# NEXUS AMONG BLOCK-CHAIN TECHNOLOGY, DIGITAL MANAGEMENT ACCOUNTING PRACTICES AND SUSTAINABLE PERFORMANCE: MODERATING ROLE OF INFORMATION TECHNOLOGY GOVERNANCE

MỐI LIÊN HỆ GIỮA CÔNG NGHỆ BLOCKCHAIN, THỰC HÀNH KẾ TOÁN QUẢN TRỊ KỸ THUẬT SỐ VÀ HIỆU QUẢ BỀN VỮNG: VAI TRÒ ĐIỀU TIẾT CỦA QUẢN TRỊ CÔNG NGHỆ THÔNG TIN

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# ABSTRACT

This article assesses the effect of block-chain technology on sustainable performance mediated by digital management accounting practices in Vietnam, a developing nation. Furthermore, information technology governance is regarded as a moderator for the aforementioned nexus. Data was acquired using an email survey. A total of 1,000 emails with the survey are sent to the chief executive officers of Vietnamese manufacturing companies that are publicly traded on stock markets, and 401 replies are collected. By employing the partial least squares structural equation modeling, our findings explicate that block-chain technology has a substantial favorable impact on sustainable performance, and digital management accounting practices positively mediate this effect. Moreover, information technology governance acts as favorable moderator role on the link between block-chain technology and digital management accounting practices. Our findings contribute to assisting the Vietnamese Government's strategy of digitized their economy, particularly for management accounting and sustainable accounting practices.

Keywords: Block-chain technology; digital management accounting practices; sustainable performance; IT governance.

# TÓM TẮT

Bài báo này nhằm mục đích đánh giá tác động của công nghệ blockchain đến hiệu quả bền vững thông qua vai trò trung gian của thực hành kế toán quản trị kỹ thuật số tại Việt Nam, một quốc gia đang phát triển. Bên cạnh đó, quản trị công nghệ thông tin được xem xét trong vai trò điều tiết mối liên hệ nêu trên. Dữ liệu được thu thập thông qua khảo sát bằng email. Tổng cộng 1.000 email kèm theo bản khảo sát đã được gửi đến các giám đốc điều hành (CEO) của các công ty sản xuất Việt Nam đang được niêm yết trên thị trường chứng khoán và đã thu về 401 phản hổi. Bằng cách sử dụng mô hình phương trình cấu trúc bình phương tối thiểu từng phần (PLS-SEM), kết quả nghiên cứu chỉ ra rằng công nghệ blockchain có tác động tích cực đáng kể đến hiệu quả bền vững và thực hành kế toán quản trị kỹ thuật số đóng vai trò trung gian tích cực cho tác động này. Hơn thế nữa, quản trị công nghệ thông tin đóng vai trò điều tiết tích cực đối với mối liên hệ giữa công nghệ blockchain và thực hành kế toán quản trị kỹ thuật số. Kết quả nghiên cứu đóng góp vào việc hỗ trợ chiến lược số hóa nền kinh tế của Chính phủ Việt Nam, đặc biệt là đối với lĩnh vực kế toán quản trị và thực hành kế toán bền vững.

Từ khóa: Công nghệ chuỗi khối; thực hành kế toán quản lý kỹ thuật số; hiệu suất bền vững; quản trị công nghệ thông tin.

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## **1. INTRODUCTION**

Up to now, digital technology has developed rapidly and is constantly changing. It affects all fields, all production and business activities, including modern accounting and auditing practices [1]. Accounting practice and digitization have a tight association as the introduction of new technology generates a modern sort of spatial and social interaction with consequences for organizational sustainability and responsibility [2, 3]. Despite this growing relevance, very few studies have investigated how accounting is affected by digitalization processes [4, 5]. Traditionally, a digital management accounting system is a system that a company utilizes to gather and process data and financial information [6], so that it can be used by decision makers, thereby improving the operational efficiency of the organization. The adoption of block-chain technology (BCT) and the Internet of Things, on the other hand, is driving the digital transformation movement, as well as creating new data mining opportunities from BCT. It has made a huge change in the current digital accounting system and practices. Nevertheless, the shift to digital management accounting practices (DMAP) has been slower than expected and has not yet reached a critical level. Furthermore, it seems that the effects of containment forces are broader in scope than those that promote spillover.

Modern techniques that can authorize the data technology uprising to attempt crucial fields such as finance, accounting and social, must be updated but not yet transformed. Based on the resource-based view theory (RBVT), the basic institute comprises of particular series of resources and the governance's capability to integrate them, enabling the institute to utilize market occasions that make a donation of performance [1]. Accordingly, BCT can potentially promote better information integration for accounting practices, especially DMAP. In terms of using RBVT, modern techniques allow inner understanding to be organized, repositioned and adjusted to produce new, valuable understanding, and it also helps institutes to work together to transmute and commercialize the latest acquired outer understanding. Currently, BCT is also emerging as a new type of tool for many benefits globally [7], especially for the accounting and finance fields [8]. Furthermore, BCT can be viewed as a technology that can help achieve sustainable accounting practices [9, 10]. There have been several papers that have examined the effect of BCT on firm performance. Nevertheless, there

has been an absence of papers on the effect of BCT on sustainable performance (SUP).

In today's rapidly changing world, information technology-enabled knowledge management has become a required competency for companies seeking to expand organizational capacity, innovate, and automate their operations [11]. Furthermore, while integrating organizational operations, including accounting processes, companies must leverage information system applications to capitalize on technological resources [1]. Information technology encourages the collaboration of stakeholders so that essential information is used effectively in the DMAP. Therefore, information technology governance (ITG) is crucial for promoting information technology adoption in organizations and enabling an organization to develop more effective strategies [12]. Additionally, the application of new and intelligent technologies (e.g., BCT and ITG) impacts the company's accounting practices in the context of accounting digitization. Considering recent changes thoroughly, the company's digitizing accounting reporting processes and practices (e.g., DMAP) need further empirical investigation. Although the literature has recently begun to consider these issues, this line of research on digital reporting practices in accounting research requires further investigation in the actual operation of businesses, especially in developing economies.

It can be seen that researchers have attempted to measure performance quantitatively derived from financial ratios, or qualitative aspects of performance measures. However, in the current green economy and sustainability landscape, performance measures should focus on the performance of sustainable accounting practices [13], and transition in a timely manner as public requirements change. Even so, there has been still a literature gap on the impact of technology-based on SUP that has not been filled. In addition, in order to properly assess SUP in accounting practices with current technological conditions, it has been compulsory to appraise the influence of several internal elements (e.g., DMAP and ITG) and outside the business (e.g., BCT). Nevertheless, examining the effect of DMAP and ITG on BCT-SUP link has been less clarified in empirical papers. And the integration of all the above factors into a research model to clarify the mechanism of the factors affecting SUP is still very limited. This has been literature gap that we try to cover by analyzing the mechanism by which organizations use BCT, DMAP and ITG to improve SUP.

Therefore, the aim of this paper has been to assess the effect of BCT on SUP as a mediator of DMAP. Furthermore, ITG is viewed as a moderating factor for the BCT-DMAP link. According to the research findings, BCT and DMAP have favorable effect on SUP in Vietnamese enterprises. Additionally, DMAP appreciable mediates the nexus between BCT and SUP, and ITG appreciable moderates the BCT-DMAP link. This study has several contributions as follows. Firstly, our paper supplements the SUP literature by indicating a favorable impact of BCT and DMAP on SUP, as well as the mediating role of DMAP. Secondly, our findings synchronize the effectiveness of ITG and its moderating roles in the above links. Ultimately, this paper has been conducted to complement experiential verification on SUP in the early digital circumstances in a developing market, particularly Vietnam.

The parts that follow include the research background and hypotheses, methodology, research results and discussion, and ultimately, a conclusion.

## 2. RESEARCH BACKGROUND AND HYPOTHESES

From the RBVT's lens, an organization's proficiency has been critical to achieving the preferred operational results by its resource foundation [14]. Correspondingly, BCT as a capital or potentiality can straightly or obliquely encourage better SUP through the intensification of other capital or potentiality. In today's digital landscape, RBVT suggests that the distinct ways a company manages and deploys resources generate the potentiality for both interim and long-term competitiveness advantages. Accordingly, the BCT is acknowledged as a major resource that could supply exceptional capacities for an organization and it's DMAP. Additionally, SUP can act as a pragmatic approach to delivering sustainable products in manufacturing companies in line with RBVT's strategic capabilities [15], thereby helping with contamination precautionary, product management and sustained evolution. Organizational information processing (OIP) theory serves as the foundation for describing company concepts and organizational behavior via information processing systems [16]. As a company's data volume grows, it necessitates the use of a variety of support services, such as those provided by external entities, to improve information processing capability. In this context, this theory may be used to evaluate the dynamics of employing digital technology to analyze information in various decision contexts. Accordingly, information processing capability boosts operational effectiveness and increases a company's competitive edge. Therefore, the

adoption of digital technology may aid businesses in harnessing the information required to make decisions on BCT and ITG implementation in all important areas, so contributing to the enhancement of DMAP.

Recently, BCT has been defined as a technologyenabled organizational capacity capable of rapidly processing massive amounts of diverse data to acquire useful insights, allowing companies to achieve a competitive edge [17]. Furthermore, BCT is emerging as a new sort of instrument for a wide range of worldwide businesses, particularly financial services. BCT's safe value transfer capabilities can help the information technology revolution reach crucial industries like banking, economics, and law, which have been updated but not totally changed shift [18]. Technological improvements have fashioned a new manner of conducting numerous accounting chores, resulting in a new revolution that has been developing [6]. Besides, contemporary digital accounting systems differ from past accounting systems in a variety of ways, particularly today's BCT-related software, opening up new data mining options [19]. Furthermore, the consequences of BCT are propelling the present and forthcoming digital practices trend. As a result, today's management accounting practice (e.g., DMAP) is substantially different and much more sophisticated than in the past, but with quicker processing speed and more information. While the BCT, ITG and DMAP are considered by many scholars, there are still very few documents defining and evaluating SUP. The SUP has been described as a vibrant activity that necessitates short-interval performance without affecting longinterval performance. The literature recommends that controlling the benefits of different related-parties' classes as part of a firm's operations should be positively related to organizational sustainability, i.e. some link between sustainability and sustainable performance. To achieve the overarching goal of enhancing SUP, a firm requires to: (1) interpret its comprehensive goals into particular activities for each of its crucial performance areas and (2) only define the metric(s) to measure the actual performance of the activities for each recognized crucial performance area [20].

The application of BCT to business activities has had a substantial influence on accounting areas. Auditing businesses have started to experiment with and implement audit process automation by combining sophisticated automation technologies with BCT and cognitive technology. Currently, the usage of BCT in management accounting practice is at a stage where accounting duties are repetitive [21]; for example, inventory counting has long been the realm of robotics. The usage of BCT for internal and external management accounting reporting has also been mentioned in the literature. In particular, many people believe that BCT is impervious to manipulation, which is its major benefit over standard databases for accounting as a transaction ledger [22]. BCT may be used to securely store management accounting data, rapidly exchange it with interested people, and boost the veracity of accounting data [23]. In other words, many people believe that BCT will be the future of accounting record keeping as an alternative ledger technology. BCT is a record-keeping technology designed to make it impossible to hack the system or forge the data stored on it, thereby making it secure and immutable. It is a type of distributed ledger technology, a digital system for recording transactions and related data in multiple places at the same time. Furthermore, data analysis may be integrated with BCT to identify abnormalities and other relevant accounting information, particularly in banking [24] and digital currency [25]. However, the BCT is extensive, and only a portion of it is applicable to the management accounting profession. Furthermore, OIP theory may be used to examine the dynamics of employing BCT to process information in diverse decision situations [26], particularly DMAP. Therefore, hypothesis H1 is presented as follows:

# H<sub>1</sub>: BCT positively impacts DMAP.

A digital management accounting information system capable of copying, recording, storing and processing data to generate information for business decisions [27]. Some scholars argue that the use of this system (e.g., DMAP) assists managers in performing management functions by providing the information they need [28] to achieve sustainability goals. The effectiveness of DMAP performance improved financial reporting quality and enhanced SUP-related practices. In addition, DMAP is recognized as an important reporting practice that stakeholders with quality provides accounting information to make useful decisions, including assessment of SUP. As commercialization has become more global, organizations have evolved DMAP that seeks to recognize data to underpin their strategies and enhance their SUP practices [29]. The ability to enhance SUP will be influenced by how information is obtained,

managed and integrated by the DMAP. Moreover, the momentousness of encouraging sustainability through information use within the DMAP licenses the ability to liaise with selections, reach concurrence and assist more particular measures. DMAP enables the use of information for sustainable development in two dissimilar routes: firstly, by linking individuals and enabling the integration of sustainable practices, and secondly, by enabling the use of storage and encoding of information about sustainable practices. Finally, goals also need customers sustainability and stakeholders to be fully informed and continuously updated through specific DMAP [30]. Thereby, the following hypothesis has been formulated:

# $H_2$ : DMAP has a significant favorable impact on SUP.

DMAP can reduce energy use and carbon dioxide emissions from production systems through efficient resource management through the application of BCT, thereby helping organizations improve their SUP. The used data of DMAP loses worth in the absence of a productive tracking apparatus for all components, leading to less accurate estimations of crucial metrics such as dependability [31]. With the support of BCT, it is possible to improve the ability of DMAP to predict incidents and avoid waste, and to some extent, improve SUP. Furthermore, with all these efforts, the DMAP of manufacturing companies can fit into a circular economy model geared towards sustainable practices. Therefore, it can be said simply that the inclusion of BCT into the DMAP has been the potentiality to intensify SUP. To promote sustainability and deliver tangible results, sustainability principles should be applied in the planning and operation of the DMAP based on modern technology as BCT. Accordingly, the used data in the DMAP reflects the mechanism utilized to institutionalize data for the future, which in part improves the organization's SUP. This ability is more effective when the DMAP is applied through an interactive usage pattern, which has been examined as a mediator between innovation (e.g., BCT) and performance (e.g., SUP). The utilization of the interaction DMAP enables the integration of information into the core competencies of the organization [32] and makes it not only an instrument but also a mechanism for enabling adapting to ecological changes, improving innovate and enhancing SUP [33]. According to the above argument, we propose hypothesis H3:

H<sub>3</sub>: DMAP mediates the relationship between BCT and SUP.



Fig. 1. The proposed research model

The link between ITG and other areas of the company has been described, explained, and predicted using RBVT. This theory believes that ITG supplements the company's other technological capabilities, assisting in the improvement of the company's digital operations (e.g., BCT and DMAP). Prior investigations indicate that ITG has become a significant aspect in supporting businesses [34], operating sustainably [35], and most importantly, keeping up with modern economic trends [36]. It can be shown that with a strong ITG, the higher the BCT, the more it will boost the company's digital process (e.g., DMAP). ITG mechanisms, in particular, facilitate the attainment of required technological capabilities (e.g., DMAP) in various companies by utilizing the synergy of modern technologies (e.g., BCT). On the contrary, if the ITG is weak, even if it fully owns the BCT, the company's digital process (e.g., DMAP) will also face difficulties [37], even leading to failure [38]. In addition, with weak ITG, even with full digital transformation support from the government, the implementation of digitalization of the company (e.g., DMAP) can hardly achieve high results [39]. Therefore, hypothesis H4 is proposed as follows:

### $H_4$ : ITG moderates the nexus between BCT and DMAP.

Finally, based on our previous discussions, Fig. 1 depicts the proposed research model.

### **3. RESEARCH METHODS**

### 3.1. Research design

Our research is conducted according to quantitative methods. The 5-point and 7-point Likert scales were used in combination to enhance response rate and response quality [40] as well as to overcome common method bias (CMB) [41]. In addition, we also used Harman's test [42] and the marker variable [43] to minimize the CMB phenomenon. These analysis results showed that the CMB phenomenon was not a concern. To test the non-response bias, we saved the timestamp of the chief

executive officer (CEO)'s response to divide the survey sample into four groups [44]. Then, the two groups of earliest and latest responders were tested for differences using the t-test. According to the results, there was no significant difference in mean for any variables between these two groups (p > 0.05). Next, the  $\chi$ 2-test was used to explore the difference between the two respondent groups in terms of demographics. The results also revealed that there was no statistically significant difference between the two response groups (p > 0.05).

Based on the theoretical model, we have outlined a survey that includes all aspects tested. The set of question items was adjusted from prior scholars. Thus, few papers have been utilized to implement the concepts of the theoretical model. All concepts utilized in our conceptual framework have been operated as reflective structures. Our operations of factors are as follows. We measured BCT inherited from Rehman Khan [7], including four indicators. We measured DMAP according to six adjusted indicators from Wu and Boateng [45]. ITG was measured by a secondary order inherited from Sirisomboonsuk [46], including four dimensions, namely information technology strategy setting (ITSS; six indicators), value delivery (VD; four indicators), risk management (RM; six indicators), and performance measurement (PM; two indicators). We measured SUP according to 4 inherited indicators from Gadenne [20]. Finally, we also used Firm size measured by total assets as a control variable in our model.

### 3.2. Data collection and analysis

Vietnam was chosen by us to study the correlation among BCT, DMAP and SUP for the following reasons. First, SUP has not been widely studied in developing countries, including Vietnam, so this study paved the way for further studies on SUP in developing countries and Vietnam. Next, Vietnamese enterprises were trying to implement sustainable resolutions to intensify their capacity to safeguard the environment and enhance SUP [47]. However, individuals and organizations might still confront numerous sustainable threatens that requested them to swiftly modify and respond, which required climate action and the development of green, sustained and little-carbon economies [48].

We used an online email questionnaire for data collection. Respondent emails were collected from the websites of companies, the Vietnamese Department of Planning and Investment and the Entrepreneur Association. Companies in each sector were selected by non-probability convenience methodology. Despite its limitations, this method allowed for rapid sampling and provides a more complete picture of the diversity and abundance of the population [49]. However, our selection followed the principle of ensuring that the proportion of enterprises in the fields would be similar to the contribution rate to Vietnamese GDP of the sectors. In addition, our business selection was based on the following ratios: (1) firm size, (2) the type of business and (3) the ownership structure. These ratios were calculated using the data of the General Statistics Office of Vietnam's 2021 enterprise census. Therefore, although the sampling method was convenient, it still ensured the similarity of our sample with the study population.

Referral letters with questionnaire links were sent to the corporate or personal emails of 700 respondents, and 475 complete responses were collected. We removed 22 inadequate responses and 13 outliers of value. The units of our analysis were organizations, so survey respondents should be CEOs representing their respective organizations. Therefore, we reviewed and removed 40 responses from the same company or industry group. Thus, the final 401 valid responses were used to analyze the data. These responses were used for data analysis, and this sample size was consistent with the quantitative study criteria of Hair [50]. Table 1 indicates the demographic data of the respondents.

Demographics	n	%	Demographics	n	%
Position			Assets (VND billion)		
Top-level	103	25.69	< 500	133	33.17
Mid-and low- level	298	74.31	501 - 1,000	117	29.18
Experience (years)			> 1,000	151	37.66
< 10	157	39.15	Employees		
11 – 20	115	28.68	< 500	109	27.18
> 20	129	32.17	501 - 1,000	171	42.64
Firm age (years)			> 1,000	121	30.17
≤ 10	142	35.41			
11 - 30	189	47.13			
31 - 50	70	17.46			

Table 1. Data of respondents

Ultimately, the PLS-SEM has been used to check the measurement model, the structural model, and mediator and moderator impacts through SmartPLS. We utilized

the bootstrap confidence interval method for mediation and moderation tests because the bootstrapping method is considered superior [51].

## 4. RESULTS

## 4.1. Measurement model evaluation

Based on Table 2, the convergence value maps the expectancy due to all average variance extracted (AVE) values have been above 0.5. The consistent reliability (CR) and Cronbach's Alpha are above 0.7. Moreover, the whole outer loading coefficients have been over the cross-loading ones. Thus, each pair of scales achieves exactness. AVE's square root has been more than equivalence correlated coefficients, and the HTMT<sub>ij</sub> index has been less than 0.9. Besides, 5.000 times bootstrapping results indicate that HTMT's confidence interval rate (of 95%) has been below 1. Thus, all scales have been discriminatory as well as our measurement model reaches discriminant exactness.

Variable	1	2	3	4	Cronbach's Alpha	CR	AVE
1. BCT	0.813ª				0.831	0.886	0.660
2. DMAP	0.762 <sup>b</sup>	0.789ª			0.878	0.908	0.622
	0.820 <sup>c</sup>						
3. ITG	0.673 <sup>b</sup>	0.627 <sup>b</sup>	0.729ª		0.824	0.871	0.531
	0.789 <sup>c</sup>	0.711 <sup>c</sup>					
4. SUP	0.806 <sup>b</sup>	0.780 <sup>b</sup>	0.601 <sup>b</sup>	0.816ª	0.832	0.888	0.666
	0.843 <sup>c</sup>	0.833°	0.716 <sup>c</sup>				
<sup>a</sup> square root of AVE, <sup>b</sup> correlation between variables, <sup>c</sup> HTMT ratio							

Table 2. Confirmatory factor analysis

### 4.2. Hypotheses

All VIF coefficients have been below 3. Thus, multicollinearity is absent in our structural model. PLS-SEM findings have been presented in Fig. 2. All indicators have loading factors more than 0,7 and the t-bootstrap values of all indicators are above 1.96.

In Fig. 2, the endogenous variable (i.e., SUP) in our model has an R<sup>2</sup> of 0.616 (p values < 0.05). Therefore, BCT and DMAP have a high level of influence on SUP. Similarly, the influence of BCT on DMAP is high, with an R<sup>2</sup> of 0.723. In Part A of Table 3, all endogenous variables have f<sup>2</sup> of more than 0.02, and the predictive power of the model containing the dependent variables, i.e., SUP and DMAP, are both averages with Q<sup>2</sup> values of 0.398 and 0.433, respectively.



#### The further test is shown in Part C of Table 3. More specifically, model (i) - the indirect effect of BCT on SUP via DMAP - has a coefficient of 0.569, and the confidence interval of this effect does not contain the value 0 with LLCI = 0.511 and ULCI = 0.627. The moderating effect of ITG on the BCT-DMAP relationship is significant at a 5% level with LLCI = 0.081 and ULCI = 0.185. In model (ii), the coefficient is 0.133; thus, the impact from BCT to DMAP will increase with stronger ITG. Moreover, Fig. 3 also provides the similar inference of moderating effects as the second table. Thus, a moderating role exists in our model.

#### Fig. 2. PLS-SEM results

The results of testing our hypotheses through the 10,000-sample bootstrapping run are shown in Part B of Table 3. All relationships in our hypotheses from H<sub>1</sub> to H<sub>4</sub> are statistically significant with 95% confidence. Specifically, BCT has a positive direct effect on DMAP, and DMAP positively impacts SUP (coefficients more than 0). This study also shows that DMAP mediates the link between BCT and SUP. Additionally, ITG positively moderates the BCT-DMAP relationship ( $\beta = 0.133$ ). Finally, the control variable has a significant positive influence on SUP. Particularly, H<sub>1</sub> predicts that BCT positively affects DMAP. The results show that it is 0.695 (p < 0.05) and has a t-value equal to 21.778. Therefore, H<sub>1</sub> is approved. H<sub>2</sub> predicts that DMAP positively affects SUP. The results show that it is 0.818 (p < 0.05) and the t-value is 47.270. Thus, H<sub>2</sub> is approved. H<sub>3</sub> predicts that DMAP positively mediates the effect of BCT on SUP. The results show that  $\beta$  is 0.569 (p < 0.05) and a t-value of 19.330, as a result, H<sub>3</sub> is approved. H<sub>4</sub> predicts that ITG moderates the BCT-DMAP nexus. To test this hypothesis, we created an interaction term, BCT×ITG, by multiplying the independent variable (i.e., BCT) and the moderating variable (i.e., ITG) after mean-centering them to avoid multicollinearity issue. The result shows that the effect of the interaction term on DMAP is significant as  $\beta$  is 0.133 (p < 0.05), and the t-value is 5.015, therefore, H<sub>4</sub> is approved.

Table	3	Hvnotheses	results

Part A							
	Endogenous variable	f²	<b>Q</b> <sup>2</sup>				
	DMAP	0.822	0.433				
	SUP	0.477	0.398				
Part B							
Hypothesis		β	t	Speculation			
$H_1$	BCT $\rightarrow$ DMAP	0.695	21.778ª	Approved			
$H_2$	DMAP $\rightarrow$ SUP	0.818	47.270ª	Approved			
H <sub>3</sub>	BCT $\rightarrow$ DMAP $\rightarrow$ SUP	0.569	19.330ª	Approved			
$H_4$	BCT x ITG $\rightarrow$ DMAP	0.133	5.015ª	Approved			
	Firm size $ ightarrow$ SUP	0.098	3.642ª				
Par	tC						
Model		Coofficient	Bootstrap				
		Coefficient	LLCI	UL CI			
(i) BCT $ ightarrow$ DMAP $ ightarrow$ SUP		0.569ª	0.511	0.627			
(ii) BCT x ITG $ ightarrow$ DMAP		0.133ª	0.081	0.185			
Moderated mediating effect							
(iii) BCT x ITG $\rightarrow$ DMAP $\rightarrow$ SUP		0.109ª	0.066	0.152			
²5%	level						

Last but not least, the authors test the moderated mediation effect in our model. Part C of Table 3 also shows the results of this test. Accordingly, the coefficient

in model (iii) is 0.109 and significant at the 5% level. As the confidence interval for the index of moderated mediation by ITG is entirely above zero, we can conclude that ITG positively moderates the indirect effect of BCT on SUP via DMAP.



Fig. 3. Moderating effects

#### 4.3. Discussion

Our findings demonstrate the favorable effects of BCT and DMAP on SUP in the Vietnamese context, as well as the significance of DMAP in mediating the BCT-SUP nexus. These results were perfectly consistent with previous studies (i.e., Abubaker [23]; Liao [24]; Yang [26]; Alkan [27]; Oyewo [29]; Asiri [30]; Mohril [31]; Herremans [32]). Most notably, the results indicate that ITG has a moderating impact on the BCT-DMAP nexus. The acceptance of this hypothesis was completely consistent with the studies of Ghosh [37], Pittaway and Montazemi [38], and Apandi [39]. In fact, significant changes have occurred in the field of global sustainability due to advances and trends in information and communication technology. The main issue to be addressed is no longer the changing perspective on sustainability but how to achieve better sustainability in the new management accounting to redefine customer interactions, seize the opportunities offered by innovation, and generate acceptable profits. An organization that wants to grow must continuously adapt to technological changes in the economic, financial and production landscape based on modern DMAP.

Furthermore, previous studies have demonstrated that using RBVT and OIP theory has a significant impact on the intention to adopt new technology for DMAP and SUP [14, 16]. This shows that organizations can use technical advances to make their DMAPs more useful, focusing on promoting the development of digital services. Customers are increasingly appreciating the benefits of digital services, such as their time-saving nature and variety of services, which somewhat increases SUP. Therefore, new technologies must be user-friendly and beneficial to customers. It is important to provide the management accounting system with appropriate training and education programs, allowing it to gradually absorb and adapt to the new realities of BCT change.

Ultimately, it can be seen that cyber risk in DMAP is a serious concern that organizations should address and that it can influence their decision to use BCT and SUP. In fact, cyber risks in DMAP can directly impact the reliability of management accounting systems. Therefore, organisations can enhance security by implementing new technology governance (e.g., modern ITG) that improves performance, reputation, as well as confidence in BCT usage and reliability. Based on the above discussion, it can be seen that the study results contribute further support to RBVT and OIP theory. Although there has been research on the indirect effects of BCT on performance (e.g., Abu Afifa [52]), this paper shows many differences. Most importantly, previous research only considered the impact of BCT on financial performance from the perspective of risk management (e.g., cybersecurity risk management, risktaking tendency [52]). Meanwhile, this paper evaluates the indirect impact of BCT on SUP through a complex intermediate mechanism.

#### **5. CONCLUSION**

This study aims to investigate the factors affecting SUP in the Vietnamese context. By providing empirical evidence from manufacturing firms, this study shows the complex impact mechanism between BCT, DMAP, ITG and SUP. Using the PLS-SEM analysis with data from 401 observations, the findings of this study show that all hypotheses are approval.

Based on our previous considerations, the results of this study have many theoretical and managerial implications. With theoretical significance, this study first supplements previous comments proposed about the complex impact mechanism between BCT, DMAP, ITG and SUP on manufacturing enterprises, especially in developing countries economy like Vietnam. Using many important fundamental theories (e.g., RBVT, OIP theory), the findings of this study add to those scientific theories by emphasizing the importance of fundamental causes promoting the adoption and implementation of new technological innovations in manufacturing enterprises. Thereby, this study secondly contributes to expanding the above theories with the case of Vietnam representing countries in developing regions where the theories have not yet been comprehensively diffused. Finally, and most notably, this study proposed to add a regulatory effect of ITG and a mediating effect of DMAP. This finding has important theoretical implications and contributes to the rationale for SUP in the context of developing regions (e.g., Vietnam).

Regarding management significance, there are some noteworthy points as follows. First, manufacturing enterprises worldwide are constantly innovating. Once they have determined to follow the innovation trend of the times, they need to continue to develop business models with advanced technology platforms to optimize production and internal administration. Therefore, the results of this study provide a comprehensive overview of the complex interrelationships among BCT, DMAP, ITG and SUP, thereby allowing Vietnamese managers and policymakers to use it as a strategy to keep up with the most rapid environmental changes, gain competitive advantage, and improve performance. Second, Vietnamese manufacturing businesses can cooperate with technology program providers to develop and expand a variety of goods and products for customers. Finally, although today's manufacturing businesses can easily access technology, they must still ensure effective exploitation to improve business productivity. Therefore, to effectively apply advanced technologies, it is necessary develop human resources in parallel with to technological development through training plans and investment in a workforce with smart technological thinking, and have highly specialized knowledge. Manufacturing businesses in developing regions need to ensure the highest possible level of safety and security for their management accounting systems. In addition to regularly reviewing confidential data protection, businesses need to promptly upgrade their ITG policies on risks or measures to tighten security and safety in the context of developing regions.

However, despite the theoretical and practical contributions of the findings of this study, several limitations remain. First, although multiple procedures were used in this study to verify that the data were free from bias, such problems are common in social and humanities research. Therefore, future research needs to use more rigorous screening mechanisms from pre-data collection to data processing. Second, the impact mechanisms between BCT, DMAP, ITG and SUP may vary depending on each country's unique cultural, social and individual factors thereby future research could examine the pattern of this study in another country or region to determine if the results are similar or different. Third, the characteristics of manufacturing enterprises, such as their size, type, production process, and internal accounting administration, may influence the components in the research model. Future researchers should therefore expand the research paradigm to include these factors, providing better scientific explanations in this context.

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