

## BUSINESS INCUBATION CENTER SUPPORT AND STARTUP PERFORMANCE: A SERIAL MEDIATION MODEL OF POTENTIAL AND REALIZED ABSORPTIVE CAPACITY

Saba Munir<sup>1</sup>, Dr. Sania Zahra Malik<sup>2</sup>, Dr. Zeshan Ahmer<sup>3</sup>

<sup>1</sup>PhD Scholar, Institute of Business Administration, University of the Punjab, Lahore

<sup>2</sup>Professor, Institute of Business Administration, University of the Punjab, Lahore

<sup>3</sup>Assistant Professor, Institute of Business Administration, University of the Punjab, Lahore

<sup>1</sup>saba\_muneer@yahoo.com, <sup>2</sup>saniazmalik@ibapu.edu.pk, <sup>3</sup>zeshan@ibapu.edu.pk

DOI: <https://doi.org/10.5281/zenodo.20791540>

### Keywords

Business Incubation Center Support, Potential Absorptive Capacity, Realized Absorptive Capacity, Startup

### Article History

Received: 23 April 2026

Accepted: 05 June 2026

Published: 22 June 2026

Copyright @Author

Corresponding Author: \*

Saba Munir

### Abstract

Business incubation centers have emerged as an important mechanism for supporting startup development. Through various business support services, they enhance the survival and growth of early-stage ventures. Drawing upon the absorptive capacity perspective, this study examines the relationship between business incubation center support and startup performance through the mediating role of potential absorptive capacity and realized absorptive capacity. Data were collected from 206 incubated startups operating under public and private incubation centers across Pakistan. The study uses a census-based sampling approach to collect data. The proposed relationships were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that business incubation center support positively impacts potential absorptive capacity, which subsequently enhances realized absorptive capacity. Realized absorptive capacity also has a significant relationship with startup performance. Furthermore, the serial mediation of potential and realized absorptive capacity between the relationship of business incubation center support and startup performance was also found to be significant. The study offers theoretical and practical implications for incubation managers, entrepreneurs, and policy makers.

### INTRODUCTION

Startups are considered an effective tool for innovation, job creation, and economic development of a country. Their role becomes more significant in an emerging economy where new ventures are considered a source of market opportunities and productivity gain. However, startups generally operate under high uncertainty due to limited resources, liability of newness, and no access to professional networks. These limitations are more prominent in developing

economies, where institutional support and entrepreneurial ecosystems are still evolving (Zaidi et al., 2023).

Pakistan has witnessed considerable growth in entrepreneurial activity during the last decade. Government and private institutions have played a critical role through the expansion of technology-based ventures, university incubation centres, and government-supported entrepreneurial initiatives (Higher Education Commission Pakistan, 2025; Invest2Innovate, 2024). Business incubation centres have become an important part of this

ecosystem because they provide early-stage ventures with mandatory training, networking opportunities, and infrastructure support (Bruneel et al., 2012). Prior incubation literature suggests that incubators help startups overcome resource constraints, access external knowledge, build networks, and improve their chances of survival and growth (Leitão et al., 2022).

Despite the increasing number of incubation initiatives, startup survival and long-term performance remain challenging in Pakistan. Many startups struggle to transform business ideas into sustainable ventures. The major reasons for this failure are limited managerial capabilities, weak access to finance, infrastructure gaps, and insufficient market knowledge (Krishna et al., 2016). Many studies have also highlighted that startup development depends not only on ecosystem support but also on the ability of entrepreneurs to develop managerial and knowledge-based capabilities (Hausberg & Korreck, 2021). Therefore, it is important to examine how business incubation center support is converted into performance outcomes.

Existing studies have highlighted the main role of the incubation center as a support provider through networking, mentoring, training, or physical space provision. Evidence regarding the effectiveness of incubation centres remains inconclusive and context-dependent (Zaidi et al., 2023). Some studies highlighted that incubation support contributes to venture growth and performance, while others suggest that the benefits of incubation may vary depending on the quality of services, startup characteristics, and the ability of entrepreneurs to use the knowledge and services provided by incubators. This indicates that incubation support alone may not be sufficient for improving startup performance unless startups are able to “acquire, absorb, transform, and exploit” the knowledge gained from incubation centres.

This study uses the absorptive capacity perspective to explain this mechanism. Absorptive capacity refers to a firm's ability to recognise the value of external knowledge, assimilate it, and use it for commercial purposes (Cohen & Levinthal, 1990). Zahra and George (2002) further reconceptualized absorptive capacity into two dimensions: potential

absorptive capacity and realized absorptive capacity. Potential absorptive capacity refers to knowledge acquisition and assimilation, whereas realized capacity refers to knowledge transformation and exploitation. This distinction is highly relevant for incubated startups because incubation centres expose startups to external knowledge, but its benefits depend on whether start-ups can first absorb that knowledge and then convert it into usable business outcomes.

In the context of business incubation centres, potential absorptive capacity enables startups to acquire and assimilate knowledge from mentors, trainers, investors, industry experts, and peer startups. However, acquiring knowledge is only the first step. Start-ups are also required to transform and exploit that knowledge in their business processes, products, and market strategies. This is the role of realized absorptive capacity. Therefore, the relationship between the BIC support and startup performance can be understood as a sequential knowledge conversion process in which incubation support first strengthens potential absorptive capacity, which then enhances realized absorptive capacity, resulting in superior startup performance.

Although absorptive capacity has received significant attention in management and entrepreneurship literature, its role in startup and incubation research remains relatively underdeveloped. Chaparro et al. (2021) in their systematic literature review highlight that absorptive capacity research in startups is concentrated around knowledge, innovation, and performance, but further work is needed to explain how startups develop and use absorptive capacity in different entrepreneurial contexts. Similarly, most of the studies focus on the direct contribution of incubator services to startup outcomes, while limited attention has been given to the internal learning mechanism through which incubation support influences performance. This gap is especially important in developing economies such as Pakistan where startups rely heavily on incubation centres for knowledge, mentoring, networking, and early-stage support. Furthermore, there is a scarcity of research on the situational factors that affect a firm's absorptive

capacity dimensions, especially in the context of emerging economies (Bouguerra et al., 2022).

As a response to their call, the present study investigates the effect of business incubation centre support on startup performance through the serial mediation of potential absorptive capacity and realized absorptive capacity. The study contributes to the incubation literature by explaining how external support from the BIC is translated into startup performance through knowledge “acquisition, assimilation, transformation, and exploitation”. The study also extends the absorptive capacity perspective by applying the distinction between potential and realized absorptive capacity in the context of business incubation and startup performance in an emerging economy.

#### Literature review

Zahra and George (2002) conceptualized absorptive capacity under Potential Absorptive Capacity (PAC) and Realized Absorptive Capacity (RAC). Potential absorptive capacity is defined as the ability to absorb and integrate new external knowledge. It is further classified into acquisition capacity and assimilation capacity. Acquisition deals with searching and attaining new external knowledge (Asare-Kyire et al., 2023). This acquired knowledge is then analyzed and processed which is called assimilation. RAC facilitates the transformation and exploitation of acquired and assimilated knowledge. RAC has also been categorized under two dimensions: transformation and exploitation. Transformation capacity helps in integrating the new external knowledge with the existing knowledge, while exploitation capacity facilitates the internalization of the assimilated and transformed knowledge.

#### Business Incubation and Potential Absorptive Capacity

Incubation centers are considered an important source of startup support (Bonfanti et al., 2025). Incubation centers provide various resources to the startups and guide them in using those resources. These resources consist of both tangible resources like office space, equipment, and intangible resources such as mentoring,

networking, and knowledge sharing (Weele et al., 2019). Learning mechanisms of incubation centers are one of such intangible resources that play a significant role in the success of a startup. Business incubation centers offer various services such as coaching, training sessions, and networking with industry experts (Gonzalez-Uribe & Leatherbee, 2018). All these activities become a source of external knowledge, which ultimately impacts the absorptive capacity of a startup. The concept of absorptive capacity is important for startups because they do not have any foundational knowledge or organizational routines. To develop learning routines, they are required to continuously acquire and assimilate the knowledge from external resources, and business incubation center provides them with various opportunities for knowledge acquisition (Vincent & Zakkariya, 2021). Schmutzler and Presse (2021) in their comparative study found higher absorptive capacity in incubated startups as compared to non-incubated startups. Arif et al. (2026) highlighted the positive impact of business incubation center services on the absorptive capacity of startups. Previous studies on absorptive capacity found that external knowledge sources are necessary for the development of a firm's acquisition and assimilation capabilities (Cohen & Levinthal, 1990; Zahra & George, 2002). Business incubation center provides such resources through mentoring, training and industry exposure. Therefore, it can be argued that business incubation center support enhances startup's potential absorptive capacity by ensuring their access to external knowledge sources. Thus, this study proposes that

**H1: Business incubation center support has a positive impact on the potential absorptive capacity of a startup.**

#### Potential absorptive capacity and realized absorptive capacity

Potential absorptive capacity is considered a prerequisite of realized absorptive capacity. PAC helps a firm identify valuable external information, acquire knowledge, and understand its applicability. However, just acquiring knowledge does not create organisational value,

firms are required to integrate newly acquired knowledge with their existing knowledge base and apply it to business activities. This transition from knowledge acquisition to knowledge exploitation represents the process through which PAC is converted into RAC.

This relationship between potential and realized absorptive capacity is particularly important for startups. Startups, because of a lack of experience and newness, do not have a knowledge base. BICs provide them with access to external knowledge that may be utilized for developing their business models. However, the benefit of such knowledge can only be realized when it is properly integrated into their product, operations, or processes. Prior studies have established that potential absorptive capacity has a positive impact on realized absorptive capacity (Elidjen et al., 2022), but most of these studies are conducted on projects (Singh et al., 2023) or large firms (Algarni et al., 2023). This study has examined this relationship in incubated startups that have different characteristics from large firms. Therefore, it is proposed that

**H2: Potential absorptive capacity has a positive impact on realized absorptive capacity.**

#### **Realized Absorptive Capacity and Startup Performance**

The success of startups does not depend on possessing certain knowledge or resources, but rather on how effectively these resources are utilized. RAC is the ability to transform and exploit acquired knowledge for commercial purposes. Unlike PAC, which focuses on the acquisition of new knowledge, RAC reflects the practical application of knowledge in organizational activities such as product or service development or process integration. For startups, RAC is particularly important because they generally operate under uncertain conditions where possessing certain knowledge or information cannot ensure success unless that knowledge is exploited and integrated into existing knowledge to improve decision quality, identify innovative solutions or develop a competitive advantage.

The absorptive capacity literature suggests that organizations with advanced RACs are in a better position to convert external knowledge into innovation and performance outcomes. RAC facilitates the commercialization of knowledge and enables firms to transform ideas into products, services, and processes (Volberda et al., 2010). This concept is more significant in startups, as they operate under resource-constrained environment. Their ability to survive depends on how effectively they exploit the existing knowledge and generate a competitive advantage for themselves.

Empirical studies have highlighted the positive role of absorptive capacity in firm performance. Research suggests that firms that are good at the transformation and exploitation of knowledge are better able to survive, innovate, and improve competitiveness (Chaparro et al., 2021; Limaj & Bernroider, 2019). Accordingly, this study proposes:

**H3: Realized Absorptive Capacity has a Positive effect on Startup Performance.**

According to the absorptive capacity perspective, organizations create value from external knowledge through a sequential process of knowledge “acquisition, assimilation, transformation, and exploitation” (Flatten et al., 2011). It suggests that external support mechanisms can only generate organizational benefits when a firm develops the ability to absorb and utilize the knowledge gained through external sources. Therefore, absorptive capacity can be considered as a mechanism through which external resources are translated into firm performance.

Business incubation centers provide a wide range of knowledge resources for startups, including mentoring, training, networking opportunities, and exposure to industry experts. These resources enhance a startup’s ability to acquire and assimilate the knowledge (Dong et al., 2023), strengthening their PAC. However, acquiring the knowledge alone will not be beneficial for the startup unless this knowledge is further transformed and exploited to generate practical business outcomes. Therefore, the business

incubation center support impacts RAC through its effect on PAC.

Singh et al. (2023) found that PAC leads towards RAC, which ultimately enhances project performance. The relationship between potential and realized absorptive capacity reflects an important learning process within an entrepreneurial venture. Startups that can acquire and understand external knowledge are also more likely to integrate it and convert it into new products, services, and processes. Therefore, PAC serves as a foundation for better realized absorptive capacity.

Absorptive capacity helps a firm to acquire and assimilate new external knowledge. This new knowledge is then transformed and applied to the firm's operations and processes. This integration of new and existing knowledge helps a firm attain superior performance (Latukha & Veselova, 2019; Phuong et al., 2022). Through effective knowledge exploitation, startups can enhance innovation, respond quickly to market changes, and identify

new opportunities. Therefore, the performance benefit of incubation support might be realized through the sequential development of potential and realized absorptive capacity.

In startup environments, where firms rely heavily on external support systems to compensate for liability of newness and limited internal resources, the sequestered knowledge process becomes critical. Based on the above discussion, the following hypotheses have been proposed.

**H4:** Potential absorptive capacity mediates the relationship between business incubation center support and realized absorptive capacity.

**H5:** Realized absorptive capacity mediates the relationship between potential absorptive capacity and startup performance.

**H6:** Potential absorptive capacity and realized absorptive capacity sequentially mediate the relationship between business incubation center support and startup performance.

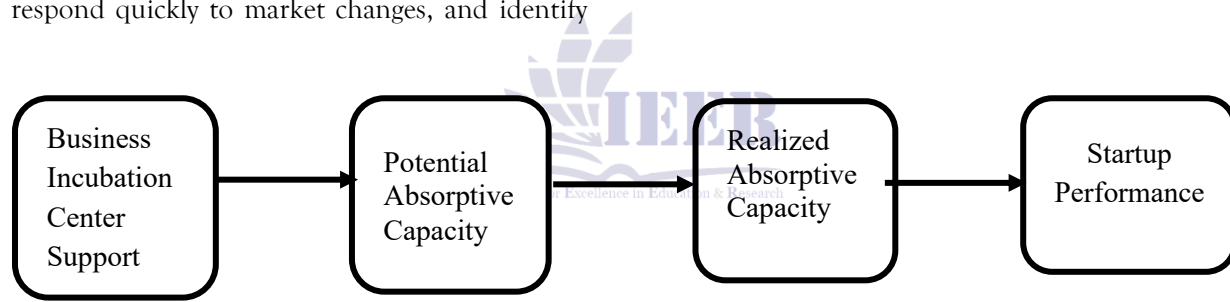


Figure:1 Conceptual Model

**Methodology**

*Participants of the study*

The current study examines the serial mediation of potential absorptive capacity and realized absorptive capacity between the relationship of business incubation center support and startup performance. Therefore, the focus of this study is the startups incubated under any incubation center in Pakistan. The reason for selecting incubated startups as the target population is that startups in Pakistan are operating under a highly volatile environment with resource constraints and an underdeveloped knowledge infrastructure. Incubation centers work as a remedy for ecosystem deficiencies and connect startups with external

knowledge resources. Startup founders were selected as key informants because they possess comprehensive knowledge regarding the incubation services received, the learning processes of their startups and startup performance.

*Data Collection procedure*

For this study, data have been collected from 69 public and private incubation centers operating in Pakistan. An email was sent to the business incubation director/manager of all the active incubation centers at the time of data collection. They were requested to share the questionnaire with their incubated startups. A census-based

sampling technique was used to collect data. The technique is used when the population is relatively small, and the researcher can reach the entire population. Through the incubation center representatives, the questionnaire link was shared with all the incubated startups. As a result, a total of 206 usable responses were received.

To reduce the possibility of common method bias, data was collected in two phases with a temporal separation of one month. During the first phase, data regarding business incubation centre support and absorptive capacity were collected. During the second phase, data regarding start-up performance were collected

The startup founders were asked about their age, gender, qualifications, and sources of funding. The study noted that 55.8% respondents were male (N=115), and 44.2% were female (N=91). The highest percentage of the age group was 18-25 (56.5%), with 52.4% having a Bachelor's degree. The most prominent source of funding for startups was incubation center and friends and family.

**Measures**

The data for this study have been collected through already developed questionnaires. The responses of all scales were measured through 5-point Likert scale. Business incubation center support was measured through a 19-item scale developed by Hackett and Dilts (2008). Absorptive capacity was measured through a multi-dimensional scale developed by Flatten et al. (2011). Both scale measured responses on 5-point Likert scale from Strongly Agree = 5 to Strongly

Disagree = 1. Startup performance was measured using a 5- item scale developed by Adomako and Ahsan (2022).

**Data Analysis**

The proposed relationships were tested using Partial Least Squares, Structural Equation Modelling (PLS-SEM) through Smart PLS 4. PLS-SEM was selected because the study examines a serial mediation model involving multiple latent constructs and focuses on prediction and theory extension (Hair et al., 2021).

**4.2 Measurement Model Assessment**

The measurement model of the study was assessed through reliability and validity indicators. Indicator reliability was evaluated through outer loadings. All indicators have loadings greater than .60 indicating acceptable indicator reliability. As all the indicators exceeded the threshold level of 0.5 (Cheung et al., 2024), all items were retained. To measure internal consistency, Cronbach's alpha and composite reliability were assessed. The Cronbach's alpha values ranged from 0.916 to 0.952, while composite reliability values ranged from 0.937 to 0.957 (See Table 1). All values exceeded the recommended threshold of 0.70 (Hair et al., 2013). While the values of Average Variance Extracted (AVE) ranged from 0.54 to 0.76, also surpassed the minimum recommended value of 0.50. These findings confirm the reliability and convergent validity of the measurement model.

**Table 1**  
**Reliability and Convergent Validity**

Construct	Cronbach's Alpha	Composite Reliability	AVE
Business Incubation Center Support	0.952	0.957	0.54
Potential Absorptive Capacity	0.932	0.947	0.75
Realized Absorptive Capacity	0.916	0.937	0.75
Startup Performance	0.922	0.941	0.76

Discriminant validity was assessed through the Heterotrait-Monotrait ratio (HTMT), which is considered a more rigorous criterion for evaluating discriminant validity in PLS-SEM.

According to Henseler et al. (2015), values below 0.90 indicate the discriminant validity of a construct. As shown in Table 3, values ranging from 0.636 to 0.866 fulfil the criterion of < 0.9.

Figure. 2 presents the measurement model of the study.

Table 2

Discriminant Validity (HTMT)

Constructs	BICS	Potential AC	Realized AC	Startup Per.
BICS	-			
Potential AC	0.651	-		
Realized AC	0.636	0.866	-	
Startup Performance	0.711	0.855	0.73	-

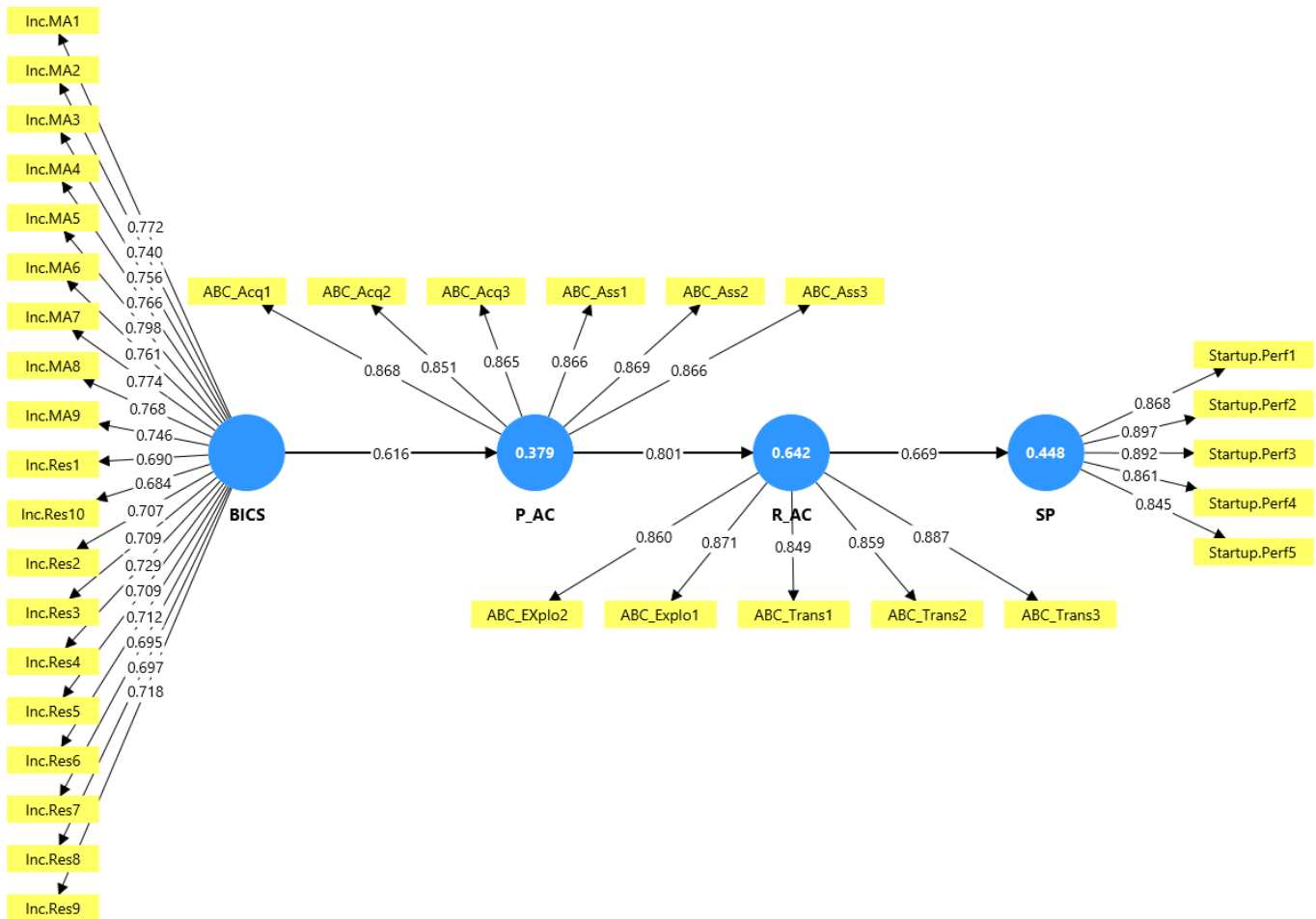


Figure 2: Measurement Model

**Structural Model Assessment**

After the establishment of the measurement model, the structural model was assessed to examine the proposed relationships among the constructs. Before hypothesis testing, model fit and collinearity diagnostics were checked. The model fit was assessed through Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). In PLS-SEM, SRMR value below

0.08 and an NFI value close to or above 0.90 is considered acceptable (Hair et al., 2023). The

SRMR value of the study was 0.041 and NFI was 0.903. Both values were within the acceptable range, providing additional support for the adequacy of the model fit.

The collinearity was evaluated using the variance inflation factor. The VIF values for all structural

relationships were equal to 1 showing no multicollinearity in the proposed model. The

values of VIF should be less than 5 to ensure no multicollinearity (Hair et al., 2017).

**Table 3**  
**Model Fit and Collinearity Assessment**

Criterion	Value	Recommended Threshold
SRMR	0.041	< 0.08
NFI	0.903	> 0.90
Maximum Inner VIF	1	< 5.00

**Direct Relationships**

After establishing model fit and the absence of multicollinearity issues, the direct relationships in

the proposed research model were examined using a bootstrapping procedure with 5000 subsamples. The results are presented in Table 4.

**Table 4**  
**Direct Effects**

Hypothesis	Relationship	$\beta$	t-value	p-value	Decision
H1	BICS → P-AC	0.616	14	<0.001	Supported
H2	P-AC → R-AC	0.801	22.9	<0.001	Supported
H3	R-AC → SP	0.669	15	<0.001	Supported

In this study, three hypotheses are developed explaining direct relationships. As per the results, business incubation center support has a positive and significant impact on potential absorptive capacity ( $\beta = 0.616$ ,  $t = 14$ ,  $p < 0.001$ ), supporting **H1**. The potential absorptive capacity also has a positive and significant relationship with realized absorptive capacity ( $\beta = 0.801$ ,  $t = 22.9$ ,  $p < 0.001$ ), supporting **H2**. This relationship has the strongest beta value of the study. Realized absorptive capacity is found to have a positive and significant impact on startup performance ( $\beta = 0.33$ ,  $t = 7.45$ ,  $p < 0.001$ ), providing support for **H3**.

**The coefficient of Determination ( $R^2$ ) and Assessment of the Effect Size ( $f^2$ )**

The predictive value of the  $R^2$  of dependent variables has been calculated to confirm the goodness of the theoretical model. According to Hair et al. (2022),  $R^2$  values of 0.25, 0.50, and 0.75 can be interpreted as weak, moderate, and substantial, respectively. Table 5 shows that business incubation center support explains 37.9 % variance in potential Absorptive Capacity. 62.4% variance in realized Absorptive Capacity is explained by potential Absorptive Capacity. While realized absorptive capacity explains 44.8% variance in startup performance. All the values indicate a moderate level of predictive accuracy.

**Table 5**  
**Coefficient of Determination ( $R^2$ )**

Endogenous Construct	$R^2$
Potential Absorptive Capacity (P-AC)	0.379
Realized Absorptive Capacity (R-AC)	0.642
Startup Performance (SP)	0.448

The results reveal that all structural relationships display large effect sizes. Business incubation center support exerts a large effect on potential absorptive capacity ( $f^2 = 0.611$ ), highlighting the

important role of incubation services in enhancing startups' knowledge acquisition and assimilation capabilities. Similarly, potential absorptive capacity demonstrates a strong effect on realized

absorptive capacity ( $f^2 = 0.793$ ). It explains that development of knowledge exploitation and transformation capabilities is dependent on startup's ability to acquire and assimilate external

knowledge. Lastly, the realized absorptive capacity also exhibits a large effect on startup performance ( $f^2 = 0.812$ ). It confirms the effective utilization of knowledge resources.

**Table 6**  
Effect Size ( $f^2$ )

Relationship	$f^2$	Effect Size
BICS → P_AC	0.611	Large
P_AC → R_AC	0.793	Large
R_AC → SP	0.812	Large

To assess the predictive relevance of the model, a blindfolding procedure was applied. Greater than zero values of  $Q^2$  imply that the model has predictive relevance. According to the results, the predictive relevance values of startup performance,

realized absorptive capacity, and potential absorptive capacity are greater than zero (see Table 7), indicating the predictive relevance of the model.

**Table 7**  
Predictive Relevance ( $Q^2_{predict}$ )

Endogenous Construct	$Q^2_{predict}$
Potential Absorptive Capacity (P-AC)	0.37
Realized Absorptive Capacity (R-AC)	0.34
Startup Performance (SP)	0.32

**Assessment of Mediation Analysis**

Table 8 summarizes the results of the mediation analysis of the three hypotheses. All three proposed relationships are statistically significant. According to the results, potential absorptive capacity mediates the relationship between business incubation center support and realized absorptive capacity ( $\beta = 0.493$ ,  $t = 11.3$ ,  $p < 0.01$ ), supporting hypothesis 4. Second indirect relationship of potential absorptive capacity and

startup performance through realized absorptive capacity is also supported, approving H5 of the study ( $\beta = 0.536$ ,  $t = 10.4$ ,  $p < 0.001$ ). Hypothesis 6 discusses the serial mediation of potential and realized absorptive capacity between the relationship of business incubation center support and startup performance. This serial mediation is also supported with  $\beta = 0.33$ . Figure 3 exhibits the structural model of the study.

**Table 8**  
Results of Serial Mediation Analysis

Hypothesis	Indirect Relationship	$\beta$	t-value	p-value	Decision
H4	BICS → P-AC → R-AC	0.493	11.3	<0.001	Supported
H5	P-AC → R-AC → SP	0.536	10.4	<0.001	Supported
H6	BICS → P-AC → R-AC → SP	0.33	7.45	<0.001	Supported

P-AC=Potential Absorptive Capacity, R-AC=Realized Absorptive Capacity, BICS=Business Incubation Center Support, SP=Startup Performance

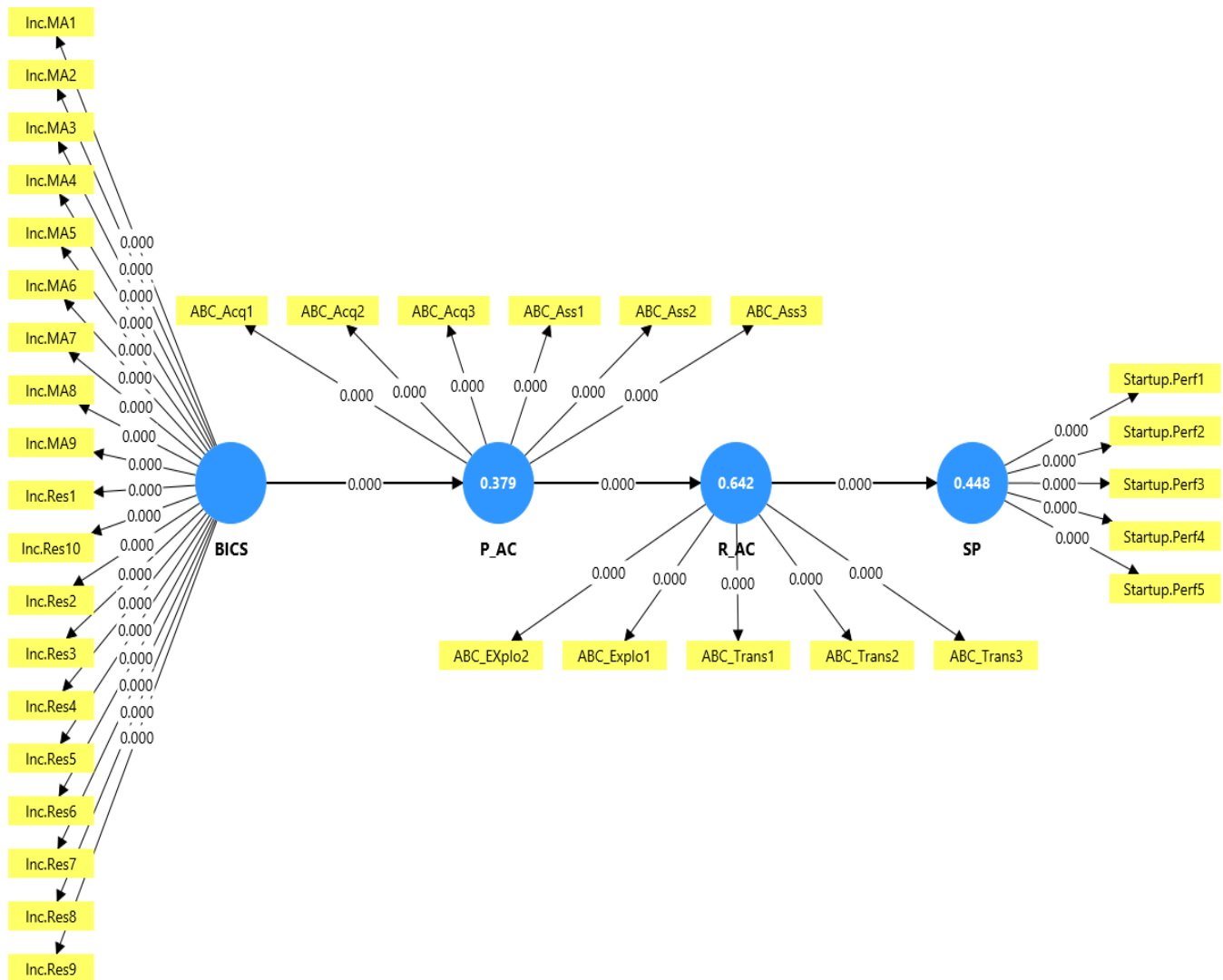


Figure 3: Structural Model

**Discussion**

The study examines the relationship between business incubation center support and startup performance through the serial mediation of potential absorptive capacity and realized absorptive capacity. The results reveal that business incubation center support significantly enhances a startup’s PAC, which contributes to the development of RAC for startups. This RAC ultimately improves startup performance. These findings support the theoretical proposition that external support mechanisms alone cannot enhance startup performance unless they possess the capabilities to assimilate, transform and

exploit the knowledge provided by business incubation programs.

The study found a positive relationship between business incubation center support and PAC. The finding suggests that incubation centers play an important role in enhancing startups’ ability to acquire and assimilate external knowledge. Through various services, such as mentoring, networking, training, and access to industry experts, incubation centers expose startups to external knowledge resources (Schmutzler & Presse, 2021). These valuable external knowledge resources help startups enhance their learning

capabilities. This finding is consistent with the absorptive capacity literature, according to which external knowledge sources facilitate a firm's ability to recognize and acquire valuable knowledge in the presence of adequate support mechanisms (França & Rua, 2017). In the context of Pakistan, where startups often face resource constraints and limited access to professional networks, incubation centers serve as important intermediaries that facilitate knowledge acquisition and learning.

The findings further indicate that PAC significantly influences the RAC. This finding supports the conceptualization of absorptive capacity proposed by Zahra and George (2002), who argue that firms are required to acquire and assimilate the knowledge, after that they will be able to transform and exploit it for commercial purposes. The strong relationship between these two dimensions suggests that a startup's ability to convert external knowledge into practical business applications is mainly dependent on its basic learning capabilities. Startups that effectively identify, acquire, and understand external knowledge are in a better position to integrate that knowledge into existing operations and utilize it to create value.

The results also demonstrate that RAC has a significant impact on startup performance. The finding reveals that the performance benefits associated with the incubation center support are realized when startups successfully transform and exploit the acquired knowledge. Having access to knowledge resources only is not sufficient to improve organizational outcomes. Instead, startups must actively transform the acquired knowledge into new product development, process improvements, and innovative business models. This finding reinforces that knowledge utilization is more important than just having access to knowledge resources. This knowledge utilization and transformation is considered a critical driver of firm performance (Bouguerra et al., 2021; Singh et al., 2023)

Bouguerra et al. (2022) highlighted the need for research on the contingencies that can impact the dimensions of absorptive capacity. As a response to their call, this study tested a serial mediation

relationship that assessed the impact of business incubation center support on startup performance through potential and realized absorptive capacity. The significant indirect effect reveals that the business incubation center support enhances the acquisition and assimilation capabilities of startups, which subsequently enhances the transformation and exploitation capabilities, ultimately leading towards startup performance. The findings extend the existing incubation center literature by demonstrating the process through which incubation support creates value for startups. Most of the previous studies have examined business incubation center support and absorptive capacity independently; the current study explains how incubation services are translated into startup performance through a sequence of knowledge-related capabilities. Through empirical findings, the study establishes absorptive capacity as a critical mechanism linking external support resources with entrepreneurial success.

The findings are particularly significant in emerging economies like Pakistan, where the entrepreneurial ecosystem is still evolving, and startups usually operate under conditions of resource scarcity. Chaparro et al. (2021) highlighted that, considering the resource constraints in emerging markets, developing partnerships with external institutions can boost the capacity of startups to identify and gather new knowledge. However, the effectiveness of incubation programs depends on startups' ability to internalize and utilize the knowledge received through their support organizations. As a result, the value of incubation support extends beyond the resource provider, and it plays a significant role in strengthening startups' learning and knowledge utilization capabilities.

### Theoretical Implications

The study has contributed to the entrepreneurship and incubation literature in several ways. First, it extends absorptive capacity theory by empirically testing the sequential relationship between potential and realized absorptive capacity in the context of incubated startups. Most of the prior research has studied absorptive capacity as a single

construct, while this study differentiates between its two dimensions. It empirically validates how they collectively facilitate the transformation of external support into startup performance.

Second, the findings contribute to the business incubation literature by explaining the mechanism through which incubation center support influences startup performance. The current literature has largely focused on the direct effect of BIC support on entrepreneurial outcomes. This study, contrary to that, highlighted that the effectiveness of business incubation center services depends on the ability of a startup to acquire, assimilate, transform and exploit the knowledge. The findings provide a unique understanding of how incubation centers provide value for startups. Finally, the study contributes to entrepreneurship research in emerging economies. The study is conducted in Pakistan, whose entrepreneurial ecosystem is still evolving and is characterized by resource constraints, underdeveloped infrastructure, and formal markets. The findings suggest that knowledge capabilities play a significant role in enabling startups to benefit from external support mechanisms. It highlights that absorptive capacity is an important explanatory mechanism that links entrepreneurial support with startup success.

### Practical Implications

The study offers several practical implications for business incubation center managers, startup founders and policy makers. For incubation managers, the results suggest that only providing mentoring, training, or networking opportunities to the incubates may not be sufficient. Business incubation centers should put more emphasis on building startups' capabilities towards knowledge acquisition, assimilation, transformation, and exploitation. Business incubation centers should incorporate learning activities in their programs to enhance the absorptive capacity of their incubates. For entrepreneurs, the findings highlight the importance of knowledge resources in attaining startup performance. The startups may realize the importance of actively engaging with incubation services and benefiting from available knowledge resources. Startups that effectively absorb and

utilize external knowledge are more likely to achieve superior performance. Startup founders, therefore, should not consider business incubation centers as a resource provider but also as a platform for organizational learning and capability development.

For policymakers, the results indicate that the effectiveness of the business incubation center services depends on their ability to facilitate entrepreneurial learning and knowledge utilization. Policymakers should encourage incubation centers to focus on the capability development of their startups by adopting structured capability development programs, including mentorship, experiential learning, and industry engagement. In an emerging economy like Pakistan, where many startups face resource and knowledge constraints, strengthening their absorptive capacity may facilitate the effective utilization of support programs.

### Limitation and Future Research

This study also has some limitations. First, the study used a cross-sectional research design and measured the absorptive capacity of startups at a point in time. Future studies may adopt longitudinal designs to examine how absorptive capacity develops over time and influences startup performance at different stages of venture growth. Second, startup performance is influenced by many organizational and environmental factors. Future studies may study the role of moderators such as government or institutional support to understand startup performance. Researchers can also examine the mediators, such as innovation capabilities or networking capabilities, as an outcome of business incubation center support, influencing startup performance.

### Conclusion

The study examines the relationship between business incubation centre support and startup performance through the sequential mediation of potential and realized absorptive capacity among incubated startups in Pakistan. Drawing on the absorptive capacity perspective, the findings reveal that business incubation centre support significantly enhances startups' ability to acquire

and assimilate external knowledge, which further enhances knowledge transformation and exploitation. The findings also reveal that realized absorptive capacity plays a significant role in translating acquired knowledge into startup performance. Furthermore, the significant serial mediation confirms that business incubation center support enhances startup performance through potential and realized absorptive capacity. The study highlights that the effectiveness of business incubation center support not only depends on the availability of various services, such as mentoring, training, and networking, but also on the ability of startups to utilize the knowledge generated through these services. Therefore, incubation centres should focus more on developing learning abilities and defining knowledge management practises of startups.

## References

- Adomako, S., & Ahsan, M. (2022). Entrepreneurial passion and SMEs' performance: Moderating effects of financial resource availability and resource flexibility. *Journal of Business Research*, *144*, 122-135. <https://doi.org/https://doi.org/10.1016/j.jbusres.2022.02.002>
- Algarni, M. A., Ali, M., Leal-Rodríguez, A. L., & Albort-Morant, G. (2023). The differential effects of potential and realized absorptive capacity on imitation and innovation strategies, and its impact on sustained competitive advantage. *Journal of Business Research*, *158*, 113674. <https://doi.org/https://doi.org/10.1016/j.jbusres.2023.113674>
- Arif, T., Munir, Y., Azeem, S., Khan, M. B., Zafar, H., & Sarwar, U. J. J. o. A. D. S. (2026). Nexus Between Business Incubators, Commercialization and Innovation: Does Absorptive Capacity Act as a Mediator? , *15*(1), 1-14.
- Asare-Kyire, L., Appienti, W., Bonsu, C., & Ackah, O. (2023). Entrepreneurial orientation and organizational resilience: role of organizational reconfiguration and absorptive capabilities. *Open Journal of Business Management Decision*, *11*(5), 2014-2033.
- Bonfanti, A., Mion, G., Vigolo, V., & De Crescenzo, V. (2025). Business incubators as a driver of sustainable entrepreneurship development: evidence from the Italian experience. *International Journal of Entrepreneurial Behavior & Research*, *31*(6), 1430-1454. <https://doi.org/10.1108/IJEBR-05-2024-0500>
- Bouguerra, A., Mellahi, K., Glaister, K., Hughes, M., & Tatoglu, E. (2021). Revisiting the Concept of Absorptive Capacity: The Moderating Effects of Market Sensing and Responsiveness. *British Journal of Management*, *32*(2), 342-362. <https://doi.org/https://doi.org/10.1111/1467-8551.12398>
- Bouguerra, A., Mellahi, K., Glaister, K., Sadeghi, A., Temouri, Y., & Tatoglu, E. (2022). Absorptive capacity and organizational performance in an emerging market context: Evidence from the banking industry in Turkey. *Journal of Business Research*, *139*, 1575-1587. <https://doi.org/https://doi.org/10.1016/j.jbusres.2021.10.077>
- Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. (2012). The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, *32*(2), 110-121. <https://doi.org/https://doi.org/10.1016/j.technovation.2011.11.003>
- Chaparro, F., Ximena, A., Kozesinski, R., Camargo, J., & Alceu, S. (2021). Absorptive capacity in startups: a systematic literature review. *Journal of Entrepreneurship, Management and Innovation*, *17*(1), 57-95.

- Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, 41(2), 745-783. <https://doi.org/10.1007/s10490-023-09871-y>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 35(1), 128-152.
- Dong, H., Murong, R., & Li, J. (2023). Research on network capacity, absorptive capacity and service innovation performance of technology business incubators—based on PLS-SEM and fsQCA methods [Original Research]. *Frontiers in Environmental Science, Volume 11* - 2023. <https://doi.org/10.3389/fenvs.2023.1154162>
- Elidjen, E., Pertiwi, A., Mursitama, T. N., & Beng, J. T. (2022). How potential and realized absorptive capacity increased ability to innovate: the moderating role of structural ambidexterity. *VINE Journal of Information and Knowledge Management Systems*, 55(1), 15-33. <https://doi.org/10.1108/VJKMS-12-2021-0298>
- Flatten, T. C., Engelen, A., Zahra, S. A., & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal*, 29(2), 98-116. <https://doi.org/10.1016/j.emj.2010.11.002>
- França, A., & Rua, O. L. (2017). Contributions of Absorptive Capabilities to Export Performance. *Periodica Polytechnica Social and Management Sciences*, 25(2), 150-157. <https://doi.org/10.3311/PPso.10281>
- Gonzalez-Uribe, J., & Leatherbee, M. (2018). The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile. *The Review of Financial Studies*, 31(4), 1566-1603. <https://doi.org/10.1093/rfs/hhx103>
- Hackett, S. M., & Dilts, D. M. (2008). Inside the black box of business incubation: Study B—scale assessment, model refinement, and incubation outcomes. *The Journal of Technology Transfer*, 33(5), 439-471. <https://doi.org/10.1007/s10961-007-9056-9>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed.). Pearson Education Limited.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2023). *Advanced issues in partial least squares structural equation modeling*. sage publications.
- Hausberg, J. P., & Korreck, S. (2021). Chapter 2: Business incubators and accelerators: a co-citation analysis-based, systematic literature review. *Handbook of Research on Business and Technology Incubation and Acceleration*. In. Edward Elgar Publishing. <https://doi.org/10.4337/9781788974783.00009>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Higher Education Commission Pakistan. (2025). *Business Incubation Centers in Public Sector Universities*. Retrieved April 5 from <https://www.hec.gov.pk/english/services/universities/EBIC/Pages/Downloads.aspx>
- Invest2Innovate. (2024). *Pakistan Startup Ecosystem Report* 2024. <https://invest2innovate.com/insights/#ecosystem-reports>

- Krishna, A., Agrawal, A., & Choudhary, A. (2016, 12-15 Dec. 2016). Predicting the Outcome of Startups: Less Failure, More Success. 2016 IEEE 16th International Conference on Data Mining Workshops (ICDMW),
- Latukha, M., & Veselova, A. (2019). Retracted: Talent management, absorptive capacity, and firm performance: Does it work in China and Russia? *Human Resource Management*, 58(5), 503-519. <https://doi.org/https://doi.org/10.1002/hrm.21930>
- Leitão, J., Pereira, D., & Gonçalves, Â. (2022). Business Incubators, Accelerators, and Performance of Technology-Based Ventures: A Systematic Literature Review. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 46. <https://doi.org/https://doi.org/10.3390/joitmc8010046>
- Limaj, E., & Bernroider, E. W. N. (2019). The roles of absorptive capacity and cultural balance for exploratory and exploitative innovation in SMEs. *Journal of Business Research*, 94, 137-153. <https://doi.org/https://doi.org/10.1016/j.jbusres.2017.10.052>
- Phuong, L. N., Tuan, K. C., Duc, N. N., & Thi, U. N. (2022). The Impact of Absorption Capability, Innovation Capability, and Branding Capability on Firm Performance—An Empirical Study on Vietnamese Retail Firms. *Sustainability*, 14(11), 6422.
- Schmutzler, C., & Presse, A. (2021). Do Startups Benefit from Incubation? An Analysis of Startups' Absorptive Capacity. In D. Mietzner & C. Schultz (Eds.), *New Perspectives in Technology Transfer: Theories, Concepts, and Practices in an Age of Complexity* (pp. 31-49). Springer International Publishing. [https://doi.org/10.1007/978-3-030-61477-5\\_3](https://doi.org/10.1007/978-3-030-61477-5_3)
- Singh, A. K., Jain, N. K., Sharma, M. G., & Nigam, S. (2023). Reconceptualization of absorptive capacity as potential and realized absorptive capacity for project-based organizations. *International Journal of Project Management*, 41(2), 102449. <https://doi.org/https://doi.org/10.1016/j.ijproman.2023.102449>
- Vincent, V. Z., & Zakkariya, K. (2021). Business Incubation and Innovation Speed: Mediating Role of Absorptive Capacity. *Dynamic Relationships Management Journal*, 10(1), 57-72.
- Volberda, H. W., Foss, N. J., & Lyles, M. A. (2010). PERSPECTIVE—Absorbing the Concept of Absorptive Capacity: How to Realize Its Potential in the Organization Field. *Organization Science*, 21(4), 931-951. <https://doi.org/10.1287/orsc.1090.0503>
- Weele, M. A. v., Rijnsoever, F. J. v., Groen, M., & Moors, E. H. (2019). Gimme shelter? Heterogeneous preferences for tangible and intangible resources when choosing an incubator.
- Zahra, S. A., & George, G. (2002). Absorptive Capacity: A Review, Reconceptualization, and Extension. *Academy of Management Review*, 27(2), 185-203. <https://doi.org/10.5465/amr.2002.6587995>
- Zaidi, R. A., Khan, M. M., Khan, R. A., & Mujtaba, B. G. (2023). Do entrepreneurship ecosystem and managerial skills contribute to startup development? *South Asian Journal of Business Studies*, 12(1), 25-53. <https://doi.org/10.1108/SAJBS-07-2020-0233>