Volume 9 • Issue 2
June 2026

NIRMA UNIVERSITY
INSTITUTE OF MANAGEMENT
NAAC ACCREDITED 'A+' GRADE
nujbms.nirmauni.ac.in



Nirma University Journal of Business and Management Studies

Nirma University Journal of Business and Management Studies is published biannually in March, June, September, and December by Institute of Management, Nirma University.

Nirma University Journal of Business and Management Studies is hosted on our web-based online submission and peer review system. Please read the manuscript submission guidelines on the journal website, and then visit https://peerreview.sagepub.com/njb to login and submit your article online. Manuscripts should be prepared in accordance with the 7th edition of the *Publication Manual of the American Psychological Association*.

Copyright © 2026 Institute of Management, Nirma University. All rights reserved. The views expressed in the articles and other material published in *Nirma University Journal of Business and Management Studies* do not reflect the opinions of the Institute.

Annual Subscription: Individual rate (print only) ₹1,720; institutional rate (print only) ₹2,790. For orders from Pakistan, Bangladesh, Sri Lanka and Maldives, SAARC rates apply: individuals $35; institutional rate $50. Prices include postage. Print subscriptions are available for institutions at a discounted rate. For subscriptions, please write to: customerservicejournals@sagepub.in

Change of Address: Four weeks' advance notice must be given when notifying change of address. Please send the old address label to ensure proper identification. Please specify the name of the journal and send change of address notification to customerservicejournals@sagepub.in

Printed and published by Dr. Pradeep Kautish on behalf of Institute of Management, Nirma University, Sarkhej-Gandhinagar Highway, Gota, Ahmedabad – 382 481, Gujarat, India. Printed at Repro Books Limited, Khasra no. 13/19, 22, 17/2, 9/1/1, Dharuhera, Village Malpura, Haryana 123110, India.

Editor: Dr. Pradeep Kautish

NIRMA UNIVERSITY
INSTITUTE OF MANAGEMENT
NAAC ACCREDITED 'A+' GRADE

About the Journal

Nirma University Journal of Business and Management Studies is a peer-reviewed, Open Access scholarly journal published by the Institute of Management, Nirma University, Ahmedabad, Gujarat, India, in collaboration with Spectrum Journals. The journal is published in the English language and is committed to disseminating high-quality research that advances knowledge and practice in the broad field of business management and its allied disciplines.

The journal aims to serve as a credible academic platform for researchers, educators, policymakers, and practitioners by fostering rigorous inquiry, critical debate, and interdisciplinary dialogue. The journal seeks to contribute meaningfully to the development of theory, empirical understanding, and applied knowledge in business management within national, regional, and global contexts.

NIRMA UNIVERSITY
INSTITUTE OF MANAGEMENT
NAAC ACCREDITED 'A+' GRADE

Aims and Scope

The objective of *Nirma University Journal of Business and Management Studies* is to promote excellence in management research by publishing original, methodologically sound, and theoretically grounded scholarly work. The journal emphasizes relevance, rigor, and impact, encouraging research that addresses contemporary challenges faced by organizations, markets, institutions, and societies. The journal publishes original contributions across all functional, cross-disciplinary, multidisciplinary, interdisciplinary and allied areas of commerce, trade and business management. The journal adopts an inclusive and expansive scope to reflect the evolving nature of management research and practice. The journal publishes the papers in the areas such as Marketing, Consumer Behaviour, and International Business; Finance, Accounting, Banking, and Financial Markets; Human Resource Management, Organizational Behaviour, Social Inclusion, and Leadership; Operations Management, Supply Chain Management, and Logistics; Strategy, Corporate Governance, and Business Policy; Entrepreneurship, Innovation, and Small Business Management; Information Systems, Business Analytics, and Digital Transformation; Economics, Business Law, and Regulatory Studies; Sustainability, ESG, Green Practices, and Environmental Management and Public Policy, Development Studies, and Social Enterprise. In addition to functional domains, NUJBS strongly encourages interdisciplinary, cross disciplinary and multidisciplinary studies that integrate perspectives from economics, sociology, anthropology, psychology, political science, law, technology, humanities, and environmental studies. Such research is expected to provide holistic insights into complex business and management phenomena.

Contextual and Applied Focus

A distinctive feature of the journal is its emphasis on applied and contextual research. The journal welcomes studies that examine business management issues in relation to contemporary economic, social, legal, cultural, political, regulatory, technological, and environmental contexts. Contributions may focus on emerging markets, developing economies, or comparative international or global settings, provided they offer clear theoretical and practical implications. The journal values research that:

Addresses real-world managerial and policy challenges

Demonstrates contextual sensitivity and empirical depth

Offers actionable insights for business stakeholders

Contributes to sustainable and socially inclusive development

Editorial Board

Editor-in-Chief

Pradeep Kautish, *Institute of Management, Nirma University, Ahmedabad, India*

Managing Editor

Aishwarya Mitra, *Institute of Management, Nirma University, Ahmedabad, India*

Associate Editors

Shashank Thanki, *Institute of Management, Nirma University, Ahmedabad, India*
Nikunj Patel, *Institute of Management, Nirma University, Ahmedabad, India*
Sunita Guru, *Institute of Management, Nirma University Ahmedabad, India*
Shubham Goswami, *Institute of Management, Nirma University Ahmedabad, India*

Advisory Board

Arslan Rafi, *Department of Business Administration & Economics, Grand Asian University, Sialkot, Punjab, Pakistan*
Khalid Mehmood, *School of Economics and Management, Hubei Engineering University, Xiaogan, China*
Kriti Swarup, *Sparsh Global Business School, Greater Noida, Uttar Pradesh, India*
Khaikholen Haokip, *School of Social Sciences, Central University of Gujarat, India*
Mahalaxmi Tiwari, *Vellore Institute of Technology, Tamil Nadu, India*
Anant Deogaonkar, *Symbiosis Institute of Business Management, Nagpur, India*
Anjani Kumar Singh, *EDII, Ahmedabad, India*
Devesh Kumar Sharma, *Central Univ. of Himachal Pradesh, Dharamshala, India*
Esrafil Ali, *NMIMS, Indore, India*
Jinu Kurian, *NMIMS, Mumbai, India*
Madhushree Sekher, *School of Skill Education, Tata Institute of Social Sciences, Mumbai, India*

Nirma University Journal
of Business and
Management Studies

Volume 9 Issue 2 June 2026

Contents

Articles

Understanding Gen Z Workplace Adaptation:
A Systematic Literature Review
Mahak Saklecha and Ruchi Sao 127

Evaluating Strategies for Promoting Adventure Tourism
Using SWOT-AHP Approach: A Case of North
East Region of India
Rupam Deb 147

A Comparative Study of the Alternate Consumption-based
Capital Asset Pricing Models: Evidence from India
M. Mallikarjun 160

Case Studies

Adani Group: Growth, Governance, and the Crisis of Credibility
Gunjan Anand, Arpan Shrivastava and Arpita Shrivastava 183

CityGrid Gas Limited: Balancing Growth Between Online
and Daughter Booster CNG Station
Harsh Pratap Singh, Omkar Sahoo and Pratham Parekh 193

Visit https://nujbms.nirmauni.ac.in/

Article

Understanding Gen Z Workplace Adaptation: A Systematic Literature Review

Nirma University Journal of Business and Management Studies
9(2) 127–146, 2026
© The Author(s) 2026
DOI: 10.1177/njb.261484986
njb.spectrumjps.com

Mahak Saklecha[1] and Ruchi Sao[1]

Abstract

The representation of Generation Z (Gen Z) employees in the global workforce has encouraged scholars in this field. Yet, the research on workplace adaptation among Gen Z remains fragmented. This study presents an integrative review of the literature on Gen Z in organizational contexts to synthesize existing knowledge and identify prevalent themes. The study includes a review of 50 Scopus-indexed articles. The PRISMA guidelines were followed for the review. Eight prevalent themes were synthesized from the literature. Based on person–organization fit theory, an Integrated Gen Z Workplace Adaptation Framework is proposed to help align the Gen Z workplace profile with organizational practices and processes. The framework proposes that alignment can lead to engagement, performance, and retention. The review also critically evaluates the current literature and provides a research agenda for future research. Practical implications are discussed for human resource practitioners, leaders, and organizational practices and processes. The findings imply that Gen Z employees strongly value flexibility, continuous learning, meaningful work, psychological safety, and supportive leadership. Overall, this review advances theoretical understanding of Gen Z in the workplace and offers actionable insights for organizations seeking to adapt to Gen Z employees in the workplace.

Keywords

Gen Z, workplace expectations, employee engagement, person-environment fit, workplace adaptation

Introduction

The contemporary workplace consists of several generations. Gen Z is the newest cohort in the workplace. People born after 1995 and before 2010 are referred

[1]Institute of Management, Nirma University, Ahmedabad, Gujarat, India

Corresponding author:
Ruchi Sao, Institute of Management, Nirma University, Ahmedabad, Gujarat 382481, India.
E-mail: ruchi.sao@nirmauni.ac.in

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed.

to as Gen Z (Chillakuri, 2020; Ensari, 2017; Maloni et al., 2019; Rosen, 2010). Each generation comes with similarities and differences in the workplace (Arora et al., 2020; Taslim et al., 2026). Gen Z differs from previous ones in several aspects (Ngobeni et al., 2026). Gen Z has different work values and motivations from previous generations (Dania et al., 2023; Maloni et al., 2019). Due to these differences, existing leaders and managers are facing significant problems managing Gen Z. Furthermore, Gen Z has experienced pandemics such as COVID-19, wars, and the rise of artificial intelligence (AI), which have shaped their workplace behavior. The report published in *McKinsey Quarterly* (McKinsey & Company, 2025) highlighted a few crucial points, such as "It is indispensable to understand the workplace characteristics of Gen Z, as by 2025, a quarter of the global workforce will be composed of Gen Z." The report notes that the influence of mental health on Gen Z's performance is greater than that of previous generations. Additionally, Gen Z is often described as more techno-savvy than former generations (Szymkowiak et al., 2021), and their learning approach is evolving; they are more inclined toward digital learning and possess greater digital capabilities (Ru-Zhue, 2025). Gen Z and previous generations are significantly different. Therefore, it is urgent to better understand Gen Z to integrate them smoothly into the organization. Lack of understanding regarding Gen Z will lead to stereotypes and bias against them (DeArmond et al., 2006).

There is increasing research that focuses on understanding Gen Z expectations, values, behavior, and engagement in the workplace (Arnold & O'Brien, 2025; Barhate & Dirani, 2022; Loring & Wang, 2022; Maan & Srivastava, 2023; Nguyen & Petchsawang, 2026; Waworuntu et al., 2022). The existing reviews of Gen Z fail to provide comprehensive guidance to practitioners and scholars. Moreover, the existing literature assumes that there is something wrong with Gen Z as a population. This assumption leads to the conclusion that the Gen Z workforce needs to change their workplace behavior. This creates a void in the organization's responsibilities for integrating Gen Z into the workplace. The present study challenges this assumption, provides an adoption mechanism for the organization, and compels organizations to adopt as well. Moreover, scholarly interest is increasing in the area of Gen Z and the workplace. But the literature in this area is not concentrated and is fragmented across domains. The theories are also not unified. All these lead to obstacles in the comprehensive understanding of Gen Z in the workplace. Therefore, without an integrated review and framework, the understanding of this phenomenon is incomplete. To understand the phenomenon, the following questions are proposed:

1. What are the prevalent characteristics and expectations of Gen Z employees?
2. Which organizational processes and practices most effectively retain and engage Gen Z employees?
3. How does Gen Z differ in terms of values and motivations, compared to those of earlier generations?
4. What are the contextual factors that shape their workplace attitude and behavior?

To address this gap, the present study conducts a systematic literature review on Gen Z in the workplace. To understand the facts and opinions about the Gen Z workplace, we conduct this review and synthesize the existing literature on it. This review provides a holistic understanding of Gen Z workplace behavior and an integrated model that clarifies employee expectations, values, and their organizational implications. There are four major objectives:

1. To identify what themes, methods, and theories are prevalent in Gen Z workplace literature.
2. To synthesize findings regarding Gen Z workplace behaviors and generate themes.
3. To develop an integrative conceptual framework that helps organizations align the Gen Z workplace profile and organizational processes and practices.
4. To conduct a critical evaluation of existing literature on Gen Z workplace behavior.

Theoretical Contribution

This review's central novelty is a shift in orientation regarding efforts to integrate Gen Z into the workplace: rather than adding a further descriptive account of "what Gen Z wants," it synthesizes 38 studies into an Integrated Gen Z Workplace Adaptation Framework (IGZWAF), grounded in person–organization fit theory (Schneider, 1987), that specifies the mechanism of alignment between the Gen Z profile and organizational practice, through which workplace outcomes are produced. This process-oriented, three-stage structure, rather than an additional list of generational traits, constitutes the study's primary theoretical contribution. Theoretically, it moves the literature from fragmented, variable-based studies toward a holistic, mechanism-based understanding of Gen Z behavior; the review also critically reconciles contradictory findings and contextual contingencies that prior single-theme reviews have not addressed. In practice, the review translates the same three-stage logic into a sequence of implications for managers, leaders, and human resource (HR) practitioners that is explicitly keyed to the evidence base underlying each recommendation, rather than being offered as generic advice.

The remainder of the article is structured as follows. First, the methodology is outlined. Second, findings from the literature, including cross-cutting contradictions and contextual contingencies, are presented. Third, the integrated model is proposed. Finally, a critical evaluation of the literature, the review's own limitations, practical implications, and a conclusion are discussed.

Methodology

This study adopted an integrated systematic literature review to synthesize existing literature on Gen Z in the workplace. An integrative review is particularly appropriate when the aim is to synthesize findings from varied theoretical

frameworks and methodological approaches to develop an understanding of a phenomenon (Tranfield et al., 2003). This technique facilitates the synthesis of empirical, conceptual, qualitative, and quantitative studies into an integrated body of knowledge, addressing the fragmented nature of Gen Z literature (Torraco, 2016). The review followed a rigorous, transparent, and replicable methodology in accordance with accepted protocols for systematic reviews as prescribed in PRISMA (Page et al., 2021).

Search Strategy

A search strategy was developed to capture peer-reviewed Scopus-indexed journal articles on Gen Z in organizational and workplace contexts. The Scopus database was used to ensure broad coverage. Scopus is recognized as one of the largest and most comprehensive multidisciplinary bibliographic databases, which provides broader journal coverage than Web of Science and more structured indexing than Google Scholar (Falagas et al., 2008; Mongeon & Paul-Hus, 2016). Previously, studies have confirmed that Scopus provides wide coverage of high-quality peer-reviewed journals, robust citation tracking, and advanced filtering options, making it particularly suitable for systematic and bibliometric reviews (Martín-Martín et al., 2018).

Consistent with recommended integrative review practice (Whittemore & Knafl, 2005), the search was deliberately restricted to this single, high-coverage database rather than being run across multiple databases. This reflects a considered trade-off rather than an oversight: for a tightly bounded population, which is Gen Z specifically, in workplace or organizational contexts specifically, a single, consistently indexed database reduces duplicate and low-quality records at the cost of the broader (but noisier) coverage that multi-database searches provide. The authors treat this as an explicit boundary condition of the review; its implications for the generalizability of the synthesis are discussed in Section "Limitations of Existing Literature and Future Research", and multi-database replication is proposed as a specific direction for future research.

The following keywords were used to retrieve the data: "Gen Z," "Generation Z," and "Workplace." The review concentrated on research published from 2017 to 2025. This timeframe was chosen for two reasons: Academic focus on Gen Z as a working demographic increased notably after 2017, with the major entry of Gen Z into full-time employment. Concentrating on this timeframe ensured the study reflected current organizational dynamics, including post-COVID-19 workplace changes such as hybrid work, digitization, and evolving employment expectations.

Inclusion and Exclusion Criteria

The screening process was conducted in multiple stages (Figure 1). First, the database search generated an initial pool of 351 articles based on keywords. Second, to ensure that only relevant studies were available for review, we developed inclusion and exclusion criteria. Only those studies were included that were from the domain of business and management, focused primarily on Gen Z as the target

population, examined issues related to the workplace, employment, or organizational behavior, were published in peer-reviewed academic journals, and were written in English. Studies were excluded if they were focused solely on Millennials or mixed generations without a specific analysis of Gen Z; addressed Gen Z only in educational or consumer behavior contexts; or were conference papers, book chapters, theses, or non-peer-reviewed reports. After applying inclusion and exclusion criteria, a pool of 121 articles remained. Third, articles were screened manually for relevance based on titles and abstracts. Studies that did not clearly address Gen Z in workplace or organizational contexts were removed. After eliminating irrelevant studies, a final sample of 50 peer-reviewed articles was retained for in-depth analysis.

Data Extraction and Coding

The systematic extraction and coding of the literature were conducted, and as a result, a matrix was developed. The following heads were used to classify the information from the literature: author(s) and year of publication, journal and disciplinary focus, country or context of study, research objectives, theoretical framework(s), key constructs examined, methodology and sample characteristics, major findings, practical implications, limitations, and future research directions. This coding process enabled cross-study comparison and facilitated the identification of recurring patterns, convergences, and contradictions in the literature.

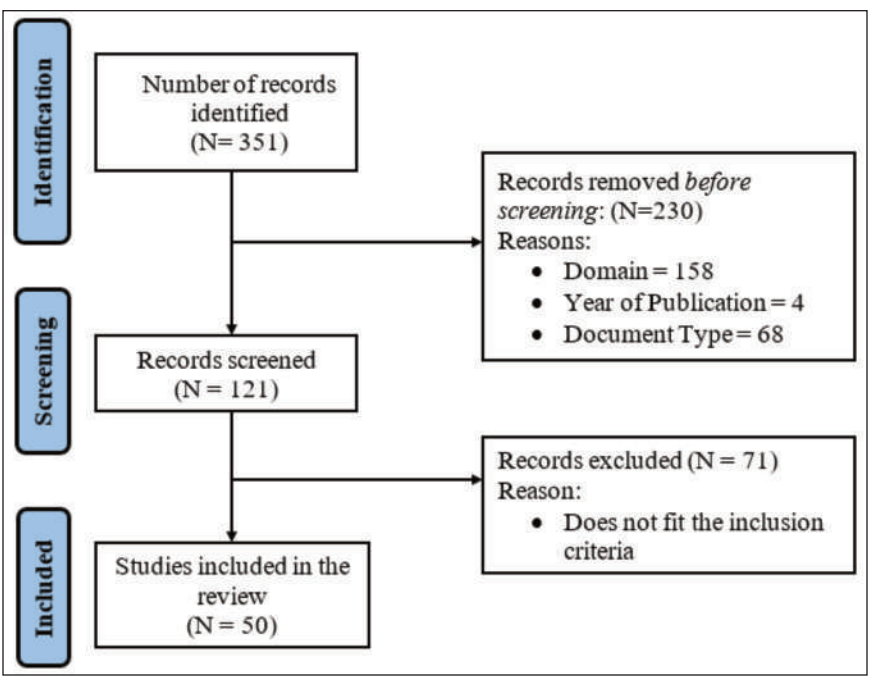


Figure 1. PRISMA Flowchart of Systematic Review Study Identification and Inclusion.

To strengthen coding reliability, the first author coded all 38 studies against this matrix, and the second author independently re-coded a purposive subset of the sample and cross-checked the resulting thematic groupings; discrepancies in category placement or theme labels were resolved through discussion until consensus was reached. This two-reviewer verification step, while more limited than full dual-independent coding of the entire sample, was intended to reduce single-coder bias in theme construction. The authors note this explicitly as a methodological boundary condition rather than a completed inter-rater reliability test, and recommend that future reviews in this stream report a quantitative reliability statistic (e.g., Cohen's kappa) computed across the full sample.

Theme Synthesis and Analysis

The analysis followed an iterative thematic synthesis approach. After coding all studies, comparison techniques were used to analyze the data and identify themes from the extracted data. The synthesis process involved creating a mind map that grouped studies by common research topic, identified dominant theoretical perspectives, and mapped methodological trends. The analysis resulted in themes presented in the next section.

Findings and Themes

Characteristics of Gen Z Employees

A major part of the existing literature has been dedicated to studying the characteristics of Gen Z. Growing up with smartphones, Gen Z has been described as more tech-savvy and as digital natives (Chillakuri, 2020; Lazányi & Bilan, 2017). These extreme uses of technology and exposure have shaped future preferences for hybrid work, instant feedback, and rapid communication.

The prevalent characteristics of Gen Z are highly independent, practical, and entrepreneurial, and Gen Z employees demonstrate a stronger inclination toward autonomy, ongoing education, and personal growth compared to millennials and previous generations (Chillakuri & Mahanandia, 2018). Nonetheless, they demonstrate diminished organizational loyalty and keen employer demands. The existing literature challenges common stereotypes that portray Gen Z as disengaged or unprofessional. Studies suggest that their level of commitment is not necessarily lower; rather, it depends on various factors (Nguyen & Petchsawang, 2026). They expect transparency, authenticity, inclusiveness, respect, and meaningful work to be essential for their engagement (Janssen & Carradini, 2021; Kataria et al., 2026). Therefore, Gen Z should be understood as a cohort that has differing expectations regarding technology, flexibility, communication, and psychological safety.

Work Values and Career Priorities of Gen Z

One of the most extensively researched strands addresses the work values and priorities of Gen Z employees. Several studies have explored the concerned topic

in different settings, and findings are more or less similar to each other. Arora et al. (2020), Maloni et al. (2019), and Pataki-Bittó and Kapusy (2021) contribute to identifying dominant work values: work–life balance, continuous learning and development, job security and stability, flexibility, autonomy, positive social relationships, and meaningful work (Nguyen & Petchsawang, 2026).

There are priorities among Gen Z that differ from those of previous generations (da Silva Sousa & Douglas Colauto, 2021). Preference for compensation is the same across the generations. The main differences lie in personal growth, flexibility, less hierarchy, and well-being, where Gen Z is more sensitive to these aspects than previous generations (Barhate & Dirani, 2022; Egerová et al., 2021). De Boer and Bordoloi (2022) argue that cross-national studies and many work values are culturally specific, although Gen Z employees have intrinsic motives and values that drive them to contribute significantly, grasp opportunities, and foster learning and observable outcomes that are universally valid.

Workplace Expectations and Psychological Contracts

Different workplace expectations are a major phenomenon unraveling across the literature. The new workplace expectations aim to foster new forms of psychological contract with the organization, including the following: transparent leadership, frequent feedback, hybrid work opportunities, friendship, respectfulness, and inclusivity (Egerová et al., 2021; Jaya et al., 2026; Maloni et al., 2019; Zhou et al., 2026).

Unlike previous generations, Gen Z is more serious about their demands. Studies from Romania and central Europe demonstrated that unmet expectations are strongly associated with dissatisfaction and turnover intentions among Gen Z (Botezat et al., 2023; De Boer & Bordoloi, 2022; Egerová et al., 2021). After COVID-19, hybrid workplace has become the most nonnegotiable demand for Gen Z (Osorio & Madero, 2025). Gen Z assesses employers from a transactional, expectation-centric, social, and legal perspective; when firms fail to meet these expectations, psychological disengagement occurs swiftly, and Gen Z is likely to engage in moonlighting (Bhore et al., 2025).

Motivation, Engagement, and Retention Drivers

A body of research focuses on the retention and motivation of Gen Z. Across industries, several consistent drivers of engagement are revealed: a supportive environment, recognition, learning, autonomy, a skill–role match, fairness, and justice. Chillakuri (2020) and Kgarimetsa and Naidoo (2024) found that supervisor support significantly moderates turnover intentions, particularly when employees experience boredom or unmet expectations. Similarly, for retention, recognition and flexibility are the main antecedents in the mining and banking industries (Brown, 2025; Kgarimetsa & Naidoo, 2024).

Unlike previous generations who are motivated by pay or status, Gen Z employees seek holistic motivational packages that combine financial, developmental, moral, and psychological elements (Botezat et al., 2020; Krishna &

Agrawal, 2024; Nguyen & Petchsawang, 2026). Moreover, the retention of Gen Z talent is influenced more by daily managerial assistance, feedback, and meaningful engagement than by conventional loyalty programs (Ignatius Soni Kurniawan et al., 2026; Peemanee et al., 2026). For example, a study was conducted in the Jordanian context, which revealed that Gen Z demands a combination of financial, social, and emotional factors that can ensure their financial-emotional well-being and interpersonal relationships (Al-Twal et al., 2025).

Organizational Support Mechanisms and Human Resource Practices

Scholars and researchers are consistently working toward the smooth integration of Gen Z into the organization. Organizational support and HR practices are major factors that can help achieve a smooth integration of Gen Z, increase satisfaction and career intentions in the workplace (Nguyen & Petchsawang, 2026; Pauli & Dudek, 2025; Tabi et al., 2025). The literature emphasizes the importance of structured onboarding, mentoring, coaching, frequent communication, experience, and development-oriented HR policies (Ngobeni et al., 2026; Pauli & Dudek, 2025).

Research on onboarding suggests that inductions that are structured, interactive, and feedback-rich are preferred more by Gen Z (Chillakuri, 2020). Furthermore, recent studies suggest increasing personalization in human resource management (HRM) by using AI technology and customized career paths (Thomas et al., 2025). Conventional uniform HR strategies are becoming progressively inadequate for Gen Z; tailored, development-oriented frameworks are essential (Pauli & Dudek, 2025).

Communication Preferences and Soft-skill Challenges

Gen Z has used digital communication aggressively and proficiently, yet several studies highlight problems in Gen Z's interpersonal and professional communication (Visser & Terblanche, 2025). Janssen and Carradini (2021) report that despite being technically fluent, Gen Z employees often struggle with face-to-face communication, conflict management, and professional etiquette. A review of soft skills of Gen Z workers reveals that communication and cooperation are the most esteemed yet most lacking soft skills among Gen Z employees (Visser & Terblanche, 2025). Organizations are continuously working to develop soft-skill programs, coaching, and mentoring to address this issue (Visser & Terblanche, 2025). In the midst of a communication crisis, digital communication has played a significant role in maintaining work–life balance by providing opportunities for flexible work and increasing job satisfaction (Gunnoo et al., 2026).

The Post-COVID and Hybrid Work Context

The most recent literature examines how the COVID-19 pandemic influenced Gen Z's workplace behavior. Studies from 2022 to 2026 indicate that hybrid and

flexible work arrangements are strongly preferred by Gen Z, which has also resulted in retention (Kgarimetsa & Naidoo, 2024; Pauli & Dudek, 2025). Mental health and well-being have become pivotal concerns; flexibility is viewed as a central employment right, and personalized work experiences are increasingly anticipated (Taslim et al., 2026). The post-pandemic period has intensified Gen Z's demand for independence, remote work opportunities, and technology-driven customization (Osorio & Madero, 2025). This increase in alternative work settings has shown mixed results for well-being, loneliness, and job satisfaction (Chmiel, 2025).

Cross-cutting Patterns in Literature

Beyond themes, several patterns emerged from the literature.

- *Methodological trends*: Most studies are cross-sectional. Students are predominantly used as samples. Use of mixed methods has increased since 2022.
- *Theoretical trends*: Several theoretical lenses are used to explain phenomena related to Gen Z—generational cohort theory, social exchange theory, self-determination theory, person–environment fit, theory of planned behavior, psychological contract, and organizational justice are the primary theories used in the literature.
- *Geographical trends*: The literature spans the globe, from Europe to North America, the Subcontinent, and Australia. Still, the representation of underdeveloped countries is less.

Critical Analysis and Contradictions, Contextual Contingencies

The eight themes above indicate the pattern of convergence across literature. It is important to discuss the points of disagreement and the contextual contingencies that warrant explicit reconciliation rather than restatement.

Influence of culture on work values: Botezat et al. (2020) and Maloni et al. (2019) considered factors such as autonomy, growth, and meaningfulness immune to culture and generalized across cultures, whereas De Boer and Bordoloi (2022) showed that cross-cultural differences largely influence the prevailing work values, compensation, and preferences. The evidence from both studies together indicates that constructs such as "flexibility" and "meaningful work" do not hold the same connotation across cultures.

Industry-contingent retention drivers: The retention drivers for Gen Z differ across industries. In the IT sector, supervisory support was found to be the prime driver of retention (Chillakuri, 2020), whereas in the banking and mining sectors, the retention lever shifted toward recognition and flexibility (Brown, 2025; Kgarimetsa & Naidoo, 2024). This pattern suggests that Gen Z retention "levers" are not sector-invariant: in operationally rigid, on-site-heavy industries where

locational flexibility is structurally limited, recognition and schedule autonomy appear to substitute for the autonomy that is more direct. Therefore, becomes more salient for knowledge workers.

Loyalty: a generational trait or a response? In the existing literature, there is a recurring question about Gen Z's loyalty and commitment to the organization (Chillakuri & Mahanandia, 2018). There is another perspective that treats this as more of a response to unmet expectations (transparency, feedback, fair treatment) required to build strong psychological contracts. The assumptions regarding loyalty as a generational trait are unsupported. Therefore, low loyalty is better understood as an outcome of unmet organizational expectations than as a fixed generational trait.

Sample inappropriateness: A large number of studies used students as a sample to make conclusions for working employees (Arora et al., 2020; da Silva Sousa & Douglas Colauto, 2021; Maloni et al., 2019), while few used actual working employees (Ngobeni et al., 2026; Peemanee et al., 2026). These two evidence bases are frequently cited interchangeably in broader literature as though they were equivalent, yet pre-employment expectations and post-entry lived experience are conceptually distinct constructs; this review treats them as related but non-identical.

Geography and representativeness: The reviewed literature clusters in North America, Europe, and parts of the Indian subcontinent (Al-Twal et al., 2025, on Jordan; Taslim et al., 2026, on Oman), with East Asian, African, and Latin American organizational contexts comparatively underrepresented outside a small number of studies (Ngobeni et al., 2026, on South Africa). Claims about Gen Z workplace behavior, which are framed as broadly generalizable, rely disproportionately on contexts from higher- and upper-middle-income countries, a boundary condition that the IGZWAF framework inherits.

An Integrated Model of Gen Z in the Workplace

One objective of the study is to translate and synthesize the findings into a coherent framework for a unified understanding of Gen Z adaptation in the workplace. The findings of the reviewed studies indicate that significant empirical work exists in the literature, but the findings are dispersed. Drawing on the themes identified in the literature, this review proposes an IGZWAF (see Figure 2) that explains how Gen Z characteristics interact with organizational practices to shape key workplace outcomes.

Drawing on person–environment fit theory, Schneider (1987) suggested that workplace outcomes for Gen Z are shaped by the degree of alignment between Gen Z's characteristics and organizational responses. The model suggests organizational practices to make the organizational environment more adaptable for Gen Z instead of focusing on what is wrong with Gen Z. The themes identified suggest that effective management of Gen Z is not possible through traditional workforce assumptions and stereotypes. There is a need for greater digital communication with Gen Z to foster greater understanding. Subsequently, organizations need to

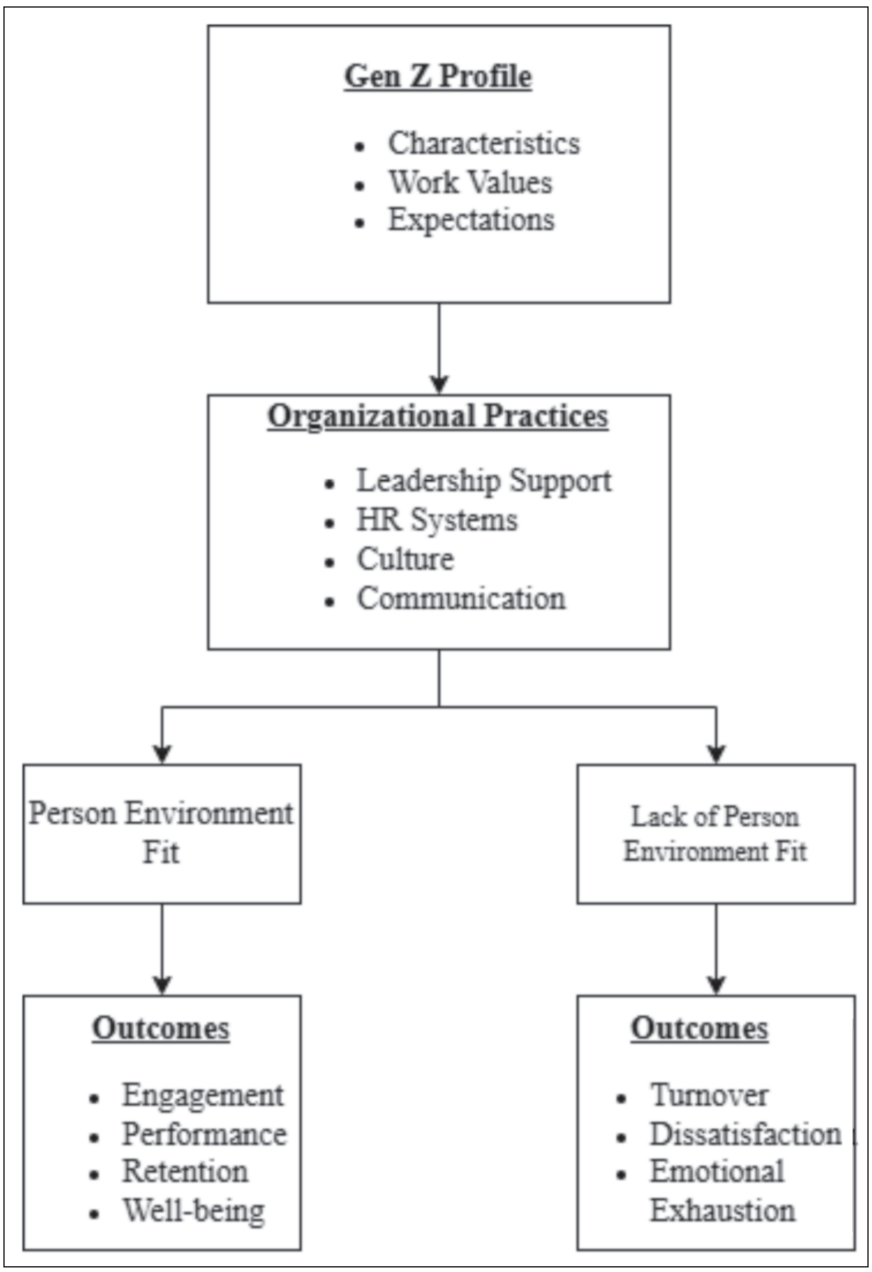


Figure 2. Integrated Gen Z Workplace Adaptation Framework (IGZWAF).

reshape their practices. As the review pointed out, Gen Z has a high technological orientation, requires well-being, expects quick communication, challenges hierarchy, and prefers flexibility. Organizational success with Gen Z, therefore, depends on the alignment of organizational and HR practices with Gen Z workplace

conduct (Saraiva & Nogueiro, 2025). The model proposes a three-stage process to explain the Gen Z workplace conduct and its outcomes. Three stages are:

1. Gen Z profile
2. Organizational practices and processes
3. Workplace outcomes.

Gen Z Profile

Gen Z has distinct characteristics, and in the workplace, expectations and values differ as well (Al-Twal et al., 2025). Table 1 outlines the characteristics, expectations, and values of Gen Z. Gen Z brings these aspects of their conduct to the workplace, and organizations must take them into account through practices and processes (Pauli & Dudek, 2025). Organizations must provide person–organization fit to these characteristics, work values, and workplace expectations (Taslim et al., 2026).

Organizational Practices and Processes

In the second stage, all practices and processes must be shaped to ensure a smooth integration of Gen Z into the workplace, rather than challenging or questioning its expectations and values. The organizational practices and processes are listed in Table 2. If the organizational practices and processes line up with Gen Z's prospects and values, the outcomes can be favorable (Pauli & Dudek, 2025). Empathetic leadership, inclusive leadership, supervisor support, reshaping organizational practices, culture, and communication have the potential to influence adaption and integration of Gen Z (Durman et al., 2026; Gunnoo et al., 2026; Janssen & Carradini, 2021; Ngobeni et al., 2026; Taslim et al., 2026).

Outcomes

The alignment between Gen Z's characteristics, values, and expectations and organizational practices and processes influences individual and organizational outcomes, as mentioned in Table 3. The better the fit, the better the outcomes. At the core of the framework is the person–environment fit. The review suggests that the organization's practices and processes need to be reshaped so that Gen Z feels a sense of fit (Chaudhry, 2024; Saraiva & Nogueiro, 2025). The misalignment between Gen Z expectations, values, and workplace processes and policies can lead to several detrimental outcomes for both individuals and the organization (Saraiva & Nogueiro, 2025) (see Table 3).

Limitations of Existing Literature and Future Research

Research on Gen Z in the workplace is growing. Several conceptual, methodological, and contextual limitations in the literature have emerged in the review.

Table 1. Gen Z Profile.

Profile Aspect	Attributes
Characteristics	Digital nativity
	Tech-dependent
	Less loyalty to the organization
	Prioritizes well-being
	Desire for autonomy
Work values	Work–life balance
	Continuous learning
	Job security
	Flexibility
	Meaningfulness
Workplace expectations	Transparent leadership
	Frequent feedback
	Hybrid workplaces
	Respectfulness
	Inclusivity

Table 2. Organizational Practices and Processes.

Practices and Processes	Attributes
Leadership and supervisor support	Empathetic leadership
	Coaching-oriented supervision
	Open communication
HR systems and policies	Structured onboarding
	Mentoring program
	Transparent performance systems
	Personalized career paths
	Development opportunities
Work design and flexibility	Hybrid and remote work
	Autonomy in task execution
	Meaningful job design
	Work–life integration policies
Communication	More digital communication
	Inclusive tone
	Less barriers
Supportive culture	Psychological safety
	Ethics and transparency

Table 3. Outcomes.

Outcome	Attributes
Individual-level	Job satisfaction
	Engagement
	Psychological well-being
	Skill development
	Organizational commitment
Organizational-level	Retention
	Performance
	Reduced turnover intentions
	Innovations and citizenship behavior

These limitations must be considered in future research to ensure a precise understanding of Gen Z workplace behavior.

Conceptual Fragmentation

The literature on Gen Z is not conceptually sound in terms of theory integration and constructs. Theories such as cohort theory, social exchange theory, self-determination theory, person–environment fit, theory of planned behavior, and organizational support theory have been used largely but without integration. Furthermore, constructs such as "expectations," "values," "engagement," and "motivation" have been studied in empirical studies explaining causation, but varied forms of conceptualization can be found for a single construct. This makes findings less cohesive.

Overreliance on General Stereotypes

The oversimplistic view of Gen Z's characteristics is another conceptual limitation that must be addressed. Although the generational cohort lens provides insight into a particular generation, several studies have ignored the role of context in shaping Gen Z's characteristics. Furthermore, the homogeneous view of Gen Z is problematic because it masks individual differences. However, evidence from cross-national research suggests significant variation by gender, culture, education level, and work experience. Consequently, some parts of the literature risk reinforcing popular stereotypes rather than offering a nuanced empirical understanding.

Dominance of Cross-sectional Design

A major pitfall in studies on Gen Z is the use of a cross-sectional design, which captures any construct at a point in time. This creates several problems: Inability

to establish causal relationships and the evolution of expectations and behavior. Considering that the careers of several Gen Z employees are in the nascent or mid-stages, longitudinal methodologies are crucial for understanding the evolution of their workplace behaviors over time.

Reliance on the Student Sample

A very large number of studies use student samples and make claims about the workplace context or for the employees. Although the sample of university students is convenient to obtain, it might not fully represent the organizational employees. This constrains external validity and prompts questions about the extent to which findings precisely reflect the experiences of Gen Z professionals in long-term job settings.

Predominance of Self-reported Data

The self-reported data dominate the literature, which raises several questions and biases: common method variance, social desirability bias, and the universality of the measure. Objective metrics of performance, retention, or organizational results are infrequently utilized. Consequently, a significant portion of the evidence base illustrates views and intentions rather than definitive workplace behaviors.

Context and Geographical Constraints

The literature is from around the world, spanning continents such as North America, Australia, Europe, and the Subcontinent. Still, the representation of underdeveloped countries is missing in the literature. This geographic bias limits the generalizability of conclusions, particularly when cultural values significantly shape work attitudes.

Neglect of Organizational and Leadership Perspectives

Most studies focus on one side of the story. That is, the leadership perspective on how they wish to integrate Gen Z is missing. The literature on the successful integration of Gen Z into the workplace from a leadership perspective can lead to greater contributions, but multilevel studies remain scarce.

Practical Implications

These findings from the integrative review offer significant implications for policymakers, HR practitioners, and organizations aiming to adapt and integrate Gen Z into the workplace. According to Maloni et al. (2019), research demonstrates that Gen Z employees want purposeful work, supportive leadership, ongoing career growth and education, and value flexibility. The following implications are suggested:

1. The HR managers, leaders, and policymakers in organizations must reconsider their organizational processes and practices. It is suggested that rigid, hierarchical policies be reinvented. Inclusive and empathetic leadership can both be performed to increase the engagement of Gen Z (Durman et al., 2026).
2. From the findings of the review, it is evident that Gen Z appreciates rational onboarding, transparency, and continuous growth (Chillakuri, 2020). It is suggested that the onboarding process for newcomers be interactive. The performance appraisal and chain of communication should be transparent. Moreover, organizations should conduct workshops, training, and development programs more frequently.
3. Personalization and meaningfulness are also important factors for Gen Z (Thomas et al., 2025). Personalization includes autonomy; organizations should provide alternative work settings (flexible and hybrid work arrangements) to Gen Z and a flexible workflow to make sure they do not feel hijacked. Moreover, they should be acknowledged for their hard work and contributions to the organization's goals, thereby reinforcing the significance of their contributions. Digital learning and training must be encouraged (Anand et al., 2025).
4. Furthermore, diversity, equity, and inclusion (DEI) are the core values of Gen Z (Thomas et al., 2025). They are very sensitive to workplace inclusivity. To attract and retain Gen Z talent, organizations must develop DEI initiatives to ensure value congruence. Leaders should participate more in inclusive leadership. Mentors are responsible for fostering inclusion in the workplace.

Conclusion and Limitations

The newest cohort in the workplace brings a different set of expectations, values, and characteristics. The existing organizational processes and practices may not align with the Gen Z workplace profile. Therefore, an organization that makes incremental changes to its routines can make the workplace more inclusive.

The present review has a few limitations that can be addressed in future research. The review is based on a single database, which may have led to the exclusion of important contributions. Future reviews can add more databases to supplement the findings of this review.

The proposed framework is the study's main theoretical contribution. It is expected that the model will guide future empirical research. Moreover, practitioners can implement the model in their workplaces to facilitate the smooth integration of Gen Z into the existing workforce. The critical analysis also revealed several limitations and gaps regarding the design of the studies, samples, theories, and biases. All these limitations must be addressed in future research to obtain a clearer picture of Gen Z workplace behavior.

Naturally, for Gen Z, both men and women are equal. They use social media, so social skills are not a problem. They are also presenting stories about themselves on social media through Instagram reels, LinkedIn profiles, and Facebook.

Self-awareness and empathy also manifest. They are also reacting to other people's stories on social media. As a result of that, there is no difference between men and women.

Overall, the findings convey the common understanding that incremental changes in organizational processes and practices can bring a significant change for Gen Z. The integration of Gen Z can only be done with inclusion and changes. Coercive measures to make Gen Z adapt to rigid organizational practices and processes are likely to backfire.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Ruchi Sao https://orcid.org/0000-0002-4283-405X

References

Al-Twal, A., Jarrar, D. M., Bedevian, V., & Eblan, M. (2025). Unlocking potential: Examining Generation Z's vision for career growth in the Jordanian context. *International Journal of Organizational Analysis*, *33*(11), 4419–4443. https://www.emerald.com/insight/content/doi/10.1108/IJOA-10-2024-4887/full/html

Anand, P., Mishra, S., & Jena, L. K. (2025). Cognitive shifts in workplace learning and Gen Z: Challenges and opportunities. *Development and Learning in Organizations: An International Journal*, *39*(6), 37–41. https://doi.org/10.1108/DLO-12-2024-0349

Arnold, S., & O'Brien, A. (2025). Employment motivations and values in the creative industries: Reorienting from creativity to well-being among Generation Zs in Ireland. *European Journal of Cultural Studies*, *28*(6), 1588–1604. https://doi.org/10.1177/13675494251317067

Arora, S., Dubey, V., & Vyas, S. (2020). Study of work values of Gen Z students. *International Journal of Technology and Globalisation*, *8*(3/4), 240. https://doi.org/10.1504/IJTG.2020.112179

Barhate, B., & Dirani, K. M. (2022). Career aspirations of Generation Z: A systematic literature review. *European Journal of Training and Development*, *46*(1–2), 139–157.

Bhore, M. B., Tapas, P., Gotise, P., & Chinmulgund, A. (2025). The juggling act: Gen Z's approach to moonlighting and full-time work. *International Journal of Organizational Analysis, 33*(4), 699–717.

Botezat, E., Fotea, S., & Fotea, I. (2023). Investigating the relationship between workplace expectations and turnover intention mindset among Romanian students as representatives of Generation Z. *Journal of East European Management Studies*, *28*(4), 630–663.

Botezat, E., Fotea, S. L., Marici, M., & Fotea, I. S. (2020). Fostering the mediating role of the feeling of belonging to an organization among Romanian members of Generation Z. *Studia Universitatis "Vasile Goldis" Arad – Economics Series*, *30*(4), 69–91. https://doi.org/10.2478/sues-2020-0025

Brown, A. B. (2025). *Exploration of Gen Z perceptions of organizational culture, person-organization fit, and loyalty* [PhD Thesis, Kansas State University]. https://search.

proquest.com/openview/521b0d2e334109f26f00e8f4f2a9ebb3/1?pq-origsite=gscholar&cbl=18750&diss=y

Chaudhry, S. (2024). Sustaining talent: A social exchange perspective on the Generation Z workforce. *Development and Learning in Organizations: An International Journal*, *38*(5), 19–22. https://doi.org/10.1108/DLO-11-2023-0245

Chillakuri, B. (2020). Understanding Generation Z expectations for effective onboarding. *Journal of Organizational Change Management*, *33*(7), 1277–1296.

Chillakuri, B., & Mahanandia, R. (2018). Generation Z entering the workforce: The need for sustainable strategies in maximizing their talent. *Human Resource Management International Digest*, *26*(4), 34–38.

Chmiel, M. (2025). Loneliness, office space arrangement and mental well-being of Gen Z PR professionals. Falling into the trap of an agile office? *Journal of Communication Management*, *29*(3), 379–400.

da Silva Sousa, R. C., & Douglas Colauto, R. (2021). The Y and Z Generations in accountancy graduate programs and work values. *Revista de Educação e Pesquisa em Contabilidade*, *15*(4), 450–466.

Dania, T., Chladkova, H., Duda, J., Kožíšek, R., & Hrdličková, A. (2023). The motivation of generation Z: A prototype of the Mendel University student. *The International Journal of Management Education*, *21*(3), 100891.

DeArmond, S., Tye, M., Chen, P. Y., Krauss, A., Apryl Rogers, D., & Sintek, E. (2006). Age and gender stereotypes: New challenges in a changing workplace and workforce. *Journal of Applied Social Psychology*, *36*(9), 2184–2214. https://doi.org/10.1111/j.0021-9029.2006.00100.x

De Boer, P., & Bordoloi, P. (2022). Nationality differences in Gen Z work values: An exploratory study. *Journal of International Education in Business*, *15*(2), 373–392. https://doi.org/10.1108/JIEB-09-2021-0088

Durman, T. Y., Peerzadah, S. A., Hanoum, S., & Abdullah, N. A. (2026). Empathetic and inclusive leadership: Job crafting and employee engagement among Generation Z. *Management Decision*, 1–23.

Egerová, D., Komárková, L., & Kutiák, J. (2021). Generation Y and Generation Z employment expectations: A generational cohort comparative study from two countries. *E+M Ekonomie a Management*, *24*(3), 93–109.

Ensari, M. S. (2017). A study on the differences of entrepreneurship potential among generations. *Research Journal of Business and Management, 4*(1), 52–62.

Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: Strengths and weaknesses. *The FASEB Journal*, *22*(2), 338–342. https://doi.org/10.1096/fj.07-9492LSF

Gunnoo, L., Ladsawut, J., & Fauzel, S. (2026). Gen Z in the digital era: Reframing job satisfaction in the modern workplace. *Journal of Organizational Effectiveness: People and Performance*, 1–24. https://doi.org/10.1108/JOEPP-12-2025-1113

Ignatius Soni Kurniawan, I., Hunik Sri Runing Sawitri, H., Sinto Sunaryo, S., & Hendrsjah, H. (2026). Quiet quitting in toxic work environments: The mediating role of emotional exhaustion across Gen Z and non-Gen Z employees in Indonesia. *Qubahan Academic Journal*, *6*(2), 462–481. https://doi.org/10.48161/qaj.v6n2a2451

Janssen, D., & Carradini, S. (2021). Generation Z workplace communication habits and expectations. *IEEE Transactions on Professional Communication*, *64*(2), 137–153.

Jaya, A., Satrianingsih, A. R., Damayanti, N. E., & Ikasari, F. (2026). From bias to belonging: Gen Z and gendered pathways to disability inclusion. *SA Journal of Human Resource Management*, *24*, 3402.

Kataria, N., Chou, S. Y., Obasi, C., & Khadka, S. (2026). Navigating the future of work: Embracing authenticity and assertiveness in the age of millennials and Gen Z. *International Journal of Organizational Analysis*, 1–20.

Kgarimetsa, T. S., & Naidoo, C. (2024). Effect of employee recognition and flexible working arrangement on Generation Z retention. *SA Journal of Human Resource Management*, *22*, 1–11.

Krishna, S. M., & Agrawal, S. (2024). Creative performance of millennials and generation Z: What matters more, intrinsic or extrinsic rewards? *Administrative Sciences*, *15*(1), 11.

Lazányi, K., & Bilan, Y. (2017). Generation Z on the labour market: Do they trust others within their workplace? *Polish Journal of Management Studies*, *16*(1), 78–93.

Loring, A., & Wang, J. (2022). Engaging Gen Z in professional selling: A systematic literature review. *European Journal of Training and Development*, *46*(5/6), 413–433.

Maan, P., & Srivastava, D. K. (2023). Factors affecting team performance: An empirical study of Indian GenY and GenZ cohorts. *Equality, Diversity and Inclusion: An International Journal*, *42*(8), 986–1006.

Maloni, M., Hiatt, M. S., & Campbell, S. (2019). Understanding the work values of Gen Z business students. *The International Journal of Management Education*, *17*(3), 100320.

Martín-Martín, A., Orduna-Malea, E., Thelwall, M., & López-Cózar, E. D. (2018). Google Scholar, Web of Science, and Scopus: A systematic comparison of citations in 252 subject categories. *Journal of Informetrics*, *12*(4), 1160–1177.

McKinsey & Company. (2025). *The Gen Z equation*. https://www.mckinsey.com/quarterly/the-five-fifty/five-fifty-the-gen-z-equation

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: A comparative analysis. *Scientometrics*, *106*(1), 213–228. https://doi.org/10.1007/s11192-015-1765-5

Ngobeni, S. P., Tebele, C., & Siwela, S. (2026). The psychosocial experiences of Gen Z entry-level employees in corporate organisations. *Administrative Sciences*, *16*(2), 96. https://doi.org/10.3390/admsci16020096

Nguyen, M. T., & Petchsawang, P. (2026). Exploring employee engagement: A qualitative study on Generation Z in Vietnam. *Human Resource Development International*, 1–23.

Osorio, M. L., & Madero, S. (2025). Explaining Gen Z's desire for hybrid work in corporate, family, and entrepreneurial settings. *Business Horizons*, *68*(1), 83–93.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *bmj*, 372.

Pataki-Bittó, F., & Kapusy, K. (2021). Work environment transformation in the post-COVID-19 era based on work values of the future workforce. *Journal of Corporate Real Estate*, *23*(3), 151–169.

Pauli, U., & Dudek, A. (2025). Young HRM professionals' perception of supportive work environment–identifying expected changes in employment settings. *Journal of Organizational Change Management*, *38*(8), 71–91.

Peemanee, J., Weerarathna, R., Issarapaibool, A., Boonlua, S., & Rathnayake, N. (2026). Beyond compensation: Effect of employee benefits on job motivation, performance, and turnover intention. *Cogent Business & Management*, *13*(1), 2607764. https://doi.org/10.1080/23311975.2025.2607764

Rosen, L. D. (2010). *Rewired: Understanding the iGeneration and the way they learn*. Macmillan+ ORM.

Ru-Zhue, J., Imjai, N., Yordudom, T., Kongrode, J., Sumiati, S., & Aujirapongpan, S. (2025). How do the role of digital connectivity capabilities and heuristic thinking skills shape the development of digital marketing competency in Gen Z marketing students?. *The International Journal of Management Education, 23*(2), 101157.

Saraiva, M., & Nogueiro, T. (2025). Perspectives and realities of disengagement among younger generation Y and Z workers in contemporary work dynamics. *Administrative Sciences*, *15*(4), 133.

Schneider, B. (1987). The people make the place. *Personnel Psychology*, *40*(3), 437–453. https://doi.org/10.1111/j.1744-6570.1987.tb00609.x

Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in society*, *65*, 101565.

Tabi, K. J., Topacio, R., Paguta, S. A. L., Pedrosa, A. U., Diorico, E., & Muñoz, K. E. (2025). Does work-based social support matter? A perspective on Gen Z hospitality interns. *Education + Training*, *67*(5–6), 684–699. https://doi.org/10.1108/ET-07-2024-0334

Taslim, M., Al-Sukaiti, M. F. M., & Albolushi, O. A. H. (2026). Bridging Gen Z values and organisational fit: A cross-sectional mediation study. *SN Business & Economics*, *6*(6), 147. https://doi.org/10.1007/s43546-026-01126-4

Thomas, M. R., Selvakumar, R., & Sharma, P. (2025). Key factors shaping personalised employee experience for the Generation Z workforce. *Management Decision*. https://www.emerald.com/insight/content/doi/10.1108/md-09-2024-2046/full/html

Torraco, R. J. (2016). Writing integrative reviews of the literature: Methods and purposes. *International Journal of Adult Vocational Education and Technology (IJAVET)*, *7*(3), 62–70.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, *14*(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Visser, C., & Terblanche, N. (2025). The soft-skills characteristics of Generation Z employees: A scoping review and research agenda. *SA Journal of Human Resource Management*, *23*, 1–23.

Waworuntu, E. C., Kainde, S. J., & Mandagi, D. W. (2022). Work-life balance, job satisfaction, and performance among millennial and Gen Z employees: A systematic review. *Society*, *10*(2), 384–398.

Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, *52*(5), 546–553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

Zhou, X., Zhao, L., Zhang, L., & Liu, X. (2026). Decoding the emotional needs of Gen Z employees: Unlocking the benefits of organizational emotional capability and workplace friendship. *International Journal of Contemporary Hospitality Management*, *38*(3), 962–983. https://doi.org/10.1108/IJCHM-04-2025-0491

Article

Evaluating Strategies for Promoting Adventure Tourism Using SWOT-AHP Approach: A Case of North East Region of India

Nirma University Journal of Business and Management Studies
9(2) 147–159, 2026
© The Author(s) 2026
DOI: 10.1177/njb.261484987
njb.spectrumjps.com

Rupam Deb[1]

Abstract

Adventure tourism is recognized as a source of regional development and livelihood for local communities. The North East Region of India possesses immense potential for adventure tourism, but a lacuna exists between its potential and actual strategic realization. This study fills this gap by applying a hybrid multi-criteria decision-making technique by integrating the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis and the Analytic Hierarchy Process (AHP). The results indicate that the most important strength in the internal environment is the "government pro-tourism approach," while the main institutional bottleneck is "poor infrastructure." Under the external environment, the top opportunity is "strong partnership with local communities," while the biggest external threat to tourist arrivals is "security threats/perceptions."

Keywords

Adventure tourism, SWOT, Analytic Hierarchy Process, strategy matrix, regional development

Introduction

Adventure tourism has become a major niche in the tourism industry. Adventurous activities are on the rise due to the demand for active living and overall physical well-being (Hanna et al., 2019; Mackenzie & Brymer, 2020). Adventure tourism is also popularly known for its mental and psychological well-being (Sahoo et al.,

[1]Institute of Management, Nirma University, Ahmedabad, Gujarat, India

Corresponding author:
Rupam Deb, Institute of Management, Nirma University, Ahmedabad, Gujarat 382481, India.
E-mail: rupam.deb@nirmauni.ac.in

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed.

2026). The rise in demand leads to the commercialization of these adventurous activities, developing the region's infrastructure and economic potential. Many countries are leveraging their adventure tourism potential due to its ecological, economic, and cultural values (Mawarni et al., 2022). The adventure tourism market is globally valued at $869.06bn and is expected to grow further in subsequent years (Fortune Business Insights, 2026).

In recent times, the COVID-19 pandemic had a widespread negative impact on many industries (Torabi et al., 2023). Tourism development strategies helped countries to recover post-pandemic. Overall, tourism helps developing regions by improving public facilities (Sirakaya et al., 2002). Adventure tourism promises a bright future for the North East Region (NER) of India with such a diverse geography. NER of India includes eight states, namely, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The NER states are endowed with stunning natural scenery, unique history, and cultural and ethnic heritage. All of this provides the region with enormous tourism potential. Due to these diverse attributes, the NER of India has the potential to become the adventure tourism hotspot of the country (ET TravelWorld, 2021). Although the region is blessed with diverse attributes, it also has several limitations concerning adventure tourism in the region. Identifying the various aspects of adventure tourism in the region will help in highlighting the various opportunities and challenges.

Strategic plan development by evaluating the current situation of a particular brand, service, or industry is crucial. Policymakers require a structured, multidimensional strategic planning framework. Evaluation of the current state helps develop plans for future approaches, and the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is commonly used to access current state (Taleai et al., 2009). Traditional SWOT analyses are widely utilized in tourism research to map regional operating environments (Reihanian et al., 2012). A SWOT analysis shows the internal strengths, weaknesses, and external areas of opportunities and threats that an industry faces. When implemented correctly, SWOT analysis can serve as a solid foundation for effective policy development.

However, standard SWOT frameworks are frequently critiqued for being purely qualitative, resulting in a descriptive narrative that fails to measure the relative importance or priority of the identified factors (Solangi et al., 2019). To further strengthen our analysis, we have combined the traditional SWOT analysis with the Analytic Hierarchy Process (AHP) technique, which helps in quantifying the different SWOT factors. The AHP method determines the relative significance of different factors within the group (Strength group, Weakness group, Opportunity group, and Threat group) and between the SWOT groups. By applying pairwise comparison matrices to the SWOT factors, the hybrid SWOT-AHP approach systematically quantifies and prioritizes subjective variables (Solangi et al., 2019). This methodology effectively transforms qualitative regional insights into a prioritized hierarchy of actionable strategies. Thus, this study utilizes the hybrid SWOT-AHP framework to evaluate, weight, and rank strategic interventions, providing an empirical roadmap for promoting sustainable adventure tourism across the NER of India.

Objectives:

1. To identify the internal strengths and weaknesses, and external opportunities and threats.
2. To apply AHP pairwise comparison matrix to determine the most important factors.
3. To identify important strategies for adventure tourism development in the region.

Background Review

It is widely evident that adventure tourism serves as a vital catalyst for regional development, particularly within peripheral or ecologically unique destinations. Because adventure tourism activities typically require highly specific environmental and topographical frameworks, they are predominantly viable within, and suited for, remote regions. Earlier research has demonstrated that adventure tourism has successfully fostered growth across various geographies, including mountainous regions (Maroudas et al., 2004), rural areas (Baldacchino et al., 2015), coastal environments (Otieno et al., 2025), and protected forest zones (Buckley, 2000). Beyond macroeconomic growth, these activities serve an essential socio-economic function by acting as a sustainable source of livelihood and community-based empowerment for local populations (Knowles, 2019).

The NER of India is uniquely blessed with diverse terrains and rich natural endowments that offer immense potential for establishing a premier adventure tourism hub. Featuring rugged mountain ranges, dense tropical forests, expansive river systems, and biodiversity-rich national parks, the region possesses the ideal environmental attributes required for specialized adventure tourism development (De, 2013). In recent years, national and regional policy frameworks, such as India's "Act East" policy, have increasingly emphasized the economic potential of the NER through tourism. However, the execution of sustainable adventure tourism across the region remains a complex challenge. Developing these initiatives requires balancing delicate ecological zones with infrastructure expansion, managing community inclusion, and navigating logistical constraints.

Methodology and Approach

Strengths, Weaknesses, Opportunities, and Threats

Strategic planning involves a thorough examination of both the inner and outer environments. Environmental aspects that an industry controls internally are typically categorized as strengths (S) or weaknesses (W), whereas external factors are categorized as opportunities (O) or threats (T). SWOT analysis has been increasingly used to make strategic decisions about various products and services.

Analytic Hierarchy Process

Although SWOT analysis is a significant tool in strategic decision-making, it lacks the ability to quantify and rank the most important factors. To counter this limitation, we combined the SWOT analysis with the AHP. The AHP is one of the multicriteria decision-making techniques that enables decision-makers to rank each element in terms of relative importance using pairwise comparisons.

For pairwise comparison and assigning relative weights to the SWOT factors, we used the scale developed by Saaty (1980), as shown in Table 1.

The three guiding steps of the AHP technique are: (a) developing a model structure; (b) pairwise comparison of the criteria and/or subcriteria; and (c) synthesizing the priorities. AHP first creates a hierarchy of interconnected decision components (criteria, subcriteria) from a complex multicriteria decision-making problem. The AHP structure consists of the main objectives, criteria, and subcriteria organized hierarchically in the form of a family tree.

After the problem has been broken down and a hierarchy has been created, the process of pairwise comparison and prioritizing the criteria and subcriteria begins in order to establish their relative weights. The comparison is done using the scale developed by Saaty (2008).

A pairwise matrix A for n criteria can be plotted as an $(n \times n)$ matrix, where each element $aij(i, j = 1, 2,\ldots, n)$ is the fractional weight of the criteria, as shown in Equation (1). Each input sheet's priorities are determined using the row geometric mean approach (RGMM).

$$A = (aij)n \times n = \begin{bmatrix} 1 & w_1 / w_2 & \ldots & w_1 / w_n \\ w_2 / w_1 & 1 & \ldots & w_2 / w_n \\ \vdots & \vdots & \ldots & \vdots \\ w_n / w_1 & w_n / w_2 & \ldots & 1 \end{bmatrix} \quad (1)$$

The next step is to normalize each matrix element to find its relative weight. The right eigenvector (W), which corresponds to the largest eigenvalue (λ_{max}), provides the normalized relative weights.

$$A_W = \lambda_{max}.W \quad (2)$$

Table 1. Pairwise Comparison Scale.

Scale	Meaning
1	The two factors are equally preferred
3	Small preference for one factor over another
5	Strong preference for one factor over another
7	Strong preference for one factor and its dominance is evident over another
9	The highest possible order of importance of one factor over another
2, 4, 6, 8	Used to denote a compromise between the preceding priority

Source: Satty (2008).

Table 2. Random Index Table.

Size of matrix (*n*)	1	2	3	4	5	6	7	8	9	10
Random Index (RI)	0	0	0.52	0.89	1.11	1.25	1.35	1.4	1.45	1.49

Source: Saaty and Vargas (1991).

According to Saaty (1977), if $\lambda_{max} = n$, it is sufficient to establish consistency. An inconsistent result may occur when λ_{max} differs from n due to inconsistent responses. An index named the consistency index (CI) has been developed to determine whether the matrix A is consistent (Equation (3)) (Saaty, 1980).

$$CI = (\lambda_{max} - n) / (n - 1) \tag{3}$$

Lastly, the consistency ratio (CR) is used to determine the final consistency. The CR is calculated by dividing the CI by the random index (RI), as shown in Equation (4). RI table (Table 2) is used to obtain the value of RI (Saaty & Vargas, 1991).

$$CR = CI/RI \tag{4}$$

The accepted upper limit for CR is set at 0.1. If the final CR is higher than this amount, then all or some of the pairwise comparisons must be repeated to enhance consistency.

The main objective of the study is to evaluate the current state of adventure tourism in the NER of India. We first identified its SWOT, as shown in Figure 1. Secondary sources such as previous literature, industry indicators, and articles were used to identify the various SWOT criteria and subcriteria.

In this study, responses were collected from stakeholders such as adventure tourists, residents of the region, private tour operators, and tourism scholars. The responses were collected using the Saaty (1980) scale. The study employs a SWOT-AHP analysis, in which the AHP is used to identify and prioritize the stakeholders' responses using a pairwise comparison concerning the SWOT criteria and subcriteria. Finally, according to the results, strategies for developing adventure tourism in the NER are established.

The steps of the research methodology for the purpose of this study are given below:

Step 1: Problem identification.
Step 2: Research method selection. For this study, we will be using the SWOT-AHP analysis.
Step 3: Determining initial SWOT factors.
Step 4: Determination of stakeholder groups—adventure tourists, residents of the region, private tour operators, and tourism scholars.
Step 5: Verification of SWOT factors—separation of factors through SWOT subcriteria according to stakeholders' opinions.
Step 6: Data collection—obtaining responses from the stakeholders based on Saaty's scale.
Step 7: SWOT-AHP analysis—creating an analytical hierarchy model, developing a pairwise comparison matrix, matrix normalization, and criteria weight calculation.

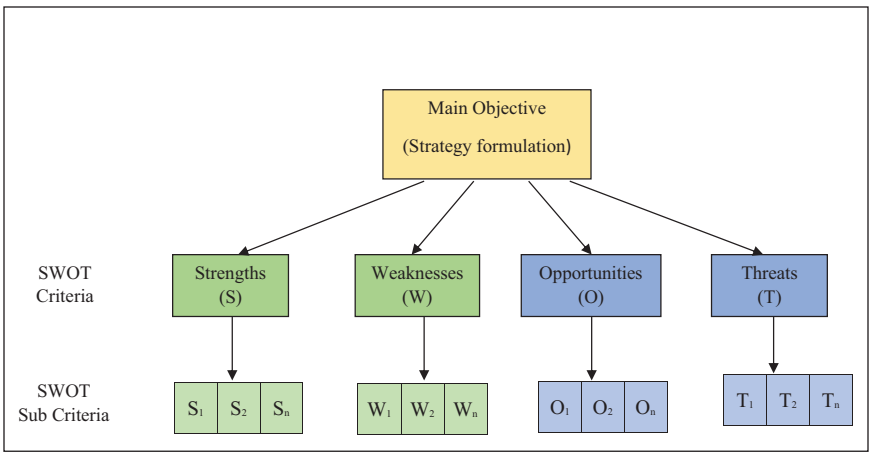


Figure 1. Strengths, Weaknesses, Opportunities, and Threats (SWOT) Matrix Hierarchical Structure.

Table 3. Comparison Matrix of Strengths, Weaknesses, Opportunities, and Threats (SWOT) Group.

SWOT Group	S	W	O	T	Priority of SWOT Group
Strength (S)	1	0.584	0.504	1.505	0.188
Weaknesses (W)	1.712	1	0.452	0.828	0.209
Opportunities (O)	1.984	2.212	1	3.337	0.440
Threats (T)	0.664	1.208	0.300	1	0.163
Consistency ratio (CR) = 0.049					

Table 4. Pairwise Comparison of Strength Subfactors.

Strengths	S1	S2	S3	S4	Priority of Strength Subfactor
(S1) North East Region (NER) is full of rich natural resources and cultural diversity	1	2.667	0.381	0.708	0.229
(S2) Clean and pollution-free environmentideal for adventurers	0.375	1	0.566	1.102	0.167
(S3) Government pro-tourism approach	2.627	1.768	1	1.744	0.390
(S4) Suitable terrain for various adventureactivities	1.412	0.908	0.574	1	0.214
Consistency ratio (CR) = 0.094					

Table 5. Pairwise Comparison of Weakness Subfactors.

Weaknesses	W1	W2	W3	W4	W5	W6	Priority of Weakness Subfactor
(W1) Ruling of unorganized tour operators	1	0.467	0.35	0.673	0.899	0.676	0.103
(W2) Low accessibility	2.141	1	1.219	0.545	1.032	0.764	0.158
(W3) Lack of trained personnel and institutes	2.857	0.820	1	0.435	1.486	1.247	0.174
(W4) Poor infrastructure	1.486	1.835	2.299	1	3.061	2.87	0.307
(W5) Accommodation issues	1.112	0.969	0.673	0.327	1	0.807	0.115
(W6) Low foreign tourist	1.479	1.309	0.802	0.348	1.239	1	0.143
Consistency ratio (CR) = 0.037							

Table 6. Pairwise Comparison of Opportunity Subfactors.

Opportunity	O1	O2	O3	O4	Priority of Opportunity Subfactor
(O1) Promoting homestays as a sustainable source of livelihood for locals	1	1.626	0.552	0.599	0.213
(O2) Development of other related industries (hospitality, travel and handicraft)	0.615	1	0.763	1.06	0.206
(O3) Strong partnership with the local communities	1.812	1.311	1	1.842	0.347
(O4) Expand adventure market by attracting foreigntourist	1.669	0.943	0.543	1	0.235
Consistency ratio (CR) = 0.050					

Table 7. Pairwise Comparison of Threat Subfactors.

Threats	T1	T2	T3	T4	Priority of Threat Subfactor
(T1) Uncertain weather conditions	1	0.343	0.807	0.869	0.160
(T2) Security threats/perceptions	2.918	1	1.723	2.758	0.440
(T3) Instability in the region affects tourist inflows	1.239	0.581	1	1.601	0.237
(T4) Competition from other states and neighboring countries	1.151	0.363	0.625	1	0.163
Consistency ratio (CR) = 0.006					

Table 8. Overall Priority Score.

SWOT Group	Group Priority	SWOT Subcriteria	Priority of Subcriteria	Overall Priority
		(S1)	0.229	0.0430
Strengths	0.188	(S2)	0.167	0.0313
		(S3)	0.390	0.0733
		(S4)	0.214	0.0403
		(W1)	0.103	0.0216
		(W2)	0.158	0.0331
Weaknesses	0.209	(W3)	0.174	0.0363
		(W4)	0.307	0.0641
		(W5)	0.115	0.0240
		(W6)	0.143	0.0299
		(O1)	0.213	0.0935
Opportunities	0.44	(O2)	0.206	0.0904
		(O3)	0.347	0.1526
		(O4)	0.235	0.1034
		(T1)	0.160	0.0261
Threats	0.163	(T2)	0.440	0.0716
		(T3)	0.237	0.0386
		(T4)	0.163	0.0266

Note: The bold text represents the highest priority. Keep it as it is.

Step 8: Consistency test.
Step 9: Development of strategies based on priority criteria.

Results and Findings

The comparison results of the SWOT group are shown in Table 3. According to our analysis, we found that the Opportunities group has the highest priority, that is, 0.440.

The comparison results of Strength subfactors are shown in Table 4. According to our analysis, we found that S3 has the highest priority, that is, 0.390.

The comparison results of Weakness subfactors are shown in Table 5. According to our analysis, we found that W4 has the highest priority, that is, 0.390.

The comparison results of Opportunity subfactors are shown in Table 6. According to our analysis, we found that O3 has the highest priority, that is, 0.347.

The comparison results of Threat subfactors are shown in Table 7. According to our analysis, we found that T2 has the highest priority, that is, 0.440.

The overall priority score is shown in Table 8. It indicates that strong partnership with the local communities is the most important factor.

Conclusion

By fusing SWOT and AHP methodologies, we have identified critical strategic determinants for the NER adventure tourism industry in this article. According to the findings, each SWOT group's priority is ranked as follows: Threats (16.27%), Weaknesses (20.93%), Opportunities (44.01%), and Strengths (18.80%). The analysis finds that "strong partnership with the local communities" from the opportunities group is the most crucial SWOT component. With a total priority value of 34.7%, this issue is the most crucial one to take into account. Other important variables are: Government pro-tourism approach (14.7%) from the Strength group, security threats/perceptions from the Threat group (4.3%), and poor infrastructure (4.3%) from the Weakness group.

It is possible to design a management strategy or receive support for important decisions using the calculated priorities of SWOT criteria (Gottfried et al., 2018). Additionally, a collection of suitable strategy alternatives for adventure tourism policies can be created using the findings of this study. Future studies may enhance the use of the AHP method with the fuzzy logic framework to more effectively examine scenarios with uncertainty.

Strategic Implications

Based on the results obtained from the hybrid SWOT-AHP analysis, four distinct sets of strategic measures can be formulated to guide adventure tourism development in NER. These strategic choices are categorized based on the interaction between internal capabilities and external market dynamics: offensive strategies (SO: combining strengths and opportunities), defensive strategies (ST: combining strengths and threats), adaptive strategies (WO: combining weaknesses and opportunities), and survival strategies (WT: combining weaknesses and threats) (Díaz-López et al., 2020). The policy-strategy matrix is depicted in Table 9.

Offensive Strategy: Community-led Policy Optimization

This strategy is obtained by combining: government pro-tourism approach (S3) + strong partnership with the local communities (O3). This strategy utilizes a strong government push to formalize and scale grassroots community partnerships with the locals. By integrating the government's pro-tourism policies with local communities, policymakers can institutionalize community-based adventure tourism networks. This includes establishing government-backed financial support and incentive models, cooperative legal advisory structures for local entrepreneurs, and training programs that empower indigenous populations to manage homestays and guide operations safely, turning state policies into a localized economic growth engine.

Adaptive Strategy: Public-Private-Community Infrastructure Development

This strategy is obtained by combining poor infrastructure (W4) + strong partnership with the local communities (O3). This strategy uses community resources

Table 9. Policy-strategy Matrix.

Policy for adventure tourism development in NER	*Internal strengths (S)*	*Internal weaknesses (W)*
	(S1) NER is full of rich natural resources and cultural diversity (S2) Clean and pollution-free environment, ideal for adventurers (S3) Government pro-tourism approach (S4) Suitable terrain for various adventure activities	(W1) Ruling of unorganized tour operators (W2) Low accessibility (W3) Lack of trained personnel and institutes (W4) Poor infrastructure (W5) Accommodation issues (W6) Low foreign tourist
External opportunities (O)	Strategy 1	Strategy 2
(O1) Promoting homestays as a sustainable source of livelihood for locals (O2) Development of other related industries (hospitality, travel, and handicraft) (O3) Strong partnership with the local communities (O4) Expand the adventure market by attracting foreign tourists	Community-led policy optimization	Public-private-community infrastructure development
External threats (T)	Strategy 3	Strategy 4
(T1) Uncertain weather conditions (T2) Security threats/perceptions (T3) Instability in the region affects tourist inflows (T4) Competition from other states and neighboring countries	Institutionalizing perception and safety upgrades	Risk-mitigating infrastructure and community governance

and local coordination as an asset to attract public and private investment to tackle critical connectivity and logistical problems. Rather than waiting for massive capital infrastructure renovations, immediate, low-impact adventure tourism infrastructure (i.e., standard campsites, eco-lodges, directional trail markers, and localized rescue points) can be co-developed with local communities. This distributive and decentralized model will expedite the infrastructure development process, keeping ownership with the locals.

Defensive Strategy: Institutionalizing Perception and Safety Upgrades

This strategy is obtained by combining government pro-tourism approach (S3) + security threats/perceptions (T2). In this strategy, the administrative authority of the government and local authorities should be utilized to break down the long-standing negative security perceptions of the NER. The approach involves the government pushing for specialized and visible infrastructure development, such as dedicated tourist police centers, centralized real-time travel advisory portals, and standardized security certifications for adventure tour operators. State machinery institutionalizing safety policies and committing the same can transform an active external barrier into a state-regulated, low-risk operating environment.

Survival Strategy: Risk-mitigating Infrastructure and Community Governance

This strategy is obtained by combining: poor infrastructure (W4) + security threats/perceptions (T2). In this strategy, the key idea is to activate the risk-reduction mechanism, which stresses the protection and stabilization of fragile tourist routes. Development should be restricted to well-defined, secure clusters in areas lacking infrastructure and where perceptions of security are weak. This includes building decentralized emergency communication systems and developing community-based tourist monitoring and safety networks. The region has structural limitations but can still be a safe place for adventure activities by empowering, educating, and guiding the local communities to be the main guardians of security and emergency response in the region.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Rupam Deb https://orcid.org/0000-0002-8209-2935

References

Baldacchino, G., Helgadóttir, G., & Mykletun, R. J. (2015). Rural tourism: Insights from the North Atlantic. *Scandinavian Journal of Hospitality and Tourism*, *15*(1–2), 1–7. https://doi.org/10.1080/15022250.2015.1020124

Buckley, R. (2000). Neat trends: Current issues in nature, eco- and adventure tourism. *International Journal of Tourism Research*, *2*(6), 437–444. https://doi.org/10.1002/1522-1970(200011/12)2:6%3C437::AID-JTR245%3E3.0.CO;2-#

De, U. K. (2013). Sustainable nature-based tourism, involvement of Indigenous women and development: A case of North-East India. *Tourism Recreation Research*, *38*(3), 311–324. https://doi.org/10.1080/02508281.2013.11081756

Díaz-López, C., Carpio, M., Martín-Morales, M., & Zamorano, M. (2020). Defining strategies to adopt Level(s) for bringing buildings into the circular economy. A case study of Spain. *Journal of Cleaner Production*, *287*, 125048. https://doi.org/10.1016/j.jclepro.2020.125048

ET TravelWorld. (2021, November 30). *Northeast has potential to become adventure tourism capital of India: ATOAI*. https://travel.economictimes.indiatimes.com/news/destination/states/northeast-has-potential-to-become-adventure-tourism-capital-of-india-atoai/88003871

Fortune Business Insights. (2026). *Adventure tourism market size & future outlook*. https://www.fortunebusinessinsights.com/adventure-tourism-market-107924

Gottfried, O., De Clercq, D., Blair, E., Weng, X., & Wang, C. (2018). SWOT-AHP-TOWS analysis of private investment behavior in the Chinese biogas sector. *Journal of Cleaner Production*, *184*, 632–647. https://doi.org/10.1016/j.jclepro.2018.02.173

Hanna, P., Wijesinghe, S., Paliatsos, I., Walker, C., Adams, M., & Kimbu, A. (2019). Active engagement with nature: Outdoor adventure tourism, sustainability and wellbeing. *Journal of Sustainable Tourism*, *27*(9), 1355–1373. https://doi.org/10.1080/09669582.2019.1621883

Knowles, N. L. (2019). Targeting sustainable outcomes with adventure tourism: A political ecology approach. *Annals of Tourism Research*, *79*, 102809. https://doi.org/10.1016/j.annals.2019.102809

Mackenzie, S. H., & Brymer, E. (2020). Conceptualizing adventurous nature sport: A positive psychology perspective. *Annals of Leisure Research*, *23*(1), 79–91. https://doi.org/10.1080/11745398.2018.1483733

Maroudas, L., Kyriakaki, A., & Gouvis, D. (2004). A community approach to mountain adventure tourism development. *Anatolia*, *15*(1), 5–18. https://doi.org/10.1080/13032917.2004.9687141

Mawarni, G., Moutinho, N., Fernandes, P. O., & Nunes, A. (2022). Factors affecting the Adventure Tourism Development Index: A worldwide analysis. In A. Abreu, D. Liberato, & J. C. Garcia Ojeda (Eds), *Advances in tourism, technology and systems. Smart innovation, systems and technologies* (pp. 371–383). Springer. https://doi.org/10.1007/978-981-19-1040-1_32

Otieno, V. A., Kariuki, A. C., & Kipkosgei, B. (2025). Types of adventure tourism product and sustainable tourism development in Nakuru County, Kenya. *Journal of Hospitality and Tourism Management*, *8*(1), 93–110. https://doi.org/10.53819/81018102t5382

Reihanian, A., Mahmood, N. Z. B., Kahrom, E., & Hin, T. W. (2012). Sustainable tourism development strategy by SWOT analysis: Boujagh National Park, Iran. *Tourism Management Perspectives*, *4*, 223–228. https://doi.org/10.1016/j.tmp.2012.08.005

Saaty, T. L. (1977). A scaling method for priorities in hierarchical structures. *Journal of Mathematical Psychology*, *15*(3), 234–281. https://doi.org/10.1016/0022-2496(77)90033-5

Saaty, T. L. (1980). *The analytic hierarchy process*. McGraw-Hill.

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International *Journal of Services Sciences, 1*(1), 83–98. https://doi.org/10.1504/IJSSCI.2008.017590

Saaty, T. L., & Vargas, L. G. (1991). *Prediction, projection and forecasting*. Kluwer Academic Publishers.

Sahoo, D., Nukhu, R., Dash, S., & Chauhan, V. (2026). Adventure tourism and visitors motivations: A mixed-method study on memorability and psychological well-being. *Journal of Hospitality and Tourism Insights*, *9*(3), 1385–1404. https://doi.org/10.1108/jhti-04-2025-0466

Sirakaya, E., Teye, V., & Sönmez, S. (2002). Understanding residents' support for tourism development in the central region of Ghana. *Journal of Travel Research*, *41*(1), 57–67. https://doi.org/10.1177/004728750204100109

Solangi, Y. A., Tan, Q., Mirjat, N. H., & Ali, S. (2019). Evaluating the strategies for sustainable energy planning in Pakistan: An integrated SWOT-AHP and Fuzzy-TOPSIS approach. *Journal of Cleaner Production*, *236*, 117655. https://doi.org/10.1016/j.jclepro.2019.117655

Taleai, M., Mansourian, A., & Sharifi, A. (2009). Surveying general prospects and challenges of GIS implementation in developing countries: A SWOT–AHP approach. *Journal of Geographical Systems*, *11*(3), 291–310. https://doi.org/10.1007/s10109-009-0089-5

Torabi, Z., Rezvani, M. R., Hall, C. M., & Allam, Z. (2023). On the post-pandemic travel boom: How capacity building and smart tourism technologies in rural areas can help—Evidence from Iran. *Technological Forecasting and Social Change*, *193*, 122633.

Article

A Comparative Study of the Alternate Consumption-based Capital Asset Pricing Models: Evidence from India

Nirma University Journal of Business and Management Studies
9(2) 160–182, 2026
© The Author(s) 2026
DOI: 10.1177/njb.261484991
njb.spectrumjps.com

M. Mallikarjun[1]

Abstract

The consumption-based capital asset pricing model (CCAPM) is considered to be one of the ingenuous and most instinctive of all asset-pricing models. Studies by Rubinstein (1976), Breeden and Litzenberger (1978), and Breeden (1979) demonstrate that equilibrium expected excess returns are proportional to their 'consumption betas'. CCAPM is an extension of the first-order condition for a utility-maximizing individual's intertemporal consumption and investment choice problem. This contrasts with the market-oriented capital asset pricing model based on a single-period economy by Sharpe (1964, *The Journal of Finance*, 19, 3, 425–442) and Lintner (1965, *Review of Economics and Statistics*, 47, 1, 13–37). In this study, two models of CCAPM are tested. The first one replaces the market premium with the growth rate of consumption. The second variant is the canonical consumption-based model proposed by Hansen and Singleton (1982, *Econometrica*, 50, 5, 269–286). The canonical model imposes the power utility Euler equation under lognormality. By transitioning from the unconstrained linear model to the canonical log-linearized CCAPM, we change the fundamental question we are asking the data. The simple CCAPM measured immediate wallet shocks—how raw, discrete changes in spending correlated with asset returns. The canonical CCAPM measures intertemporal human psychology—how households smooth their proportional consumption over time. This article attempts to provide an empirical comparison across these two models using Consumer Pyramids Household Survey data from the Centre for Monitoring

[1]Institute of Management, Nirma University, Ahmedabad, Gujarat, India

Corresponding author:
M. Mallikarjun, Institute of Management, Nirma University, Ahmedabad, Gujarat 382481, India.
E-mail: mmallikarjun@nirmauni.ac.in

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed.

Indian Economy, granular unit-level data. The data collected for the study were monthly, ranging from January 2014 to August 2023. Average consumption expenditure per household across 24 major states and union territories (rural, urban and combined) was considered.

Keywords

CAPM, CCAPM, Canonical Consumption based Model, Consumption Expenditure

Introduction

Indian capital market has grown and developed phenomenally over the last three decades. Its evolution is a powerful narrative of economic transformation, from a modest beginning with the setting up of Bombay Stock Exchange (BSE) in 1875 to becoming the world's fifth-largest stock market, crossing the threshold of $5 trillion in market capitalization in 2024. The journey in rupee terms has been more dramatic, from ₹10 lakh crore in September 2003, the market cap surged 40 times to ₹400 lakh crore in April 2024.

The relationship between the economy and the capital market is not one-way; it is two-way and multidimensional. Research studies have established a strong, significant (statistically) association between stock and other asset prices and macroeconomic variables, such as gross domestic product (GDP), inflation, interest rates, exchange rate, foreign direct investment (FDI) and consumption expenditure.

Domestic demand continues to be the main driver of India's economic growth. The driver for this demand happens to be consumption, supported by a positive macroeconomic environment, characterized by low and stable inflation and employment conditions. Both rural and urban consumption expenditure have been quite stable over the years. India's private final consumption expenditure (PFCE) has been consistently accounting for more than half of its GDP. The share of PFCE in GDP rose to 61.5% in FY26, the highest level since FY12. An important aspect of India's consumption story is the steady rise of rural spending, which is providing the impetus to domestic demand. Monthly per capita expenditure (MPCE) in rural India has nearly tripled, jumping from ₹1,429 in 2012 to ₹4,122 in 2024. This rise is also narrowing the gap between urban and rural India.

Indian households, on one hand, are spending more as well as differently, which has brought a structural shift in their consumption basket. The share of expenditure on food has declined across both rural and urban India, falling from 52.9% (2011–2012) to 47% (2023–2024) in rural areas and from 42.6% to 39.7% in urban areas. This has been followed by an increase in the relative share of non-food expenditure, rising from 47.1% to 53.0% in rural areas and from 57.4% to 60.3% in urban areas.

This shift has been witnessed due to increased spending on durable goods and services, especially in rural India, where it has increased by more than 200% per person.

India's capital market is interlinked with its real economy and its growth. This relationship is driven by a critical variable: consumption expenditure. The

allocation of consumption over time also involves a saving decision, that is, a one way (the other being the return on assets) through which wealth can be increased or depleted. The intertemporal consumption framework is developed by examining the individual's choice decision regarding consumption (*Ct*) in the present period versus consumption (*Ct*+1) in the future time period. It is assumed that the individual is 'bestowed' with a given quantity of goods in each of the two periods and, to the extent that *Ct* and *Ct*+1 differ from the amount held in *t* and *t* + 1, the individual would be saving or borrowing in the present. It is assumed that the given amount held takes the form of wealth (*Wt*) and this is available at the start of the present period (assuming the wealth was accumulated in the past). The difference between wealth and present consumption, *Wt* – *Ct*, becomes saving (if positive) or borrowing (if negative). In either situation, it can be seen that wealth is transferred between *t* and *t* + 1 at a given rate of interest, *rt*+1.

The capital asset pricing model (CAPM), originally developed by Sharpe–Lintner–Mossin, establishes a general equilibrium relationship in the capital markets. It relates the expected rate of return for any security or portfolio with the relevant risk measure under a set of assumptions. Following the introduction of the CAPM, numerous extensions were proposed. They all boil down to relaxing one or more of the assumptions and result in models that bear a more or less close resemblance to the CAPM according to the changes in the assumptions. One of the most important classes of modifications to the CAPM involves modifying the underlying mean-variance (single-period) structure to allow for an intertemporal decision-making process. The outcome of these models has been jointly labelled as either the intertemporal CAPM (ICAPM) or the consumption-based CAPM (CCAPM) models. These models provide a framework for making intertemporal arrangements by investors, who are now assumed to have the opportunity to revise their present portfolio decisions and to consume later a part of their wealth as per their preferences.

Understanding Asset Pricing Through Macroeconomic Framework

Traditional risk models, such as the CAPM, measure a security's riskiness by looking at how its returns move in relation to the broader market. However, this framework offers little insight into the underlying forces that actually make the market volatile in the first place. Macroeconomic theory helps us understand this gap. It provides us with insights into identifying the relevant connecting variables, such as national income, corporate earnings, interest rate policy, and government spending, which help researchers identify the sources of systemic uncertainty and trace the pathways through which they impact returns.

Within the world of stochastic macroeconomic modelling, the CCAPM has emerged as a distinct model, where it focuses on the behavior of asset prices and returns in the financial decisions of households with regard to how much to spend, how much to save, and how to allocate wealth across different assets.

A large number of research studies have examined the comparative performance of CCAPM and other market-based models. One of the early works by Working (1960) analyzed quarterly asset returns and their covariance in the spot consumption rate. The study observed that the variance in consumption measured across intervals was approximately two-thirds of that observed at the spot rate. Tiao (1972) generalized these results for empirical validation of CCAPM later.

Grossman et al. (1987) used maximum likelihood estimation to correct distortions in the measurement of consumption over time rather than at a precise moment. They validated the fact that the CCAPM estimates the asset prices based on shifts in total consumption between two defined points. Marsh (1980), while proposing an alternate method, suggested a latent variable framework to estimate the model's parameters. His results validated the notion that asset returns and individual consumption trajectories follow continuous stochastic processes and that, over discrete periods, their joint distribution approximates normality. Independently, Breeden's (1979) study demonstrated that betas calculated relative to a portfolio with the highest possible correlation to aggregate consumption growth can serve as a valid substitute for betas computed directly against aggregate consumption figures.

One major problem in testing the CCAPM is the difficulty of obtaining reliable consumption data across extended time periods. Researchers use expenditure data on non-durable goods and services as a proxy, following the approach advocated by Hall (1978). The major measurement issues identified have been: the gap between what people spend and what they actually consume; the use of averaged consumption figures instead of instantaneous readings; the infrequency of consumption reporting compared to the frequency of asset return data; and ordinary sampling error arising from the fact that only a fraction of real-world consumption activity is ever captured in official statistics.

Pricing Risk in Financial Markets

The CCAPM is an outcome of multiperiod consumption and portfolio selection decisions. In the CCAPM, the rate of growth of consumption plays a role similar to the rate of return on the market portfolio in the static CAPM. The major distinction between CAPM and CCAPM is what each treats as the central driver of risk.

The basic construct of the CCAPM is straightforward: both aggregate consumption and asset returns are assumed to trace an optimal trajectory that, over time, approximates a normal distribution.

The CAPM operates entirely within market dynamics. Developed by Sharpe in 1964 and Lintner in 1965, it introduced the beta coefficient as its primary measure of risk—a single number that expresses how much systematic risk a given security carries relative to the market as a whole. He further developed this framework to the statistical relationship between a security's expected return and the covariance of that return with the market. When covariance = 0, price accurately reflects underlying value—a stable, equilibrium state. Negative covariance causes prices

to fall short of fundamental value, while positive covariance inflates them beyond it. These departures from fair value generate speculative activity that nudges prices back towards equilibrium: undervalued assets attract buyers, pushing prices up, while overvalued ones face selling pressure that brings them down.

In essence, the two models share the same destination—a rational, equilibrium-based explanation of how assets are priced—but arrive there by entirely different routes. The CAPM traces risk through market behavior; the CCAPM grounds it in the consumption choices of the households that make up the broader economy.

Methodology

The first model specified below postulates a consumption factor within the conventional static CAPM by replacing the market premium with consumption growth.

$$Y = a + bR_{t+1}$$

where Y is the asset return and R is the consumption return (proxy for the growth rate of consumption). While b is the measure of sensitivity of the asset's return to the growth rate in real aggregate average consumption, they are unconstrained estimates with regard to CCAPM.

The second variant is the canonical consumption-based model with time-separable power utility based on the classic form studied by Hansen and Singleton (1982). In the suggested model, the risk-return relationship is proposed as:

$$Y_{t+1} = \frac{\beta\left(Ct+1\right)^{-\eta}}{ct}$$

where Y symbolizes the excess returns, C is consumption, β is the market premium, and η is the consumption utility or premium. By taking logarithms, the canonical consumption-based model with power utility can be specified as:

$$y_{t+1} = \ln(\beta) - \eta \ln\left(c_{t+1} - c_t\right)$$

where c represents consumption (per capita). The benefit of this model is that it is able to measure the dynamic intertemporal structure of the original CCAPM model in a simple manner while providing a general framework for evaluating CCAPM in diverse market situations.

Data

Data for this study were taken from the Consumer Pyramids Household Survey (CPHS) data of the Centre for Monitoring Indian Economy (CMIE). The CPHSs of the CMIE are repetitive large-scale longitudinal surveys of people. These surveys have been covering the same sample of houses (covering 160,000 plus households) thrice a year, every year since 2014. CPHS captures data to create a

monthly time-series of two sets of indicators. These are indicators that help estimate the total income of a household and estimate the distribution of expenses. The estimate of expenses has been used as a measure for consumption expenditure. In this study, average total expenditure, expenditure on food, electricity, transport, and health were considered from each household across 24 major states and union territories (UTs) with rural and urban categorization. Average consumption expenditure per household was calculated across rural, urban, and combined levels for these 24 states and UTs and at an all-India level. The corresponding market indices, S&P BSE Sensex, Fast Moving Consumer Goods, Power, Auto, and Healthcare, were considered accordingly. A monthly time series was constructed from January 2014 to August 2023. Nominal values were converted to real values using respective state-wise consumer price index (CPI) data for the given time period.

This data was collected across 9 broad categories: food (32 items); intoxicants, restaurants, and entertainment (9 items); clothing and cosmetics (5 items); toiletries and home care products (13 items); bills, rents, EMIs, and appliances (11 items); fuel, transport, and communication (14 items); education (10 items); health (8 items); and miscellaneous expenses (15 items). Rapid minor has been used for these calculations.

Analysis

The 2014–2023 decade was one of the most dynamic periods in Indian financial history. It encompassed the initial 2014 structural bull run, the disruptions of demonetization and GST, the 2018 NBFC credit crisis, the unprecedented 2020 COVID-19 crash, and the massive liquidity-driven recovery that culminated in all-time highs by late 2023.

Evaluating the BSE Sensex, S&P BSE FMCG, BSE Power, BSE Auto, and BSE Healthcare indices over this specific 10-year period reveals vastly different structural behaviors. While the BSE Sensex represents the diversified market baseline, the sectoral indices showcase how investors were compensated (or penalized) for taking on concentrated economic risks (Table 1).

The Sensex acts as the baseline for the equity risk premium. Because it is highly diversified, its standard deviation (volatility) remained balanced. Whether the economy was booming in 2017 or locked down in 2020, the fast-moving consumer goods (FMCG) index exhibited the lowest standard deviation of the group. Healthcare acted as the ultimate uncorrelated hedge, as it provided protection exactly when the rest of the economy failed. Automobiles are a highly discretionary, interest-rate-sensitive sector. The 10-year chart is a rollercoaster: a massive boom from 2014–2017, followed by a severe multi-year bear market driven by the IL&FS credit crunch, the BS-VI emission transition, and pandemic supply-chain shock. For the first half of the decade (2014–2020), the Power sector was a wealth destroyer, plagued by non-performing assets (NPAs), stranded thermal capacities, and debt. Its volatility was immense.

Table 1. Descriptive Statistics for Monthly Returns.

Year	Ln Returns	Bse Sensex	SP FMCG	SP Power	SP Auto	SP Health	Simple Returns	Bse Sensex	SP FMCG	SP Power	SP Auto	SP Health
2014	AVG	0.0218	0.0140	0.0173	0.0349	0.0323	AVG	0.0226	0.0146	0.0223	0.0366	0.0343
	SD	0.0353	0.0347	0.1000	0.0478	0.0553	SD	0.0358	0.0354	0.1075	0.0492	0.0564
2015	AVG	–0.0043	0.0011	–0.0056	–0.0005	0.0117	AVG	–0.0037	0.0017	–0.0045	0.0004	0.0131
	SD	0.0347	0.0340	0.0484	0.0433	0.0544	SD	0.0345	0.0341	0.0471	0.0435	0.0540
2016	AVG	0.0016	0.0027	0.0013	0.0075	–0.0115	AVG	0.0026	0.0036	0.0034	0.0095	–0.0108
	SD	0.0468	0.0441	0.0679	0.0650	0.0376	SD	0.0471	0.0443	0.0668	0.0654	0.0371
2017	AVG	0.0205	0.0228	0.0151	0.0232	0.0004	AVG	0.0211	0.0236	0.0159	0.0241	0.0015
	SD	0.0273	0.0339	0.0394	0.0369	0.0502	SD	0.0278	0.0343	0.0401	0.0375	0.0494
2018	AVG	0.0048	0.0084	–0.0146	–0.0208	–0.0051	AVG	0.0058	0.0098	–0.0130	–0.0191	–0.0033
	SD	0.0470	0.0537	0.0568	0.0575	0.0625	SD	0.0471	0.0538	0.0562	0.0559	0.0635
2019	AVG	0.0112	–0.0030	–0.0031	–0.0100	–0.0030	AVG	0.0117	–0.0026	–0.0020	–0.0076	–0.0024
	SD	0.0305	0.0318	0.0494	0.0723	0.0363	SD	0.0310	0.0321	0.0501	0.0712	0.0361
2020	AVG	0.0122	0.0084	0.0057	0.0099	0.0399	AVG	0.0172	0.0093	0.0098	0.0198	0.0442
	SD	0.1053	0.0455	0.0952	0.1503	0.0840	SD	0.0999	0.0457	0.0921	0.1402	0.0901
2021	AVG	0.0166	0.0074	0.0436	0.0147	0.0158	AVG	0.0174	0.0083	0.0471	0.0158	0.0166
	SD	0.0385	0.0435	0.0716	0.0477	0.0395	SD	0.0395	0.0441	0.0765	0.0482	0.0402
2022	AVG	0.0036	0.0128	0.0192	0.0128	–0.0108	AVG	0.0045	0.0138	0.0238	0.0140	–0.0098
	SD	0.0439	0.0432	0.0979	0.0493	0.0446	SD	0.0445	0.0449	0.1007	0.0495	0.0439
2023	AVG	0.0143	0.0201	0.0236	0.0315	0.0262	AVG	0.0149	0.0207	0.0282	0.0331	0.0277
	SD	0.0324	0.0272	0.0961	0.0468	0.0482	SD	0.0330	0.0278	0.0959	0.0480	0.0496

Table 2. Simple and Log Yield and Risk Across Indices.

Ln Returns	Bse Sensex	SP FMCG	SP Power	SP Auto	SP Health	Simple Returns	Bse Sensex	SP FMCG	SP Power	SP Auto	SP Health
Annual % yield	12.2745	11.2873	10.2076	11.6316	11.2347		12.9920	11.6730	12.9978	13.8273	12.4450
Risk	16.5454	13.5560	25.2664	23.7651	18.5223		16.2659	13.7164	25.7027	23.0660	18.9745

When annualized returns and their corresponding annualized volatility (Table 2) are looked into, we observe that the BSE Sensex outperformed the other indices, returning 12.27% annualized compared to other indices. The Power and Auto sectors were highly volatile. Power exhibited the highest risk (25.62% volatility) but yielded the lowest annualized return (10.2%). This suggests that investing in the Power index during this timeframe was highly inefficient. The FMCG sector had the lowest volatility (13.56%), making it less risky than the broader Sensex while still delivering an 11.29% return. The same is witnessed when we calculate the Sharpe ratio. FMCG leads with a Sharpe ratio of 0.83. While it did not generate the absolute highest returns, Health and Sensex have Sharpe ratios of 0.60 and 0.74. Auto has a value of 0.48 and Power has the lowest Sharpe ratio of 0.40.

An analysis of average monthly per capita consumption expenditure (MPCE) (Annexure 1) shows significant regional and sectoral variance in growth across Indian states. When the average expenditure growth, along with the corresponding standard deviations, is analyzed, wide differences between rural (R) and urban (U) sectors, as well as essential versus discretionary spending categories, are observed.

Mean growth rates for food were found to be consistently low and tightly bounded across both rural and urban sectors, highlighting its role as a basic necessity with limited consumption scalability.

In the case of trans (transport) and health sectors, huge volatility and higher average spikes were observed. Spending in these categories is relatively more elastic, discretionary, or event-driven, which varies significantly depending on state-level infrastructure and levels of urbanization.

The data also brought out key structural disparities when comparing the rural (R) and urban (U) segments across states.

Rural sectors exhibited stable but lower average expenditure growth in non-food items, showing a heavy household reliance on baseline subsistence.

Significantly higher standard deviations and average expenditure were observed in the case of urban centers in categories such as transport and healthcare. This trend emphasizes greater economic financialization, diverse market dependencies, and a higher vulnerability to price shocks within urban spaces.

An analysis of the simple CCAPM estimates (Annexure 2) provides insights into the relationship between asset returns and regional consumption growth.

Combined TotExp has a negative slope (–0.0498). This is a contradiction to the basic CCAPM prediction, where asset returns should be positively related to consumption growth (positive consumption beta). When we analyze other slope

coefficients, we observed that food and electricity had small positive slopes (0.037, 0.050). Transport slope was very close to zero (0.012) and health slope was strongly negative (–0.135), which can be interpreted as higher health consumption growth is associated with *lower* asset returns.

Across all sectors (combined, rural, urban) and most states, the slope for health was negative. India aggregate: –0.135 (combined), –0.119 (rural), –0.152 (urban). Health expenditure often rises during economic downturns (illness, stress) when asset returns are low, which would have a negative correlation. Alternatively, health spending may be a 'necessity' that crowds out investment in risky assets.

The rural slope was positive (+0.043) and the urban slope was found to be (–0.002). Rural consumption growth is more aligned with asset returns—perhaps because rural incomes are tied to agricultural cycles that also drive corporate earnings.

In the case of food, the rural slope (+0.315) has an order of magnitude larger than the urban slope (+0.042). In rural areas, food consumption is a dominant part of the basket and highly sensitive to income shocks, making it a strong pricing factor.

In the case of health, the urban negative slope is more pronounced than the rural slope, suggesting that urban health spending is even more counter-cyclical or measured with more error.

When Total Expenditure versus Disaggregated Categories was compared, the negative or near-zero slope for TotExp (for combined and urban) can be interpreted to mean that aggregate consumption growth is a poor pricing kernel in India. In the case of the analysis at the disaggregated categories, food and electricity sometimes yielded positive slopes, indicating that specific components of consumption may better capture marginal utility growth.

For states such as Andhra Pradesh, Bihar, Chandigarh, Maharashtra, and Uttar Pradesh, we observed consistently positive slopes for food and TotExp (especially rural), implying stronger CCAPM validation there.

In the case of states such as Karnataka, Jammu and Kashmir, Rajasthan, and Tamil Nadu, we observed negative TotExp slopes across sectors.

Standard theory predicts $b > 0 b > 0$ for assets that are positively correlated with consumption growth (most risky assets). The negative b for TotExp at the India level negates the basic CCAPM with aggregate consumption.

Even in the case of disaggregated categories such as food give positive but often unstable estimates across states. Only rural food comes close to a plausible risk aversion interpretation ($b = 0.3$ would imply a coefficient of relative risk aversion of around 3–5, which is reasonable).

When we transition from the unconstrained linear model to the canonical log-linearized CCAPM, we change the fundamental question we are asking the data.

The simple CCAPM measured how raw, discrete changes in spending correlated with asset returns. The canonical CCAPM measures how households smooth their proportional consumption over time, accounting for the coefficient of relative risk aversion.

Canonical CCAPM analysis covers 24 Indian states (including UTs) for combined, rural, and urban sectors, across five consumption categories (Annexure 3).

All coefficients except those for Chandigarh (CH) are statistically significant at conventional levels (presumably 5% or 1%). This high degree of significance is justifiable because typical CCAPM regressions often suffer from large standard errors due to weak correlation between consumption growth and asset returns (Cochrane, 2005). This significance can be interpreted as either low measurement error, high consumption volatility, or a well-specified model for Indian data.

Chandigarh's insignificance may be due to its small size, unique consumption patterns as a UT, or data quality issues.

All point estimates were found to be negative, satisfying the theoretical sign restriction. The implied risk aversion coefficients were found to be around 1.0, which is at the lower bound of the possible range but consistent with the habit formation literature (Campbell & Cochrane, 1999), where effective risk aversion can be time-varying but average near 1.

In the case of health consumption, we observed the highest risk aversion ($\eta = 1.14$). This can be explained as health expenditures are often inelastic and rise during economic downturns (due to illness, stress, or public health crises), creating a negative covariance with asset returns. Assets that perform poorly when health spending spikes require a higher risk premium, manifesting as a larger value.

Electricity showed relatively lower risk aversion in rural areas ($\eta = 0.529$) compared to urban ($\eta = 0.868$) and combined ($\eta = 0.926$). This rural–urban gap is economically and statistically significant. A likely explanation is that rural electricity consumption is subsidized, irregular, or driven by non-economic factors (e.g., government rationing), decoupling it from the marginal utility of consumption. Urban electricity usage is more closely linked with income changes and discretionary spending.

For 23 out of 24 states (excluding Andhra Pradesh combined), all categories except electricity in a few states exhibited negative slope coefficients. This consistency with regard to the canonical CCAPM is remarkable and suggests that consumption-based pricing is a robust cross-state phenomenon in India, with an exception in the case of Andhra Pradesh combined.

The positive slope coefficients for combined Andhra Pradesh in cases of TotExp, food, and electricity violate the fundamental risk aversion restriction. Since the rural and urban subsamples separately conform to theory, the anomaly likely arises from aggregation bias: when pooling rural and urban consumption data, the constructed consumption growth series may be contaminated by composition effects (e.g., changes in rural–urban population shares, differential price indices, or measurement errors in aggregate consumption). This is a classic Simpson's paradox: the sign of the correlation reverses when disaggregating. Researchers must therefore exercise caution when using aggregate state-level consumption data; sectoral disaggregation is essential.

Total consumption and food consumption have similar marginal utility dynamics. This is plausible because food constitutes a large fraction of the consumption basket in India (especially in rural areas). The CCAPM is robust to the choice of consumption aggregate.

The transport coefficient was found to be consistent across states and sectors, with very little variation.

In the case of electricity, the rural–urban difference in the coefficient was observed across states.

With the exception of Chandigarh (insignificant) and the combined Andhra Pradesh aggregation anomaly (positive slopes), the canonical CCAPM with log consumption growth is strongly supported across 23 Indian states and both rural and urban sectors. The estimated relative risk-aversion coefficients are remarkably close to 1 for total expenditure, food, and transport, slightly higher for health (–1.14), and lower for electricity in rural areas (–0.53). These results provide credible, significant evidence that consumption risk is priced in Indian asset markets, aligning with the theoretical predictions of power utility. The rural–urban divergence for electricity calls for separate pricing kernels or for inclusion of sector-specific consumption measures in empirical asset pricing.

Conclusion

The canonical model's coefficients were found to be more stable, interpretable, and significant—a strong indicator that the log specification is the correct functional form for testing the CCAPM for the dataset used in this study.

The results of the canonical model observed near-complete significance of the coefficients, suggesting that log consumption growth is a much stronger predictor of asset returns than simple growth rates. This was expected because log differences are able to better approximate the continuous-time diffusion processes assumed in theory and reduce heteroskedasticity.

The observed results of the canonical CCAPM were theory-consistent and statistically significant across nearly all Indian states and sectors, establishing that consumption risk is priced with a risk aversion coefficient of approximately 1. The simple CCAPM suffers from functional form misspecification and yielded misleading slope coefficients for important consumption categories such as food. For the dataset used, the log-specified CCAPM was more appropriate in terms of its results and interpretation as compared to simple consumption-based asset-pricing tests.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

M. Mallikarjun https://orcid.org/0000-0002-1295-8481

References

Breeden, D. T. (1979). An intertemporal asset pricing model with stochastic consumption and investment opportunities. *Journal of Financial Economics*, *7*(3), 265–296.

Breeden, D. T., & Litzenberger, R. H. (1978). Prices of state contingent claims implicit in option prices. *Journal of Business*, *51*(4), 621–651.

Campbell, J. Y., & Cochrane, J. H. (1999). By force of habit: A consumption based explanation of aggregate stock market behavior. *Journal of Political Economy*, *107*(2), 205–251.

Cochrane, J. H. (2005). *Asset Pricing. Princeton*, NJ: Princeton University Press.

Grossman, S. J., Melino, A., & Shiller, R. J. (1987). Estimating the continuous-time consumption-based asset-pricing model. *Journal of Business and Economic Statistics*, *5*(3), 315–327.

Hall, R. E. (1978). Stochastic implications of the life cycle-permanent income hypothesis: Theory and evidence. *Journal of Political Economy*, *86*(6), 971–987.

Hansen, L. P., & Singleton, K. J. (1982). Generalized instrumental variables estimation of nonlinear rational expectations models. *Econometrica*, *50*(5), 269–286.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics*, *47*(1), 13–37.

Marsh, T. A. (1980). *Intertemporal capital asset pricing and the term structure of interest rates* [Unpublished PhD dissertation, Graduate School of Business, University of Chicago].

Rubinstein, M. (1976). The valuation of uncertain income streams and the pricing of options. *Bell Journal of Economics and Management Science*, *7*(2), 407–425.

Sharpe, W. F. (1964). Capital asset prices: A theory of asset pricing under conditions of risk. *The Journal of Finance*, *19*(3), 425–442.

Tiao, G. C. (1972). Asymptotic behaviour of temporal aggregates of time series. *Biometrika*, *59*(3), 525–531.

Working, H. (1960). Note on the correlation of first differences of averages in a random chain. *Econometrica: Journal of the Econometric Society*, *28*(4), 916–918.

Annexure 1: Average Monthly Consumption Expenditure Growth

State	CTOTEXP	CFOOD	CELECTRI	CTRANS	CHEALTH	RTOTEXP	RFOOD	RELECTRI	RTRANS	RHEALTH	UTOTEXP	UFOOD	UELECTRI	UTRANS	UHEALTH
AP	0.006343	0.000953	–0.00079	0.391498	0.013239	0.006908	0.001609	0.000381	0.364297	0.015136	0.006079	0.00056	–0.00126	0.401986	0.013923
AS	0.002201	0.000724	0.001402	0.08717	0.018139	0.005115	0.001902	0.006324	0.080673	0.044445	0.001897	0.00044	0.001312	0.111598	0.018883
BH	0.001883	1.17E–05	0.000887	0.146738	0.016153	0.002646	0.00075	0.00363	0.097123	0.028789	0.002366	0.000238	1.25E–05	0.192153	0.015636
CD	0.006981	–0.00011	0.184267	0.700294	0.033907	0.006464	–7.00E–05	0.184222	0.698981	0.03321	0.006562	0.002653	–0.00257	0.161947	0.012035
CH	0.006562	0.002653	–0.00257	0.161947	0.012035	0.007238	0.004072	0.000518	2.190329	0.019804	0.006305	0.001924	–0.00319	0.141657	0.014776
DL	0.00501	0.000943	0.047943	1.036409	0.021039	0.003123	0.000421	0.112008	0.632846	0.022737	0.00533	0.001221	0.040648	1.78533	0.028028
Goa	–0.00847	–0.01119	–0.00529	0.059829	–0.00261	–0.00755	–0.00942	–0.00054	0.133232	0.001635	–0.00812	–0.01157	–0.00698	0.072376	0.000365
GJ	0.002603	0.001151	0.010593	0.0305	0.016551	0.00227	0.001545	0.022355	0.026799	0.034773	0.002425	0.001112	0.012241	0.036352	0.01867
HR	0.002856	0.000398	0.012698	0.045063	0.017789	0.002585	–0.00088	0.042768	0.058396	0.021901	0.003099	0.00093	0.025155	0.046775	0.018809
HP	0.006038	–0.00013	0.023622	0.13956	0.022601	0.005008	–0.00205	0.055455	0.397818	0.034317	0.006317	–5.91E–05	0.028979	0.126429	0.03086
JK	0.020074	0.045428	0.003567	0.011729	0.014269	0.004607	0.002355	0.003556	0.042338	0.015983	0.044433	0.101732	0.008454	0.007016	0.062485
JH	0.002142	0.000607	0.001821	0.021101	0.016304	0.0016	0.000252	0.002932	0.11754	0.021222	0.002144	0.000544	0.001182	0.018087	0.026208
KA	0.003783	–0.00053	–0.00936	0.039614	0.017923	0.00332	0.000674	–0.00393	0.070307	0.017834	0.003882	–0.00078	–0.01108	0.040517	0.019382
KE	0.002068	–0.00057	0.032732	0.106016	0.002696	0.002386	–0.00071	0.044352	0.092083	0.004129	0.002516	–0.00033	0.041609	0.114833	0.003298
MP	0.005531	0.001397	–0.00437	0.106827	0.014348	0.007285	0.0029	–0.00275	0.099756	0.014891	0.004859	0.000738	–0.00536	0.121607	0.016732
MH	0.000306	–0.00242	0.000888	0.040146	0.007994	0.001714	–0.00161	0.00315	0.04052	0.008982	0.000276	–0.00234	0.001519	0.042793	0.00951
OD	0.077568	0.203728	0.003984	0.018525	0.012568	0.007711	0.003593	0.009882	0.017676	0.023033	0.109604	0.307154	0.003023	0.02395	0.013062
PB	0.004351	0.000107	0.019987	0.087152	0.015173	0.00678	0.001959	0.039679	3.124995	0.0288	0.003507	–0.00049	0.047632	0.10233	0.018332
RJ	0.004423	0.001378	0.003596	0.099958	0.01424	0.004588	0.000953	0.009112	0.044121	0.016626	0.004027	0.001234	0.004052	0.148882	0.015394

(Annexure 1 continued)

(Annexure 1 continued)

State	CTOTEXP	CFOOD	CELECTRI	CTRANS	CHEALTH	RTOTEXP	RFOOD	RELECTRI	RTRANS	RHEALTH	UTOTEXP	UFOOD	UELECTRI	UTRANS	UHEALTH
TN	0.002376	–0.00028	0.008301	0.283108	0.016104	0.004535	0.001463	0.024546	1.69267	0.021946	0.001858	–0.00074	0.009869	0.334409	0.015319
TL	0.007601	0.015311	–0.00047	0.365435	0.006281	0.00439	0.001772	0.002596	1.690959	0.012825	0.009072	0.01966	–0.00102	0.305544	0.008099
UP	0.000244	–0.00243	0.000715	0.033145	0.011998	0.001323	–0.00148	0.004286	0.058267	0.017028	–0.00019	–0.00259	0.000305	0.029121	0.012052
UK	0.008039	–0.00052	0.014716	2.07452	0.029748	0.008135	–0.00024	0.098777	0.493202	0.064874	0.007938	–0.00077	0.020417	2.559095	0.027544
WB	0.004857	0.000687	0.001595	0.073105	0.011106	0.005267	0.000873	0.013552	0.118409	0.015196	0.005142	0.000683	0.001734	0.064742	0.011928
India	0.002951	0.003041	–0.00161	0.039677	0.007745	0.002656	0.000124	0.001087	0.036407	0.007912	0.003398	0.004811	–0.00195	0.041595	0.008062
State	LNTOTEXP	LNFOOD	LNELECTRI	LNTRANS	LNHEALTH	LNRTOTEXP	LNRFOOD	LNRELECTRI	LNRTRANS	LNRHEALTH	LNUTOTEXP	LNUFOOD	LNUELECTRI	LNUTRANS	LNUHEALTH
AP	0.00344	0.000625	–0.00142	0.005534	0.009077	0.003832	0.00116	–0.00073	0.004054	0.008266	0.002873	0.00018	–0.00202	0.006538	0.009448
AS	–0.00053	–0.00117	–0.0026	–0.00662	0.000415	0.000804	–0.00118	0.003161	–0.00301	0.006633	–0.00113	–0.00152	–0.00483	–0.00799	–0.00173
BH	0.000757	–0.00033	0.000349	0.000584	0.008022	0.001563	0.000311	0.00288	0.001392	0.008452	0.000837	–0.00015	–0.00088	0.001252	0.00905
CD	0.00159	–0.0012	0.001511	0.025879	0.0117	0.001012	–0.00116	0.001401	0.025302	0.011122	0.002677	0.001626	–0.00409	0.000352	0.001507
CH	0.002677	0.001626	–0.00409	0.000352	0.001507	0.003746	0.003069	–0.00231	0.000507	0.000135	0.001785	0.00062	–0.00461	0.000104	0.002483
DL	0.001164	0.000156	0.003842	–0.00869	0.00824	–0.0005	–0.00086	0.003063	–0.00819	–0.00023	0.000993	0.000465	0.003614	–0.00858	0.009717
Goa	–0.00295	–0.00386	–0.00154	–0.00534	–0.00102	–0.00296	–0.00333	–0.00064	–0.00476	0.000127	–0.00357	–0.00435	–0.0022	–0.00619	–0.00207
GJ	–0.0006	0.000452	–0.00367	0.003309	0.005312	–0.00043	0.000866	–0.00142	0.002722	0.003237	–0.00157	0.00016	–0.00426	0.00359	0.006682
HR	0.001158	–0.00015	–0.00279	–0.00105	0.012404	0.000799	–0.00192	–0.00198	–0.00741	0.014149	0.001012	0.000289	–0.00155	0.000673	0.012524
HP	0.002337	–0.00109	–0.00289	0.001599	0.011475	0.000396	–0.00339	–0.00282	0.008214	0.009335	0.001682	–0.00124	–0.00678	0.001864	0.011896
JK	–0.00021	0.000942	–0.00065	–0.00632	0.00577	0.001771	0.001185	0.000565	–0.00648	0.006687	–0.00104	0.000788	–0.00074	–0.00571	0.006012
JH	0.000181	–0.00035	–0.00011	–0.0104	0.005513	–0.00186	–0.00138	–0.00647	–0.01447	0.003057	–0.00015	–0.00054	–0.00077	–0.00951	0.005069
KA	0.001576	–0.00093	–0.01319	–0.00162	0.003872	0.001452	2.27E–05	–0.00984	–5.7E–05	0.000602	0.00123	–0.00127	–0.01462	–0.00201	0.004613

(Annexure 1 continued)

(Annexure 1 continued)

State	LNTOTEXP	LNFOOD	LNELECTRI	LNTRANS	LNHEALTH	LNRTOTEXP	LNRFOOD	LNRELECTRI	LNRTRANS	LNRHEALTH	LNUTOTEXP	LNUFOOD	LNUELECTRI	LNUTRANS	LNUHEALTH
KE	–0.00135	–0.00199	0.000332	–0.00817	–0.00096	–0.00172	–0.00235	–0.00276	–0.00899	–0.00113	–0.00093	–0.0018	0.001739	–0.00755	–0.00072
MP	0.002623	0.000323	–0.00572	0.007132	0.007415	0.004571	0.001845	–0.00454	0.004956	0.009131	0.001456	–0.00055	–0.00687	0.00788	0.007118
MH	–0.00202	–0.00284	–0.00238	–0.00804	0.002928	–0.00039	–0.00204	–0.00028	–0.00608	–2.7E–05	–0.0023	–0.00281	–0.00209	–0.00792	0.004256
OD	0.003951	0.001177	–0.00222	–0.00529	0.007291	0.006293	0.002613	0.003546	–0.00509	0.009043	0.002963	0.000587	–0.00382	–0.00497	0.006684
PB	0.001854	–0.00046	–0.00555	0.021455	0.006652	0.002892	0.000558	–0.00777	0.021714	0.009937	0.000719	–0.00108	–0.00391	0.021862	0.005987
RJ	0.001841	0.000536	–0.00402	0.000213	0.006212	0.002308	–3.5E–05	–0.00244	–0.00482	0.005781	0.001047	0.000285	–0.00597	0.001447	0.00641
TN	5.37E–05	–0.0007	–0.00982	0.000215	0.006898	0.001835	0.000765	–0.00558	0.000235	0.009044	–0.00066	–0.0012	–0.01105	0.000309	0.006147
TL	0.001141	0.000973	–0.00144	0.001964	–0.00085	0.000761	0.001076	–1.2E–06	–0.00172	–0.00336	0.000904	0.000916	–0.00215	0.003293	5.95E–05
UP	–0.00089	–0.00276	–0.00128	–0.00049	0.008183	0.000262	–0.00242	0.002874	0.001508	0.00908	–0.00161	–0.00295	–0.00227	–0.00082	0.007778
UK	0.005363	–0.00112	0.000234	0.00351	0.017661	0.004441	–0.00104	–0.00083	0.028198	0.020161	0.004588	–0.00151	–0.00107	0.007568	0.017058
WB	0.001662	–3.2E–05	–0.00207	–0.0022	0.008116	0.002116	0.000041	–0.00032	–0.00073	0.008674	0.001739	–8.7E–05	–0.00218	–0.00242	0.008425
India	0.000908	–0.00069	–0.00281	–0.00106	0.005442	0.001639	–0.00013	–0.00056	–0.00163	0.005385	0.000703	–0.00101	–0.00347	–0.0007	0.005562
	C: Combined		R: Rural		U: Urban										

Note: AP: Andhra Pradesh; AS: Assam; BH: Bihar; CD: Chhattisgarh; CH: Chandigarh; DL: Delhi; GJ: Gujarat; Goa: Goa; HP: Himachal Pradesh; HR: Haryana; JH: Jharkhand; JK: Jammu and Kashmir; KA: Karnataka; KE: Kerala; MH: Maharashtra; MP: Madhya Pradesh; OD: Odisha; PB: Punjab; RJ: Rajasthan; TL: Telangana; TN: Tamil Nadu; UK: Uttarakhand; UP: Uttar Pradesh; WB: West Bengal.

Annexure 2: Simple CCAPM Results

	TOTEXP	TOTEXP	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	HEALTH	HEALTH
Combined	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
AP	0.0065	0.0138	0.0047	0.4085	0.0074	0.1217	0.0073	0.0011	0.0080	–0.1578
AS	0.0070	–0.0503	0.0057	0.0427	0.0050	–0.0550	0.0084	0.0017	0.0061	–0.0248
BH	0.0072	0.0435	0.0056	0.4745	0.0081	0.2136	0.0083	0.0043	0.0062	–0.0331
CD	0.0078	–0.0884	0.0052	0.1256	0.0088	–0.0035	0.0075	0.0009	0.0068	–0.0152
CH	0.0065	0.0997	0.0046	0.2597	0.0062	0.1081	0.0085	0.0003	0.0063	–0.0167
DL	0.0061	0.0289	0.0047	0.2452	0.0055	0.0159	0.0081	0.0008	0.0060	0.0159
Goa	0.0067	–0.0036**	0.0058	0.0338**	0.0096	0.0547	0.0077	0.0122	0.0062	–0.0200
GJ	0.0065	0.1009	0.0052	0.1899**	0.0062	–0.0194	0.0065	0.0385	0.0064	–0.0294
HR	0.0059	0.0413	0.0046	0.2049	0.0092	0.0118	0.0090	0.0019	0.0058	0.0003
HP	0.0069	–0.0760	0.0051	–0.0068	0.0101	–0.0096	0.0078	0.0066	0.0055	0.0062
JK	0.0067	–0.0169	0.0055	–0.0091**	0.0055	–0.1269	0.0094	0.0125	0.0072	–0.0911
JH	0.0063	–0.0321	0.0048	0.1646	0.0059	–0.1472	0.0082	0.0069	–0.0394	0.0090
KA	0.0071	–0.1489	0.0053	0.1254	0.0045	–0.0376	0.0088	–0.0014	0.0064	–0.0335
KE	0.0064	–0.0176	0.0050	0.0321	0.0062	–0.0185	0.0087	0.0033	0.0055	–0.1014**
MP	0.0067	0.0207	0.0054	0.0577	0.0069	0.1030	0.0073	0.0079	0.0075	–0.0839
MH	0.0060	0.0953	0.0056	0.3365	0.0068	0.1090	0.0076	0.0265	0.0064	–0.0685
OD	0.0064	0.0020	0.0048	0.0022	0.0068	0.0182	0.0090	–0.0041	0.0057	0.0197
PB	0.0065	–0.0568	0.0049	0.0872	0.0071	–0.0068	0.0077	0.0136	0.0052	0.0392
RJ	0.0065	–0.0805	0.0046	0.1175	0.0092	–0.0592	0.0085	0.0060	0.0063	–0.0278

(Annexure 2 continued)

(Annexure 2 continued)

	TOTEXP	TOTEXP	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	HEALTH	HEALTH
Combined	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
TN	0.0065	–0.0366	0.0051	0.0767	0.0067	–0.0441	0.0079	0.0034	0.0068	–0.0468
TL	0.0062	0.0095	0.0047	0.0153	0.0054	0.1475	0.0081	0.0011	0.0062	–0.1038
UP	0.0059	0.0383	0.0052	0.2481**	0.0066	0.2643	0.0080	0.0164	0.0061	–0.0805
UK	0.0063	0.0174	0.0052	0.2054	0.0075	–0.0061	0.0086	0.0003	0.0061	–0.0167
WB	0.0059	–0.0389	0.0043	0.1208	0.0056	0.0562	0.0090	0.0067	0.0056	0.0392**
India	0.0070	–0.0489	0.0051	0.0373	0.0071	0.0497	0.0078	0.0124	0.0070	–0.1352
	TOTEXP	TOTEXP	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Rural	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
AP	0.0060	0.0936	0.0045	0.5163	0.0073	0.3719	0.0068	0.0012	0.0071	–0.0863
AS	0.0073	–0.0253	0.0058	0.0505	0.0046	0.0661	0.0085	–0.0003	0.0067	–0.0209
BH	0.0071	0.1005	0.0058	0.3179	0.0085	0.0758	0.0081	0.0069	0.0057	–0.0023
CD	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH	0.0070	0.0943	0.0059	0.2098	0.0062	0.0004	0.0085	0.0053	0.0058	0.0019
DL	0.0072	0.1088	0.0056	0.1194	0.0085	0.0063	0.0078	0.0011	0.0064	–0.0058
Goa	0.0077	0.0158**	0.0064	0.0461	0.0064	0.1041	0.0078	0.0048	0.0067	–0.0295
GJ	0.0068	0.0961	0.0049	0.1957	0.0093	–0.0352	0.0077	0.0419	0.0047	0.0290
HR	0.0067	0.0271	0.0053	0.1087	0.0081	0.0092	0.0081	0.0038	0.0045	0.0252
HP	0.0075	–0.0188	0.0058	0.0156	0.0074	0.0212	0.0000	0.0000	0.0055	0.0254
JK	0.0064	0.0011	0.0054	–0.0672	0.0056	–0.0365	0.0073	0.0123	0.0063	–0.0895
JH	0.0070	–0.0098	0.0054	0.1842	0.0058	–0.0659	0.0081	0.0057	0.0058	0.0054

(Annexure 2 continued)

(Annexure 2 continued)

	TOTEXP	TOTEXP	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Rural	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
KA	0.0068	–0.0124	0.0049	0.3163	0.0066	0.0409	0.0084	0.0087	0.0061	–0.0173
KE	0.0067	0.0114	0.0056	0.0655	0.0064	–0.0007**	0.0075	0.0035	0.0062	–0.0254
MP	0.0070	–0.0249	0.0050	0.0912	0.0085	0.2053**	0.0080	0.0058	0.0068	–0.0715
MH	0.0068	0.0719	0.0056	0.2113	0.0062	0.1232	0.0078	0.0254	0.0061	–0.0520
OD	0.0063	0.0632	0.0044	0.2011	0.0070	0.0304	0.0079	0.0089	0.0062	–0.0088
PB	0.0074	–0.0506	0.0053	–0.0156	0.0076	0.0208	0.0080	0.0002	0.0050	0.0276
RJ	0.0072	–0.0670	0.0052	0.0691	0.0086	–0.0478	0.0085	0.0054	0.0063	–0.0348**
TN	0.0067	–0.0310	0.0049	0.0989	0.0062	–0.0160	0.0077	0.0004	0.0070	–0.0548
TL	0.0065	–0.0538	0.0043	0.2175	0.0068	0.1337	0.0077	0.0002	0.0050	–0.0408
UP	0.0067	0.1475	0.0055	0.1595	0.0068	0.1894	0.0082	0.0118	0.0062	–0.0287
UK	0.0061	0.0725	0.0049	0.0381	0.0066	0.0066	0.0000	0.0000	0.0060	0.0022
WB	0.0072	–0.0598	0.0053	0.0502**	0.0070	–0.0082	0.0075	0.0050	0.0052	0.0230
India	0.0068	0.0432	0.0052	0.3152	0.0073	0.0171	0.0081	0.0136	0.0066	–0.1192
	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Urban	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
AP	0.0060	0.0244	0.0047	0.3407	0.0070	0.0276	0.0081	0.0010	0.0083	–0.1489
AS	0.0068	0.0106	0.0055	0.0650	0.0035	0.0748	0.0086	0.0018	0.0057	–0.0169
BH	0.0063	0.0872	0.0051	0.4657	0.0056	0.2585	0.0089	0.0033	0.0066	–0.0562
CD	0.0068	–0.0663	0.0051	0.0920	0.0097	–0.0059	0.0063	0.0015	0.0062	–0.0200
CH	0.0061	0.0289	0.0047	0.2452	0.0055	0.0159	0.0081	0.0008	0.0060	0.0159

(Annexure 2 continued)

(Annexure 2 continued)

	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Urban	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1	Intercept	X Variable 1
DL	0.0070	0.0591	0.0058	0.1696**	0.0056	0.0318	0.0088	0.0004	0.0055	0.0200
Goa	0.0078	–0.0456	0.0066	0.0439**	0.0059	0.2294	0.0084	0.0038	0.0072	–0.0337
GJ	0.0067	0.0662	0.0054	0.1548	0.0076	0.0132	0.0073	0.0305	0.0071	–0.0748
HR	0.0063	0.0986	0.0052	0.1535	0.0075	0.0070	0.0078	0.0018	0.0048	–0.0046
HP	0.0077	–0.0431	0.0061	0.0484	0.0099	–0.0287	0.0080	0.0078	0.0068	–0.0125
JK	0.0072	–0.0078	0.0059	–0.0038	0.0059	–0.0769	0.0072	0.0194	0.0042	0.0022
JH	0.0070	0.0135	0.0056	0.2043	0.0059	–0.0725	–0.0683	0.1580	0.0065	–0.0212
KA	0.0070	–0.1199	0.0052	–0.0307	0.0066	–0.0502	0.0088	0.0032	0.0067	–0.0302**
KE	0.0069	–0.0058	0.0056	0.0496	0.0069	–0.0127	0.0072	0.0031	0.0063	–0.1039
MP	0.0069	0.0138	0.0056	0.0496	0.0092	0.1535	0.0074	0.0078	0.0066	–0.0617
MH	0.0066	0.0986	0.0059	0.2580	0.0060	0.0910	0.0075	0.0244	0.0057	–0.0584
OD	0.0066	0.0007	0.0050	0.0012	0.0073	0.0090	0.0078	–0.0086	0.0058	0.0138
PB	0.0070	–0.0220	0.0057	0.1621	0.0080	–0.0023	0.0073	0.0101	0.0052	0.0258
RJ	0.0068	–0.0294	0.0053	0.0985	0.0088	–0.0138	0.0079	0.0048	0.0059	–0.0179
TN	0.0065	–0.0212	0.0052	0.0789	0.0068	–0.0628	0.0072	0.0027	0.0066	–0.0337**
TL	0.0058	0.0186	0.0043	0.0167	0.0074	0.0591	0.0071	0.0014	0.0047	–0.0844
UP	0.0067	0.0246	0.0061	0.2544	0.0076	0.1715	0.0082	0.0159	0.0065	–0.0666
UK	0.0064	0.0258	0.0055	0.1991	0.0080	–0.0082	0.0070	0.0003	0.0072	–0.0402
WB	0.0071	–0.0425	0.0055	0.1173	0.0067	0.0641	0.0072	0.0087	0.0049	0.0298**
India	0.0068	–0.0022	0.0053	0.0416	0.0075	0.0199	0.0079	0.0084	0.0068	–0.1519

Note: AP: Andhra Pradesh; AS: Assam; BH: Bihar; CD: Chhattisgarh; CH: Chandigarh; DL: Delhi; GJ: Gujarat; Goa: Goa; HP: Himachal Pradesh; HR: Haryana; JH: Jharkhand; JK: Jammu and Kashmir; KA: Karnataka; KE: Kerala; MH: Maharashtra; MP: Madhya Pradesh; OD: Odisha; PB: Punjab; RJ: Rajasthan; TL: Telangana; TN: Tamil Nadu; UK: Uttarakhand; UP: Uttar Pradesh; WB: West Bengal. *5% level of significance; **10 % level of significance.

Annexure 3: Canonical CCAPM Results

	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Combined	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
AP	0.0055	0.0115	0.0042	0.3893	0.0049	0.0916	0.0056	–0.0168	0.0059	–0.1595
AS	0.0100	–1.0679	0.0090	–1.0583	0.0099	–0.2521	0.0096	–1.0299	0.0088	–1.0314
BH	0.0100	–0.9706	0.0091	–0.8929	0.0094	–0.2824	0.0098	–1.0138	0.0092	–1.0445
CD	0.0101	–1.0840	0.0091	–0.9556	0.0066	–0.2732	0.0099	–1.0038	0.0092	–1.0313
CH	0.0097	–0.9022	0.0089	–0.8889	0.0046	–0.8624	0.0098	–1.0116	0.0089	–1.0202
DL	0.0099	–0.9479	0.0090	–0.8641	0.0055	–0.3577	0.0097	–1.0097	0.0088	–0.9992
Goa	0.0103	–0.9885	0.0096	–0.9298	0.0055	–0.3577	0.0097	–1.0097	0.0088	–0.9992
GJ	0.0100	–0.9328	0.0090	–0.9743	0.0071	–0.3353	0.0097	–0.9908	0.0091	–1.0510
HR	0.0099	–0.9161	0.0091	–0.9333	0.0051	–0.2826	0.0097	–1.0276	0.0091	–1.0235
HP	0.0101	–1.0463	0.0091	–0.9819	0.0006	–0.2202	0.0098	–0.9999	0.0089	–1.0036
JK	0.0100	–1.0326	0.0091	–1.0243	0.0086	–0.5506	0.0097	–1.0080	0.0093	–1.0888
JH	0.0100	–1.0527	0.0091	–0.9508	0.0066	–0.8231	0.0094	–1.0307	0.0091	–1.0455
KA	0.0102	–1.1149	0.0090	–1.0649	0.0060	–0.2238	0.0097	–1.0240	0.0091	–1.0674
KE	0.0100	–1.0019	0.0091	–0.9843	0.0077	–0.2888	0.0096	–1.0231	0.0087	–1.1129
MP	0.0101	–1.0289	0.0091	–1.0151	0.0020	–0.8815	0.0099	–1.0137	0.0096	–1.1061
MH	0.0102	–0.9056	0.0094	–0.8675	0.0078	–0.6913	0.0097	–1.0112	0.0091	–1.0884
OD	0.0100	–0.9997	0.0090	–0.9945	0.0058	–0.2137	0.0096	–1.0354	0.0087	–0.9790
PB	0.0101	–1.0633	0.0091	–0.9869	0.0054	–0.3784	0.0101	–1.0173	0.0088	–0.9892
RJ	0.0101	–1.0713	0.0090	–0.9821	0.0040	–0.4887	0.0098	–1.0189	0.0092	–1.0634

(Annexure 3 continued)

(Annexure 3 continued)

	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Combined	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
TN	0.0100	–1.0368	0.0090	–1.1175	0.0098	–0.2505	0.0098	–1.0177	0.0093	–1.0721
TL	0.0100	–0.9969	0.0090	–0.9786	0.0023	–0.8984	0.0098	–1.0155	0.0087	–1.1034
UP	0.0101	–0.9388	0.0093	–0.8979	0.0079	–0.4833	0.0097	–1.0190	0.0095	–1.0864
UK	0.0100	–1.0043	0.0091	–0.9212	0.0026	–0.3183	0.0098	–1.0149	0.0094	–1.0320
WB	0.0101	–1.0400	0.0091	–0.9849	0.0078	–0.4538	0.0097	–1.0257	0.0085	–0.9603
India	0.0100	–1.0140	0.0091	–0.9788	0.0051	–0.9264	0.0097	–1.0255	0.0096	–1.1401
	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Rural	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
AP	0.0098	–0.9573	0.0089	–0.8246	0.0044	–0.0357	0.0098	–1.0154	0.0096	–1.0977
AS	0.0101	–1.0681	0.0090	–1.0215	0.0087	–0.2931	0.0096	–1.0394	0.0090	–1.0317
BH	0.0100	–0.9814	0.0090	–0.9697	0.0104	–0.7571	0.0098	–1.0133	0.0089	–1.0075
CD	0.0101	–1.0843	0.0091	–0.9593	0.0067	–0.2737	0.0098	–1.0038	0.0092	–1.0334
CH	0.0097	–0.9071	0.0088	–0.9120	0.0064	–0.6747	0.0098	–1.0051	0.0088	–1.0110
DL	0.0100	–0.9149	0.0091	–0.8897	0.0067	–0.1066	0.0097	–1.0123	0.0088	–1.0241
Goa	0.0103	–0.9753	0.0095	–0.9380	0.0067	–0.1066	0.0097	–1.0123	0.0088	–1.0241
GJ	0.0100	–0.9169	0.0090	–0.9720	0.0065	–0.3099	0.0097	–0.9947	0.0088	–0.9849
HR	0.0100	–0.9717	0.0091	–0.9965	0.0036	–0.2031	0.0095	–1.0292	0.0087	–0.9933
HP	0.0100	–1.0116	0.0091	–1.0011	0.0021	–0.1581	0.0000	0.0000	0.0087	–0.9881
JK	0.0100	–1.0016	0.0091	–1.0802	0.0063	–0.6024	0.0097	–1.0130	0.0095	–1.0946
JH	0.0100	–1.0282	0.0091	–0.9791	0.0063	–0.5920	0.0096	–1.0117	0.0089	–1.0122

(Annexure 3 continued)

(Annexure 3 continued)

	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Rural	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
KA	0.0100	–1.0096	0.0091	–0.8028	0.0029	–0.2174	0.0098	–1.0132	0.0089	–1.0498
KE	0.0100	–0.9879	0.0091	–0.9693	0.0075	–0.2554	0.0095	–1.0249	0.0088	–1.0488
MP	0.0103	–1.0544	0.0091	–1.0298	0.0003	–0.9188	0.0099	–1.0200	0.0096	–1.0835
MH	0.0100	–0.9315	0.0092	–0.9398	0.0072	–0.4603	0.0097	–1.0141	0.0088	–1.0725
OD	0.0097	–0.9533	0.0090	–0.9890	0.0014	–0.2516	0.0096	–1.0244	0.0089	–1.0054
PB	0.0102	–1.0665	0.0091	–1.0422	0.0046	–0.1931	0.0099	–1.0062	0.0087	–0.9874
RJ	0.0102	–1.0882	0.0091	–0.9872	0.0021	–0.4573	0.0096	–1.0287	0.0092	–1.0564
TN	0.0101	–1.0316	0.0091	–1.0364	0.0071	–0.1595	0.0098	–1.0137	0.0096	–1.0835
TL	0.0101	–1.0605	0.0090	–0.9182	0.0037	–0.1595	0.0097	–1.0120	0.0086	–1.0556
UP	0.0100	–0.8445	0.0092	–0.9199	0.0069	–0.5564	0.0098	–1.0066	0.0091	–1.0305
UK	0.0096	–0.9024	0.0090	–1.0353	0.0001	–0.2711	0.0000	0.0000	0.0087	–0.9951
WB	0.0101	–1.0679	0.0091	–1.0459	0.0069	–0.3602	0.0097	–1.0232	0.0086	–0.9717
India	0.0100	–0.9856	0.0091	–0.9913	0.0051	–0.5291	0.0097	–1.0248	0.0094	–1.1109
	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Urban	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
AP	0.0100	–1.0040	0.0091	–1.0182	0.0059	–0.3206	0.0099	–1.0174	0.0102	–1.1488
AS	0.0100	–1.0423	0.0090	–1.0552	0.0104	–0.3722	0.0096	–1.0247	0.0088	–1.0207
BH	0.0100	–0.9939	0.0091	–0.9239	0.0101	–0.1992	0.0098	–1.0137	0.0095	–1.0748
CD	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH	0.0099	–0.9153	0.0090	–0.9025	0.0040	–0.8981	0.0098	–1.0126	0.0089	–1.0186

(Annexure 3 continued)

(Annexure 3 continued)

	TOT Exp	TOT Exp	FOOD	FOOD	ELECTR	ELECTR	TRANS	TRANS	Health	Health
Urban	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η	ln(β)	η
DL	0.0100	–0.9660	0.0090	–0.8919	0.0055	–0.4264	0.0097	–1.0076	0.0088	–0.9926
Goa	0.0102	–1.0056	0.0095	–0.9514	0.0055	–0.4264	0.0097	–1.0076	0.0088	–0.9926
GJ	0.0101	–0.9559	0.0091	–0.9974	0.0073	–0.3147	0.0097	–0.9900	0.0094	–1.0827
HR	0.0099	–0.9122	0.0090	–0.9336	0.0046	–0.2803	0.0098	–1.0241	0.0091	–1.0207
HP	0.0101	–1.0365	0.0091	–0.9318	0.0027	–0.3011	0.0098	–1.0002	0.0091	–1.0225
JK	0.0100	–1.0294	0.0091	–1.0186	0.0100	–0.5265	0.0099	–0.9692	0.0089	–1.0065
JH	0.0100	–1.0626	0.0091	–0.9604	0.0071	–0.7416	0.0095	–1.0307	0.0090	–1.0303
KA	0.0102	–1.1194	0.0089	–1.1432	0.0072	–0.2335	0.0097	–1.0271	0.0091	–1.0652
KE	0.0100	–1.0134	0.0091	–0.9894	0.0079	–0.3305	0.0096	–1.0225	0.0087	–1.1164
MP	0.0100	–1.0246	0.0090	–1.0240	0.0028	–0.8388	0.0098	–1.0083	0.0095	–1.0879
MH	0.0102	–0.9157	0.0094	–0.8656	0.0078	–0.7349	0.0097	–1.0102	0.0092	–1.0791
OD	0.0100	–1.0010	0.0091	–0.9950	0.0068	–0.2479	0.0096	–1.0376	0.0087	–0.9869
PB	0.0100	–1.0536	0.0091	–0.9432	0.0057	–0.3398	0.0101	–1.0159	0.0088	–0.9980
RJ	0.0101	–1.0619	0.0091	–0.9978	0.0054	–0.4651	0.0098	–1.0167	0.0092	–1.0546
TN	0.0100	–1.0386	0.0089	–1.1235	0.0107	–0.2573	0.0098	–1.0171	0.0092	–1.0601
TL	0.0100	–0.9931	0.0090	–0.9829	0.0020	–0.8731	0.0098	–1.0159	0.0088	–1.0919
UP	0.0100	–1.0198	0.0090	–1.0055	0.0085	–0.5118	0.0097	–1.0238	0.0095	–1.0858
UK	0.0101	–1.0237	0.0092	–0.9254	0.0042	–0.2860	0.0099	–1.0149	0.0099	–1.0622
WB	0.0101	–1.0269	0.0091	–0.9546	0.0080	–0.4214	0.0097	–1.0255	0.0086	–0.9693
India	0.0100	–1.0223	0.0091	–0.9822	0.0054	–0.8679	0.0097	–1.0258	0.0096	–1.1406

Note: AP: Andhra Pradesh; AS: Assam; BH: Bihar; CD: Chhattisgarh; CH: Chandigarh; DL: Delhi; GJ: Gujarat; Goa: Goa; HP: Himachal Pradesh; HR: Haryana; JH: Jharkhand; JK: Jammu and Kashmir; KA: Karnataka; KE: Kerala; MH: Maharashtra; MP: Madhya Pradesh; OD: Odisha; PB: Punjab; RJ: Rajasthan; TL: Telangana; TN: Tamil Nadu; UK: Uttarakhand; UP: Uttar Pradesh; WB: West Bengal.

Case Study

Adani Group: Growth, Governance, and the Crisis of Credibility

Nirma University Journal of Business and Management Studies
9(2) 183–192, 2026
© The Author(s) 2026
DOI: 10.1177/njb.261484992
njb.spectrumjps.com

Gunjan Anand[1], Arpan Shrivastava[2] and Arpita Shrivastava[3]

Abstract

This educational case study analyzes the governance and strategic problems that the Adani Group faced in connection with numerous high-visibility crises from 2023 to 2025. Following allegations of financial misconduct and an indictment by the U.S. Department of Justice, the case places students at a decision point in time (November 2024), with respect to declining market valuation, heightened scrutiny from regulators, and reduced trust by key stakeholders, while still grappling with how to maintain their aggressive growth plan. Throughout this case, there is a tension between continuing to expand as a means of signaling strength through resilience versus pausing to implement governance processes. Finally, it raises larger issues faced by many conglomerates in developing markets, such as concentrated ownership structures, leveraged businesses/operations, and complex regulatory environments associated with cross-border transactions or businesses where domestic and international regulations apply.

Keywords

Corporate governance, emerging markets, growth strategy, risk

[1]Institute of Management, Nirma University, Ahmedabad, Gujarat, India
[2]IPS Academy, Institute of Business Management & Research, Indore, Madhya Pradesh, India
[3]Anil Surendra Modi School of Commerce, SVKM's Narsee Monjee Institute of Management Studies, Mumbai, Maharashtra, India

Corresponding author:
Arpan Shrivastava, IPS Academy, Institute of Business Management & Research, Indore, Madhya Pradesh 452012, India.
E-mail: arpan.mitm@gmail.com

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed.

Prologue: A Turning Point

In November 2024, Gautam Adani convened an emergency board meeting following the announcement of an indictment by the U.S. Department of Justice for bribery, securities fraud, and omission of material information. Of course, the news caused a stir in the financial markets. Within just a few days, the stock valuation of the group's companies lost a market value of several billion dollars. The issuing of bonds on the international market was abandoned, and many foreign partners conducting business started reviewing their partnerships (Cuervo-Cazurra, 2006; Rodriguez, Uhlenbruck, & Eden, 2005).

Though the group had previously been under intense scrutiny, this incident was different. Get this, now the situation is beyond reputation and has entered the legal and regulatory arena. It is even international in nature. The choice was on how to signal resiliency: either the group continues with its expansion program or calls off its growth plans and focuses on implementing governance reforms and rebuilding stakeholders' confidence.

Growth Strategy and Business Orientation

The Adani Group was formed in 1988 as a commodities trader and has transformed into a vast infrastructure conglomerate within three decades. It also has activities in ports, logistics, energy, mining, airports, and media, which are the areas directly related to the national development priorities. Some characteristics describe the growth model of the group; first, it is important to note that fast build-up of assets, use of leverage, and link to national infrastructure goals were part of the strategy adopted by the Group. The decision-making system was centralized; however, this led to the development of structural dependencies regarding capital markets and regulations (Jensen & Meckling, 1976).

That meant the organization could quickly grow and establish itself as a leader in that area. There, however, were certain structural dependencies vis-à-vis capital markets, the regulatory system, and the trust of its stakeholders. The growth strategy followed by the Group materializes in high capital intensity, and scalability can be followed, based on continued funding. Such it is possible that the growth strategy followed by the Group has shown a high capital intensity with scalability subjected to continuous funding, on the other hand, it is possible to say that such a strategy made it possible to dominate within the market with the case being that the firm was exposed to vulnerabilities with regards to shocks influenced by investors' perceptions, regulators, and capital markets in general at global level (Morck, Wolfenzon, & Yeung, 2005; Khanna & Palepu, 2000).

Context Within the Industry: Infrastructure Development and Conglomerate Expansion in Emerging Markets

Infrastructure construction in emerging markets such as India requires huge amounts of investment, long-term plans, and high levels of interconnection with government policy decisions. Big business houses tend to be highly involved in

the process of creating infrastructure, given their ability to pull together all the required resources and orchestrate the process (Khanna & Yafeh, 2007)(Khanna & Yafeh, 2007).

At the same time, conglomerates such as the Adani Group function within the framework of both the public and private sectors whose business expansion is directly related to government schemes. Such a nature of model entails that there is always a need for capital inflows, and this need is met through debt financing and capital market operations (Exhibit 3). Leveraged growth implies that such companies are perpetually subject to the threats of shifts in investor sentiments toward them, thereby leading to greater vulnerability (March & Shapira, 1987). Besides, infrastructural construction usually presupposes big investments made for long time periods during which a change of strategy might become too costly. Sustainability is thus also linked to effective governance and confidence of the stakeholders.

The Shock of 2023: Market's Trust Tested

A report issued during the month of January 2023 by a US-based group that is involved in short selling raised issues related to manipulation of stock prices, utilization of offshore vehicles, and transparency (Exhibit 1). The group issued a strong denial of the claims. The response from the market was immediate as follows:

- Decline in market capitalization;
- Withdrawal of its equity issuance plans;
- Greater attention and monitoring by both investors and regulators.

Despite the steps that were undertaken by the group to help restore its reputation, including repaying debts and engaging investors, it raised serious questions in regard to its governance and disclosure practices (Exhibit 2). The event clearly showed a gap in stakeholder behavior. Domestic stakeholders were proven to be more tolerant toward risks, whereas global investors were less patient.

Expectations of Global Investors and Domestic Investors

There was also a difference in expectations from the stakeholders, depending on whether the stakeholders were domestic investors or global investors (Exhibit 4). It is likely that the reaction from domestic investors would be different from reactions from global investors because the former would be used to local dynamics, while the latter would be expected to evaluate the case with stricter standards for governance, transparency, and environmental, social, and governance (ESG). As far as the Group was concerned, this added another layer of complexity in that it meant that there were two sets of demands being made on the organization simultaneously. While growth and keeping pace with national developments may be key priorities for domestic markets, international investors may add disclosure and independence of the board as priorities.

Performance Amid Changing Conditions

The performance of the organization was quite constant throughout the year 2023 and into 2024. Performance of the major businesses continues to yield revenues, and the group continues on the same growth path as it did previously. However, the environment in which this took place was not as favorable as prior to this, as investor confidence was no longer unconditional, but conditional, and their margin of safety was reduced.

The 2024 Indictment: Escalation of Risk

This issue was therefore magnified by the indictment in November 2024. Bribery and fraud charges with regard to misleading shareholders became a legally problematic issue since the group was now dealing in international financial markets. This was a new ball game because there could be legal repercussions, and thus strategy and governance were all the more important. The consequences were:

- Loss of market value;
- Delay or rethinking of overseas projects;
- Suspension of financing projects;
- Regulatory inspection.

Accumulating Pressures Across Stakeholders by the End of 2024, the Group was Under Pressure from Different Stakeholders

Stakeholder Key Expectation Risk Investors Transparency Capital withdrawal Regulators Compliance Legal exposure Employees Stability Talent attrition Partners Credibility Contract risk. Notably, the stakeholders started to comprehend the events in a cumulative rather than an individual manner, which developed a larger narrative governing risk (Freeman, 1984).

Complexity of Governance in Emerging Markets Business Groups

Governance in emerging markets is likely to be affected by institutional settings that are still developing. Ownership of business groups in emerging markets features the degree of ownership still maintained by the founding promoters, with control over key decision-making mechanisms. Though the ownership structure provides for great flexibility and foresight, it adversely affects the ability of independent governance to function effectively (Claessens, Djankov, & Lang, 2000; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). In addition, the institutional settings in emerging markets are likely to be developing at a slower pace than growth in corporate itself, hence the so-called "institutional voids," according to researchers (Khanna & Palepu, 2000). This results in enforcement,

reporting, and accountability inconsistencies. In the case of cross-border operational firms, the issue is much compounded since they have to accommodate different governance requirements (Filatotchev & Wright, 2011).

Governance, therefore, goes beyond being a compliance issue but a critical element of strategic planning that shapes the ability of firms to raise funds and reputation coupled with the survival of corporate entities (Shleifer & Vishny, 1997; Daily, Dalton, & Cannella, 2003).

Interpreting the Pattern

The dynamic environment raised behavioral and structural issues in organizational decision-making. Centralization of control raised issues of adequacy of control mechanisms as the company became bigger and more complicated. On the other hand, strategic thinking that persists despite adversity is also considered evidence of the role of behavioral biases, especially under ambiguity and losses (Kahneman & Tversky, 1979; Sitkin & Pablo, 1992). Ethical issues arose slowly as operations took place in different parts of the world where varying levels of regulatory standards were in place, thus exposing the possibility of minor infringements of universal standards (Ashforth & Anand, 2003; Palazzo, Krings, & Hoffrage, 2012). Management responses also featured prominently in assessing stakeholder perceptions, as overconfidence internally may be interpreted externally as a failure to adequately acknowledge emerging issues (Bazerman & Tenbrunsel, 2011).

Redefining the Strategic Problem

The critical problem for the business was not about expansion per se, but it was about balancing expansion and legitimacy. Success in the organization is built on flexibility, capacity, and risk-taking ability (Sitkin & Pablo, 1992). Nonetheless, the present context necessitated that the firm give more attention to issues of transparency, responsibility, and governance.

Market Perception and External Narratives

However, as the situation developed, there were external narratives that defined the perceptions of the involved stakeholders on the scenario that unfolded. Various financial analysts, media houses, and ratings agencies viewed the situation through their lens, thus influencing how information was disseminated to other markets. Here, perception is not only an objective measure of performance but also an expectation system that is a function of trust and credibility (Fombrun & Shanley, 1990). Negative narratives will only exacerbate the problem, as will delays in the communication of any statement relating to the issue; thus, perception management remains a key consideration for the Adani Group (Coombs, 2007).

Option	Description	Potential Benefits	Key Risks
Aggressive expansion	Continue growth trajectory across sectors	Signals confidence, maintains market position	Reinforces governance concerns, increases scrutiny
Governance reset	Focus on transparency, compliance, and oversight	Builds investor trust, reduces regulatory risk	Slower growth, internal resistance
Selective retrenchment	Divest non-core assets and reduce leverage	Improves financial stability, reduces risk	Market perception of weakness
Global compliance alignment	Adopt international governance standards	Enhances global credibility	Increased operational complexity and cost

Strategic Alternatives

There were a number of strategies that the Group could employ to deal with its problems. Some entailed a tradeoff between growth, governance, and perceptions. Strategic alternatives open to the Group include:

Each of these strategies has its own advantages and disadvantages. Aggressive growth will guarantee continuity and strength in signaling but might exacerbate governance problems. Governance restructuring will improve the credibility of the company but can hamper the progress of the organization. Retrenchment, while providing greater stability for the firm financially, might signal negative perceptions in the marketplace. Global compliance integration will provide long-term legitimacy but will add complexity to the process.

In practical terms, all of these strategies will work if the plan is implemented effectively and meets the expectations of stakeholders.

The Decision

By November 2024, Gautam Adani had to make a significant decision that would require immediate action and have significant consequences for the future. The strategy of the group had to be determined in a matter of weeks because all current projects and investors were depending on what signals would be sent by the leadership. This was not a strategic decision; rather, it was more of a symbolic decision.

An imminent challenge for the collective was how to proceed with an aggressive growth strategy, to show the group's support for the group's ongoing plans, and to illustrate the collective's sustained efforts to improve its resilience and to eliminate the governance reform concerns (Ulmer, Sellnow, & Seeger, 2018; Boin, 't Hart, Stern, & Sundelius, 2016; James & Wooten, 2005). The collective

has two choices: one path is to aggressively expand the organization and provide evidence of the group's resilience but possibly make the organization's governance concerns worse than they are; the other path is to stop expanding the organization and work on the governance reform concerns, which is an acknowledgement of weakness.

"This decision needs to be communicated in the next several weeks because there are many ongoing initiatives, investor expectations, and regulatory obligations connected to whichever direction the group takes next." An aggressive growth strategy may convey a sense of resilience; that the collective is confident about its inherent strengths.

"Conversely, an aggressive growth strategy will indicate support for the culture of the group; however, it will also indicate to stakeholders that the group will not address the emerging governance issues that require reform. The second path is to cease expanding the organization, which will convey institutional strength but may also create the appearance of insecurity in infrastructure industries that are rapidly changing." Each of the possible paths has its positives and negatives regarding the impact on the organization's future growth, on demonstrating resilience or being perceived to be ignoring growing governance concerns, and on creating perceived weakness if the group ceases expanding.

Financial repercussions for making decisions are considered when it comes to future access to capital, borrowing costs, and how much investors would participate in future projects. Given that the Group had been dependent on external sources of funding, it is critical to maintain its relationship with its investors (in both domestic and international markets). In this instance, the business decision made would have also needed to take into account the impacts on various stakeholders while still making an appropriate strategic choice.

Epilogue

The Adani Group continues to be subject to scrutiny from global investment communities and regulators since the emergence of this situation. While there is potential for recovery financially in the future, the institution's credibility represents a much larger issue (Treviño & Nelson, 2021). The question this case study aims to address is:

Whether developing economies can achieve growth and meet the evolving expectations for accountability in their corporate governance structures or whether they should be looking to make a drastic change from their previous strategies.

The answer to this question goes beyond just individual organizations to represent a significant change in how global businesses operate. The case presents no future direction of strategic resiliency with either growth or through transformation as a means to achieve this change.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Gunjan Anand https://orcid.org/0000-0001-6012-5073
Arpan Shrivastava https://orcid.org/0000-0003-3992-4422
Arpita Shrivastava https://orcid.org/0009-0007-5563-3947

References

Ashforth, B. E., & Anand, V. (2003). The normalization of corruption in organizations. *Research in Organizational Behavior*, *25*, 1–52.

Bazerman, M. H., & Tenbrunsel, A. E. (2011). *Blind spots: Why we fail to do what's right and what to do about it*. Princeton University Press.

Boin, A., 't Hart, P., Stern, E., & Sundelius, B. (2016). *The politics of crisis management* (2nd ed.). Cambridge University Press.

Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, *58*(1–2), 81–112.

Coombs, W. T. (2007). Protecting organization reputations during a crisis. *Corporate Reputation Review*, *10*(3), 163–176.

Cuervo-Cazurra, A. (2006). Who cares about corruption? *Journal of International Business Studies*, *37*(6), 807–822.

Daily, C. M., Dalton, D. R., & Cannella, A. A. (2003). Corporate governance: Decades of dialogue and data. *Academy of Management Review*, *28*(3), 371–382.

Filatotchev, I., & Wright, M. (2011). Agency perspectives on corporate governance of multinational enterprises. *Journal of Management Studies*, *48*(2), 471–486.

Fombrun, C. J., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. *Academy of Management Journal*, *33*(2), 233–258.

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.

James, E. H., & Wooten, L. P. (2005). Leadership as (un)usual. *Leadership Quarterly*, *16*(1), 141–156.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291.

Khanna, T., & Palepu, K. (2000). Is group affiliation profitable in emerging markets? *Journal of Finance*, *55*(2), 867–891.

Khanna, T., & Yafeh, Y. (2007). Business groups in emerging markets: Paragons or parasites? *Journal of Economic Literature*, *45*(2), 331–372.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, *58*(1–2), 3–27.

March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science*, *33*(11), 1404–1418.

Morck, R., Wolfenzon, D., & Yeung, B. (2005). Corporate governance, economic entrenchment, and growth. *Journal of Economic Literature*, *43*(3), 655–720.

Palazzo, G., Krings, F., & Hoffrage, U. (2012). Ethical blindness. *Journal of Business Ethics*, *109*(3), 323–338.

Rodriguez, P., Uhlenbruck, K., & Eden, L. (2005). Government corruption and the entry strategies of multinationals. *Academy of Management Review*, *30*(2), 383–396.

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, *52*(2), 737–783.

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, *17*(1), 9–38.

Treviño, L. K., & Nelson, K. A. (2021). *Managing business ethics: Straight talk about how to do it right* (8th ed.). Wiley.

Ulmer, R. R., Sellnow, T. L., & Seeger, M. W. (2018). *Effective crisis communication: Moving from crisis to opportunity* (4th ed.). Sage Publications.

Appendix

Additional data supporting case analysis are presented in the following exhibits.

Exhibit 1. Market Capitalization Impact.

Date	Event	Index Value
December 2022	Pre-crisis	100
January 2023	Hindenburg report	65
March 2023	Stabilization efforts	72
November 2024	DOJ indictment	55
January 2025	Partial recovery	60

Source: Compiled by the author based on data from Bombay Stock Exchange (BSE), National Stock Exchange (NSE), and financial reports from Reuters and Bloomberg (2023–2025). Values are indexed for illustrative purposes.

Exhibit 2. Debt Versus Revenue.

Year	Debt (USD Bn)	Revenue (USD Bn)
2020	15	10
2021	20	13
2022	28	17
2023	32	19
2024	34	21

Source: Compiled by the author using data from Adani Group annual reports and disclosures to the Securities and Exchange Board of India (SEBI). Figures are indicative and presented for analytical purposes

Exhibit 3. Geographic Spread of Adani Group Operations Include.

Region	Key Business Activity
India	Ports, logistics, energy, airports
Australia	Mining operations
Africa	Infrastructure projects
Middle East and Southeast Asia	Emerging investments

Source: Compiled by the author based on Adani Group annual reports, corporate disclosures, and subsidiary information.

Exhibit 4. Stakeholder Expectations Versus Risk Exposure.

Stakeholder	Key Expectation	Risk to Firm
Investors	Transparency	Capital flight
Regulators	Compliance	Legal penalties
Employees	Stability	Talent loss
Governments	Development	Political scrutiny
Partners	Credibility	Contract loss

Source: Compiled by the author based on Freeman (1984) and analysis of stakeholder risks in the Adani Group case.

Case Study

CityGrid Gas Limited: Balancing Growth Between Online and Daughter Booster CNG Station

Nirma University Journal of Business and Management Studies
9(2) 193–199, 2026
© The Author(s) 2026
DOI: 10.1177/njb.261484993
njb.spectrumjps.com

Harsh Pratap Singh[1], Omkar Sahoo[1] and Pratham Parekh[1]

Abstract

The growing adoption of compressed natural gas (CNG) vehicles in India is driving demand for efficient, financially viable CNG infrastructure. This case examines CityGrid Gas Limited's (CGGL) investment decision for establishing a CNG station at Abu Road, Rajasthan. CGGL is evaluating two alternatives: a daughter booster (DB) station supplied through mobile cascades and an online station connected directly to the existing gas pipeline network. The case evaluates these alternatives considering capital investment, operating costs, demand growth, financing, taxation, depreciation, station capacity, and long-term infrastructure requirements. It also examines each alternative's strategic flexibility and scalability, as CNG demand is expected to increase significantly. The case enables learners to apply capital budgeting techniques while integrating financial and non-financial considerations in infrastructure investment decisions.

Keywords

Financial feasibility, capital budgeting, cash flow analysis and net present value (NPV)

During the recent review meeting, Bhavesh, the Executive Vice President of Operations at CityGrid Gas Limited (CGGL), provided an overview of the performance of CGGL's compressed natural gas (CNG) station. Referring to an industry report published in May 2026, he highlighted that CNG vehicle adoption in India increased by 40.7% from May 2025, despite a 45% increase in CNG prices over

[1]Institute of Management, Nirma University, Ahmedabad, Gujarat, India
Corresponding author:
Harsh Pratap Singh, Institute of Management, Nirma University, Sarkhej-Gandhinagar Highway, Ahmedabad, Gujarat 382481, India.
E-mail: pratham.parekh@nirmauni.ac.in

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed.

the last 2 years. This shift in consumer preference towards cleaner and more cost-effective transport options has forced automakers to offer CNG-powered vehicles in the Indian passenger vehicle market. Bhavesh further added that the increase in CNG-powered vehicles on the road will require more and more efficient CNG fuel stations to support this expanding demand in India.

Supporting Bhavesh's claim, Pankaj, the head of CGGL's CNG division, advised that we also need to expand our infrastructure to meet rising CNG consumption in a cost-effective, financially viable way.

CityGrid Gas Limited: Background

CGGL, one of the leading city gas distribution companies in India, primarily operates in four states: Maharashtra, Gujarat, Rajasthan and Haryana. It has further planned to expand its operations in Punjab and Madhya Pradesh in recent years. CGGL operates in four key verticals: piped natural gas (PNG)-domestic, PNG-commercial, PNG-industrial and CNG stations. As of 31 March 2024, the company has a network of 640 CNG stations, serving 15.5 lakh+ households, 12,900 commercial customers and 6,300 industrial customers.

Compressed Natural Gas Station Division of CityGrid Gas Limited

CGGL has a vast network of 640 CNG stations in four states, with a major presence in Gujarat. The Gujarat operations are further classified into four clusters: Saurashtra (217 CNG stations, 106 daughter booster [DB] stations, 27 mother stations and 84 online stations), Central Gujarat (109 CNG stations), South Gujarat (184 CNG stations) and North Gujarat (34 CNG stations). Outside Gujarat, CGGL has a very limited network, with 33 CNG stations in Maharashtra, 43 in Rajasthan and 20 in Haryana.

CGGL's CNG division operates through its network of mother CNG stations, DB CNG stations and online CNG stations. A mother station is one that is directly connected to the gas grid and supplies CNG to DB stations. Figure 1 and Figure 2 illustrates the operating process of a mother CNG station and DB CNG Station respectively. A mother station is usually located near a natural gas supply pipeline and supplies CNG to its nearby DB stations in mobile cascades. CGGL usually has 2–3 mother stations in each district and supplies around 15–20 DB stations. The operations of the online CNG station and mother CNG stations are similar, except that the online CNG station is used for retail fuelling only. However, it can be converted to a mother station by installing a mobile cascade fill panel.

In areas where an underground gas pipeline is unavailable, CGGL operates through its DB CNG stations. For these stations, gas is supplied via a mobile cascade from a mother station. Gas is compressed by a booster compressor and

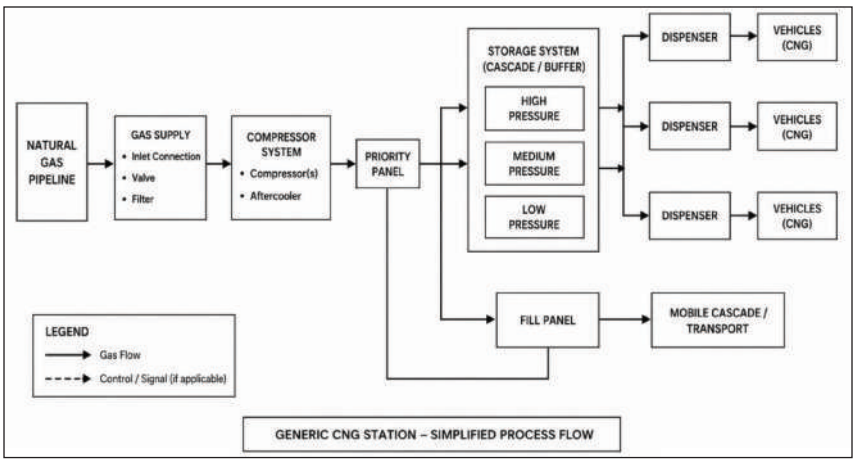


Figure 1. Operating Diagram of the Mother Compressed Natural Gas (CNG) Station.

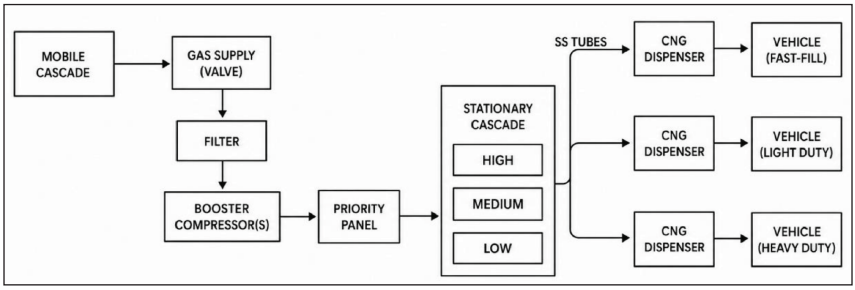


Figure 2. Operating Diagram of the Daughter Booster Compressed Natural Gas (CNG) Station.

stored in a stationary cascade at the DB CNG station. This operational model allows for efficient gas distribution and vehicle refuelling in locations where underground pipeline infrastructure is not feasible or economically viable. Unlike the online/mother CNG station, the DB station requires minimal infrastructure. The capital requirement for land is also much lower in a DB station than that for an online CNG station. However, the transportation expenses at the DB station are much higher than those at the online station. These costs include trailer packages, trucks, fuel and driver salaries, collectively impacting the station's operational expenses. In contrast, mother/online stations necessitate substantial investments in gas pipeline infrastructure, including initial installation and ongoing maintenance. Pipelines are designed to last 20 years per industry standards, with mandatory hydraulic pressure testing every 3 years to ensure safety and operational integrity.

CityGrid Gas Limited's Expansion Plan for Compressed Natural Gas Stations

To keep up with the growing demand for CNG vehicles, CGGL plans to expand its CNG station network. CGGL plans to develop a new CNG station at Abu Road, approximately 46 km from its existing mother CNG station in Pindwara, Sirohi, Rajasthan. CGGL is evaluating two options for developing a CNG station at the Abu Road location, with an estimated life of 20 years:

1. *DB CNG station*: In this option, CGGL is required to establish a DB CNG station at Abu Road. DB stations will receive CNG supply from the mother CNG station at Pindwara.
2. *Online CNG station*: Alternatively, CGGL is considering establishing an online CNG station at Abu Road. Online CNG stations are directly connected to the main supply pipeline originating from the mother CNG station at Pindwara.

CGGL is evaluating both options based on financial and operational criteria to optimise the expansion of CGGL's CNG network in Abu Road and its vicinity. The head of the CNG division, along with the finance and sales departments, collected pertinent financial, operational and market data to support informed decision-making. As per the forecast submitted by the sales department, demand for CNG in the Abu Road area is expected to remain around 7,000 kg per day for the first 5 years, then increase to 15,000 kg per day and remain at 15,000 kg/day thereafter. This increase in CNG demand will require CGGL to install more CNG stations in the area. The current sales price of CNG in the area is ₹81 per kg and is expected to increase at an annual growth rate of 3%. The DB CNG station can practically dispense a maximum of 5,000 kg of CNG per day, whereas the online station can dispense a maximum of 6,000 kg per day. The advantage of installing an online station is that it provides flexibility, allowing CGGL to convert it into a mother station to supply CNG to other DB stations to be installed in the area in the future by adding an external fill panel. However, to install an online CNG station, a 12″ underground carbon steel gas pipeline spanning 48 km must be laid from Pindwara Station. This pipeline requires an investment of ₹7,000,000 per km to cover labour, civil work and piping costs. The estimated lifespan of this pipeline is 20 years, with annual maintenance. Apart from this, investment is also required for stationary cascades, mobile cascades, unloading panel, cascade filling systems, electrical connections and fittings, hose pipes, valves, couplings, breakaway devices, gas detectors, booster compressor and CNG dispensers. All these assets have a lifespan of 20 years, with annual maintenance. The depreciation on all these assets is calculated using the straight-line method. The financing of these assets will be done through a bank loan at an annual interest rate of 9%. CGGL also pays a 30% tax on its profit. The detailed financial data on the operating expenses of both the DB station and the online station are presented in Exhibit 1. Additionally, Exhibit 2 provides information on the capital expenditure requirements for establishing both the DB station and the online station.

Discussion Questions

1. Should CGGL set up a DB station or an online station at Abu Road? Which option creates more value financially, and why?
2. With demand expected to grow from 7,000 to 15,000 kg/day, which type of station is better suited to handle future demand, and why?
3. Should CGGL adopt a phased approach (starting with DB stations and later upgrading) or invest upfront in online infrastructure? Justify your recommendation.
4. What are the non-financial considerations involved in the investment decision of establishing a DB CNG station or online CNG stations?

Exhibit 1. Operating Expenses for Daughter Booster and Online Stations.

Daughter Booster Station		
Expenses Category	Incidence of Cost	Amount
1. Power Charges		
a. For CNG boosting and dispensing	Charges incurred based on per kg of CNG dispensed and boosted	₹1.5 per kg of CNG dispensed and boosted
b. For general lighting and air conditioning	Fixed for the period	₹120,000 per year
2. Gas transportation charges via mobile cascades	Charge incurred based on per kg of CNG transported	₹7 per kg of CNG transported
3. Human resources charges	4 operators @ ₹500 per day 1 supervisor with a fixed monthly salary of ₹50,000	₹110,000 per month
4. Fixed maintenance charges for station equipment	A yearly maintenance agreement can be executed at a rate of ₹120,000, covering comprehensive maintenance services. The contract is subject to renewal with an annual increase of 2%	
5. Procurement of natural gas	Including all expenses till procurement	₹31 per kg of CNG procured

Online Station		
Expenses Category	Incidence of Cost	Amount
1. Power Charges		
a. For CNG boosting and dispensing	Charges incurred based on per kg of CNG dispensed and boosted	₹1 per kg of CNG dispensed and boosted
b. For general operations and air conditioning		₹120,000 per year for general operation and air conditioning

(Exhibit 1 continued)

(Exhibit 1 continued)

Online Station		
Expenses Category	Incidence of Cost	Amount
2. Fixed maintenance charges for station equipment	A yearly maintenance agreement can be executed for ₹120,000, covering comprehensive maintenance services. The contract is subject to renewal with an annual escalation of 2%	
3. Human resources charges	4 operators @ ₹500 per day per operator 1 supervisor with a fixed monthly salary of ₹50,000	₹110,000 per month
4. Annual maintenance of high-pressure underground gas pipeline.	A yearly maintenance agreement can be executed at a rate of ₹200,000 and covers comprehensive maintenance services. The contract is subject to renewal with an annual escalation of 2%	
5. Procurement of natural gas	Including all expenses till procurement	₹31 per kg of CNG procured

Note: All the charges, including power charges, gas transportation charges, human resources charges and procurement of natural gas, are expected to increase @ 2% per annum due to inflation.

Exhibit 2. Capital Expenditure to Establish Daughter Booster Station and Online Station.

Components	Specification for Daughter Booster	Expected Cost (in ₹)	Specification for Online	Expected Cost (in ₹)
Land requirements	A plot of 1,000 m^2 with a minimum frontage of 25 m	7,000,000	A plot of 1,500 m^2 with a minimum frontage of 35 m	13,000,000
Underground gas pipeline	Not required	Nil	12″ carbon steel gas pipeline for 48 km @ ₹7,000,000 per km labour, civil work and piping cost	336,000,000
Stationary cascades	The 4,500 WL cascade, which is 60 cylinders of 75 water litres each, can store 530 kg	3,500,000	A 3,000 WL cascade, which is 40 cylinders of 75 water litres each, can store 530 kg	2,000,000
Mobile cascade	4,500 WL cascade, which is 60 cylinders of 75 water litres, can store 530 kg	3,500,000	Not required	Nil

(Exhibit 2 continued)

(Exhibit 2 continued)

Components	Specification for Daughter Booster	Expected Cost (in ₹)	Specification for Online	Expected Cost (in ₹)
Unloading panel	1 unloading panel is required	2,000,000	Not required	Nil
Cascade filling systems	3 pipe filling system	1,200,000	3 pipe filling system	1,200,000
Electricity connection and fitting		1,800,000		1,800,000
Hose pipes, valves, couplings, breakaway devices and gas detectors		1,500,000		1,500,000
Booster compressor		1,800,000		1,800,000
CNG dispenser specification	3 CNG dispensers with a maximum instant flow capacity of 15 kg/min @ ₹500,000 per CNG dispenser	15,000,000	3 CNG dispensers with a maximum instant flow capacity of 15 kg/min @ ₹500,000 per CNG dispenser	15,000,000

Note: The straight-line depreciation method is applicable to all capital assets with a useful life of 20 years and a zero-salvage value.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

ORCID iD

Harsh Pratap Singh https://orcid.org/0000-0002-4634-164X

Nirma University Journal of Business and Management Studies: Guidelines for Authors

Manuscript submission

- The preferred format for your manuscript is MS Word.
- The journal does not consider a paper that has been published elsewhere or that is under submission to another publisher. Authors must attest to this at the time of submission. It is also author's responsibility to disclose any potential conflict of interests regarding their submitted papers.
- Authors will be provided with a copyright form once the contribution is accepted for publication. The submission will be considered as final only after the filled-in and signed copyright form is received.

Basic formatting of the manuscripts

The journal publishes the following article types:

- Research Articles. The paper length should not exceed 8000 words including tables, references and appendices. Abstract (of up to 250 words) and 3-5 keywords are mandatory for an original research paper.
- Review Articles
- Case Reports
- Interviews

Please refer to the Submission Guidelines on the journal website for details on formatting.

Spelling and numerical usages

- Consistent use of either British or American spelling is advised, but not both at the same time.
- Spell out numbers from one to nine, 10 and above to remain in figures. However, for exact measurements use only figures (e.g. 3 km, 9%). Please use '13th' instead of 'thirteenth century'; use '1960s' instead of 'nineteen sixties'.

Quotations, notes, tables and figures

- British English uses single quotation marks to indicate quotations or dialogue, double quotation marks for quotation inside quotation (nested quotation). American English flips that method and uses double quotation marks to indicate quotations or dialogue, and single quotation marks for nested quotations.
- Notes should be numbered serially and presented at the end of the article. Notes must contain more than a mere reference.
- Tables and figures must be cited in the text, and indicated by number separately (Table 1), not by placement (see Table below). Source details for figures and tables should be mentioned irrespective of whether or not they require permissions.
- All photographs and scanned images should have a resolution of minimum 300 dpi and 1500 pixels, and their format should be TIFF or JPEG. Due permissions should be taken for copyright-protected photographs/images.

References and their text citations

- References and their citations should be given in accordance with APA 7th edition.
- Please ensure that all references mentioned in the reference list are cited in the text and vice versa.

For detailed style guidelines, please visit https://nujbms.nirmauni.ac.in/

Spectrum Journals | NIRMA UNIVERSITY INSTITUTE OF MANAGEMENT NAAC ACCREDITED 'A+' GRADE

Powered by Sage