

RESOURCE CONSTRAINTS AND EMPLOYEE FRUGAL INNOVATION BEHAVIOR: THE MEDIATING ROLE OF CREATIVE SELF-EFFICACY AND THE MODERATING ROLE OF ENTREPRENEURIAL LEADERSHIP

Dr. Ajmal Inayat^{*1}, Dr. Haseeb Hassan², Kaleem Saifullah³

^{*1,3}Lecturer, Department of Management Sciences, Hazara University Mansehra

²Assistant Professor, Department of Management Sciences, Hazara University, Mansehra,

^{*1}ajmalinayat@gmail.com; ²haseebhssn@gmail.com; ³kaleem@hu.edu.pk

Corresponding Author: *

Farida Siddique

DOI: <https://doi.org/10.5281/zenodo.17139404>

Received	Revised	Accepted	Published
16 June 2025	20 August, 2025	31 August 2025	17 September 2025

ABSTRACT

Small and medium-sized enterprises (SMEs) frequently face persistent resource constraints, which are often perceived as barriers to innovation. However, emerging research suggests that scarcity can also act as a catalyst for creativity by compelling employees to adopt frugal approaches to problem-solving. Drawing on Conservation of Resources (COR) theory, this study examines the relationship between resource constraints and employee frugal innovation behavior, with creative self-efficacy as a mediating mechanism and entrepreneurial leadership as a moderating factor. Data were collected from 310 employees working in SMEs across the hospitality, textiles, and technology sectors. Using structural equation modeling and Hayes' PROCESS macro, the findings reveal that resource constraints positively influence frugal innovation behavior, and this relationship is partially mediated by creative self-efficacy. Furthermore, entrepreneurial leadership strengthens the positive link between resource constraints and employee frugal innovation behavior, highlighting the role of leadership in transforming scarcity into opportunity. The study contributes theoretically by extending COR theory to the context of employee-level frugal innovation, illustrating how employees activate psychological resources under conditions of scarcity. Practically, it provides valuable insights for SME leaders and policymakers, emphasizing the importance of enhancing creative self-efficacy and adopting entrepreneurial leadership practices to harness constraints as drivers of innovation. Overall, this research advances understanding of how SMEs can leverage limitations to build sustainable competitiveness in resource-scarce environments.

Keywords: Resource constraints, Frugal innovation behavior, Creative self-efficacy, Entrepreneurial leadership, SMEs, COR theory

INTRODUCTION

Small and medium-sized enterprises (SMEs) are increasingly acknowledged as vital contributors to economic growth, job creation, and sustainable development across the globe (OECD, 2023). In emerging economies, where institutional infrastructures are often weak and multinational corporations dominate key markets, SMEs account for more than 90% of business activity and nearly 70% of

employment (World Bank, 2022). Despite their strategic importance, SMEs are persistently challenged by resource constraints—including limited financial capital, inadequate technological infrastructure, scarcity of skilled labor, and restricted access to international markets (George et al., 2016; Wu et al., 2022). These constraints hinder SMEs from competing on equal footing with larger firms.

However, scholars increasingly argue that resource constraints do not always act as barriers but can also stimulate innovation by compelling firms and employees to “do more with less” through creative problem solving (Radjou & Prabhu, 2015). In this regard, frugal innovation behavior has gained attention as a unique adaptive response to scarcity. Unlike traditional innovation, which often depends on abundant R&D resources, frugal innovation emphasizes affordability, efficiency, and contextual fit (Rosca et al., 2017).

While organizational-level frugal innovation has been well-documented in the literature, employee-level behaviors driving such outcomes remain relatively underexplored. Employees in SMEs often operate under ambiguous roles, multitasking across functions, and working directly with limited resources—making them central to the firm’s adaptive capacity (Ahuja et al., 2020). Yet, how individual employees translate resource constraints into frugal innovation behavior is still poorly understood. Initial research suggests that employees’ creative self-efficacy (CSE)—their confidence in generating novel solutions—may play a pivotal mediating role (Tierney & Farmer, 2002; Newman et al., 2018). When employees believe in their creative capacity, they are more likely to experiment, improvise, and reconfigure available resources into innovative outcomes. This aligns with the growing recognition that individual-level psychological mechanisms can explain why some employees thrive under constraints while others succumb to frustration (Anderson et al., 2014). However, empirical studies specifically examining CSE as a mediator between resource constraints and frugal innovation behavior in SMEs remain scarce. In addition to individual cognition, contextual factors—particularly leadership—play a decisive role in shaping how employees respond to scarcity. Research in organizational behavior highlights that leaders can either exacerbate resource pressures through rigid control or transform constraints into opportunities by fostering adaptability and risk-taking (Hmieleski et al., 2013). Entrepreneurial leadership has emerged as a leadership style highly relevant to SMEs. Characterized by opportunity recognition, proactive risk-taking, and empowering subordinates (Renko et al.,

2015), entrepreneurial leadership can serve as a boundary condition that determines whether resource constraints enhance or hinder innovation. In SMEs, where leaders often work in close proximity with employees, their influence is particularly salient. Entrepreneurial leaders encourage employees to experiment, embrace failure as part of the learning process, and view constraints not as limitations but as opportunities to innovate creatively (Leitch & Volery, 2017). Despite its importance, the moderating role of entrepreneurial leadership in the resource constraints–frugal innovation link has not yet received adequate empirical attention, especially in the SME context.

The existing literature provides valuable insights into the negative impacts of resource constraints on SME performance (George et al., 2016; Wu et al., 2022) and has also begun to recognize frugal innovation as a promising strategy for resource-limited contexts (Radjou & Prabhu, 2015; Rosca et al., 2017). However, three key gaps persist. First, prior studies largely examine frugal innovation from a firm or managerial perspective, overlooking the individual employees who act as the primary agents of innovation in SMEs (Ahuja et al., 2020). Second, while creativity and improvisation are acknowledged in frugal innovation, few studies empirically investigate creative self-efficacy as the mediating psychological mechanism that links resource constraints to employee innovation (Newman et al., 2018). Third, leadership is recognized as a driver of innovation in SMEs, yet the specific role of entrepreneurial leadership in moderating how employees translate resource scarcity into frugal innovation behavior remains unexplored (Renko et al., 2015). Addressing these gaps, this study proposes and tests a model in which creative self-efficacy mediates the relationship between resource constraints and employee frugal innovation behavior, while entrepreneurial leadership moderates this process in SMEs. This research contributes to the literature in three important ways. First, it extends the frugal innovation literature by shifting the focus from organizational to employee-level behaviors, recognizing employees as central actors in SME innovation. Second, it enriches organizational behavior research by highlighting creative self-efficacy as

a critical psychological mechanism enabling innovation under resource constraints. Third, it advances leadership studies by demonstrating the moderating influence of entrepreneurial leadership, thereby offering practical insights into how SME leaders can transform scarcity into an engine of innovation.

The study is underpinned by Conservation of Resources (COR) theory (Hobfoll, 1989, 2011), which posits that individuals strive to acquire, maintain, and leverage resources to cope with stressors and achieve valued outcomes. Resource constraints can be viewed as stressors that deplete external resources but simultaneously activate compensatory mechanisms, whereby individuals rely on psychological resources such as creative self-efficacy to generate adaptive solutions (Halbesleben et al., 2014). In line with COR, employees experiencing resource scarcity may engage in frugal innovation behavior when they mobilize internal resources to counteract external limitations. Moreover, COR theory emphasizes the importance of supportive environments in shaping resource gain spirals. Entrepreneurial leadership, by providing vision, empowerment, and tolerance for risk, fosters a context that amplifies employees' psychological resources and enables them to innovate despite scarcity. Thus, integrating COR theory with entrepreneurial leadership perspectives provides a robust explanatory framework for understanding how resource-constrained SMEs can foster employee-level frugal innovation behavior.

Resource Constraints and Employee Frugal Innovation Behavior

Small and medium-sized enterprises (SMEs) face persistent challenges that threaten their growth and sustainability, with resource constraints being among the most critical. Operating with limited financial, human, and technological capital, SMEs often struggle to compete with larger firms that benefit from economies of scale and abundant resources (George et al., 2016; Wu et al., 2022). Traditionally, resource scarcity has been perceived as a major obstacle to innovation, given the reduced ability of firms to invest in research and development, advanced technologies, or highly skilled personnel (Baker

& Nelson, 2005). However, emerging research suggests that constraints do not always function as barriers. Instead, scarcity can paradoxically stimulate creativity by compelling employees to think differently, improvise, and make optimal use of available resources (Radjou & Prabhu, 2015). This perspective reframes constraints not as limitations but as triggers that encourage employees to develop frugal innovation behavior, which involves creating affordable, efficient, and context-specific solutions with minimal inputs (Rosca et al., 2017).

At the employee level, frugal innovation behavior is closely linked with adaptive responses such as improvisation, resource reconfiguration, and cost-conscious creativity (Ahuja et al., 2020). Employees working in SMEs are particularly exposed to resource scarcity, often multitasking across diverse functions and operating under uncertain conditions, which increases their reliance on frugal approaches (Bhatti et al., 2018). Research shows that scarcity pressures can push employees to experiment, reimagine existing processes, and adapt available inputs to meet organizational goals (Gibbert et al., 2007; Cadeddu & Taisch, 2021). Baker and Nelson (2005), for example, highlighted how firms operating in resource-limited environments innovated through "bricolage," wherein employees creatively recombined limited resources to generate workable solutions. These findings suggest that scarcity, rather than simply restricting innovation, can stimulate resourceful and frugal problem-solving. Nevertheless, the literature also presents a more cautious view. Some studies highlight that resource scarcity, if extreme or prolonged, can produce counterproductive outcomes such as heightened stress, reduced motivation, disengagement, and even avoidance of experimentation (Amabile, 1996; Andriopoulos & Lewis, 2009). This indicates that the effects of resource constraints on innovation are not uniformly positive and may depend on the broader context as well as employee-level psychological factors. In SMEs, however, resource constraints are not occasional disruptions but rather an inherent and enduring condition of business operation. Consequently, employees in such organizations may normalize scarcity and use it as a basis for

developing survival strategies, with frugal innovation behavior emerging as one of the most effective responses (Rosca et al., 2017). This dynamic can be better understood through the lens of Conservation of Resources (COR) theory, which argues that individuals strive to acquire, preserve, and optimize resources in the face of threats or depletion (Hobfoll, 1989, 2011). From this perspective, resource scarcity acts as a stressor that threatens the availability of valued assets. Instead of succumbing to depletion, employees mobilize psychological and cognitive strategies to cope with constraints, leading them to innovate in cost-effective and resource-efficient ways (Halbesleben et al., 2014). COR theory further explains that such adaptive behaviors can create “resource gain spirals,” whereby employees’ frugal solutions generate organizational value, replenish scarce resources, and sustain long-term competitiveness. Accordingly, resource constraints, when approached proactively, can stimulate employees to engage in frugal innovation behavior, especially in SMEs where creative adaptation is vital for survival and growth.

Based on this discussion, it is reasonable to hypothesize that:

H1: Resource constraints are positively related to employee frugal innovation behavior.

The Mediating Role of Creative Self-Efficacy

Innovation within organizations has long been understood as not only a product of structural or resource-related factors but also deeply shaped by the psychological states of employees. In the context of SMEs, where resource scarcity is an everyday reality, the way employees perceive their own creative abilities plays a decisive role in determining whether constraints hinder or stimulate innovative outcomes. Creative self-efficacy, defined as an individual’s belief in their capacity to produce creative ideas and solutions, has emerged as a critical mechanism linking external challenges to innovative behavior (Tierney & Farmer, 2002; Newman et al., 2018). When employees hold strong creative self-efficacy, they are more confident in their ability to experiment, improvise, and transform limited resources into novel solutions, which makes them more likely to engage in frugal innovation behavior. Prior

studies have shown that perceptions of resource scarcity can trigger employees to draw more heavily on their self-beliefs and inner resourcefulness. For instance, when faced with constraints, individuals with higher creative self-efficacy are more likely to approach problems with persistence, flexibility, and optimism, which enhances their ability to reconfigure existing resources in affordable and effective ways (Gong et al., 2009; Hsu et al., 2011). Conversely, employees with low creative self-efficacy may interpret the same constraints as insurmountable barriers, leading to disengagement or avoidance of innovative behavior (Zhang & Bartol, 2010). Thus, creative self-efficacy acts as the psychological bridge through which external scarcity translates into constructive employee-level responses such as frugal innovation. This mediating role can also be explained through Conservation of Resources (COR) theory, which emphasizes that individuals faced with resource loss or threats rely on psychological resources to cope and adapt (Hobfoll, 1989, 2011). Resource constraints represent a form of external stressor, but employees with high creative self-efficacy can compensate by mobilizing internal psychological resources. In this sense, creative self-efficacy allows individuals to transform scarcity into opportunity by enabling them to generate novel solutions with minimal inputs. Moreover, the process can trigger resource gain spirals, as the innovative solutions derived from employee creativity replenish organizational resources and reduce the intensity of constraints over time (Halbesleben et al., 2014). Therefore, creative self-efficacy provides a compelling explanation for why resource scarcity may not only fail to inhibit innovation but can, under the right conditions, act as a stimulus for frugal innovation behavior in SMEs.

Based on this reasoning, it is proposed that:

H2: Creative self-efficacy mediates the relationship between resource constraints and employee frugal innovation behavior.

Moderating Role of Entrepreneurial Leadership

While individual psychological resources such as creative self-efficacy are vital in explaining how employees respond to constraints,

contextual factors also play a critical role in determining whether scarcity leads to innovation or stagnation. Among these, leadership is particularly influential in SMEs, where employees work in close proximity to their leaders and decision-making processes are less formalized. Entrepreneurial leadership, defined as a leadership style that emphasizes opportunity recognition, risk-taking, and empowerment, has been identified as especially relevant in resource-constrained environments (Renko et al., 2015). Leaders who exhibit entrepreneurial qualities not only encourage employees to experiment with limited resources but also provide the confidence and autonomy necessary for employees to pursue unconventional solutions. Previous studies suggest that leadership can serve as a boundary condition in shaping the effects of resource scarcity on innovation. Leaders who rely on rigid control or punitive responses may intensify the negative consequences of resource constraints, such as stress and disengagement, thereby suppressing innovative efforts (Hmieleski et al., 2013). In contrast, entrepreneurial leaders encourage improvisation, tolerate failure, and foster a culture of experimentation, which makes employees more willing to transform constraints into opportunities (Leitch & Volery, 2017). By signaling openness to new ideas and rewarding proactive behaviors,

entrepreneurial leadership creates a supportive environment in which employees' creative self-efficacy can be activated and directed toward frugal innovation behavior. This moderate influence can also be explained using the Conservation of Resources (COR) theory. According to COR, external resources provided by leaders, such as support, encouragement, and empowerment, can reduce the stress of scarcity and enhance employees' ability to mobilize internal psychological resources (Hobfoll, 2011). Entrepreneurial leaders effectively expand the resources available to employees, not necessarily by providing material resources but by strengthening psychological and social resources. This leadership style transforms the threatening aspects of scarcity into challenges that employees feel capable of tackling, thereby amplifying the positive link between resource constraints and frugal innovation behavior. Thus, entrepreneurial leadership acts as a catalyst, enabling employees in SMEs to convert adversity into innovative responses that sustain organizational performance.

Based on this discussion, the following hypothesis is proposed:

H3: Entrepreneurial leadership moderates the relationship between resource constraints and employee frugal innovation behavior, such that the relationship is stronger under high levels of entrepreneurial leadership.

Conceptual Framework

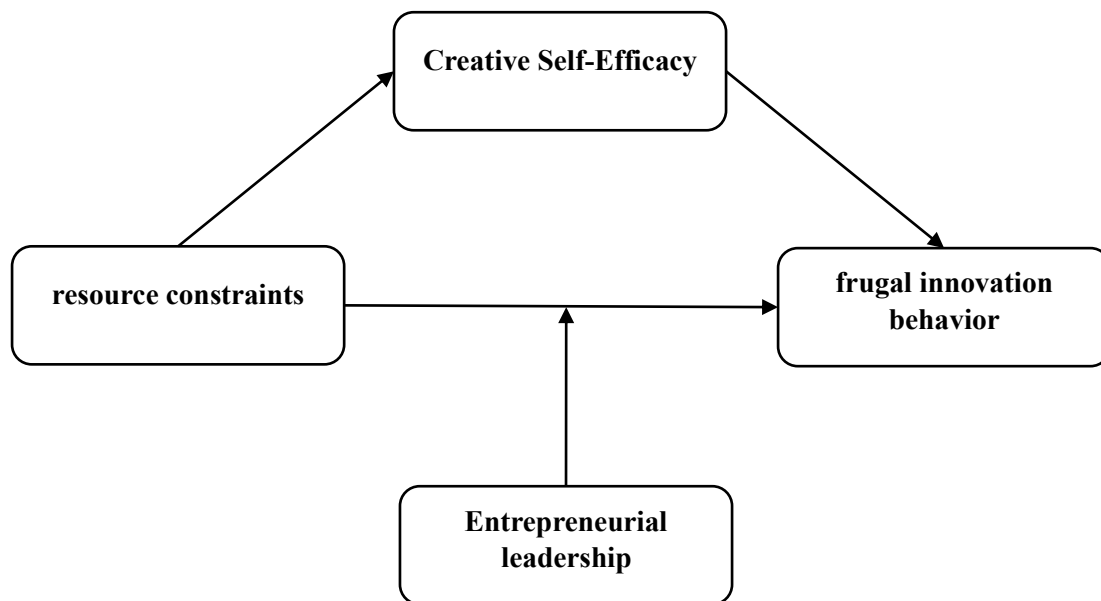


Figure No. 1: Conceptual Framework

Methodology

Research Design

This study adopts a quantitative, cross-sectional research design to examine the relationships among resource constraints, creative self-efficacy, entrepreneurial leadership, and employee frugal innovation behavior in small and medium-sized enterprises (SMEs). A structured questionnaire was developed using previously validated scales and administered to employees working in SMEs across the service and manufacturing sectors. The cross-sectional approach is appropriate because it enables the collection of data from a large sample at a single point in time, thereby allowing the testing of hypothesized relationships through statistical modeling (Creswell, 2014).

Population and Sample

The target population for this study consisted of employees working in SMEs, as these firms frequently operate under resource-constrained conditions and rely heavily on employee innovation for survival and growth. SMEs were identified based on national definitions, considering firms with fewer than 250 employees. Data were collected using purposive sampling, targeting firms in sectors such as hospitality, textiles, and technology services, which are known for high resource dependence and frequent innovation demands. A total of 350 questionnaires were distributed, and after

excluding incomplete responses, 310 usable responses were retained for analysis, yielding a response rate of approximately 88%. This sample size meets the minimum requirements for structural equation modeling, ensuring sufficient statistical power (Hair et al., 2019). The demographic characteristics of respondents further highlight the diversity of the sample. Among the 310 employees, 62% were male and 38% female, reflecting the gender composition of many SMEs. In terms of age distribution, the majority (47%) were between 26 and 35 years, 30% were between 36 and 45 years, 15% were below 25 years, and 8% were above 45 years. Regarding education, 54% held a bachelor's degree, 32% a master's degree, and 14% reported diplomas or intermediate qualifications. With respect to tenure, 41% of respondents had been working in their current organizations for less than 3 years, 37% had between 3 and 7 years of experience, and 22% had more than 7 years of service. These demographic insights indicate that the sample comprised a mix of younger and experienced employees with varied educational backgrounds, thereby enhancing the representativeness and generalizability of the findings.

Measures

The following table provides the details of the measures adopted from previous studies along

with the sample items and Cronbach's alpha score.

Table No. 1: Instrumentation

Construct	Scale Source	No. of Items	Sample Item	Cronbach's α
Resource Constraints	George et al. (2016)	5	"Our organization lacks sufficient resources to carry out innovative projects."	0.82
Creative Self-Efficacy (CSE)	Tierney & Farmer (2002)	6	"I have confidence in my ability to solve problems creatively."	0.88
Entrepreneurial Leadership	Renko et al. (2015)	8	"My leader encourages me to take risks when pursuing new opportunities."	0.90
Employee Frugal Innovation Behavior	Rosca et al. (2017); Bhatti et al. (2018)	6	"I often find low-cost solutions to problems by using resources in new ways."	0.85

Data Analysis

Data were analyzed using a two-step approach as recommended by Anderson and Gerbing (1988). In the first step, Confirmatory Factor Analysis (CFA) was conducted to assess the measurement model and evaluate the reliability and validity of the constructs. Convergent validity was established by ensuring that factor loadings exceeded the recommended threshold of 0.50, average variance extracted (AVE) values were above 0.50, and composite reliability (CR) values were greater than 0.70 (Fornell & Larcker, 1981). Discriminant validity was examined by comparing the square root of AVE with the inter-construct correlations, and by employing the Heterotrait-Monotrait ratio (HTMT) criterion, with values below 0.85 indicating acceptable discriminant validity (Henseler et al., 2015). In the second step, the structural model was tested using Structural Equation Modeling (SEM) with maximum likelihood estimation. SEM was employed to evaluate the hypothesized relationships among resource constraints, creative self-efficacy, entrepreneurial leadership, and employee frugal innovation behavior. The mediating effect of creative self-efficacy was tested using the bootstrapping method with 5,000 resamples, which provides bias-corrected confidence intervals for indirect effects (Preacher & Hayes, 2008). The moderating role

of entrepreneurial leadership was examined through an interaction term approach, where the interaction between resource constraints and entrepreneurial leadership was tested for its impact on employee frugal innovation behavior. Model fit was assessed using multiple indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Following Hu and Bentler's (1999) guidelines, values of CFI and TLI greater than 0.90, RMSEA less than 0.08, and SRMR below 0.08 were considered indicative of good model fit. Control variables such as age, gender, and organizational tenure were also included in the analysis to rule out potential confounding effects.

Descriptive Statistics and Inter-Construct Correlation

Table 1 presents the means, standard deviations, reliabilities, and inter-construct correlations for all study variables. The results indicate that all constructs demonstrated good internal consistency, with Cronbach's alpha values above the recommended threshold of 0.70. The correlations show that resource constraints were positively related to employee frugal innovation behavior, and creative self-efficacy was strongly correlated with both

resource constraints and frugal innovation behavior. Entrepreneurial leadership also showed significant positive associations with

creative self-efficacy and frugal innovation behavior, providing initial support for the hypothesized relationships.

Table No. 2: Descriptive Statistics and Correlation

Variable	Mean	SD	α	1	2	3	4
1. Resource Constraints	3.42	0.71	0.82	1			
2. Creative Self-Efficacy	3.65	0.76	0.88	0.41**	1		
3. Entrepreneurial Leadership	3.58	0.69	0.90	0.36**	0.44**	1	
4. Employee Frugal Innovation Behavior	3.73	0.74	0.85	0.48**	0.52**	0.46**	1

Model fitness explanation:

The results in Table 3 show that the hypothesized four-factor model provides the best fit to the data ($\chi^2/df = 2.21$, CFI = 0.93, TLI = 0.91, RMSEA = 0.06, SRMR = 0.05), meeting conventional thresholds for acceptable model fit (Hu & Bentler, 1999). In contrast, the alternative models (one-factor, two-factor, and three-factor) demonstrated significantly poorer fit, suggesting that the constructs of resource constraints, creative self-efficacy, entrepreneurial leadership, and employee frugal innovation behavior are empirically distinct. These results provide strong evidence of discriminant validity among the study variables.

Table No. 3: Model Fitness

Model	χ^2/df	CFI	TLI	RMSEA	SRMR
One-factor model	6.12	0.61	0.57	0.14	0.12
Two-factor model	4.73	0.73	0.70	0.11	0.10
Three-factor model	3.85	0.81	0.78	0.09	0.08
Hypothesized four-factor model	2.21	0.93	0.91	0.06	0.05

Note: χ^2/df = Chi-square/degree of freedom ratio; CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Parallel Mediation Analysis using Andrew Hayes' PROCESS Macro (Model 4)

The results in Table 3 show that resource constraints had a significant **direct effect** on employee frugal innovation behavior ($\beta = 0.32$, $p < 0.01$). Resource constraints also positively predicted creative self-efficacy ($\beta = 0.28$, $p < 0.01$), which in turn significantly predicted frugal innovation behavior ($\beta = 0.35$, $p < 0.001$). The **indirect effect** through creative self-efficacy ($\beta = 0.10$, 95% CI [0.05, 0.17]) was significant, as the confidence interval did not include zero. This confirms that creative self-efficacy partially mediates the relationship between resource constraints and employee frugal innovation behavior.

Table No. 4: Result Summary

Path	β	SE	t	p	95% CI (LL–UL)
Resource Constraints → Frugal Innovation (Direct Effect)	0.32	0.08	4.00	0.001	[0.16, 0.48]
Resource Constraints → Creative Self-Efficacy	0.28	0.07	4.00	0.001	[0.14, 0.42]
Creative Self-Efficacy → Frugal Innovation	0.35	0.06	5.83	0.000	[0.23, 0.47]
Indirect Effect (RC → CSE → FIB)	0.10	0.03	—	—	[0.05, 0.17]

Discussion

The primary objective of this study was to examine how resource constraints shape employee frugal innovation behavior in SMEs,

and to explore the mediating role of creative self-efficacy and the moderating role of entrepreneurial leadership. The findings provide strong support for all proposed

hypotheses, offering both theoretical and practical insights into how scarcity conditions can be transformed into opportunities for innovation.

First, the results confirm that resource constraints positively predict employee frugal innovation behavior, supporting H1. This finding aligns with the growing body of research suggesting that scarcity does not necessarily suppress innovation but can instead stimulate creative problem-solving and resource reconfiguration (Radjou & Prabhu, 2015; Rosca et al., 2017). Consistent with Baker and Nelson's (2005) concept of bricolage, employees in resource-constrained SMEs find alternative ways of achieving goals by recombining limited resources in novel forms. However, this study extends the literature by offering empirical evidence at the employee level, whereas prior work has primarily examined frugal innovation at the organizational or managerial level (George et al., 2016; Wu et al., 2022).

Second, the study demonstrates that creative self-efficacy mediates the relationship between resource constraints and employee frugal innovation behavior, supporting H2. This suggests that when employees face scarcity, they build confidence in their creative capabilities, which in turn enables them to design cost-effective and innovative solutions. This result echoes earlier work by Tierney and Farmer (2002) and Newman et al. (2018), who emphasized the role of self-belief in stimulating creativity and innovation. Importantly, while prior studies highlight creative self-efficacy as a general predictor of innovation, our findings uniquely position it as a psychological mechanism that translates external constraints into frugal innovation outcomes in SMEs.

Third, the findings reveal that entrepreneurial leadership moderates the relationship between resource constraints and creative self-efficacy, such that employees working under leaders who promote risk-taking, opportunity recognition, and empowerment are more likely to channel scarcity pressures into innovative outcomes. This supports H3 and is consistent with earlier studies suggesting that leadership is critical in shaping employee responses to uncertainty and limited resources (Renko et al., 2015; Leitch & Volery, 2017). Our results expand on Hmieleski

et al. (2013), who emphasized entrepreneurial leadership as a driver of innovation, by showing that its influence becomes particularly salient under conditions of scarcity—precisely the context where SMEs operate most frequently.

Taken together, these findings contribute to literature by providing a more nuanced understanding of how and when resource constraints can foster innovation at the employee level. While some scholars have argued that prolonged scarcity hinders innovation by inducing stress and limiting experimentation (Amabile, 1996; Andriopoulos & Lewis, 2009), our study shows that in SME contexts—where scarcity is often normalized, employees can adapt positively, especially when supported by entrepreneurial leaders.

Finally, the results are theoretically grounded in Conservation of Resources (COR) theory (Hobfoll, 1989, 2011). According to COR, individuals strive to acquire, preserve, and leverage resources in the face of stressors. Resource constraints, although threatening, can trigger compensatory mechanisms in which employees mobilize internal psychological resources, such as creative self-efficacy, to protect and extend the value of limited resources (Halbesleben et al., 2014). Entrepreneurial leadership, in turn, strengthens these gain spirals by empowering employees with a vision and tolerance for experimentation, enabling them to turn scarcity into an opportunity for innovation. Thus, the study not only confirms the applicability of COR theory in SME contexts but also extends it by integrating leadership as a boundary condition that amplifies resource-driven innovation outcomes.

Contributions

This study makes significant contributions to both theory and practice in the domains of organizational behavior, leadership, and innovation within SMEs. It extends the frugal innovation literature by shifting the focus from the organizational level to the employee level, showing that individual employees can act as key drivers of innovation in resource-constrained environments. While prior studies emphasized firm-level strategies (George et al., 2016; Rosca et al., 2017), this research

highlights how employees themselves engage in frugal innovation behavior.

The study also advances understanding of the role of creative self-efficacy as a mediating mechanism. Although self-efficacy has been well established in creative research (Tierney & Farmer, 2002), this study empirically demonstrates how it translates resource constraints into employee innovation outcomes, offering fresh insights into psychological processes that drive frugal innovation. In addition, it contributes to leadership research by identifying the moderating role of entrepreneurial leadership. While entrepreneurial leadership has been associated with SME growth (Renko et al., 2015), this study shows how such leadership strengthens the impact of resource constraints on employee innovation through the lens of Conservation of Resources (COR) theory. This integration enriches the theoretical understanding of how leaders can transform scarcity into opportunity.

From a practical perspective, the study provides actionable insights on how to harness constraints as opportunities for innovation. Leaders should focus on strengthening employees' creative self-efficacy through training, problem-solving workshops, and recognition of innovative efforts. Adopting entrepreneurial leadership practices—such as empowering employees, encouraging risk-taking, and rewarding resourceful solutions—can convert limitations into platforms for innovation. Finally, policymakers and SME support organizations can design initiatives that help SMEs cultivate leadership capacity and foster employee creativity to enhance competitiveness under resource scarcity.

Practical Implications

This study offers several practical implications for SMEs operating in resource-constrained environments. First, it demonstrates that resource scarcity, rather than being solely a barrier, can be strategically leveraged to stimulate employee frugal innovation behavior. Managers should therefore foster a workplace culture where constraints are reframed as opportunities for creative problem-solving rather than obstacles to growth. Second, the findings highlight the importance

of enhancing employees' creative self-efficacy. Organizations can invest in skill-development programs, creativity workshops, and innovation challenges that build employees' confidence in their ability to generate novel solutions under limited resources. Recognizing and rewarding employees who develop cost-effective solutions can further strengthen this confidence and sustain innovative behavior.

Third, entrepreneurial leadership emerges as a critical driver of employee innovation. Leaders in SMEs should actively encourage risk-taking, empower employees to experiment with new approaches, and provide autonomy in decision-making. Such leadership behaviors not only enhance employees' willingness to innovate but also ensure that resource constraints are managed proactively rather than defensively.

Finally, policymakers and SME support institutions can design training and capacity-building initiatives that promote entrepreneurial leadership and employee creativity. By institutionalizing practices that encourage resourceful innovation, SMEs can enhance their competitiveness and long-term sustainability in dynamic markets.

Conclusion

This study set out to examine how resource constraints influence employee frugal innovation behavior, with creative self-efficacy acting as a mediator and entrepreneurial leadership serving as a moderator in the context of SMEs. The findings confirm that resource constraints, often viewed as barriers, can in fact stimulate innovation when employees are equipped with the confidence to generate creative solutions and are guided by entrepreneurial leaders who frame scarcity as opportunity. By integrating these mechanisms, the research provides a deeper understanding of how SMEs can transform limitations into platforms for sustainable competitiveness.

The study contributes to theory by extending the application of Conservation of Resources (COR) theory, illustrating how employees under resource scarcity activate gain spirals through frugal innovation. It further highlights the psychological and leadership processes that bridge the gap between constraints and innovative outcomes, offering a more nuanced

perspective on resource-constrained innovation in SMEs.

From a practical standpoint, the study emphasizes the importance of building employees' creative self-efficacy and fostering entrepreneurial leadership practices that empower, inspire, and reward resourceful problem-solving. For SMEs that frequently face financial and operational limitations, these insights offer concrete strategies to harness constraints as drivers of innovation.

Limitations and Future Research

Despite its contributions, this study is not without limitations, which open avenues for future research. First, the data were collected using a cross-sectional survey design, which limits the ability to make strong causal inferences between resource constraints, creative self-efficacy, entrepreneurial leadership, and frugal innovation behavior. Future studies could employ longitudinal or experimental designs to capture the dynamic processes through which constraints evolve into innovation over time.

Second, the research relied on self-reported data from employees, which may introduce common method bias or social desirability bias. Future research could incorporate multi-source data, such as supervisor ratings or objective measures of innovation outcomes, to enhance the robustness of findings.

Third, the study was conducted in SMEs within selected sectors, such as hospitality, textiles, and technology services. While these industries are highly relevant to the theme of resource scarcity, the results may not be fully generalizable to larger firms or industries with abundant resources. Comparative studies across different firm sizes and sectors would provide richer insights into whether frugal innovation behaviors are context-specific.

Finally, although this study examined creative self-efficacy and entrepreneurial leadership as key mechanisms, other individual and organizational factors—such as resilience, psychological empowerment, or organizational culture—may also shape the relationship between resource constraints and innovation. Future research could integrate these variables into extended models to deepen the

understanding of employee-level frugal innovation.

REFERENCES

- Ahuja, S., Akhtar, S., & Wali, O. P. (2020). Frugal innovation: A review and research agenda. *Journal of Cleaner Production*, 252, 119727. <https://doi.org/10.1016/j.jclepro.2019.119727>
- Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Westview Press.
- Anderson, N., Potočník, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297–1333. <https://doi.org/10.1177/0149206314527128>
- Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-exploration tensions and organizational ambidexterity: Managing paradoxes of innovation. *Organization Science*, 20(4), 696–717. <https://doi.org/10.1287/orsc.1080.0406>
- Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50(3), 329–366. <https://doi.org/10.2189/asqu.2005.50.3.329>
- Bhatti, Y. A., Basu, R., Barron, D., Jain, R. K., & Corredoira, R. A. (2018). Frugal innovation: Models, means, methods. *Cambridge Journal of Economics*, 42(3), 657–681. <https://doi.org/10.1093/cje/bex075>
- Cadeddu, C., & Taisch, M. (2021). The role of frugal innovation in achieving sustainable development goals: Insights from the literature. *Sustainability*, 13(3), 1156. <https://doi.org/10.3390/su13031156>
- George, G., Howard-Grenville, J., Joshi, A., & Tihanyi, L. (2016). Understanding and tackling societal grand challenges through management research. *Academy of Management Journal*, 59(6), 1880–1895. <https://doi.org/10.5465/amj.2016.4007>
- Gibbert, M., Hoegl, M., & Välikangas, L. (2007). In praise of resource constraints.

- MIT Sloan Management Review, 48(3), 15–17.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Halbesleben, J. R. B., Neveu, J. P., Paustian-Underdahl, S. C., & Westman, M. (2014). Getting to the “COR”: Understanding the role of resources in conservation of resources theory. *Journal of Management*, 40(5), 1334–1364. <https://doi.org/10.1177/0149206314527130>
- Hmieleski, K. M., Cole, M. S., & Baron, R. A. (2013). Shared authentic leadership and new venture performance. *Journal of Management*, 39(5), 1476–1499. <https://doi.org/10.1177/0149206311415419>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Hobfoll, S. E. (2011). Conservation of resource caravans and engaged settings. *Journal of Occupational and Organizational Psychology*, 84(1), 116–122. <https://doi.org/10.1111/j.2044-8325.2010.02016.x>
- Leitch, C. M., & Volery, T. (2017). Entrepreneurial leadership: Insights and directions. *International Small Business Journal*, 35(2), 147–156. <https://doi.org/10.1177/0266242616681397>
- Ibrahim, S. (2022). Driving eco-innovation through green transformational leadership: The power of employee voluntary green behavior. *Qlantic Journal of Social Sciences and Humanities*, 3(2), 59–76.
- Ibrahim, S., Waseem, M., & Scholar, I. P. (2025). Leading Green, Innovating Clean: Exploring the Path from Transformational Leadership to Eco-Innovation through Employee Behavior. *Journal of Business and Management Research*, 4(1), 995–1029.
- Ibrahim, S., & Khan, R. U. (2025). From Sharing To Shaping: Investigating The Link Between Knowledge Exchange And Innovative Work Behaviour Among Educators. *Journal of Business and Management Research*, 4(3), 1–14.
- Newman, A., Tse, H. H. M., Schwarz, G., & Nielsen, I. (2018). The effects of employees’ creative self-efficacy on innovative behavior: The role of entrepreneurial leadership. *Journal of Business Research*, 89, 1–9. <https://doi.org/10.1016/j.jbusres.2018.04.001>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- OECD. (2023). *Financing SMEs and entrepreneurs 2023: An OECD scoreboard*. OECD Publishing. <https://doi.org/10.1787/61bb7a6c-en>
- Radjou, N., & Prabhu, J. (2015). *Frugal innovation: How to do more with less*. The Economist Books.
- Renko, M., El Tarabishy, A., Carsrud, A. L., & Brännback, M. (2015). Understanding and measuring entrepreneurial leadership style. *Journal of Small Business Management*, 53(1), 54–74. <https://doi.org/10.1111/jsbm.12086>
- Rosca, E., Arnold, M., & Bendul, J. C. (2017). Business models for sustainable innovation—An empirical analysis of frugal products and services. *Journal of Cleaner Production*, 162, S133–S145. <https://doi.org/10.1016/j.jclepro.2016.02.050>
- Sajid, R. N., Ibrahim, S., Qureshi, J. A., & Rooh, S. (2025). The moderating role of competitiveness on the effect of strategy formulation process on innovation performance dimensions in microfinance banks of Pakistan. *Center for Management Science Research*, 3(3), 835–845.
- Sajid, R. N., Rooh, S., Qureshi, J. A., & Ibrahim, S. (2025). The impact of price competition on profitability and market share dynamics in Pakistan's telecom sector: a quantitative analysis. *Policy Research Journal*, 3(6), 405–410.
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and

- relationship to creative performance. *Academy of Management Journal*, 45(6), 1137-1148.
<https://doi.org/10.2307/3069429>
- World Bank. (2022). *Small and medium enterprises (SMEs) finance: Improving SMEs' access to finance and finding innovative solutions to unlock sources of capital*.
<https://www.worldbank.org/en/topic/sme/finance>
- Wu, J., Ma, Z., & Yang, Z. (2022). Resource constraints and firm innovation: A meta-analysis. *Journal of Business Research*, 139, 1110-1122.
<https://doi.org/10.1016/j.jbusres.2021.10.060>

