

CUSTOMER ACCOUNTING STRATEGY OF COMMERCIAL BANKS

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Abstract

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Customer accounting (CA) is a strategic management accounting (SMA) technique (McManus & Guilding, 2008; Nuong, 2020) that helps evaluate customer value, optimize costs, support decision-making, enhance customer relationship management, and improve organizational efficiency. The need for CA is grounded on the growing popularity of customer relationship management as a strategic business orientation (Au & Tse, 2021). This study examines the current status of CA practice at the Head Office and branches of Vietnamese commercial banks and surveys 189 managers, accountants, and credit experts at banks on factors affecting CA practice, assessing the impact of CA implementation on the performance of Vietnamese commercial banks. The study uses mixed methods, combining qualitative and quantitative approaches through conducting interviews and surveys using questionnaires. The results show that CA is implemented at different levels among Vietnamese commercial banks; five factors positively affect CA implementation at Vietnamese commercial banks in order from high to low, including environmental uncertainty, business strategy, information technology application, organizational culture, and competitive intensity. The study also found a significant impact of CA implementation on the performance of Vietnamese commercial banks. Based on the survey results, the study provides recommendations to help Vietnamese commercial banks enhance their application of CA, thereby improving the organization's operational performance.

Keywords: Customer Accounting, Operate Performance, Commercial Banks, Influencing Factors

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1. INTRODUCTION

Customers are the ones who decide the existence and development of the organization. Competing effectively in the contemporary marketing landscape is becoming increasingly challenging. Equally increasing, therefore, is the pertinence for organizations to be customer-oriented (Ojra et al., 2023). Information about the organization's customer activities should be analyzed and incorporated into business decisions. Therefore, companies are increasingly using customer accounting (CA) to support strategic planning, implementation, and evaluation of strategies with customers to achieve business performance. CA has

the potential to be implemented in all industries, but the service industry tends to use CA information more than other industries, such as trade and construction (Cadez, 2006). Although recent years have witnessed a slight increase in studies promoting accounting analyses based on individual customers or customer groups, the overall number of such studies remains small (McManus, 2013). Au and Tse (2021) and Ojra (2014) have emphasized the need to further clarify CA practices scientifically.

Banking is one of the financial service industries that mobilizes and provides capital for economic development, playing an essential role in the strong growth of countries (Allan et al., 2021), especially countries with transitional economies like

Vietnam that face many uncertain factors in business conditions. In recent years, regulatory, structural, and technological factors have dramatically changed the banking environment, leading to intense competition among Vietnamese commercial banks. This requires banks to develop customer-oriented strategies to compete successfully in this highly competitive environment, including implementing CA to varying degrees. However, the extent to which CA is implemented in Vietnamese commercial banks remains unclear, as CA is still a relatively new concept that has not received much attention from scholars (Nguyen & Le, 2023).

This study aims to fill that knowledge gap by evaluating the current state of CA implementation, the degree to which various factors influence CA usage, and the impact of CA application on the performance of Vietnamese commercial banks. A questionnaire was used to collect data, with analysis based on 189 responses from managers and accountants at participating Vietnamese commercial banks. The research seeks to answer the following question:

RQ1: To what extent are Vietnamese commercial banks implementing CA practices?

Based on contingency theory, a research model and hypotheses were developed to answer two additional questions:

RQ2: What are the contingency factors that influence the implementation of CA in these banks?

RQ3: What is the impact of CA practices on the organizational performance of Vietnamese commercial banks?

This research contributes to the growing body of knowledge about CA in the Vietnamese banking sector, which is crucial. An in-depth understanding of CA and the factors influencing its implementation will support Vietnamese bank managers in making more informed, customer-related business decisions to enhance performance.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 outlines the research methodology. Section 4 discusses the main findings, while Section 5 provides additional discussion. Finally, Section 6 presents the concluding remarks.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Literature review

Customer accounting is considered a part of strategic management accounting (SMA), defined as identifying, measuring, communicating, and reporting economic information related to customers or customer groups. Guilding and McManus (2002) and Lind and Strömsten (2006) divided CA into four types according to the implementation method: customer profitability analysis (CPA), customer segment profitability analysis, analysis of customer lifetime profitability, and value customers as assets. Then Cadez and Guilding (2008) arranged them into three groups: CPA, customer lifetime profitability analysis, and customer asset valuation.

CPA: This is critical to CA. Accordingly, the profit earned from a specific customer/customer group will be determined based on the revenue and

costs that can be tracked for that customer/customer group. This tool aims to choose customer, market, and distribution channel strategies.

Lifetime customer profitability analysis (LCPA): This is essential to CA (Cadez & Guilding, 2008; McManus, 2013). This tool extends the time horizon for CPA to include future years. It focuses on all expected future revenue streams and costs in servicing a particular customer (Cadez & Guilding, 2008). When determining customer lifetime value, at least the following information is required: remaining customer lifetime (period, e.g., in years), net cash flows over these years, and capital expenditure.

Valuation of customers as assets (VCA): Valuing customers as assets refers to a comprehensive approach that involves managing customer relationships as assets to maximize customer equity through the total value of a company's current and potential customers. This technique refers to calculating the value of a customer to a company by determining the current value of a particular customer (Cadez & Guilding, 2008). This is usually done by computing the present value of all future streams attributable to a particular customer.

CA is integral to SMA (Foster & Gupta, 1994; Hoque, 2001). How accounting measures customers is an essential topic in both practice and academia. However, according to McManus (2013), the number of studies on CA still needs to grow. Therefore, Fish et al. (2017) and Ojra (2014) argue that CA research needs to be strengthened. In recent years, the number of CA studies has improved. In addition to critical studies describing the nature and potential of CA, e.g., Foster and Gupta (1994), most of the studies have focused on explaining different CA techniques such as CPA (Kaplan & Narayanan, 2001; Mulhern, 1999), valuation of customer as asset (Gupta & Lehmann, 2003) and lifetime customer profitability (Pfeifer et al., 2005; Reinartz & Kumar, 2003). Empirical studies on CA have also attracted many scholars, including CA studies as a component of the SMA tools system and in-depth studies on CA. Of these, in-depth studies on CA are fewer and can be seen as examples such as Al-Mawali et al. (2012), McManus (2013), Ussahawanitchakit (2017), and Ojra et al. (2023). Empirical research shows inconsistent results on the level of implementation of CA tools, factors affecting CA implementation, and the impact of CA implementation on business performance. The research results of Al-Mawali et al. (2012) show that CA information used in Jordanian companies is above average, except for customers' valuation as assets, which is used below average. The most used technique is CPA, followed by LCPA, and the lowest is the valuation of the customer as an asset. Business performance is impacted by how organizations use CA information. Ussahawanitchakit (2017) empirically confirmed that both CPA and VCA are critical aspects of CA, which play an essential role in explaining business performance. Customer lifetime profitability analysis does not affect the performance of the business. McManus (2013) surveyed 165 hotel managers in Australia. The results provided evidence that large, highly market-oriented hotels with decentralized structures use more customer-centric marketing and accounting methods. A strong positive correlation was also supported between market orientation and

prospector-type strategy and between market orientation and financial and non-financial performance. To evaluate the degree of CA tool implementation and the effect of CA implementation on hotel performance (financial and non-financial), the model incorporates two groups of internal factors (business strategy, market orientation, organizational size, and organizational structure) and external factors (intensity of competition, perception of environmental uncertainty).

Ojra et al. (2023) study on CA practices in the Kuwaiti financial services industry discovered five contingent factors affecting CA implementation: intensity of competition, organizational strategy, perception of environmental uncertainty, centralization process, and formalization process. The study results found that units with a higher intensity of competition will use CA more, organizations pursuing a prospector strategy will apply CA more than defenders, and organizations with a high level of formalization process will apply CA more. The results also show that the application of CA positively impacts the performance of financial institutions in Kuwait. In Vietnam, several empirical studies on CA have been conducted as a tool of SMA, such as Anh (2012), Quy (2020), Nuong (2020), Nguyen et al. (2023), and Do and Tran (2024). The studies agree that SMA, including CA, is implemented at a low level in Vietnamese enterprises and that the implementation of SMA positively impacts enterprises' performance. Quy (2020) investigated and discovered six factors that positively affect the implementation of SMA in the production enterprises in the Southeast region of Vietnam, including company size, level of competition, business strategy development, accounting participation in strategic decision-making, management decentralization, and technology level. Nuong (2020) surveyed 301 medium and large-scale manufacturing enterprises in Vietnam and found that the customer asset assessment technique was used the least frequently among the applied SMA techniques. Seven factors affecting SMA implementation in Vietnamese manufacturing enterprises include market fluctuations, competitive intensity, organizational structure, organizational technology, organizational strategy, culture, and employee qualifications.

From empirical studies, it is shown that although CA has the potential to be implemented in all industries, from manufacturing to services, with the characteristics of customer relationships with activities, CA plays an important role and receives more attention, especially in the hotel sector with typical studies such as Guilding and McManus (2002) and McManus (2013). In the banking sector and financial institutions, it needs to be implemented more in general studies on SMA as a technique of SMA. Among the tools of CA, the CPA tool is used by many organizations.

2.2. Contingency theory and model of factors affecting customer accounting implementation

Contingency theory was developed in the 1960s as an approach to studying organizational behavior, emphasizing the role and influence of situational factors on the operations of businesses. The theory explains the relationships between influencing factors and business performance by analyzing

business behavior and explaining specific contextual factors such as environment, strategy, and size that can affect the above relationship. Contingency theory began to be applied in management accounting research in the 1970s (Hutaitab, 2005). According to Cadez and Guilding (2008), Otley (2016), and Fisher (1995), contingency theory is considered the dominant model in management accounting research. Contingency theory has been applied in management accounting research in general and SMA in particular, with the implication that the successful implementation of SMA techniques depends on specific contingency factors, including the environment, technology, size, and structure of an organization as well as competitive strategy, strategic mission and culture (Anh, 2012; McManus, 2013; Nuong, 2020; Ojra et al., 2023; Quy, 2020). The successful application of SMA will result in the company's business performance. Based on the contingency theory and previous empirical studies, the model and research hypotheses are stated as follows:

Intensity of competition: The business environment in which organizations operate is constantly changing. The development of technology, communication, and new materials rapidly changes consumer tastes, thus increasing the level of competition that organizations face. Foster and Gupta (1994) suggested that CA systems may be more suitable for companies operating in highly competitive markets. On the other hand, where there is low competition, often in government-controlled monopolies, the demand for CA will be limited (Guilding & McManus, 2002). In recent years, with the need for capital to meet the high-growth economy and rapid integration into the global economy, the banking industry in Vietnam has significantly increased the number of commercial banks. It is believed that the intensity of competition in the banking sector is increasing, so banks must pay more attention to measuring, communicating, and reporting economic information related to customers to meet the needs of making business decisions. Therefore, the first hypothesis is stated as:

H1: Competitive intensity has a positive relationship with CA implementation in Vietnamese commercial banks.

Perception of environmental uncertainty: Perception of environmental uncertainty is related to managers' inability to predict their company's external environment accurately. In an environment with high uncertainty, managers need information that is timely and up-to-date and provides quick feedback on decisions. Theoretically, organizations operating in highly uncertain environments will have a higher demand for accounting information; however, when studying the influence of the perceived level of uncertainty of the business environment on the application of CA, different scholars have given conflicting opinions. For example, McManus (2013) found no support for the hypothesis that there would be a higher rate of use of CA measures in hotels where managers perceive more significant environmental uncertainty, while Ojra et al. (2023) suggested that perceptions of environmental uncertainty would negatively impact the use of SMA techniques (including CA). Based on the theoretical and empirical evidence, hypothesis H2 is stated as follows:

H2: Perception of environmental uncertainty has a positive relationship with CA implementation in Vietnamese commercial banks.

Information technology (IT): IT changes how people produce, communicate, and consume (Grabski et al., 2009). The changes in IT are core aspects of technological development in organizations and structure the overall modern business market, leading to automation in operations. IT helps consumers find the best products, services, and suppliers. IT allows organizations to collect and analyze customer needs faster and more accurately based on big data and virtual reality. Therefore, with IT development, organizations have many opportunities and obstacles to implement CA. Hyvönen (2007) stated that IT supports the development of management accounting and strategic management systems. Therefore, hypothesis *H3* is stated as follows:

H3: Information technology application has a positive relationship with CA implementation in Vietnamese commercial banks.

Business strategy: Business strategy is the formulation of long-term operational objectives of the organization for the future and planning how to achieve the organizational objectives (Ojra, 2014). Building a business strategy is how an organization becomes unique and effectively develops a competitive advantage. Business strategy is another crucial variable proposed in the management accounting literature because it influences an organization's CA information needs. Based on prior research (Ojra, 2014; Guilding & McManus, 2002; Nuong, 2020), there are more and more opinions that the application of SMA is influenced by business strategy. McManus (2013) and Ojra (2014) found that prospecting companies have a higher demand for SMA information than defender companies. Nuong (2020) believes that to maintain existing market share and expand new markets, most Vietnamese manufacturing enterprises implement a prospector business strategy, so they need information provided by SMA. The research results of Nuong (2020) also confirm that the companies implement a prospector

business strategy in the same direction as SMA implementation. Vietnamese commercial banks must create suitable business plans in the current dynamic business climate. Therefore, hypothesis *H4* is stated as follows:

H4: Business strategy has a positive relationship with CA implementation in Vietnamese commercial banks.

Supportive culture: Schein (2010) considers culture an important factor and a driving force in determining the effectiveness of business operations. Organizational culture is expressed in the beliefs, values, attitudes, and behaviors of members of the organization. Aspects of organizational culture act as a premise for operational efficiency, a driving force for progress, and a foundation for differentiation and breakthrough for the organization. When an organization has a consensus of support among its employees, departments, and managers, it is easy for them to formulate and implement successful business strategies. Nuong (2020) has studied the influence of culture on the success of applying SMA, including CA. The results show that the higher the supportive culture, the greater the influence on implementing SMA. The relationship between corporate culture and CA implementation is stated as follows:

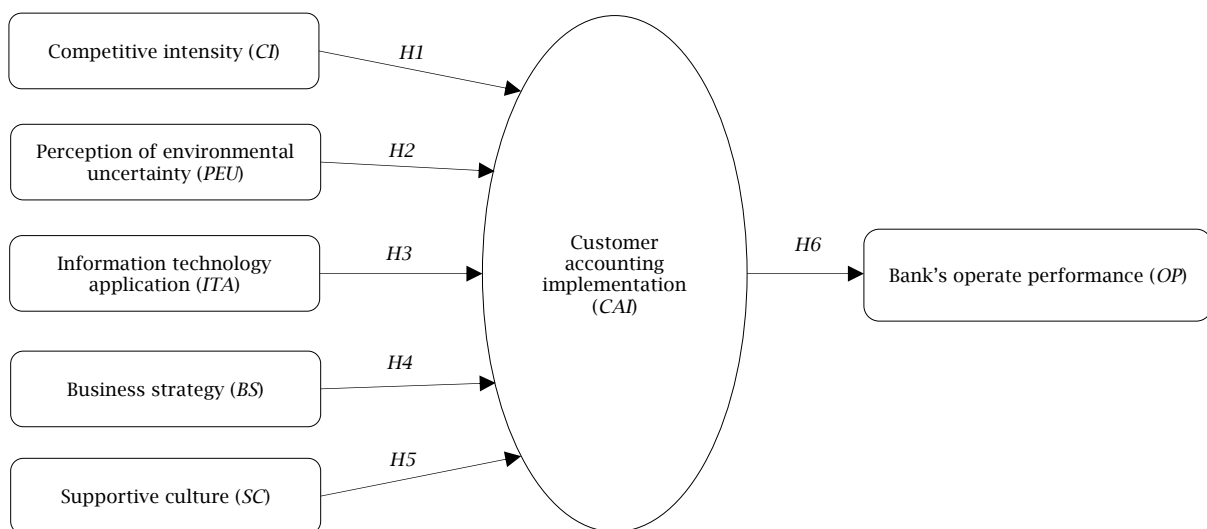
H5: Supportive culture has a positive relationship with CA implementation in Vietnamese commercial banks.

Impact of CA adoption on bank performance: According to the contingency theory, organizational performance depends on how the organization is organized. On the other hand, previous studies have shown different results on the relationship between the application of SMA (including CA), such as Cadez and Guilding (2008), Anh (2012), Al-Mawali et al. (2012), Quy (2020) and Nuong (2020). Therefore, *H6* is stated as follows:

H6: CA implementation has a positive relationship with bank performance.

The research model proposed by the author is described in Figure 1:

Figure 1. Model of factors affecting customer accounting



3. RESEARCH METHODOLOGY

To conduct the research, the authors used a survey investigation method by designing a questionnaire to collect information on the current application of CA and factors influencing CA in commercial banks in Vietnam.

The questionnaire consists of three parts:

1. The first part includes general information about the survey subjects.
2. The second part consists of survey questions exploring the current application of CA in Vietnamese commercial banks.
3. The third part contains survey questions on factors affecting the application of CA and the impact of CA application on the performance of commercial banks.

In the section analyzing the current status of the research issue, the questions aim to evaluate the implementation of CA by commercial banks. In the content concerning factors affecting CA application and testing the relationship between CA application and bank performance, the authors rely on a model with six proposed factors to define 32 observed variables (Appendix, Table A.1), measured on a five-point Likert scale, ranging from level 1 (strongly disagree) to level 5 (strongly agree).

The research process was conducted as follows:

Step 1: Survey to refine the questionnaire.

In this step, the authors conducted direct surveys with two groups: experts in the research field, including accounting lecturers at two universities, and individuals such as accountants, staff, department heads, and directors at five commercial banks. The interview subjects were informed in advance about the purpose and general content of the interview. All participants explicitly agreed to take part in the interview process. The author committed to using the responses solely for research purposes and not for any other purposes.

Interviews with accounting experts at universities: Interviews conducted with academic experts in accounting were guided by a semi-structured format, utilizing a set of pre-designed questions with flexibility for follow-up inquiries based on participants' responses. The discussions primarily centered on the techniques of CA and their potential applicability within the banking sector. Based on expert feedback, it was recommended that the questionnaire be developed around the specific components and practices of CA, rather than referencing the three core techniques explicitly. This adjustment was suggested to avoid potential misunderstandings among respondents who may not possess in-depth familiarity with these technical approaches.

Interviews with experts at commercial banks: A structured questionnaire was employed in interviews with professionals from commercial banks, aiming to preliminarily assess factors influencing the adoption of CA practices within these institutions. The insights gained from these interviews facilitated the refinement of two observed variables associated with the construct of competitive intensity, thereby enhancing their relevance to the operational context of Vietnamese commercial banks.

Moreover, the interviews revealed that a significant number of participants lacked adequate understanding of CA. In response, the scope of

the target population for the formal survey was narrowed to individuals possessing relevant knowledge or holding roles in departments directly involved in the collection and processing of CA information (e.g., executive management, accounting, and finance departments).

The expert interviews played a crucial role in validating and adjusting the questionnaire, thereby ensuring its conceptual clarity and contextual relevance prior to the large-scale survey implementation.

Based on the feedback and suggestions from these experts and preliminary survey participants, the initial questionnaire was adjusted to be more complete before the official survey.

Step 2: Conducting the official survey. Before conducting the survey, the authors defined the research sample. The sampling procedure began with defining the overall sample. According to statistics at the time of the research, 35 commercial banks operated in Vietnam, including 31 joint-stock commercial banks and four state-owned commercial banks. The authors used purposive sampling, focusing on individuals with knowledge or those working in areas related to collecting, analyzing, and processing CA data, including accounting, finance departments, and directors at the 35 headquarters and 47 branches of Vietnamese commercial banks.

Step 3: Data collection. 342 surveys were distributed directly or online to individuals in the research sample. Of these, 195 responses were collected, with 189 valid responses after filtering. A valid response included complete information and non-identical answers to all questions.

Step 4: Data processing. Based on the collected data, the authors applied descriptive statistical methods to reflect the current state of CA applications in banks. They also conducted reliability analysis, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) using R software (R is a free software environment for statistical computing and graphics) to test the influence of various factors on CA practices and assess the impact of CA on the performance of Vietnamese commercial banks.

4. RESULTS

4.1. Survey results on the application of customer accounting at Vietnamese commercial banks

From the collected data, the author employs the descriptive statistics method to process the data. Information about the survey participants is detailed in Table 1.

Table 1. The demographics of the survey participants

Characteristics	Number	Rate (%)
Position		
Branch accounting	21	11.11%
Headquarters accounting	63	33.33%
Branch leadership	21	11.11%
Headquarters leadership	22	11.64%
Branch finance department	25	13.23%
Headquarters finance department	37	19.58%
Years of service		
< 5 years	37	19.57%
5-10 years	47	24.87%
10-20 years	79	41.80%
Over 20 years	26	13.76%

To analyze the application of CA in commercial banks, the authors filtered the survey responses to ensure that participants from the same bank provided consistent answers to specific questions. These questions focused on how banks conduct customer profitability and lifetime value analyses and assess customer valuation as an asset.

If responses within the same bank were consistent, the survey response was deemed reliable and included.

After data filtering, the results showed in Table 2 indicated that responses within the same bank were consistent, ensuring the data's reliability for descriptive statistical analysis.

Table 2. The results of customer accounting at 35 commercial banks in Vietnam

No.	CA practice description	Rate (%)
1	The bank tracks individual direct costs for each customer.	71.4
2	The bank consolidates common costs based on cost categories.	65.7
3	The bank allocates common costs to each customer using a standard criterion.	85.71
4	The common criterion used is usually the average balance.	82.86
5	The bank tracks detailed customer service costs.	82.85
6	The bank allocates customer service costs to each individual customer.	31.42
7	The bank calculates profit per customer.	82.85
8	The bank determines the customer profitability ratio/customer service cost for certain customers/groups.	77.14
9	The bank identifies the churn rate for customers/customer groups.	77.41
10	The bank forecasts income for each customer group/segment over the next five years.	77.41
11	The bank forecasts income for each customer group/segment over the next 10 years.	45.16

The results indicate that all banks are applying various CA techniques to some extent, emphasizing cost collection and analysis. Many banks (71.4%) track individual direct costs for each customer. For typical costs, 65.7% of banks consolidate them by cost category, and most banks allocate these costs to individual customers using a common criterion, typically the average balance. However, while banks track total customer service costs, they generally do not allocate these costs to individual customers but instead group them into expected costs. A high proportion of banks (82.85% and 77.14%, respectively) track and determine profit and profitability ratios by customer. Banks also analyze and assess customer churn rates (77.41%). Banks are interested in forecasting future customer income to determine customer value, typically within five years (77.41%).

Despite the widespread implementation of CA practices, all respondents noted the complexity of these techniques. They also cited challenges such as insufficient analytical data and tools hindering effective implementation.

4.2. Survey results on factors affecting customer accounting in commercial banks in Vietnam

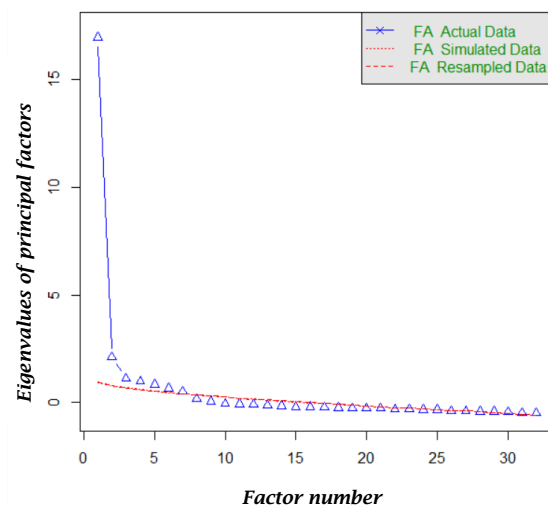
4.2.1. Reliability and validity analysis

The researchers carried out a Kaiser-Meyer-Olkin (KMO) test to assess the dependability of the data for analysis. Kaiser (1974) advised a minimum value of 0.5. However, the KMO result was 0.94.

To select the number of main factors to extract, the study used parallel analysis. The results, shown in Figure 2, suggest that seven factors are appropriate.

The study used EFA using a cutoff level of 0.50 to determine the variables that make up each factor. This figure was chosen using the rule that a factor loading > 0.4 is essential, and a factor loading > 0.5 is practically significant.

Figure 2. Results of parallel analysis to determine the appropriate number of factors for the model



From the analysis results in Table 3, the observed variable *PEU2* was removed from the model. Based on the survey data, the model includes the following factors:

- Factor 1: *CI* — includes variables *CI1*, *CI2*, *CI3*, *CI4*, *CI5*;
- Factor 2: *PEU* — includes variables *PEU1*, *PEU3*;
- Factor 3: *BS* — includes variables *BS1*, *BS2*, *BS3*, *BS4*, *BS5*;
- Factor 4: *ITA* — includes variables *ITA1*, *ITA2*, *ITA3*, *ITA4*;
- Factor 5: *SC* — includes variables *SC1*, *SC2*, *SC3*;
- Factor 6: *CAI* — includes variables *CAI1*, *CAI2*, *CAI3*, *CAI4*, *CAI5*, *CAI6*, *CAI7*;
- Factor 7: *OP* — includes variables *OP1*, *OP2*, *OP3*, *OP4*, *OP5*.

Table 3. Results of the analysis of observed variables constituting factors

Factor	PA1	PA6	PA2	PA3	PA5	PA4	PA7
CI1			0.82				
CI2			0.84				
CI3			0.84				
CI4			0.82				
CI5			0.81				
PEU1							0.80
PEU3							0.69
BS1				0.58			
BS2				0.76			
BS3				0.65			
BS4				0.74			
BS5				0.77			
ITA1					0.80		
ITA2					0.85		
ITA3					0.78		
ITA4					0.59		
SC1						0.91	
SC2						0.79	
SC3						0.80	
CAI1	0.71						
CAI2	0.74						
CAI3	0.76						
CAI4	0.71						
CAI5	0.74						
CAI6	0.74						
CAI7	0.56						
OP1		0.74					
OP2		0.71					
OP3		0.84					
OP4		0.93					
OP5		0.84					

Note: PA stands for parallel analysis.

Source: Authors' elaboration.

In the current study, reliability analysis was performed using the R program. Cronbach's alpha was used to measure the scales' reliability. Previous research suggests that a Cronbach's alpha above 0.7 is appropriate (Cronbach, 1951). Table 4 shows Cronbach's alpha values ranging from 0.86 to 0.97, which meet the required reliability criterion.

Table 4. Scale reliability test results

Constructs	Mean	Standard deviation	Cronbach's alpha
CI	4.0	0.84	0.95
PEU	3.9	0.79	0.86
BS	3.9	0.87	0.93
ITA	4.1	0.94	0.93
SC	3.9	0.92	0.87
CAI	4.0	0.85	0.96
OP	4.2	0.83	0.97

4.2.2. Model fit analysis

Based on the results from the EFA analysis, the model with seven factors and associated variables was confirmed as suitable for measurement. To test whether the measurement model is effective and whether the scales meet the requirements, this study conducted a CFA. Table 5 presents some key values from the CFA test.

Table 5. Confirmatory factor analysis fit indices results

Indicator	Value	Requirement
Chi-square / df	893.091 / 413.000 = 2.16	<= 3
Root mean square error of approximation (RMSEA)	0.079	< 0.08
Comparative fit index (CFI)	0.984	> 0.93
Tucker-Lewis index (TLI)	0.982	> 0.93
Standardized root mean square residual (SRMR)	0.055	< 0.09

The absolute fit indices for the structural model in this study are $\chi^2/df = 2.16$ and RMSEA = 0.079. According to Hair et al. (2019),

χ^2/df values below 3, RMSEA values below 0.08, CFI values > 0.93, TLI values > 0.93, and SRMR values < 0.09 are considered to indicate a good fit. Overall, the results shown in Table 6 indicate that the measurement model fits well with the observed data, suggesting that the structural model in this study effectively explains the causal relationships among the concepts.

4.2.3. Path analysis

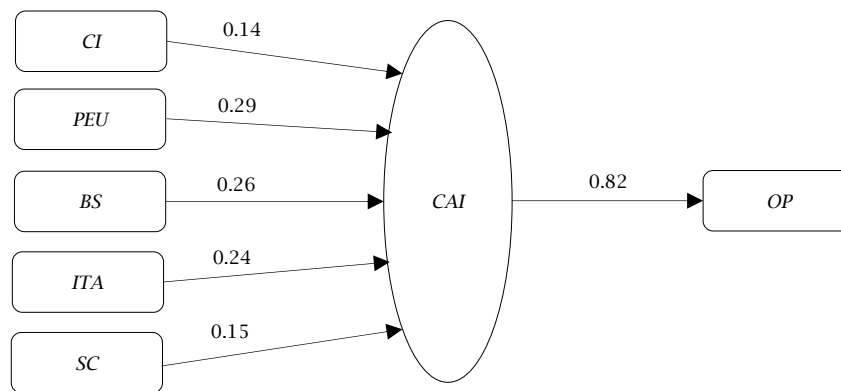
The structural equation modeling model was tested using R software. The estimated parameters of the latent variables (CI, PEU, BS, ITA, SC, CAI, OP), as described in Table 6, are all statistically significant ($p > |z| < 0.05$), indicating that the relationships between the observed variables and the latent variables are meaningful.

Table 6. Regression analysis between factor variables in the model

Factor	Estimate	Std. error	z-value	p (> z)
CAI				
CI	0.274	0.125	2.197	0.028
PEU	0.572	0.151	3.787	0.000
BS	0.503	0.140	3.601	0.000
ITA	0.464	0.144	3.226	0.001
SC	0.294	0.112	2.631	0.009
OP				
CAI	0.739	0.084	8.790	0.000

The path coefficients for each hypothesis are presented in Figure 3 and are statistically significant. CI is related to CAI ($\beta = 0.14$, $p < 0.01$), supporting H1. PEU is positively related to CAI ($\beta = 0.29$, $p < 0.001$), supporting H2. BS is positively related to CAI ($\beta = 0.26$, $p < 0.001$), supporting H3. ITA is positively related to CAI ($\beta = 0.24$, $p < 0.01$), supporting H4. SC is related to CAI ($\beta = 0.15$, $p < 0.01$), supporting H5. CAI has a strong correlation with OP ($\beta = 0.82$, $p < 0.001$), supporting H6.

Figure 3. Path analysis's results



5. DISCUSSION AND RECOMMENDATIONS

5.1. Discussion

The research results show that the factor *PEU* is the most significant factor influencing the implementation of CA at commercial banks in Vietnam ($\beta = 0.29$, $p < 0.001$). This result differs from the Ojra et al. (2023) and McManus (2013) studies. The characteristics of the banking sector in Vietnam can explain this. The financial market in Vietnam is not yet fully stable. It is affected by various factors: the influence of international financial markets, the state bank's interest rate management, and the interest rate adjustments made by competing banks. When banks perceive market uncertainty, to improve operational efficiency, they need to analyze customer-related factors, such as customer service costs, customer profitability, customer churn rate, etc., to make appropriate decisions in managing and retaining customers effectively while attracting new ones. Attracting customers and outperforming competitors is the primary goal of every bank, and when market uncertainty is recognized, banks are more likely to implement CA.

The factor *OP* also positively impacts the implementation of CA in commercial banks in Vietnam. Each organization, particularly banks, may have different operational strategies at other times. For banks with a strategy focused on customers by increasing customer satisfaction and offering products/services that meet customer needs to maximize profits, there will be a tendency to implement CA.

The factor *ITA* is one of the critical factors affecting the implementation of CA in commercial banks in Vietnam. This result aligns with the research findings of Quy (2020) and Nuong (2020), which are studies conducted in the same context of organizations operating in the Vietnamese market. Due to the nature of the banking industry, which is constantly faced with significant challenges in managing vast amounts of data, ensuring accuracy and safety in data mining for strategic decision-making is not easy. In 2021, the State Bank of Vietnam approved the digital transformation plan for the banking sector through 2025, with a vision for 2030. However, most commercial banks are still in the early stages of their data management implementation roadmap. A study on digital banking

in Southeast Asia by PricewaterhouseCoopers (PWC, n.d.) reported that the top digital skills gap in banks is the lack of data science analysis skills (67%), followed by business analysis (48%) and overall architecture (37%). Therefore, the *ITA* factor will significantly impact data collection and processing for implementing CA in the banking sector.

According to the authors' research, the *SC* factor influences the implementation of CA in commercial banks. In practice, the connection between departments and divisions and the support from management will be crucial in facilitating the collection and processing of customer data. In a bank, depending on the type of transaction, customer data may be generated across various departments, such as credit, treasury, etc. Therefore, coordination between departments to achieve common goals is extremely important for analyzing customer profits, evaluating customers, etc.

The factor *CI* in the authors' research is identified as influencing the implementation of CA in banks. This result aligns with the findings of Ojra et al. (2023) and McManus (2013). The current competitive context in all sectors of the economy can explain this. However, unlike the study by Ojra et al. (2023), which suggests that *CI* is the most vital influencing factor, this study finds that *CI* is the weakest factor influencing CA implementation in banks. In the banking sector in the Vietnamese market, in terms of individual and small customers, competition over interest rates is one of the most decisive competitive factors. However, the State Bank of Vietnam sets the operating interest rates and determines the maximum interest rate ceiling for deposits by organizations and individuals at banks. As a result, one of the competitive factors between banks is limited, leading to a reduction in the level of competition. Therefore, while competition does influence the implementation of CA, it is not the most dominant factor. The products and services commercial banks offer are often not significantly differentiated.

The study's results also indicate that the implementation of CA has a significant impact on the performance outcomes of banking organizations, which further supports the findings of previous studies (Ojra et al., 2023). In commercial banks in Vietnam, the application of CA helps banks assess the results of individual customers/customer groups, predict expected profits over the near future, and, as a result, assist banks in making

critical strategic decisions, improving the bank's overall performance.

The study results faced limitations regarding the research context and survey subjects during the research process. Apart from the headquarters, each commercial bank in Vietnam has hundreds of branches nationwide. However, during the survey process, the study could not survey a larger sample size due to constraints on time and accessibility to the survey subjects. Therefore, future research with larger sample sizes is necessary. This will provide more accurate insights into the factors affecting the adoption of CA and its influence on the operational performance of commercial banks in Vietnam.

5.2. Recommendation

The implementation of CA is essential as it will have a significant impact on improving the performance outcomes of the organization. Therefore, banks should strengthen the implementation of CA through specific measures such as:

Firstly, banks need to modernize their IT systems and enhance the application of IT in collecting, processing, and analyzing customer data. Since customer-related data in banks is large and complex, appropriate supporting tools are necessary to meet the management accounting needs of customers with diverse and complex information requirements.

Secondly, enhancing the connectivity between departments within the banking system is essential. As analyzed in the current situation, customer data is generated across various departments. An effective connection will ensure that data collection and processing are comprehensive, accurate, and efficient. This requires attention from the management team and clear regulations on the department responsible for data collection, the types of data collected, the content, and the departments accountable for processing data, and the methods of automatic data transfer between departments.

Thirdly, managers need to raise awareness about the implementation of CA further, recognizing the role and significance of CA in improving the bank's performance. Only by realizing this can managers effectively utilize the information provided by CA to make appropriate and efficient management decisions.

6. CONCLUSION

Compared with previous studies, the research results show that different factors may influence

the application of CA within the organization, depending on the type of organization. However, this study once again affirms that the factors CI and OP are key factors affecting the implementation of CA within organizations. Other factors, such as ITA, SC, and PEU, may not have a significant impact on the application of CA in organizations like hotels or financial institutions. However, in the context of banks in developing countries like Vietnam, these factors have a relatively strong influence. This study also reinforces the idea that implementing CA contributes to improving the performance outcomes of organizations. Therefore, while organizations and businesses may have different characteristics, they can consider implementing CA as it can help enhance their operational performance.

This study provides empirical evidence for the application of contingency theory in management accounting research related to customer strategy. It offers an in-depth understanding of the level of implementation and the factors affecting the adoption of CA in Vietnamese commercial banks, within the context of intense competition in the banking industry. Additionally, it evaluates the impact of CAI on bank performance, thereby offering practical recommendations for relevant stakeholders to enhance CA adoption and improve overall performance.

This study has several limitations that can be addressed in future research. The research was conducted solely on Vietnamese joint stock commercial banks, which limits the generalizability of the findings. Future studies could include foreign banks operating in Vietnam to provide broader insights.

The study collected 189 questionnaire responses from 35 headquarters and 47 branches of Vietnamese commercial banks. While this sample size is suitable for testing the research model, it does not fully represent the large number of banks and branches in Vietnam. Therefore, increasing the sample size in future research would help improve the accuracy and representativeness of the results. The study focused exclusively on variables derived from contingency theory, which may not capture all relevant factors influencing CA implementation. Future research should consider incorporating variables from other theoretical frameworks to gain a more comprehensive understanding.

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APPENDIX

Table A.1. Observed variables of factors affecting customer accounting

<i>Factor</i>	<i>Observed variables</i>	<i>Source</i>
Competitive intensity	Intense competition for market share in the banking industry	McManus (2013), Quy (2020), Ojra et al. (2023)
	Intense price competition in the banking industry	
	Intense product/service competition in the banking industry	
	Intense brand competition in the banking industry	
	Intense customer service competition in the banking industry	
Perception of environmental uncertainty	Banks react promptly to competitor actions	Ojra et al. (2023)
	Banks are aware of and quickly respond to frequent technological changes in the industry	
	Banks are aware of the changing customer preferences	
Business strategy	In banks, strategies are analyzed before being turned into specific actions	Quy (2020), Nuong (2020), Ojra et al. (2023)
	Banks focus on strategies to enhance customer satisfaction	
	Banks focus on strategies centered around key products	
	Banks focus on strategies to maximize profits	
	Banks play a pioneering role in developing new products/services	
Information technology application	Flexible IT systems allow for the collection, analysis, and reporting of customer data	Quy (2020), Nuong (2020)
	IT is a core element of the bank's operating system	
	Software systems are interconnected, facilitating data transmission between departments to provide customer information	
	IT systems are easily integrated with new technologies	
Supportive culture	Departments in the bank support each other in collecting and analyzing customer data	Nuong (2020)
	All members strive toward common goals	
	Employees receive support from the management team	
Customer accounting implementation	Banks perform customer cost analysis	McManus (2013), Quy (2020), Nuong (2020), Ojra et al. (2023)
	Banks perform customer revenue analysis	
	Banks perform customer profit analysis	
	Banks perform customer lifetime value analysis	
	Banks perform customer acquisition rate analysis	
	Banks perform customer retention rate and customer satisfaction analysis	
Operate performance	Banks perform customer behavior analysis	Quy (2020), Nuong (2020), Ojra et al. (2023)
	Revenue growth	
	Profit growth	
	Market share growth	
	Development of new products/services	
	Increased customer satisfaction	