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The Varying Effects of Four Components of Employee Psychological Capital on Sustainable-Business-Model Innovation in the New Normal

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Abstract: In view of the intensification of market uncertainty and complexity, interest in sustainable-business-model innovation (SBMI) has increased among both global companies and educational institutions in the *new normal*. However, although many organisations find it challenging to accomplish their sustainability goals, limited research has delved into SBMI in the post-pandemic era. To address this research gap, we adopt a unique micro-foundational approach to investigate how the four components of employees' psychological capital (PsyCap) affect SBMI. Based on a primary survey of 430 employees of small and medium-sized Chinese enterprises using online and offline methods, we used structural equation modelling to analyse the results. We found that optimism, hope, and self-efficacy were each positively related to SBMI, with resilience moderating these positive associations. The main theoretical contribution of our study is the use of a micro-foundational approach to unravel the different effects of the four dimensions of PsyCap on SBMI, thus offering novel insights into a deeper, more comprehensive understanding of relevant issues in the age of the COVID-19 pandemic. Practically, our findings can help global managers to develop strategies to leverage the psychological resources of individuals in order to cope with firm-level innovation challenges during this turbulent time.

Keywords: psychological capital; sustainable-business-model innovation; resilience; SmartPLS

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1. Introduction

Psychological capital (PsyCap) refers to an individual's positive psychological state and is deemed key to enhancing organisational innovation [1,2]. The literature on PsyCap shows that PsyCap is positively associated with a diverse set of innovation-related outcomes in organisations, such as creativity [3], innovative performance [4], and innovative workplace behaviour [5]. However, the combination of rising geopolitical risk and uncertainty brought about by COVID-19 has negatively affected firms' ability to innovate, which is a topic that was not discussed adequately in prior studies. Re-visiting and re-examining the effects of PsyCap on corporate innovation during this turbulent time are thus imperative.

Sustainable-business-model innovation (SBMI) refers to the generation of groundbreaking or improved business models that can facilitate the production of integrated and competitive solutions by significantly mitigating detrimental external effects and/or producing favourable effects on the environment and society [6]. In conditions of constant change, many firms are compelled to alter or renew their traditional business models in order to cope with external dynamics [7]; therefore, SBMI has become increasingly crucial to organisational success and survival in the contemporary business environment. While numerous studies have demonstrated the effects of various firms' capabilities in SBMI [8,9], limited empirical research has explored the links between PsyCap and SBMI.

Taking the above arguments together, we aim to address this research gap by adopting a micro-foundational approach that involves psychology and human-resource behaviours. This approach assists in understanding how interpersonal dynamics, which encompass how employees interact, may be founded on individual traits and behaviours. It is intended to obtain insights into the personalities of employees (individuals) and approaches to enhancing productivity, which are significant to advancing strategic management. The importance of the micro-foundational approach may be understood through the emphasis it places on the need to thoroughly comprehend unique, interactive, and collective effects that are not just additive but also emergent [10]. Moreover, the approach is a theoretical lens we can use to examine how a micro-level analysis affects SBMI and the possibility of studying organisational outcomes by examining individuals as units of analysis. More specifically, we explore transformational mechanisms from the psychological qualities of individual actors to the collective phenomenon of SBMI. León-Medina stated that transformational mechanisms explain the path from the components of a system at the micro level (entities and activities) to its macroscopic properties [11]. They refer to the processes through which individual actors' psychological qualities lead to the emergence of the collective phenomenon of SBMI. This definition underscores the underlying processes or mechanisms that facilitate the conversion or translation of individual psychological qualities into a larger collective phenomenon. Furthermore, PsyCap is characterised by four distinct positive mental states of employees (i.e., self-efficacy, optimism, hope, and resilience) [1], which were found to exert different effects on organisational outcomes [12,13]. Through our research, we aim to explore the interplay between the four individual-level elements of PsyCap and their effects on organisational SBMI.

The theoretical contribution of our study is the establishment of a link between the interactions of these individual PsyCap components and organisational SBMI, shedding light on the diverse ways in which individual psychological resources contribute to the development of innovative practices during challenging times. From a practical standpoint, our findings are valuable for global managers seeking to develop strategies for leveraging individuals' psychological resources in order to effectively address innovation challenges at the firm level during turbulent periods.

2. Literature Review and Hypothesis Development

2.1. PsyCap and SBMI

The term PsyCap can be conceptualised as an individual's constructive psychological condition, which encompasses the following attributes: (1) possessing the self-assurance (self-efficacy) to exert the requisite effort in order to excel in demanding endeavours; (2) adopting a positive perspective (optimism) regarding present and future prospects for success; (3) persisting in the pursuit of objectives and, when necessary, adapting strategies to attain them (hope); and (4) maintaining resilience and rebounding when confronted with challenges and adversity, even surpassing previous levels (resilience) to achieve success [14]. As pointed out by scholars such as Doci et al. [15] and Yavan Temizkan [16], the unique value of PsyCap is its four-dimensional construct, which can characterise critical, socio-psychological frameworks beyond the individual level; therefore, it has been vastly expanded and applied by many social-science scholars from a wide range of disciplines, such as Management, Psychology and Organisational Behaviour. Although a substantial body of empirical research has focused on exploring the individual effects of the four constituent elements of PsyCap (i.e., self-efficacy, optimism, hope, and resilience) on organisational outcomes associated with innovation [17–20], the role that each PsyCap dimension plays in affecting SBMI needs to be probed in depth and in a more timely manner. The four distinct components may exert contingent or independent influences on SBMI in this peculiar post-pandemic time.

According to Luthans et al. [21], self-efficacy, optimism, and hope all refer to people's mental-developmental states, revealing their expectations about whether their behaviours will be successful, while resilience reflects a person's developable capacity/ability to re-

bound or recover from adversity. Yu et al. [3] added that, from a developmental perspective, some employees may not experience any severe setbacks and, thus, have no opportunities to display or exercise resilience. Therefore, we exclusively evaluate the intervening function of resilience in altering the mechanisms between the three PsyCap components and SBMI, in accordance with the viewpoint of Yu et al. [3]. The research framework we constructed on PsyCap and SBMI is shown in Figure 1.

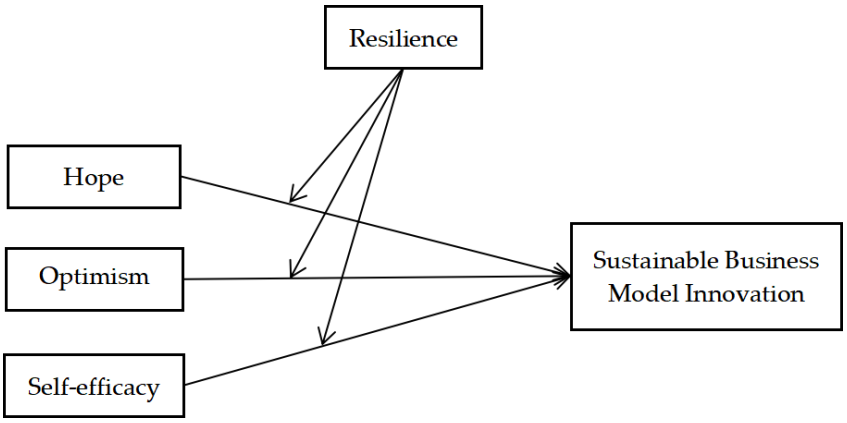

Figure 1. Research framework.

Hope is a positive motivational state in which prevailing beliefs are expected to be accomplished [22]. It is characterised as the volition to engage in creative endeavours, and it serves as the driving force behind the imaginative exploration of diverse avenues to achieve desired objectives [21]. According to Snyder et al. [23], individuals with high levels of hope use goal-oriented cognition to navigate chosen paths and persistently advance. Ultimately, individuals with a sense of hopefulness can effectively accomplish their goals by investing increased effort in their actions and behaviours. In this context, individuals frequently predict that investing more effort into their actions and behaviours will help them attain their goals. As they are goal-oriented, people with high hope typically exert greater effort to achieve their objectives, and when performing work tasks, they exhibit initiative and often take risks. In the face of challenges, they exhibit a positive attitude and apply innovative strategies to formulate alternative pathways for accomplishing their objectives [3,24]. Despite the new and very real challenges presented by dynamic working environments being dynamic, individuals with higher levels of hope overcome these challenges. According to Presenza et al. [25], SBMI represents a transformative approach to organisational functioning aimed at reducing negative external effects while concurrently generating novel positive external advantages for both society and the environment. The innovative development of a sustainable business model is undertaken with the intention of exerting a positive impact on individuals [26]. In this context, fostering hope is essential for effectively training individuals to proficiently execute newly established operational procedures, optimising their abilities and cultivating their self-assurance and commitment within the framework of the novel business model. Hope has been found to be associated with SBMI. Despite problems at work, hopeful employees remain very enthusiastic about innovation [22]. This phenomenon can be attributed to the fact that optimistic employees, characterised by a hopeful disposition and positive expectations, tend to exhibit positive behavioural tendencies, which, in turn, stimulate innovation-related activities, including the development of SBMI. In light of this reasoning, we propose the following hypothesis:

H1a. *Hope is positively related to SBMI.*

Optimism is a psychological state indicating the extent to which an individual attributes positive outcomes to future success [27]. In other words, optimistic employees exhibit positive emotions regarding future expectations [28]. A significant relationship be-

tween optimism and SBMI has been established [29]. Enterprises can modify their business models through adaptation [30]. This is achievable when individuals with a higher propensity for optimism exhibit positive emotions and confidence [22]. Osterwalder et al. [31] noted that business-model innovation transcends the practice of examining competitors, as it does not involve mere imitation or benchmarking. Instead, it focuses on the creation of novel mechanisms that generate value and revenue. In essence, it entails the questioning of established beliefs and conventions to devise unique models that effectively cater to unmet, emerging, or concealed customer demands. Individuals' well-being is supported through positive cognitive and affective evaluations of past, present, and future events [32]. Research suggests that optimistic individuals tend to strive for new solutions and alternatives in addressing challenges through SBMI. However, if it is not balanced with realism, optimism can also contribute to a disregard for the potential risks associated with SBMI. By downplaying or ignoring risks, organisations may fail to adequately plan for contingencies, resulting in costly setbacks or failures in their sustainability efforts [33,34]. The complacency bred by optimists can reinforce a status quo bias, in which organisations become resistant to change and fail to recognise the urgency of adopting sustainable practices. Optimistic assumptions about current business models may discourage the exploration of alternative approaches that could lead to more sustainable outcomes [35,36]. Assessing all these variables together, we expect to find that optimism enables people to engage in challenging activities which influence SBMI. Accordingly, the following hypothesis is proposed:

H1b. *Optimism is positively related to SBMI.*

Self-efficacy can be defined as an individual's firm belief in their capacity to mobilise the motivation, cognitive resources, and strategic actions required to effectively carry out a specific task [36]. It represents an individual's confidence in their ability to handle challenging environmental demands and successfully accomplish a designated task. Research has suggested that people with high self-efficacy tend to embrace challenging and risky endeavours, investing considerable effort into achieving their goals [37]. Furthermore, they demonstrate adaptability by developing innovative approaches to task execution in the face of failures and difficulties [38]. Bolaños revealed that self-efficacy involves an assessment of individuals' self-confidence regarding their proficiency in undertaking necessary actions associated with future situations [39]. An innovative process is necessary to change the logic through which firms create and distribute value, either by developing entirely new business models, diversifying into other models, or moving from one business model to another [40]. Firms must adapt their internal structures as part of the SMBI process. According to Zahra et al. [41] and Bocken et al. [42], organisations can rethink and reinvent their business practices by focusing on sustainability. Business-model adaptation is undertaken with the objective of surmounting obstacles inherent to both the internal operations of an organisation and its external environment. Sustainability in a business model can be accomplished through self-efficacy. Higher self-efficacy makes individuals more eager to take on challenging tasks, and PsyCap can encourage people to generate new ideas and innovate. People with self-efficacy and self-motivated goals can increase their confidence in taking on and undertaking efforts to succeed in challenging tasks [43] and are likely to be involved in SBMI. Consequently, robust associations have been found between positive self-efficacy and work-related performance, and between self-efficacy and innovation [44]. Based on this evidence, we deduce that employees who demonstrate elevated levels of self-efficacy possess motivational and cognitive reservoirs that facilitate their effectiveness and innovative capabilities. Therefore, they are more likely to engage in SBMI than employees who have low self-efficacy. The following hypothesis is therefore proposed:

H1c. *Self-efficacy is positively related to SBMI.*

2.2. Moderating Role of Resilience

The aim of SBMI as a strategic imperative is to secure the long-term viability of organisations amid environmental fluctuations and volatility. Moreover, business-model innovation and resilience have key elements in common that strongly suggest a causal relationship. In this regard, we argue that examining PsyCap components individually is important to better understand the mechanisms of their influence on SBMI. We also examine the impact of resilience as a moderating variable to determine the relative strength of PsyCap.

In today's competitive era, the work environment, especially in the tech industry, has become increasingly challenging. The novelty of the present study is that it emphasises that resilience can be regarded as a crucial resource repository that enables individuals to effectively navigate dynamic and evolving circumstances [45]. Compared to people who possess the other three PsyCap dimensions (i.e., hope, optimism, and self-efficacy), resilient people recover from adverse situations and adapt well. They recover quickly and effectively from major setbacks. First, resilience provides the necessary mental strength and endurance to navigate the positive and negative of the innovation process [46], ensuring that setbacks do not lead to a decline in optimism, hope, or self-efficacy. Second, resilience acts as a buffer against potential negative outcomes and mitigates the impact of failure or obstacles on the other dimensions of PsyCap [47]. It helps individuals and organisations to recover from setbacks and continue in their pursuit of SBMI. In addition, resilience contributes to the adaptive capacity of individuals and organisations, allowing them to learn from their failures and refine their innovative approaches [48]. It fosters a growth mindset, in which setbacks are seen as opportunities for learning and improvement rather than as permanent barriers. Thus, we argue that resilience, a dynamic adaptive capability, may regulate hope, optimism, and self-efficacy to influence SBMI and help attain creative outcomes [49]. This adaptive capacity is particularly important for SBMI, as it involves continuous learning, experimentation, and adaptation to changing market conditions and stakeholder needs. The process of identifying uncertainties entails the assessment and recognition of potential obstacles that pose risks to current business-innovation models. In this study, the phase in which uncertainties are identified is enhanced by the inclusion of a diverse group of participants with varied backgrounds and interests, including employees who have experienced the recent COVID-19 pandemic [50].

A sustainable business model uses business ecosystems to achieve advantages and sustainability, enabling resilience and value generation by changing business practices. Firms must adapt their business models as a result of changing, improving, and replacing various organisational components [51]. Understanding these components is important as it makes it easier to analyse organisational processes, plan the transition from one business model to another, and boost a firm's resilience and likelihood of success [38]. Therefore, higher risk mitigation and resilience could be further advantages of sustainable business strategies [52].

Consequently, resilience was chosen as a moderating variable in the context of SBMI because it supports the endurance, adaptability, learning, and well-being necessary to sustain innovation efforts over time. We expect that resilience will be found to strengthen psychological resources, namely, hope, optimism, and self-efficacy, which directly influence SBMI. We also argue that employees who possess a strong sense of resilience are inclined to hold the belief that their hope, optimism, and self-efficacy contribute to their active participation in the process of SBMI, leading to the acquisition of additional resources. Therefore, we hypothesise that resilience moderates the effects of hope, optimism, and self-efficacy on SBMI.

H2a. *Resilience moderates the relationship between hope and SBMI, such that higher resilience strengthens the positive relationship between hope and SBMI.*

H2b. *Resilience moderates the relationship between optimism and SBMI, such that high resilience strengthens the positive relationship between optimism and SBMI.*

H2c. *Resilience moderates the relationship between self-efficacy and SBMI, such that high resilience strengthens the positive relationship between self-efficacy and SBMI.*

3. Materials and Methods

3.1. Measures

As Chinese employees are apt to disguise their true feelings by choosing the midpoint of a scale, we adopted a six-point Likert-type scale with anchors ranging from 'strongly disagree' to 'extremely agree' to avoid response bias [53].

PsyCap. We adopted Luthans et al.'s [21] PsyCap scale, which comprises four dimensions: optimism, hope, resilience, and self-efficacy. Sample items of the four dimensions are as follows: 'I can think of many ways to reach my current work goals' (hope), 'I feel confident helping to set targets/goals in my work area' (self-efficacy), 'I always look on the bright side of things regarding my job' (optimism), and 'I usually take stressful things at work in stride' (resilience).

SBMI. This was measured using Amoroso et al.'s scale [54], which includes three items for SBMI. An example item is: 'We regularly incorporate novel operational processes, routines, and norms into our sustainable business framework'.

3.2. Sample and Data Collection

The questionnaire was distributed both online and offline because of the COVID-19 pandemic. The research commenced in July 2022 and lasted one month, incorporating two time points. The respondents were employees of Chinese small and medium-size enterprises (SMEs). In the online survey, we used the services of an online-survey provider called Sojump. Through this platform, our questionnaires were distributed to participating employees via WeChat, a popular messaging application. In the offline survey, we printed paper questionnaires and assigned a single staff member to assist in the distribution of the questionnaires in each SME. Prior to the formal surveys, we conducted comprehensive interviews with managers representing the chosen SMEs to verify the validity of our logical reasoning. To facilitate the data collection and conduct the formal survey, we directly collaborated with representatives from the human-resource departments of the different SMEs.

To avoid the likelihood of common method variance, we collected two-wave survey data to meet the basic requirement of the time-lag research design [55]. We measured PsyCap at period 1 and SBMI at period 2 (with a gap of one month). As a result, data from 430 employees, encompassing both periods 1 and 2, were successfully obtained, with a response rate of 70.49%. The sample population consisted of 191 females and 239 males, most of whom were 31 to 40 years old, accounting for 51.4% of the sample; 36.51% were 21 to 30 years old, 11.40% were 41 to 50 years old, and only 0.6% were over 50 years old. In terms of civil status, 133 were unmarried, accounting for 30.9% of the total, and 297 were married, accounting for 69.1%. Regarding educational qualifications, 20 individuals had a diploma or below, accounting for 4.7% of the sample; 276 individuals had a bachelor's degree, accounting for 64.1%; and 134 individuals had a master's degree or higher, accounting for 31.2% of the total. Furthermore, 124 individuals were ordinary employees, accounting for 28.8% of the sample; 114 were frontline managers, accounting for 26.5%; 143 were middle managers, accounting for 33.3%; and 49 were senior managers, accounting for 11.4% of the total. Regarding the nature of the companies, 146 individuals were employed in state-owned enterprises, accounting for 40% of the sample; 154 were employed in private enterprises, accounting for 35.8%; 34 were employed in joint-stock enterprises, accounting for 7.9%; 51 were employed in foreign/joint enterprises, accounting for 11.9%; and 45 were employed in enterprises with other ownership types, accounting for 10.5% of the total.

4. Results

4.1. Data Analysis

We used SmartPLS 3.2.2 software as the data-analysis tool in this study. SmartPLS 3.2.2 offers advanced statistical techniques, such as structural equation modelling (SEM) and partial least squares (PLS) regression, which are well suited for analysing complex and multivariate data [56]. The software uses robust algorithms and has efficient model-estimation capabilities and a user-friendly interface, making it suitable for our research objectives. By leveraging SmartPLS 3.2.2, we ensured an accurate and comprehensive analysis of the data in a rigorous and efficient manner.

In this study, we used the SEM technique to explore the correlation between the four components of PsyCap and SBMI. Initially, we evaluated the reliability and validity of each construct; a detailed overview can be found in Table 1. The results indicate that all the item-factor-loading values surpassed the threshold of 0.60. Moreover, the alpha, rho-A, and composite reliability (CR) values for each construct surpassed the recommended threshold of 0.70, and the average variance extracted (AVE) value exceeded 0.50. It can be concluded that the measurement scale used in this study demonstrated reliability and validity.

Table 1. Reliability and validity of the scale.

Constructs	Items	Factor Loadings	Cronbach's Alpha	rho-A	CR	AVE
Hope	PCH1	0.903	0.895	0.902	0.935	0.827
	PCH2	0.917				
	PCH3	0.907				
Self-efficacy	PCS1	0.898	0.881	0.882	0.927	0.808
	PCS2	0.905				
	PCS3	0.894				
Optimism	PCO1	0.825	0.848	0.853	0.908	0.767
	PCO2	0.906				
	PCO3	0.894				
Resilience	PCR1	0.858	0.826	0.828	0.896	0.741
	PCR2	0.861				
	PCR3	0.865				
Sustainable-business-model innovation	SBMI1	0.928	0.925	0.926	0.953	0.870
	SBMI2	0.932				
	SBMI3	0.938				

Notes: N = 430, PCH = hope; PCS = self-efficacy; PCO = optimism; PCR = resilience; SBMI = sustainable-business-model innovation; CR = composite reliability; AVE = average variance extracted.

The heterotrait–monotrait ratio (HTMT) approach was used to evaluate the discriminant validity in this study; it is a more contemporary method than the Fornell-and-Larcker approach [57,58]. The HTMT approach is used to calculate the correlations between items across variables in relation to the average correlations between items measuring the same construct [58]. The recommended threshold for HTMT to establish discriminant validity is below 0.90. Values exceeding 0.90 indicate a lack of discriminant validity. Table 2 displays the HTMT values for each item, all of which were below 0.90. Consequently, the scale used in this study met the criteria for discriminant validity.

Table 2. HTMT ratios.

	SBMI	PCH	PCO	PCR	PCS
SBMI					
PCH	0.626				
PCO	0.641	0.780			
PCR	0.552	0.737	0.704		
PCS	0.653	0.858	0.714	0.692	

Note: N = 430.

We conducted an assessment of the collinearity and suitability of the overall model using established academic methods. To evaluate collinearity issues, we used SEM and confirmed the elimination of collinearity. The threshold value for the variance inflation factor (VIF) was set at less than 5 [56]. Analysing the results presented in Table 3, we observed that the VIF value was below 5, indicating the absence of collinearity problems among the study's dimensions. Furthermore, the appropriateness of the overall model was assessed using commonly used indicators, such as the standardised root-mean-square residual (SRMR) and the normed fit index (NFI). The threshold value for SRMR is within the range of 0 to 1, and a value below 0.08 is considered to indicate the best fit for the model [59]. Similarly, the threshold value for NFI falls within the range of 0 to 1, and a value above 0.8 signifies a well-fitting model [59]. Specifically, the SRMR value should be below 0.06 [60], while the NFI value should be above 0.8 [61]. In our study, the model had an NFI value of 0.876 and an SRMR value of 0.045, as illustrated in Table 3. These results indicate the adequate fitness of the model, meeting the established thresholds for both NFI and SRMR.

Table 3. Goodness-of-fit model and VIF.

	SBMI	**Model-Fit Indices**
SBMI		
Hope	3.064	SRMR = 0.045 NFI = 0.876
Optimism	2.070	
Resilience	1.865	
Self-efficacy	2.582	

Notes: N = 430, SRMR = standardised root-mean-square residual; NFI = normed fit index; VIF = variance-inflation factor.

Chin et al. [62] proposed a minimum R^2 value of 0.10 as a requirement for ensuring adequate model fitting. In line with this, the SBMI achieved an R^2 value of 0.429, surpassing the recommended threshold and indicating that the model adequately represented the collected data (Table 4). The goodness of fit (GoF) is one of the metrics used to assess the fit of a structural equation model. In SmartPLS, GoF analysis is used to determine the discrepancy between the observed data and the model predictions within a structural equation model. It provides a means to evaluate the adequacy of a model and ascertain whether it accurately explains the observed data [63]. The GoF ranges from 0 to 1, with values of 0.36, 0.25, and below 0.1 considered effective, average, and weak, respectively. The GoF index is used to assess the plausibility and parsimony of a model, and its formula is GoF = sqrt ((average AVE) $\times$ (average R^2)). The GoF value for the full model was 0.384, indicating that the model was both parsimonious and plausible, as presented in Table 4.

Table 4. Coefficient of determination (R^2) and goodness-of-fit index.

	AVE	**R Square**
SBMI	0.870	0.429
PCH	0.827	
PCS	0.808	
PCO	0.767	
PCR	0.741	
	0.803	0.429
GoF	0.384	

Notes: N = 430. GoF = goodness of fit.

The structural models depicted in Figures 2 and 3 illustrate the framework for this study, with R^2 denoting the coefficient of determination for each endogenous and predicted latent variable. The R^2 value for the dependent variable, SBMI, was 0.429, indicating that the four independent variables, PCS, PCH, PCO, and PCR, collectively accounted for approximately 42.9% of the variability observed in the SBMI.

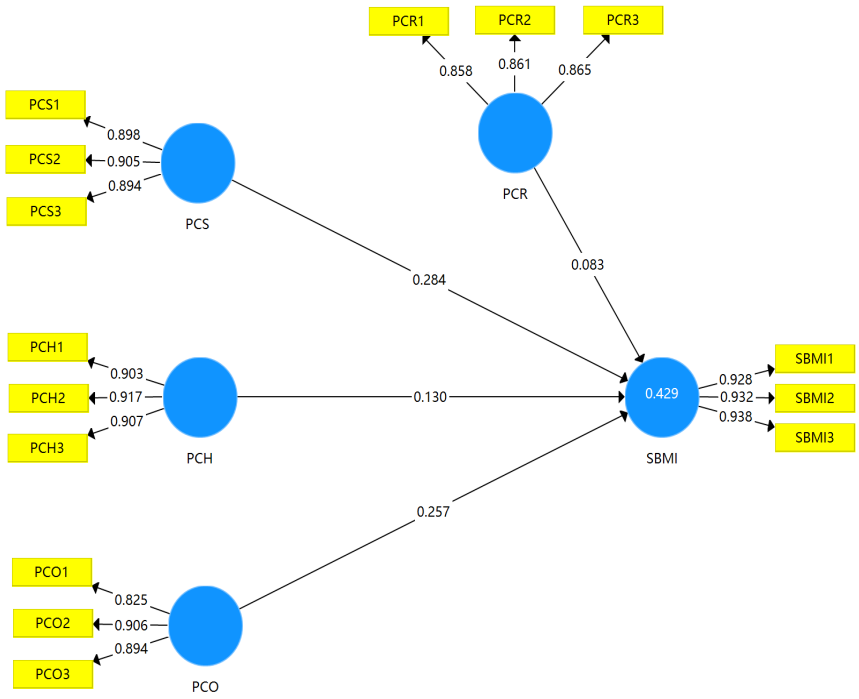

Figure 2. Structural equation model (PLS algorithm).

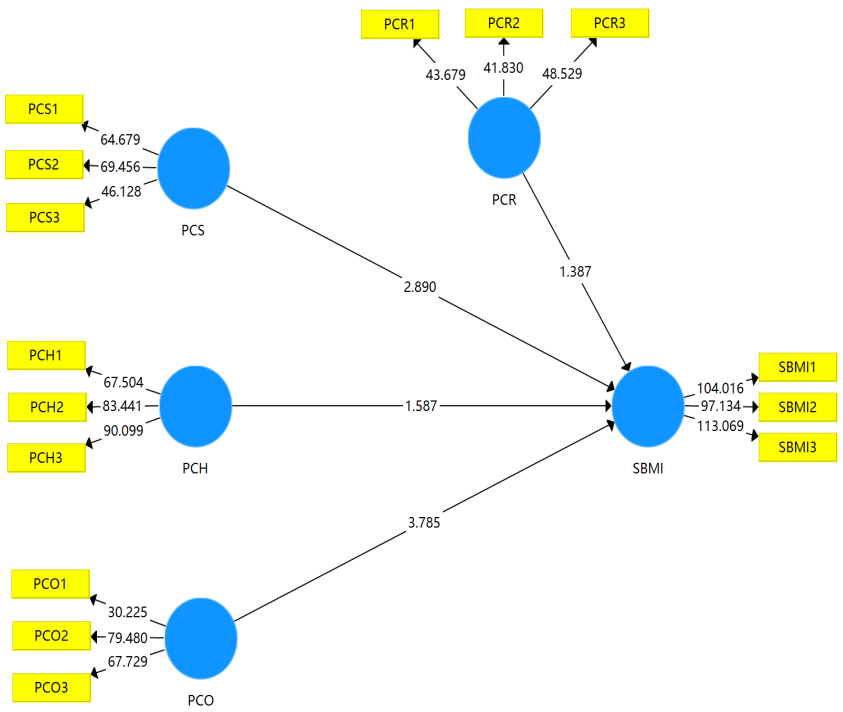

Figure 3. Structural equation model (bootstrapping).

4.2. Direct Effects

We conducted empirical investigations to examine the hypotheses by using beta values, the *t*-test, and bootstrapping at a sub-sample level of 5000. The results of our analysis indicate that the dependent variable, SBMI, had no statistically significant impact, as evidenced by the *p*-value exceeding 0.05. As shown in Table 5, three of the four dimensions of PsyCap, namely, hope, optimism, and self-efficacy, had positive associations with the SBMI (Mh = 0.215, $p < 0.05$, Mo = 0.241, $p < 0.05$, and Ms = 0.213, $p < 0.05$, respectively), as given in Table 5. This indicates that H1a, H1b, and H1c were supported.

Table 5. Hypothesis testing.

Hypothesis	M	SD	T Stats	*p* Values
Hope→SBMI	0.215	0.075	2.813	0.005
Optimism→SBMI	0.241	0.070	3.436	0.001
Self-efficacy→SBMI	0.213	0.092	2.376	0.018
H*R	0.142	0.061	2.422	0.015
O*R	0.155	0.061	2.562	0.010
S*R	0.158	0.059	2.806	0.005

Notes: N = 430, H*R = hope*resilience; O*R = optimism*resilience; S*R = self-efficacy*resilience.

4.3. Moderating Effects of Resilience

The next step in the hypothesis testing was to check the moderating effect of resilience on the nexus of hope, optimism, self-efficacy, and SBMI. As indicated in Table 5, the findings showed that the effects of H*R, O*R, and S*R on the SBMI were positive and significant (Mh = 0.142, $p < 0.05$, Mo = 0.155, $p < 0.05$, Ms = 0.158, $p < 0.05$, respectively), supporting H2a, H2b, and H2c, respectively. To better understand the moderating mechanisms, we also plotted the interactions in Figure 4, which shows that resilience strengthened the effects of hope, optimism, and self-efficacy on the SBMI.

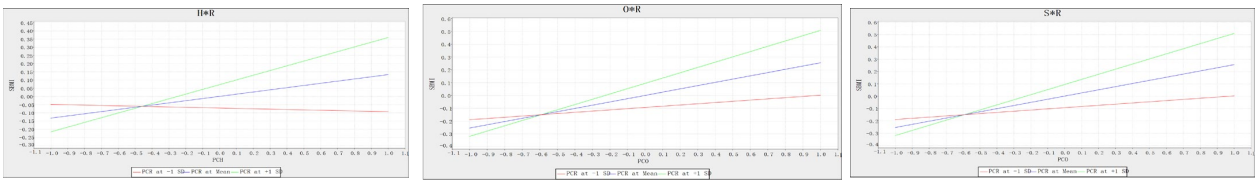

Figure 4. Moderation of H*R, O*R, and S*R on SBMI.

5. Discussion

Despite the extensive body of research examining the factors influencing PsyCap [1,14], little conclusive evidence has been obtained regarding the relationship between PsyCap's dimensions and SBMI, as well as the moderating role of resilience in these relationships. In other words, how do the four distinct PsyCap dimensions function methodically, and how are they organised to affect SBMI? As mentioned previously, the aim of the current study was to explore how resilience moderates the individual associations of SBMI with hope, self-efficacy, and optimism. This study's empirical findings validated the significant and positive relationships between three of the four dimensions of PsyCap and SBMI, thus providing support for H1a, H1b, and H1c.

Empirical evidence shows that resilience serves as an anchor in challenging times. Luthans [1] defined resilience as the ability to recover or adapt in the face of various challenges, such as adversity, conflict, and failure. Furthermore, SBMI produces positive outcomes, highlighting the crucial role of innovation in thriving during times of adversity [64]. The results of this study provided interesting insights and verified the positive and significant moderating effects of resilience on hope, optimism, and self-efficacy, thus supporting H2a, H2b, and H2c, respectively.

Overall, the findings suggest that the development and fostering of high levels of PsyCap may be important strategies for developing SBMI in the context of the COVID-19 pandemic. The results show that PsyCap is an important driver of SBMI and that policies and programmes supporting the development of PsyCap in SMEs can contribute to the attainment of sustainable-development objectives. Further research is needed to explore the mechanisms through which PsyCap affects SBMI and to test the generalisability of our findings across different contexts and industries. This would involve the implementation of training programmes or other interventions designed to enhance employees' levels of self-efficacy, hope, resilience, and optimism. In this way, organisations may become better equipped to adapt to the challenges of the current environment and to develop innovative business models that are both financially and environmentally sustainable.

6. Theoretical Implications

The discussion above showed that the four components of employee PsyCap had varying effects on SBMI during the pandemic. Previous preliminary research on SBMI mainly focused on new knowledge, resource use, past experiences, and management skills [65–67], whereas research on key PsyCap dimensions, such as hope, optimism, self-efficacy, and resilience, is relatively scant.

This study contributes to the literature by revealing how Chinese SMEs adjust their sustainable business models in response to crises. It confirms that firms adapt their sustainable business models to cope with external challenges [68,69]. This study also makes a valuable addition to the current body of research on SBMI by offering novel perspectives on the adaptive strategies used by Chinese SMEs to address external difficulties. In particular, this work highlights the role of resilience in driving business-model adaptation, which was not sufficiently explored in prior research. By shedding light on the mechanisms through which firms respond to crises, this study advances the understanding of the dynamic nature of SBMI.

7. Practical Implications

The findings of this study have several practical implications for global managers as they develop strategies to help individuals to use their psychological resources in order to cope with the challenges of SBMI during turbulent times. The results also have useful implications for employees of SMEs in China, particularly managers. First, this study suggests that managers should cultivate resilience in themselves and in their employees, as resilience amplifies the effects of the other components of PsyCap on SBMI. By encouraging resilience, managers can foster an organisational culture that encourages employees to take risks and innovate, which, in turn, can help them to adapt to changing circumstances and overcome setbacks. Deliberate and planned business-model-innovation processes may be necessary in many larger innovation projects, such as the introduction of new products or services; the purpose is to align all of the business model's elements optimally for exploitation and to gain competitive advantages over conventional diversification activities.

Second, because of the ongoing technological and scientific revolution, workers must constantly update their knowledge, abilities, and skills in order to adapt themselves to unceasingly evolving job demands. While individuals are very likely to stay in their organisations, it is also imperative to explore the deeper meanings of their psychological states during times of uncertainty. In this sense, organisations should also take employees' PsyCap into account when designing modified and new business models.

Third, senior managers should consider implementing specialised training or mentorship programmes to improve the PsyCap of employees and develop SBMI within organisations. This would allow the more efficient and effective deployment of sustainable solutions and technologies in SMEs. By investing in the development of employees' psychological resources, managers can enhance their ability to cope with stress and uncertainty, as well as increasing their motivation and their commitment to their organisations' goals. This, in turn, can help firms to avoid the retrenchment of employees and ensure the survival of these firms, particularly in the context of Chinese SMEs, in which PsyCap is critical to business success. Managers must pay attention to positive PsyCap. Organisations that focus on their employees' PsyCap may return to normalcy more rapidly. Sustainable-business-model innovation can also replace some strategic mergers and acquisitions.

8. Limitations and Future Research

Despite the theoretical and practical implications of this study, it is essential to acknowledge its limitations and to provide suggestions for future research. One notable limitation is the exclusive focus on Chinese SME workers in China, which potentially restricts the generalisability of the findings to global managers. To enhance the relevance and applicability of the research findings, we recommend that future studies adopt a more diverse approach by collecting data from employees from various countries. The expansion

of the scope of the study to encompass a broader range of cultural contexts and nationalities would enable a comprehensive understanding of the phenomenon under investigation. Another notable limitation is that other latent variables that were not considered may have influenced the outcomes of the study. For instance, factors such as leadership style [70] and organisational culture [71] may play significant roles in the relationship between PsyCap and business-model innovation. Future research may adopt more comprehensive and diverse research methods and consider a greater number of potential variables to deepen the understanding of these relationships.

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