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Research on Factors Impact on Circular Economy Application and Sustainable Performance: Manufacturing Enterprises in Industrial Zones

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ABSTRACT

Manufacturing enterprises in industrial parks play an important role in local economic development in Ninh Binh province. Therefore, a circular economy associated with sustainable development is an inevitable trend as well as is effective method to help enterprises increase profits and protect the environment. The study was conducted to evaluate and analyze the impacts of factors on the successful application of circular economy (CE) and the relationship of CE to sustainable development in enterprises in industrial parks in Ninh Binh province. The study used quantitative methods by using SEM model. The author surveyed 80 enterprises in six industrial parks in Ninh Binh province and information was analysed by SMART PLS 4. The results showed that (1) There are 06 factors affecting the application of circular economy including Government support (GS); Leadership (LS); Innovation (IN); Technology capacity (TC); Financial capacity (FA); and Pressure from customers (CP) has a positive impact on the application of circular economy (CE) and (2) Circular economy application (CE) has positive impact on Sustainable performance (SP). From the research results, the authors help policy makers and the government propose solutions to help businesses successfully apply a circular economy associated with sustainable development.

1. INTRODUCTION

Traditional economy and linear economy revealed various limitations, especially in the context of resource exhaustion and increasing environmental pollution [1]. Waste in the manufacturing field is acknowledged as one of the primary reasons for environmental degradation and resource exhaustion [2]. Moreover, the linear economy is based on the consumption of resources to produce, and this is not possible within countries that own limited natural resources [3]. Additionally, the main challenges of a linear economy are waste, scarce resources, environmental pollution, and unsustainable development [4]. Therefore, circular economy (CE) is becoming more important as an optimal alternative solution to develop sustainable development. It is also a reliable solution that helps address environmental pollution [5]. At the macro level, Barros et al. [6] show that investment in research and development in a circular economy helps enterprises reducing significantly negative impacts on the environment while reducing resource waste and promoting sustainable performance at the companies. Recently, although the circular economy has received considerable attention because of its benefits, but the practical application of the circular economy in the manufacturing field requires various challenges [7]. The method literature review has pointed out that adopting a circular economy model deals with many factors including policy frameworks, technological advancements, public awareness, human capital, as well as technical, economic, and sociocultural aspects [8-11]. Factors such as technical, economic, legal, and cultural are also identified as factors affecting CE application [12, 13]. The studies mentioned above were conducted in Vietnam; however, the authors primarily employed qualitative methods or case studies to identify the advantages and limitations affecting the implementation of a circular economy. This approach reduces the practicality and generalizability of the research findings. Furthermore, these articles focus on various sectors such as agriculture and services, with no studies evaluating manufacturing enterprises within industrial zones. Moreover, external factors such as customer demand, government support, technological advancements, and financial constraints significantly influence the adoption of circular economy practice [14, 15]. Using an experimental approach with small and medium-sized enterprises across different sectors, these factors have been assessed. However, the survey samples in these studies included various types of businesses without focusing on manufacturing enterprises, which have a profound impact on economic growth and climate change. Beyond the aforementioned, Vietnamese businesses approach significant hurdles in securing the necessary financing to implement a circular economy [11, 16]. Because transiting into a new model like circular economy requires huge initial capital, which is beyond the capable of almost enterprises in Vietnam. Not only this financial barrier is exclusive to Vietnam, but also businesses globally face challenges in securing the substantial initial investment

required for the transition [17, 18]. Furthermore, empirical researches indicate that leadership capabilities, managerial experience, organizational culture, and production processes significantly influence the successful adoption of circular economy application in Vietnamese companies the role of management, particularly the skills and awareness of managers, is pivotal in orientation businesses towards a circular economy model [19-22].

The industrial park model in Vietnam is also in the transition from traditional model to sustainable development due to the awareness of its enormous effect on the ecological environment [23]. Manufacturing enterprises in Vietnam face growth challenges due to environmental pollution, non-recyclable waste, depletion of natural resources, and increasing levels of polluting emissions, etc., … [24]. In this context, the Vietnamese government and practitioners have affirmed that transitioning to a circular economy is an effective approach to addressing these issues [25]. Consequently, the government has proposed various solutions, such as amending environmental protection laws and implementing carbon pricing mechanisms. Notably, in the documents of the 13th Party Congress, a critically important directive for economic development, adopting the circular economy model has been identified as the primary development direction for Vietnam's manufacturing sector in the future [26]. Therefore, the industrial sector in Ninh Binh also aligns with this overarching national strategy. In addition, the reason we chose Ninh Binh is the location where we collected data is in here very famous for tourism destinations such as Bai Dinh Pagoda, Trang An eco-tourism area. This tourism destination is quite successfully implementing the circular economy and sustainability trend due to support strongly of the government [27, 28]. Besides, Ninh Binh also has many opportunities to develop a sustainable economy based on manufacturing firms in industry zones but has not been given due attention. For that reason, the Resident's Committee of Ninh Binh Province sets a goal that by 2025, the proportion of industrial fields will account for 37% of the province's total GDP [23]. By 2030, Ninhbinh province will be an industrial province that is a modern, friendly environment and sustainable, and by 2035, it will become a modern industrial province [23]. Additionally, industrial zones in Ninhbinh are employing 37 thousand people while contributing over 80% of the province's budget revenue [29]. This highlights that the manufacturing field in Ninh Binh plays a crucial role in economic development. However, there is no specific policy in place to promote a circular economy and sustainable development. Therefore, the result of this paper will help enhance the awareness of both enterprises and the government regarding the circular economy. Additionally, the research proposes several solutions to facilitate the successful adoption of the circular economy in the local context.

Overall, the literature review reveals that most existing studies primarily rely on qualitative analysis to evaluate the factors influencing the adoption of a circular economy. The notable limitation is that many studies lack a strong theoretical framework to explain the relationships between these factors and the adoption of the circular economy. Additionally, the relationship between the circular economy application and sustainability development in Vietnam is still unclear, especially, in research focusing on sustainable performance [25]. Moreover, the above studies were all researched in various areas but limited to the production area of industrial zones. In while industrial zones play a vital role in economic development in Vietnam [30]. Therefore, my study will address this gap by employing a quantitative approach and using dynamic capability theory to explain these relationships of manufacturing firm in industrial zones.

This study primarily aims to address the following research questions (RQs):

RQ1: How does the impact of government support, leadership, innovation, technology capacity, financial capacity, customer pressure on the application of circular economy at manufacturing enterprises in industrial parks?

RQ2: How does applying a circular economy affect the sustainable performance of enterprises in industrial zones?

2. BACKGROUND

2.1 Dynamic capability theory

In this study, the authors use dynamic capability theory which was introduced by research of Molin [31] and Teece et al. [32]. Dynamic capability (DC) refers to a company's capacity to adapt swiftly to changing environments by integrating, developing, and restructuring both internal and external competencies. The concept of dynamic capability reflects the ability of a company to achieve competitive advantage in a new and more innovation in current market conditions [31]. Initially, DC was identified as consisting of three basic components [31]. But recent, further in-depth research found that DC of enterprises was affected by six components including cognitive capacity, receptive capacity, adaptive capacity, creative capacity, connection capacity, and combining capacity [33-35]. Dynamic capability theory finds that the ability of enterprises when they develop a new method, strategy, and productive management largely depends on the internal of their business and how the business adapts to the external environment [36]. Indeed, studies show that the CE application requires changes in organizations to restructure the enterprises to gain sustainable development, and the challenges of internal, and external prevent applying circular economy successfully [37]. Logically, DC theory will be considered suitable to explain how manufacturing business can apply circular economy to deal with sustainability problems [25, 36]. Recent research by Chowdhury et al. [25] also mainly uses DC theory to develop a hypothesis about internal factors impact on applying CE in SME enterprises. Therefore, with this research, we continue to use DC theory to consolidate and test hypotheses about favorable and barrier factors that affect CE practices and sustainable development.

2.2 Circular economy in manufacturing field

The concept of the circular economy (CE) has been explored from various perspectives. Still, a common feature is that this model aims to minimize resource consumption while creating closed loops for materials, energy, and waste in consumption processes [3, 38]. According to MacArthur [39], the international foundation, has introduced a general concept of the circular economy, defining it as a production and consumption model in which goods and products are reused whenever possible instead of discarded. From an indirect approach, the circular economy is often considered a refined way of referring to used products. It is a sustainable economic model that focuses on reusing and recycling materials to reduce the consumption of natural resources and minimize

waste generation. Geng et al. [40] emphasizes that the circular economy in production "encourages organizing economic activities that mimic natural ecosystem processes through a 'natural resource-to-conversion' system, where products are manufactured, and byproducts of the manufacturing process are used as inputs for other industries."

A review of the literature reveals that research on the circular economy has increased in recent years. However, its practical application within manufacturing enterprises remains limited [41]. From the perspective of sustainable performance, the challenges faced by the manufacturing industry include reducing material consumption, minimizing energy inputs, curbing the release of harmful substances into the environment, extending product lifespans, and, most importantly, focusing on sustainable design from the outset [42, 43]. The manufacturing industry plays a pivotal role in driving economic development, especially in developing countries like Vietnam [25]. Hus, transitioning to this new model must be approached cautiously. Many experts argue that manufacturing enterprises must prioritize product design from the initial stages [44], ensuring that products are long-lasting, easy to recycle, or capable of serving as inputs for other production cycles.

Although numerous proposals have been made to implement the circular economy, manufacturing enterprises face significant challenges. These barriers or opportunities are often identified in case studies and are quite limited. Therefore, the objective of this study is to provide empirical evidence on the circular economy in the context of Vietnam, specifically Ninh Binh province. This study aims to deliver essential insights to support the government and small and medium-sized enterprises in transitioning to a circular economy.

2.3 Literature review and hypothesis development

According to Rodríguez-Espíndola et al. [15], the lack of government support, such as ineffective legal and tax systems, makes it difficult for businesses to invest in new models. This results in complex administrative procedures, prolonged timelines, and reduced motivation for businesses to innovate. In terms of qualitative approach, studies in Vietnam also indicate that the government has yet to establish a comprehensive mechanism to promote the development of a circular economy among businesses. This has led to reduced competitiveness for Vietnamese enterprises compared to foreign counterparts. For example, in Vietnam, lacking support policies including creating a convenient legal corridor, and policies that help companies approach capital is one of the big barriers which are prevent enterprises develop CE [5]. Many studies find that pressure from government regulations and policies has a positive impact on circular economy application in enterprises [15, 45]. The need for general and mixed policies, non-financial support, and economic incentives will help businesses overcome barriers [46]. Additionally, in small and medium-sized enterprises, a lack of investment in technology and support from the government are some of the biggest barriers to applying a circular economy [17].

H1: *Government support has a positive impact on circular economy application*.

Humans have always been regarded as a crucial factor in the success or shortcomings of an organization, a point that has been substantiated by numerous studies. Among human factors, leadership plays a vital role, serving as the decision-maker who sets strategic directions to guide the organization. The research by Chowdhury et al. [25] highlighted the significance of leaders as a factor within organizations influencing circular economy practices. However, the research did not establish a direct relationship for this factor but rather regarded it as a driving variable. By contrast, leadership ability is defined that it is one of the most important factors in gaining innovation in organizations [19, 47] in while it includes circular economy application in their company [22]. Importantly, applying CE is that enterprises apply a new method, and new solution to achieve business performance and sustainable development. The main leadership capacity has orientation, coordination, and awareness which has a positive impact on starting and maintaining the exchange process to circular economy in enterprises [25, 48]. Opposite things, limitations in awareness, and method of management play an important role in barriers to applying CE successfully [25, 49]. From the perspectives mentioned above, we propose a hypothesis:

H2: *Leadership has a positive impact on circular economy application.*

Innovation in management is relevant to implementing new methods in enterprises with the ultimate goal of improving business performance [50]. Innovation can manifest in different ways, such as business models, processes, services, or products. So any change in input, method, or output enhances a commercial position and it is a new thing in the market that is innovation [51, 52]. In while circular economy exactly is a new production method and needs innovation of companies to improve profit. According to Khan et al. [17], innovation to applying circular economy is identified as a limitation of leaders and managements. However, many studies argue that successful innovation requires collaboration between leaders and employees to achieve new a strategy. The definition of CE encompasses innovation in closed-loop supply chains, meaning the planning, execution, and controlling activities that integrate the forward and reverse sides of a supply chain [53]. This aims to optimize value creation throughout a product's life cycle by dynamically recovering value from various types and amounts of returns over time. Additionally, Xu and Wang [54] also find that applying a circular economy involved all of the innovation in processes, products, techniques, and services across the entire supply chain. From the perspectives mentioned above, we propose the hypothesis*:*

H3: *Innovation has a positive impact on the application of circular economy.*

A significant body of evidence indicates that insufficient information within organizations results in inefficiencies in resource utilization, waste management, and process optimization [40]. Therefore, integrating information technology to promote the adoption of circular economy practices in empirical studies can help identify correlations and provide additional evidence for businesses. Through empirical evidence from small and medium-sized companies, Khan et al. [17] demonstrated that the lack of investment in technologies focused on circular product design (eco-design)

and operations is a result of the lack of advanced resource-efficient technologies within these businesses. This may also be similar for manufacturing enterprises. Barriers to technology ability identified include product design, recycled products quality, technical solutions, and management systems [55]. The technology of designing, reusing, recycle products are big barrier to business [38]. Companies lack their own technology that allows them to process recycled materials to create cheaper products [14]. Additionally, applying advantages technologies plays a vital role in assisting enterprises to exchange successfully to form of circular economy [56]. From the perspectives mentioned above, we use the hypothesis:

H4: *Technology capacity has a positive impact on the circular economy application.*

As presented in the theoretical framework, the link between financial capability and the circular economy has been explained through the dynamic capabilities theory. Additionally, legitimacy theory has also provided insights into the relationship between these two factors [57]. The key issue lies in how companies allocate financial resources to achieve sustainable performance. In the short term, investing in developing, and transforming to CE model in the manufacturing field is a expensive process and it also requires a large money [58]. It does not make a profit immediately but in the long term, it is completely impossible [5]. A lack of appropriate financial mechanisms makes CE applying more difficult even when enterprises are fully aware of its benefits [7, 18]. Small and medium-sized enterprises also need to have a financial investment in machinery and processes to achieve sustainable development [17]. A case study in Africa demonstrated that financial readiness and investment preparedness impact the supply of financing and investment for the circular economy [59]. The components of circular finance include the ability to invest in green infrastructure, financial incentives for green investments, and awareness of circular investments within enterprises [59]. These premises drive businesses to become more conscious and proactive in participating in the circular economy. From the perspectives mentioned above, we propose the hypothesis:

H5: *Financial capacity has a positive impact on the circular economy application.*

While it is believed that environmental awareness, such as recycling and reuse, can influence sustainable performance [60], the specific impact of awareness on the circular economy has not yet been clear. On the one hand, some studies find that customer awareness of choosing friendly environment products is increasing [61]. Therefore, customer satisfaction will be one of the factors that motivate the company to convert into a circular economy model and produce sustainable products [62]. On the other hand, there are many viewpoints that consumers are not too concerned about product sustainability. Most customers are not interested in green products but they are more interested in their preferences and initial purchase intentions [7, 63]. A study conducted in the United States and Europe has shown that even when customers are fully aware of environmental protection, they do not frequently choose green products or services [63]. However, most of the studies mentioned above were conducted in developed countries, whereas the Vietnamese market is an emerging one. Therefore, there are likely differences in customer behavior [64], as well as in the perceptions and actions of manufacturing businesses. Second, understanding how customer pressure shapes CE adoption provides valuable insights for businesses to align their strategies with market demands, especially in contexts where environmental awareness is evolving. Finally, the conflicting perspectives in the literature reveal a gap that this study aims to address by investigating whether customer pressure serves as a driver or a barrier to CE adoption in the manufacturing sector. From unclear perspectives, we continuously evaluate the factors of pressure from consumers and we propose the hypothesis:

H6: *Pressure from customers has a positive impact on the circular economy application.*

During the literature review process, we indicated that the relationship between sustainable performance and circular economy has been widely explored in Vietnam, especially in the agriculture field, as typically evidenced by the documents of Hieu [65] and Thuy and Huu [66] who proposed a sustainable development model for the future. The connection between the circular economy, green economy, and sustainable development performance has also been highlighted, with the green economy serving as a mediating variable [67]. Circular economy and sustainable development have a close correlation but there are limited empirical researches. Supporting this, a literature review by Mora-Contreras et al. [68] has confirmed the positive correlation between CE and sustainable development across various sectors, underpinned by theories such as ecological modernization, and natural resource theory, ... Results of some empirical studies find that has positive relationship between two factors in construction and manufacturing [68]. This relationship has also been similarly demonstrated in SMEs in many other sectors in Vietnam [15, 25]. However, the correlation between the two factors is unclearly in enterprises in Vietnam, especially in the manufacturing field. From the perspectives mentioned above, we propose the hypothesis:

H7: *Circular economy application has a positive impact on the sustainable performance.*

The research model is presented in Figure 1.

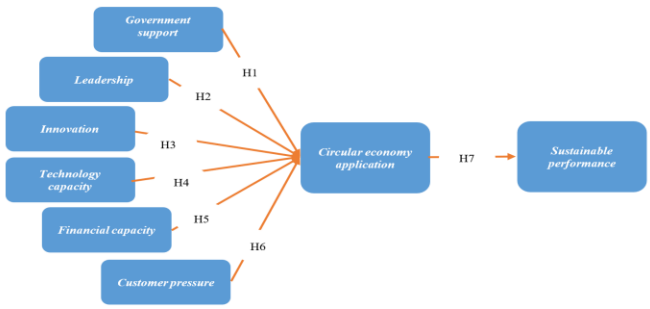

Figure 1. Research model

3. METHODOLOGY

3.1 Data collection and sampling

This paper employs purposive sampling, focusing on

employees and leaders who are knowledgeable about the circular economy and actively participate in their organization's management processes, to ensure the data collected is meaningful. In addition, we established necessary conditions to mitigate the limitations of this sampling method. For the collection of data, we created a survey questionnaire via Google Forms and paper forms. From the introduction letter of my university where we are working, studying and the existing contacts, we were given the opportunity from the industry zones management board of NinhBinh province to send randomly online and papers survey to companies leaders, employees and we also had the chance to conduct an actual survey at industrial parks. Industrial zones in Ninh Binh include 06 areas, namely Khanh Cu, Khanh Phu, Phuc Son, Gian Khau, Tam Diep I, and Kim Son with a total area of approximately 1.086 Hectares.

Table 1. Demographic of the sample

Sector (N=80 Enterprises)	Frequency	Percentage
Mechanical manufacturing industry	12	15
Automobile production and assembly mechanics	13	16.25
Electronics industry	17	21.25
New-materials industry	4	5
High-tech materials	3	3.75
Processing industries serving agricultural production	24	30
Consumer goods manufacturing industry	7	8.75
Turnover (VND) (N=80 enterprises)		
Less than 300.000.000	2	2.5
From 300.000.000 to 600.000.000	3	3.75
From 600.000.000 to 1.200.000.000	6	7.5
From 1.200.000.000 to 3.200.000.000	23	28.75
From 3.200.000.000 to 6.200.000.000	18	22.5
From 6.200.000.000 to 12.200.000.000	20	25
From 12.200.000.000 to 30.000.000.000	8	10
Over 30.000.000.000	0	0
Frequency of employee management (N=215 responses)		
Always	13	6.04
Most of the time	22	10.23
About half the time	21	9.76
Sometimes	56	26.04
Rarely	103	47.9

The literature review reveals a significant lack of research on the adoption of Circular Economy (CE) practices in Vietnam and their impact on sustainable development performance. Additionally, search results have also extremely reported limited empirical investigation. Practitioners' literature, along with insights from government policymakers and the Vietnamese Chamber of Commerce, highlights the recognized importance of adopting CE practices within manufacturing enterprises. This study adopts the definition of an industrial park as outlined in Decree 35/2022/ND-CP by the Vietnamese Government: a geographically defined area specializing in the production of industrial goods and providing services to support industrial production. And industrial enterprises are companies that carry out production activity in industrial zone, and economic zones. The inclusion criteria, derived from the study by Chowdhury et al. [25], were incorporated into the survey as a series screening questions to ensure that all respondents met the following requirements: (1) they were employed by industrial companies within industrial zones; (2) they had two to five years of experience working in the same company, ensuring a clear understanding of organizational processes; (3) they held full-time or permanent positions within the business operations team; (4) they possessed knowledge of Circular Economy (CE) practices and the organization's sustainable business performance; and (5) their organization had implemented circular economy practices [25]. The purpose of that is to ensure the people who answer this survey have the knowledge and the ability to make decisions and that also makes data meaningful.

Following recommend from Hair et al. [69], the minimum of the survey sample of this study is 195 samples. Depend on formulae that is use is: i x 5 (i: number of items of scales). After sending paper survey to 80/122 companies in 06 industrial zones (two or three employees for each organizes) we has received 223 responses, and based on our screening, 215 were deemed as useful to conduct analyst. Demographic of the sample was presented below (see Table 1).

3.2 Scales and questionnaire development

To prove a correlation between factor impact the circular economy application and its effect on sustainable development, all scales used in our study were adopted from previous research. Particularly, the eleven-item scale of “Sustainable performance”, the four-item of “Circular economy application”, four-item of “Innovation”, and four-item of “Leadership” was adapted from Chowdury et al. [25]. The six-item of “Technology capable”, four-item of “Pressure of customer”, and six-item of “Government support” was adapted from Rodríguez-Espíndola et al. [15]. Finally, the “Financial capable” scale was adopted eight-item from research of Agyapong and Tweneboah [59].

All of the items were all scored from 1 to 5 (five-point Likert-type format), including “strongly disagree” to “strongly agree” respectively. Additionally, to ensure the estimates of the relationships between factors are not biased we translated all of items into Vietnamese by experts who have many years of living in both Vietnam and America to create a survey form. After that, the data was analysed using the multiple mediation analysis function in SmartPLS 4.

3.3 Data analysis

First, we conducted an evaluation of the measurement model to eliminate unqualified observed variables based on factors such as the quality of observed variables, scale reliability, and convergent and discriminant validity. The quality of observed variables was assessed using the outer loading indicator. According to Hair et al. [70], an outer loading coefficient greater than 0.7 indicates a high-quality variable, as the variable explains more than 50% of the observed variable's variance. Scale reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR) indices. Previous studies affirm that a threshold of 0.7 for Cronbach's Alpha and CR is appropriate in most cases [70]. Convergent validity was evaluated using the Average Variance Extracted (AVE). A scale is considered to meet convergent validity if the AVE is 0.5 or higher. To assess discriminant validity, we used the square root of the Average

Variance Extracted (AVE) as recommended by Fornell and Larcker [71]. Discriminant validity is confirmed when the square root of the AVE for each latent variable exceeds the correlation coefficients between that variable and others, indicating that each construct is distinct.

Second, we evaluated the structural model after confirming that the variables in the construct model met the required conditions. The structural model was assessed through VIF (Variance Inflation Factor) to evaluate multicollinearity, evaluation of the impact relationships, R-squared coefficient, and f-squared coefficient. Multicollinearity was assessed using the VIF, where a VIF ≥ 5 indicates a very high likelihood of multicollinearity, multicollinearity may occur when 3 ≤ VIF ≤ 5, and with VIF < 3, multicollinearity is unlikely to occur [70]. According to Hair et al. [70], in the evaluation of the impact relationships, we assessed two indicators: standardized path coefficients (Original Sample) to determine the level of impact and P-values smaller than 0.05 to identify statistically significant impacts. To evaluate the level of influence of independent variables on the dependent variable, we used the R-squared coefficient. The R-squared value ranges from 0 to 1, with values closer to 1 indicating that the independent variables explain more of the variation in the dependent variable. The strength of the impact of independent variables on the dependent variable is reflected through the f-squared coefficient, specifically: f-squared < 0.02 indicates an extremely small or negligible impact, f-squared between 0.02 and 0.15 indicates a small impact, f-squared between 0.15 and 0.35 indicates a medium impact, and f-squared ≥ 0.35 indicates a large impact of the independent variable on the dependent variable.

Finally, we tested the hypotheses using the P-value. According to Hair et al. [70] a P-value > 0.05 indicates that the model is statistically significant.

4. RESULTS

4.1 Reliability and converge validity

The research team evaluated the quality of latent variables based on the outer loading factor index. The results in Table 2 show that the outer loading coefficients range from 0.709 to 0.931, all exceeding 0.7, indicating that all items are accepted.

The study results reveal that the Cronbach's Alpha coefficients for the scales range from 0.873 to 0.937, while the Composite Reliability (CR) coefficients range from 0.913 to 0.947. All coefficients exceed 0.7, confirming a high level of reliability for the scales used in the research. Additionally, the Average Variance Extracted (AVE) coefficients for the scales are all greater than 0.5 which is ranging from 0.613 to 0.817, ensuring the convergent validity of the scales.

4.2 Discriminant validity

The results in Table 3 indicate that the square root AVE values are 0.851, 0.807, 0.785, 0.904, 0.863, 0.869, 0.803, and 0.703, respectively. The correlation indices between latent variables indicate that the square root AVE coefficients are all greater than the correlation coefficients between the variables, confirming that discriminant validity is ensured.

4.3 Hypothesis testing

All hypotheses have a t-statistic value greater than 1.96 and a p-value smaller than 0.05, indicating positive relationships for all hypotheses. The t-statistic values are assessed using the Rules of Thumb, specifically t-statistic bigger than 1.96 and a significance level of p-value 0.05 (5%). Therefore, all hypotheses are accepted.

The analysis results from Table 4 show that the VIF values range from 1.362 to 2.283, all are smaller than 3, indicating no multicollinearity between variables. Additionally, the results also indicate that the f^2 values range from 0.021 to 0.548, suggesting that the variables have a small to moderate effect on the dependent variable. For R^2, the R-squared of CE is 0.598, indicating that the independent variables GS, LS, IN, TC, FC, and CP explain 59.8% of the variation in CE. Meanwhile, the R-squared of SD is 0.354, meaning that CE explains 35.4% of the variation in SD.

The p-values for all relationships in Table 4 are below 0.05, confirming that these relationships are statistically significant. The analysis results in Table 4 show the impact of Government Support (GS) on Circular Economy (CE) at β = 0.262; Sig = 0.000, which is the highest level. Leadership (LS) impacts CE at β = 0.215; Sig = 0.000. Innovation (IN) impacts CE at β = 0.165; Sig = 0.003. Financial Capacity (FC) impacts CE at β = 0.117; Sig = 0.012. Technological Capacity (TC) impacts CE at β = 0.149; Sig = 0.016. Customer Pressure (CP) impacts CE at β = 0.140; Sig = 0.034. Finally, CE impacts Sustainable Performance (SP) at β = 0.595; Sig = 0.000.

Table 2. Reliability and converge validity

Items	Mean	Outer Loadings	Cronbach's Alpha	rho_A	CR	AVE
CE			0.873	0.873	0.913	0.725
CE1	3.71	0,816				
CE2	3.40	0,850				
CE3	3.57	0,916				
CE4	4.00	0,820				
TC			0.893	0.903	0.918	0.652
TC1	3.98	0,805				
TC2	3.52	0,759				
TC3	3.62	0,824				
TC4	3.57	0,840				
TC5	2.90	0,780				
TC6	3.50	0,832				
FC			0.911	0.917	0.928	0.617
FC1	3.30	0.766				
FC2	3.32	0.757				
FC3	3.40	0.718				

FC4	2.89	0.854				
FC5	2.70	0.798				
FC6	3.00	0.803				
FC7	3.16	0.772				
FC8	3.48	0.808				
IN			0.925	0.928	0.947	0.817
IN1	4.01	0.931				
IN2	4.08	0.913				
IN3	3.88	0.868				
IN4	3.88	0.901				
CP			0.886	0.892	0.921	0.745
CP1	3.90	0.875				
CP2	3.89	0.871				
CP3	3.80	0.860				
CP4	3.71	0.845				
LS			0.892	0.894	0.925	0.755
LS1	3.78	0.881				
LS2	3.77	0.846				
LS3	3.60	0.881				
LS4	3.63	0.866				
GS			0.891	0.922	0.916	0.645
GS1	3.92	0.828				
GS2	3.88	0.866				
GS3	3.54	0.799				
GS4	3.41	0.711				
GS5	3.73	0.794				
GS6	3.67	0.813				
SP			0.937	0.945	0.946	0.613
SP1	3.61	0.824				
SP2	3.56	0.772				
SP3	3.60	0.821				
SP4	3.74	0.883				
SP5	3.52	0.783				
SP6	3.50	0.782				
SP7	3.52	0.781				
SP8	2.99	0.709				
SP9	3.58	0.763				
SP10	3.85	0.718				
SP11	3.78	0.762				

Table 3. Fornell - Larcker criterion

	CE	**TC**	**FC**	**IN**	**CP**	**LS**	**GS**	**SP**
CE	0.851							
TC	0.579	0.807						
FC	0.432	0.292	0.785					
IN	0.568	0.515	0.265	0.904				
CP	0.628	0.613	0.361	0.564	0.863			
LS	0.527	0.341	0.483	0.347	0.426	0.869		
GS	0.633	0.580	0.280	0.540	0.649	0.333	0.803	
SP	0.595	0.631	0.306	0.666	0.628	0.353	0.649	0.783

Table 4. Results of the hypothesis testing

Hypothesis	**Relationship**	**O**	**M**	**T Statistics**	**P Values**	**Decision**	**VIF**	**F^2**	**R^2**
H1	GS -> CE	0.262	0.264	4.684	0.000	Supported	1.997	0.086	
H2	LS -> CE	0.215	0.216	4.202	0.000	Supported	1.467	0.021	
H3	IN -> CE	0.165	0.163	3.004	0.003	Supported	1.670	0.041	0.598
H4	TC -> CE	0.149	0.153	2.406	0.016	Supported	1.843	0.030	
H5	FC -> CE	0.117	0.122	2.507	0.012	Supported	1.362	0.025	
H6	CP -> CE	0.140	0.134	2.129	0.034	Supported	2.283	0.021	
H7	CE -> SP	0.595	0.595	11.686	0.000	Supported		0.548	0.354

5. DISCUSSION

The findings of this empirical study address the research questions by demonstrating the relationship between six factors that influence the application of the circular economy and sustainable development.

RQ1: The final results show that there are 06 factors including Government support; Leadership; Innovation; Technology capacity; Financial capacity; Pressure from

customers that have a positive effect on circular economy application in manufacturing firms. The adoption of a circular economy is most strongly influenced by government support, followed by leadership, innovation, technological capabilities, financial capacity, and finally, customer pressure respectively. The combination of all these factors creates a favorable ecosystem for businesses to transition to a circular economy. Moreover, the paper's findings provide an overview of the key factors to consider when developing policies or strategies to enhance the adoption of the circular economy in businesses.

Institutions/policies from the government play a vital role for the transition in manufacturing enterprises toward CE application [15]. The government support enables companies to have an opportunity to access potential financial resources to encourage the adoption of sustainable practices. Policies support also help orient businesses to be conscious of environmental protection. Additionally, systematic support from the government can create a ripple effect, encouraging the entire production supply chain to adopt the circular economy. This finding can assist policy-makers to evaluating the effectiveness of existing programs, and having a sustainable policies to promote sustainable activities.

Leadership is an important person who plays the role as an orientation-people for all of the enterprises' activities. Therefore, CE practice is also influenced by leadership, which depends on awareness, and management style of them [25]. The application of CE within manufacturing enterprises will lead to strategic shifts that align with the company's business priorities, integrating both management practices and sustainable innovation [25]. These perspectives are necessary to explain our findings about the influence of leadership on circular economy application.

Innovation in the company is implementing new methods [50] while CE is a new production and needs innovation of the organization. CE requires businesses to design products and processes that can be recycled, reused, or minimize waste. Innovative businesses not only adopt circular economy more effectively but also improve their competitiveness in the market. However, in small enterprises, innovation can be a big barrier due to it require a large of financial and human resource investment. This requires businesses to develop effective strategies to enhance innovation within their organizations, thereby achieving long-term sustainability.

Investing in technology, digital platforms helps enhance the implementation of sustainable activities [15], which help manufacturing companies manage resources including human, material, process, … productively. Digital platforms offer real-time data, facilitating quicker and more precise decision-making. When successfully implemented, technology also can become a powerful tool to drive supply chains toward sustainability. This finding can help managers understand the impact of current digital programs on the adoption circular economy.

Findings revealed that financial capacity significantly influences circular economy application. This implies that the ability of organizations into CE greatly influences drawing circular economy financing and investment [59]. Businesses with strong financial capacity find it easier to invest in green infrastructure and new technologies. By integrating waste management and sustainability into their financial strategies. The ability to identify financial resources and incorporate waste and sustainable management into financial strategies provides manufacturing companies with a competitive advantage in attracting investment for the circular economy. In contrast, small enterprises or those with limited financial resources may face significant challenges in adopting circular economy models.

This study highlights the impact of customer pressure on the adoption of CE practices in the manufacturing sector. This result contradicts findings from developed countries [63]. The impact of customer pressure in developing countries may differ due to lower environmental awareness or a preference for price over sustainability. However, Wognum et al. [62] find that customer satisfaction will be one of the vital reason which motivate the company to transition to a circular economy and sustainable activities. For instance, environmentally conscious customers may demand more sustainable products or services, driving businesses to make the transition. Thus, our findings offer empirical evidence of the influence of customer pressure on the adoption of CE practices in Vietnam.

RQ2: The investigation shows that CE application strongly and positively impacts on sustainable performance of manufacturing enterprises in industrial parks – Ninh Binh province. Additionally, the results of this study consolidate the theory and hypothesis before about the relationship between two factors which means applying CE (reduce, reuse, and recycle) will improve the sustainable performance of manufacturing enterprises. The strength coefficients representing the relationship between two factors are very high, which can be used in this scale for measurement at the same situations. A report by the European Union press indicates that reducing resource consumption could result in the creation of 1.4 to 2 million new jobs [25]. As a result, the circular economy (CE) will support sustainable development in manufacturing organizations by improving environmental and social well-being, in addition to enhancing economic productivity.

6. IMPLICATION

6.1 Theoretical implication

Theoretically, the study developed a model based on the collection of reliable data, thereby strengthening DC theory. In this, when a new approach like CE is applied, businesses face not only internal challenges but also external factors. Although numerous previous studies have pointed out barriers and facilitators to adopting a circular economy within organizations, no research has yet used an appropriate theory to explain the relationship between these factors in the context of CE. My study has shown that factors such as government support, innovation, leadership capability, and technological and financial capacity positively impact the adoption of the circular economy in organizations. This finding adds to the theoretical framework of DC and demonstrates that these factors enable companies to be more flexible in implementing a new business model, thus promoting sustainable development. The study has broadened the understanding of CE in addressing major challenges rose by climate change. Additionally, it contributes to business management literature in enterprises.

6.2 Managerial implication

Empirically, based on findings about the relationships among factors influencing the application of circular economy

(CE) activities in manufacturing and its impact on sustainable efficiency, this study offers insights to help businesses and policymakers develop effective policies. Key implications include the following:

The government should enhance policy frameworks to support businesses in successfully implementing circular economy. This includes creating regulations corporate responsibility for reclaiming resources from used waste products, along with economic tools such as resource taxes and environmental protection fees. A revision and expansion of the Environmental Protection Law is also necessary to facilitate these changes. Adjustments in energy planning are essential to reduce reliance on fossil fuels. This involves managing and attracting investment projects by evaluating factors like production, technology standards, environmental techniques, and project location. Existing technologies should also be updated to improve energy efficiency, reduce waste, and maximize resource use. Both government and business entities should focus on creating a circular economy model in production as a prototype. This model would serve as a basis to evaluate the advantages and challenges of CE adoption and facilitate broader implementation.

In term of business owner, they need to increase their awareness of the benefits of CE adoption. This includes investing resources in promoting environmentally conscious production processes and conserving natural resources, which will enhance the sustainability and overall performance of the business.

Leaders should provide training or create opportunities for employees within the organization to share knowledge about CE application. This mechanism can be facilitated through an open-access data platform, enabling employees to easily access, search, and share information related to sustainable development strategies within their organization. This not only helps develop a sustainable community but also allows businesses to effectively manage knowledge and creativity within the organization. Such an initiative fosters a culture of exchange and collaboration, where members of the organization can learn from each other, thereby adapting flexibly to environmental changes. Indeed, regular knowledge sharing across levels in the organization facilitates the adoption of new strategies, including the implementation of circular economy practices.

Next, small and medium-sized enterprises (SMEs) in the same industrial zone or region can collaborate to support each other in transitioning to a circular economy model. Successfully implementing this model requires the participation of multiple stakeholders, including supply chains, financial resources, labor forces, and knowledge sharing. Additionally, SMEs can link with educational institutions and research institutes to leverage academic knowledge about the circular economy. This also presents an opportunity for businesses to access a high-quality labor force from universities. Furthermore, businesses, governments, and research institutes should collaborate to develop a pilot circular economy model on a smaller scale. This can serve as a foundation for evaluating the advantages and challenges of implementing a circular economy in practice.

Moreover, to support CE application, enterprises must prioritize upgrading outdated technologies and integrating advanced solutions such as IoT, AI, and big data analytics. These technologies enable better monitoring of resource flows, waste management, and energy consumption, thereby optimizing production efficiency. Managers should also consider adopting lifecycle assessment tools to evaluate the environmental impact of their products and processes comprehensively.

Additionally, managers should focus on fostering innovation in product design, manufacturing processes, and supply chain management. By investing in eco-design and resource-efficient production technologies, businesses can minimize waste generation and maximize resource utilization. Collaboration with research institutions or innovation hubs can support the development of circular solutions tailored to industry-specific challenges.

Finally, managers need to allocate sufficient financial resources for implementing CE practices. This includes setting aside budgets for upgrading technologies, conducting employee training, and initiating pilot projects for CE adoption. Furthermore, businesses should actively seek financial incentives, subsidies, or partnerships offered by government programs supporting CE transitions.

7. CONCLUSIONS

7.1 Conclusion

The transition of manufacturing enterprises toward sustainable development is aligning with the global goals of reducing environmental impacts. Therefore, this research was conducted with an interest in adopting CE in organizations that will assist to gain sustainable development goals. This also aligns with the Ninh Binh and Vietnamese government's initiatives to reduce climate change, develop the economy, and achieve international environmental commitments. Although, the existing literature has reported, in some situations, demonstrated the internal and external factors impacting CE application and sustainable development, but there are quite limited empirical research investigating the linkage between Government support; Leadership; Innovation; Technology capacity; Financial capacity; Pressure from customers to CE adoption and this factor to sustainable development in the manufacturing field. This study provided empirical evidence for government policymakers and enterprise decision-makers to develop and apply successfully CE. The study provides actionable insights to enhance the regulatory and economic environment for CE adoption. These include strengthening governmental support mechanisms, revising environmental protection laws, and offering incentives such as subsidies or tax breaks to encourage investments in sustainable technologies. Additionally, the study emphasizes the importance of raising awareness among enterprises about the long-term benefits of CE, fostering innovation, and facilitating technology transfer to improve resource efficiency. Moreover, this research highlights the need to prioritize leadership commitment to sustainability, invest in technological modernization, and engage stakeholders across the value chain in circular initiatives.

7.2 Future research

Our research was conducted in Ninh Binh which not only is well-known for tourism but also has much potential in the manufacturing field. Although standards have been set for sample selection to ensure representation, the model may be limited to other locations, sectors, or sample sizes. This phenomenon can be explored further through additional

empirical studies in other business sectors, which would help validate the findings. This research offers a foundation for further investigation into internal and external organizational factors influencing CE adoption, which can assist manufacturing enterprises in improving their sustainable performance.

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REFERENCES

[1] Ghisellini, P., Ulgiati, S. (2020). Circular economy transition in Italy. Achievements, perspectives and constraints. Journal of Cleaner Production, 243: 118360. https://doi.org/10.1016/j.jclepro.2019.118360

[2] Ghaithan, A.M., Alshammakhi, Y., Mohammed, A., Mazher, K.M. (2023). Integrated impact of circular economy, Industry 4.0, and lean manufacturing on sustainability performance of manufacturing firms. International Journal of Environmental Research and Public Health, 20(6): 5119. https://doi.org/10.3390/ijerph20065119

[3] Bonciu, F. (2014). The European economy: From a linear to a circular economy. Romanian Journal of European Affairs, 14: 78-91.

[4] Luttenberger, L.R. (2020). Waste management challenges in transition to circular economy–case of Croatia. Journal of Cleaner Production, 256: 120495. https://doi.org/10.1016/j.jclepro.2020.120495

[5] Huong, H.T.M., Hoang, D., Pham Thi, Q., Pham Thi, L. (2024). Research on the impact of circular economy application on tourist satisfaction: A case study in Tam Dao District - Vinh Phuc Province. In Smart Tourism and Sustainable Development: Potentials, Opportunities and Challenges, pp. 440-456.

[6] Barros, M.V., Salvador, R., do Prado, G.F., de Francisco, A.C., Piekarski, C.M. (2021). Circular economy as a driver to sustainable businesses. Cleaner Environmental Systems, 2: 100006. https://doi.org/10.1016/j.cesys.2020.100006

[7] Kumar, V., Sezersan, I., Garza-Reyes, J.A., Gonzalez, E.D., Al-Shboul, M.D.A. (2019). Circular economy in the manufacturing sector: Benefits, opportunities and barriers. Management Decision, 57(4): 1067-1086. https://doi.org/10.1108/MD-09-2018-1070

[8] Anh, T.T.X., Lan, T.H.L.N.N., Linh, N.H.T.N.T. (2022). Circular economy: Opportunities and challenges for sustainable development in Vietnam. https://tapchinganhang.gov.vn/kinh-te-tuan-hoan-co-hoi-va-thach-thuc-doi-voi-viet-nam-12359.html.

[9] Dung, P.T.T. (2024). Analysis of factors affecting the ability to apply circular economic models of small enterprises in the construction industry in the Mekong Delta. City University of Economics. Ho Chi Minh City. https://digital.lib.ueh.edu.vn/handle/UEH/71159.

[10] Minh, H.N.T., Lan, P.M. (2023). Barriers and directions for circular agriculture development in Vietnam. Journal of Economics and Development, 318(2): 2-10. https://doi.org/10.33301/JED.VI.1345

[11] Nghia, T.T.M., Tuyet, N.T.A. (2021). Circular economy research - CE solutions applied to small and medium enterprises in Vietnam. Environment Magazine, Vietnamese Thematic Issue I/2021. http://tapchimoitruong.vn/chuyen-muc-3/nghien-cuu-cac-giai-phap-kinh-te-tuan-hoan--ce-ap-dung-cho-cac-doanh-nghiep-vua-va-nho-o-viet-nam-23199.

[12] Trang, B.H. (2022). Circular economy: The key to sustainable development after the COVID-19 pandemic.

[13] Nam. (2022). Circular economy: Sustainable development direction for Vietnamese enterprises. https://tapchicongsan.org.vn/web/guest/kinh-te/-/2018/825071/kinh-te-tuan-hoan-huong-toi-phat-trien-ben-vung-o-viet-nam.aspx.

[14] Osei-Tutu, S., Ayarkwa, J., Osei-Asibey, D., Nani, G., Afful, A.E. (2023). Barriers impeding circular economy (CE) uptake in the construction industry. Smart and Sustainable Built Environment, 12(4): 892-918. https://doi.org/10.1108/SASBE-03-2022-0049

[15] Rodríguez-Espíndola, O., Cuevas-Romo, A., Chowdhury, S., Díaz-Acevedo, N., Albores, P., Despoudi, S., Malesios, C., Dey, P. (2022). The role of circular economy principles and sustainable-oriented innovation to enhance social, economic and environmental performance: Evidence from Mexican SMEs. International Journal of Production Economics, 248: 108495. https://doi.org/10.1016/j.ijpe.2022.108495

[16] Ngan, N.T. (2022). Financial resources for Vietnamese small and medium enterprises towards a circular economy. https://scholar.dlu.edu.vn/thuvienso/bitstream/DLU123456789/174450/1/CVv168S6092022117.pdf.

[17] Khan, E.A., Chowdhury, M.M.H., Hossain, M.A., Mahmud, A.S., Baabdullah, A.M., Dwivedi, Y.K. (2024). Performance of small firms in a circular economy: configuring challenges and entrepreneurial orientation. Management Decision, 62(8): 2428-2450. https://doi.org/10.1108/MD-05-2022-0731

[18] Siddik, A.B., Yong, L., Rahman, M.N. (2023). The role of Fintech in circular economy practices to improve sustainability performance: A two-staged SEM-ANN approach. Environmental Science and Pollution Research, 30(49): 107465-107486. https://doi.org/10.1007/s11356-023-25576-7

[19] Bashynska, I., Malynovska, Y., Kolinko, N., Bielialov, T., Järvis, M., Kovalska, K., Saiensus, M. (2024). Performance assessment of sustainable leadership of enterprise's circular economy-driven innovative activities. Sustainability, 16(2): 558. https://doi.org/10.3390/su16020558

[20] Ellen MacArthur Foundation. It's time for a circular economy. https://www.ellenmacarthurfoundation.org/, accessed on Jul. 27, 2024.

[21] Górecki, J., Núñez-Cacho, P., Rutkowska, M. (2022). Study on circular economy implementation propensity of construction companies in context of prevailing management styles. Applied Sciences, 12(8): 3991. https://doi.org/10.3390/app12083991

[22] Soni, V., Gnekpe, C., Roux, M., Anand, R., Yaroson, E. V., Banwet, D.K. (2023). Adaptive distributed leadership and circular economy adoption by emerging SMEs. Journal of Business Research, 156: 113488. https://doi.org/10.1016/j.jbusres.2022.113488

[23] Ministry of Industry and Trade. Ninh Binh: Industry restructuring until 2030, orientation to 2035. in Ministry of Industry and Trade. https://tapchicongthuong.vn/ninh-binh--co-cau-lai-nganh-cong-nghiep-den-nam-2030--dinh-huong-den-nam-2035-112515.htm.

[24] Le, T.T., Behl, A., Pereira, V. (2024). Establishing linkages between circular economy practices and sustainable performance: The moderating role of circular economy entrepreneurship. Management Decision, 62(8): 2340-2363. https://doi.org/10.1108/MD-02-2022-0150

[25] Chowdhury, S., Dey, P.K., Rodríguez-Espíndola, O., Parkes, G., Tuyet, N.T.A., Long, D.D., Ha, T.P. (2022). Impact of organisational factors on the circular economy practices and sustainable performance of small and medium-sized enterprises in Vietnam. Journal of Business Research, 147: 362-378. https://doi.org/10.1016/j.jbusres.2022.03.077

[26] Resolution of the 13th National Congress of the Communist Party of Vietnam, T. C. P. o. Vietnam, 2021. https://moj.gov.vn/en/Pages/Activities-of-public-administrative-and-justice-reform.aspx?ItemID=3399#:~:text=Resolution%20of%20The%2013th%20National%20CongressThe%2013th%20National%20Party%20Congress,of%20the%2010%20years%20of.

[27] Na, A. (2024). Ninh Binh: Developing tourism comprehensively, quickly and sustainably in the coming time. https://ninhbinh.gov.vn/thong-tin-chi-dao-dieu-hanh/ninh-binh-phat-trien-du-lich-toan-dien-nhanh-va-ben-vung-trong-thoi-gian-toi-335046.

[28] Thanh, D.T. (2024). Green tourism is the key to sustainable development in Ninh Binh. https://baoninhbinh.org.vn/du-lich-xanh-chia-khoa-phat-trien-ben-vung-tai-ninh-binh/d20240607080654238.htm.

[29] Building Ninh Binh industrial parks to become the driving force and spearhead of the province's economic development. Ninh Binh Newspaper. https://izaninhbinh.gov.vn/tin-trong-tinh/xay-dung-cac-khu-cong-nghiep-ninh-binh-tro-thanh-trong-diem-dong-luc-phat-trien-kinh-te-cua-tinh-575.html.

[30] Vuong, N.H. (2022). Sustainable economy in Vietnam. https://scholar.dlu.edu.vn/thuvienso/bitstream/DLU123456789/182182/1/CVv146S242022137.pdf.

[31] Molin, M.J. (2001). Dynamic Capabilities How can we make them work? https://www.researchgate.net/publication/241603919_Dynamic_Capabilities_How_can_we_make_them_work.

[32] Teece, D.J., Pisano, G., Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7): 509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

[33] Jusoh, R., Parnell, J.A. (2008). Competitive strategy and performance measurement in the Malaysian context: An exploratory study. Management Decision, 46(1): 5-31. https://doi.org/10.1108/00251740810846716

[34] Lindblom, A.T., Olkkonen, R.M., Mitronen, L., Kajalo, S. (2008). Market-sensing capability and business performance of retail entrepreneurs. Contemporary Management Research, 4(3): 219-236. https://doi.org/10.7903/cmr.1042

[35] Sy, N.T. (2013). Dynamic capabilities – A new approach to creating competitive advantage for small and medium enterprises in Vietnam. Development and Integration Magazine, 12(22): 15-20. https://www.zun.vn/tai-lieu/nang-luc-dong-huong-tiep-can-moi-de-tao-ra-loi-the-canh-tranh-cho-doanh-nghiep-nho-va-vua-o-viet-nam-57860/.

[36] Prieto-Sandoval, V., Jaca, C., Santos, J., Baumgartner, R.J., Ormazabal, M. (2019). Key strategies, resources, and capabilities for implementing circular economy in industrial small and medium enterprises. Corporate Social Responsibility and Environmental Management, 26(6): 1473-1484. https://doi.org/10.1002/csr.1761

[37] Khan, O., Daddi, T., Iraldo, F. (2020). Microfoundations of dynamic capabilities: Insights from circular economy business cases. Business Strategy and the Environment, 29(3): 1479-1493. https://doi.org/10.1002/bse.2447

[38] Masi, D., Kumar, V., Garza-Reyes, J.A., Godsell, J. (2018). Towards a more circular economy: Exploring the awareness, practices, and barriers from a focal firm perspective. Production Planning & Control, 29(6): 539-550. https://doi.org/10.1080/09537287.2018.1449246

[39] MacArthur, T.E. (2021). The circular economy in detail. https://www.ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive.

[40] Geng, Y., Fu, J., Sarkis, J., Xue, B. (2012). Towards a national circular economy indicator system in China: An evaluation and critical analysis. Journal of Cleaner Production, 23(1): 216-224. https://doi.org/10.1016/j.jclepro.2011.07.005

[41] Bjørnbet, M.M., Skaar, C., Fet, A.M., Schulte, K.Ø. (2021). Circular economy in manufacturing companies: A review of case study literature. Journal of Cleaner Production, 294: 126268. https://doi.org/10.1016/j.jclepro.2021.126268

[42] Chen, W.K., Nalluri, V., Hung, H.C., Chang, M.C., Lin, C.T. (2021). Apply DEMATEL to analyzing key barriers to implementing the circular economy: An application for the textile sector. Applied Sciences, 11(8): 3335. https://doi.org/10.3390/app11083335

[43] Bhavsar, V., Sridharan, S.R., Sudarsan, J.S. (2023). Barriers to circular economy practices during construction and demolition waste management in an emerging economy. Resources, Conservation & Recycling Advances, 20: 200198. https://doi.org/10.1016/j.rcradv.2023.200198

[44] Girard, L.F., Nocca, F. (2017). From linear to circular tourism. Aestimum, 70: 51. https://doi.org/10.6092/2284-4732/7269

[45] Pigosso, D.C., McAloone, T.C. (2021). Making the transition to a circular economy within manufacturing companies: The development and implementation of a self-assessment readiness tool. Sustainable Production and Consumption, 28: 346-358. https://doi.org/10.1016/j.spc.2021.05.011

[46] Rizos, V., Bryhn, J. (2022). Implementation of circular economy approaches in the electrical and electronic equipment (EEE) sector: Barriers, enablers and policy insights. Journal of Cleaner Production, 338: 130617. https://doi.org/10.1016/j.jclepro.2022.130617

[47] Dess, G.G., Picken, J.C. (2000). Changing roles: Leadership in the 21st century. Organizational Dynamics, 28(3): 18-34. https://doi.org/10.1016S0090-2616(00)88447-8

[48] Kişi, N. (2022). The role of collaborative leadership in the circular economy. Circular Economy and Sustainability, 1: 535-544. https://doi.org/10.1016/B978-0-12-819817-9.00011-9
[49] VNB. Facilitating SME Growth in Vietnam. http://asean.dla.go.th/download/attachment/20171106/BDECC46C-745F-DCF4-34D6-4568DE48F30C_Facilitating_SME_Growth_in_Vietnam.pdf, accessed on Jul. 20, 2024.
[50] Mol, M.J., Birkinshaw, J. (2010). Management innovation and the multinational corporation. In The Past, Present and Future of International Business & Management. Emerald Group Publishing Limited, Leeds, pp. 479-495. https://doi.org/10.1108/S1571-5027(2010)00000230026
[51] Gelhard, C., Von Delft, S. (2016). The role of organizational capabilities in achieving superior sustainability performance. Journal of Business Research, 69(10): 4632-4642. https://doi.org/10.1016/j.jbusres.2016.03.053
[52] Padmore, T., Schuetze, H., Gibson, H. (1998). Modeling systems of innovation: An enterprise-centered view. Research Policy, 26(6): 605-624. https://doi.org/10.1016/S0048-7333(97)00039-5
[53] Reimann, M., Xiong, Y., Zhou, Y. (2019). Managing a closed-loop supply chain with process innovation for remanufacturing. European Journal of Operational Research, 276(2): 510-518. https://doi.org/10.1016/j.ejor.2019.01.028
[54] Xu, L., Wang, C. (2018). Sustainable manufacturing in a closed-loop supply chain considering emission reduction and remanufacturing. Resources, Conservation and Recycling, 131: 297-304. https://doi.org/10.1016/j.resconrec.2017.10.012
[55] Grafström, J., Aasma, S. (2021). Breaking circular economy barriers. Journal of Cleaner Production, 292: 126002. https://doi.org/10.1016/j.jclepro.2021.126002
[56] Pavlović, A., Nestic, S., Bošković, G. (2021). Circular economy management in business organizations using digital technologies. Serbian Journal of Engineering Management, 6(1): 22-29. https://doi.org/10.5937/SJEM2101022P
[57] Suchman, M.C. (1995). Managing legitimacy: Strategic and institutional approaches. Academy of Management Review, 20(3): 571-610. https://doi.org/10.5465/amr.1995.9508080331
[58] Debnath, B., Bari, A.M., de Jesus Pacheco, D.A., Karmaker, C.L. (2023). An integrated best–worst method and Interpretive structural modeling approach for assessing the barriers to circular economy implementation. Decision Analytics Journal, 7: 100250. https://doi.org/10.1016/j.dajour.2023.100250
[59] Agyapong, D., Tweneboah, G. (2023). The antecedents of circular economy financing and investment supply: The role of financial environment. Cleaner Environmental Systems, 8: 100103. https://doi.org/10.1016/j.cesys.2022.100103
[60] Vanalle, R.M., Ganga, G.M.D., Godinho Filho, M., Lucato, W.C. (2017). Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain. Journal of Cleaner Production, 151: 250-259. https://doi.org/10.1016/j.jclepro.2017.03.066
[61] Ageron, B., Gunasekaran, A., Spalanzani, A. (2012). Sustainable supply management: An empirical study. International Journal of Production Economics, 140(1): 168-182. https://doi.org/10.1016/j.ijpe.2011.04.007
[62] Wognum, P.N., Bremmers, H., Trienekens, J.H., Van Der Vorst, J.G., Bloemhof, J.M. (2011). Systems for sustainability and transparency of food supply chains–Current status and challenges. Advanced Engineering Informatics, 25(1): 65-76. https://doi.org/10.1016/j.aei.2010.06.001
[63] Song, L., Lim, Y., Chang, P., Guo, Y., Zhang, M., Wang, X., Yu, X., Lehto, M.R., Cai, H. (2019). Ecolabel's role in informing sustainable consumption: A naturalistic decision making study using eye tracking glasses. Journal of Cleaner Production, 218: 685-695. https://doi.org/10.1016/j.jclepro.2019.01.283
[64] Gbadamosi, A. (2016). Consumer behaviour in developing nations: A conceptual overview. In Handbook of Research on Consumerism and Buying Behavior in Developing Nations. IGI Global, pp. 1-29. https://doi.org/10.4018/978-1-5225-0282-1.ch001
[65] Hieu, T.V. (2022). Circular economy - Strategy and solutions for sustainable development in the Mekong Delta region. Can Tho University Science Magazine, 58: 125-133. https://doi.org/10.22144/ctu.jvn.2022.198
[66] Thuy, L.N.T., Huu, L.T. (2022). Circular economy development in agriculture towards sustainable development In Hai Phong. Journal of Marine Science and Technology, 71: 99-103. https://jmst.vimaru.edu.vn/index.php/tckhcnhh/article/view/340.
[67] Nam, N.H., Chinh, N.T., Tran Van, Y. (2020). The relationship between green growth, green economy, circular economy and sustainable development. Economic Research Journal. https://www.researchgate.net/publication/344603657_Moi_quan_he_giua_Tang_truong_xanh_Kinh_te_xanh_Kinh_te_tuan_hoan_va_Phat_trien_ben_vung.
[68] Mora-Contreras, R., Torres-Guevara, L.E., Mejia-Villa, A., Ormazabal, M., Prieto-Sandoval, V. (2023). Unraveling the effect of circular economy practices on companies' sustainability performance: Evidence from a literature review. Sustainable Production and Consumption, 35: 95-115. https://doi.org/10.1016/j.spc.2022.10.022
[69] Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L. (2006). Multivariate Data Analysis (Vol. 6). Upper Saddle River, NJ: Pearson Education.
[70] Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1): 2-24. https://doi.org/10.1108/EBR-11-2018-0203
[71] Fornell, C., Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1): 39-50. https://doi.org/10.1177/002224378101800104