Journal of Cleaner Production, 142, 180–190. https://doi.org/10.1016/j.jclepro.2016.05.064
- Elhoushy, S., & Ribeiro, M. A. (2024). Socially responsible consumers and stockpiling during crises: the intersection of personal norms and fear. Social Responsibility Journal, 20(1), 180–203. https://doi.org/10.1108/SRJ-01-2023-0011
- Erdle, L. M., Nouri Parto, D., Sweetnam, D., & Rochman, C. M. (2021). Washing Machine Filters Reduce Microfiber Emissions: Evidence From a Community-Scale Pilot in Parry Sound, Ontario. Frontiers in Marine Science, 8(November), 1–9. https://doi.org/10.3389/fmars.2021.777865

- ESCAP, U. N. (2017). Achieving sustainable development goals in East and North-East Asia.
- Exchange, O. (2007). Organic Cotton Market Report highlights.[WWW document]. URL Http://Www. Organicexchange. Org/Documents/Market_high_fall07. Pdf (Accessed on 8 January 2010).
- Fang, W. T., Chiang, Y. Te, Ng, E., & Lo, J. C. (2019). Using the norm activation model to predict the pro-environmental behaviors of public servants at the central and local governments in Taiwan. Sustainability (Switzerland), 11(13). https://doi.org/10.3390/su11133712
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39–50. https://doi.org/10.1177/002224378101800104
- Galvão, A., Aleixo, M., De Pablo, H., Lopes, C., & Raimundo, J. (2020). Microplastics in wastewater: microfiber emissions from common household laundry. Environmental Science and Pollution Research, 27(21), 26643–26649. https://doi.org/10.1007/s11356-020-08765-6
- Gam, H. J., & Banning, J. (2011). Addressing sustainable apparel design challenges with problem-based learning. Clothing and Textiles Research Journal, 29(3), 202–215. https://doi.org/10.1177/0887302X11414874
- Guarín, A., & Knorringa, P. (2014). New Middle-Class Consumers in Rising Powers: Responsible Consumption and Private Standards. Oxford Development Studies, 42(2), 151–171. https://doi.org/10.1080/13600818.2013.864757
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks. Sage, 165.
- Hameed, I., Waris, I., & Amin ul Haq, M. (2019). Predicting eco-conscious consumer behavior using theory of planned behavior in Pakistan. Environmental Science and Pollution Research. https://doi.org/10.1007/s11356-019-04967-9
- He, X., & Zhan, W. (2018). How to activate moral norm to adopt electric vehicles in China? An empirical study based on extended norm activation theory. Journal of Cleaner Production, 172, 3546–3556. https://doi.org/10.1016/j.jclepro.2017.05.088
- Henninger, C. E., Alevizou, P. J., & Oates, C. J. (2016). What is sustainable fashion? Journal of Fashion Marketing and Management: An International Journal, 20(4), 400–416.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43, 115–135.
- Hopper, J. R., & Nielsen, J. M. (1991). Recycling as altruistic behavior: Normative and behavioral strategies to expand participation in a community recycling program. Environment and Behavior, 23(2), 195–220.
- Hosta, M., & Zabkar, V. (2021a). Antecedents of Environmentally and Socially Responsible Sustainable Consumer Behavior. Journal of Business Ethics, 171(2), 273–293. https://doi.org/10.1007/s10551-019-04416-0
- Hosta, M., & Zabkar, V. (2021b). Antecedents of Environmentally and Socially Responsible Sustainable Consumer Behavior. Journal of Business Ethics, 171(2), 273–293. https://doi.org/10.1007/s10551-019-04416-0
- Jung, H. J., Oh, K. W., & Kim, H. M. (2021). Country differences in determinants of behavioral intention towards sustainable apparel products. Sustainability (Switzerland), 13(2), 1–23. https://doi.org/10.3390/su13020558
- Jung, S., & Jin, B. (2014). A theoretical investigation of slow fashion: sustainable future of the apparel industry. International Journal of Consumer Studies, 38(5), 510–519.
- Khare, A. (2015). Antecedents to green buying behaviour: A study on consumers in an emerging economy. Marketing Intelligence and Planning, 33(3), 309–329. https://doi.org/10.1108/MIP-05-2014-0083
- Le, M. H., & Nguyen, P. M. (2022). Integrating the Theory of Planned Behavior and the Norm Activation Model to Investigate Organic Food Purchase Intention: Evidence from Vietnam. Sustainability (Switzerland), 14(2). https://doi.org/10.3390/su14020816
- Li, L., Wang, Z., Li, Y., & Liao, A. (2021). Impacts of consumer innovativeness on the intention to purchase sustainable products. Sustainable Production and Consumption, 27, 774–786. https://doi.org/10.1016/j.spc.2021.02.002
- Lim, E., Arita, S., & Joung, S. (2019). Advancing sustainable consumption in Korea and Japan-from re-orientation of consumer behavior to civic actions. Sustainability (Switzerland), 11(23). https://doi.org/10.3390/su11236683
- Mara, D. (2013). Domestic wastewater treatment in developing countries. Routledge.
- Marks, J. (2007). Eco-friendly merchandising on the rise. Home Textiles, 29, 12.
- Nayak, R., Houshyar, S., Patnaik, A., Nguyen, L. T. V, Shanks, R. A., Padhye, R., & Fegusson, M. (2020). Sustainable reuse of fashion waste as flame-retardant mattress filing with ecofriendly chemicals. Journal of Cleaner Production, 251, 119620.
- O'Brien, S., Okoffo, E. D., O'Brien, J. W., Ribeiro, F., Wang, X., Wright, S. L., Samanipour, S., Rauert, C., Toapanta, T. Y. A., & Albarracin, R. (2020). Airborne emissions of microplastic fibres from domestic laundry dryers. Science of the Total Environment, 747, 141175.
- Periyasamy, A. P. (2023). Microfiber Emissions from Functionalized Textiles: Potential Threat for Human Health and Environmental Risks. Toxics, 11(5), 1–31. https://doi.org/10.3390/toxics11050406
- Prata, J. C. (2018). Microplastics in wastewater: State of the knowledge on sources, fate and solutions. Marine Pollution Bulletin, 129(1), 262–265.
- Remy, F., Collard, F., Gilbert, B., Compère, P., Eppe, G., & Lepoint, G. (2015). When microplastic is not plastic: the ingestion of artificial cellulose fibers by macrofauna living in seagrass macrophytodetritus. Environmental Science & Technology, 49(18), 11158–11166.
- Riyaz, M., Jan, A., Khan, D., & Nadroo, Z. M. (2024). Purchase Intention of Gen X and Millennials for Eco-Friendly Home Appliances: A Moderated Multi-Group Analysis. IUP Journal of Marketing Management, 23(3), 5–26.
- Schwartz, S. H. (1977). Normative Influences on Altruism11This work was supported by NSF Grant SOC 72-05417. I am indebted to L. Berkowitz, R. Dienstbier, H. Schuman, R. Simmons, and R. Tessler for their thoughtful comments on an early draft of this chapter. (L. Berkowitz (ed.); Vol. 10, pp. 221–279). Academic Press.

https://doi.org/https://doi.org/10.1016/S0065-2601(08)60358-5

- Scott, L., & Vigar-Ellis, D. (2014). Consumer understanding, perceptions and behaviours with regard to environmentally friendly packaging in a developing nation. International Journal of Consumer Studies, 38(6), 642–649. https://doi.org/10.1111/ijcs.12136
- Sethuraman, P., Arasuraja, G., & Rajapriya, M. (2023). Social Media'S Effect on Millennials and Generation Z'S Green Purchasing Habits. International Journal of Professional Business Review, 8(5), 1–18. https://doi.org/10.26668/businessreview/2023.v8i5.1470
- Setiawan, B., Afiff, A. Z., & Heruwasto, I. (2021). Personal Norm and Pro-Environmental Consumer Behavior: an Application of Norm Activation Theory. ASEAN Marketing Journal, 13(1), 40–49. https://doi.org/10.21002/amj.v13i1.13213
- Statista. (2022). Annual production of plastics worldwide from 1950 to 2021. Statista Hamburg, Germany.
- Tey, Y. S., Brindal, M., & Dibba, H. (2018). Factors influencing willingness to pay for sustainable apparel: A literature review. Journal of Global Fashion Marketing, 9(2), 129–147. https://doi.org/10.1080/20932685.2018.1432407
- Trivedi, R. H., Patel, J. D., & Acharya, N. (2018). Causality analysis of media influence on environmental attitude, intention and behaviors leading to green purchasing. Journal of Cleaner Production, 196, 11–22.
- Vehmas, K., Raudaskoski, A., Heikkilä, P., Harlin, A., & Mensonen, A. (2018). Consumer attitudes and communication in circular fashion. Journal of Fashion Marketing and Management: An International Journal, 22(3), 286–300.
- Vining, J., & Ebreo, A. (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities 1. Journal of Applied Social Psychology, 22(20), 1580–1607.
- Woodall, L. C., Sanchez-Vidal, A., Canals, M., Paterson, G. L. J., Coppock, R., Sleight, V., Calafat, A., Rogers, A. D., Narayanaswamy, B. E., & Thompson, R. C. (2014). The deep sea is a major sink for microplastic debris. Royal Society Open Science, 1(4), 140317.
- World Bank. Available online: https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medioambiente (accessed on 19 June 2020).
- Zhang, Y., Wang, Z., & Zhou, G. (2013). Antecedents of employee electricity saving behavior in organizations: An empirical study based on norm activation model. Energy Policy, 62, 1120–1127.

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¹Dr Syed Irfan Shafi ²Dr. Asif Iqbal Fazili ³Dr. Imran Ul Amin

<u>Abstract</u>

In the modern world, society expects that socially responsible corporations will provide more benefits. On a worldwide scale, corporate social responsibility is having a strong impact on it. Numerous industries have realised the advantages and benefits of executing corporate social responsibility strategies for both business and society. According to studies conducted in developed economies, corporate social responsibility (CSR) affects a brand's performance. However, there are few studies of this sort available in developing economies such as India. Therefore, this study explores the connection between corporate social responsibility and brand equity (BE). Several studies have been conducted in this field, but the results are contradictory. As a result, previous studies failed to consider mediating factors and/or confounding factors, which can alter the direction of a relationship. Therefore, this study considered brand awareness, association, and loyalty to the brand, as well as perceived quality as potential mediators. Based on the results of a structural equation modelling (SEM) approach, we conclude that different CSR activities enhance the value of firm brands. However, not all activities contribute significantly to brand value. CSR activities relating to product based are key brand drivers that impact brand value whereas activities associated with the consumer have no significant impact on brand value. The results of Corporate-governance-based, environmental based and overall CSR contribute significantly to the creation of overall brand equity of firm.

Keywords: Brand equity, corporate social responsibility, Brand association, Brand loyalty, Perceived quality, Brand awareness, India.

1. Introduction

Across the world, corporations are adjusting to their new role, which is to address the requirements of today's generation without jeopardising the needs of tomorrows. Businesses are slowly but steadily accepting responsibility with regard to the social and environmental implications of their business. Any business's goal is to improve everyone's quality of life. A discrepancy between the objectives led to the creation of corporate social responsibility (CSR) of the organization is to maximize its benefits and it's responsible to society and the environment. Over the last few decades, CSR has been the subject of extensive research and debate, despite being a very subjective concept (Jamali & Mirshak, 2008). As per the World Business Council for Sustainable Development (WBCSD), businesses have a responsibility to contribute to social and economic development, which means that they must

3 Assistant Professor, Department of Management Studies, Islamic University of Science and Technology, Awantipora Pulwama, Kashmir-192122; email: imran.amin@iust.ac.in

¹ Assistant Professor, Department of Management Studies, Islamic University of Science and Technology, Awantipora Pulwama Kashmir-192122; email: drsyedirfanshafi@gmail.com

² Associate Professor, Department of Management Studies, Islamic University of Science and Technology, Awantipora Pulwama Kashmir-192122; email: asif.fazili@islamicuniversity.edu.in

corporate with their employees, including their families, communities at local level including society to facilitate the quality of their lives.

According to the European Commission, CSR refers to the processes that enterprises employ every day in regards to their operations and interactions with their stakeholders, which comprise of employees, business partners, stockholders, government agencies, nongovernmental organisations, and the environment (Paper, 2001). There was a noticeable shift in the way shareholders understood how to develop value in the mid-1980s (Knowles, 2013). Before this, assets which were tangible and considered the principal base of firm value and a major source of concern for shareholders. Global rivalry has heightened the ephemeral nature of competitive advantages such as technology and enhanced the long-term value of brands to business owners (Lindemann, 2004). Coca-Cola, Disney, IKEA, and GE, which were founded in 1886, 1923, 1943, and 1978, respectively, keep their products on the store for lengthier periods of time, sometimes even years. Branding costs a lot of money, but once you invest it, your company will reap huge rewards. "Brands are essentially patterns of familiarity, meaning, fondness, and reassurance that exist in the minds of people" (Tom Goodwin). The essence of branding lies in the fact that it not only builds a lasting impression with consumers, but it also provides your clients and consumers a sense of who you are. It's a procedure by which one can distinguish himself from the clutches of competition by expressing briefly what you one has to offer that leads to the best choice. One's brand of the company is created for reflecting properly what one is and how he wants to be perceived.

A brand is established in a variety of methods, which consists of advertising, services provided to the customers, social responsibility, stature and graphics. Such aspects collectively lead to a one-of-a-kind and (positively) attention-impactful profile. Branding is extremely important for any organisation because of the overall impact it has. Once executed poor lying any case at all, branding would have an impact on the mode of perception about the company, generate new business and increases brand value - but its opposite impact cannot be ruled out. Due to the improving competition, increased product, process performance and the pressure the business owners will have with regard to their behaviour that should be socially acceptable, brands contribute significantly to social value in addition to economic value (Lindemann, 2004). A transition with regard to the roles and responsibilities of corporate in the late 1980s also resulted in an increase in expectations of corporate behaviour (Tjärnemo, 2001). Businesses have demonstrated increased through their attempts ethical behaviour which persuade customers and showcase their responsibilities since the mid-2000s. According to Cohen and Altman (2000), the firm's ultimate goal to maximise wealth meant for the owners through a sustainable manner as a contributing member of society. A viewpoint that extends beyond the financial implications of the situation (Friedman, 1984). This declaration is in response to growing concerns about a company's obligation to its stakeholders. Despite the fact that their social value is less evident than their economic value, it seems the ethical awareness a corporation exhibits has a proportional credibility (Lindemann, 2004).

2. Statement of the Problem

The effectiveness of a company's CSR policy is heavily influenced by its customers' success. As a result, it is critical to comprehend them. Finding out why these customers buy from organisations that include social responsibility into their business processes is key to understanding these customers. Consumers will only support a company that engages in CSR once they get some type of value in return (Green & Peloza (2011). Consumers, according to Green and Peloza, don't look at CSR as a single perception of a firm, but rather at each CSR activity as it contributes to their overall value proposition. According to D'astous & Legendre (2009), the self-interest is preferred by consumers over societal interests.

The majority of businesses engage in some kind of corporate, environmental and social responsibility, along with the major goal to improve welfare of communities and societies which they have any influence upon. Nonetheless, demand is mounting to elevate CSR to the status of a corporate discipline and to ensure that each activity is quantifiable. That's asking too much of CSR and it evades the focus from what it is showing to be doing: integrating social and environmental operations of a company along with its corporate values and mission. If they do, CSR operations should minimise risks, maximize reputation, and provide it's contribute for the success of corporate. Those outcomes, on the other hand, are a result of many CSR programmes, not the purpose for their existence. This report explains why businesses should refocus their CSR efforts. On this overarching goal and lays out a mechanism for ensuring that their CSR programmes are both cohesive and disciplined. In addition, this research looks into the mechanism of effects and impact of corporate social responsibility on brand equity of pharmaceutical industry in India.

3. Literature Review and Hypothesis Development

During the last few decades, business researchers have developed an increasing interest in CSR. With increasing rights and importance given to stakeholders in the business world, the term CSR became more and more important. CSR has been uses as an expedient, as per the previous research studies, once the social and commercial interesting areas grew equally important to service the stakeholders in the 1980s.In the coming decades, the concept of CSR developed, and after two decades it was considered crucial for all strategic decisions in a business. Jones et al. have examined the relationship between CSR practices and corporate performance. CSR actions considerably ensure impactful brand reputation in the eyes of customers, as per the study conducted by Garberg & Fombrun (2012), after they made it a strategic investment which could be counted as a type of reputation development. Furthermore, recent research reveals that socially responsible businesses can quickly gain a competitive edge and improve their financial performance. According to Stanwick & Stanwick (1998), there is an optimal degree of CSR in which organisational administrators have control over the economic view of costs and benefits.

In the same way, a high equity brand has a high value. Brand equity is the market value of a brand. There are several definitions of this concept, such as Sarstedt's, which states that it is an overall estimation of how a company is held by its stockholders. Despite this, this concept is not fully understood. Brand equity is the ability of a brand to create value for its consumers that are referred to as brand assets, liabilities, and its name and symbol. This is equally known as the differential influence of brand understanding on customer responses to brand promotion. The brand name value is determined by the assumption that its owner may profit from its recognition. According to Buil & Dechernatony, (2013), brand equity is both the brand image of the company and customer loyalty to the company. Consumers' favourable or negative experiences and impressions determine the level of brand power, which is one component of overall brand equity. According to marketing specialists, a company's most valuable asset is its brand. As a result, strategic investments, economic increase in market share, critical associations, and prestige value all contribute to brand equity. Customers choose items and companies based on their ability to empathise with them. In addition, the business must provide a group of values which will increase the value of a product once its image is sold. This could result in the great image of a brand that should express trustworthiness, quality and accountability including ethics. As a result, differentiation in its positioning strategy can be done in a socially acceptable manner. It is evident from this review of the literature that brand equity is extremely important to businesses and means a lot to them. Additionally, this study discusses the various definitions and ideas of brand equity. There are five components of brand equity: Accessory, Value, Social Image, Performance, and Honesty. All factors that go into

determining brand equity are customer loyalty, potential price premium, the brand's, high comparative quality, distinctiveness from other brands, the brand's perceived worth and market share of the brand.

over the last few decades, a great deal of study has been conducted on the topic of brand equity, which resulted in a variety of brand equity dimensions including its diverse approaches for analysing brand equity (Yoo & Donthu, 2001). As a result, it was found that the customerbased brand equity can be divided into four categories: brand loyalty, brand association, brand awareness, and perceived brand quality

.3.1 Aspects of CSR and Brand Equity: The Suggested Model

Ecologically focused CSR initiatives can be included into every area of the marketing mix, to ensuring the safety of the products for the environment so that environmental friendly distribution and disposal systems are built (Menon et al., 1999). Brand equity is essentially a metric assessed by customers and major stakeholders outside of the company. Brand awareness is consider as the essential factors in brand equity models. Mackay, (2001) defines brand awareness as the ability to recognise and recall a brand even in unusual situations, also the capability to relate the logo, name, and many features of the brand with particular relationships including brand supremacy, brand knowledge, top-of-mind and brand estimation. A brand's complete set of associations is its brand knowledge. Therefore,

H1 (a): Environmental CSR activities will have a positive relationship with Brand Awareness

CSR activities that improve the quality of the product offered are likely to be apparent and linked with the interests of individuals making purchase decisions. Furthermore, buyers may perceive an organization's legitimacy based on product quality and innovation (Servaes and Tamayo, 2013). CSR's credibility and visibility improve things like brand associations, attitudes and identification, resulting in increased brand equity (Sen et al., 2006; Bhattacharya & Sen, 2004). Firms that have solid governance system (Arora & Dharwadkar, 2011) or better working kinships with their employees may be seen to have high product quality (Vomberg et al., 2015). Brand relationship reigns supreme as a traditional characteristic of brand equity. Associations are the basic factors for brand loyalty and purchase decisions. Brand relations are the things associated with a brand, including opinions, approaches, perceptions, attitudes, experiences, images (Kotler & Keller, 2006) or memories of the brand. Chen classified brand associations into two types in 2001, organizational and product associations. Therefore,

H1 (b): Product-based CSR activities will have a positive relationship with Brand Association.

CSR Contributes to a favourable image in the community through charitable contributions, education support, housing and also volunteer programs. CSR that is centred on the community is often quite visible to organisational stakeholders. Malik and Kanwal (2016), discovered enterprises had likelihood to reveal CSR activities which are related to involvement of community rather than those which are connected to the environment, employees, or consumers as part of a study that enquired the impact of disclosing CSR activities. The promise to purchase favourable products from the same brand in the future is known as brand loyalty (Oliver, 1999). Although rival brands' marketing methods may entice customers to switch brands, a high level of brand loyalty might mean client retention. Furthermore, brand loyalty has a tremendous effect on the long-term profitability of a company, which can add value to the company. Furthermore, as a result the receivers of the efforts done by the firm are external to the corporation, community-based CSR can be seen as trustworthy. According to Pai et al. (2010), industrial buyers were more likely to evaluate brand equity positively when they Suppliers were thought to be doing CSR so that the reasons for intrinsic (altruistic) rather than extrinsic (self-interested) can be considered. Moreover, it was found by Du et al. (2010) that CSR builds credibility towards community and customer loyalty, which in reverse increases

business effectiveness. Therefore,

H1 (c): Community-based CSR activities are positively related to Brand Loyalty

With regard to their effects that they have on business performance, research on the research based on the relationship between corporate-governance-based CSR initiatives and the results is equivocal. Strong corporate governance, according to researchers, can decrease negative CSR activities in general, but the influence of good CSR is much complicated because of business stakeholders' with difference in viewpoints on how governance might best benefit those (Arora & Dharwadkar, 2011). On one hand stockholders can see certain governance initiatives as bad if they appear to restrict short-term earnings, other stakeholders may see them as good if they improve the company's long-lasting image (Arora & Dharwadkar, 2011; Johnson & Greening, 1999). Customers' perceptions of a product's or services overall features are referred to as 'perceived quality,' rather than objective quality measurements (Yoo et al., 2000). The perceived quality of a product or service, according to this definition, is determined by a number of elements. Customer views of a product or service can differ based on such a definition. According to Yoo et al, (2000), the level of perceived quality impacts the level of brand equity. Therefore,

H1 (d): Corporate-governance-based CSR activities are positively related to Perceived Quality of Brand.

The relation between corporate social responsibility and brand equity has been proven by researchers (He & Lai, 2011; Lai, et al., 2010). A halo effect is a cognitive bias in psychology that occurs when a measure of one trait is absorbed into a measure of another (Thorndike, 1920). In business, halo effects can be a comprehensive or partial measure of a company's spill over into a specific metric. Starbucks' fair-traded coffee beans, for example, may help buyers to associate the company's CSR image with the flavour and quality of its products. CSR efforts can generate a halo effect on brand equity by extending components into other domains (Klein &Dawar, 2004). The relation between CSR and brand equity is supported by the resourcebased view (RBV) theory (McWilliams & Siegel, 2010). A firm, according to RBV, is a collection of tangible and intangible assets that provide a competitive advantage (Wernerfelt, 1984). Heterogeneous, scarce, or immovable resources can be used to gain a long-term competitive edge. CSR contributes to brand equity in addition to creating favourable reputations and improving brand images and loyalty. Intangible resources are difficult to replicate and can provide a corporation with a long-term competitive edge (Jones & Bartlett, 2009). Hence, the relationship between CSR and brand equity provides strategic value to a company. Therefore

H1 (e): CSR practices are positively related to Overall Brand Equity

4. Method

Identified as an exploratory and relational research, this research examines if CSR aids in the development of brand equity of a company. It further intends to investigate the relation between CSR and brand equity. Marketers would have a better knowledge of the following two primary variables: Corporate Social Responsibility (CSR) and Brand Equity. The main aim behind this study is to assess whether or not the knowledge of a consumer's knowledge for a company's brand leads to a purchase of a product or service from that company. Due to these the perception of consumer's about the issue of corporate social responsibility and brand equity is the major focus of this study. Exploratory research aims to observe, gather information, and hypothesis about what has been observed. This strategy is applicable to the study so that the association between CSR and brand equity is determined. This strategy would be useful because as it permits the researcher to put forth multiple questions, measure multiple variables, and test multiple hypotheses all at once.

This research focused exclusively on top online pharmaceuticals industries in India, so the sample population for this study was composed of customers and employees. Because of its size and lack of resources, collecting data from the entire population was extremely difficult. In order to carry out this research, a feasible sample size of 200 was selected. The study surveyed 110 customers and 80 employees of the company. The entire population could not be surveyed due to two reasons. Logistic costs are significant, and the population is dynamic in the sense that the people who make up the population vary over time. Furthermore, because data gathering is quicker and the data set is smaller, ensuring homogeneity and improving data quality is easy. Therefore, questionnaires were the best instrument for this research. The study collected data from both primary and secondary sources. Bliakie (2003) claimed that combining different sources of data decreases each source's unique biases. The data was divided into two categories: primary and secondary. Interviews and questionnaires were utilised to gather primary data. Secondary data was collected from related studies, existing literature, and various pharmaceutical company reports. The results of this study were analysed through descriptive statistics, correlation analysis and random effect model using structural equation modelling.

5. Results

The various aspects of brand equity (brand association, brand loyalty, brand awareness and perceived quality) have been used as dependent variables. In order to measure the company's CSR activities comprehensively and authentically, we followed the "Environmental, Social, and Corporate Governance KPI framework" recommended by the UN Environment Program Finance Initiative (UNEP FI) and the World Business Council for Sustainable Development (WBCSB), and developed five different factors (Environmental CSR, Product-based CSR, Community-based CSR, Corporate-governance-based CSR and overall corporate social responsibilities) as independent variables by which companies CSR can be measured.

Table 1 gives descriptive statistics of major variables in this model, followed by a correlation analysis.

	Mean	SD	Min.	25%	Median	75%	Max
				Quantile		Quantile	
Environmental	4.14	2.24	0	0	4	5	7
CSR							
Product Based	3.14	1.19	1.26	2.33	3.65	4.21	6.36
CSR							
Community	3.22	1.43	0	0	4	4	5
Based CSR							
Governance	0.81	0.19	0	0	1	1	1
Based CSR							
Overall CSR	0.08	0.29	0	0	0	0	1
Brand Awareness	39.97	14.39	11.95	20.00	38.99	60.97	92.98
Brand	0.99	0.23	0	0	1	1	1
Association							
Brand Loyalty	3.58	1.77	0	0	4	4	6
Perceived Quality	0.94	0.29	0	0	1	1	1
Brand Equity	19,178.25	19,225.	3,145	4,032	11,452	59,536	118,367
		35					

 Table1: Descriptive Statistics

As previously mentioned, we included five CSR variables from different fields in our model.

Table 2: Correlation Analysis										
	E-	PB-	CB-	CGB-	CSR	BA	BAS	BL	PQ	BE
	CSR	CSR	CSR	CSR						
Environmental	1									
CSR										
Product Based	0.169	1								
CSR										
Community Based	0.061	0.149	1							
CSR										
Governance	0.023	0.444	0.141	1						
Based CSR										
Overall CSR	0.424	0.195	-0.052	0.149	1					
Brand Awareness	0.239	0.077	0.031	0.101	0.369	1				
Brand Association	-0.093	0.123	0.061	0.19 -	-0.089	-0.197	1			
Brand Loyalty	0.043	0.047	0.134 -	0.245	0.137 -	0.044	-0.245	1		
Perceived Quality	0.179	0.313	0.245	0.199	0.010	0.159	0.181	0.011	1	
Brand Equity	0.438	0.371	0.049	0.179	0.208	0.524	0.170	0.141	0.168	1
EIE C D	14									

Additionally, all the brand equity control variables are included. Our model does not suffer from serious multi-colinearity issues based on the correlation analysis between key variables

5.1 Estimation Results

The results of present study are estimated, by using random effect model (Baltagi& Li, 2002). Taking into account the results of the houseman test (Chi-squared = 29.03, p-value <*0.05), a fixed effect model is chosen for testing the hypotheses. The estimation results that both of these models gave are presented in Table 3. This study provides strong evidence that CSR activities contribute to the creation of firm brand value. Yet, all the activities did not contribute significantly to brand value. CSR activities relating to product based are key brand drivers that impact brand value whereas activities associated with the consumer have no significant impact on brand value. The results of Corporate-governance-based, environmental based and overall CSR contribute significantly to the creation of overall brand equity.

The findings of this study have important implications for multinational pharmaceutical companies' CSR strategy. It is pertinent to mention that in order to gain the public trust and differentiate oneself from other competitors in a highly competitive environment where numerous companies are trying their hard to harness themselves with colourable CSR activities. Firms must instead gain public trust by being accountable to the customers they have, rather than simply announcing perfunctory CSR policies. Taking the time to link the executives' pay to their CSR activities or passionately taking part in well-established sustainability organizations can be an indication of the company's commitment to the real social responsibility. Furthermore, providing comprehensive CSR training programmes for their staff helps to build brand value, as does adopting employee regulations do not have an immediate impact on developing brand value of a firm. Moreover, environmental activities should be carefully planned and implemented by managers. According to our research, implementation of environmental policies or initiatives cannot be fruitful in maximizing the company's brand value. There is a possibility that this is linked to the nature and mode of environmental activities. Based on First & Khetriwal, (2010) companies face a challenge to persuade consumers with regard to their environmental policies and activities are dedicated to the environment. Further, Ramus & Montiel (2005) contend that frequently environmental policy are discussed used for the purpose of "green-washing", so conventional environmental activities are ineffective for raising the company's brand recognition.

Variables	Estimates	Brand	Brand	Brand	Perceived	Brand	
	& S.E.	Awareness	Association	Loyalty	Quality	Equity	
Environmental CSR	Estimates	2,588.89***	2,689.89***	2,689.89***	2,599.99***	2,699.99***	
	S.E.	599.29	-88.99	683.14	663.14	683.12	
Product Based CSR	Estimates	2,999.87***	-108.00***	899.55**	2,934.00***	-102.99***	
	S.E.	799.99	34.39	41.99	899.96	35.92	
Consumer Based CSR	Estimates	279.52	186.00	282.70*	136.77	-2.933	
	S.E.	-0.499	4.799	-2.936	4.589	-2.723	
Corporate Governance	Estimates	3.299***	0.5899***	0.879***	2.897***	2,836.99***	
Based CSR	S.E.	0.599	0.229	0.301	0.222	879.32	
CSR Practices	Estimates	2,813.12***	907.99**	-112.13***	2,610.83***	0.4998***	
	S.E.	-89.98	409.30	35.99	662.13	0.310	
Ν					300		
Observation per group	7.8						
R-sq within	0.3399						
R-sq between				0.2675			
R-sq overall				0.2549			
F-statistics/Chi-statistic	8.79***						
(p-value				0.000			
Hausman Test				28.99**			
Chi-statistics (p-value)				0.015			

Table 3: Estimation Results

* *P*< 0.10, ** *p* < 0.05, *** *p* < 0.01

Another interesting finding is that brand value is negatively impacted by CSR disclosure, we also found that overall CSR disclosures are negatively significant. It may seem counterintuitive, but dissemination of overall CSR information may be a discussion between a firm and the stakeholders, which could result in assisting them for better understanding about the activities of the company and affecting their perspectives and expectations (Adams & McNicholas, 2007). Furthermore, the ill consequences of CSR disclosure show that just sharing more information does not guarantee a higher assessment of reputation and brand value of a company. It could lead to the credibility of genuineness. More disclosures are not a good indicator because of the voluntary character of the disclosure. As shown in Table 2, the consumer based CSR and overall CSR programmes are negatively correlated. This tends that firms focus more on consumer based programmes. Companies lacking in good commitments to CSR initiatives and knowledge and skill, on the other hand, can put a strong impact on brand equity disclosure. He reason could be that further disclosure could result in high expectation of people about the company and disappointed them later when the CSR performance company doesn't fulfil their expectations, even though they take part in CSR activities proportional to their competitors. Examining how disclosures influence people's expectations and identifying the fundamental elements driving organisations' disclosure behaviour would be intriguing. This study does not cover this topic and left it to future research.

6. General Discussion

This study has used multinational company data from multiple sources. The impact of CSR initiatives on brand value is investigated in this study. Partially, we found that CSR activities relating to product based contribute to a company's brand value creation. Whereas activities associated with the consumer are not all effective. The huge support for the CSR activities which are related to corporate-governance-based, environmental based and others related to overall CSR, which is consistent with some of the earlier research. Through empirical evidences and a distinctive database, the understanding of CSR impacts on brand value creation

of multinational companies in the CSR literature is established. Through this study it was found that there is an essential and positive association between corporate social responsibility and brand equity, which forms the conclusion of the study. In view of the results of the study, the entire pharmaceutical industry is offered the recommendation that the approach to increase the brand equity means is to place a high value on corporate social responsibility. Further, it is suggested that, industry players must provide excellent service to their customers and the communities in which they operate, and as a result, the organization's brand equity will improve. The researcher also invites further theoretical and conceptual research regarding people's reactions to CSR activities in each domain.

References:

- Adams, C. A., & McNicholas, P. (2007). Making a difference: Sustainability reporting, accountability and organisational change. Accounting, Auditing and Accountability Journal, 20(3), 382–402. https://doi.org/10.1108/09513570710748553
- Arora, P., &Dharwadkar, R. (2011). Corporate governance and corporate social responsibility (CSR): The moderating roles of attainment discrepancy and organization slack. Corporate Governance: An International Review, 19(2), 136– 152. https://doi.org/10.1111/j.1467-8683.2010.00843.x
- Baltagi, B. H., & Li, D. (2002). Series estimation of partially linear panel data models with fixed effects. Annals of Economics and Finance, 3(1), 103–116.
- Blaikie, N. (2003). Analysing quantitative data: From description to explanation. SAGE.
- Buil, I., Martínez, E., & De Chernatony, L. (2013). The influence of brand equity on consumer responses. Journal of Consumer Marketing, 30(1), 62–74. https://doi.org/10.1108/07363761311290849
- d'Astous, A., & Legendre, A. (2009). Understanding consumers' ethical justifications: A scale for appraising consumers' reasons for not behaving ethically. Journal of Business Ethics, 87(2), 255–268. https://doi.org/10.1007/s10551-008-9883-0
- Dorssemont, F. (2004). Corporate social responsibility, what's in a name? A critical appraisal of the Green Paper. Transfer: European Review of Labour and Research, 10(3), 362–371. https://doi.org/10.1177/102425890401000304
- Du, S., Bhattacharya, C. B., & Sen, S. (2010). Maximizing business returns to corporate social responsibility (CSR): The role of CSR communication. International Journal of Management Reviews, 12(1), 8–19. https://doi.org/10.1111/j.1468-2370.2009.00276.x
- First, I., &Khetriwal, D. S. (2010). Exploring the relationship between environmental orientation and brand value: Is there fire or only smoke? Business Strategy and the Environment, 19(2), 90–103.
- Friedman, M. (1984). Are we creating a'brand'new language? A content analysis of commercial expressions in the lyrics of popular American songs in the post-war era [Working paper]. Eastern Michigan University, Department of Psychology.
- Hegner, S. M., Beldad, A. D., &Kamphuisop Heghuis, S. (2014). How company responses and trusting relationships protect brand equity in times of crises. Journal of Brand Management, 21(5), 429–445. https://doi.org/10.1057/bm.2014.12
- Huang, H., & Lai, Y. (2011). Brand management problems in SMEs: Case study on GävleVandrarhem AB and Chai lease international finance corporation-Shenzhen branch.
- Iwamoto, H., & Suzuki, H. (2019). An empirical study on the relationship of corporate financial performance and human capital concerning corporate social responsibility: Applying SEM and Bayesian SEM. Cogent Business and Management, 6(1), 1656443. https://doi.org/10.1080/23311975.2019.1656443
- Jones, K., & Bartlett, J. (2009). The strategic value of corporate social responsibility: A

relationship management framework for public relations practice. Prism, 6(1), 1-16.

- Klein, J., &Dawar, N. (2004). Corporate social responsibility and consumers' attributions and brand evaluations in a product–harm crisis. International Journal of Research in Marketing, 21(3), 203–217. https://doi.org/10.1016/j.ijresmar.2003.12.003
- Kotler, P., & Keller, K. L. (2006). Marketing management 12e p. 143. NJ.
- Lindemann, J. (2004). Brand Valuation, a chapter from brands and branding, an economist book. Interbrand.
- Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. Journal of Finance, 72(4), 1785–1824. https://doi.org/10.1111/jofi.12505
- Maio Mackay, M. M. (2001). Evaluation of brand equity measures: Further empirical results. Journal of Product and Brand Management, 10(1), 38–51. https://doi.org/10.1108/10610420110382812
- Maden, C., Arıkan, E., Telci, E. E., &Kantur, D. (2012). Linking corporate social responsibility to corporate reputation: A study on understanding behavioural consequences. Procardia – Social and Behavioural Sciences, 58, 655–664. https://doi.org/10.1016/j.sbspro.2012.09.1043
- Malik, M. S., & Kanwal, L. (2018). Impact of corporate social responsibility disclosure on financial performance: Case study of listed pharmaceutical firms of Pakistan. Journal of Business Ethics, 150(1), 69–78. https://doi.org/10.1007/s10551-016-3134-6
- Mirshak, R., & Jamali, D. (2008, August). CSR in conflict prone areas: An empirical investigation in Lebanon. In Academy of Management Proceedings (Vol. 2008, No. 1, pp. 1-6). Briarcliff Manor. Academy of Management, 2008(1), NY10510. https://doi.org/10.5465/ambpp.2008.33636435
- Oliver, R. L. (1999). Whence consumer loyalty? Journal of Marketing, 63(4), 33–44
- Pai, D. C., Lai, C. S., Chiu, C. J., & Yang, C. F. (2015). Corporate social responsibility and brand advocacy in business-to-business market: The mediated moderating effect of attribution. Journal of Business Ethics, 126(4), 685–696. https://doi.org/10.1007/s10551-013-1979-5
- Ramus, C. A., & Montiel, I. (2005). When are corporate environmental policies a form of greenwashing? Business and Society, 44(4), 377–414. https://doi.org/10.1177/0007650305278120
- Stanwick, & Stanwick. (1998). Corporate social responsibility influences, employee commitment and organizational performance. African Journal of Business Management, 4(13), 2796–2801.
- Sweetin, V. H., Knowles, L. L., Summey, J. H., & McQueen, K. S. (2013). Willingness-to-punish the corporate brand for corporate social irresponsibility. Journal of Business Research, 66(10), 1822–1830. https://doi.org/10.1016/j.jbusres.2013.02.003
- Thorndike, E. L. (1920). Intelligence examinations for college entrance. Journal of
Educational Research, 1(5), 329–337.
https://doi.org/10.1080/00220671.1920.10879060
- *Tjärnemo, H. (2001). Eco-marketing and eco-management. Exploring the eco-orientationperformance link in food retailing.*
- Wernerfelt, B. (1984). A resource-based view of the firm. Strategic Management Journal, 5(2), 171–180. https://doi.org/10.1002/smj.4250050207
- Yoo, B., &Donthu, N. (2001). Developing and validating multidimensional consumer-based brand equity scale. Journal of Business Research, 52(1), 1–14. https://doi.org/10.1016/S0148-2963(99)00098-3

Power, Policy and Progress: The evolution of the Energy Policyscape in Jammu and Kashmir

¹Baasit Abubakr

<u>Abstract</u>

This paper explores the contours of energy policy in Jammu and Kashmir, that have been shaped by the interplay of technological innovations, institutional reconfigurations, and shifting governance paradigms. The analysis begins with the state's early reliance on hydropower projects, which were central to its sociotechnical imaginaries, developmental aspirations and energy security strategies. However, in present times there is increasing focus on decentralized renewable energy systems, including solar, small hydro, and smart grid technologies. The paper critically examines the neoliberal shift in energy governance, marked by the privatization of electricity generation, the restructuring of distribution companies (DISCOMS), and the introduction of smart meters, alongside evolving electricity laws. It also explores dedicated plans and policies for rural electrification, which have sought to address energy access disparities but remain constrained by a supply-oriented approach that often overlooks the complex, interconnected challenges of energy security, equitable access, and environmental sustainability. By challenging linear narratives of progress, the paper reveals the fragmented and contested processes that characterize energy governance in a region grappling with ecological fragility and developmental imperatives. It argues for a shift from the conventional supply-focused energy strategy to a more holistic approach that simultaneously addresses energy security, equitable access, and environmental protection, offering critical insights into the complexities of aligning energy policies with sustainable development goals in the Global South.

Keywords: Energy Policy, Policyscape, Electricity, Jammu and Kashmir, Power, Progress

1. Introduction

Energy systems form the backbone of modern-day economies. energy systems evolve in tandem with technological and societal changes, often marked by periods of disruption and adaptation such as successive periods witnessing colonial legacies, postcolonial development strategies, and contemporary energy challenges. Until around 200 years ago, the world economies were almost entirely powered by renewable sources powered by the sun, whether in the form of solar energy converted to food as fuel for humans and animals, into woodlands to provide firewood, and into wind power and water power used to power transportation and machinery. However with the advent of industrialisation, an Energy Transition–whereby coal replaced wood and biomass materials–started taking place (Podobnik, 2006). Newer forms and methods of harnessing energy have been become commonplace since then, such as generation of hydrolelectricity. Post-Industrialisation world requires energy systems not merely as technological infrastructures but socio-technical configurations powering the economy, and at the same time being embedded in socio-political, economic and cultural frameworks that co-

¹ Baasit Abubakr is a Ph.D. scholar at the Centre for Studies in Science Policy, Jawaharlal Nehru University, New Delhi. He can be reached at baasitabubakr@gmail.com

produce their design and governance. Within this context, this paper focuses on the evolution of the Energy landscape focussing on electrical energy in the state of Jammu and Kashmir–since its early Energy Transition towards hydroelectricity in early twentieth century(Bhaduri and Abubakr, 2023)–to the present times. The evolution of this particular Energy landscape has been systematically shaped by various plans, policies and programs as well as being moudled by various socio-technical imaginaries of progress.

A close look at the energy policies of Jammu and Kashmir(henceforth referred to as J&K), a state with abundant hydropower potential, reveals multiple actors and institutional frameworks operating at various levels negotiate the contours of energy transitions. As the global imperative to decarbonize accelerates, subnational entities like J&K serve as critical nodes in implementing and innovating energy strategies. The state's energy landscape reflects a convergence of aspirations: national-level objectives of energy security and sustainability intersect with local demands for equitable access and environmental preservation. These aspirations, however, are mediated by structural challenges, including seasonal energy variability, geographic constraints, and socio-economic disparities. This paper situates the evolution of Jammu and Kashmir's energy trajectory within the broader co-constitutives relationship between policy, technology, economy and society, exploring how global discourses on renewable energy and sustainability manifest in the localized practices of this Himalayan state.

2. Energy Policyscape: In lieu of a literature review

Energy as a motive force fuels progress and processes and is emerging as a contested terrain due to transitioning energy paradigms worldwide. Energy drives the contemporary world's machinery, appliances and equipment, and is the lifeblood of development. As businesses, transportation, and residential life become increasingly interconnected, the energy demand has increased to previously unheard-of heights. In addition to driving economic growth, this unquenchable desire for energy poses a serious threat to the environment and the planet's future. The energy challenge in the present-day epoch of the Anthropocene has global implications due to resource scarcity accompanied by enormous population growth in an increasingly unpredictable social and environmental climate. An emerging scholarship of 'energy policy landscapes' has been continuously pushing the envelope to explore overlapping and interactive subject-object relationships, and over the course of many decades, various international institutions, countries, states, and local governments have implemented dedicated energy policies to achive various objectives such as resource adequacy, access to energy, mitigating pollution and to achieve global climate change objectives of the twenty first century to balance growth, development and sustainability (Das, A. et.al., 2024 ; Zohuri, 2023).

Another essential concept relevant to this discussion is the theoretical frame of a 'policyscape', which encompasses a conceptual landscape of policies created in the past that establish themselves as institutions have over a period of time, and having ramifications for governing operations, policy agendas, as well as social and political behaviour (Mettler, 2016). These policies that constitute a policyscape are not static, and they follow trajectories that even the creators of these policies would not have fathomed, leading to lateral effects, design changes and unintended consequences (Mettler, 2016).

Energy security is one of the most commonly occuring component of energy policyscapes. Energy security, has been defined by the International Energy Agency(henceforth referred to as IEA) as 'the reliable supply of energy at an affordable price' (IEA, 2001). Energy security debates are becoming increasingly critical due to volatility in world energy markets, stern competition for energy resources, and the global imperatives of economic development and poverty reduction (World Bank, 2005). As opposed to the IEA's simplistic definition of energy security as a reliable and affordable supply of energy, many scholars have broadened its horizon to define it as consisting of fours A's, i.e (Availability, Affordability, Accessibility and Acceptability), however, two of the four As – availability and affordability – have dominated the discourse onclassic energy security studies (Deese, 1979; Yergin, 1988). The other two As – accessibility and acceptability – are relatively recent phenomena, as both constituted the global energy goals of the World Energy Council in its *Millennium Declaration* (WEC, 2000), however, they weren't linked to energy security until 2007 (APERC, 2007).

Cherp and Jewell (2014) have critically examined Energy Security beyond the 'four As of energy security' (availability, accessibility, affordability, and acceptability) and they argue to account for vulnerabilities and resilience vis-a-vis Energy Security. Cherp and Jewell problematise the concept of energy security as 'low vulnerability of vital energy systems'. This perspective paves the way for a thorough investigation of vulnerabilities as a confluence of risk exposure and resilience, as well as the connections between vital energy systems and crucial social functions. Other perspectives on Energy security involve assessment of (a) security of supply and production, and (b) emergent insecurities (such as availability and pricing) to promote the safeguarding of energy supply and local production capabilities (Ang et al. 2015, Mansson et al. 2014).

With respect to energy governance, the most commonly used approaches have so far focussed heavily on production and consumption as distinct outcomes of energy provision, whereby energy supply is governed by piecemeal and temporary responses without accounting for 'fairness' and justice (Florini and Sovacool, 2009). A holistic lens to account for 'fairness' and to envisage long-lasting solutions to energy policy and governance is through the theoretical framework of 'Energy Justice'. Energy Justice not only acknowledges energy needs but also explores how to distribute the benefits and burdens of energy systems in a fair manner (Sovacool 2014). Energy Justice has been defined by Sovacool and Dworkin (2014) as a just global system where both benefits and costs of energy services are shared, and where representation and impartial decision making are ensured on the path towards eradication of 'Energy Poverty'. Energy Poverty encompasses lack of adequate, affordable, reliable, environmentally sustainable and safe energy services (Dong et al., 2021; Halkos and Gkampoura, 2021a; Halkos and Gkampoura, 2021b).

3. Energy Indicators of Jammu and Kashmir: A Bird's Eye View

The state of Jammu and Kashmir possesses swathes of hydropower potential which, when exploited fully, can boost the state's economy. Developing this potential requires large-scale investments, resources, technical expertise, administrative reforms, proper regulation and management, besides competitive marketing, policy formation and people's participation. Optimising the usage of this enormous hydropower potential would not only enable the state to meet its internal energy needs but would also allow for supplying electricity to other states.

Jammu and Kashmir has an estimated hydropower potential of 20,000 Megawatts (MW) of which 16,475 MW have been recognized, with the Chenab basin having 11,283 MW, the Jhelum basin having 3084 MW, the Ravi basin having 500 MW, and the Indus basin having 1608 MW (Sharma and Thakur, 2017). Jammu and Kashmir's energy profile reveals an installed capacity of approximately 3,800 MW, with a significant reliance on hydropower and growing contributions from solar energy. However, in comparison with neighbouring Himalayan states such as Himachal Pradesh, J&K has not lived up to its potential. J&K and Himachal Pradesh each have an estimated hydropower potential of around 20,000 MWs. Hydel power potential of both J&K and Himachal Pradesh states is estimated at 20,000 MW each. According to the Government of Jammu and Kashmir's Economic Survey, 2016, the State of Himachal Pradesh has harnessed capacity/projects to the extent of 6370 MW (32% of estimated

potential) while as J&K State has exploited 3263.46 MW (16% of estimated potential) only.

Despite possessing a huge hydropower potential, Jammu and Kashmir remains energydeficient, relying on external sources to meet its energy demand and in turn having fiscal ramifications on the state's finances and expenditures. Therefore, a dispassionate analysis has been intended in this paper to explore the interplay between national energy policies, plans and programmes on one hand, and, state-level initiatives like the State Action Plan on Climate Change (SAPCC), dedicated solar, small hydro and wind power policies, and neoliberal reforms such as privatization of the government run Power department and distribution companies (DISCOMS), and digitalization through smart metering. These 'reforms', envisaged at improving efficiency, have also led to rising electricity prices, raising concerns about affordability and equity for consumers. As compared to other states, an institutional hiccup that has stalled harnessing of hydropower on a large scale in Jammu and Kashmir is the Indus Water Treaty (IWT). The Indus Water Treaty (IWT) between India and Pakistan means that J&K is the only state in India where all hydropower projects, both under development and previously commissioned, are based on the run-of-the-river kind (Kumar and Thakur, 2017). Another dubious distinction of Jammu and Kashmir, vis-a-vis it's electricity scenario is that J&K has been consistently topping the charts among Indian states and Union Territories when it comes to Aggregate Technical and Commercial (AT&C) losses. AT&C losses are the sum of technical and commercial losses in a power distribution system, and according to government data the AT&C losses in Jammu and Kashmir for the year 2020-2021 was a whopping 59.28% (Press Information Bureau Government of India, 2023).

The Jammu & Kashmir State Power Development Corporation Limited (JKSPDCL) was founded by the J&K government and formed as a private limited company on February 16, 1995, to assume control of, carry out, finish, run, and maintain all of the State's power plants and projects. The Corporation received the assets of every electricity plant in the state, both the completed ones and those in the planning stages. The Corporation now owns 20 hydroelectric projects, including 450 Megawatts Baglihar Hydroelectric Project, and several other power plants with an installed capacity of 758.70MW spread throughout several regions of Jammu & Kashmir. At Pampore, close to Srinagar, the Corporation has 175 MW of installed gas turbines based on High Speed Diesel. Ten small Hydroelectric plants have been assigned by the Jammu and Kashmir State Power Development Corporation (JKSPDC) in 2003, complying with the State Hydel Policy to Independent Power Producers (IPPs).

Despite the aforementioned power generation capacities of the state, there have been criticisms that the lion's share of total electric power generation of the state's installed capacity is not controlled by the state, but by the National Hydroelectric Power Corporation (NHPC). Many experts and critics have posited that there is a consensus among numerous individuals, including the state's top leadership, regardless of political affiliation, who think that transferring these NHPC projects to the state Government will resolve the state's energy scarcity (Drabu, 2018). Even the central government appointed Group of Interlocutors had remarked that the hydro-electricity potential of the state be tapped and further hydro-electric projects be set up for which the central government should meet the entire equity capital. The following pie chart (Figure 1) employs government data from the official website of the state Power Development Department(JKPDD) to graphically illustrate the sector-wise installed capacity of electric power generation between the Centre, State and Private players.

Figure 1 : Sector-wise Installed Capacity of Electric Power Generation in Jammu and Kashmir



Source: JK PDD Website https://pdd.jk.gov.in/

Moreover, economic considerations have so far guided a preference for hydroelectricity over thermal power generation due to the high costs associated with importing coal, since Jammu and Kashmir is home to rivers with abundant untapped hydroelectric potential, and the region does not have any substantial coal reserves. Hydroelectric projects, which integrate electricity generation with irrigation, have been viewed as the most economically viable projects, with varying degrees of social and ecological costs. Globally, the push towards renewable energy and climate crisis of contemporary times have also allowed for transitioning away from simplistic economic considerations and in line with these developments, there has been a gradual increase in small hydro and solar power generation capacity in Jammu and Kashmir. The following pie chart (Figure 2), graphically illustrates the category-wise installed capacity in J&K and the preponderance of hydropower, as on 31st March 2024, based on data from the Central Electricity Authority (CEA), Ministry of Power, Government of India.

Figure 2 : Category wise Installed capacity of Jammu and Kashmir



Source: Report On Resource Adequacy Plan for the Union Territory of J&K and Ladakh, Central Electricity Authority (CEA), Ministry of Power, Government of India, 2024.

The per capita consumption of electrical energy in terms of Kilowatt hours (kWh) in Jammu and Kashmir was 1322 kWh for the year 2018-19 (Press Information Bureau, Government of India, 2019). To explore whether the gradual increase in electricity generation, electricity consumption per capita, and the increase in population in Jammu and Kashmir, are correlated or not, however, that is beyond the scope of this paper and might be an interesting entry point for future research. An analysis of year-wise energy generated in Jammu and Kashmir implies

over the last decade implies that, there has been a gradual increase in power generation in Jammu and Kashmir from around 3958 Million Units (MUs) in 2014-15 to around 5191 Million Units (MUs) in the year 2022-23. The trends in Gross energy generation in J&K (Figure 3) have been illustrated by the following graph (Figure 3), encapturing this gradual increase in gross generation in Million Units, year-wise, over the course of last decade.

Figure 3 : Year-wise Gross Generation (Million Units) from 2014-14 upto 2023-24 (November)



Source: Reply to part (b) of unstarred Question no. 1916 answered in the Rajya Sabha on 19.12.2023 https://sansad.in/getFile/annex/262/AU1916.pdf?source=pqars

3.1 Energy Deficit

Whereas the installed capacity has increased manifold over the years across India, and electrical networks have expanded spatially across regions as well, however, there still exist some regions where there is considerable energy deficit (i.e the difference between peak energy demand and the peak demand met) or in other words 'demand not met'. The information contained in the following Figure 4, graphically illustrates the Energy deficit percentage of States and UTs, to go beyond absolutist calculations and present a relativist scenario, according to official government data from the All India Electricity Statistics General Review 2022.



Figure 4: Energy Deficit Percentage of States and UTs

Source: All India Electricity Statistics General Review 2022 (Containing Data for the Year 2020-21). Government of India, Ministry of Power, Central Electricity Authority, New Delhi, May 2022

Jammu and Kashmir was a frontrunner in electricity generation in South Asia, possessing a 'first mover' advantage, and home to one of the first hydropower projects in South Asia i.e Mohra Powerhouse, which was inaugurated in 1908 (Abubakr and Bhaduri, 2023). However, in recent times the region has been a laggard, having an energy deficit percentage to the tune of around 18%, which is highest among all states and Union Territories of India, as has been illustrated in Figure 4 above.

In recent times, however, Government has claimed that there have been downward trends in energy deficit in Jammu and Kashmir over the course of last few years as is evident from the information contained in Figure 5 below.



Figure 5 : Year-wise Energy Deficit percentage of Jammu and Kashmir

Source: Reply To Part (C) Of Unstarred Question No. 1916 Answered In The Rajya Sabha On 19.12.2023 https://sansad.in/getFile/annex/262/AU1916.pdf?source=pqars

Another offshoot of energy deficit in Jammu and Kashmir is its negative impact on the fiscal sustainability of the state. Higher energy deficit leads to higher power expenditures in Jammu and Kashmir, which in turn results in fiscal sustainability because of the positive correlation between power sector spending and the gross fiscal deficit. Using data from the RBI Bulletins for 1990–91 to 2019–20, a study used this data to examine the correlation between gross fiscal deficit and electricity expenditure, and its findings showed that electricity expenditure and the state gross fiscal deficit in Jammu and Kashmir are positively correlated, suggesting that higher power expenditures are associated with less fiscal sustainability (Katoch, 2024).

4. Energy Policies at National Level

Energy policies in India since independence can be broadly classified chronologically into five phases, with each phase located in a temporal context, a backdrop of political economy factors and global imperitives (Bardhan et.al, 2019). The information contained in the following schematic (Figure 6) graphically illustrates these phases of evolution of energy policies in India since 1947.



Figure 6 : Phases of evolution of energy policies in India since 1947

Source : Bardhan, R., Debnath, R., & Jana, A. (2019). Evolution of sustainable energy policies in India since 1947: A review. Wiley interdisciplinary reviews: Energy and environment, 8(5), e340.

As is evident from the above schematic, Phase I (1947–1970) concentrated on supply adequacy with an overarching focus on infrastructure development as the cornerstone of the Indian economy. Phase II (the 1970s) saw a change in emphasis toward solving issues of energy access. For the sake of energy security, Phase III (the 1980s) focused on supply diversification, augmentation, and streamlining. The 1990s, or Phase IV, was when the focus shifted towards the modernisation of Indian electrical infrastructure. Lastly, Phase V since 2000s, includes contemporary times where energy policy is shaped by the current stage of market reforms and global imperatives to mitigate climate change.

The national energy policy landscape of India has undergone significant transformation since independence, reflecting changing national priorities and development challenges. The journey began with centralized approaches to build basic infrastructure, gradually shifting toward addressing rural energy access, then incorporating efficiency reforms, and more recently integrating sustainability concerns. This evolution shows how energy governance has responded to India's growing economy, technological possibilities, and social needs. Table.1 below captures this progression chronologically, listing key policy measures year wise along with their main objectives. It reveals how early supply-side interventions gradually made way for more comprehensive strategies that attempt to balance multiple goals - expanding access, improving reliability, and addressing environmental impacts while maintaining affordability. Each phase built on previous experiences while introducing new approaches to meet emerging challenges.

Year	Policy	Feature(s)		
1948	The Electricity Supply Act	Created State Electricity Boards (SEBs) to manage power generation and distribution		
1974	Minimum Needs Programme	Launched rural electrification as part of poverty alleviation efforts		
1988	Kutir Jyoti Yojana	Provided single-point lighting to below-poverty-line rural households		
1991	Electricity Supply Amendment Act	Opened power generation to private sector participation		
1998	Electricity Regulatory	Established CERC and SERCs for tariff regulation		

Table 1: Evolution of National Energy Policies of India

		Commissions Act	and sector oversight
	2001	Remote Village Electrification Programme	Used renewable energy for off-grid village electrification
	2001	Accelerated Power Development Programme (APDP)	Focused on improving power sector infrastructure
	2002	Accelerated Power Development and Reforms Programme (APDRP)	Expanded APDP with additional reforms for distribution
	2003	Accelerated Rural Electrification Programme	Boosted rural electrification efforts
	2003	Pradhan Mantri Gramodaya Yojana	Aimed to electrify un-electrified villages
	2003	The Electricity Act	Comprehensive legislation to reform and liberalize power sector
	2005	Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)	Targeted universal household electrification by 2012
	2005	National Electricity Policy	Framework for power sector development and rural electrification
	2006	National Tariff Policy	Guidelines for rational electricity pricing and subsidies
	2006	Rural Electrification Policy	Specific provisions for rural electrification implementation
	2008	Restructured APDRP (R- APDRP)	Strengthened distribution infrastructure with IT integration
	2014	Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)	Focused on rural electrification and feeder separation
	2015	Ujwal DISCOM Assurance Yojana (UDAY)	Scheme for financial turnaround of power distribution companies
ľ		Pradhan Mantri Sahaj Bijli Har Ghar Vojana (SAUBHAGVA)	Last-mile connectivity for universal household electrification
	2017		
	2017 2020	Electricity Amendment Act	Further reforms for competition and consumer choice

Source: Self compiled by the author

5. State Level Energy Polices of Jammu and Kashmir

The energy policy landscape of Jammu and Kashmir has evolved in response to the region's unique geographical constraints and developmental needs. Early initiatives focused on establishing basic regulatory frameworks, gradually shifting toward harnessing local renewable resources like hydro, solar, and wind power. More recent measures reflect attempts to balance energy security with sustainable development, particularly through decentralized solutions and private sector participation. The table below presents this chronological progression, listing key policy interventions year-wise along with their primary objectives. It demonstrates how the region's energy governance has adapted over time - from foundational electricity regulations to contemporary renewable energy strategies - while addressing both local

requirements and broader energy transitions. This trajectory highlights a growing emphasis on energy access, efficiency, and environmental considerations in the region's policy approach.

Year	Policy	Features				
1940	Jammu and Kashmir Electricity Act	Established the legal framework for electricity regulation in the state				
1963	Jammu and Kashmir Electricity (Duty) Act	Introduced levies on electricity consumption to generate state revenue				
1989	Setting up of J&K Energy Development Agency	Created to promote renewable energy and rural electrification				
2000	J&K State Electricity Regulatory Commission Act	Formed an independent regulator for tariff determination and sector oversight				
2010	Jammu and Kashmir Electricity Act, 2010	ectricity Consolidated and modernized electricity laws, replacing older legislation				
2011J&K Energy Conservation ActPolicy for Micro/Mini Hydro2011Power Projects		Mandated energy efficiency measures across sectors				
		Encouraged small-scale hydropower development for local energy needs				
2013	Solar Power Policy	Promoted solar energy adoption through incentives and targets				
Rooftop Solar PV Policy (Net 2016 Metering)		Enabled grid-connected rooftop solar systems with net metering benefits				
2019	J&K Reorganisation Act	Repealed the 2010 Electricity Act post-state reorganization into a Union Territory				
2022 Bio-energy Policy		Focused on biomass and waste-to-energy projects for sustainable power				
2022	Hydropower Policy	Aimed at harnessing the region's hydropower potential with private participation				
2023	Wind Power Policy	Introduced frameworks for wind energy development in suitable zones				

Table 2: Evolution of State/UT level Energy Policies of Jammu and Kashmir

Source: Self compiled by the author

6. Rethinking Reforms for Equity and Sustainability:

This energy policy trajectory of India at the national level and of Jammu and Kashmir at the regional level has gradually changed from a supply-centric, state-dominated model to a hybrid paradigm that balances inclusive electrification, market processes, and the incorporation of renewable energy. However, ongoing issues—such as the DISCOMs' financial sustainability, fair energy transitions, and the conflict between centralized and decentralized systems indicate that Jammu and Kashmir's energy policy development is still an incomplete process Persistent conflicts between increasing access, maintaining financial viability, and promoting sustainability are revealed by exploring the evolution of energy policy in Jammu and Kashmir. Even though market processes and private participation have been prioritized in reforms since the 1990s, issues of equity, inefficiencies in the distribution sector, and the integration of renewable energy still need to be addressed. Similar to this, Jammu and Kashmir's energy trajectory shows efforts to take use of the region's renewable energy potential while battling financial limitations made worse by power sector spending. These experiences highlight the

need for reforms that specifically address fairness and sustainability as interrelated objectives, as techno-economic solutions alone are insufficient.

A revised strategy would acknowledge that energy transitions are highly political processes that call for institutional changes that strike a balance between inclusive governance and budgetary restraint. For example, when combined with community-centric approaches, localized renewable energy, as exemplified by J&K's rooftop solar and mini-hydro initiatives, could both improve access and ease financial burden. In order to democratize energy planning and make sure that climate obligations are in line with livelihood demands, national restructuring must go beyond tariff rationalization. Reforms run the risk of maintaining the erroneous division between equitable outcomes and economic efficiency in the absence of such systematic rethinking. Both national and J&K's policy trajectories demonstrate that polycentric governance, which empowers states and local players while acknowledging national and global imperitives, might be a possible solution.

When it comes to striking a balance between efficiency and equity, the drive for marketoriented reforms in Jammu and Kashmir's energy sector-prioritizing privatization, tariff rationalization, and competitive generation-has produced uneven outcomes. Although certain states have seen an improvement in operational performance as a result of these policies, their distributive effects are still up for debate, especially in areas like Jammu and Kashmir where fiscal constraints intersect with developmental deficits. The retreat of state provisioning in favor of market mechanisms has created new tensions between cost recovery imperatives and issues of equitable energy access. This raises critical questions about whether neoliberal frameworks have inadvertently deepened spatial inequalities in energy affordability and reliability. The Jammu and Kashmir experience illustrates how fiscal austerity measures interact with unique regional challenges, where heavy reliance on hydropower and transmission losses compound the equity impacts of reform. At the national level, the tension persists between renewable energy transitions driven by private investment and the unmet need for democratized energy planning. Examining these dynamics reveals a fundamental paradox: market-centric approaches may enhance sector efficiency while risking the marginalization of consumers, unless consciously coupled with institutional safeguards for distributive justice.

The persistence of unequal energy access and affordability across India reveals deeper structural imbalances in the governance of energy transitions. While urban centers and industrial consumers benefit from reliable supply and tariff protections, rural households and small commercial users—particularly in regions like Jammu and Kashmir—continue to face erratic access and regressive cost burdens. These disparities are compounded by environmental externalities, as coal-dependent generation and large hydropower projects displace communities and degrade local ecosystems without commensurate benefit-sharing. Governance challenges further exacerbate these inequities. Weak regulatory oversight, coupled with fragmented policy implementation, allows inefficiencies in distribution systems to coexist with unfulfilled renewable energy promises. The result is a dual exclusion—where marginalized populations bear both the costs of energy poverty and the ecological consequences of centralized energy expansion. Addressing this requires moving beyond technical fixes to confront the political economy of energy planning, ensuring that sustainability transitions do not reproduce historical patterns of spatial and social disadvantage.

7. Conclusion and Policy Implications

India's energy policy evolution—from centralized state-led expansion to market-driven reforms—has made progress on energy access, yet persistent gaps in affordability and reliability reveal unresolved tensions between efficiency and equity. Jammu and Kashmir's experience illustrates these contradictions starkly, where fiscal constraints, energy deficits, and

governance challenges intersect with the region's renewable potential. Energy reliability is another key concern, because despite a plethora of policies, plans and programs dedicated to address this issue, the average power cuts in the state of Jammu and Kashmir still continue to be a norm, especially in the winter months. According to Government data, on average there were 3 to 5 hours of power cuts in Jammu and Kashmir for the months of December 2022, January 2023, and February 2023, that too in metered areas. While national policies have increasingly emphasized sustainability, distributional inequities remain entrenched, with energy poverty and issues of energy reliability disproportionately affecting marginalized communities.

Three key policy implications emerge: First, energy transitions must integrate decentralized renewable solutions with financial mechanisms that protect vulnerable consumers. Second, governance reforms should strengthen regulatory accountability to balance cost recovery with equitable service delivery. Finally, Jammu and Kashmir's hydropower and solar potential must be harnessed through participatory planning that links energy access to local development. Without such systemic rethinking, the region's energy future risks replicating the very inequalities it seeks to resolve.

<u>References</u>

- Abubakr, B., & Bhaduri, S. (2023). Advent, appropriation, and aesthetics of electric light in the princely state of Jammu and Kashmir,(1900–1920). Indian Journal of History of Science, 58(3), 196-202.
- All India Electricity Statistics General Review 2022 (Containing Data for the Year 2020-21). Government of India, Ministry of Power, Central Electricity Authority, New Delhi, May 2022
- Ang, B. W., Choong, W. L., & Ng, T. S. (2015). Energy security: Definitions, dimensions and indexes. Renewable and sustainable energy reviews, 42, 1077-1093.
- APERC, Asia Pacific Energy Research Centre, 2007. A Quest for Energy Security in
- Bardhan, R., Debnath, R., & Jana, A. (2019). Evolution of sustainable energy policies in India since 1947: A review. Wiley interdisciplinary reviews: Energy and environment, 8(5), e340.
- Cherp, A., & Jewell, J. (2014). The concept of energy security: Beyond the four As. Energy policy, 75, 415-421.
- Das, A., Shuvo, R. M., Mukarram, M. M. T., & Sharno, M. A. (2024). Navigating the energy policy landscape of Bangladesh: A stern review and meta-analysis. Energy Strategy Reviews, 52, 101336.
- Deese, David A., 1979. Energy: economics, politics, and security. Int. Secur. 4 (3),
- Dong, K., Jiang, Q., Shahbaz, M., & Zhao, J. (2021). Does low-carbon energy transition mitigate energy poverty? The case of natural gas for China. Energy Economics, 99, 105324.
- Drabu, Iftikhar. (2018). For power-starved J&K, is transfer of hydro power projects from NHPC to State a solution? https://www.orfonline.org/expert-speak/43373-powerstarved-jk-transfer-hydro-power-projects-nhpc-state-solution
- Economic Survey 2016, Directorate of Economics & Statistics, Government of Jammu and Kashmir https://ecostatjk.nic.in/pdf/publications/ecosurvey/2016.pdf
- Florini, A., & Sovacool, B. K. (2009). Who governs energy? The challenges facing global

energy governance. Energy policy, 37(12), 5239-5248.

- Halkos, G. E., & Gkampoura, E. C. (2021)a. Coping with energy poverty: Measurements, drivers, impacts, and solutions. Energies, 14(10), 2807.
- Halkos, G. E., & Gkampoura, E. C. (2021)b. Evaluating the effect of economic crisis on energy poverty in Europe. Renewable and Sustainable Energy Reviews, 144, 110981.
- IEA, 2001. Toward a Sustainable Energy Future. International Energy Agency,
- Jammu and Kashmir Power Development Department (JKPDD) website https://pdd.jk.gov.in
- Katoch, O. R. (2024). Exploring the relationship between expenditure on power and state finances: an empirical study in Jammu and Kashmir, India. Environment, Development and Sustainability, 26(10), 26397-26413.
- Månsson, A., Johansson, B., & Nilsson, L. J. (2014). Assessing energy security: An overview of commonly used methodologies. Energy, 73, 1-14.
- Mettler, S. (2016). The Policyscape and the Challenges of Contemporary Politics to Policy Maintenance. Perspectives on Politics, 14(2), 369–390. doi:10.1017/S1537592716000074 Paris.
- Podobnik, B. (2006). Global energy shifts: fostering sustainability in a turbulent age Temple University Press. Business & Economics-P, 320.
- Press Information Bureau, Government of India, 2019
- Press Information Bureau Government of India, 11 August 2023.
- https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1947709
- Reply To Unstarred Question No. 1916 Answered In The Rajya Sabha On 19.12.2023 https://sansad.in/getFile/annex/262/AU1916.pdf?source=pqars
- Report of the group of Interlocutors for Jammu and Kashmir https://prsindia.org/theprsblog/report-of-the-group-of-interlocutors-for-jammuand-kashmir?page=379&per-page=1
- Report On Resource Adequacy Plan for the Union Territory of J&K and Ladakh, Central Electricity Authority (CEA), Ministry of Power, Government of India, 2024.
- https://cea.nic.in/wp-content/uploads/irp/2024/07/JK RA Report.pdf
- Sharma, A. K., & Thakur, N. S. (2017). Energy situation, current status and resource potential of run of the river (RoR) large hydro power projects in Jammu and Kashmir: India. Renewable and Sustainable Energy Reviews, 78, 233-251.
- Sovacool, B. K., & Dworkin, M. H. (2014). Global energy justice. Cambridge University Press.
- Sovacool, B. K. (2014). What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. Energy Research & Social Science, 1, 1-29.
- the 21st Century: Resources and Constraints. Institute of Energy Economics,
- WEC, 2000. World Energy Council, Energy for Tomorrow's World Acting Now. World Energy Council, London
- World Bank, 2005. Energy Security Issues. World Bank, Moscow–Washington.

Yergin, Daniel, 1988. Energy Security in the 1990s. Foreign Aff. 67 (1), 110–132.

Zohuri, B. (2023). Navigating the global energy landscape balancing growth, demand, and sustainability. J. Mat. Sci. Apl. Eng, 2(7).

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School of Business Studies University of Kashmir, Srinagar - 190006 (India) Tel: (0194) 2272266 Fax: (0194) 2427507