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CONTENTS

Leader Organizational Citizenship Behaviour and Perceived Followers Support as Outcomes of Proactive Followership: A Social Exchange Perspective

Sajjad Nawaz Khan* Zaheer Ahmed** Asad Khan*** Hamad Ul Haq Ansari****

Abstract

In recent decades, leadership research has tended to focus on leaders and the role of followers has been given less attention. This study, which uses the social exchange theory, investigates the role of proactive followership in leadership outcomes, considering the moderating influence of individual-level power distance orientation (PDO). Non-probability sampling was employed to tests the proposed hypotheses, 182 respondents participated in the research. The data was analysed using SmartPLS 3. The results showed that proactive followership has a positive effect on leader organizational citizenship behaviour (OCB) and the perceived support of followers. PDO significantly moderates the relationship between proactive followership and leader OCB, with low PDO strengthening the role of proactive followers in shaping leader OCB. These findings suggest that organizations should focus on developing their followers in order to improve leadership outcomes and strengthen relationships.

Keywords: Proactive followership; leadership; power distance; leader OCB; perceived follower support; social exchange theory; organizational behaviour.

JEL Classification: M19, J24

1. Introduction

After more than five decades of research on leadership, it has been acknowledged that leadership and followership are closely related to organisational success (Matshoba-Ramuedzisi et al., 2022; Epitropaki et al., 2017; Leroy et al., 2015; Carsten et al., 2018). Leaders are seen as the primary drivers of an organization; they set long-term strategies, goals, and objectives, design processes and policies, and ensure that their followers follow them to achieve the organization's goals. As a result, much of the previous research on

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leadership has focused on leaders and has given less attention to followers (Tewari et al., 2019; Wallace et al., 2021; Farid et al., 2022; Saleem et al., 2022). While it is important to understand leaders and their roles, it is also crucial to recognize that leaders are not the only ones responsible for organizational success; followers also play a role (Aghaei et al., 2021). Leadership skills are often particularly important in times of crisis, but it is clear that followers also have a role to play in achieving organizational goals.

Essentially, the leadership perspective needs to incorporate the followership perspective, and we ought to recognise that "leadership initiative can't be concentrated separated from followership" (Ronald & Julia, 2021). Identifying the role of followers in leadership behaviour is exceptionally significant. Therefore, followership is gradually gaining popularity and relevance in the leadership domain. Alvesson (2020) detailed the proposal for 'reversing the lens' and downplayed the importance of the role and influence of followers in the leadership process. Leadership cannot succeed without followers, and follower behaviours have become vital knowledge. Behind the success of every organisation, the leaders and followers contribute a vibrant role. According to Bastardoz and Van Vugt, (2019), "On the off chance that leadership involves effectively impacting others, followership involves permitting oneself to be impacted". Research on the subject of 'Leadership' has gained traction following the identification of new study features from the perspective of 'followership'. Several scholars' studied follower's identities and styles (Epitropaki, 2017), follower's behaviour (Siangchokyoo et al., 2020), follower's effect on a leader's emotional level (Wong & Law, 2017), changing leadership behaviour (Khan et al., 2020) and role of followers in the development of leader's perception and motivation (Carsten et al., 2018) demonstrate researchers' attention to this vantage point (Carsten et al., 2018). Consequently, the present study investigates the role of proactive followership in a leader's organisation citizenship behaviour (LOCB) and perceived followers' support. Based on the role orientation perspective of Zhao et al. (2019) and Maden-Eyiusta (2021), Proactive followers contribute ideas and thoughts, discover problems and help solve them, and actively challenge the status quo.

They believe that the active participation of the followers completes the leadership process.Specifically, the paper aims to establish the connection between follower role orientation (proactive followership), LOCB, and perceived followers' support. For example, Vipraprastha et al. (2018) Anand et al. (2018) found that OCB has been the area of strength for a leader's behaviour, either at an individual or group level. Indeed, OCB has been examined broadly as a result of leadership styles, particularly transformational and transactional leadership styles (Alshihabat & Atan, 2020; Young et al., 2021; Kao, 2017; Dewi et al., 2022). On the other hand, no such effort has been made to reverse the lens and investigate the role of followers (proactive followership) in LOCB. According to Hackett et al. (2018), to understand the modelling of leader OCB for the process and effectiveness of leadership. Leader OCB is direct to the group of individuals and can possibly spur the entire

group (Zhang et al., 2023; Liu et al., 2017), which prompts organizational adequacy and effectiveness (Lasrado & Kassem, 2021).

Similarly, A leader's overall sense of workgroup dedication, empowerment and support influences many leadership decisions (Arshad et al., 2022; Singh et al., 2023). Leaders must forestall their team's readiness to work together. Perceived Follower Support is defined by leaders' thoughts that their followers their commitments and care about their prosperity. According to Herttalampi et al. (2023), perceived follower support directs leaders' expectations of follower support in various settings. According to Carsten et al. (2018), When leaders see a belief that directs follower behaviour towards the vision and mission of the organization, they anticipate more positive results. Therefore, the present study attempts to bridge the uncovered areas and understand the proactive followership role in identifying a leader's outcomes (i.e. leader OCB and perceived followers' support).

Considerable research highlighted that within the same society cultural values may differ among individuals (Smith & Bond, 2019; Sarwar et al., 2020), and these individual differences have a profound role in leader-follower relationships. This study further examined individual power distance orientation (PDO) as a moderator to comprehend its role in a leader's outcomes. Bao et al. (2021) and Sarwar et al. (2020), express that to understand its role on the micro-level in organizations. Similarly, it is one of the most essential cultural elements found in almost all cultural frameworks. Thus, it is mandatory that we investigate PDO at the employee level. PDO implies the level to which an individual gives importance to status, authority, and power in an organisation. Culture in Pakistan is moderately high in terms of power distance orientation.

This study was conducted in public sector organisations in Pakistan with tall organisational hierarchies, which resulted in higher power distance. Mansoor et al. (2011) suggested that a distinct feature in Pakistan government organisations is that their "tall structures constituted by many levels of hierarchy" power and authority are centralised at the top of these organizational structures. Job titles carry much weight. Previous studies from a leader-centric perspective highlighted that higher power distance mitigates the positive outcomes of different leadership styles, like Transformational leadership (Shahzad et al., 2024), ethical leadership (Ahmad & Gao, 2018), benevolent leadership (Koveshnikov et al., 2022) and visionary leadership (Luo et al., 2020). Therefore, this study investigates the moderating role of (PDO) from the follower-centric perspective.

In previous studies leadership and its types have been thoroughly examined and studied in the context of organizational success, but the role of followers has been minimally explored. In this given context, the roles of followers focused on the contribution of leadership behaviour and organizational achievement. However, this idea or area has not been investigated earlier.

In a nutshell, to study the impact of proactive followership on leader outcomes, this study followed the role-orientation perspective of followership, which explains the role of followers in leadership by explaining leaders' behavioural and attitudinal outcomes (Carsten et al., 2018; Velez & Neves, 2022). To highlight the role of followership the theoretical framework is based on social exchange theory. First, a theoretical framework followed by research hypotheses was discussed. Second, the methodology and results are provided, followed by the conclusion and contribution. Following are the research questions of the study;

1. What is the impact of proactive followership on leader's OCB?
2. How does PDO moderate the relationship between proactive followership and leader's OCB?
3. What is the impact of proactive followership on Perceived follower support?
4. How does PDO moderate the relationship between proactive followership and perceived follower support?

2. Theoretical Framework

This study relies on social exchange theory (SET) to anchor the theoretical opinions. The basic premise of SET is comprehending the role of leaders and organizations in providing a positive attitude and a feeling of responsibility. SET is pertinent to an endless series of favourable actions started by an organization's treatment of its employees, with the assumption that such conduct will be eventually reciprocal (Gergen 2021; Knapp et al., 2020). According to Nazir et al. (2018), strengthening the relationship between two parties, social exchanges requires a long-term perspective based on continuous exchange and obliged feelings. Understanding SET is based on two notions reciprocal interdependence and self-interests. Before involving in any social interaction, employees review the perceived rewards and the cost associated with tasks. However, this probably won't imply that people try to amplify their advantages (rewards) at the expense of others (Stafford et al., 2014). In leadership scholarship, the focus of SET is relational, which means that a leader must focus on developing a solid relationship with followers (McCauley & Palus, 2021; Uhl-Bien & Carsten, 2022; Jian, 2022).

Conversely, from the followership viewpoint, the role of followers does not get any active consideration in social exchange relationships. Instead, they passively form or control leadership outcomes (Carsten et al., 2018; Khan et al., 2020). The position of followers in leader-member relationships was mostly termed as "targeted individuals or recipients (Cropanzano et al., 2017; Hu et al., 2022). Hence, the present study endeavours to verbalise the followers' part in return connections with the leader by featuring the role of proactive followership in leadership results.

2.1 Proactive Followership and LOCB

Followership entails more than simply following the leader's orders. " Followership is the qualities, activities, and individual process of actions in association with leaders," according to Uhl-Bien et al. (2014). "Strong" co-creation convictions and beliefs describe proactive followership, though "frail" co-creation convictions portray a more detached development (Freeder, 2019; Uhl-Bien et al., 2014). Effective and proactive followers are admired at work, and as a result, they are willing to take on additional responsibilities, look for problems that are not being handled, and reduce the need for intensive supervision (Thompson &Wilson, 2020). In general, leaders' value proactive followers who are enthusiastic about their jobs. Successful leader initiative is the consequence of a collective endeavour of followers. Literature supported the premise that followers can help the leader (Decuypere & Schaufeli, 2020; Ford et al.,2020). Proactive behaviour is the conduct of discretionary extra-role behaviour that is self-stated, future-oriented and consistent (Frese & Fay, 2001).

OCB is another voluntary conduct meant to aid/help with tasks that are not explicitly needed to be completed (Deprez, 2017).Cunningham (2019) considers how followership can generate upward influence based on the bond/relationship between the two. Leader OCB helps to the smooth operation of any organisation (Elche et al., 2020) and is essential for improving social connections and organizational effectiveness at all three levels (Podsakoff et al., 2014). According to Mi et al. (2019), Proactive followers endeavor to lay out an excellent relationship with their bosses, resulting in more OCB and greater job satisfaction. How leaders respond to proactive followership activities is a complicated and persistent issue. The social exchange mechanisms in leader-follower interactions play a role in inducing OCBs in leaders. Therefore, the following hypothesis develops:

H1: Proactive followership significantly affects a Leader's Organizational Citizenship Behaviour.

2.2 Proactive Followership and Perceived Follower Support

Individuals must demonstrate more than just executing assigned activities in the face of volatility and organisational dynamism since survival and success now entail proactivity. Although leaders have conflicting sentiments regarding their followers' proactive behaviour, leaders admire followers who proactively aid them with their job load and stress (Wu & Parker, 2017). For at least two reasons, followers play an active role in the leadership process: first, there is no leader without followers; second, all leaders are followers at times (Ahmad & Loch, 2020). A proactive follower can assist the leader in meeting deadlines, integrating operational activities with corporate goals, sharing experiences to address gaps, and providing a frank stance for needed change.

As a result, when leaders perceive mutual partnership and mission development beliefs of followers are steady with co-growth direction, leaders experience more favourable results (Carsten et al., 2018). A rigorous analysis in an organizational setting is essential to determine how leaders understand proactive followership in general and whether they see the same support and aid. The proactive follower will take the initiative to discuss with their leader if their tasks or performance style are altered. Followers' utilization of voice conduct (endeavors to help the leader or group testing the leader positively) (Lapointe & Vandenberghe, 2018) and innovation development (Chen et al., 2018) developed as followers' way of behaving turned out to be proactive. Given the above conversation, the accompanying hypothesis proposed:

H2: Proactive Followership significantly affects a Leader's Perceived follower's support.

2.2.3 The moderating role of PDO

The validity of unequally dispersed power in institutions and organizations is term as power distance (Puni & Hilton, 2020). It establishes the legality of unequal power distribution in organizations (Amis et al., 2020), which can be seen in the majority of organizations studied and is likely to influence the actions and reactions of subordinates. individuals with a more power distance are all the more mentally dependent on their leader for defining clear objectives and group goals (Miao et al., 2018) and regard their bosses as superiors with elite rank (Merkin & Merkin, 2018). They believe that because they consider themselves inferior, leaders are in charge of directing activities and controlling substantial resources. On the other hand, lower PDO employees regard themselves as equals to leaders and place a premium on fairness (Masih, 2022). PDO may influence subordinates' perceptions of leaders' reactions. Congruence in power-distance orientation between leaders and followers has significant consequences for followers (Cole et al., 2013). Employees with high PDO are submissive, defer to their leaders, consider their leaders to possess more power than what they have and are more willing to accept the organizational relationship (Peltokorpi, 2019).

Instead of contradicting the leader, they accept and obey leaders; these individuals are likely to remain passive compared to low power distance individuals, for whom disagreement and criticism with supervisors are not inappropriate (Mackey et al., 2017; Lin et al., 2013). Leader-centric perspective highlighted that higher power distance extenuates the positive outcomes of different leadership styles, like Transformational leadership (Epitropaki et al., 2020), ethical leadership (Ahmad & Gao, 2018), benevolent leadership (Koveshnikov et al., 2022) and visionary leadership (Luo et al., 2020). Therefore, the present study examined the moderating role of PDO at the individual level from the followers' perspective, and developed the following hypotheses:

H3: Individual-level PDO significantly moderates the relationship between Proactive Followership and Leader's OCB such that when PDO is higher, the relationship between Proactive Followership and Leader's Organizational Citizenship Behaviour will be weaker.

H4: Individual-level PDO significantly moderates the relationship between Proactive Followership and Perceived follower Support such that when PDO is higher, the relationship between Proactive Followership and Perceived follower Support will be weaker.

3. Method

3.1 Sample and Procedure

A bureaucratic structure based on British colonial rule in public sector organization employees took part in the research. The employees are called "civil servants," holding various job titles (Taj, 2017). Independent of their work titles, government employees are perceived in light of their basic pay scale (BPS), going from BPS-1 to BPS-22: the most minimal are BPS-1, while BPS-22 are viewed as the most noteworthy. Also, these organizations are described fundamentally by high power distance. Employees acknowledge inconsistent power distribution and answer well to the top leaders (Huang et al., 2015). For this study, convenience sampling has been employed to get the maximum responses from readily accessible employees. Therefore, the study sample consisted of employees working in Administrative Services, Inland Revenue Services, Pakistan Customs, Office Management Group and Audit and Accounts Service of Pakistan. Questionnaires were distributed among 182 respondents. A total sample size of 182 respondents was collated and it is considered a significant for many social science's statistical analysis (Cohen, 1988).

The study examination does not provide a clear justification on the specific number for power analysis through which the true effects within the data could be detected. 5 points Likert-type scale used as 1 is "Strongly Disagree" and 5 described "Strongly Agree". The respondents consisted of 76.92% of males and 23.08% of females. Age-wise, 29.7% of the respondent's range in the age group of 25-30, and 41.8% belong to the age group of 31-35. Most respondents have a master's level qualification (60.1%), and the majority of respondents fell in the experience bracket of more than 10 years (32.8%) and 1-5 (32.2%).

3.2 Measures

For measuring Proactive Followership, a 10-item shortened version of Bateman and Crant (1993) was used, sample item was "My subordinates in my organization are constantly on the lookout for new ways to improve their life". A leader's OCB was measured by using 14 14-item scale of Podsakoff et al. (1990); the sample item was "Being a leader I willingly give my time to help others (subordinates) who have work-related problems". Perceived follower support was measured with Eisenberger et al. (2004) 5-item scale, i.e. "As a Leader, I feel my subordinates strongly consider my goals and values". Finally, Power Distance Orientation was assessed with an 8-item scale adapted from Earley and Erez (1997) i.e. "In

my organization in most situations, leaders / higher management make decisions without consulting their subordinates".

4. Analytical Approach

PLS-SEM has gained extensive admiration across numerous fields (Cheah et al., 2019; Hair et al., 2017). Cheah et al. (2019) and Hair et al. (2011) argued that PLS-SEM is considered the Holy Grail and silver bullet of advanced research analysis in investigating complex latent variables models. There are two models through which PLS-SEM analyses the data. First is the measurement model (relationship between observed and latent variables) and second is a structural model (relationships between the latent variables) (Hair et al., 2019).

4.1 Assessment of Measurement Model

The measurement model explains that convergent, discriminant validity, internal consistency and indicator reliability are used to assess the validity and reliability. Instrument reliability, convergent and discriminant validity are achieved using composite reliability values, average variance extracted values and Fornell and Lacker (1981) Criterion, respectively. The degree to which each item of the construct is interrelated is explained by the internal consistency, i.e.Composite reliability (CR) (Karstoft et al., 2018). The CR values greater than 0.60 are acceptable; values between 0.70 and 0.90 are satisfactory (Ramayah et al., 2018). In Table 1, the CR Value of each construct is greater than 0.8, supporting that all items under a single construct have a higher inter-item correlation.

Furthermore, to obtain convergent validity, each construct under study requires 50% variance by the assigned items/indicators values (Hair et al., 2017), which is illustrated in Table 1. Table 2 shows the discriminant validity using Fornell and Larker (1981) criterion. The diagonal values are higher than off-diagonal ones, thus highlighting discriminant validity.

Table 1
Measurement model items loading, Composite Reliability and AVE

Construct	CR	AVE
Proactive Followership	0.925	0.555
Leader's Organizational Citizenship Behavior	0.922	0.501
Perceived Follower's Support	0.918	0.692
Power Distance Orientation	0.801	0.507

Note: LOCB7, LOCB9, PDO1, PDO2, PDO3 & PDO8 were deleted due to low loading.

Table 2
Discriminant Validity using Fornell and Lacker Criterian

Construct	LOCB	PDO	PFS	PF
LOCB	0.706			
PDO	-0.145	0.712		
PFS	0.345	0.244	0.832	
PF	0.364	0.027	0.452	0.745

4.2 Structural Model Assessment

To test hypotheses, the structural model provides the capability to try and predict the hypothesized relationships. Table 3 highlights the results generated through 5000 bootstrapping resamples. In table 3, for H1 (β=.36, t>1.65, LLCI (0.234), ULCI (0.477), and H2 (β=.44, t>1.65, LLCI (0.303), ULCI (0.571), shows a significant positive effect of proactive followership on leader OCB and perceived followers support. Hence, it supported H1 and H2. Moreover, for moderation testing, the results of bootstrapping (see table 3) highlighted that PDO significantly moderates the relationship between proactive followership and leader OCB (β= -0.19, t>1.65, LLCI (-0.384), ULCI (-0.014); therefore, H3 is supported. Finally, for H4, table 3 showed (β= -0.02, t<1.65, LLCI (-0.153), ULCI (0.124), which is not significant. Hence, H4 is not supported. Table 3 further highlights the model predictive power i.e. R2 values.

It shows (R2=0.23), and (R2=0.26), indicating weak predictive power (Hair et al., 2011; Henseler et al., 2014). To understand the individual contribution of exogenous variables f2 (effect size) values were generated. Table 3 showed that proactive followership (H1) and the interaction term (H3) showed low effects (f2= 0.17, 0.10), On the other hand, proactive followership (H2) showed a medium effect (f2=0.26), while no effect was found for the interaction term (H4) on perceived follower support. Moreover, to understand the moderating role of PDO between proactive followership and leader OCB a graph was generated at 1 standard deviation above and below the mean (Figure 2).

It shows that when power distance is lower (red line), the relationship between proactive followership and leader OCB is higher and vice versa when the PDO is higher (green line).

Table 3
Hypotheses Testing Results

Relationships	β	SD	T	LLCI	ULCI	R^2	f^2
Proactive Followership -> Leader's OCB	0.36	0.07	4.92	0.234	0.477	0.23	0.17
Power Distance Orientation*Proactive Followership1 -> Leader's OCB	-0.19	0.12	-1.966	-0.385	-0.014		0.10
Proactive Followership -> Per Follower Support	0.44	0.08	5.453	0.303	0.571	0.26	0.26
Power Distance Orientation *Proactive Followership -> Per Follower Support	-0.02	0.08	-0.507	-0.153	0.124		0.00

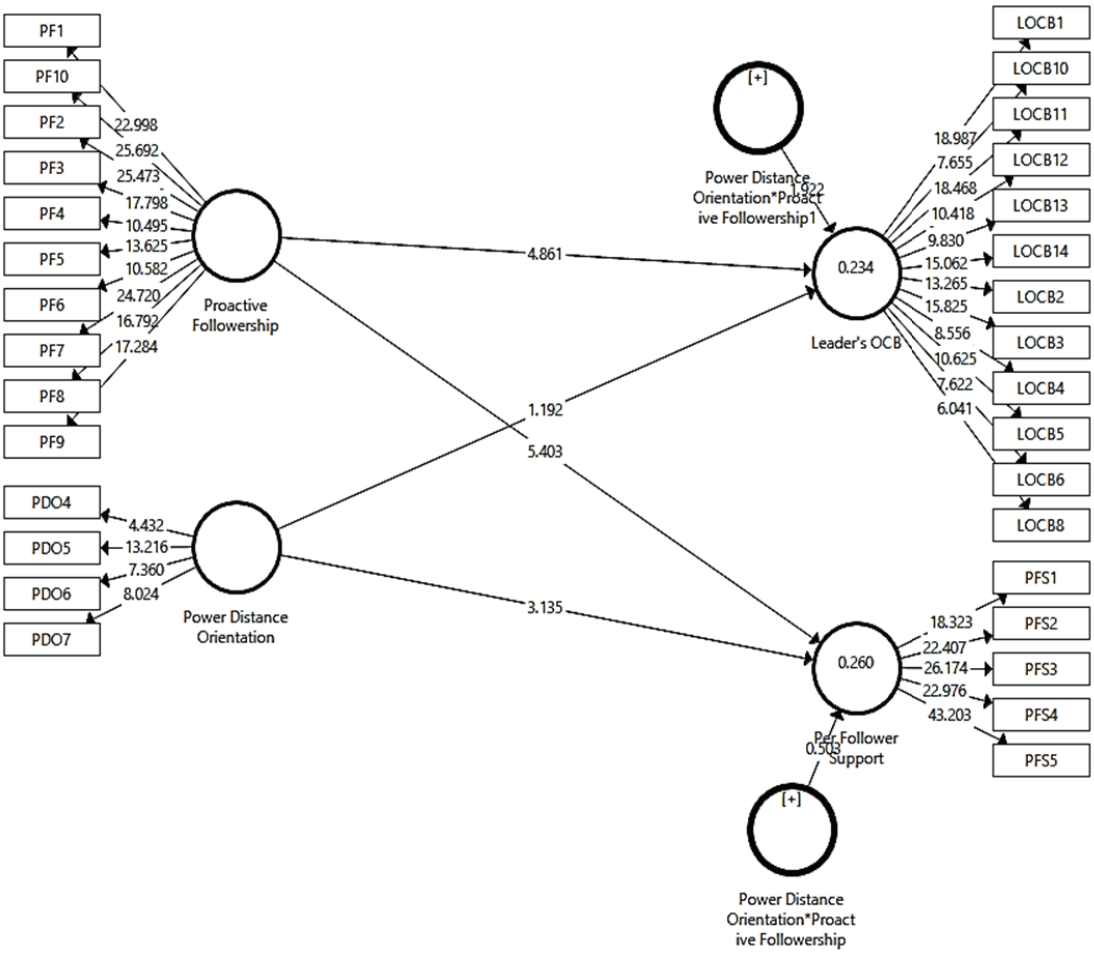

Figure 1: Structure Model

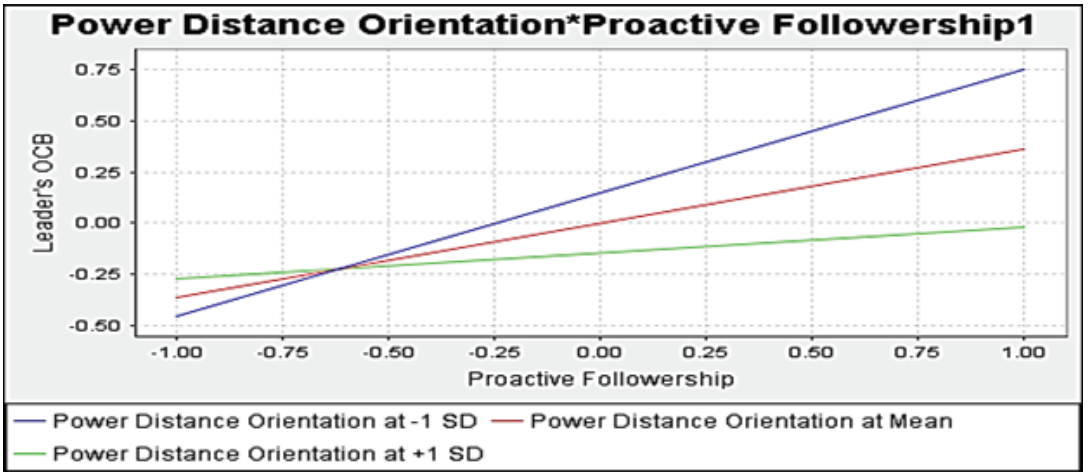

Figure 2: Moderation Graph

5. Discussion

Based on the study's quantitative analysis, it has been concluded that proactive followership promotes a leader's OCB and perceived follower support. proactive personalities employees are more willing to engage in tasks (Wang & Liang, 2020). Involving themselves in citizenship behaviour and eventually exerting upward influence (Cunningham, 2019) allows us to conclude that Leader's OCB is the outcome of the follower's proactive behaviour (Jiwen Song et al., 2024). Furthermore, this study supports the "reverse the lens" perspective of followership playing a substantial role in leadership behaviour (Khan et al., 2020). Schneider et al. (2014) revealed that passive followers provoke the negative emotions of the leader as compared to active followers who trigger positive feelings. This study concludes that followers who create ideas and express their opinions, can recognize the problems and hold a participative view in decision making and constructively challenge the status quo. These activate, elevate and trigger the leader's cooperative, helping, congenial, altruistic and volitional behaviour. Therefore, the organization's success or failure depends on how the leaders lead and equally on how the followers follow (Gottfredson & Aguinis, 2017). Influential followers not only manage themselves but also create a competitive environment of efficacy. Cremers et al. (2019) summarise that contemporary managers now desire active participants in contrast to passive recipients.

This study also concludes that proactive followership encourages the leader's perceived followers' support. This study ascertains Montani et al. (2020) finding that supervisors recognize and motivate subordinates who actively participate in their assignments. There is a positive relationship between trust and proactive followership (Khan et al., 2020). This study further aligned with Carsten et al. (2018) findings that leaders view followers with strong PDO. Thus, proactive behaviour yields positive impressions in the leader's mind. A leader's

trust and perception are enhanced when followers align with their mission and act proactively and courageously.

Furthermore, to highlight the cultural dimension of South Asia this study incorporated PDO as a moderating variable. The unique geographical terrain and its contribution to the world population (India (second), Pakistan (sixth), and Bangladesh (eight)) South Asia is one of the largest continents on earth. According to Yang (2020) and Thach (2021) south Asian countries have a collectivist cultural orientation and collectivism and Power distance are positively correlated. Similarly, from a leader-centric perspective, PDO has been extensively highlighted as a moderating mechanism in the Asian context (Mulki et al., 2015; Nabi & Liu 2021; De Clercq et al., 2021). However, limited attention has been given from the followership perspective. Therefore, in this study, the moderation of PDO indicates a significant negative effect of PDO's direct relationship between LOCB and proactive followership. With higher PDO, the association of Proactive followers and Leader OCB decays, and with lower PDO, the strength of the direct relationship enhances. Obedience and dependence are plausible characteristics of societies having high PDO (Bao et al., 2021).

Employees in such organizations tend to believe that their voice would be assumed as insubordination; consequently, they behave in a docile manner to avoid any disagreement. They are building the argument based on the notion that employees with high PDO are submissive and defer to their leaders. Instead of contradicting the leader, they accept and obey leaders; these individuals are likely to remain passive compared to low PDO individuals, for whom disagreement and criticism with supervisors are part of the work environment (Lin et al., 2013). This study concludes that the passive behaviour of individuals due to high PDO is not likely to increase the leader's citizenship behaviour. In contrast, employees with lower power distance orientation who comfortably place their opinions are presumed to be proactive and likely to increase the leader's OCB (Chen et al., 2018).

Furthermore, there is an insignificant negative effect of PDO found between the direct relationship of proactive followership and the perceived follower's support. According to the Power Distance Index utilized by Hofstede, for Pakistan with an intermediary score of 55, finishing up the inclination for Pakistan in this dimension isn't striking. Perhaps the people do not intend to disclose their inclination to either side. Bao et al. (2021) elucidate that individuals with high PDO do not open up, and their restricted behaviour is due to their mistrust of the reciprocal relation. They prefer to maintain a considerable distance from their bosses and do not tend to develop strong bonds with their managers. On the other hand, from the social exchange perspective, trust plays a vital role in establishing a solid relationship with leaders. According to Zanini and Migueles (2018), to overcome the fear of employees expressing disagreement with their leader, participation and engagement play an essential role which enhances the perception of integrity and results in the continuous development of trust. Therefore, in the public sector of Pakistan, individual PDO does not play any role in

mitigating the relationship between proactive followership and a leader's perceived follower support.

5.1 Theoretical Contribution

A follower engaged and proactive role profoundly affects the leader's behaviour, motivation and performance over time (Carsten et al., 2018). This study empirically supports the social exchange perspective that followers are not only on the recipient side in the leadership process. However, they have an active role and participation in establishing a solid relationship. Moreover, this study has contributed by highlighting the prominence of followers as influencers in the leader and follower exchange relationship. Leadership has enjoyed dominance in the exchange relationship, being the influence rather than the recipient, while the conclusion drawn through this study illuminates that followers are not passive recipients. Instead, they can actively participate in making the leader-follower relationship more robust. This study progresses social exchange theory on leader perceptual and persuasive results. As per Carsten et al. (2018) and Uhl Bien et al. (2014); Co-production direction featured that followers ought to accomplice and effectively draw in with leaders to improve the adequacy of the work unit. In like manner, Pioneer OCB and saw adherents help bring about the proactive way of behaving of supporters (Khan & Khan, 2022). Proactive followers have major areas of strength for co-production orientation and acknowledge independent decision-making as a chance to help their leader in departmental efficiency (Carsten et al., 2018).

Conversely, reactive followers hold a passive co-production orientation and are more likely to engage in upward delegation. As per previous studies, individuals with strength for power distance view directors are liable for critical thinking and navigation and experience more pressure when requested to be engaged in decision-making (Tabesh & Vera, 2020; Carsten et al., 2018). Therefore, followers' proactive behaviour is essential for establishing a robust social exchange relationship with leaders.

5.2 Practical Implications

The followers' role in the leadership process has been highlighted in the study, considering followers as essential to leadership outcomes. This study suggests that followers' proactive involvement in the public sector of Pakistan promotes leader OCB and perceived follower support. The practical implications effectively contribute to followers' successful engagement to co-produce leadership outcomes (Schlappa et al., 2021; Carsten et al., 2018). Managers and leaders must implement the 'reversing the lens' concept to attain the desired efficiency level. Furthermore, the power distance orientation role as the constituent of bringing requisite modification.

High power distance has contributed to a culture where taller and more centralized organizational structures are normal, and decision-making is concentrated at higher levels, collectively resulting in sycophancy (Pandey, 2022; Mansoor et al., 2011). The results suggest that leaders can appropriately utilise PDO to strengthen the leader-follower relationship. Recognising that followers, when exposed to high power distance, would not behave proactively can open new avenues in the leader-follower relationship. It is recommended that organizations use training programs, mentoring, inclusive decision-making, and feedback systems to empower followers, minimize power distance, and improve leadership outcomes. These actions enhance the organization's overall performance by fostering proactive employee participation and cooperation.

6. Limitations and Future Research Directions

There are several limitations such as the sample is limited and derived from a single sector which may limit its generalizability to other cultural contexts. Therefore, researchers need to explore the followership theory and its implication in the leadership process using diverse samples and organizational backgrounds. Although the results are specific to the Pakistani context, future studies could be employed in different economies. Moreover, longitudinal studies could enhance more robust outcomes, and a mixed-method study will generalize the results and provide more insights into respondents through focus groups. This article only focused on proactive followership. At the same time, there is still a need to investigate other followership constructs (personality traits, implicit followership theories, followership types and demographics). Finally, this research focused on PDO as an essential cultural dimension; future studies should investigate the role of other cultural dimensions to understand the moderating mechanism in the proposed relationship.

7. Conclusion

Due to its significant importance research is growing to study the role of followership in the leadership process/outcomes. This study articulates that proactive followers contribute to positive leadership outcomes. For Leader citizenship behaviour and perceived follower support the role of proactive followers is important in the sense that when followers contribute ideas, discover problems and actively participate in the exchange relationship their leaders will exhibit more OCB and their perception of their followers' support will be more positive. Similarly, this relationship will be stronger when the power distance between leaders and followers is minimal because in higher power distance culture followers feel detached and cannot share ideas and not actively participate in social exchange relationships with their leaders.

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Cultivating Team Learning: Interplay of Ambidextrous Leadership and Psychological Safety

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Abstract

This study aimed to explore the mediating role of psychological safety between ambidextrous leadership and team learning. The data were collected from 339 employees working in the service sector using a self-administered questionnaire. The scales in the questionnaire were adopted from well-known and valid sources. The data were analyzed to test the proposed hypothesis using the PROCESS Macro by Andrew Hayes in SPSS 26 and AMOS 24 for confirmatory factor analysis. The study found that there was a significant effect of ambidextrous leadership on team learning and psychological safety significantly mediated the said relationship. The study added to the literature on the theory of planned behavior by adding the novel variables of team learning and ambidextrous leadership in the context of the service sector organizations. Other studies can be initiated to explore the effects of other psychological variables like emotional intelligence and positive psychological capital to further the relevant literature. The study can be further extended to other workplaces including manufacturing and primary sector organizations.

Keywords: Team learning; psychological safety; ambidextrous leadership; team culture.

JEL Classification: J24, O15

1. Introduction

The way leaders transform organizations and people has been a focus of research in the past century (Ahsan, 2019; Zaman et al., 2017). They do so by making decisions, organizing and effectively allocating resources, developing and managing teams and prioritizing projects (Iqbal et al., 2022). Leadership behavior, in turn, is a significant driver of creativity, innovation and skills building, process implementation, building learning environments and so on (Klonek et al., 2023). The crux of many leadership activities involves team learning and making it effective and seamless.

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This study aims to explore the role of ambidextrous leadership on team learning. Literature suggests that for ambidextrous leadership, both transformational and transactional leadership are required, which influences team integrity, trust, and communication (Ahmed et al., 2024; Iqbal et al., 2022; Rosing & Zacher, 2023; Shafaei et al., 2024). Key elements of effective ambidextrous leadership include informed decisions, motivating employees, and encouraging new ideas. Ambidextrous leadership also indirectly affects team learning through psychological safety. Leaders who provide psychological safety foster higher team learning (Rosing & Zacher, 2023). Positive leader interactions instill energy that promotes cooperation and innovation, while negative interactions hinder psychological safety and innovation (Iqbal et al., 2022). Learning equips employees to handle uncertainty and insecurity more effectively (Iqbal et al., 2022; Rosing & Zacher, 2023).

Ambidexterity is the ability to use both transformational as well as transactional elements in the research on organizational management, especially team learning (Asad et al., 2022; Mueller et al., 2020). However, in the previous studies, to the best of our knowledge, psychological safety has never been explored to work as the mediator between the two (Asad et al., 2022; Klonek et al., 2023; Mueller et al., 2020; Zaman et al., 2017). Therefore, this study aims at this gap and addresses an overlooked aspect in existing research.

Our research contributes to the fields of ambidextrous leadership, psychological safety as well as team learning in many ways (Iqbal et al., 2022). The study also adds to the existing knowledge of the theory of planned behavior. First, while previous research has mainly remained focused on leadership styles including authentic, charismatic, transformational, and ethical leadership, this study is novel in the sense that it examines the relationship between ambidextrous leadership and team learning, while introducing the mediational effect of ambidextrous leadership between the proposed relationship (Asad et al., 2022; Klonek et al., 2023; Mueller et al., 2020; Parker & du Plooy, 2021; Zaman et al., 2017). Theoretically, this research is embedded in the confines of the Theory of Planned Behavior (TBP) that predicts individuals' intentions and the resulting behaviors. Thus our study adds a new dimension to the existing literature (Cauwelier et al., 2016; Ortega et al., 2014). The current study has global connection to literature and advancement of the knowledge. As the study is focused on a general workplace setting, its results can be generalized to the general workplace globally and the benefits both in theory and practice can be extended to any kind of workplace.

1.1 Ambidextrous Leadership

Ambidextrous leadership refers to a leader's ability to both discover opportunities and utilize them effectively (Ahmed et al., 2024; Asad et al., 2022; Gouda & Tiwari, 2024). Ambidextrous leaders do not only identify chances but also leverage them to the best of the organization's benefits. While many leaders can find opportunities, they often fail to utilize them effectively. Ambidextrous leaders, however, can create and capitalize on new

opportunities whenever necessary (Ahsan, 2019; Klonek et al., 2023). Leadership is a prestigious position that comes with power and control, allowing leaders to direct the course of events (Mueller et al., 2020). People look up to leaders who bear more responsibilities and, consequently, enjoy greater rewards. However, not everyone is suited for leadership, as it requires specific skills and hard work that may not appeal to everyone. Aspiring leaders must possess various skills, including learning from other leaders.

No one is born with all the necessary leadership qualities; these must be developed through studying the lives of past leaders and working on personal skills (Mueller et al., 2020; Rosing & Zacher, 2023). Effective leaders must be confident and self-assured, demonstrating to their followers that they are trustworthy and competent. An ambidextrous leader takes on more responsibilities than their team members, showcases the feasibility of challenging tasks, and values the ideas and feedback of others (Klonek et al., 2023).

The term 'ambi' comes from Latin, meaning "both," and 'dexter' means favorable, thus making ambidexterity "both favorable" (Ahsan, 2019; Klonek et al., 2023; Rosing & Zacher, 2023). Effective leaders have both transformational and transactional leadership styles which they use according to what the situation demands (Jia et al., 2024; Mueller et al., 2020). Ambidextrous leaders encourage innovation and creativity in their teams, enabling them to handle ambiguous situations and constraints more effectively. This leadership style is positively linked with business success and improved outcomes for both established companies and startups (Zaman et al., 2017). Balancing current performance with future opportunities can be challenging but enhances a company's ambidexterity (Klonek et al., 2023).

Ambidextrous leadership impacts the management team by fostering respect for subordinates, promoting integrity and honesty, enhancing efficiency, and maintaining open communication lines (Mueller et al., 2020). It involves shared leadership across different levels of an organization, addressing tensions, and managing flaws, thus integrating both transformational and transactional leadership as needed (Rosing et al., 2011).

1.2 Leadership and Team Learning

Just as the leader's role is crucial for team learning, the process of team learning is equally important for enhancing and refining the leader's skills. (Ahmed et al., 2024; Gouda & Tiwari, 2024; Zaman et al., 2017). Whenever a leader deals with any teamwork, he meets up and deals with several mentalities together. He must deal with every member according to his or her approach and psyche. Every time a leader leads a team he gets so many experiences with leading many minds in all different ways. So, teamwork is very important for the improvisation of leadership qualities. The leader has experience working with different people, he is expected to perform well (Ahsan, 2019; Zaman et al., 2017).

Team learning involves structured tasks or activities that help organizations develop essential capacities, improve interpersonal relations, solve problems, and achieve goals. Often facilitated by external consultants, it aims to diagnose group functions, identify difficulties, and suggest improvements (Kozlowski & Bell, 2007; Van Offenbeek, 2001). Collaborative innovation in learning communities fosters curiosity and a shared focus on both individual and collective learning.

For team learning to be productive, the team itself must be strong. Effective team building, which is crucial for successful learning, involves factors such as coaching, training, collaboration, skills, solutions, support, and motivation. Each factor is vital and interdependent; for instance, without motivation, coaching may not lead to the practical application of new skills, and without collaboration, members cannot learn from each other, leading to repeated mistakes. A good team requires a mentor to provide direction, which in team learning is referred to as coaching. This initial stage is crucial for effective training, as well-trained members develop better skills. Good training programs and drills not only polish existing skills but also teach new ones, enabling members to solve problems more efficiently and with better approaches that are less time-consuming, cost-effective, and low-risk (Ellis et al., 2003).

Leaders play a crucial role in organizations, serving as the backbone by influencing team members' effectiveness and efficiency (Ellis et al., 2003; Zain, 2024). They promote team learning in both adaptive and developmental tasks, motivating members towards goals and fostering an environment where everyone can share knowledge and ideas freely (Van Woerkom & Croon, 2009). Good leaders ensure team unity despite diverse backgrounds, skills, and behaviors among members, finding common ground and collaborative motivation. Without strong leadership skills, key aspects of team learning are compromised.

Teams are the primary units for learning and knowledge creation in organizations, involving exploratory and exploitative learning. Social interaction is foundational in workplace relationships, enhancing the frequency and quality of information exchange. Deep interactions with external partners help bridge knowledge gaps, aiding firms in identifying, understanding, and exploiting valuable external knowledge (Kozlowski & Bell, 2007; Van Woerkom & Croon, 2009). Collaborating with diverse external partners is crucial for innovation, as it provides access to various knowledge types(Ellis et al., 2003; Van Offenbeek, 2001).

Absorptive capacity, the ability to acquire, process, and use external information, is vital for employee learning in project-based organizations (Kozlowski & Bell, 2007; Van Offenbeek, 2001; Van Woerkom & Croon, 2009). Managers play a key role in enhancing employees' learning abilities by effectively assimilating and transferring information. In Pakistani organizations, project managers face challenges related to employee learning and

team confidence, highlighting the need for increased social interaction to boost learning (Van Woerkom & Croon, 2009).

Team performance benefits from employees' involvement and coordination, influenced by individual personality traits. Research shows significant relationships between personality characteristics and team performance, with factors like locus of control and self-esteem predicting outcomes as effectively as cognitive ability (Ahmed et al., 2024; Cauwelier et al., 2016; Ortega et al., 2014). Individual differences, such as extroversion, also impact team contributions (Edmondson & Lei, 2014; Parker & du Plooy, 2021).

1.3 Psychological Safety

Psychological safety, defined by Maslow (1943) in his hierarchy of needs, is essential for employee well-being and productivity. It enables people to work in teams effectively. When employees feel safe psychologically from the negative consequences to self-image, organizational status, career prospects and, psychological safety is supposed to be present, which in turn harnesses members' ability to innovate, take risks, and make independent decisions (Cauwelier et al., 2016; Parker & du Plooy, 2021; Vella et al., 2024). As such, psychological safety is a perception where employees perceive that their work environment is free from stress and pressure, and conducive to stress-free work. Psychological safety has been defined on three levels: individual, group/team, and organization (Cauwelier et al., 2016; Edmondson & Lei, 2014; Maslow, 1943; Parker & du Plooy, 2021). At workplaces, employees might face interpersonal risks and uncertainties due to organizational or personal reasons, which can lead to a lack of confidence and ineffective communication (Ortega et al., 2014).

Leaders must have the ability to make interaction members in a team feel positive emotions (Edmondson & Lei, 2014), which could significantly impacts workplace dynamics. This presence signifies and influences follower performance through the variance in emotions experienced by individuals at work (Ortega et al., 2014; Vella et al., 2024). Affective presence, an important personality trait among leaders, affects the followers or team members during interactions. It is not common to notice that researchers use trait effects to leverage leaders' individual differences impacting followers' innovative behavior (Edmondson et al., 2004; Talib et al., 2019; Wanless, 2016). Trait affect is intrapersonal in nature and can affect self-reported feelings of leaders. Positive affective presence from leaders enhances followers' feelings of safety and collaboration and gives rise to creativity and a sense of common goals and their pursuit (Frazier et al., 2017). On the other hand, negative feelings toward leaders reduce psychological safety and innovation (Newman et al., 2017).

Effective leaders recognize and leverage individual trait differences to enhance team performance, fostering enthusiasm, trust, and strong collaboration, which are crucial

for organizational innovation. Positive affective presence from leaders promotes a safe environment for interpersonal risk-taking and constructive innovative behavior (Talib et al., 2019). In contrast, poor interpersonal relations, marked by inadequate collaboration and communication, diminish psychological safety, innovation, productivity, and customer satisfaction.

1.4 Psychological Safety and Team Learning

It's all about individual capability of their own learning, it also allows the employees to grow themselves and make themselves able to face all the doubts and solve them in a better way. It can be divided into three levels: individual ,team and organizational level.. For example, individual must be mentally strong before achieving the goals or doing their jobs because they encounter numerous challenges while achieving success wither in an organization or in a team (Asad et al., 2022; Bransby et al., 2024; Zaman et al., 2018). when in organization have learning orientation, it means they have an ambidextrous leader who allow their members to openly learn and make a better environment for employees that's why the employees team learning also can be influence they may learn in a good way and the teams give best result and are obviously psychologically safe. This all happens because organizations have a good ambidextrous leader who provides them with a good learning environment so they can learn what they want and develop themselves and compete with different uncertainty in effective way (Bucic et al., 2010; Duc et al., 2020).

It can be said that it is the thinking of the team members overall e.g., the thoughts of the members about the specific goals (Han et al., 2022; Zacher & Rosing, 2015). That is how they can easily achieve their goals. The team learning can be better when they have an ambidextrous leader because he can influence on learning commitment and know how to share vision and mission and take suggestions from team members and have open mindedness in every decision and intra knowledge sharing about how to achieve goals (Bouwmans et al., 2019; Bransby et al., 2024; Bucic et al., 2010).

When the members of the group cooperate with each other peacefully, free from uncertainty, conflict, or disputes, while doing their teamwork they create a supportive environment that enhances collaboration, boosts productivity, and enables them to achieve their shared goals efficiently (Harvey et al., 2019; Zhao et al., 2023). The less social people create more negativity in organization the reason behind the negativity is that they are less motivated and less encouraged. And having a low social orientation (Asad et al., 2022; Van Offenbeek, 2001; Zaman et al., 2017). Employees experiencing negative social interaction with their leaders decreases innovativeness in performing tasks because their leader is not an ambidextrous leader who can handle negativity and manage various uncertainties that's why the people are not social and feel risk while interacting in teams and not open to share their ideas, vision and accept differences In contrast, when an organization has a strong leader,

they provide a positive environment that strengthen psychological safety, enhances team learning, and encourages open communication. Such leaders promote a learning environment, reward innovation, and motivate employees, ultimately leading to better performance and results (Bouwmans et al., 2019; Iqbal et al., 2022; Tang et al., 2021; Van Offenbeek, 2001).

2. Theoretical Framework and Hypothesis

2.1 Overarching Theory: Theory of Planned Behavior

This study borrowed its tenets from the theory of planned behavior. The theory was first proposed by Icek Ajzen on the theory of reasoned actions. The theory is useful to explain how intentions result into behaviors and reasoned actions (Ulker-Demirel & Ciftci, 2020). The theory can be explained by three key components: (1) attitude towards the behavior, (2) subjective norms, and (3) perceived behavioral control (Conner, 2020).

The current study borrows its conceptual framework from the theory as following. Ambidextrous leadership serves as the attitude forming element through its provision of creating the dynamic environment of exploration (Blue, 1995; Conner, 2020). As a result, the team members feel psychologically safe which results in the norms leading to support and trust in the team. Finally, the team learning is the result of the change in the attitude and norms team learning takes place which is an outcome of the behavioral change and reasoned action (Ulker-Demirel & Ciftci, 2020). Figure 01 shows these relationships in the form of a theoretical framework.

2.2 Theoretical Framework

Research Model of Ambidextrous Leadership Impact on Team Learning: Mediating role of psychological safety

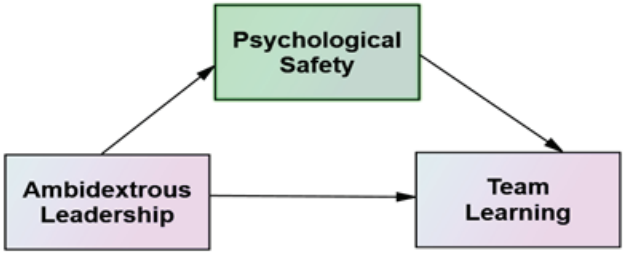

Figure 1: Figure of the Confirmatory Factor Analysis

Ambidextrous leaders are responsible for motivating and supporting their employees to feel free when bringing new ideas (Mueller et al., 2020; Rosing & Zacher, 2023). They influence their team members to work efficiently, respect each other's differences, cultures, norms, and values, and maintain strong interactions among themselves (Bransby et al., 2024; Klonek et al., 2023; Rosing & Zacher, 2023). Furthermore, ambidextrous leaders use both opening and closing behaviors, depending on the situation. Opening leadership refers to a leader's behavior in teamwork, such as encouraging innovation, experimentation, promoting independent thinking, and providing support (Rao-Nicholson et al., 2016; Zhao et al., 2023). This leadership style positively impacts exploratory learning, enhancing knowledge and skills.

Leaders exhibiting open behavior motivate their members to introduce innovations and integrate new knowledge with existing knowledge. While, closing leadership behaviors aim to reduce differences in team members' behavior, facilitating helpful actions and goal achievement (Rosing & Zacher, 2023). This style affects exploitative learning, focusing on existing knowledge and skills. Leaders in closing leadership encourage their members to combine existing knowledge to create new, useful, and innovative knowledge and skills. Both leadership styles together support team learning and innovation. For instance, if top managers and team workers collaborate effectively on a project, they can achieve their goals, whether they involve innovation or other objectives.

In project-based organizations, absorptive capacity is crucial for employee learning. It involves a manager's ability to identify, acquire, transform, and use external information (e.g., scientific and technological information) to enhance the organization's learning and gain a competitive advantage through adaptation (Rosing & Zacher, 2023). In recent years, the role of managers has become increasingly important for developing employees' learning abilities. Today, project managers often face challenges related to employee learning and team confidence. In such situations, a manager's ability to identify information, transfer it to employees, provide effective coaching, and build strong collaboration and communication among team members can significantly enhance employee learning (Tang et al., 2021). In this context, we can argue that ambidextrous leadership positively affects team learning. Hence the hypothesis:

H1: Ambidextrous Leadership has a positive association with team learning.

In any organization, team performance can be improved through individual-level collaboration among employees (Cauwelier et al., 2016; Ortega et al., 2014). Given that people with different personality traits work together, employees are often assessed based on the Big Five personality traits to determine the strengths they bring to team output. For example, highly extroverted individuals tend to be more social, confident, and may exhibit strong leadership abilities in team performance compared to non-extroverts. One of the major

elements that is affected both by the ambidextrous leadership is psychological safety. Recent literature suggests that there is ambidextrous leadership improves psychological safety (Ahmed et al., 2024; Gouda & Tiwari, 2024). Furthermore, the literature on psychological safety suggests a positive relationship between ambidextrous leadership and psychological safety (Sacramento et al., 2024; Vella et al., 2024).

H2: Psychological safety mediates the association between ambidextrous leadership and team learning.

3. Research Methodology

3.1 Participants: Population, Sampling Technique, Sample Size

The current study observes similarities in characteristics among items of the same nature, drawing its population from this observed group's behavior. Specifically, the study examines employees working in residences in Quetta, with a sample size of 399 respondents who completed the required questionnaires, yielding a response rate of 100%. We collected data from more than 300 respondents since we intended to run CFA, a multivariate technique for data validation. This is a recommended threshold as by Hair (2009). Data collection utilized the survey method, with a focus on random sampling (job-oriented individuals) within a specified time. This approach contrasts with other techniques such as strata and cluster sampling. The method was chosen to ensure the collection of robust data suitable for generalizing responses to the entire population, while also considering resource and time constraints.

3.2 Research Instrument and measurements

In our research methodology, questionnaires were chosen as the primary data collection method due to their effectiveness in gathering quantitative data. We distributed our questionnaire to various institutions, including banks and educational organizations. The survey questionnaire included three factors Ambidextrous Leadership, Team Learning, and Psychological Safety alongside other demographic variables. We adopted the 7-item scale developed by Edmondson (1999) to measure psychological safety that involved questions relating to employees' perceptions of various workplace aspects including interpersonal relations, idea generation, risk-taking, and the overall work environment. The scales had a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

In order to measure the ambidextrous leadership we used a 13-item scale by Rosing et al. (2011). The scales measures employees' perceptions towards their leaders in terms of ambidextrous leadership skills. Respondents rated statements such as "My manager motivates me to take risks" and "My manager fosters an environment for new ideas" using a 5-point scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Finally, the team learning scale was the biggest scale of all. It has several sub-sections including Absorptive Capacity of Project Manager, Employee Learning, and Project Innovation Performance. We used a 10-item scale developed by Zahra and George (2002) to measure team learning. We have run the confirmatory factor analysis and estimated the convergent and discriminant validity statistics for the entire scale on each section separately to ensure integrity of the original scale.

4. Data Analysis Technique

4.1 Data screening, cleaning, and transformation

The first step of the data analysis process was to screen the dataset for its participant's engagement, missing values and any transformation needed. We used a case-wise standard deviation to detect any unengaged responses. Similar technique has been used by Rejer et al. (2024) in their study. Further missing data analysis was done and checked if the missing values occurred only randomly using the Little's test. Any missing values were transformed using the k-nearest neighbor technique (Monsen, 2024). Finally, outliers were detected using the boxplot and cases with extreme outliers were removed.

As the proposed analysis was based on OLS, it was imperative to test if the estimates were BLUE- Best Linear Unbiased Estimator. To do this, we made use of techniques suggested in Field (2024). We tested the normality of data using the P-P plots in SPSS 26. Further, the homoscedasticity was tested by plotting the standardized residuals against the predicted values and finally multicollinearity was detected using the VIF scores. There were no traces of these issues.

4.2 Data Validity and Reliability

To estimate the reliability and validity of the data we used Cronbach alphas as well as the composite reliability statistics in AMOS 24 through CFA. Both the discriminant and convergent validity were tested.

4.3 Mediation Analysis

To test the proposed mediation, we used the PROCESS add-on in SPSS developed by Andrew Hayes. The statistical procedure involved Ordinary Least Squares (OLS) based regression models. First, assumptions of the Best Linear Unbiased Estimators (BLUE) were tested to ensure the validity of the regression results. These assumptions include linearity, independence of errors, homoscedasticity, and normality of residuals. Linearity was assessed through scatterplots of the variables, independence of errors was examined using Durbin-Watson statistics, homoscedasticity was evaluated through scatterplots of residuals against

predicted values, and normality of residuals was assessed using histograms and Q-Q plots. The significance of the indirect effect was measured using bootstrapping with 5,000 resamples.

5. Results

Table 1
Demographics

	Demographic Variable	Frequency	Percent	Valid Percent	Cumulative Percent
1	**Gender**				
	Male	150	44.2	44.2	44.2
	Female	189	55.8	55.8	100.0
	Total	339	100.0	100.0	
2	**Age**				
	20-30 Years	79	23.3	23.3	23.3
	31-40 Years	88	26.0	26.0	49.3
	41-50 Years	85	25.1	25.1	74.3
	51-above Years	87	25.7	25.7	100.0
	Total	339	100.0	100.0	
3	**Education**				
	Bachelors	55	16.2	16.2	16.2
	Masters	104	30.7	30.7	46.9
	MS	89	26.3	26.3	73.2
	PHD	84	24.8	24.8	97.9
	other Any	7	2.1	2.1	100.0
	Total	339	100.0	100.0	
4	**Experience**				
	less or 1 year	90	26.5	26.5	26.5
	2-3 Years	82	24.2	24.2	50.7
	4-6 Years	85	25.1	25.1	75.8
	6 and above Years	82	24.2	24.2	100.0
	Total	339	100.0	100.0	

The tables present demographic characteristics of the study sample, including gender, age, education, and experience. Gender distribution shows most male respondents (44.2%) compared to female respondents (55.8%). The age distribution indicates that respondents aged 31-40 years constitute the largest group (26.0%), followed by those aged 41-50 years (25.1%). In terms of education, the majority hold a master's degree (30.7%), followed by those with a bachelor's degree (16.2%). Experience-wise, a significant portion of respondents reported having 4-6 years of experience (25.1%). These demographic variables

provide insights into the composition of the study sample and are crucial for understanding the characteristics of the participants.

5.1 Correlation analysis

The current study used correlation analysis to determine the correlation among variables. The present study assumed that ambidextrous leadership and team learning could be highly and significantly correlated. Also, the study hypothesized the mediating role of psychological safety to make valid the proposed hypotheses and thus correlations between all these variables were tested.

Table 2 shows information related to correlation among variables. Results show that ambidextrous leadership is significantly correlated with all variables. Ambidextrous leadership had a correlation of ($r=0.185$, $p<0.05$) with psychological safety. It also had other correlations with Absorptive capacity ($r=0.283$, $p<0.05$), Leader affective ($r= -0.143$, $p<0.05$), Innovation ($r=0.170$, $P<0.05$), employee learning ($r=0.104$, $p<0.05$), project innovation performance ($r=0.044$, $p<0.05$), learning orientation ($r=0.089$, $p<0.05$), innovation work behavior ($r=0.188$, $p<0.05$). The correlation shows that the scale is valid. The diagonal value of correlation in column and row are the same and high in column and row as well which means there is no issue in scale.

5.2 Confirmatory Factor Analysis: Discriminant and Convergent Validity

Figure 02 gives the overall confirmatory factor analysis and the final items that were included in the analysis. It also gives the loadings and estimates of the items that load on the factors. The CFA results are given in table 3 to indicate the discriminant and convergent validity of the scales used and the data collected. The model fit estimates have also been reported in the notes to table 3.

The results of the mediation analysis are divided into three models. In model 1, Ambidextrous Leadership significantly affected the mediator, Psychological Safety (est. = 0.1723; t = 3.855, p = 0.0001). In model 2, both Ambidextrous Leadership (est. = 0.9853; t = 7.5587; p = 0.000) and Psychological Safety (est. = 1.1756; t = 4.8282; p = 0.000) significantly affected team learning. Finally, in model 3, Ambidextrous Leadership significantly affected team learning (est. = 1.1878; t = 9.3181; p = 0.000).

The bootstrapping results show that Psychological Safety significantly mediated the relationship between Ambidextrous Leadership and team learning (BootLLCI = 0.0409; BootULCI = 0.1479) as both the upper and lower limits were positive. The R square of Psychological Safety on Ambidextrous Leadership is 0.0831, indicating that 8.31% of the variance in the dependent variable is explained by the independent variable. The R square

of Psychological Safety on team learning is 0.3786, meaning that 37.86% of the variance in the dependent variable is explained by the independent variable. Similarly, the total effect of team learning has an R square of 0.2867, indicating that 28.67% of the variance in the dependent variable is explained by the independent variable.

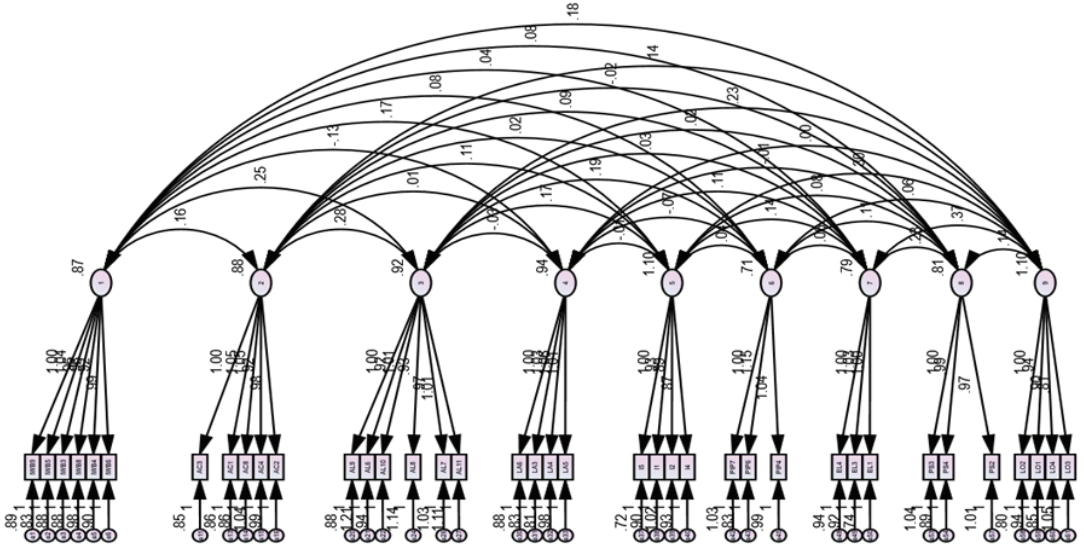

Figure 2: Results of the Confirmatory Factor Analysis (CFA)

Table 2
Correlations

		1	2	3	4	5	6	7	8	9
Ambidextrous Leadership	AL	0.694								
Psychological Safety	PS	0.185**	0.699							
Team Learning	AC	0.283***	0.308***	0.675						
	LA	-0.143*	0.014	-0.037	0.728					
	I	0.170*	0.115†	0.169*	-0.01	0.717				
	El	0.104	0.025	0.231**	-0.091	0.047	0.676			
	PIP	0.044	0.112	0.032	0.134†	0.154*	0.083	0.695		
	LO	0.089	-0.029	0.018	-0.006	0.088	0.140†	0.291***	0.669	
	IWB	0.188**	0.145*	0.226**	0	0.271***	0.069	0.392***	0.148*	0.708

**. Correlation is significant at the 0.05 level (2-tailed).*

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

Table 3
Reliability, Convergent and Discriminant Validity

Scales	Component	CR	AVE	MSV	MaxR (H)	1	2	3	4	5	6	7	8	9
Ambidextrous Leadership	1	0.848	0.582	0.08	0.849	0.694								
Psychological Safety	2	0.827	0.501	0.095	0.829	0.185**	0.699							
Team Learning	3	0.834	0.546	0.095	0.836	0.283***	0.308***	0.675						
	4	0.818	0.53	0.02	0.819	-0.143*	0.014	-0.037	0.728					
	5	0.808	0.514	0.074	0.813	0.170*	0.115†	0.169*	-0.01	0.717				
	6	0.716	0.547	0.053	0.721	0.104	0.025	0.231**	-0.091	0.047	0.676			
	7	0.737	0.583	0.154	0.738	0.044	0.112	0.032	0.134†	0.154*	0.083	0.695		
	8	0.709	0.548	0.085	0.709	0.089	-0.029	0.018	-0.006	0.088	0.140†	0.291***	0.669	
	9	0.8	0.501	0.154	0.805	0.188**	0.145*	0.226**	0	0.271***	0.069	0.392***	0.148*	0.708

The Results of CFA show that the data were highly valid. All the values of CR's for the main two components of Ambidextrous leadership and Psychological Safety and the seven sub-components of Team learning were above .7 indicating that the data were highly reliable (Hu & Bentler, 1999; Malhotra et al., 2020). Convergent validity was established using the Average Variance Extracted (AVE's) and all values were above the threshold of .5; thus, there was convergent validity in all the components. Finally, the discriminant validity was established by comparing the values of Maximum Shared Variance (MSV) and AVEs. All the values of MSVs were below AVE, thus there was discriminant validity among all the components. Finally, the data fit values were also above the required cutoffs indicating good model fit (CMIN/DF=1.474; GFI=.879; CFI-.972; RMSEA=.038; PCLOSE=1).

5.3 Results of the Mediation Analysis

Table 4
Results of the Regression Analyses

Models	R	R-sq	MSE	F(HC0)	df1	df2	p
Model 1 Ambidextrous Leadership on Psychological Safety	0.2883	0.0831	35.4652	14.8614	1	337	0.0001
		coeff	**se(HC0)**	**t**	**P**	**LLCI**	**ULCI**
	constant	14.5956	1.8837	7.7486	0.000	10.8904	18.3008
	AL	0.1723	0.0447	3.855	0.0001	0.0844	0.2602
	R	**R-sq**	**MSE**	**F(HC0)**	**df1**	**df2**	**p**
	0.6153	0.3786	332.389	70.8688	2	336	0
Model 2 Amb. Leadership and Psy. Safety on Team Learning		**coeff**	**se(HC0)**	**t**	**p**	**LLCI**	**ULCI**
	constant	93.3293	5.6851	16.4164	0.000	82.1464	104.5122
	Al	0.9853	0.1304	7.5587	0.000	0.7289	1.2417
	PS	1.1756	0.2435	4.8282	0.000	0.6967	1.6546

Table to be continued...

Models	R	R-sq	MSE	F(HC0)	df1	df2	p
	0.5354	0.2867	380.4177	86.8273	1	337	0
		coeff	**se(HC0)**	**T**	**p**	**LLCI**	**ULCI**
	constant	110.488	5.2736	20.951	0.000	100.1145	120.8614
	Al	1.1878	0.1275	9.3181	0.000	0.9371	1.4385

Table 5
Total, Direct and Indirect effects of X on Y

Effect	se(HC0)	t	P	LLCI	ULCI	c_ps	c_cs
1.1878	0.1275	9.3181	0	0.9371	1.4385	0.0515	0.5354
Direct effect of X on Y							
Effect	se(HC0)	t	P	LLCI	ULCI	c'_ps	c'_cs
0.9853	0.1304	7.5587	0	0.7289	1.2417	0.0427	0.4441
Indirect effect(s) of X on Y:							
	Effect	**BootSE**		**BootLLCI**		**BootULCI**	
PS	0.2025	0.0626		0.0891		0.3357	
Partially standardized Indirect Effects of X on Y:							
	Effect	**BootSE**		**BootLLCI**		**BootULCI**	
PS	0.0088	0.0026		0.004		0.0141	
Completely standardized indirect effects of X on Y							
	Effect	**BootSE**		**BootLLCI**		**BootULCI**	
PS	0.0913	0.027		0.0409		0.1479	

6. Discussion

Our statistical analysis reveals that the first hypothesis was supported by the empirical evidence that ambidextrous leadership is positively associated with team learning. These findings are consistent with prior literature, further reinforcing the significant and positive relationship between ambidextrous leadership and team learning. Successful project outcomes necessitate leaders who embody ambidexterity, adept at both exploration and exploitation depending on the situation to address challenges and limitations. Leaders must navigate complex environments alongside their team members and try to foster adaptability and efficiency in stable environments.

Hypothesis 01: Ambidextrous leadership affects team learning.

Our first hypothesis proposed if ambidextrous leadership positively affected team learning (Ahmed et al., 2024). We found a significant and positive relationship between the two where ambidextrous leadership significantly affected team learning. existing literature suggests that ambidextrous leadership has the tendency to switch between exploitation and exploration (Gouda & Tiwari, 2024). The exploration side of ambidextrous leadership fosters creativity and innovation which are instrumental in team learning. ambidextrous leaders create a dynamic and conducive environment to learning in teams that help team members perform in an innovative way and maintain high-level performance (Gouda & Tiwari, 2024; Zain, 2024).

Previous studies have emphasized the importance of leaders adapting their styles to suit situational needs (Ahmed et al., 2024; Asad et al., 2022; Klonek et al., 2023; Zaman et al., 2017). Ambidextrous leaders facilitate efficient teamwork, build mutual respect and cultural understanding as well as interpersonal interactions conducive to the achievement of organizational goals. In doing so, they employ both opening and closing behaviors as needed. Opening leadership behaviors encourage experimentation, independent thinking, and innovation among team members, promoting exploratory learning and skill development. Conversely, closing leadership behaviors harmonize team dynamics, facilitating goal achievement and leveraging existing knowledge for exploitative learning and skill enhancement (Ahmed et al., 2024; Gouda & Tiwari, 2024; Iqbal et al., 2022; Mueller et al., 2020; Vella et al., 2024). Together, these leadership styles synergize to support team learning and innovation, enabling organizations to achieve their objectives effectively. In project-based organizations, Absorptive Capacity plays a pivotal role in employee learning. It refers to a manager's ability to identify, acquire, transform, and utilize external information, such as scientific and technological insights, to foster organizational learning and gain a competitive advantage through adaptation and change.

Hypothesis 02: Psychological safety mediates ambidextrous leadership- team learning relationship.

Similarly, our second hypothesis has also been validated, which posits that psychological safety mediates the ambidextrous-leadership and team-learning relationship. In today's successful organizations, collaborative efforts are essential for achieving shared goals. Psychological safety plays a pivotal role in understanding how individuals collaborate toward common objectives. Initially conceptualized by Maslow (1943) within his hierarchy of needs, psychological safety encompasses various factors, among which is the influential presence of a leader.

The result showed that psychological safety mediated the relationship between ambidextrous leadership and team learning. The first part of the finding related to the effect of ambidextrous leadership on psychological safety (Gouda & Tiwari, 2024; Shafaei et al., 2024). The literature of the field suggests that ambidextrous leaders create an environment of trust, support and facilitation that makes team members feel psychologically safe in the team (Bransby et al., 2024; Vella et al., 2024). Consequently, the perception of psychological safety develops an environment that is conducive to learning in teams (Vella et al., 2024). In turn, there occurs an indirect effect of ambidextrous leadership on team learning through psychological safety.

The analysis findings corroborate the assertions of previous literature, such as that by (Bouwmans et al., 2019; Duc et al., 2020; Han et al., 2022), highlighting how a leader's ability to foster positive emotions among followers enhances organizational innovation. Leaders who provoke arousal tend to better promote cooperative behavior among team members. On the other hand, negative provocation on part of leaders can undermine psychological safety and impede individual team behavior (Duc et al., 2020; Han et al., 2022; Zacher & Rosing, 2015). Additionally, a leader's interpersonal relationships with subordinates play a critical role in cultivating trust and psychological safety. As a result, employees reciprocate with commitment extra-role behaviors. Group studies on leadership effectiveness have consistently shown that a leader's interpersonal relations influence team learning and other aspects as well as team performance (Bouwmans et al., 2019; Han et al., 2022).

We argue that learning orientation (LO) is instrumental to an individual's inclination toward self-directed learning, making them able to adapt to uncertain and insecure environments (Iqbal et al., 2022; Klonek et al., 2023; Zhao et al., 2023). This concept encompasses individual, team/group, and organizational levels of learning. Leaders can build a strong team learning environment that reflects the collective inclination of a team toward learning (Rosing & Zacher, 2023; Zhao et al., 2023), encompassing aspects such as learning commitment, shared vision, open-mindedness, and intra-organizational knowledge sharing. Conversely, negative affectivity, rooted in individual personalities, inhibits social interactions and innovation (Zaman et al., 2017).

7. Conclusion

The study aimed to explore the impact of ambidextrous leadership on team learning, with psychological safety serving as a mediator. We collected data from 339 respondents out of 350 questionnaires distributed. Our results identified a positive and significant relationship between ambidextrous leadership and team learning. Our findings underscored the importance of ambidextrous leadership in nurturing team learning in a supportive environment conducive to dealing with psychological safety. Recommendations for future research include considering both mediator and moderator methods, exploring additional

variables related to ambidextrous leadership, and considering a mixed method data collection method. Limitations of the study include constraints imposed by the COVID-19 pandemic, limitations in accessing data, and time constraints.

7.1 Theoretical Implications of the Study

The study has used the theory of planned behavior as the overarching theory to explain the overall model of the study. This study adds to the literature of the study in allocating three important constructs of ambidextrous leadership which serves as the norms setting environment; psychological safety as the element that improves the perceived behavioral control of the team members, and the team learning as the change in the behavior of the members.

The study provides a comprehensive understanding of the framework of how ambidextrous leadership influences the psychological perception to drive behavior that led to learning.

7.2 Practical Implications

The results of the study can be used to drive a team environment that is conducive to learning and innovation. It can help remove any leadership related impediments that hamper team trust, perception of safety and support.

7.3 Future Directions

Future research can be directed to study the different aspects of ambidextrous leadership in isolation to explore their effects on team learning as well as mediation through psychological safety.

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Effect of Democratic Leadership on Project Success in Higher Education Sector

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Abstract

This paper investigates the leadership practices in the Higher Education Commission projects of Punjab, Pakistan. Democratic Leadership looks the most appropriate in the world but it has not been investigated in the Pakistan Higher Education Sector projects. The research approach in this study is positive therefore it is a quantitative study. The sample size is only 86 because the target population of this paper is the higher education sector of the Punjab province. In this research, SPSS has been used for the data analysis. The reliability and regression tests were performed. The results indicate that the Democratic leadership significantly impact the project success. This research is cross sectional as data was collected one time, though in future this research will be conducted in whole Pakistan and then South Asia.

Keywords: Democratic leadership; project success; Higher Education; quantitative study.

JEL Classification: O22 project analysis, D81 criteria for Decision Making under Risk and Uncertainty

1. Introduction

Organizations continuously thrive for success as this is the need of the contemporary competitive era. The leadership process has grown over the years where new dimensions, types and styles of leadership are being studied by academicians, researchers and practitioners across the world. Over the last century, various theories have evolved discussing leadership traits, characteristics, and behaviors that influenced project success. In addition, the Higher Education Commission (HEC) of Pakistan has recognized six priority areas to further expand the higher education system in Pakistan, in accordance with the national objectives outlined in Higher Education Commission of Pakistan. Hence, the significance of a leader is of paramount importance in planning for long-term objectives and then achieving that

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through implementing institutional growth. Furthermore, it is apparent that project managers, sponsors, senior management and other stakeholders worldwide have consistently faced the challenge of effectively managing projects due to the complex and diverse range of issues involved. Consequently, projects experienced delays and frequently incurred cost overruns. As a result, projects got delayed and often resulted cost overrun (Khan et al., 2021).

1.1 Research Gap

Numerous studies have been conducted in the last decade, discussing the impact of leadership on project success. In a recent study, Mughal et al. (2019) has examined the correlation between top management support and project success, with a focus on the mediating impact of leadership styles in Pakistan's IT industry. That study has determined that project leaders have a vital role and exhibit a significant and positive relationship with project success. Hence, the study demonstrated the need to determine and investigate the impact of different leadership styles, such as democratic and autocratic, on project success. Imam and Zaheer (2021) found that characteristics of leaders contribute to the success of projects in the national IT industry, with knowledge sharing as a mediator. In their study, Zulfqar et al. (2016) investigated the transformational leadership and participative decision-making (PDM) among deans/heads in both public and private universities in Pakistan, and found the relationship positive and significant. This goal of this study is to determine the influence of democratic leadership on the success of projects in the Higher Education Sector of Pakistan.

The research question of this research is;

- What is the relationship of democratic leadership style on project success?

The objective of this research is;

- To determine the impact of democratic leadership style on the project success in higher education sector projects of Pakistan.

2. Literature Review

This section of the paper discusses leadership perspectives that can be adopted based on the organizations' internal and external factors. Hersey and Blanchard (1969) were the pioneers in the development of situational leadership theory. They argue that there is no singular optimal leadership style for effectively managing a team; instead, it should be flexible subject to the specific requirements of the organization. In recent times, contrariwise, Bans-Akutey (2021) proclaims that according to the path-goal theory one leadership style cannot be adapted in all situations, highlighting the absence of a universally applicable leadership style. As, the directive style is used in task-related tasks, whereas the supportive style is requirement of relational activities successful management.

It has been stated by Amabile et al. (2004) that the effect of leadership depends upon internal and the external environment of work, complexity of the project and the organizational structure, and more importantly the organizational process assets. In their very interesting study, Opoku et al. (2015). studied six different styles of leadership among the UK construction industry leaders. These were transactional, transformational, autocratic, democratic, strategic and laissez-faire styles, which are already established in the industry and the academia. It was concluded through the research that each leadership style exhibits results different according to the circumstances. That study had found that the strategic leadership had a more significant role in ensuring the sustainability of projects. Therefore, it can be said undeniably that leadership is the more pivotal factor that translates the vision of an organization into reality through success.

2.1 Democratic Leadership Style

Basit et al. (2018) performed a very interesting study to compare authoritarian and laissez-faire leadership and democratic leadership. This study was performed in private and public enterprises. The main purpose of the study was to determine worker engagement and performance in respect to democratic leadership. The results reflected that, democratic leadership had the greatest impact on worker performance because it encourages involvement of followers in the decision-making process. Moreover, research by Liphadzi et al. (2015) indicates that democratic leadership gives decision-making authority to project team members. Moreover, it gives them direction to achieve project goals. It was found by the researchers in South Africa that democratic style of leadership was to a certain extent associated with successful project completion. Contrary to autocratic leaders, democratic leaders foster an environment where employees feel comfortable speaking out and contributing, as per the research of Khan et al. (2015). Subsequently, the employees felt esteemed and remained motivated, which not only had a positive effect on the project team and employees, but also supported leaders to gain insight into the diverse opinions of team members. This evidence might prove valuable for a democratic leader when making decisions. This approach yielded high-quality output through its collaborative workforce, as multiple studies indicated that financial incentives were not the sole driving force for employees for the keen contribution to the growth of the organization.

Hence, the team was driven to perform at their utmost potential due to the incentive and inspiration provided by recognition. The study also highlighted that the democratic leadership style is most appropriate when a project or organization consists of a group of exceptionally proficient teams. Abodunrin (2022) examined the correlation between the democratic leadership style and employee performance in the educational sector of Nigeria. The research findings revealed that the democratic leadership style was widely embraced within the higher education sector of Nigeria, resulting in enhanced employee performance and success rates.

2.2 Project Success

Angus et al. (2005) aimed to achieve the desired project goals by considering the efficient management of the triple constraints (time, money, and quality) as a determinant of project success. However, according to Hussain et al. (2020), the three components of time, cost, and quality are insufficient to meet the criteria for project success. This is due to the fact that projects as a whole necessitate high-quality management methods and the satisfaction of all parties involved stakeholders. The alignment of organizational objectives with the project objectives which also reflect as integrated project management, customer influence on project performance, project effectiveness, and workspace environment for project implementation, are all factors that have been studied in relation to project success (Albert et al., 2017).

Hussain et al. (2022) conducted extensive research on building projects in Pakistan that used renewable energy and discovered that projects need government support, community involvement, and organizational innovation to be effective. Furthermore, Uçar et al. (2012) investigated the relationship between different leadership styles and project success and decision-making. Therefore, the purpose of this study was to investigate the relationship between democracy and project success within the context of higher education development projects.

2.3 Democratic Leadership and Project Success

According to Grzesik and Piwowar-Sulej (2018), there are three types of tasks involved in project implementation: operational, supporting, and management. The role of project management is the most important. The project team members chose a democratic leadership style, which was followed throughout the project's implementation. A more satisfactory work environment, particularly when faced with adversities, can be accomplished through democratic leadership (Khan et al., 2015).

Similarly, Karakiliç (2019) also studied that a democratic leadership style positively influences the performance of an organization. Additionally, Mohiuddin (2017) revealed that democratic leadership styles were more widely held in innovative businesses or projects requiring interdepartmental collaboration. One more Greek study saw at the relationship between project success factors and managers' emotional, behavioural, and managerial abilities (Trivellas & Drimoussis, 2013). Project managers with high levels of emotional intelligence, and behavioral skills were more likely to see their initiatives through to accomplishment. In contrast to authoritarian leadership, democratic leadership was more likely to succeed when emotional social awareness, team behavior, and managerial cooperation were recognized. Akpoviroro et al. (2018) also noted that employees' engagement in decision-making processes significantly increased their productivity. Employee motivation is also positively related with a participative leadership style, noted by the above researcher.

In order to determine how supportive leadership styles, affect the success of renewable energy projects, Zaman et al. (2022) performed research in Pakistan. Results showed that subordinates and followers were more likely to achieve success when their leaders were supportive. Elenkov (2002) argues that in today's cutthroat business climate, a leader's capacity to make sound judgements hinges on the backing and cooperation of their team. Because it successfully combines directive and empowering tactics, the democratic leadership is more results-oriented as discussed in the above literature.

This all supports us to establish through this study, in the higher education sector of Pakistan; the impact of democratic leadership on project success.

H1: Democratic leadership positively impact Project Success in the Pakistan Higher Education Sector.

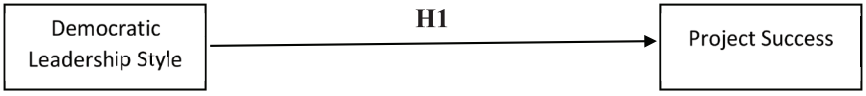

Figure 1: Research Framework

3. Methodology

This study is a quantitative investigation that examines the numerical influence of Democratic Leadership on the success of a project. Various scales from diverse sources have been utilized to examine the factors. The democratic leadership measure was derived from Tarhan and Tutgun (2021) while the project success scale was derived from Aga et al. (2016).

The questionnaire was created using Google Forms, and responses were collected for both pilot and detailed testing. The data analysis for this step was conducted using SPSS 26 software. The participants consisted of project leaders who held top positions and were directly involved in project matters. The variables under investigation corresponded to outcomes derived from the primary data source. The data was gathered from public sector universities located in the Punjab area of Pakistan. In this study, the term "project" refers to a specific unit of analysis that was carried out in public sector universities in Pakistan, with the support of the Higher Education Commission (HEC).

Prior to the comprehensive data collection process, pilot testing was undertaken to assess the reliability of scales used in the questionnaires, in accordance with the research objectives. A total of 110 projects in the Punjab province of Pakistan were completed by the Higher Education Commission (HEC) throughout the past decade. Based on the findings of Krejcie and Morgan (1970), it was determined that the ideal sample size is 86 because of the lesser number of HEI's in Pakistan. According to Saunders et al. (2003), the questionnaire

required enhancements to ensure that respondents could answer the questions without difficulty. They also emphasized that a pilot study should involve a least of 10 participants. Table 1 of Summary of Pilot Testing Reliability Statistics presents the Cronbach Alpha α, which was used to assess the scale reliability and reflect its internal consistency.

Table 1
Summary of Pilot Testing Reliability Statistics

S:No	Scale Description	Cronbach's Alpha	N of Items
1	Democratic Leadership Style	.721	7
2	Project Success	.832	14

Nunnally (1978) provided that $\alpha > 0.700$ as a thumb rule for reliability of the scale. After having satisfactory values of Cronbach Alpha (α) against all the scales, the questionnaire was widely circulated.

4. Data Analysis

This section presents a comprehensive examination of the data gathered from participants and investigates the correlation between the variables. Initially, the data screening process was finalized, and each response item was systematically assigned a code to prevent any inconsistencies. An assessment was conducted to verify the dependability and accuracy of the data and measurement scales. Following the attainment of good results, a comprehensive examination of the data was conducted using SPSS using regression analysis to confirm the hypothesis.

The main focus of the study was the project leaders employed at institutions in Punjab. Among the 86 respondents, 82.5% (71) were male participants involved in project management activities, whereas just 18.5% (15) were female. The data suggested that the majority of individuals engaged in university projects were of the male gender.

Table 2
Gender Summary

	Gender	Frequency	Percent
Valid	Female	15	18.5
	Male	71	82.5
	Total	**86**	**100.0**

The data, gathered through a google form, was subsequently transferred to Microsoft Excel. Since all the choices in the questionnaire were designated as obligatory, there were no absent values detected in the data sheet. Subsequently, every row was encoded to associate each response with its corresponding numerical code designation. The data was examined for any atypical responses provided by the respondent(s). Upon reviewing 86 replies, no evidence of abnormal data representation was found. Correlation is a statistical metric that quantifies the extent of the relationship between two or more variables. The correlation coefficient is a statistical measure that runs from -1 to +1. A value of 0 indicates no correlation, -1 indicates a perfect negative correlation, and +1 indicates a perfect positive correlation. Table 3 of Correlation Summary displays the association between the Democratic Leadership Style and the effectiveness of the project.

Table 3
Correlations Summary

Variables	**Democratic Leadership Style**	**Project Success**
Democratic Leadership Style	1	
Project Success	.522**	1

The hypothesis test demonstrated a significant influence of the democratic leadership style (DL) on project success (PS). In order to examine the hypothesis, a regression analysis was conducted to assess the relationship between the independent variable, democratic leadership style (DL), and the dependent variable, project success (PS). The study found a significant relationship between the use of a democratic leadership style and project success ($F = 71.099$, $p < 0.001$). This suggests that the leadership style had a substantial influence on the project's outcome ($b = 0.522$, $p < 0.001$). The data unequivocally showed a moderate positive correlation between the democratic leadership style (DL) and PS. The table 4 of Regression Analysis of Democratic Leadership Style and Project Success, presents a concise overview of the findings.

Table 4
Regression Analysis of Democratic Leadership Style and Project Success

Hypothesis	**Regression Weight**	**Beta Coefficient**	**R^2**	**F**	**t-value**	**p-value**	**Hypothesis supported**
H1	DL → PS	.522	.272	71.099	8.432	0.000	Yes

Note: p value <0.05, DL: Democratic Leadership Style, PS: Project Success

Every positive movement of one unit in democratic leadership style resulted in a.522-unit increase in project success. In addition, with an R2 of 0.272, the model clarified that democratic leadership style accounted for 27.2% of the variance in project success. This provides evidence for hypothesis H1.

5. Results and Conclusion

Projects in Pakistan's higher education sector benefited from a democratic leadership style, according to the report. According to the results, a democratic leadership style was 27.2% responsible for the project's success in public sector universities' project leaders. Basit et al. (2018) discovered a favorable association between the democratic leadership style and employee performance, which contributed to project success, therefore past literature also supports this. Democratic leadership, according to Liphadzi et al. (2015), allows project staff to have some independence while yet receiving direction to reach project goals. This led to the Hypothesis approval.

5.1 Implications of the Study

The purpose of this research was to determine effect of democratic leadership styles on project success in Pakistan higher education sector where universities were responsible for carrying out actual project execution. The study relied on both theoretical predictions and real data. The Higher Education Commission (HEC) has just released its first ever comprehensive report on its funded higher education projects. The results showed that democratic leadership approaches were somewhat positively correlated with project performance. The research showed that initiatives are more likely to be successful when their leaders are democratic and have good rapport with the team members. As a result, Pakistan's public sector institutions desperately need qualified project managers, so the country must improve the overall project performance.

6. Limitations and Future Direction

Public sector institutions in Punjab that received funding from Pakistan's Higher Education Commission (HEC) were the focus of this study. The research is continuing to incorporate data from all of Pakistan, even though this paper only covered Punjab province projects of higher education sector. In future research, decision making as a mediating factor will also be investigated. Project success has been influences by the democratic leadership style, according to the results of this research paper. It is recommended that both in Pakistan and internationally, the higher education sector should get benefit from this research in the long and short term. It will further encourage more studies in the area of leadership, strategic management and project management.

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Pricing Intellectual Capital in Asset Pricing Models: A study on Shanghai Stock Exchange

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Abstract

This study aims to examine the validity of intellectual capital as a priced risk factor in the asset pricing model. We have used the data of companies listed on the Shanghai Stock Exchange from 2000 to 2021. To test the models, time series as well as cross sectional analysis have been done using the Fama-MacBeth method. The results show that intellectual capital is a significant risk factor and after augmenting IC into asset pricing models improves the explanatory power to explain the variation in the stock returns. It further suggests that IC can be priced in the Chinese market, over and above what can be explained by covariance risk, size, value, investment and profitability factors.

Keywords: Intellectual capital; CAPM; Fama-French model; IC augmented model; Shanghai Stock Exchange.

JEL Classification: C1, G12

1. Introduction

` Over the last few years, several asset pricing models have been developed for relating the risks and returns in security markets. The first capital asset pricing model was formulated by Sharpe (1964) and Lintner (1965) which predicted asset return to be relative to beta, a measure of the risk of an asset compared to the market portfolio.

The key assumption for testing the asset pricing model is that the total stock market index can adequately represent the market portfolio. Despite it being widely used, Capital Asset Pricing Model was criticized by many researchers, including Fama and French (1992); Black (1972); and Fama and MacBeth (1973). The primary reason that beta is not the only significant systematic risk to capture variation in the cross-section returns (Silva et al., 2020). Roll (1977) challenged the model, arguing that the market portfolio return cannot be accurately measured by the stock market index return. Thus, in response to this criticism, researchers attempted to find other factors that can explain variations in the expected return premiums.

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The earnings-price ratio was found to have good explaining power for average return (Basu, 1977). Similar results were drawn by Rosenberg et al. (1985) for the book-to-market ratio, Bhandari (1988) for leverage and Banz (1981) for market capitalization. Fama and French (1992) introduced a model with three factors the market portfolio, size and value. Due to the shortcomings in the Fama-French three-factor model (FF3F) of not being able to completely capture variance in cross-section returns, two more factors were added: investment and profitability to form the Fama-French five-factor model (FF5F) in 2015. While several studies show FF5F to perform better than CAPM and FF3F; some research such as Fama and French (2017), Kubota and Takehara (2018) and Roy and Shijin (2019) found FF5F is not a successful model. Roy and Shijin (2018b) and Roy (2021) added another factor to the asset pricing model which was human capital and tested the model, finding it to outperform the older versions of the model.

Human capital is one of the components of intellectual capital (IC). Thus, IC is more comprehensive, which has been known as an important intangible asset that creates value for any firm (Xu et al., 2023; Sardo & Serrasqueiro, 2017). Hence, IC has been included as a factor in the asset pricing model by a few researchers. A study on the Egyptian Stock Exchange was conducted by Shahawy and Wahba (2021) that included components of IC in CAPM and they were found to be insignificant. While a research by Maharani and Narsa (2023) on the Indonesian stock market, added intellectual capital in asset pricing models; the findings showed intellectual capital to have a significant impact on the excess stock returns.

Chinese stock market, a prime example of an emerging market, is gradually maturing within the globalized economy. Despite being the second-largest stock market in the world, the factors influencing risk-premia on Chinese stocks are still not well understood. This uncertainty indicates that much remains to be uncovered about China's market's distinctive features and dynamics, especially regarding how risk is priced. As given in literature such as Weqar et al. (2020) and Xu and Liu (2021), intellectual capital is an essential resource of any firm and thus it can be considered a risk factor in the asset pricing model. Hence, this study will test the performance of intellectual capital factors in CAPM as well as in other multi-factor models including the Fama-French three-factor and five-factor model with theoretical justification in the Shanghai Stock Exchange.

Since the inclusion of intellectual capital as a factor in the asset pricing model is still not explored widely. Therefore, this study will further contribute to the literature on asset pricing. The empirical results from the study can help financial advisors assess market risks more effectively. Investors can thoroughly consider the intellectual capital as a factor, before making investment decisions.

In this study, first we will calculate the intellectual capital of the non-financial companies listed on the Shanghai Stock Exchange using the method given by Pulic (1998) known as

Value Added Intellectual Capital (VAIC) and then construct decile portfolios sorted on IC. The remainder of the study is organized as follows: Section 2 reviews existing literature on asset pricing models, while Section 3 details the methodology employed in this research. Section 4 presents the empirical results, and Section 5 offers the study's conclusion.

2. Literature Review

2.1 Asset Pricing Models

Asset pricing is an evolving field that has seen significant progress over time. The first major advancement was the Modern Portfolio Theory (MPT) introduced by Henry Markowitz in 1952 which stated that diversification allows an investor to select a portfolio that maximizes returns. This process consists of two phases: the first one involves past assessment of an asset, followed by forecasting its performance in the future. The second phase starts with estimating the assets' performance in the future and ends with the selection of the portfolio.

Markowitz's mean-variance rule posits that through diversification the risk can be reduced, although it cannot be entirely eliminated. An optimal portfolio is dependent on the covariance between the assets included in it (Pollet & Wilson, 2008). Thus, there is a trade-off between an asset's risk and its expected returns, requiring investors to select a portfolio that aligns with their risk-tolerance.

2.2 Capital Asset Pricing Model

Building on Markowitz's MPT, the conventional mean-variance capital asset pricing model (CAPM) was formulated by Sharpe (1964) and Lintner (1965). The model assumes that investors consider only the mean and variance of an asset's returns, consistent with MPT's assumption that systematic risk is the only risk that cannot be mitigated through diversification. Numerous studies have tested CAPM's validity in the stock market. One of the earliest was Black (1972), who validated CAPM by proving a linear relationship between expected returns and respective betas using data from the NYSE. Jensen et al. (1972) and Fama and MacBeth (1973) also supported CAPM's validity. However, Roll (1977) and Ross (1976) criticized the model, arguing that the market portfolio's proxy is inefficient because it does not contain all assets, making it an incomplete representation of the market portfolio.

2.3 Fama-French Three Factor Model

In response to CAPM's criticisms, researchers expanded the model by incorporating additional factors. Fama and French introduced a three-factor model (FF3F), adding two risk factors—size and value effects—besides market risk. They argued that an asset's return

depends on three risk factors: market beta, the difference between small and large company stocks, and the difference between high and low book-to-market company stocks. Studies by Hassan and Javed (2011), Bhatti and Hanif (2010), Eraslan (2013), Rossi (2012) and Mirza (2008) found three-factor model superior to CAPM. Regardless of its success, the FF3F model faced criticism for lacking theoretic instinct for its size and value factor formation (Haugen & Baker, 1996; Griffin, 2002; Fama & French, 2012).

2.4 Fama-French Five Factor Model

In 2015, Fama and French added two more factors: investment and profitability to its previous model. Several studies on different equity markets have shown five factor model (FF5F) to perform better. Lin (2017) found that in the Chinese market, FF5F performed better than FF3F from 1997 to 2015 but the investment factor was found to be redundant. Similar results were found in the Chinese market by Huang (2019) from 1994 to 2016 and by Guo et al. (2017) from 1995 to 2014, but here a weak impact was found in the investment factor. Similarly, studies by Lohano and Kashif (2019) and Ali et al. (2019) on the Pakistani market also found FF5F to be better than previous models in finding the cross-sectional returns.

A study by Leite et al. (2018) was done on developing economies where four and five factor models outperformed three factor model but the inclusion of profitability and investment factor made the value factor irrelevant. Foye (2018) studied eighteen different emerging economies where FF5F performed better than FF3F; however, for Asian markets, the premiums of investment and profitability were not distinguishing enough.

2.5 Addition of human capital

Due to the issues with the FF5F model, researchers have continued to introduce new factors into asset pricing models. Roy and Shijin (2018a) developed and tested a multifactor equilibrium asset pricing model that included Fama-French factors, bond market factors, market portfolio, human capital, and momentum. They concluded that only the market portfolio and human capital were significantly priced factors in both emerging and developed markets. Maiti and Balakrishnan (2018) incorporated human capital as the sixth factor in the FF5F model. This enhanced model outperformed the CAPM, FF3F, and FF5F models, demonstrating that human capital is a significant factor in predicting stock returns of the Indian stock exchange. In another study, Roy and Shijin (2018b) included human capital in the asset pricing model and found the new augmented models to perform better than previous ones in explaining the variation in asset returns of listed firms of NYSE, NASDAQ and AMEX. Using the data from the Japanese market, Roy (2021) found that human capital is a significant risk factor in the asset pricing models. The studies on Pakistani market by Khan et al. (2023) and Thalassinos et al. (2023) concluded that the human capital-based asset pricing model performed better than previous models.

2.6 Addition of intellectual capital

Intellectual capital components were included in CAPM by Shahawy and Wahba (2021) using the dataset of firms listed on the Egyptian Stock Exchange from 2013 to 2018. Fama-MacBeth regression was used for cross section analysis. The results show that intellectual capital components are not significant and thus IC is not a suitable factor in the Egyptian market. In a study by Maharani and Narsa (2023) on Indonesian stock market from the year 2012 to 2022, intellectual capital was added to Fama French six factor model. IC factor was calculated using modified value added method. The GLS regression and GMM was used to test the models. The results showed intellectual capital to have a significant impact on the excess stock returns.

2.7 Research Gap and Contribution

Both the studies (Shahawy & Wahba, 2021; Maharani & Narsa, 2023) did not make investment portfolios. However, in this study we have made investment decile portfolios based on IC which are not made in any previous research. Additionally, we made a factor of IC using the methodology given by Moreno and Rodriguez (2009), Harvey and Siddique (2000), and Kostakis et al. (2012) which is different from the IC factor used in the previous studies. Therefore, these are the two contributions of our study on the Shanghai Stock Exchange. The findings of this study can assist financial advisors in more effectively assessing market risks.

2.8 Intellectual Capital

Intellectual capital (IC) is deemed as a strategic asset that boosts financial performance of business firms (Xu & Liu, 2021). Shih et al. (2011) described intellectual capital (IC) as the combined abilities and knowledge of all participants that contribute to creating competitive edge and generating wealth. Vishnu and Gupta (2014) characterized IC as wealth generated by utilization of knowledge. According to Soetanto and Liem (2019), IC is the knowledge useful in competition and creation of wealth.

Investors aim to accurately calculate returns of their investment. Researchers have developed methods for assessing investments and cash flow risks. IC plays a crucial role in determining a firm's performance, influencing its market value. Therefore, it is essential to consider IC when making investment decisions, as it is a significant source of competitive advantage and can enhance a firm's efficiency (Meles et al., 2016; Kehelwalatenna & Premaratne, 2014; Chang & Hsieh, 2011). If IC provides a competitive advantage, it should positively impact a firm's financial performance, making it a valuable investment.

Intellectual capital consists of structural capital, customer capital, and human capital, (Bayraktaroglu et al., 2019). Human capital includes an individual's talents, knowledge, capabilities and proficiency used to attain its goals (Medina et al., 2011; Weqar et al., 2020). It is highly valued as it is based on personal traits that is useful for the firm performance (Curado, 2008). Structural capital is the component of IC that is created by the human resource but remains within the company (Bontis et al., 2015). It consists of customs, processes, and values that support the knowledge produced by human resources and convert it into intellectual assets (Gates & Langevin, 2010). Customer capital includes the resources derived from individual and organizational networks (Ngah & Ibrahim, 2009; Ferreira & Martinez, 2011). It serves as a bridge between the firm and its various stakeholders including competitors, customers, communities and shareholders (Bozbura, 2004; Weqar et al., 2020).

Intellectual capital measurement methods are categorized into financial and non-financial valuation (Tan et al., 2008). Financial methods assess economic-value of intangible assets, enabling performance comparison with competitors. These methods include VAIC (Pulic, 1998), Tobin's Q (Luthy, 1998), and economic value added (Stewart, 1994). Non-financial methods identify the types, locations, and uniqueness of IC components within an organization. These include Intellectual-Capital Index (Roos et al., 1997) and Balanced Scorecard (Kaplan & Norton, 1992).

Among these methods, the value-added method is most widely used. Other methods often face issues of unavailable information, making external analysis difficult. However, VAIC calculations use data from publicly available financial reports (Clarke et al., 2011). VAIC allows for easy data retrieval, calculations, and firm comparisons due to its standardized measurement method (Maditinos et al., 2011).

In accordance to VAIC, IC comprises capital-employed efficiency, structural-capital efficiency, and human-capital efficiency (Pulic, 1998). Capital-employed efficiency measures how effectively financial capital is used by the firm, represented by the net assets' book value. Human-capital efficiency is the value generated from investing in employees, with salaries and wages often serving as proxies for human capital (Molodchik et al., 2012; Wang & Chang, 2005). Structural-capital includes delivery-networks, supply-chains, IT applications, and brands (Tan et al., 2008), and is calculated as the difference between human capital and value-added.

3. Research Methodology

3.1 Data and variables

Data for all the delisted and listed companies on the Shanghai Stock Exchange is taken from Thomson Reuters Eikon and DataStream and the financial report of the stock

exchange listed firms of China from the period January 2000 to July 2021. To refrain from survivorship bias, delisted firms (dead and suspended/merged) are also included in the data sample. However, financial firms are excluded from analyzing the impact of cash and non-cash-based measures on the firms of non-financial sector.

To calculate stock returns, the prices of the firms for the period under study are required. The data was cleaned and required treatment for dead companies was done by assigning a stock return value of -1 for the month when company became dead; as suggested by Soares and Stark (2009). To calculate market return, data for all share index for the Shanghai Stock Exchange is taken. For calculation of excess returns, risk-free rate is required; a proxy of which is taken as SHIBOR (data is taken from Federal Reserve Economic Data).

The variables involved in making size, value, profitability and investment factors are Common Equity (WC03501), number of shares (NOSH), Total Assets (WC02999) and Earnings before tax (this was calculated by adding Net Income (WC01651) and Tax (WC01451)). For calculating the intellectual capital, data for the following variables was extracted: Earnings before interest and tax (WC18191), Depreciation (WC01148), Salaries and benefits expenses (WC01084) and Total Liabilities (WC03351). Data of all these variables are taken from Thomson Reuters Eikon and DataStream. The definitions of the variables are provided in Appendix A.

3.2 Estimation of Intellectual Capital

IC has been calculated using the model of Pulic (1998, 2000). According to studies i.e. (Shahawy & Wahba, 2021; Xu & Wang, 2018; Sardo & Serrasqueiro, 2017; Nimtrakoon, 2015; Vidyarthi, 2019), value-added Intellectual capital (VAIC) is calculated as:

$$VAIC=SCE+CEE+HCE \longrightarrow (1)$$

Where SCE is structural-capital-efficiency, CEE is capital-employed-efficiency, and HCE is human-capital-efficiency.

According to the various studies i.e., (Bontis & Fitz-enz, 2002; Pulic, 2004; Maji & Goswami, 2016; Haris et al., 2018; Weqar & Haque, 2022); value added is calculated by:

$$\text{Value added (VA)}=EBIT+PC+D+A \longrightarrow (2)$$

where EBIT is earnings before interest and tax, PC is personal cost like wages, salaries and other expense, A is amortization and D is depreciation.

$$CEE = \frac{VA}{CE} \longrightarrow (3)$$

where CE is capital employed:
CE= total assets – total liabilities (4)

$$HCE = \frac{VA}{HC}$$
where HC is the personal cost. (5)

$$SCE = \frac{SC}{VA}$$ (6)

where SC is a capital structure:
SC = VA-HC (7)

3.3 Construction of Portfolios

Portfolios have been constructed based on single sorting and double sorting. In single sorting, the sorting criteria is Intellectual Capital (IC). The value of IC and market value was taken at time 't-1' while excess returns were taken at time 't'. After calculations, decile portfolios were formed both equally-weighted and value-weighted.

In double sorting, keeping the size factor fixed at the end of June of year *t*, stocks are assigned to one of the three IC portfolios. The intersections of these independent double-sorts result in size and IC portfolios. After the portfolio construction, the annualized returns for these portfolios are calculated.

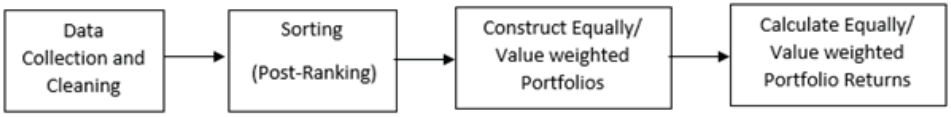

Figure 1: Flowchart for construction of portfolios

3.4 Construction of Factors

To test the Fama-French three and five model, their respective factors are constructed; namely size (SMB), value (HML), investment (CMA) and profitability (RMW) using the method given by Fama and French (1993) and Fama and French (2015) for the three-factor and five-factor model respectively. For size-factor, two groups were formed by dividing the data in halves based on small and big market cap. For the value-factor, data of book-to-market was divided in three groups (low, neutral, high) using median break-up point thirtieth and seventieth percentiles. For profitability-factor, data on operating-profit was divided into three groups (weak, neutral, robust) using median with break-up point of thirtieth and seventieth percentiles. For investment-factor, data on investment was divided in three groups (aggressive, neutral, conservative) using a median with break-up points of thirtieth and seventieth percentiles.

4. Empirical Analysis

4.1 Preliminary Findings

Table 1 shows descriptive statistics for each intellectual capital portfolio for the full sample (July 2000-June 2021) on Shanghai Stock Exchange. The portfolios are sorted on basis of intellectual capital. P1 is the portfolio of firms with the lowest intellectual capital and P10 is the portfolio of firms with the highest intellectual capital. In the equally-weighted portfolios, P9 and P10 have more returns as compared to P1 and P2; showing that the returns are increasing from P1 to P10. Similar pattern is observed in value-weighted portfolios as well. The table also shows the average market value in million yuan of shares for P1 to P10. P1 has lowest average market value and P10 has higher average market value compared to other portfolios. We can notice, that here low market value companies have fewer returns and high market value companies have high return showing no size effect.

We observe that the firms with low IC have lower returns and firms with high IC have higher returns. An investor can accept a low premium for holding shares of low IC firms (P1) while it would pay a higher premium for holding higher IC firm (P10) shares. the literature indicates that higher levels of intellectual capital (IC) are associated with greater returns (Bayraktaroglu et al., 2019; Saeed et al., 2016) As a result, our investment strategy is set to be P10-P1. The spread of P10-P1 is positive and significant in both equal-weighted and value-weighted portfolios; hence fulfilling our investment strategy.

Table 1
Intellectual capital portfolios: Characteristics and performance

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
EW Return (%)	0.96	5.53	9.24	8.15	8.32	10.06	10.85	12.74	13.34	14.13	13.17	3.52
VW Return (%)	-3.73	-0.66	2.68	2.07	1.56	2.58	3.53	5.15	8.84	6.47	10.20	2.11
Avg. MV (CNY m)	0.56	0.73	0.92	1.03	0.97	0.95	1.07	1.29	1.53	2.83	2.27	17.64
CAPM Beta	0.99	1.01	1.05	1.01	1.02	1.00	0.98	1.01	1.00	1.04	0.05	1.27

The table shows descriptive statistics of decile portfolios sorted on IC of the firms listed on Shanghai Stock Exchange from July 2000 to June 2021. EW and VW returns are per annum. ***, **, * is significance-level at 1%, 5%, 10% respectively.

4.2 Risk-adjusted Asset Pricing

Here, the performance of time-series is estimated for ten portfolios sorted on intellectual capital; using CAPM, FF3F and FF5F asset-pricing models.

First, Jensen-alpha is calculated for CAPM; followed by alphas of FF three and five factor models:

$$R_{it} - R_t^f = \alpha_{capm} + \beta_{\mathrm{Mi}}(R_{\mathrm{Mt}} - R_t^f) + \epsilon_{it} \longrightarrow (8)$$

$$R_{it} - R_t^f = \alpha_{ff3} + \beta_{\mathrm{Mi}}(R_{\mathrm{Mt}} - R_t^f) + \beta_{\mathrm{i,SMB}}(SMB_{\mathrm{t}}) + \beta_{\mathrm{i,HML}}(HML_{\mathrm{t}}) + \epsilon_{it} \longrightarrow (9)$$

$$R_{it} - R_t^f = \alpha_{ff5} + \beta_{\mathrm{Mi}}(R_{\mathrm{Mt}} - R_t^f) + \beta_{\mathrm{i,SMB}}(SMB_{\mathrm{t}}) + \beta_{\mathrm{i,HML}}(HML_{\mathrm{t}}) + \beta_{\mathrm{i,RMW}}(RMW_{\mathrm{t}}) + \beta_{\mathrm{i,CMA}}(CMA_{\mathrm{t}}) + \epsilon_{it} \longrightarrow (10)$$

Where α_{capm} is the Jensen alpha for CAPM; α_{ff3} and α_{ff5}, are alphas for FF3F and FF5F models respectively; R_{it} is return of portfolio 'i' in month 't', R_{Mt} is the return of market portfolio in month 't' and R^t_f is risk-free return for month 't'. SMB, HML, RMW and CMA are the size, value, profitability and investment factors respectively. The above models are estimated using Generalized Method of Moments with Newly-Wested approach of heteroscedastcity and serial-correlation standard errors.

Panel A of Table 2 presents alphas of the ten equal-weighted portfolios sorted on intellectual capital. P1 represents the equal weighted portfolios with lowest IC and P10 represents EW portfolios with highest IC. Furthermore, the table shows if the behavior of P1 and P10 is different or not. In all the models (CAPM, FF3F and FF5F), alpha values show an increasing trend from P1 to P10. P10 which contains shares of high IC firms has annualized Jensen alpha of 14.20% pa (t=2.17), Fama French three factor alpha of 20.36% pa. (t=2.78) and Fama French five factor alpha of 16.31% pa. (t=2.17).

The spread of P10 - P1 is positive and significant yielding abnormal performance for all the models: for CAPM it is 13.16% pa. (t= 3.53), for FF3F is 14.50% pa. (t=3.69) and for FF5F is 14.10% pa. (t=3.57). These findings prove that IC is significantly priced at the Shanghai Stock Exchange over-and-above market, value, size, investment and profitability.

Wald test has been used to evaluate the significance of pricing errors of the models and examine the joint significance of all the portfolios' alpha. Wald test rejects null hypothesis of zero jointly alphas estimates; CAPM (p=0.004), FF3F (p=0.0009) and FF5F (p=0.0016); indicating that all portfolios are different from each other. They are different assets. The partial difference between P10 and P1 is positive and significant in CAPM, FF-3F and FF-5F; thus all models fail to explain; showing existence of partial investment strategy. People can take long position in P10 and short positon in P1.

Panel B shows alphas of the ten value-weighted portfolios sorted on intellectual capital. The spread strategy of P10 - P1 has abnormal performance for all the models. These support that intellectual capital is significantly priced on Shanghai Stock Exchange. This suggests that intellectual capital can be considered as risk-factor and priced significantly on Shanghai Stock Exchange.

The above results suggest that intellectual capital can be considered as risk-factor and be priced significantly on Shanghai Stock Exchange.

Table 2
Intellectual capital portfolios: Alphas

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	Chi-sq.
Panel A: Equal weighted portfolios sorted on intellectual capital												
CAPM	1.03	5.59	9.29	8.19	8.37	10.11	10.90	12.78	13.40	14.20	13.16	25.80
Alpha	(0.14)	(0.79)	(1.30)	(1.20)	(1.22)	(1.52)	(1.70)*	(2.01)**	(2.12)**	(2.17)**	(3.53)***	[0.00]***
FF3F-	5.86	9.91	13.17	12.48	12.42	14.48	15.73	17.75	18.43	20.36	14.50	29.93
Alpha	(0.75)	(1.28)	(1.71)*	(1.69)*	(1.66)*	(2.00)**	(2.23)**	(2.53)**	(2.67)***	(2.78)***	(3.69)***	[0.00]***
FF5F-	2.21	4.72	7.70	7.85	7.82	9.85	12.07	14.01	15.03	16.31	14.10	28.35
Alpha	(0.27)	(0.58)	(0.94)	(1.02)	0.99	(1.31)	(1.66)*	(1.91)**	(2.12)**	(2.17)**	(3.57)***	[0.00]***
Panel B: Value weighted portfolios sorted on intellectual capital												
CAPM	-3.67	-0.61	2.72	2.11	1.59	2.61	3.58	5.19	8.88	6.51	10.18	13.02
Alpha	(-0.52)	(-0.09)	(0.39)	(0.33)	(0.24)	(0.41)	(0.61)	(0.88)	(1.53)	(1.12)	(2.12)**	[0.22]
FF3F-	-0.64	1.90	5.83	6.46	5.80	6.59	7.35	8.43	12.36	8.93	9.57	17.21
Alpha	(-0.09)	(0.26)	(0.79)	(0.96)	(0.82)	(0.99)	(1.19)	(1.33)	(1.99)**	(1.48)	(1.95)*	[0.07]***
FF5F-	-4.17	-1.82	1.78	2.91	2.65	2.55	4.14	5.46	9.81	5.92	10.09	16.62
Alpha	(-0.52)	(-0.23)	(0.22)	(0.41)	(0.35)	(0.37)	(0.62)	(0.80)	(1.51)	(0.96)	(2.00)**	[0.08]***

This table shows annualized alphas of the decile portfolios sorted on intellectual capital. The t-stats is in parenthesis and p-value is in brackets. ***, ** and * is significance-level at 1%, 5% and 10% respectively

4.3 Cross-Sectional Analysis

To check whether the risk factors are able to describe the variation in cross-sectional returns of portfolios; two-stage Fama-Macbeth (1973) regression is performed using decile portfolios sorted on intellectual capital. In stage one, time-series regression is done and beta coefficients are estimated for each decile portfolio as given in equations 8,9 and 10. In the stage two, cross sectional regression is done between excess return and beta (from stage one). Cross-sectional analysis is done on CAPM, FF3F and FF5F models using following equations.

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{M}t}\hat{\beta}_{\mathrm{i,M}} + \forall_{it} \longrightarrow \quad (11)$$

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{M}t}\hat{\beta}_{\mathrm{i,M}} + \lambda_{\mathrm{SMB}t}\hat{\beta}_{\mathrm{i,SMB}} + \lambda_{\mathrm{HML}t}\hat{\beta}_{\mathrm{i,HML}} + \forall_{it} \longrightarrow \quad (12)$$

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{M}t}\hat{\beta}_{\mathrm{i,M}} + \lambda_{\mathrm{SMB}t}\hat{\beta}_{\mathrm{i,SMB}} + \lambda_{\mathrm{HML}t}\hat{\beta}_{\mathrm{i,HML}} + \lambda_{\mathrm{RMW}t}\hat{\beta}_{\mathrm{i,RMW}} + \lambda_{\mathrm{CMA}t}\hat{\beta}_{\mathrm{i,CMA}} + \forall_{it} \longrightarrow \quad (13)$$

Cross-sectional test was done on the decile portfolios constructed on the basis of intellectual capital. Table 3 shows the estimated risk-premium coefficients of the IC sorted portfolios for CAPM, FF3F and FF5F. From Panel A (equal weighted portfolios), we can see that for all models i.e. CAPM, FF-3F and FF-5F, cross-sectional relation between market beta and portfolio returns is negative and significant which is contradictory to the theory of CAPM similar to studies by (Florackis et al., 2011; & Kostakis et al., 2012). The same result occurs when size, value, investment and profitability factors are introduced. The size factor is positive and significant in both FF-3F and FF-5F. The value factor is negative and significant in FF3F. However, the value, profitability and investment factors in FF-5F have no significance over cross-sectional portfolio returns. Further, it can be seen that the R-square

is increased when more risk factors are included in the models while adjusted R-square is very low for all models. The intercept is positive and significant for CAPM and insignificant for F-3F and FF-5F. These findings indicate that these asset-pricing models do not explain variation in cross-sectional returns of portfolios sorted on intellectual; capital; which gives us an indication to add more factor(s) i.e. leading to constructing intellectual capital factor.

Panel B (value weighted portfolios) in table 3, for all models, cross-sectional relation between market beta and portfolio returns is negative and significant which is contradictory to theory of CAPM. The size, value and profitability factors in FF-3F and FF-5F are negative and have no significance on cross-sectional portfolio returns. Further, it can be seen that the R-square is increased when more risk factors are included in the models while the adjusted R-square is very low for all models. The coefficient of the intercept is positive and insignificant for CAPM; while the intercept is positive and significant for FF-3F and FF-5F; this is known as model misspecification. These findings indicate that these asset-pricing models do not explain the variation in cross sectional portfolio returns; which gives us an indication to add more factor(s) i.e. leading to constructing intellectual capital factor.

Table 3
Intellectual capital portfolios: Cross-sectional asset-pricing tests

	λ_0	λ_M	λ_{SMB}	λ_{HML}	λ_{RMW}	λ_{CMA}	R^2	Adj. R^2
Panel A: Equal weighted portfolios sorted on intellectual capital								
CAPM	0.0147	-0.0543					0.19	0.09
	(2.19)**	(-2.40)**						
FF3F	0.0004	-0.1267	0.0633	-0.0322			0.54	0.31
	(0.05)	(-3.70)***	(2.99)**	(-2.31)**				
FF5F	0.0072	-0.1856	0.1193	-0.0138	0.0012	0.0253	0.71	0.35
	(0.67)	(-3.66)***	(3.38)**	(-0.83)	(0.07)	(2.07)**		
Panel B: Value weighted portfolios sorted on intellectual capital								
CAPM	0.0078	-0.0591					0.14	0.04
	(1.44)	(-2.52)**						
FF3F	0.0126	-0.0691	-0.0210	-0.0067			0.41	0.12
	(1.71)*	(-2.56)**	(-1.42)	(-0.41)				
FF5F	0.0202	-0.0601	-0.0162	-0.0015	-0.0072	0.0214	0.65	0.23
	(2.20)**	(-2.45) **	(-1.24)	(-0.09)	(-0.36)	(1.24)		

This table shows risk-premium coefficient (λ). t-stats are in parenthesis. The last columns show R2 *and adj. R2 are from the second-stage FMB regression. ***, **, * is significance-level at 1%, 5%, 10% respectively.

4.4 Double sorted Portfolios

Table 4 shows the average annualized returns of the ten portfolios sorted on size and intellectual capital of China from July 2000 to June 2021. Across each IC group (low, medium and high), average return increases as the size increases; indicating the presence

of a size effect in the Shanghai stock exchange. In every size group, the high IC portfolio outperforms the low IC portfolios. This shows the presence of IC effect in the market.

Table 4
Size and Intellectual capital portfolios: Characteristics and performance

	Low	Medium	High	High-Low
Small	-7.26	-1.18	3.33	10.59
	(-0.88)	(-0.15)	(0.44)	(4.22)***
Big	-1.15	1.00	5.10	6.25
	(-0.14)	(0.13)	(0.75)	(2.29)**

The table shows average annualized returns of the size and IC sorted portfolios of firms listed on Shanghai Stock Exchange. The t-stats is reported in parenthesis ***, **, * is significance-level at 1%, 5%, 10% respectively.

Table 5 shows the intercepts (alphas) of CAPM, FF3F and FF5F and their t-stats of the full sample time-series regression applied on the portfolios double-sorted on size and IC. When double sorting was done on size and IC with size kept constant; we see from table 5 that P10-P1, is significant and positive for CAPM and FF3F for both small and big size firms while in the case of FF5F, results for small size firms are significant and positive. These results show that IC can be added to the models as an additional risk factor.

Table 5
Alphas of size-IC portfolios

	Low	Medium	High	High-Low
		CAPM (%p.a.)		
Small	-6.60	-0.55	3.95	10.56
	(-1.33)	(-0.13)	(1.00)	(4.24)***
Big	-0.47	1.64	5.73	6.21
	(-0.11)	(0.48)	(2.28)**	(2.31)**
		FF3F (%p.a.)		
Small	0.55	4.03	12.50	11.95
	(0.18)	(1.39)	(4.43)***	(4.61)***
Big	-1.83	-0.26	4.41	6.24
	(-0.53)	(-0.08)	(1.83)*	(2.69)**
		FF5F (%p.a.)		
Small	7.33	7.36	13.05	5.71
	(2.70)**	(2.38)**	(4.33)***	(2.77)**
Big	5.23	2.64	5.68	0.45
	(1.58)	(0.81)	(2.22)**	(0.22)

This table shows annualized alphas of size-IC sorted portfolios. The t-stats is in parenthesis. ***, **, * is significance-level at 1%, 5%, 10% respectively.

4.5 IC Augmented Model

From the cross-section and double sorting results we see that there is a need to add a factor to the model. Therefore, the factor of Intellectual Capital has been constructed using the approach by Moreno and Rodriguez (2009), Harvey and Siddique (2000), and Kostakis et al. (2012). First, we sort the shares every month in accordance to their IC values. Then, we allot the 15% (in terms of market-value) of the shares with the highest IC estimated values to portfolio IC+ and the 15% of the shares with the lowest IC estimated values to portfolio IC- and compute their equally-weighted returns. IC factor has been defined as spread return (IC+ - IC-). This factor is then augmented in CAPM, FF3F and FF5F models; and FMB regression is performed again. In stage one, time-series regression is done and beta coefficients are estimated for each decile portfolio as given in equations 14, 15 and 16.

$$R_{it} - R_t^f = \alpha_{capm} + \beta_{\mathrm{Mi}}\,(R_{\mathrm{Mt}} - R_t^f) + \beta_{\mathrm{i,IC}}\,(IC_{\mathrm{t}}) + \in_{it} \longrightarrow \quad (14)$$

$$R_{it} - R_t^f = \alpha_{ff3} + \beta_{\mathrm{Mi}}\,(R_{\mathrm{Mt}} - R_t^f) + \beta_{\mathrm{i,SMB}}\,(SMB_{\mathrm{t}}) + \beta_{\mathrm{i,HML}}\,(HML_{\mathrm{t}}) + \beta_{\mathrm{i,IC}}\,(IC_{\mathrm{t}}) \quad \in_{it} \quad (15)$$

$$R_{it} - R_t^f = \alpha_{ff5} + \beta_{\mathrm{Mi}}\,(R_{\mathrm{Mt}} - R_t^f) + \beta_{\mathrm{i,SMB}}\,(SMB_{\mathrm{t}}) + \beta_{\mathrm{i,HML}}\,(HML_{\mathrm{t}}) + +\beta_{\mathrm{i,RMW}}(RMW_{\mathrm{t}}) + \beta_{\mathrm{i,CMA}}\,(CMA_{\mathrm{t}}) + \beta_{\mathrm{i,IC}}\,(IC_{\mathrm{t}}) + \in_{it} \longrightarrow \quad (16)$$

In stage two, cross-sectional regression is done between excess return and beta (from stage one). Cross-sectional analysis is done on augmented CAPM, FF3F and FF5F models using the following equations.

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{Mt}}\hat{\beta}_{\mathrm{i,M}} + \lambda_{\mathrm{ICt}}\hat{\beta}_{\mathrm{i,IC}} + \forall_{it} \longrightarrow \quad (17)$$

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{Mt}}\hat{\beta}_{\mathrm{i,M}} + \lambda_{\mathrm{SMBt}}\hat{\beta}_{\mathrm{i,SMB}} + \lambda_{\mathrm{HMLt}}\hat{\beta}_{\mathrm{i,HML}} + \lambda_{\mathrm{ICt}}\hat{\beta}_{\mathrm{i,IC}} + \forall_{it} \longrightarrow \quad (18)$$

$$R_{it} - R_t^f = \lambda_0 + \lambda_{\mathrm{Mt}}\hat{\beta}_{\mathrm{i,M}} + \lambda_{\mathrm{SMBt}}\hat{\beta}_{\mathrm{i,SMB}} + \lambda_{\mathrm{HMLt}}\hat{\beta}_{\mathrm{i,HML}} + \lambda_{\mathrm{RMWt}}\hat{\beta}_{\mathrm{i,RMW}} + \lambda_{\mathrm{CMAt}}\hat{\beta}_{\mathrm{i,CMA}} + \lambda_{\mathrm{ICt}}\hat{\beta}_{\mathrm{i,IC}} + \forall_{it} \longrightarrow \quad (19)$$

Table 6 presents the estimated coefficients of the ten IC - sorted portfolios from the second-stage regression. Table 7 presents the estimated risk-premium coefficients using a restricted version of the models, where the intercept λ0 equals to zero which is its correct value theoretically. It is confirmed from the results that the IC factors have significant explanatory power over the cross-section of IC portfolio returns. From CAPM we can say, a single factor-loading of IC risk significantly generates a 1.02% monthly premium across equal weighted IC portfolios in equal and a 0.78% monthly premium across value weighted IC portfolios. Adjusted R-square of the model is as maximum as 44% in every case which is more than those obtained from CAPM, FF3F and FF5F models.

Table 6
Unrestricted Cross-sectional Analysis of IC augmented models

	λ_0	λ_M	λ_{SMB}	λ_{HML}	λ_{RMW}	λ_{CMA}	λ_{IC}	R^2	Adj. R^2
Panel A: Equal weighted portfolios sorted on intellectual capital									
CAPM-IC	0.0138	-0.0259					0.0102	0.49	0.35
	(2.03)**	(-1.10)					(3.60)***		
FF3F-IC	0.0171	-0.007	0.0047	0.0282			0.0104	0.64	0.36
	(1.57)	(-0.22)	(0.2)	(1.86)*			(3.65)***		
FF5F-IC	0.0155	-0.013	0.0113	0.0262	0.0021	0.001	0.0103	0.81	0.44
	(1.44)	(-0.40)	(0.45)	(1.70)*	(0.13)	(0.1)	(3.61)***		
Panel B: Value weighted portfolios sorted on intellectual capital									
CAPM-IC	0.0039	-0.0183					0.0078	0.41	0.24
	(0.67)	(-0.86)					(2.01)**		
FF3F-IC	0.0031	-0.0086	0.0086	0.0104			0.0079	0.57	0.23
	(0.4)	(-0.34)	(0.93)	(0.7)			(1.94)**		
FF5F-IC	0.0095	-0.0212	0.0027	0.0101	-0.0053	0.0119	0.0059	0.77	0.3
	(1.10)	(-0.80)	(0.27)	(0.67)	(-0.28)	(0.84)	(1.43)		

This table shows risk-premium coefficient (λ). t-stats is reported in parenthesis. Last columns show R2 *and adj. R2 are from second-stage FMB regression. ***, **, * is significance-level at 1%, 5%, 10% respectively.

Table 7
Restricted Cross-sectional Analysis of IC augmented models

	λ_0	λ_M	λ_{SMB}	λ_{HML}	λ_{RMW}	λ_{CMA}	λ_{IC}	R^2	Adj. R^2
Panel A: Equal weighted portfolios sorted on intellectual capital									
CAPM-IC	-	-0.0246					0.0102	0.49	0.35
		(-1.04)					(3.61)***		
FF3F-IC	-	0.0067	-0.0076	0.0256			0.0104	0.64	0.36
		(0.22)	(-0.28)	(2.22)**			(3.66)***		
FF5F-IC	-	0.0065	-0.0074	0.0255	0.0083	-0.0065	0.0104	0.81	0.44
		(0.20)	(-0.24)	(1.91)**	(0.45)	(-0.43)	(3.70)***		
Panel B: Value weighted portfolios sorted on intellectual capital									
CAPM-IC	-	-0.0173					0.0079	0.41	0.24
		(-0.81)					(2.02)**		
FF3F-IC	-	-0.0174	0.0021	0.0134			0.0074	0.57	0.23
		(-0.69)	(0.20)	(0.94)			(1.84)*		
FF5F-IC	-	-0.0230	0.0020	0.0138	0.0047	0.0018	0.0066	0.75	0.26
		(-0.86)	(0.19)	(0.96)	(0.23)	(0.10)	(1.56)		

This table shows risk-premium coefficient (λ). t-stats is in parenthesis. Last columns show R2 *and adj. R2 are from second-stage FMB regression. ***, **, * is significance-level at 1%, 5%, 10% respectively.

5. Conclusion

The primary objective of the study was to empirically evaluate how well traditional asset pricing models, such as CAPM, FF3F, and FF5F, explain the variations in returns of intellectual capital portfolios of the Shanghai Stock Exchange. The second objective of this study was to extend traditional asset pricing models by incorporating a factor derived from intellectual capital to assess risk in the context of intellectual capital.

Initially, the CAPM, FF3F and FF5F were tested with portfolios constructed based on IC; the results of descriptive statistics align with the literature suggesting higher IC is associated with higher returns (Saeed et al., 2016; Bayraktaroglu et al., 2019). The time-series and cross-sectional results showed that the traditional asset-pricing models do not fully explain the variation in returns based on IC. This indicated a need for an additional factor, such as IC, to better explain portfolio returns. Hence, after adding the IC factor in all the models, the results supported the robustness of IC as a priced risk factor in the Shanghai Stock Exchange. This is consistent with the findings of the study conducted by Maharani and Narsa (2023) on the Indonesian stock market.

This study contributes to the existing literature by underlining the significance of intellectual capital and its role in estimating cross-sectional returns. The study concludes that intellectual capital is a significant factor in asset pricing. Traditional models like CAPM, FF3F, and FF5F fail to capture the full impact of IC on returns. Incorporating IC into asset pricing models improves their explanatory power, suggesting that IC should be considered a key risk factor in financial markets.

The empirical findings of the study underscore the importance of intellectual capital, suggesting that investors should consider this factor when deciding on investments. The results can help financial advisors in assessing market risk and developing investment strategies.

The current study focuses on the stock market of China and can be expanded to other emerging markets, including India, Pakistan, and others. This study could also be applied to developed markets such as the USA, Japan, and beyond. Moreover, the data definitions could be broadened by using alternative proxies for the variables.

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APPENDIX A

Definitions of Variables

Variable Name	Mnenomic Code	Definition
Price	P	The most recent price from the relevant market in the primary currency units.
Common Equity	WC03501	The investment made by common shareholders in a firm.
Depreciation	WC01148	Process of distributing the cost of a depreciable asset over the accounting periods within its anticipated useful life.
Earnings before Interest & Taxes	WC18191	Firm's earnings before interest expense and income taxes
Income Taxes	WC01451	All income taxes imposed on a firm's earnings
Number of Share-in-Issue	NOSH	The total number of ordinary shares that constitute the firm's capital.
Total Assets	WC02999	Sum of total current assets, net property, plant and equipment, investment in unconsolidated subsidiaries, long term receivables, other investments, and other assets.
Total Liabilities	WC03351	All short-term and long-term obligations that the firm is expected to fulfill..
Salaries & Benefits Expense	WC01084	Wages paid to the firm's employees.

Market Orientation, Supply Chain Integration, and Marketing-Technical Integration: Antecedents of Competitive Advantage

Muhammad Khurram Shahzad* Sheraz Ahmed** Farooq Anwar***

Abstract

The purpose of the study is to examine how knowledge-based dynamic capabilities contribute to firms' competitive advantage. The current study identifies essential supply chain management and marketing capabilities: market orientation, marketing-technical integration, and supply chain integration, as key knowledge-based dynamic capabilities and lays a theoretical foundation that connects these capabilities with competitive advantage. Employing a quantitative design, the study utilized multi-item scales to measure all constructs and collected data from the pharmaceutical industry of Pakistan. The study used partial least squares structural equation modeling for data analysis. The findings of the analysis indicate that market orientation creates the most significant influence on competitive advantage. Supply chain integration as well as marketing-technical integration also raises the development of competitive advantage. A fundamental requirement that allows the development of knowledge-based dynamic capabilities to sustain a competitive position is identified in the research study. It encourages the managers to discover the preferences of customers and closely monitor the activities of competitors. Furthermore, the study provides guidance on the possibility of collaborating with supply chain partners and cross-functional cooperation. The study fills gaps in the existing literature concerning such knowledge-based dynamic capabilities and thus positions these capabilities in an essential role for the achievement of competitive advantage.

Keywords: Competitive advantage; market orientation; marketing-technical integration; supply chain integration; knowledge-based dynamic capabilities.

JEL Classification: M31, D41, D83

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1. Introduction

In the current era of the economic business environment, firms usually face more severe challenges that require creative thinking. Economic instability, fluctuations, and probable falls could have an important influence on corporate investment decisions (Hameed et al., 2021). Rapid technology shift requires organizations to change at all times to avoid being stuck in failure. Moreover, the expectations from customers are shifting in the direction of more experiential and a sense of urgency for delivery service. All this makes the firms competitive. Therefore, this complex scenario calls for a multi-functional approach that will strike a balance between short-term operational needs and long-term strategic vision (Baah et al., 2022). Many critical resources support the survival of a firm in a competitive environment, for example, an effective vision, strong strategic direction, knowledge about the needs of customers, and working efficiently. Also, operational efficiency is crucial as it streamlines the processes, reduces costs, and develops responsibility in a firm. The other essential factor is the workforce. Firms that concentrate on enhancing their employees can yield productive results (Bhardwaj et al., 2023). That is why, upon integrating these resources, a firm gets an easy guide to ensuring continuous business success (Zahra, 2021). Despite the effective strategies and efficient resource usage, failure events are witnessed. Even though a firm can be able to go successful in vision and operation efficiency, it fails because the product and the needs of customers are not in the proper direction. The rapid technological shift makes firms vulnerable to their competitors. Fluctuations in economic activity and unstable market conditions make difficult tasks for most firms. So, good resources cannot provide a guarantee of success.

Traditionally, knowledge has been considered to be one of the primary sources for the establishment of competitive advantage. Companies can depend on knowledge and can achieve a competitive position on their competitors. Developing an organizational learning culture helps firms to adapt faster to the changes. Knowledge sharing promotes teamwork and innovation, and innovations are a catalyst for success (Zhang et al., 2023). The dynamic capability view explains that resource is the basic building block of competitive advantage, but companies would need to have dynamic capabilities if they have to use resources in response to any change in the environment (Coppola et al., 2023). Strategic integration, learning, and customer evaluation are crucial determinants of firm competitiveness. Knowledge-based dynamic capabilities (KBDCs) are there to use the available resources in such a way as to efficiently facilitate the development of competitive advantage. Therefore, an important question arises: which of the firm's capabilities need to be treated as KBDCs? From the literature, it is evident that such capabilities are not properly defined. Knowledge-acquiring capability, knowledge-generating capability, and knowledge-combining capability are the major types of KBDCs that have arisen from the literature (Zheng et al., 2011).

The base pillars for developing customer value have been seen in marketing and supply chain management functions (Fianko et al., 2023). Recently, it has been found that the supply chain management-marketing interface has come under the consideration of researchers (Jahanbakhsh Javid & Amini, 2023). In this regard, awareness about the capabilities of a firm for managing marketing and supply chain management functions has prevailed (Salam & Bajaba, 2023). Even though a body of literature supports the integration of supply chain management with marketing, there is little attention to how different related capabilities connect with each other, according to (Freije et al., 2022). In this regard, there is a need for some empirical studies on the capability of supply chain and marketing.

Market orientation (MO) is identified as an important marketing capability (Ozsomer et al., 2023), through which firms relate to their environments and extract information about their customers (Aydin, 2021). Thus, MO can be seen as a knowledge-acquiring capability. Further, MO makes the firm informative and responsive at the whole organizational level (Crick, 2021), which in turn feeds the need for integrated capabilities beyond MO. Supply chain integration is a knowledge-generating capability since it generates knowledge that enhances the development and delivery process (El-Mokadem & Khalaf, 2023; Kamble et al., 2023). Marketing-technical integration is somehow different from this one in the sense that it results in initiating the combining of knowledge (Ghonim et al., 2022) therefore making it a knowledge-combining capability.

1.1 Research Objectives

The current study seeks to fill the gap in the literature by identifying some unique capabilities of firms as KBDCs and examining how these capabilities contribute to competitiveness. By focusing on supply chain management and marketing functions, we aim to empirically assess MTI, SCI, and MO that enable firms to use their knowledge for competitive advantage. Through this exploration, we intend to enhance our understanding in the areas of supply chain management, marketing, and strategic management. Additionally, the study attempts to offer insights for practice by effective use of KBDCs.

The study analyzes the pharma industry operating in Pakistan. The firms are facing numerous challenges including intense competition, rapidly changing regulatory landscape, and limited access to innovative techniques. With an increase in healthcare needs, firms are under intense pressure to deliver high-quality products at low cost. The high reliance of firms on imported raw materials makes the situation more challenging. The loss of blockbuster products in the industry creates significant challenges for the firms. As a result, pharmaceutical companies allocate substantial budgets to research work (Kourtis et al., 2022). Therefore, KBDCs are crucial for the survival of these pharmaceutical firms.

2. Literature Review

2.1 Theoretical Foundation

KBDC, as a concept, arises from the integration of the knowledge-based view and dynamic capability view. Processes of knowledge are inherently dynamic and play a vital role in the reconfiguration and renewal of a firm's resources, and dynamic capabilities are based on knowledge (Robertson et al., 2023). The dynamic capability view describes the importance of dynamic capabilities in developing competitiveness (Tamirat & Amentie, 2023).

Dynamic capability is described as an ability to develop and modify competency to respond to changes in a firm's environment. This ability allows organizations to effectively reconfigure their resources and enables them to capitalize on new opportunities to address potential threats. The knowledge-based view emphasizes the central role of knowledge as knowledge is a fundamental resource that positions a firm's capabilities to create, integrate, and modify functions effectively. This perspective suggests that knowledge is a dynamic and evolving resource that can significantly enhance a firm's competitive advantage. (Cooper et al., 2023; Fernandes et al., 2022). The knowledge-based view highlights that the dynamic capabilities of a firm originate from its knowledge processes. These processes build KBDCs, which are antecedents of competitive advantage (Kaur, 2022).

The literature on KBDCs does not provide a clear definition. The conflicting interpretations of KBDCs hinder researchers from building a complete understanding of these capabilities. KBDCs are related to acquiring, generating, and combining knowledge effectively as knowledge is an important source to address any change in the environment (Robertson et al., 2023). Acquiring knowledge is possible when a firm gathers information from various sources, including market trends, and customer feedback. The knowledge generation process involves innovation and research, which makes firms create new insights through experimentation and collaboration. The knowledge-combining process refers to the integration of both internal and external knowledge, which enables firms to synthesize diverse information and perspectives into a cohesive strategy. By the use of these capabilities, organizations can respond better to dynamic market conditions. Firms can adapt to new challenges, and get emerging opportunities. Hence, firms should develop a clear understanding of KBDCs to enhance their adaptability and maintain a competitive advantage (Mubarik et al., 2022).

Zheng et al. (2011) have efficiently categorized KBDCs into three key types. The first type is knowledge-acquiring capabilities, which enable the systematic search in organizations and assimilate new information from a variety of sources, such as market trends, and customer feedback. These capabilities help in identifying relevant data and integrating it into existing

practices. This allows firms to stay informed and responsive to changes in their environment (Idrees et al., 2022). The second type is knowledge-generating capabilities, which focus on the internal processes. These capabilities cause creativity, and innovation, and encourage research and collaboration among different departments. So, firms can develop new products and services. This type of KBDC is crucial for innovation. It transforms ideas and insights into tangible outcomes. A supportive culture is created in firms that value experimentation and learning to generate new knowledge (Enninga & Yonk, 2023). The third type is knowledge combining capabilities, these capabilities synthesize a diverse piece of knowledge to form cohesive, and actionable strategies. These capabilities bring together different types of information and ensure their alignment with the firm's goals (Zheng et al., 2011). By the effective combination of knowledge, firms create comprehensive solutions to their problems and address complex challenges. All this leads to improved decision-making (Gonzalez, 2022). These types of KBDCs create a dynamic framework that makes it possible to adapt to rapidly changing environments. This supports continuous learning which is critical for the development of competitive advantage (Robertson et al., 2023).

2.2 Market Orientation

MO is an important marketing capability that has an outward-looking focus. It connects organizations with their external environment. MO always involves the understanding of customer needs that is required for appropriate response. It also includes the monitoring of competitors' actions that helps to identify emerging threats in the market (Aydin, 2021). The market information gathered from various sources, including customer feedback, market research, and competitive analysis is disseminated throughout the organization. So, MO ensures that all departments are aligned and informed. MO helps firms in effective use of the information that enables them to develop strategic responses to meet customer demands (Crick, 2021). Thus, MO is a knowledge-acquiring capability that establishes its direct link to competitive advantage.

H1: MO directly affects competitive advantage.

2.3 Supply Chain Integration

SCI describes the formation of a network with various partners throughout the supply chain. Particularly suppliers and customers are important (Siagian et al., 2021; Ganbold et al., 2021). Suppliers play a critical role in the exchange of essential information. The information is related to their expertise like production schedules. This integration develops a collaborative environment in the firms. The firms can utilize suppliers' insights to create new knowledge (El-Mokadem & Khalaf, 2023). Customers always serve as a vital source of information. They can provide insights into their preferences for products. This customer-driven information is always valuable for firms. The information supports decisions on

product design, packaging, and marketing strategies. In this way, firms can better align their offerings with market demands. The integration of customer feedback into the supply chain leads to enhanced product development (Kamble et al., 2023). Through the effective use of SCI, organizations generate new knowledge. This knowledge directly influences product design and delivery performance. So, SCI builds a knowledge-rich environment. So, we identify SCI as a knowledge-generating capability that has a direct impact on competitive advantage.

H2: SCI directly affects competitive advantage.

2.4 Marketing-Technical Integration

MTI serves as a vital cross-functional capability within an organization. It reflects the cooperation of marketing with technical staff in enhancing overall performance. Robson et al. (2023) noticed that this integration can develop an efficient combination of information from both sides. MTI also develops an ability in the firms to create a comprehensive understanding of trends in the market. By its major focus on communication and collaboration, MTI has enabled marketing professionals to share valuable customer insights with technical experts who can apply this information to product development and innovation. As MO is directly involved in the sharing of critical data between the two important groups of the firm, it ensures that business decisions are well-informed and aligned with both market demands and technical feasibility (Ghonim et al., 2022). The current study considers MTI as a knowledge-combining capability directly involved in developing competitive advantage.

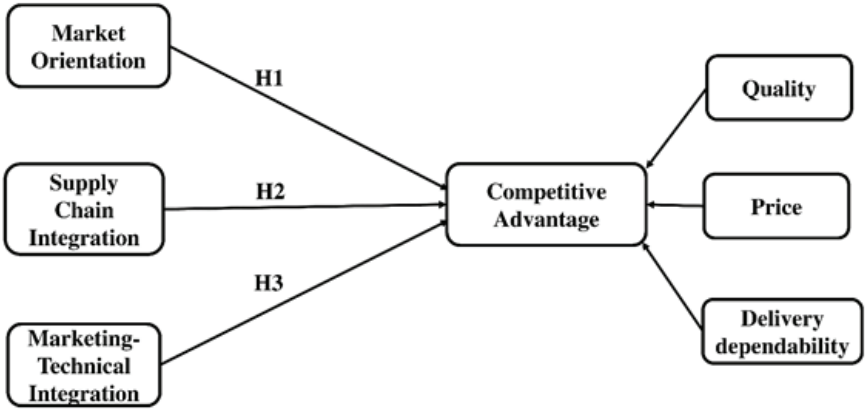

Figure 1: Research Model

3. Methodology

We designed the study by developing a conceptual framework with a very strong theoretical foundation (Figure 1). Survey-based design is one of the most effective ways to use in research. We employed this design in our research for collecting data from a vast and diversified population of participants. This large-scale data helped to understand the constructs in much greater detail.

3.1 Instrument

The study employed a self-administered questionnaire, which was designed based on established and validated measures, as outlined in Table 1. The approach ensured that the questions were grounded in reliable frameworks, enhancing the credibility of the data collected. To further refine the instrument and adjustments we consulted with experts in the relevant fields. Their insights helped to clarify the language and context of the questions. Each item in the questionnaire was evaluated using a five-point Likert scale. A score of 1 represented strong disagreement, while a score of 5 indicated strong agreement.

Table 1
Detail of Instrument

Constructs	Number of items	Reference
Competitive Advantage	9	(Liao et al., 2017)
Market Orientation	12	(Lukas & Ferrell, 2000)
Marketing-Technical Integration	3	(Roach, 2011)
Supply Chain Integration	9	(Tseng & Liao, 2015)

3.2 Data Collection

The population of the current study was comprised of 625 pharma firms working in Pakistan (Ahmad et al., 2023). Rather than drawing a sample, the entire population was selected for analysis. Postal mail service was used to distribute the questionnaires. 271 responses were found suitable for the study, so the response rate was 43.3%.

3.3 Analysis Techniques

Partial least squares structural equation modeling by Smart PLS was performed. Smart PLS was preferred for the study due to the small number of observations as it can analyze small samples without compromising the results' accuracy.

4. Analysis and Result

4.1 Construct Validity and Reliability

Factors cross-loading assessment analysis was performed and indicators having loadings 0.7 or more were selected for further analysis (Table 2).

Table 2
Cross Loading Assessment

Items	Competitive Advantage	Market Orientation	Marketing-Technical Integration	Supply Chain Integration
CA1	0.784	0.367	0.282	0.473
CA2	0.755	0.435	0.242	0.415
CA3	0.713	0.390	0.184	0.323
CA4	0.787	0.385	0.303	0.479
CA5	0.738	0.344	0.225	0.340
CA6	0.786	0.382	0.181	0.373
CA7	0.734	0.407	0.220	0.311
CA8	0.719	0.345	0.110	0.251
CA9	0.753	0.415	0.179	0.336
MO2	0.424	0.710	0.205	0.412
MO3	0.386	0.849	0.097	0.381
MO4	0.421	0.765	0.067	0.329
MO5	0.463	0.846	0.127	0.375
MO6	0.429	0.808	0.139	0.329
MO7	0.334	0.787	0.146	0.329
MO8	0.350	0.767	0.107	0.367
MTI1	0.212	0.158	0.753	0.235
MTI2	0.244	0.080	0.786	0.254
MTI3	0.221	0.129	0.779	0.324
SCI1	0.415	0.428	0.352	0.706
SCI4	0.272	0.412	0.155	0.712
SCI5	0.365	0.387	0.294	0.798
SCI6	0.314	0.339	0.266	0.740
SCI7	0.343	0.250	0.205	0.736
SCI8	0.425	0.271	0.236	0.743
SCI9	0.417	0.306	0.274	0.781

To establish the reliability and stability of the constructs in the study, Cronbach's alpha and composite reliability values were determined. The value of the composite reliability over 0.70 is generally regarded as being good reliability. Further, the value of Cronbach's

alpha greater than this number also indicates the degree of reliability of the constructs. Both values were above 0.70, meaning that the outcome of the study was satisfactory (Kalkbrenner, 2023). Besides measuring reliability, the study had converged validity that was measured by AVE. For each construct, AVE values were higher than the minimum threshold value of 0.5 proposed by Fornell and Larcker (1981) (Table 3).A

Table 3
Validity and Reliability Analysis

Constructs	CA	CR	AVE
Competitive Advantage	0.907	0.923	0.572
Market Orientation	0.901	0.922	0.629
Supply Chain Integration	0.866	0.897	0.555
Market-technical Integration	0.770	0.819	0.602

Note: CA is Cronbach's alpha; CR is composite reliability; AVE is average variance extracted

To test discriminant validity, the criterion by Fornell and Larcker (1981) was utilized because it is one of the most accepted approaches in testing the appropriateness of a construct to differ from another. It states that the square root of the AVE for every construct should be greater than the correlation coefficients for every pair of constructs. As analysis results, this requirement is satisfied since the square root of the AVE of each construct is set above the correlations of such constructs with other variables. Thus, the finding confirms that constructs are marked with satisfactory discriminant validity (Table 4). Apart from the Fornell-Larcker criterion, we used the heterotrait-monotrait ratio (HTMT) in order to test discriminant validity. From the above analysis, as presented in Table 5, HTMT values are less than 0.90 (Panzeri et al., 2024) which shows good discriminant validity.

Table 4
Fornell-Larcker's Criterion

	CA	MO	SCI	MTI
Competitive Advantage	***0.755***			
Market Orientation	0.512	***0.794***		
Market-technical Integration	0.290	0.160	***0.775***	
Supply Chain Integration	0.497	0.459	0.349	***0.746***

Table 5
Heterotrait-Monotrait Ratio

	CA	MO	SCI	MTI
Competitive Advantage				
Market Orientation	0.558			
Market-technical Integration	0.363	0.209		
Supply Chain Integration	0.540	0.518	0.449	

4.2 Common Method Bias

Common method bias creates the possibility of biased results. Common method bias is considered a major problem of research concern due to the possibility of interfering with the real relationship of variables. To identify if there existed a common method bias, the authors utilized the single-factor test by Harman. This form of test points out whether the application of a single factor covers most of the variance in data under analysis. In this case, the result pointed to the fact that maximum variance accounted by a single factor stood at 34% and this means a common method bias did not affect the results of the study conducted (El-Baz & Ruel, 2021). Additionally, the VIF values obtained were all below 3.3 (Kariya et al., 2024) which further supported the findings.

4.3 Structure Model

The fit of the structural model was assessed using an appropriate, systematic procedure. In this process, the model fit is checked by the standardized root mean square residual, one of the most suggested metrics to measure how well a developed model could explain the observed data (Lee, 2021). For this research, the computed value of 0.073 was found as SRMR that falls under the threshold of 0.08 (Shi et al., 2022). This implies that a good model fit can be exhibited by the result found. All the findings from the hypothesis test are accepted (Table 6). The first hypothesis that MO directly affects competitive advantage, is accepted ($\beta = 0.359$, $t = 4.996$). The second hypothesis stating that SCI directly influences competitive advantage, is accepted ($\beta = 0.287$, $t = 4.365$). The third hypothesis stating MTI has a direct influence on competitive advantage, is also accepted ($\beta = 0.132$, $t = 2.773$). The result offers great empirical evidence for the claim that MO, SCI, and MTI each have positive relationships with competitive advantage.

Table 6
Hypotheses Test Results

Effects	Relationships	*β*-value	*t*-value	*p*-value	Decision
H1	Market Orientation → Competitive Advantage	0.359	4.996	0.000	Accepted
H2	Supply Chain I ntegration → Competitive Advantage	0.287	4.365	0.000	Accepted
H3	Marketing-technical I ntegration → Competitive Advantage	0.132	2.773	0.006	Accepted

5. Discussion

MO, SCI, and MTI all have positive impacts on the competitive advantage. MO is an important capability related to the generation of knowledge so that firms may collect

and actively evaluate the information brought forward by the customer. It refers not only to collecting information regarding customer preferences and needs but also to the communication among different departments so that the organization can be aligned with the market insights (Aydin, 2021). Considering these elements, MO promotes an accumulation and dissemination way of information to make the right responses toward shifting market demands and thereby assures competitiveness (Crick, 2021). In addition, MO ensures that customer insights are implemented in all business operations for corporate performance (Mathafena & Msimango-Galawe, 2023). Through integration, the cumulative effect points toward the creation of a knowledge base that serves as a strategic asset for the firm. This means that the MO lies at the heart of the competitive advantage(Mohammad-Shafiee et al., 2024). SCI is an important knowledge-generating capability that is an important need for collaboration between firms and their external partners, such as suppliers, distributors, and customers (Ganbold et al., 2021). The collaborative actions cause interactive knowledge sharing (El-Mokadem & Khalaf, 2023). The knowledge flows are always required by firms to achieve awareness regarding the latest alterations in technology and innovation that may cause organizations to alter productivity and efficiency (Zhu et al., 2022). Effective use of SCI forces firms to develop new competencies or types of expertise within the firm to help the firm discover ways to solve issues concerning business operations (Tiwari, 2021).

MTI develops a collaborative culture that enables teamwork in solving the complex problems identified (Robson et al., 2023). The collaborative approach motivates innovative practices which make the firms successful. It gives them a competitive advantage in their adaptation to the ever-evolving customer needs and technological evolutions (Ghonim et al., 2022). MO, SCI, and MTI are like the implementing tools through which business systems can eventually excel in achieving competitive advantage. Firms' engagement with customers mainly gives them deep insights into developing the products and efficient usage of resources. Advanced integration of marketing and technical functions bridges consumers' expectations with technical capabilities. The study clearly identifies that firms survive and grow in a competitive environment under the critical necessity of a knowledge-based approach. Innovative usage of knowledge by firms helps them find innovative solutions and sustainable leadership positions in their respective markets. These findings are consistent with the knowledge-based view in the way that knowledge is an asset for strategic use. More broadly, findings support the significant roles of KBDCs in organizations since these capabilities are crucial for competitive advantage.

5.1 Theoretical Implications

This current study is an important integration of the dynamic capability view with the knowledge-based view and completely explores how firms can create competitive advantages through their capabilities. In addition, research ascertains the most significant marketing and supply chain management capabilities, thus upgrading the existing literature

concerning KBDCs, and indicates that such capabilities directly influence a firm's ability to compete in the marketplace. The empirical evidence from this study has proved that such KBDCs undertake a key role in achieving competitiveness advantage. This study contributes towards a deeper understanding of mechanisms that operate with theory. It explains how these capabilities can be effectively used by firms to perform better.

5.2 Practical Implications

The study offers insights for managers who want to improve the competitive position of their firms. Specifically, the study guides the managers on the critical role that MO plays in gathering information regarding the needs of the customers. A deep understanding of these needs is crucial to build customer loyalty and to promote sales in a highly competitive environment. From the research study, more guidance on integrated supply chain operations can be produced. Coordination of all parts of the supply chain properly enhances efficiency. The adoption of MTI bridges the gap between marketing and technical functions. As a whole, it has been realized in this research that the development of KBDCs is necessary for business performance. KBDCs can empower firms to adapt and respond dynamically to changing market conditions.

5.3 Future Research Directions

Although the current study has made tremendous contributions, it has limitations. The research was constrained to only one industry, and thus generalization of findings toward other industries is required. Every industry goes to exhibit some variance in terms of dynamics, competitive forces, and ways of working. In future studies, data from many industries could be included. Using the question-based data, the information was somehow limited, which added some sort of constraint to the understanding of the phenomena. Though questionnaires are very effective in collecting quantitative data, they lack information. Thus, the interviews-based methodology may be employed in further studies to explore the experiences and views of the participants. More research can be provided in further studies with a more radical look at KBDCs. The rich interactions cannot explained by further studies with the mediating roles of variables.

6. Conclusion

The business environment is based on fast-changing knowledge. It allows an organization to achieve and sustain a competitive advantage through knowledge-based dynamic capability. Some of the important ones are market orientation, supply chain integration, and marketing technical integration. Market orientation provides an organization with the possibility of an active approach in responding to market demand. Supply chain integration is an essential factor in raising organizational flexibility and responsiveness. By

such integration, it becomes easier to collaborate with other partners in the supply chain. In this way, firms may streamline the processes and increase their operational efficiencies. The marketing-technical integration enhances innovative products and services. All these capabilities enable firms to continue learning, to stay successful in the long run in the competitive market.

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