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Impact of Management Accounting and the Circular Economy Model on Business Performance: A Study of Enterprises in Hanoi

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Abstract
The information management accounting provides to improve productivity and resource allocation leads to direct financial benefits for businesses as well as value for society. Effective management accounting will help improve business performance and bring competitive advantages to businesses. Meanwhile, a circular economy is an economic model in which design, production, consumption, and service activities aim to reduce the exploitation of raw materials, increase the product life cycle, limit waste generation, and minimize adverse impacts on the environment. The author collects data on 115 enterprises in Hanoi and uses PLS-SEM, a research model that is evaluated through two steps: evaluation of measurement models and structural models, to explore the impact of management accounting systems and circular economy model implementation on the performance of enterprises in Hanoi. The results show that both the management accounting system and the circular economy have a positive impact on the performance of the business.

Keywords: Management Accounting, Circular Economy, Operational Efficiency

1. Introduction
Many studies have found that the industrial economy has greatly damaged the environment over the past several decades. Inefficient processes consume too many natural resources, create waste, and pollute the environment. A lot of businesses use natural capital in the form of oil, wood, minerals, or natural gas and return it to nature as waste, most of which is non-biodegradable and cannot be reused. The circular economy adds value to businesses, reduces resource exploitation, reduces waste treatment costs, and minimizes environmental pollution. A circular economy involves turning the waste output of one industry into an input resource for another industry or circulating within the business itself. In the current era of heightened environmental awareness, the role of the circular economy is fundamental to improving operational efficiency and enhancing the sustainable development of businesses.
Byrne and Pierce (2007) [4] argue that the role of management accounting is mainly seen as contributing directly to the planning and control of organizational activities. As a result, management accounting is increasingly seen as playing an important role in the decision-making processes of organizations. Waste is a serious problem for society and management accounting. An important purpose of management accounting is the efficient use of resources. The information management accounting provides to improve productivity and resource allocation leads to direct financial benefits for organizations as well as value for society. Effective management accounting will help improve business performance and bring competitive advantages to businesses.
Recognizing the important role of the management accounting system and the implementation of the circular economy model on the performance of enterprises, this study aims to explore the impact of the management accounting system and the implementation of the circular economy model on the performance of enterprises in Hanoi. The research results are expected to bring added value to the documents on management accounting and circular economy to the sustainable development of enterprises.

2. Research Overview and Research Hypothesis
2.1 Management Accounting
Management accounting is the process of continuously improving and adding value to the planning, design, evaluation, and operation of financial and non-financial information systems to guide management actions, motivate, support, and create the

cultural value necessary to achieve an organization's strategic, tactical, and operational goals. A management accounting system is a complex management system implemented to provide financial and non-financial information to business managers so that they can perform their functions. Management accounting becomes a useful tool that plays an important role in supporting and developing the performance measurement process of enterprises (Sultan *et al*., 2021). According to research by Ghasemi *et al*. (2019), management accounting consists of traditional and modern tools that have proven their effectiveness in measuring sustainable performance and assessing business goals in developed countries. Initially applied to businesses, management accounting is mainly used to determine and control costs. Abdel (2006) [1] finds that as the business environment changes, management accounting focuses more on planning and control. In recent years, management accounting techniques have focused on providing information for efficient use of resources and supporting strategy formulation and implementation. Management accounting techniques are geared towards creating added value for customers, shareholders, and corporate innovation (Abdel, 2006) [1].

2.2 Circular Economy

According to the Ellen MacArthur Foundation (2013), a circular economy describes an economy designed and operated with the primary objective of reducing, controlling, and eliminating the harmful effects of toxic chemicals, and increasing renewable energy waste generation and disposal. The circular economy operates on the following principles: Design to eliminate waste; Enhance resilience through diversity; Use renewable energy; Think systematically; and waste is also the raw material.

The United Nations Industrial Development Organization defines a circular economy as a closed cycle, where wastes are reused, becoming raw materials for production, thereby reducing all negative impacts on the environment, ecosystems, and human health. In Vietnam, the concept of a circular economy is mentioned in Article 142 of the Law on Environmental Protection, specifically: "Circular economy is an economic model in which the activities of design, production, consumption, and services in order to reduce the exploitation of raw materials and materials, prolong the product life cycle, limit waste generation, and minimize adverse impacts on the environment."

The circular economy is one of the recent modern focus areas, especially in the business management system. According to Vermesan *et al*. (2020) [14], the circular economy can contribute by improving production and production processes to improve the quality and efficiency of resources in enterprises. Thus, the circular economy reduces waste in the use of resources, reduces environmental pollution, and enhances social responsibility.

2.3 Operational Efficiency

Usually, the performance of an enterprise is expressed in terms of financial performance and non-financial performance. Murphy *et al*. (1996) [12] stated that financial efficiency is the performance of an enterprise which is reflected through the performance of some financial indicators of the enterprise. Measuring financial performance is still the most popular measurement method in research on corporate governance in general and accounting in particular (Hudson, 2001) [9]. Lau and Sholihin (2005) [10] have shown that the fact that there are many studies using financial results to reflect the performance of enterprises comes from certain advantages that are objectivity and convenience. In fact, these advantages come from the fact that financial ratios are always provided from accounting records and they are always followed according to principles to ensure objectivity, reasonableness, and validity. However, the financial aspect only reflects a part of the performance of the business, in many cases, the existence and long-term development of the business lies in the satisfaction of customers, the development of skills of employees, or the improvement of internal management processes. Therefore, in modern management, measuring performance on non-financial aspects is increasingly focused both in theory as well as in practical application. For example, the introduction of the balanced scorecard model of Kaplan and Norton (1996) [6] and the pyramid model of Lynch and Cross (1991). Specifically, Kaplan and Norton (1996) [6] use a combination of 04 aspects namely customer, financial, internal process, and development learning to reflect the performance of the business. The combination of financial results with non-financial results will help businesses operate more stably in the long term as well as better implement strategic business plans.

2.4 Research Hypothesis

2.4.1 The management Accounting System has a Positive Impact on the Performance of the Business

The American Institute of Management Accountants has pointed out that the role of management accounting information is to assist managers in strategic planning and performing activities to meet specific decision-making needs at all levels of the organization. The goal of management accounting is to provide information for managers to effectively use resources to achieve business goals. To examine the relationship between management accounting, firm capacity, and operational performance, Mia *et al*. (1999) used the path analysis method, and management accounting results have a significant impact on firm performance. Bedford (2015) [3] through the study of data from 400 enterprises to show the role of the management accounting system in promoting business performance, the research shows that the management accounting system provides information to help strengthen decision-making and thereby improve business performance. Uyar and Kuzey (2016) [13] through using the structural model to examine the management system in the enterprise. The results show that management accounting has a positive impact on business performance. Similarly, Prasad and Green (2015) [11] also studied the role of management accounting information systems in affecting organizational performance by enhancing added value. Studies have determined that management accounting has a significant positive role in the performance of the business. Flexible management accounting information, with modern management accounting techniques, is an important factor to increase the performance of the business. Inheriting from previous studies, the author hypothesized:

H1: The management accounting system has a positive impact on the performance of enterprises in Hanoi

2.4.2 The Circular Economy Model has a Positive Impact on the Performance of the Business

Lee *et al*. (2015) [11] studied the circular economy's contribution to reducing carbon emissions and improving corporate performance. Ly *et al*. (2020) study on the environmental responsibility, of the circular economy affecting the value of enterprises, the results show that environmental change and circular economy enrich the energy organization, reducing the adverse impact of its activities on the environment. Rath (2021) also argues that the circular economy adds value-added services that bring long-term positive results to the financial performance of the business. Circular economy model as a solution to improve business performance. Therefore, the author proposes the hypothesis:

H2: The circular economy model has a positive impact on the performance of enterprises in Hanoi

3. Research Method

With the goal of studying the impact of the management accounting system and the circular economy model on the performance of enterprises, the author uses quantitative research, specifically applying PLS-SEM. According to Henseler & Chin (2010) [8], when applying PLS-SEM, the research model is evaluated through two steps: the evaluation of the measurement model and the structural model. First, the measurement model is evaluated by evaluating the reliability, convergence value, and discriminant validity of the measurement concepts in the model. Next, the structural model is evaluated through the coefficient of determination R2, the path coefficient. According to Schumaker and Lomax (1996), the bootstrapping test method is a suitable method to evaluate the reliability of the estimates in the analysis of linear structural models..

The number of survey questionnaires distributed was 130, sent to 130 businesses, and the number of votes collected was 115 from 115 businesses, reaching 88.5%. All receipts met the required information requirements.

The author built a questionnaire on Google Forms, sent it to the chief accountant and business director via email according to a convenient sampling method, and sent it to friends, relatives, and partners.

The scales of this study are inherited from Gordon and Narayanan (1984) with 4 variables on "Management accounting system", Lee and Min (2015) [11] with 5 variables on "Circular economic model" and Zhu *et al*. (2016) [15] with 4 variables on "Operating efficiency".

Apply the 5-point Likert scale: 1- Strongly disagree; 2 - Disagree, 3 - Normal, 4 - Agree, 5- Strongly Agree

Table 1: Description of variable scale

S. No	Factor	Code	No. Variables
1	Management accounting system	MAS	4
2	Circular economy	CE	5
3	Operational efficiency	EF	4

From the above theoretical analysis, the research model is proposed:

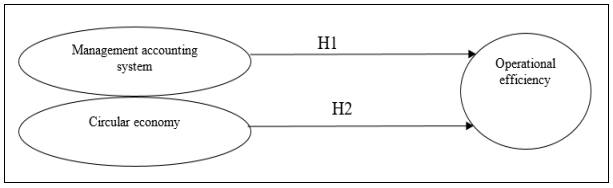

Fig 1: Proposed research model

4. Results

4.1 Measurement Model Analysis

Hair *et al* (2014) [5] suggested that the outer loading factor should be greater than or equal to 0.708 observed variables that are quality. According to the survey results, 13 observed variables all have an upload system of more than 0.708, so all observed variables are evaluated as having high quality.

Table 2: Outer Loadings

	CE	EF	MAS
CE1	0.828		
CE2	0.740		
CE3	0.747		
CE4	0.808		
CE5	0.833		
EF1		0.791	
EF2		0.714	
EF3		0.858	
EF4		0.757	
MAS1			0.733
MAS2			0.782
MAS3			0.839
MAS4			0.720

After the observed variables were evaluated for quality, the author assessed the reliability of the scale. The reliability of the variables in the measurement model is assessed through two main indicators, Cronbach's Alpha and Composite Reliability. Many researchers such as Hair *et al*. (2010), and Bagozzi & Yi (1988) [2] agree that 0.7 is an appropriate threshold. The values of Cronbach's Alpha and Composite Reliability in this study on management accounting systems, circular economy models, and business performance are all higher than 0.7. Therefore, the study's scales ensure reliability.

Table 3: Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CE	0.853	0.873	0.894	0.627
EF	0.787	0.803	0.862	0.611
MAS	0.775	0.813	0.853	0.593

To evaluate the convergence, the author relies on the average variance extracted index AVE (Average Variance Extracted). Hock & Ringle (2010) [7] suggest that a scale achieves convergent value if the AVE is 0.5 or higher. The measurement model analysis shows that the AVE values of the management accounting system and the circular economy model are all greater than 0.5 (Table 3). That measures the convergence of the accepted variables.

Next, the author uses the Fornell-Larcker Criterion to test the discriminant validity of all measurement models. Fornell and Larcker (1981) recommend that discriminability is guaranteed when the square root of the AVE for each latent variable is higher than all correlations between the latent variables. Table 4 shows that the square root of the AVE values of all variables (management accounting system, circular economy model) is more important than the correlation values between the structures.

Table 4: Discriminant Validity Fornell-Larcker Criterion

	CE	EF	MAS
CE	0.792		
EF	0.483	0.782	
MAS	0.261	0.467	0.770

With the HTMT index, Henseler *et al*. (2015) suggest that if this value is below 0.9, discriminant validity is guaranteed. Table 5 shows that all HTMT indexes are less than 0.9. Therefore, all variables have discriminant values.

Table 5: Heterotrait-Monotrait Ratio (HTMT)

	CE	EF	MAS
CE			
EF	0.563		
MAS	0.286	0.560	

4.2 Structural Model Analysis

Before conducting structural model analysis, the author checks and evaluates the phenomenon of multicollinearity between latent variables. According to Hair *et al*. (2019), if the VIF is from 3 onwards, the model has a very high probability of having multicollinearity. The analysis results show that the resulting VIF coefficients are all less than 3, so there is no multicollinearity in the model.

Table 6: Inner VIF Values

	CE	EF	MAS
CE		1.073	
EF			
MAS		1.073	

The results of structural model analysis show that all P Values of the effects are equal to 0.000 < 0.05, so these effects are statistically significant. Specifically, the results of PLS-Sem confirm that the management accounting system has a positive impact on corporate performance in Hanoi (β=0.366, P<0.050), supporting hypothesis H1. Meanwhile, the results of PLS-Sem confirm that the circular economy model has a positive impact on corporate performance in Hanoi (β=0.388, P<0.050), supporting hypothesis H2.

Table 7: Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
CE -> EF	0.388	0.394	0.065	5.947	**0.000**
MAS -> EF	0.366	0.372	0.064	5.700	**0.000**

To evaluate the impact of one or more independent variables on a dependent variable in the SEM model, the author uses the adjusted R-squared index. The adjusted R-squared of EF is 0.347, so the independent variables affecting EF including MAS and CE have explained 34.7% of the variation (variance) of the EF variable.

Table 8: R Square

	R Square	R Square Adjusted
EF	0.358	0.347

5. Conclusion

The results of the partial least squares structure model have identified two factors: the management accounting system and the circular economy model, that have a positive and significant impact on improving the performance of enterprises in Hanoi. Two independent variables, the management accounting system and the circular economy model, explained 34.7% of the variation of the dependent variable on corporate performance.

Therefore, the research has shown that the role of information provided by the management accounting system is the basis for Hanoi's corporate administrators to make many decisions that contribute to improving business performance. With a timely and reliable source of information, businesses in Hanoi will cut costs, manage time effectively, and operate smoothly in a fiercely competitive environment. Using an effective management accounting system helps to improve company performance and increase competition for businesses.

Circular economy development is an inevitable trend in sustainable development. The reason is due to the increase in demand for raw materials, while this source of raw materials is increasingly depleted, especially for mineral resources and non-renewable resources; the impact on climate change (emission of greenhouse gases) increases the process of extreme climate change, causing serious consequences; and it creates economic opportunities, especially for businesses in innovation, design, recycling, and creativity. In the current business environment, business managers are always aware of the environment, so the role of transforming the circular economy model is highly appreciated by business managers. According to the above research results, transforming the circular economy model has a positive impact on the performance of enterprises in Hanoi, thereby being a premise for the sustainable development of enterprises. The circular economy promotes new innovative business models and breakthrough technologies that help businesses in Hanoi improve operational efficiency through cost reduction; reduce energy consumption and CO2 emissions; strengthen supply chains and conserve resources; contribute to reducing the risk of over-product crises and resource scarcity; create motivation to invest, innovate technology, reduce production costs, increase supply chain.

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