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RESEARCH ARTICLE

The Causal Relationship of the Application of the BCG Economic Model Affecting the Competitive Advantage and Performance of Community Enterprise

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ABSTRACT

This research aimed to study the causal relationship of the application of the BCG economic model affecting the competitive advantage and performance of community enterprise. The sample consisted of 280 executives from president or vice president of a community enterprise group in Thailand. Data were collected via questionnaire, with SEM being used for analysis. The results indicated that 1) business resources capabilities positively affect the application of the BCG economic model, competitive advantage, and performance of community enterprise. Therefore, community enterprises should pay attention to business resources capabilities, which includes the value of resources, scarcity of resources, difficulty in imitation, and organizational management abilities. 2) The application of the BCG economic model positively affect competitive advantage, and performance of community enterprise. Therefore, community enterprises should pay attention to the application of the BCG economic model to their operations, which includes bio economy, circular economy and green economy. 3) Competitive advantage positively affect performance of community enterprise. Therefore, the organization must develop to lead to creating a competitive advantage, consisting of making a difference, cost advantage and rapid response.

INTRODUCTION

In the context of the globalized economy, where economic, social, technological, and consumer dynamics are constantly evolving, coupled with the growing focus on sustainable development, nations worldwide are accelerating efforts to drive their economies towards sustainability. The Thai government is placing great emphasis on the "BCG Model" a new economic theory aimed at sustainable development. This model integrates three key components: the Bioeconomy, Circular Economy, and Green Economy. The goal is to foster national development in both social and economic areas while ensuring tangible environmental conservation, enabling Thailand to achieve the United Nation Sustainable Development Goals (SDGs). The Bioeconomy involves using knowledge, technology, and innovation to build on Thailand's existing strengths in biological resources and agricultural products, enhancing the value of goods such as developing rice varieties with improved nutritional content. The Circular Economy focuses on maximizing the efficient use of resources, aiming to minimize or eliminate waste (Zero Waste). For instance, converting waste into other products to create additional value. Meanwhile, the Green Economy promotes the simultaneous development of the economy, society, and environmental conservation. This involves preserving and restoring natural resources to promote environmental sustainability, including pollution control, green investments, and hosting environmentally friendly events. According to the National Science and Technology Development Agency (NSTDA, 2020), organizations should adopt the BCG model to enhance competitiveness and achieve long-term sustainability. For an organization

to gain a competitive edge or achieve outstanding performance, a key factor lies in its resource base. Analyzing an organization's internal resources involves determining how those resources can create value for consumers, assessing their uniqueness, whether they can be imitated, and how that value can drive sustainability (Knott, 2015). The resource-based view (RBV) is one approach used to analyze the factors that contribute to competitive advantage. It focuses on an organization's resources and capabilities, exploring how they can develop strategies to sustain competitiveness over time (Barney, 1991; Grant, 1991).

This study focuses on community-owned production units, or community enterprises, as micro level production organizations built from local capital, making them the central theme of the research. The importance of the principles and potential of community enterprises is recognized, particularly as they are the result of continuous government support and promotion in Thailand. These enterprises have followed governmental guidelines and have integrated the BCG (Bio economy, Circular Economy, Green Economy) economic model into their operations, helping drive economic progress in line with national goals. The researcher aims to investigate the "causal relationship of the application of the BCG economic model on the competitive advantage and performance of community enterprises." The findings from this research can be used as a resource to help further develop community enterprises and other related businesses by applying the BCG economic model to enhance competitive advantage and business performance.

Objectives

The objectives of the study were:

- To examine the consistency of the causal relationships between the application of the BCG economic model, competitive advantage, and the performance of community enterprises.
- To develop a causal model for how the application of the BCG economic model affects the competitive advantage and performance of these enterprises.

LITERATURE REVIEWS AND HYPOTHESIS DEVELOPMENT

The BCG cconomic model (BCG)

The BCG Model represents a holistic approach to economic development, advancing three interconnected dimensions: the Bioeconomy, Circular Economy, and Green Economy. The Bioeconomy focuses on utilizing biological resources to add value, particularly by creating high-value products. It is closely linked to the Circular Economy, which emphasizes maximizing the reuse of materials to minimize waste. Both of these are part of the overarching Green Economy, which seeks not only economic growth but also balanced social development and environmental preservation, leading to security and sustainability. The model aims to transform Thailand's advantages in biodiversity and culture into innovation-driven competitiveness, fostering an economy that grows sustainably, competes globally, reduces inequality, strengthens communities, and remains environmentally friendly (NSTDA, 2020).

The term Bioeconomy has been used since the early 1980s, emerging from advances in biological sciences and biotechnology. It refers to an economy rooted in biological knowledge and science, seen as a way to mitigate climate change while promoting economic growth and human well-being. Many governments and international organizations have adopted this approach to support sustainability. The Bioeconomy has the potential to revolutionize industrial production processes by transforming biological knowledge into sustainable, environmentally-friendly, and competitive products. It revolves around the production of renewable biological resources and bio-based materials that can be converted into value-added products using technology and innovation, with a focus on renewable resources and materials derived from biological sources.)Lewandowski et al., 2018; The Board of Investment of Thailand, 2022; Stephenson & Damerell, 2022)

The concept of the Circular Economy became widely recognized in the 1990s, as a replacement for the traditional linear economic model, which contributes to the problem of single-use resource consumption and waste. The Circular Economy is a framework within sustainable development that aims to produce goods and services while minimizing waste, water, and energy consumption. Its core principles include reducing resource use, reusing products, and recycling materials to minimize waste generation. It seeks to keep the value of products, materials, and resources in the economic system for as long as possible. Integrating sustainability into the Circular Economy provides a long-term vision for achieving environmental and social sustainability, aligning with the United Nations' Sustainable Development Goals (SDGs) (Awan & Sroufe, 2022). The Circular Economy focuses on ensuring long-term economic sustainability, especially in industries with large-scale production and significant waste from production processes that negatively impact the environment.)Ferreira et al., 2018; The Board of Investment of Thailand, 2022)

The concept of the Green Economy was first introduced in the late 1980s. The United Nations Environment Programme (UNEP) defines it as an economy that enhances human well-being and social equity while significantly reducing environmental risks and ecological scarcities. It focuses on low carbon emissions, resource efficiency, and social inclusiveness. The Green Economy was a central theme at the United Nations Conference on Sustainable Development because of its clear relevance to sustainable development. It offers a way to align economic policies and behaviors with social and environmental needs, addressing the uncertain recovery of the global economy. The idea of the Green Economy is closely connected to low-carbon development and eco-industrial practices, which shift from end-of-pipe environmental protection technologies to resource-saving technologies driven by innovation and competitive markets. This leads to environmentally friendly production processes, emphasizing material recycling, resource decoupling, valuing ecosystem services, and efficient energy management. All of this is powered by technological innovations that promote resource efficiency, leveraging natural processes to benefit humanity in an equitable and inclusive manner without compromising the sustainability of ecosystems. The core focus of the Green Economy is the role ecosystems play in providing inputs to society and the economy, aiming to create balanced development across three key areas: economic growth, social equity, and environmental sustainability.)Bina, 2013; The Board of Investment of Thailand, 2022; Bilgaev et al., 2022)

Business resource capabilities (BRC)

The analysis of an organization's internal resources can be evaluated by examining how these resources create value for consumers. This involves considering the worth of the resources the organization possesses, whether they can be easily replicated, and how the organization can leverage them to ensure long-term sustainability (Knott, 2015). The Resource-Based View (RBV) is a concept used to analyze factors that contribute to a competitive advantage by focusing on an organization's resources and capabilities and how they can be developed into strategies for sustainable competition (Barney, 1991; Grant, 1991). Resources, in this context, include assets, capabilities, human resources, processes, information, knowledge, or other elements that the organization can control, develop, and apply. These resources are typically divided into four categories: 1) Physical resources: such as location, tools, and machinery. 2) Managerial resources: including organizational structure, processes, and the ability to manage various factors. 3) Human resources: referring to skills, abilities, and experience. 4) Financial resources, among others (Barney, 1991; Miethlich & Oldenburg, 2019). The VRIO Framework (Valuable, Rare, Inimitable, Organization) was developed by Barney (1991) as a way to help organizations build competitive advantages by focusing on their resources (Geraldes et al., 2019). The framework examines four key aspects: 1) Value: Whether the organization's products, services, or resources can be utilized to implement strategies that increase efficiency and effectiveness, while also addressing market threats. 2) Rareness: Whether the resource is rare or scarce. If only a few organizations have access to it or it's available in limited quantities, this gives a competitive edge. Scarcity could depend on factors like production volume or limited high-quality supplies used in the manufacturing process. 3) Inimitability: Whether the resource is difficult to replicate. Even if competitors can imitate it, the cost may be prohibitively high. Historical conditions also contribute to inimitability; resources developed from long-standing historical events or unique local processes can be difficult for others to copy. 4) Organization: The extent to which the

organization's policies and structure are capable of utilizing these resources effectively. Even valuable resources will fail to deliver value if the organization neglects or mismanages them. Therefore, the organization must create a system to support these resources, identify key assets, and recognize their potential to drive competitive advantage.

Competitive advantage (CA)

Competitive advantage is what sets an organization apart, and it stems from the organization's core competencies. This could be the ability to do something others cannot or doing it better than others (Barney & Clark, 2007). Fuller (2004) adds that creating competitive advantage involves generating high profits through product differentiation, targeting specific market segments, or focusing on production or distribution channels to distinguish the organization from its competitors. Achieving competitive advantage requires not only differentiation but also cost leadership and the ability to respond quickly to customer needs, all of which contribute to a sustainable advantage over competitors. A business's competitive strategy will succeed if it can effectively compete and retain its customer base. Healy et al. (2014) further suggest that building competitive advantage enables a business to differentiate itself from competitors and adopt appropriate strategies aimed at superior performance. This approach can lead to becoming an industry leader through differentiation, cost leadership, quick responsiveness, and targeting niche markets. For this study, the researcher chose to use the concept of competitive advantage as the framework, focusing on differentiation, low-cost advantage, and quick responsiveness as key components.)Porter, 1990: Fuller, 2004; Healy, et al. 2014)

Business performance (BP)

Kaplan and Norton authored an article titled "The Balanced Scorecard: Measures that Drive Performance," published in the Harvard Business Review in 1992. In this article, they introduced the concept of measuring organizational performance through a balanced scorecard, a tool for assessing performance that goes beyond financial metrics. It includes non-financial measures such as customer satisfaction, internal business processes, innovation, and learning. Since its introduction, the balanced scorecard has gained widespread popularity and success in performance measurement across various industries. The Balanced Scorecard comprises four key perspectives:

1) Financial Perspective: This answers the question, “How should we treat our shareholders to achieve financial success?” 2) Customer Perspective: This focuses on how customers perceive the organization and whether it can deliver the value that target customers demand. 3) Internal Business Perspective: This evaluates the internal processes that are critical for delivering value and meeting customer needs. It asks, “What are the key internal processes we must excel at to satisfy our customers?” 4) Learning and Growth Perspective: This considers how the organization can continuously improve and create value, ensuring it achieves its vision by fostering innovation and learning.)Kaplan & Norton, 2004; Chang & Ku, 2009)

Business resource capabilities and the application of The BCG economic model

Influence on the application of the BCG economic model, Chaiphawang (2022) studied the relationship between business resources, competitive strategy, and the implementation of the BCG economy model among community enterprises in Chiang Rai province. The study found that all dimensions of business resources, as defined by the Resource-Based View (RBV) theory—value, rarity, inimitability, and organizational capability—are significantly related to the implementation of the BCG economy model across its three pillars: biocircular economy, circular economy, and green economy, at 0.01 statistical significance level. The business resources of these community enterprises can predict their operations under the BCG model by 95.40%. Additionally, the study highlighted the use of local wisdom, passed down through generations, as an invaluable resource that is difficult to replicate, contributing significantly to the success of these enterprises.)Bunniyom & Sathirad, 2019). The synthesis of this literature leads to Hypothesis 1.

H1: Business resource capabilities has a direct positive effect on the application of the BCG economic model of community enterprise

Business resource capabilities and competitive advantage

Another study, by Iam-arrom (2013), examined the resource-Based Theory: source of sustainable competitive advantage of SMES. The research concluded that resources and capabilities are critical factors in creating sustainable competitive advantages for businesses. This aligns with Kim et a.l (2015), who studied the impact of project management assets on the VRIO characteristics of PM process for competitive advantage. The purpose of this research is to investigate the impact of project management capability as the source of a firm's competitive strategy by focusing on the VRIO (value, rarity, inimitability, organisation) characteristics of project management processes. The results show that project management assets have significant impacts on the VRIO characteristics of the PM process. One of the meaningful findings is to confirm that the intangible project management assets play a mediating role for the tangible project management assets to achieve the VRIO characteristics of the PM process for competitive advantage. This aligns with Su-ying et al. (2013), who studied the VRIO characteristics of corporate strategic human capital at business level. structural equation to analyze and compare the V (value), R (rarity), I (inimitability) and O (organization), the four areas of strategic human capital characteristics; finally, adopting the analysis findings that on the base of not ignoring the value (V) of employees, when take the measure of cost leadership strategy, the corporate strategic human capital better equipped with the rarity (R) and the inimitability (I) characteristics; however with the product differentiation strategy, the corporate strategic human capital characteristics of the rarity (R), the inimitability (I(and the organization (O) are more important. Moreover, this aligns with Chaiphawang (2022) studed the relationship between business resources, competitive strategy, and the implementation of the BCG economy model among community enterprises in Chiang Rai province. The study found that all dimensions of business resources, as defined by the Resource-Based View (RBV) theory value, rarity, inimitability, and organizational capability are significantly related to strategies for creating difference in community enterprises. It was also found that resources were difficult to imitate. It is significantly related to the community enterprise's differentiation strategy. Having resources that cannot be replaced or duplicated This would give community enterprises an advantage in producing products that other competitors cannot produce (Bunniyom & Sathirad, 2019). The synthesis of this literature leads to Hypothesis 2.

H2: Business resource capabilities has a direct positive effect on competitive advantage of community enterprise

Business resource capabilities and business performance

In reviewing the literature on business resource capabilities and their influence on business performance, Chaiphawang (2022) found that all dimensions of business resources, as defined by the Resource-Based View (RBV) theory—value, rarity, inimitability, and organizational capability are significantly related to the implementation of business performance at a 0.05 statistical significance level. Rarity has a positive effect at the level of .527, value has a positive effect at the level of .393, inimitability has a positive effect at the level of .162, and organizational capability has a positive effect at the level .044. This aligns with Su-ying et al. (2013) who studied the VRIO characteristics of corporate strategic human capital at business level. structural equation to analyze and compare the value, rarity, inimitability and organization.The analysis findings that on the base of not ignoring the value of employees, when take the measure of cost leadership strategy, the corporate strategic human capital better equipped with the rarity and the inimitability characteristics; however with the product differentiation strategy, the corporate strategic human capital characteristics of the rarity, the inimitability and the organization are more important. The synthesis of this literature leads to Hypothesis 3

H3: Business resource capabilities has a direct positive effect on business performance of community enterprise

The application of the BCG economic model and competitive advantage

In reviewing the literature on the Application of the BCG economic model and competitive advantage, Chaiphawang (2022) found that competitive advantage are related to operations according to the BCG economic model at 0.01 statistical significance level. In addition, the implementation of the BCG economic model is closely related to the strategy of targeting niche markets. This approach focuses on environmental conservation and aims to address pollution issues to reduce sustainable impacts on the planet. It reflects a trend among niche consumers who are environmentally conscious. By creating product differentiation that emphasizes nature preservation and environmental sustainability, consumers who care about the environment can make easier purchasing decisions (Chinsattapong, 2018). Furthermore, Sangmaneedet et al. (2024) conducted a study on management practices based on the circular economy model to create competitive advantages in the recycled fashion business. They found that managing under the circular economy principles in the recycled fashion industry involves product design based on the 3R principles: Reuse, Recycle, and Redesign. This approach leads to the efficient and sustainable use of resources, maximizing resource value in all processes. The study also found that a green economy can enhance competitiveness and strengthen an organization's image by creating environmentally friendly products and services (Chen et al., 2006; Hart, 1995; Peattie, 1995; Porter & van der Linde, 1996).Green products help businesses achieve environmental sustainability and improve their competitive efficiency (Dangelico & Pujari, 2010). Additionally, green innovation enhances the design of high-quality green products, building credibility in addressing environmental concerns. This presents a significant opportunity for organizations to differentiate their products, allowing them to set higher prices and achieve better returns (Chen, 2011). The synthesis of this literature leads to Hypothesis 4

H4: The application of the BCG economic model has a direct positive effect on competitive advantage of community enterprise

The application of the BCG economic model and business performance

A review of the literature on the application of the BCG economic model reveals its impact on performance. Isarangkun & Leangjaero (2023) noted that the BCG economic model aims to transform economic and social development into sustainable and inclusive growth by developing three areas: bioeconomy, circular economy, and green economy. Thailand has designated the drive for the BCG economy as a national agenda since 2022. This aligns with Maimun et al. (2023), who studied the BCG economic model for balanced and sustainable development. They stated that the BCG model, encompassing bioeconomy, circular economy, and green economy, is a new economic development framework adopted by many countries. Thailand's Cabinet approved the BCG model as a sustainable development economic model and a national agenda since 2021. This corresponds with Phupongsak (2021), who wrote an academic article on the national agenda regarding BCG economic development, concluding that this approach will help Thailand achieve several goals: 1) increasing economic growth rates and enhancing citizens' income, 2) ensuring food, health, and energy security to improve the quality of life for Thais, and 3) achieving sustainability for nature and the environment, among others. Moreover, this aligns with Phonrong et al. (2022), who studied management based on the concepts of bioeconomy, circular economy, and green economy in event management. They applied these principles to plan and design events and festivals, leading to sustainable development that promotes efficient resource use under the 3R principles and reduces environmental impact while creating positive social and economic effects. Additionally, Lalaeng & Subongkod (2022) studied the management of businesses under the green economy concept in Thailand's manufacturing industry, empirically testing causal variables and outcomes. They found that management within the green economy positively influences performance, with a direct positive influence coefficient of 0.83 ($p < .01$), consistent with Jabbar & Abid (2017), who indicated that the impacts of the green economy positively affect organizational performance. และ Yousef Eiadat et al. (2008) , who studied Green and competitive? An empirical test of the mediating role of environmental innovation strategy, found that environmental innovation strategies affect business performance. The synthesis of this literature leads to Hypothesis 5

H5: The application of the BCG economic model has a direct positive effect on business performance of community enterprise

Competitive advantage and business performance

Review of literature related to creating competitive advantage and business performance. Establishing a competive advantage involves surpassing competitors by differentiating and leading change, employing effective personnel, and swiftly responding to customers' needs (Porter, 1990). Healy et al. (2014) note that creating a competive advantage enables a business to differentiate itself from competitors and find strategies that lead to better operational performance, aiming for business leadership. This includes differention, cost leadership, and rapid market-specific responses. Literature reviews confirm that competive advantage leads to business performance. Navarro, et al. (2010) in their study Implications of perceived competive advantages, adaptation of marketing tactics and export commitment on export performance found that the achievement of perceived competive advantages in foreign markets, which positively infuence export perfomance. This is consistent with the study of Haim et al. 2011) stataing that effective strates for creating competitive advantage enhance business operational efficiency. The synthesis of this literature leads to Hypothesis 6

H6: Competitive advantage has a direct positive effect on business performance of community enterprise

From the study of these theories, the researcher developed a conceptual framework to illustrate the relationships between all variables and links them to hypotheses, as shown in the figure.1

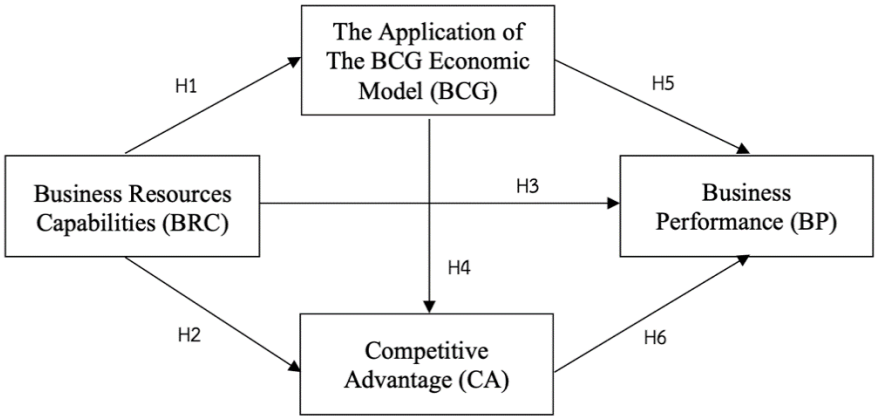

Figure 1: Conceptual framework showing proposed hypothesis

RESEARCH METHODOLOGY

Population and sample

The population utilized in this study comprised 450 community enterprises in Chumphon Province, Thailand (Community Enterprise Information System Community Enterprise Promotion Division Department of Agricultural Extension, 2022). The unit of analysis of this research was at the organization level, were the president or vice president of the community enterprise. By defining the sample of the analysis causal structural models with latent variable. Wiratchai, (1999) suggested that the appropriate sample size should be 1 observed variable per 10 - 20 times or the least acceptable sample can be determined by the Holster statistic, which must be greater than 200 (Hoelter, 1983). Therefore, it is considered that the causal relationship model is consistent with the empirical data. In this study, there were 14 observable variables, which if using a sample size of 20 times the observed variables. A sample of 280 was required and use probability theory in simple random sampling.

Instrument development and validation

The development and validation of instruments involved the use of a questionnaire designed based on the intended conceptual framework and operational definitions. The questionnaire is divided into 4 sections. Section 1, general information about community enterprises. Section 2, questions about business resources capabilities include: 1) valuable 2) rareness 3) ability to imitate 4) giving importance to the organization. Section 3, questions about the application of the BCG economic model include: 1) Bio Economy 2) Circular Economy 3) Green Economy. Section 4, questions about competitive advantage include: 1) differentiation 2) cost leadership 3) rapid response. Section 5, questions about business performance include: 1) financial perspective 2) customer perspective 3) internal business perspective 4) learning and growth perspective.

For the validity measurement of the research instrument, 3 experts were consulted to assess the congruence between the question items and the research objectives using the index of item objective congruence (IOC). Each item had an IOC value greater than 0.5, therefore, the questionnaire passed the research validity test. The reliability of the questionnaire was evaluated by using a trial questionnaire with a sample of 30 individuals. The Cronbach's alpha coefficient was calculated to be 0.88, indicating that the questionnaire was highly reliable (Hair et al., 2019). Contentent vality testing, which found that the Scale-Content Validity Index/Average (S-CVI/Ave) was 0.96, mecting the acceptable criteria set by Polit & Beck (2006), who suggested that the S-CVI/Ave should not be lower than 0.90.

Data analysis

The statistics used in data analysis include: 1) Basic statistics, such as pentage, mean, and standanddeviation; 2) Statistics used to check the quality of research tools, including the assessment of Cont Validity through the calculation of the Inder Item-Object Congruence (10C) based on the evaluation of the tool's quality by three experts, and the detemination of tool reliability calculating Cronbach's Alpha Coefficient; 3) Statistics used testing the basic conditions of the developed Structural Equation Modeling)SEM), including 3.1) Testing for normal disenbution of data by considering Skewness and Kurtosis values, where Skewness should be between -3 and +3, and Kurtosis should be berween-10 and +10, indicatng that the variables are normally distributed Wanichbancha, (2014); 3.2) Testing for Multicolinearity by using Pearson's Product Moment Correlation, where the correlation coeficient of vables should not exceed 0.90, ensuring no excessive correlation between variables (Pallant, 2010) 3.3) Testing for the independence of these variables with the Kaiser-Meyer-Olkin (KMO) measure, which ranges between 0and I , and is equal to I when each variable can predict others without error (Hair et al., 2019(, and the Bartlett's Test of Sphericity check the suitability of the variable group to see if the variables are related. If the Bartlett's Test of Sphericity is stically significant,it indicates that the variables are related and can be analyzed (Hair et al., 2019(; and 4) Statistics used in testing research hypotheses, inding 4.1) Confirmatory Factor Analysis using the Model Fit Index, Composite Reliability (CR), Average Vance Extracted (AVE), and Standardized Factor Loading; 4.2) Analysis of the research model using the same Model Fit Index as mentioned in 4.1, and the values of Direct Effect, Indirect Effect, and Totalfect.

RESEARCH RESULTS

Preliminary data analysis

The measurement model was analyzed using confirmatory factor analysis (CFA) to investigate its structural validity (Convergent Validity). Consideration was given to factor loadings. To ensure the reliability and validity of the constructs, the first step involved evaluating internal consistency using composite reliability (CR), Cronbach's alpha (α), and the average variance extracted (AVE). The analysis results found that the model is consistent with the empirical data: It was observed that the variables could indeed be components of latent variables. Factor loadings ranged from 0.82 to 0.91, all of which were greater than the threshold of 0.50 (Hair et al., 2019). Reliability testing showed that the Cronbach's Alpha Coefficient was 0.72 – 0.80, which is considered acceptable as it is higher than

0.70 (Nunnally, 1994; George & Mallery, 2010), following the clarity rule for evaluating Gronbach's Alpha Coefficient (George Mallery, 2010). Composite reliability (CR) values ranged from 0.85 to 0.91, and were also above the minimum of 0.70, while the average variance extracted (AVE) ranged from 0.71 to 0.79, surpassing the 0.50 threshold. The model's goodness of fit indices were as follows: $\chi 2$ = 202.14; df = 71; TLI = 0.989; CFI = 0.996; GFI = 0.995; AGFI = 0.992; RMSEA= 0.04; $\chi 2/df$ = 2.84, indicating that the test results for congruence between the measurement model and the empirical data met the established criteria. (Table 1)

Table 1: Factor loading, indicators reliability, Cronbach's alpha, AVE and composite reliability for the measurement model

Observable variables	**Factor loading**	**Indicator Reliability**	**Cronbach's alpha**	**AVE**	**CR**
1. The Application of The BCG Economic Model)BCG)			0.72	0.71	0.85
1.1 Bio Economy (BCG1)	0.82	0.67			
1.2 Circular Economy (BCG2)	0.87	0.75			
1.3 Green Economy (BCG3)	0.85	0.72			
2. Business Resources Capabilities (BRC)			0.76	0.74	0.91
2.1 Valuable (BRC1)	0.87	0.76			
2.2 Rareness (BRC2)	0.82	0.67			
2.3 Ability to Imitate (BRC3)	0.85	0.72			
2.4 Giving Importance to the Organization (BRC4)	0.89	0.79			
3. Competitive Advantage (CA)			0.80	0.79	0.90
3.1 Differentiation (CA1)	0.87	0.76			
3.2 Cost Leadership (CA2)	0.91	0.83			
3.3 rapid response (CA3)	0.90	0.81			
4. Business Performance (BP)			0.76	0.73	0.88
4.1 Financial Perspective (BP1)	0.82	0.94			
4.2 Customer Perspective (BP2)	0.85	0.87			
4.3 Internal Business Perspective (BP3)	0.91	0.92			
4.4 Learning and Growth Perspective (BP4)	0.84	0.89			

χ^2 = 202.14; df = 71; TLI = 0.989 CFI =0.996; GFI = 0.995; AGFI = 0.992; RMSEA= 0.04; $\chi 2/df$ =2.84

According to the Fornell-Larcker criterion, a specific variable should demonstrate greater variability with its own items compared to other variables. The correlation between any two constructs should be less than the square root of the average variance extracted (AVE), it was found that the Pearson correlation coefficient for each latent variable ranged from 0.484 to 0.577, indicating that the relationships between variables were quite good (Fornell & Larcker, 1981). The results of the discriminant validity for latent variables revealed that the square root of the average variance extracted (AVE), shown in the diagonal results of the table, was greater than the internal correlation for each latent variable. This suggests that the discriminant validity criterion was met, and the issue of multicollinearity (a high degree of internal correlation between two or more independent variables) was not detected (Hair et al., 2019). (Table 2)

Table 2: Discriminant validity withthe Fornell-Larcker criterion

	Fornell-Larcker criterion			
	BCG	BRC	CA	BP
BCG				
BRC	.525**			
CA	.490**	.553**		
BP	.484**	.480**	.577**	

Note: ** mean p < 0.5, ** mean p < 0.1*

Structural modelling

The analysis of the structural mode's fit to empical data revealed that the model was consistent with observed data. This was indicated by the y/df value being less than 5, along with the CFI and TLI indices being close to 1 (> 0.90), and the RMSEA and SRMR indices being lower than 0.08 (Hu & Bentler, 1999), supporting the primary hypothesis that the theoretical model aligned with empirical data, that the model was accurate. The structural equation modeling analysis was executed to assess the hypotheses, with particular attention given to the path coefficients. The results from the examination of the research hypotheses indicate that business resources had a positive impact on the application of the BCG economic model (ß = 0.45, p < 0.05(. Business resources had a positive impact on the competitive advantage (ß = 0.57, p < 0.01), and business resources had a positive impact on business performance (ß = 0.40, p < 0.01). Additionally, the application of the BCG economic model positive influence on the competitive advantage (ß = 0.36, p < 0.01), and the application of the BCG economic model positive influence on the competitive advantage (ß = 0.47, p < 0.01). Furthermore, the competitive advantage a positive impact on business performance (ß = 0.37, p < 0.01). Consequently, hypotheses H1– H6 found support. (Table 3)

Table 3: Hypothesis testing results

	Direct influence	**ß**	**b**	**S.E.**	**t-test**	**Result**
H1:	BR→ BCG	0.45*	0.42	0.06	7.39	Accepted
H2:	BR → CA	0.57**	0.51	0.04	6.30	Accepted
H3:	BR → BP	0.40**	0.36	0.05	3.02	Accepted
H4:	BCG → CA	0.36*	0.29	0.04	2.34	Accepted
H5:	BCG → BP	0.47**	0.41	0.10	6.82	Accepted
H6:	CA → BP	0.37**	0.39	0.07	7.28	Accepted

Note: ** mean p < 0.5, ** mean p < 0.1*

Moreover, Figure 2 presents the results of the hypothesis tests, which were used in the Path Analysis. This analysis reveals that factors corresponding to hypotheses H1 - H6 exhibited direct effects at the significance levels of 0.01 and 0.05, respectively. The study also considered factors exerting an indirect influence on the business of community enterprise. When considering the indirect influence through the application of the BCG economic model, it was found that business resource significandy influenced business performance indirectly at the .01 level, with a posive coefficient of 0.24 (ß = 0.24). Similarly, the indirect influence through application of the BCG economic model, it was found that business resources also significandy influenced the competitive advantage indirectly at the 01 level, with a posive coefficient of 0.21 (ß = 0.21) (Table 4).

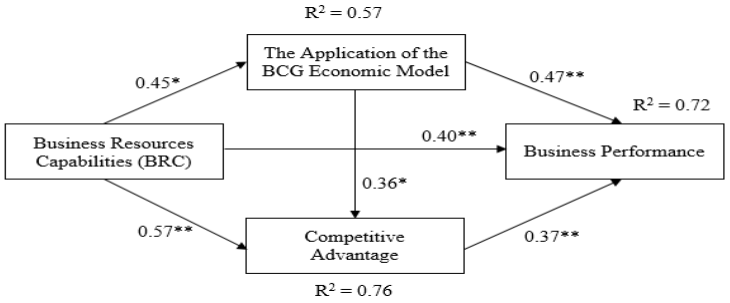

Figure 2: Results of the structural equation model (path analysis)

Table 4: Coefficients for the direct effect, indirect effect, and total effect

Variables	**Effect Size**								
	BCG (R^2 = 0.57)			**CA** (R^2 = 0.76)			**BP** (R^2 = 0.72)		
	DE	**IE**	**TE**	**DE**	**IE**	**TE**	**DE**	**IE**	**TE**
BR	0.45*		0.45**	0.57**	0.21	0.79**	0.40**	0.24	0.64**

BCG				0.36*		0.36*	0.47**		0.47**
CA							0.37**		0.37*

Note: ** mean p < 0.5, ** mean p < 0.1*

CONCLUSION AND DISCUSSION

Discussion

Based on hypothesis1, business resources capabilities had a positive effect on the application of the BCG economic model, and the study confirmed this hypothesis. Business resources capabilities play an important role in the application of the BCG economic model, leading to competitive advantage and business performance. This aligns with Chaiphawang (2022) studied the relationship between business resources, competitive strategy, and the implementation of the BCG economy model among community enterprises in Chiang Rai province. The study found that all dimensions of business resources, as defined by the Resource-Based View (RBV) theory value, rarity, inimitability, and organizational capability are significantly related to the implementation of the BCG economy model across its three pillars: biocircular economy, circular economy, and green economy, at 0.01. All dimensions of business resources are significantly related to the implementation of business performance at 0.05 statistical significance level. The business resources of these community enterprises can predict their operations under the BCG model by 95.40%.

Based on hypothesis 2, business resources capabilities had a positive effect on competitive advantage, and the study confirmed this hypothesis. Business resources capabilities are an important factor in creating an organization's competitive advantage, by considering the capabilities of the organization's resources from 1) being valuable 2) rarity 3) difficulty in imitation and 4) organizational capabilities. This aligns with the resource-based view (RBV) is one approach used to analyze the factors that contribute to competitive advantage. It focuses on an organization's resources and capabilities, exploring how they can develop strategies to sustain competitiveness over time (Barney, 1991; Grant, 1991). Moreover, this aligns with Iam-arrom (2013), examined the resource-Based Theory: source of sustainable competitive advantage of SMES. The research concluded that resources and capabilities are critical factors in creating sustainable competitive advantages for businesses. This aligns with Chaiphawang (2022) found that all dimensions of business resources, as defined by the Resource-Based View (RBV) theory are significantly related to the implementation of competitive advantage. Additionally, the study highlighted the use of local wisdom, passed down through generations, as an invaluable resource that is difficult to replicate, contributing significantly to the success of these enterprises. (Bunniyom & Sathirad, 2019).

Based on hypothesis 3, business resources capabilities had a positive effect on business performance, and the study confirmed this hypothesis. Business resources capabilities are an important factor in creating an organization's competitive advantage, by considering the capabilities of the organization's resources have an impact on the business performance. This aligns with Chaiphawang (2022) found that all dimensions of business resources, value, rarity, inimitability, and organizational capability are significantly related to the implementation of business performance at 0.05 statistical significance level. Rarity has a positive effect at the level of .527, value has a positive effect at the level of .393, inimitability has a positive effect at the level of .162, and organizational capability has a positive effect at the level .044. This aligns with Su-ying et al. (2013) who studied the VRIO characteristics of corporate strategic human capital at business level. structural equation to analyze and compare the V (value), R (rarity), I (inimitability) and O (organization).The analysis findings that on the base of not ignoring the value of employees, when take the measure of cost leadership strategy, the corporate strategic human capital better equipped with the rarity and the inimitability characteristics; however with the product differentiation strategy, the corporate strategic human capital characteristics of the rarity, the inimitability and the organization are more important.

Based onhypothesis 4, the application of the BCG economic model had a positive effect on competitive advantage, and the study confirmed this hypothesis. BCG economic Model represents a holistic approach to economic development, advancing three interconnected dimensions: the bioeconomy,

circular economy, and green economy. This aligns with Chaiphawang (2022) found that competitive advantage are related to operations according to the BCG economic model at 0.01 statistical significance level. In addition, the implementation of the BCG economic model is closely related to the strategy of targeting niche markets. This approach focuses on environmental conservation and aims to address pollution issues to reduce sustainable impacts on the planet. It reflects a trend among niche consumers who are environmentally conscious. By creating product differentiation that emphasizes nature preservation and environmental sustainability, consumers who care about the environment can make easier purchasing decisions (Chinsattapong, 2018). Furthermore, Sangmaneedet et al.(2024) conducted a study on management practices based on the circular economy model to create competitive advantages in the recycled fashion business. They found that managing under the circular economy principles in the recycled fashion industry involves product design based on the 3R principles: Reuse, Recycle, and Redesign. This approach leads to the efficient and sustainable use of resources, maximizing resource value in all processes. The study also found that a green economy can enhance competitiveness and strengthen an organization's image by creating environmentally friendly products and services (Chen et al., 2006; Hart, 1995; Peattie, 1995; Porter & van der Linde, 1996). Green products help businesses achieve environmental sustainability and improve their competitive efficiency (Dangelico & Pujari, 2010). Additionally, green innovation enhances the design of high-quality green products, building credibility in addressing environmental concerns. This presents a significant opportunity for organizations to differentiate their products, allowing them to set higher prices and achieve better returns (Chen, 2011).

Based on hypothesis 5, the application of the BCG economic model had a positive effect on business performance, and the study confirmed this hypothesis. This aligns with Isarangkun & Leangjaero (2023) noted that the BCG economic model aims to transform economic and social development into sustainable and inclusive growth by developing three areas: bioeconomy, circular economy, and green economy. Thailand has designated the drive for the BCG economy as a national agenda since 2022. This aligns with Maimun et al. (2023), who studied the BCG economic model for balanced and sustainable development. They stated that the BCG model, encompassing bioeconomy, circular economy, and green economy, is a new economic development framework adopted by many countries. Thailand's Cabinet approved the BCG model as a sustainable development economic model and a national agenda since 2021. This corresponds with Phupongsak (2021), who wrote an academic article on the national agenda regarding BCG economic development, concluding that this approach will help Thailand achieve several goals: 1) increasing economic growth rates and enhancing citizens' income, 2) ensuring food, health, and energy security to improve the quality of life for Thais, and 3) achieving sustainability for nature and the environment, among others. Moreover, this aligns with Phonrong et al. (2022), who studied management based on the concepts of bioeconomy, circular economy, and green economy in event management. They applied these principles to plan and design events and festivals, leading to sustainable development that promotes efficient resource use under the 3R principles and reduces environmental impact while creating positive social and economic effects. Additionally, Lalaeng & Subongkod (2022) studied the management of businesses under the green economy concept in Thailand's manufacturing industry, empirically testing causal variables and outcomes. They found that management within the green economy positively influences performance, with a direct positive influence coefficient of 0.83 ($p < .01$), consistent with Jabbar & Abid (2017), who indicated that the impacts of the green economy positively affect organizational performance.

Based on hypothesis 6, competitive advantagehad a positive effect on business performance, and the study confirmed this hypothesis. Competitive advantage is what sets an organization apart, and it stems from the organization's core competencies. This could be the ability to do something others cannot or doing it better than others (Barney & Clark, 2007). further suggest that building competitive advantage enables a business to differentiate itself from competitors and adopt appropriate strategies aimed at superior performance. This approach can lead to becoming an industry leader through differentiation, cost leadership, quick responsiveness, and targeting niche markets (Healy et al., 2014). This aligns with Navarro et al. (2010) in their study Implications of perceived competive advantages, adaptation of marketing tactics and export commitment on export performance found that the achievement of perceived competive advantages in foreign markets,

which positively infuence export perfomance. This is consistent with the study of Haim et al. 2011) stataing that effective strates for creating competitive advantage enhance business operational efficiency.

Theoretical contributions

The present study contributes significantly to theoretical advancements in the field by examining the relationships between various organizational factors. The theoretical underpinning of the research is primarily grounded in the Resource-Based View (RBV) theory, shedding light on how organizations attain and sustain competitive advantages through Business Resources Capabilities. The study synthesizes empirical findings across multiple hypotheses, offering insights that enhance our understanding of key strategic elements. In summary, the research makes significant theoretical contributions by extending and integrating various concepts into the RBV framework. This study found that, business resources capabilities positively affect the application of the BCG economic model, competitive advantage, and performance of community enterprise. In addition the application of the BCG economic model positively affect competitive advantage, and performance of community enterprise. And competitive advantage positively affect performance of community enterprise.

Practical implications

The benefits obtained from the research to community enterprise agencies and related agencies are; 1) a causal model for how the application of the BCG economic model affects the competitive advantage and performance of these enterprises. 2) Obtain information from path analysis) between resource capabilities, application of BCG economic model, competitive advantage and the performance of community enterprises. Which was found; 2.1)) business resources capabilities positively affect the application of the BCG economic model, competitive advantage, and performance of community enterprise. Therefore, community enterprises should pay attention to business resources capabilities, which includes the value of resources, scarcity of resources, difficulty in imitation, and organizational management abilities. 2) The application of the BCG economic model positively affect competitive advantage, and performance of community enterprise. Therefore, community enterprises should pay attention to the application of the BCG economic model to their operations, which includes bio economy, circular economy and green economy. 3) Competitive advantage positively affect performance of community enterprise. Therefore, the organization must develop to lead to creating a competitive advantage, consisting of making a difference, cost advantage and rapid response.

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