

## Factors of Value Chain Affect Bank Efficiency

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### Abstract

This paper aims to determine and estimate the factors in the value chain that affect the efficiency of state-owned commercial banks in Vietnam. The study employs a combination of qualitative techniques, such as conducting interviews with top executives, financial managers, chief accountants, and employee surveys, along with quantitative methods like ordinary least squares analysis. The outcomes reveal four critical segments within the value chain – the retail department, operation department, back office, and call center – all of which significantly influence the efficiency of the banks. Additionally, drawing upon value chain theory and Porter's model (1985), the author underscores the significance of implementing a robust value chain strategy. This strategic approach has the potential to substantially enhance the competitive advantages of state-owned commercial banks in Vietnam.

### Keywords:

Value Chain;  
Primary Activities;  
State-owned Commercial Banks;  
Vietnam.

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## 1- Introduction

Porter [1] defines the value chain as a network of interrelated activities that influence an organization's competitive position. To achieve a competitive edge, Porter [1] proposes that the organization should enhance the value of its products and services through a sequence of activities rather than focusing solely on the cumulative extra expenses tied to these actions. This approach enables the company to reach the optimal value for a particular product or service. By effectively executing these activities, the company can establish a competitive advantage concerning the product or service. Consequently, customers willingly engage in transactions and contribute more significant value to the organization. The value chain concept serves as a tool for organizations to pinpoint their competitive strengths. Additionally, Porter [1] contends that a company can present customers with a product or service of equivalent value to competitors but at lower or higher costs with distinct features that customers find appealing. He distinguishes between primary activities, which are directly involved in augmenting the value of goods (or services) during production, and supportive activities, which indirectly influence the final value of products.

Ricciotti [2] confirms that collaboration in the value chain supports the company's remaining competitive by focusing on the relationship between customers, suppliers, and other related parties. Porter [1] proposes that a company can achieve a competitive edge by concentrating on strategies that minimize costs, developing distinct products or services, or adopting a blend of these approaches. The United Nations Industrial Development Organization [3] verifies that value chains establish connections among stakeholders through a series of actions encompassing production, transformation, and the presentation of products to end consumers. The value chain creates strategic connections between various business entities. Hence, the United Nations Industrial Development Organization discusses the evolution within value chains, encompassing value-enhancing activities, interconnected linkages, networks, and the progression from

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production to consumption, resembling a cyclical process [3]. Adopting the value chain standpoint is crucial for apprehending the interactions among companies within the chain, the mechanisms that drive efficiency enhancements, and how firms can elevate both productivity and value. This approach aids in enhancing auxiliary services and the overall business environment. The value chain strategy is employed to steer and advance impactful, sustainable initiatives to refine the productivity, competitiveness, and operations of small and medium-sized enterprises [4].

Based on the research of Ricciotti [2], the value chain becomes the essential method to support the firm's operational efficiency. Besides, to become successful in business, companies must adopt the high speed of customer expectation, updated technology, and determine the right alliances and threats [2]. Some previous studies focused on the value chain applied in different industries such as logistics [5], tourism, information and communication technologies [6], food supplies [7], the manufacturing industry [8], public transport [9], and travel agencies [10]. However, there is still no mention of financial institutions, especially the banking sector. So, the research assesses the impact of value chain elements on the operational efficiency of state-owned commercial banks (SOCB) in Vietnam. The value chain encompasses two distinct categories of activities that aid companies in achieving efficiency: five primary and four supporting activities. However, this paper focuses on the five primary activities within the value chain that contribute to organizational efficiency. These activities include inbound logistics, operations, outbound logistics, marketing, sales, and services—all of which are pertinent to the banking sector in Vietnam. The study addresses the question, "To what extent do the five primary activities of the value chain influence the operational efficiency of state-owned commercial banks in Vietnam?".

The article offers valuable insights into the operational practices of Vietnamese banks. To begin with, it highlights the necessity for banks to synergize their departmental strengths in delivering financial services and products to their clientele. Moreover, the Customer Service Centers (named Call Centers) represent a pivotal platform for engaging with customers, providing financial services, and addressing any arising issues. Consequently, there is a need for banks to strategically invest in the development and reinforcement of the roles and responsibilities of these 24/7 customer service centers. Notably, these centers in Vietnam diverge from those in more advanced economies. While customer centers have long been established and efficiently operated in developed nations, Vietnamese banks, particularly the Agriculture and Rural Development Bank (Agribank), introduced them in 2017.

## 2- Literature Review and Hypotheses Development

### 2-1- Value Chain Theory

During the 1970s, most banks adopted a segmented structure, where their operations were categorized into branch operations, various product lines or services, operations, and supportive services, as depicted in Figure 1 [11]. U.S. banks were confined to operating within a single state during this era. Each product or service was perceived as an individual value chain within this context. Therefore, if posed with the value chain concept, senior executives of banks in California, for instance, might have conceptualized a framework akin to Figure 2 [11]. Aligning with the argument by Harmon (2012) [11], banks were either constructed or acquired with software systems tailored to support specific services. Data about customers who utilized account services was organized in databases structured around account numbers and customer details. Consequently, the focus and execution of bank services were prioritized over customer-centric approaches. However, as the late 1970s unfolded, pioneering banks started recognizing the importance of prioritizing customer relationships.

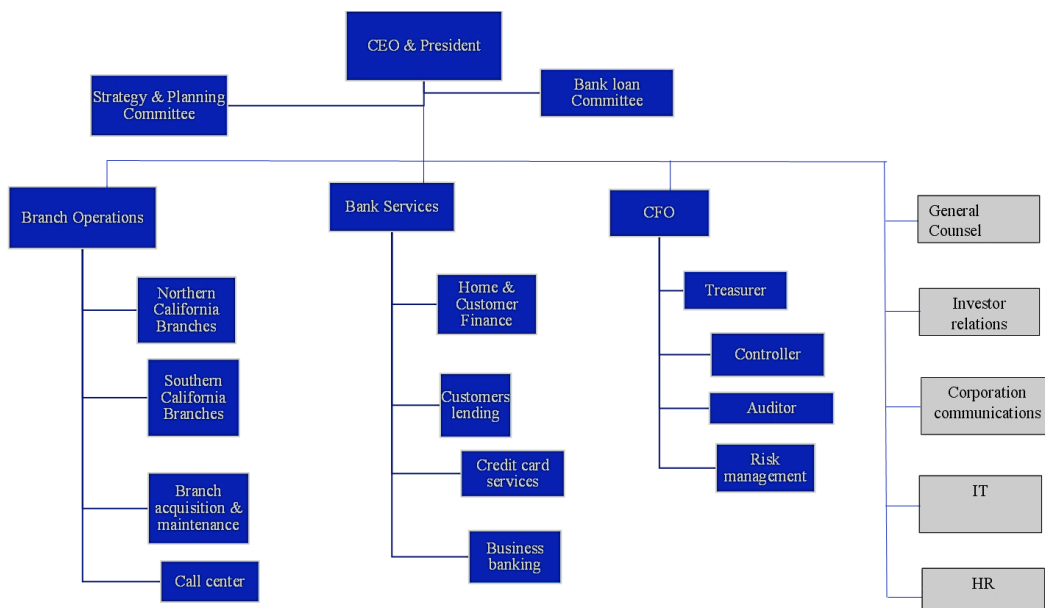
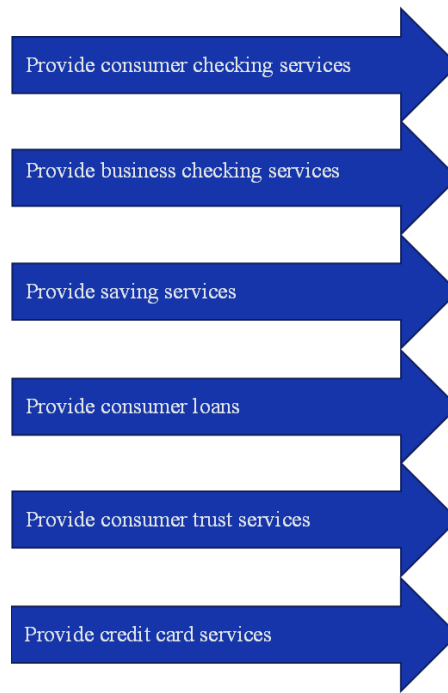


Figure 1. Typical organization for a small mid-1970s California bank



**Figure 2. Possible value chains in a small California bank**

Previous research indicates that customers with only a single bank account opt for a bank close to their residence or workplace. Moreover, they tend to switch their accounts to a different bank when they relocate. Conversely, another study revealed that customers who maintain multiple accounts within the same bank tend to remain loyal to that bank even after moving to a new location. Consequently, banks have initiated campaigns encouraging customers to establish multiple accounts. Given the organizational structure where different databases are organized according to individual accounts and considering that banks were using multiple databases in the absence of relational databases until the early 1980s, there needs to be a straightforward method for identifying customers with multiple accounts. Consequently, banks have made various efforts to consolidate customer information, such as sending letters to inform customers that their accounts could be linked if they provided account numbers for all their accounts with the bank.

Nonetheless, the primary challenge lies in determining the optimal value chain. Both banks and researchers believe that the most effective way to define the value chain is by aligning it with customer needs rather than product or service lines. To illustrate, individuals and families require services like account management, including checking and savings accounts, credit cards, online banking, ATM services, and financial management. The specific products offered represent diverse ways banks cater to these customer needs.

The value chain concept is rooted in the organizational perspective that considers an entity as a system composed of interconnected subsystems featuring inputs, processes, and outputs [12]. These subsystems encompass acquiring and utilizing various resources like capital, workforce, materials, machinery, land, administration, and management. Throughout the transformation of inputs into outputs, businesses undertake numerous operations. Companies have attained sustainable competitive advantage through factors such as competitiveness, customer-centric focus, ongoing strategic innovation, and optimization of organizational processes.

Utilizing the legal framework of the value chain can serve as a potent analytical instrument for strategic planning and structuring an efficient leadership model within an organization. The value chain concept holds applicability across individual business units and can be expanded to encompass the entirety of supply chains and distribution networks [13]. To establish a triumphant product within an organization, infusing value into every stage that the product traverses across its lifecycle is imperative. The most optimal value creation occurs during the product development phase, necessitating the incorporation of value across each step. This demands the integration of various value chain activities and seamless coordination among all involved actions. An apt organizational structure must encompass all necessary functional units to carry out these activities and adopt a practical communication approach to synchronize the functionalities of these units efficiently.

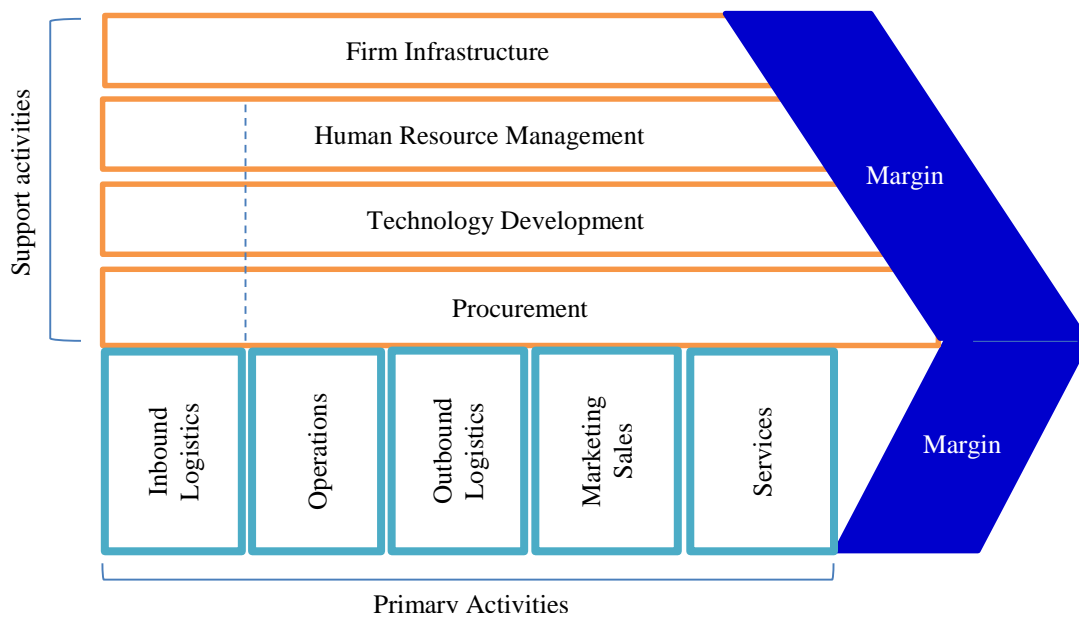
A lasting competitive advantage denotes the capacity to compete effectively over an extended period, with immunity to replication or elimination. Businesses must employ enduring competitive strategies to contend with market dynamics, and various strategic management theories aid in the formulation of such advantages. Companies adopt the Resource-Based View theory (RBV), primarily by leveraging transformable tangible resources and priceless intangible resources

[14]. Barney [15] illustrates that to transform a short-term competitive advantage into a lasting one, these resources must differ in their intrinsic nature and exhibit no substitutive efficiency between them. This distinctiveness renders them valuable assets that are arduous to supplant or irreplaceable.

As stated by Barney [15], sustained competitive advantages within an industry stem from the distinct attributes of a company. However, these distinctive features often lack a foundation in the company's internal strengths, rendering them susceptible to imitation and unsuitable for long-term viability [15]. Eisenhardt & Martin [16] note that the Resource-Based View theory highlights the selection of appropriate resources, while the concept of moving capacities emphasizes the cultivation and renewal of these resources. Business competition yields benefits for consumers, compelling companies to deliver exceptional goods and services, unless they face financial setbacks. These dynamics were first introduced in Harvard Business Review, influencing a company's capacity to meet customer needs and generate profits. These forces are: (1) Potential competitors (Threat of new entrants); (2) Substitutes (Threat of substitutes); (3) Customers (Bargaining power of customers); (4) Suppliers (Bargaining power of suppliers); (5) Industry rivalry (Competition intensity among existing rivals).

Although Porter's Five Forces model in 1979 scrutinizes the components contributing to business profitability, it has faced criticism due to its lack of methodological rigor [17]. Introduced in the Harvard Business Review in 1979, the model is commonly referred to as "Porter's Five Forces" and is an insightful tool for dissecting the sources of business profitability. Notably, the model furnishes competitive strategies for companies to either sustain or elevate their profit margins. It's extensively employed in business and economic management to analyze competition within specific industries [1]. He characterizes these forces as part of a "microenvironment" closely associated with a company. Consequently, he evolved a value framework centered on the industry's attractiveness as the primary determinant of profit potential, which aligns with the central focus of this study.

Porter's value chain model (1985) is illustrated in Figure 3. This model encompasses both primary activities and support activities that contribute to a company's profit generation.



**Figure 3. Value Chain Model**

To harness the value chain as a fundamental instrument for attaining a competitive edge, a company must first delineate the value chain within its industry. Each distinct value activity exhibits mutual economic influence on others, possess substantial potential variance, and constitutes a noteworthy portion of costs [1]. Porter [1] segments an organization into distinct, vital processes or functions based on specificity. Based on his argument, the value chain enables a company to compete with rivals based on pricing. Additionally, this concept empowers the company to differentiate its product or service within a specific customer segment compared to its competitors.

According to Porter [1], a company can be envisioned as transforming raw materials into products and services, subsequently selling these offerings to customers. Porter's perspective illustrates that each step along this continuum enhances the product's value in customers' eyes. His model examines external forces affecting a company while scrutinizing its internal value chain. In this context, the end products or services hold greater perceived value than the cumulative costs incurred throughout the process. The discrepancy between these costs and the product's value dictates the resulting profit.

The value chain model extends its applicability to individual organizations and the broader spectrum of supply chains and distribution networks. Porter [1] mentions that the value chain encompasses internal and external activities undertaken by an organization to generate a product or service. Creating a product necessitates a well-defined strategy. In 1990, Porter introduced an extensive value chain system wherein value chains are interconnected within a "value chain system." This ecosystem encompasses supplier chains (including secondary suppliers), distribution channels, and the companies purchasing the products. Porter identified five primary and support activities, each contributing significantly to creating enduring competitive advantages.

Illustrated in Figure 3, Porter [1] outlines the primary activities comprising inbound logistics, operations, outbound logistics, marketing sales, and service. Inbound logistics encompasses receiving, transporting, and storing incoming materials. Operations pertain to the process of creating products, while outbound logistics involve the transportation and warehousing of finished goods. Marketing and sales encompass product introduction and selling activities, and service encompasses warranties, repairs, customer support, and assistance.

Porter [1] continuously emphasizes operations due to their crucial role in converting inbound materials into finished products. This process encompasses various tasks such as handling, packaging, assembly, monitoring, and establishment operations. In the banking industry, these activities are often distributed among departments such as finance, risk management, credit, accounts, and legal divisions [18, 19]. Porter deduces that effective operation management is paramount for success within the service sector.

Services encompass post-sale activities aimed at enhancing or sustaining the value of a product. These activities comprise installation, repair, maintenance, and customization to address specific buyer requirements, customer discontent, or grievances [17]. Odero [20] underscores the primary objective of facilitating customer access to optimal support services due to the intangible nature of services. He further contends that services are a means to gauge recurring purchase behavior within the target market and are pivotal in assessing customer satisfaction levels. In this context, nearly all banks have established contact centers or customer care facilities to give customers access to daily services and information concerning the banks' products or offerings.

Support activities are complementary functions accompanying primary activities to bolster product creation. These are indirect undertakings that contribute value to products. This category of activities encompasses: (1) Procurement: This involves the acquisition of machinery, equipment, fixed assets, and raw materials required for the production process. (2) Technology development: It encompasses the application of foundational research outcomes and experimentation with practical applications, enhancing existing technologies. Technology transfer is also included to refine products and production processes. (3) Human resource management: This encompasses recruitment, training, skill development, and the preservation of competencies and professional qualifications. It also involves the implementation of rational compensation structures, including mechanisms for salaries, bonuses, and leave. (4) Firm infrastructure: This involves the management, financial, accounting, and legal services that provide the foundational framework for the company's operations. These activities contribute to profit generation across various industries, including the banking sector. In the value chain model, revenue corresponds to the selling price of goods, with these values emanating from the activities delineated within the value chain model. Costs, on the other hand, represent the expenditure incurred in carrying out these activities.

Porter [1] establishes that the link within the value chain signifies the interrelation between how a value activity is executed and its associated cost. While the activities within the value chain contribute to competitive advantages, they represent a collection of individual components that are interdependent through connections between primary and secondary activities. Johnson et al. [21] similarly recognize a correlation between primary and support activities. Porter [1] posits that these linkages furnish competitive advantages through optimization and coordination. Optimization entails a long-term strategy wherein a company curbs service costs by employing high-quality materials and implementing rigorous quality control. In contrast, coordination is a competitive strategy to fortify differentiation or cost advantage.

Addressing competition strategies, Porter [1] underscores that organizations must augment the value of their products by effectively coordinating primary and support activities to drive profitability. Hines [22] re-evaluated Porter's model, concluding that an organization must ensure that primary activities are orchestrated to yield a product that aligns with customers' satisfaction. Hines additionally elucidated that an individual company's competitive prowess hinges on its ability to harmonize its comprehensive value chain activities. Hines' value chain framework spans from the initial material suppliers to the ultimate consumers, aiming to fulfill customers' demands comprehensively.

## ***2-2-Empirical Studies***

Hill et al. [23] conducted research indicating that the value chain model aids in identifying a company's fundamental strengths and competitive edges, encompassing cost advantage and differentiation. This understanding prompts the company to efficiently trim extraneous expenses from its operations while bolstering its competitive potential, enabling it to capitalize on more opportunities than its rivals.



Ouma [19] corroborates the effectiveness of a well-constructed value chain in enhancing the competence and competitive advantage of an insurance company in Kenya. In addition to implementing Porter's value chain model, the Kenya Revenue Authority enhanced its performance by streamlining unnecessary expenditures [19]. Njau [24] highlights the influence of value chain management strategies on the performance of oil companies operating in Kenya. These value chains encompass the entire continuum, from input acquisition to operational processes' final output. The study discerns multiple factors contributing to performance enhancement, including marketing endeavors, strategic placement of outlets, efforts in public relations, and the integration of computerized value chain processes. These factors collaborate to facilitate cooperation with partner entities, fostering the overall development of company performance.

Munyi [25] adopts a value chain approach that demonstrates the potential to significantly elevate competitive prospects, particularly within Kenya's oil industry. Employing qualitative methodology, Munyi [25] dissects expert questionnaire responses, uncovering the diverse competitive advantages that oil companies derive from their unique value chain implementations. The research underscores the imperative for policymakers to prioritize value chain considerations, focusing on augmenting companies' competitive position by reducing costs, establishing distinctive market positions, and nurturing customer-centric strategies. Johansen et al. [26] show that there are four phases in the plastic value chain: design, production, use and end of life. Especially, Johansen et al. [26] and Milios et al [27] confirm the importance of the value chain to determine the lack of both supply and demand in recycled plastic. Furthermore, the coordination in the value chain focuses on the investment in innovation and technology development to reduce the polymers and additives usage in plastic products, procurement for resource efficiency, and recycling materials.

Linkov et al. [28] emphasize the role of value chain resilience in supporting economic recovery after a crisis. It means that the value chain clarifies the inefficiencies at a system level, which leads to interruptions and the face of adverse circumstances in the systems. Analyzing the value chain can build competitive advantages in short-term and long-term strategies to increase efficiency and increase earnings through decreasing the cost with the magnitude of the suitable time and value delivery [8]. According to Clay and Feeney [29], the value chain implies all aspects such as economy, technology, and society, so analyzing the value chain needs to determine the objectives and motivations to find out the tackled issues that exist in the system, especially in the agribusiness focus on sustainability, health's consumers, and social and environmental value relevant to the economic value.

To sum up, empirical investigations on the application of the value chain within businesses have been conducted in various companies. However, one notable exception is the study conducted by Ouma [19], which pertains to the governmental sector. None of these studies have examined the correlation between the five primary activities of the value chain and the efficiency of the banking system, particularly in the context of Vietnam. Consequently, this study is designed to address this research gap.

## ***2-3-Factors Affect Bank Efficiency***

### ***2-3-1- The Retail Department***

The retail department within a bank is responsible for managing customer transactions involving cash inflows and outflows. This department oversees a comprehensive array of financial banking products and services tailored to customers' needs. The retail department offers payment accounts, savings accounts, mortgage accounts, lending accounts, debit cards, credit cards, and supplementary non-financial services. Retail banks are intermediary financial institutions that mobilize funds from savers (those with surplus income) and then lend them to individual and business customers [19, 20]. Essentially, this department directly engages with individual customers seeking personal financial solutions, including deposit products, home loans, equity loans, mortgage loans, auto loans, bill payments, credit cards, and debit cards.

Retail banking encapsulates an extensive spectrum of financial products and services, strategically benefiting banks by diversifying their asset portfolios. This diversification yields elevated profits while simultaneously minimizing associated risks. Most of these customer interactions predominantly transpire within the bank's physical branches through face-to-face or telephonic communication.

***Hypothesis 1 (H<sub>1</sub>):*** the *retail department* affects the efficiency of Vietnamese SOCB positively.

### ***2-3-2-The Operating Department***

In the banking sector, the operational department is pivotal in managing banking operations to address transactional complexities and meet client needs. This department oversees adherence to banking regulations and rectifies any disparities in professional proficiency across operational activities. Its core objective revolves around coordinating the operations of the Front Office, which is responsible for generating bank revenue and engaging directly with customers.

***Hypothesis 2 (H<sub>2</sub>):*** the *operating department* affects the efficiency of Vietnamese SOCB positively

### 2-3-3- The Back Office

The back office constitutes a comprehensive division responsible for overseeing various administrative functions, a role applicable to banks and other businesses. This department is tasked with compiling and managing customer records encompassing financial and non-financial transactions related to the bank's offerings. Its crucial function is meticulously monitoring each product and service provided to customers, ensuring that the final services align with customers' expectations, complete with noteworthy provisions or terms. To achieve this, the department consistently updates customer records within the bank's system, facilitating the timely preparation of reports for managerial review.

**Hypothesis 3 (H<sub>3</sub>):** the *back office* affects the efficiency of Vietnamese SOCB positively.

### 2-3-4- The Marketing Department

Within the banking realm, the marketing department is responsible for strategizing and implementing marketing initiatives. This involves the careful planning, execution, monitoring, and fine-tuning marketing and promotional strategies for the bank's array of financial products and services. Moreover, this department designs brands, financial products, and services that align with short-term, mid-term, and long-term strategic marketing plans to enhance market share. Through the bank's marketing endeavours, the public gains insight into the bank's current offerings and future product and service offerings.

**Hypothesis 4 (H<sub>4</sub>):** the marketing department affects the efficiency of Vietnamese SOCB positively.

### 2-3-5- The Call Center Department

Within the banking context, the call center division manages various customer communications, including phone calls, email correspondence, SMS messages, voice messages, and materials submitted by customers. This is accomplished through a systematic and organized approach to address recurring situations swiftly and effectively. Each interaction is closely monitored to ensure accountability and uphold service quality standards. As a result, this department is responsible for overseeing, administering, and enhancing customer interactions and inquiries related to the bank's services.

Moreover, the call center department's personnel undergo rigorous training, boasting elevated qualifications and professionalism. This concerted effort elevates customer interactions and inquiries, reinforcing the relationship between customers and the bank.

**Hypothesis 5 (H<sub>5</sub>):** the call center affects the efficiency of Vietnamese state-owned commercial banks positively.

## 3- Research Methodology

### 3-1- Samples

The survey method has been identified as the most suitable approach for collecting data concerning the value chain and the efficiency of banks [30-32]. Therefore, self-administered questionnaires employing a 5-point Likert scale were employed to gather data for this research. The information collected is ensured to be confidential and privacy for respondents. The study obtained information from the relevant department of selected branches within state-owned commercial banks in Hochiminh City. Detailed information was also provided to the participants. Data was specifically collected from top managers, finance managers, chief accountants, and employees through surveys.

This study encompasses four state-owned commercial banks in Vietnam: the Vietnam Bank for Agriculture and Rural Development (Agribank), Global Petrol Bank (GP Bank), Ocean Commercial One Member Limited Liability Bank (Ocean), and Construction Bank (CB). The selected random sample comprises 350 staff members from these four banks. Questionnaires were distributed between December 10<sup>th</sup>, 2021, and March 7<sup>th</sup>, 2022. A total of 350 questionnaires were disseminated among state-owned commercial bank employees using a simple random sampling method (Appendix I). Of these, 315 questionnaires were returned, with 298 deemed valid, constituting 94.6%.

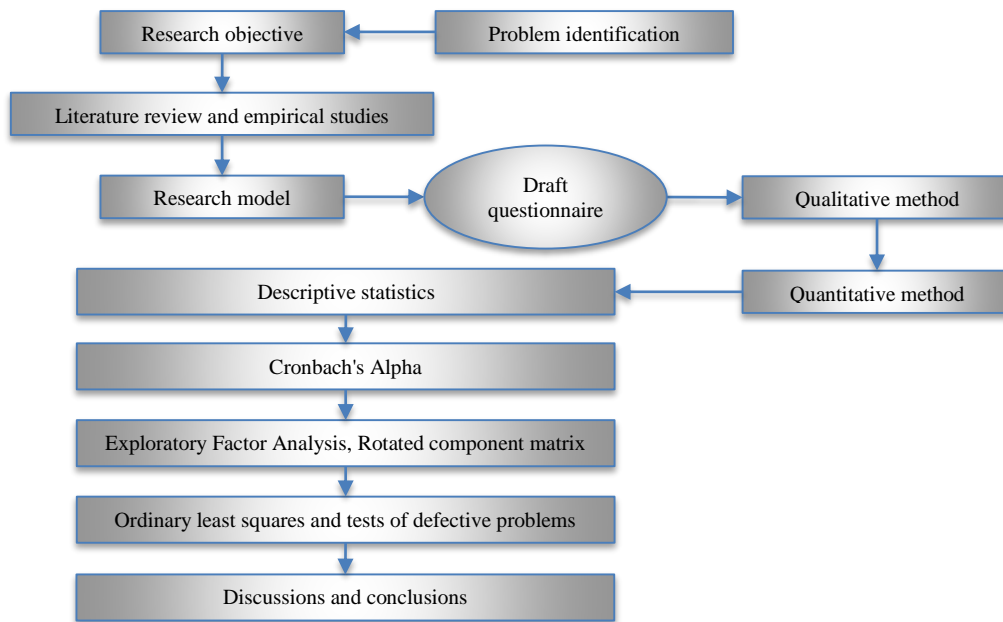
The sampling approach employed in this study adheres to the conditions outlined by Jr et al. [33] as necessary for conducting exploratory factor analysis. Considering that the study involves a total of 20 observed variables, according to Jr et al. [33], a minimum of 105 samples is required. However, the number of valid questionnaires collected exceeded this requirement with 298 samples, ensuring that the sample size criteria were met (Table 1).

**Table 1. Customer survey results**

Criteria	Number of survey questionnaires	Percentage
Number of forms distributed	350	100%
Number of forms collected	315	90%
Number of valid forms	298	94.6%

### 3-2- Research Procedures and Methodology

This segment delves into the research procedures and methodology employed in this study. The discussion commences by outlining the research procedures, delineating each step in Figure 4. Furthermore, the research methods elucidate the data collection and analysis approaches, all aligned with the overarching research objective.



**Figure 4. Flowchart of the study**

The research process delineates the sequential actions undertaken in this study, with the primary aim of assessing the impact of the value chain's primary activities on bank efficiency. Subsequently, the research model is subjected to regression analysis using the ordinary least squares method. Several tests are conducted to uphold the integrity and credibility of the findings, including assessments for autocorrelation, heteroscedasticity, and the normal distribution of residuals.

### 3-3- Proposed Model

Based on the value chain theory and Porter's value chain model, combined with the empirical studies [19, 25], the proposed model is suggested as follows.

$$EFF_i = \beta_0 + \beta_1 RD_{TB_i} + \beta_2 OD_{TB_i} + \beta_3 BO_{TB_i} + \beta_4 MD_{TB_i} + \beta_5 CC_{TB_i} + \mu \quad (1)$$

where  $EFF_i$  is the efficiency of bank  $i$ ,  $RD_{TB_i}$  is the retail department at bank  $i$ ,  $OD_{TB_i}$  is the operating department at bank  $i$ ,  $BO_{TB_i}$  is the back office at bank  $i$ ,  $MD_{TB_i}$  is the marketing department at bank  $i$ ,  $CC_{TB_i}$  is call center department at bank  $i$ .

## 4- Research Results and Discussions

### 4-1- Research Results

To determine the degree of application of the value chain at Vietnamese state-owned commercial banks, survey question results stated that the primary activities determined include the Retail department, Operation department, Back office, Marketing department, and Call center (customer service center). These departments introduce financial products and services to customers, manage applications, improve products and product details, promote the bank's financial product, and ensure that existing customers achieve the product value in the best manner compared to other banks. First, the author measures and analyzes the factors' reliability using Cronbach's alpha.

Table 2 summarizes the scales of factors. From testing the scales through Cronbach's alpha, the scales in Table 2 achieved reliability based on the principle of evaluating the total Cronbach's alpha coefficient; The correlation coefficient of the total variable and the coefficient "Cronbach's Alpha if Item Deleted" satisfy the requirements [34]. Therefore, the scales are all reliable. The subsequent phase involves the execution of exploratory factor analysis (EFA), a method within factor analysis designed to uncover the underlying relationships between measured variables.



**Table 2. Summary of scales**

No.	Construct	Number of Observations	Cronbach's Alpha	Evaluate
1	Retail department (RD)	4	0.908	Satisfactory
2	Operation department (OD)	4	0.957	Satisfactory
3	Back office (BO)	4	0.929	Satisfactory
4	Marketing department (MD)	4	0.911	Satisfactory
5	Call center (CC)	4	0.886	Satisfactory
6	Bank efficiency (EFF)	5	0.977	Satisfactory

Utilizing the Principal Components extraction method and applying Varimax rotation, the aim is to enhance the clarity of variable and factor interpretation. The outcomes of the Bartlett test are outlined in Table 3. The significant Sig result of 0.000 indicates the rejection of the hypothesis that variables lack correlation within the population. Moreover, the KMO index (Kaiser-Meyer-Olkin) of 0.900, exceeding the threshold of 0.5, validates the suitability of employing the factor analytical method for data analysis.

**Table 3. KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.900
	Approx. Chi-Square	5672.213
Bartlett's Test of Sphericity	df	190
	Sig.	0.000

Referring to the provided table (Table 4), where seven distinct factor groups have been derived, it becomes feasible to account for 81.21% of the variance in the data. This proportion surpasses the acceptable threshold necessary for the creation of a novel factor (50%). The process of assigning variables to respective factors is guided by the examination of the sample matrix. For each variable's row, if the factor loading of attributes is the highest in any specific factor and further satisfies the criterion of higher 0.4, then the variable is allocated to that factor. Consequently, variables with the highest factor loadings in rows that fall below 0.4 are excluded due to their lack of measurement significance for any factor (Table 5).

**Table 4. Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.114	50.571	50.571	10.114	50.571	50.571	3.496	17.478	17.478
2	1.989	9.945	60.516	1.989	9.945	60.516	3.251	16.255	33.733
3	1.676	8.378	68.895	1.676	8.378	68.895	3.250	16.249	49.982
4	1.455	7.276	76.171	1.455	7.276	76.171	3.137	15.687	65.669
5	1.009	5.044	81.215	1.009	5.044	81.215	3.109	15.546	81.215
6	0.549	2.745	83.960	-	-	-	-	-	-
7	0.469	2.345	86.305	-	-	-	-	-	-
8	0.415	2.077	88.382	-	-	-	-	-	-
9	0.370	1.849	90.232	-	-	-	-	-	-
10	0.280	1.401	91.633	-	-	-	-	-	-
11	0.279	1.397	93.030	-	-	-	-	-	-
12	0.258	1.289	94.320	-	-	-	-	-	-
13	0.224	1.121	95.441	-	-	-	-	-	-
14	0.216	1.080	96.520	-	-	-	-	-	-
15	0.175	0.874	97.395	-	-	-	-	-	-
16	0.152	0.759	98.154	-	-	-	-	-	-
17	0.134	0.668	98.821	-	-	-	-	-	-
18	0.097	0.486	99.307	-	-	-	-	-	-
19	0.079	0.397	99.705	-	-	-	-	-	-
20	0.059	0.295	100.000	-	-	-	-	-	-

Extraction Method: Principal Component Analysis.

**Table 5. Rotated Component Matrix <sup>a</sup>**

	Component				
	1	2	3	4	5
OD4	0.859	-	-	-	-
OD1	0.839	-	-	-	-
OD3	0.813	-	-	-	-
OD2	0.796	-	-	-	-
MD3	-	0.831	-	-	-
MD1	-	0.806	-	-	-
MD2	-	0.804	-	-	-
MD4	-	0.798	-	-	-
RD4	-	-	0.858	-	-
RD3	-	-	0.835	-	-
RD2	-	-	0.814	-	-
RD1	-	-	0.771	-	-
CC2	-	-	-	0.845	-
CC3	-	-	-	0.792	-
CC1	-	-	-	0.774	-
CC4	-	-	-	0.726	-
BO2	-	-	-	-	0.813
BO3	-	-	-	-	0.788
BO4	-	-	-	-	0.764
BO1	-	-	-	-	0.746

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Upon executing the Rotated Component Matrix (depicted in Table 5), the outcomes reveal that the original research model will be adjusted to a 5-factor model. The component matrix resulting from the rotation process (rotated component matrix) shows a more precise and significant distribution of variables in the model.

Applying the multiple regression method, the examination of the Durbin-Watson statistic (presented in Table 6) does not reveal any violation, as the value stands at 1.391, within the range of 1 to 3. This suggests the absence of residual autocorrelation in the model, aligning with previous research [33, 35]. Moreover, the coefficient of  $R^2$  (R\_Square) stands at 0.839, indicating that 83.9% of the overall variation in bank efficiency ( $EFF_{TB}$ ) can be accounted for by the regression model [33, 35]. Additionally, the Breusch-Pagan test has been conducted and confirms the absence of heteroskedasticity within the model.

**Table 6. Model Summary <sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.916 <sup>a</sup>	0.839	0.837	0.29161	1.391

a. Predictors: (Constant),  $CC_{TB}$ ,  $RD_{TB}$ ,  $MD_{TB}$ ,  $OD_{TB}$ ,  $BO_{TB}$ ;

b. Dependent Variable:  $EFF_{TB}$ .

Table 7 displays the results of the ANOVA test. The outcome of the ANOVA test indicates a level of significance (Sig.) of 0.000, affirming the compatibility of the multiple regression model with the provided data.

**Table 7. ANOVA <sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	129.795	5	25.959	305.263	.000 <sup>b</sup>
1 Residual	24.831	292	0.085		
<b>Total</b>	154.626	297			

a. Dependent Variable:  $EFF_{TB}$ ;

b. Predictors: (Constant),  $CC_{TB}$ ,  $RD_{TB}$ ,  $MD_{TB}$ ,  $OD_{TB}$ ,  $BO_{TB}$ .

where  $EFF_i$  is the efficiency of bank  $i$ ;  $RD_{TB_i}$  is the retail department at bank  $i$ ;  $OD_{TB_i}$  is the operating department at bank  $i$ ;  $BO_{TB_i}$  is the back office at bank  $i$ ;  $MD_{TB_i}$  is the marketing department at bank  $i$ ;  $CC_{TB_i}$  is call center department at bank  $i$ .

In multicollinearity testing, multicollinearity refers to a situation in which over two explanatory variables in a multiple regression model are highly linearly related [36]. Multicollinearity reduces the precision of the estimated coefficients, which weakens the statistical power of the regression model. A variance inflation factor (VIF) detects multicollinearity in regression analysis. All variance inflation factors (VIF) of independent variables (Table 8) are under ten, so the multicollinearity of the model is low [33].

**Table 8. Coefficients <sup>a</sup>**

Model	Standardized Coefficients		t	Sig.	Collinearity Statistics	
	Beta				Tolerance	VIF
(Constant)			-0.111	0.912		
1	RD_TB	0.410	12.033	0.000	0.473	2.114
	OD_TB	0.068	2.310	0.022	0.631	1.585
	BO_TB	0.321	9.131	0.000	0.444	2.253
	MD_TB	0.051	1.635	0.103	0.573	1.746
	CC_TB	0.248	7.958	0.000	0.567	1.764

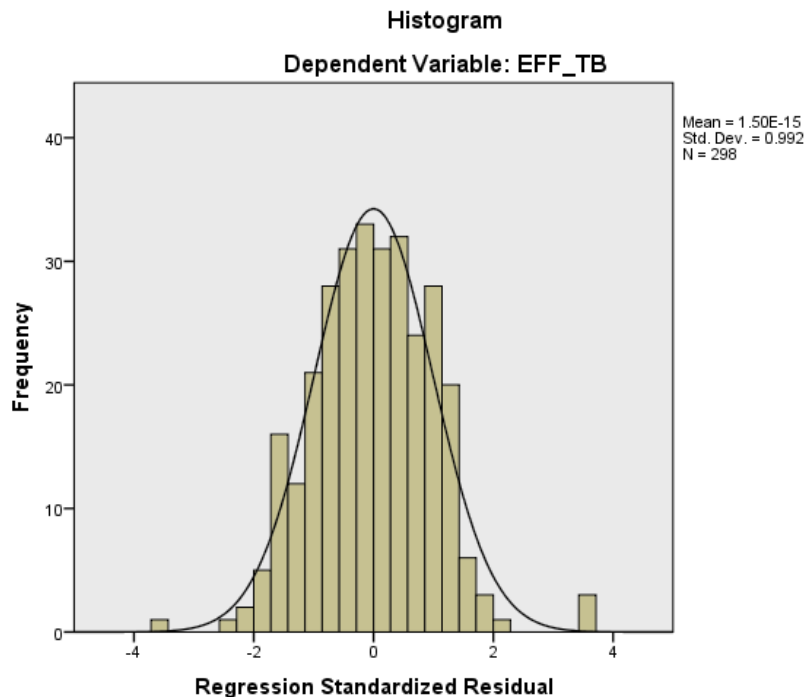
a. Dependent Variable: EFF\_TB

The regression results show the model has four primary activities of value chain statistically significant at 5%, including retail department; operating department; back office; and call center. All factors positively impact the efficiency of Vietnamese SOCB because the beta coefficients (standardized) of the above factors are all positive. Moreover, the p-values of 4 factors in Porter’s model [1] are larger than 5%, so all the hypotheses are accepted, excluded hypothesis 4. Thus, the regression model takes the form:

$$EFF_{TB} = 0.068 \times RD_{TB} + 0.41 \times OD_{TB} + 0.321 \times BO_{TB} + 0.248 \times CC_{TB} \tag{2}$$

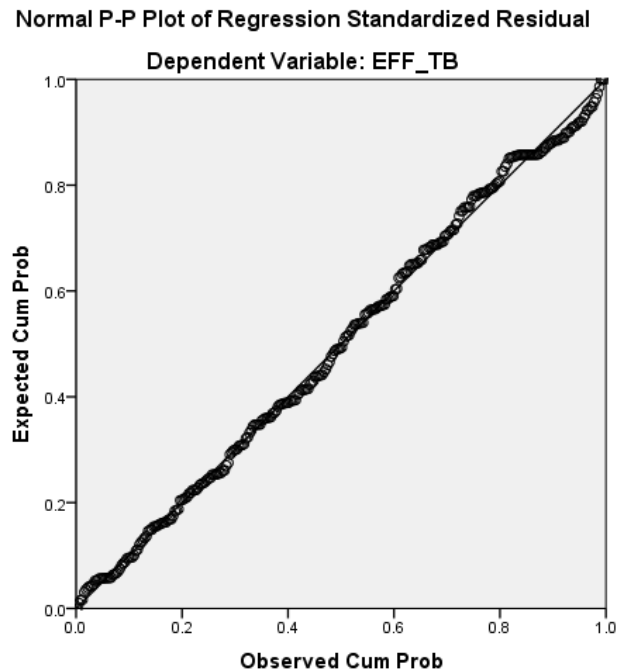
Referring to equation 2, we observe a positive linear correlation that entails assessing the connection between the efficiency of banks and independent variables like Retail department (RD), Operation department (OD), Back office (BO), and Call center (CC). To be specific, first, when the Retail department increases by one unit while keeping other variables constant, it results in a 0.068-unit increase in bank efficiency. Second, a one-unit increase in the Operation department, with all other variables held constant, leads to a 0.41-unit increase in bank efficiency. Third, an increase of one unit in the Back office, while holding other variables constant, corresponds to a 0.321-unit increase in bank efficiency. Finally, a one-unit increase in the Call center, with other variables unchanged, leads to a 0.248-unit increase in bank efficiency.

The following section discusses the normality test results using the Regression Standardized Residual Histogram and the Normal P-P Plot of Regression Standardized Residual (Figures 5 and 6). Examining the Regression Standardized Residual Histogram (Figure 5), we can conclude that the data conforms to a normal distribution. Figure 5 illustrates that the mean values of the observations are minimal and close to zero (Mean), with a standard deviation of approximately 0.992, nearly equal to 1. This supports the assumption that the residuals adhere to a well-accepted normal distribution



**Figure 5. Regression standardized residual histogram**

Moreover, the plot for Normal P-P plot of regression standardized residual is shown in Figure 6. The regression standardized residual is also found to be normally distributed whereby the observed and expected values all lie along the line, without any significant out of it. Figure 5 shows a normal probability plot of standardized residuals of a linear regression model. The regression line closely passes through 298 data points.



**Figure 6.** Normal P-P plot of regression standardized residual

The results indicate that four factors associated with the primary activities of the value chain exert a significant influence on the efficiency of banks in Vietnam. These factors encompass the retail department, operation department, back office, and call center. All these factors demonstrate statistical significance at a 5% level and exhibit a positive impact on bank efficiency. These outcomes are in accordance with the study's intended objective, which revolves around assessing the extent to which primary value chain activities are implemented within the banking sector.

First, focusing on the retail department, its coefficient stands at 0.41, surpassing zero, thus signifying a positive impact on the efficiency of Vietnamese state-owned commercial banks. Holding other variables constant, increasing one unit in the retail department leads to an augmentation of 0.41 units in bank efficiency. These findings align harmoniously with the value chain theory and the insights of Porter [1]. Porter [1] affirms that the retail department represents one of the five fundamental activities within the value chain, which bolsters and amplifies organizational efficiency. The banking sector faces intensified competitive pressures owing to political stability, rapid technological shifts, and global market integration. For instance, the banking field contends with formidable rivalry from the mobile industry (such as Momo wallet), which facilitates money transfers through mobile platforms. To preempt this unforeseen competition, retail departments must adapt their products and services to harmonize with the mobile money transfer system. Remarkably, the retail department is prominent regarding features and technologies applied to inbound material within the banking system. The process of receiving inbound materials can effectively discern counterfeit or subpar items, a factor contributing to the success of SOCB. To sustain its competitive edge, the retail department should create products and services that seamlessly align with prevailing market demands.

Moving to the operation department factor, it manifests a coefficient of 0.068, exceeding zero, thus signifying a positive influence on the efficiency of Vietnamese state-owned commercial banks. In scenarios where other variables remain unaltered, a unitary elevation in the operation department results in a corresponding uptick of 0.068 units in bank efficiency. These results align with the value chain theory and Porter [1] ideas. Porter points out that the operation department plays a vital role in the primary activities of the value chain, which helps and improves organizational efficiency. Notably, the operation department has emerged as a catalyst within the banking sector, embarking on the responsibility of addressing the daily transactional challenges encompassing the recording and accounting of financial, non-financial, and monetary transactions to meet the industry's requisites. This remit encompasses credit management, transaction centers, and legal departments. The study reveals that operations are executed with a high level of proficiency, thereby necessitating lucid policies and judicious work arrangements. The operation department contributes to business augmentation by meticulously reconfiguring business procedures to heighten customer contentment, curtail operational costs, and foster a thriving competitive landscape. Within the purview of the study's surveyed banks, operation support mechanisms characterized by advanced professionalism and efficacy, including credit and transactional centers, have significantly trimmed operational expenditures. These banks persistently pursue standardization endeavors to realize their overarching visions and missions.

The back-office factor exhibits a coefficient of 0.321, surpassing the zero thresholds, thus signifying a favorable impact on the efficiency of Vietnamese state-owned commercial banks. When other variables remain unaltered, a unitary increase in the back-office facet results in a corresponding enhancement of 0.321 units in bank efficiency. These findings are consistent with both the value chain theory and Porter's argument [1], which emphasizes the back office's significant role in the value chain's primary activities, bolstering and improving organizational efficiency. The back-office domain encompasses providing support and oversight for financial services and bank accounts. The study emphasizes that Vietnamese state-owned commercial banks perform the duties performed by this department to a significant extent. The bank's procedures must be modernized for optimal effectiveness in this realm by configuring banking products with novel technologies and incorporating distinctive attributes to counteract fraudulent activities. Establishing an appropriate internal monitoring mechanism ensures the integration and execution of internal monitoring elements. To perpetuate its competitive edge, the back-office division should proactively enhance the support and supervision of tellers' transactions and professional conduct while diligently adhering to the bank's stipulations.

Finally, focusing on the call center factor, its coefficient registers at 0.248, surpassing the zero threshold. Consequently, it positively influences the efficiency of Vietnamese state-owned commercial banks. While keeping other factors unchanged, a unit increase in the call center attribute corresponds to a rise of 0.248 units in bank efficiency. These findings align with the value chain theory and the assertions of Porter's study [1]. Once more, Porter [1] affirms that the call center constitutes another crucial primary activity within the value chain, fostering and amplifying organizational efficiency. The call center stands out as a nexus of interaction with customers within an organization, serving as the designated point of contact for customer inquiries and concerns, all while being meticulously controlled and monitored. Through 24/7 hotlines, customers can reach the bank via mobile phones, text services, the internet, and social communication channels from anywhere. Queries and customer assistance requests are funneled to the pertinent department for effective resolution. The study underscores that call centers are a highly supportive and effective operation, proficiently addressing customer issues and needs.

However, the establishment of call centers within SOCB in Vietnam, such as Agribank, is a relatively recent development, having emerged approximately six years ago. This stands in contrast to the global banking landscape, where call centers took root much earlier, dating back to as early as 1980 (Jain et al., 2008). To illustrate, Agribank officially inaugurated its call center, complete with the hotline 1900558818, on September 29, 2017. Similarly, GBBank introduced its call center, accessible via the hotline 1800585866 or (024) 3514 9094. Ocean Bank established its call center reachable through the hotline 1800 58 88 15, while CB inaugurated its own call center with the hotline 1900 1816. These call centers are situated within the banks' premises, where dedicated staff members handle customer queries and address any complaints that arise. Each customer interaction undergoes careful supervision by supervisors or managers, ensuring accountability and service quality. The call center staff members are well-equipped with comprehensive training, have high qualifications, and boast significant professional experience in the field.

## 5- Conclusions

The results show the model has four primary activities of the value chain statistically significant at 5%, including the retail department, operating department, back office, and call center. They are consistent with the previous studies in different sectors, such as the food industry [7], the tourism industry [37], public transport [9], and agribusiness [29]. These studies emphasize the four primary activities, such as inbound logistics, operations, outbound logistics, and services, in Porter's value chain models.

Through a combination of qualitative and quantitative approaches, the author has approximated the impact of four main activities of the value chain on the operational effectiveness of SOCB in Vietnam. These activities constitute four fundamental elements in the framework, all of which contribute positively to the bank's efficiency. Notably, the research findings emphasize that the retail segment holds the utmost significance within the banking sector. Respondents in the survey affirm that the retail department stands as the most valuable division annually in the banking sector, achieved through activities such as providing financial services, acquisition, lending, and account opening. To differentiate from other services, this division must define protocols within banking operations and remain responsive to market dynamics. For instance, these functions necessitate enhancement, modernization, and prompt addressing of customers' financial requirements.

Furthermore, the results also indicate that the back office emerges as the second crucial element contributing to the enhancement of operational effectiveness for banks. The back office is responsible for checking, loan handling, comparing, and recording business operations, accounting, and service quality control systems, which are the most important and valuable to achieving the banks' objectives and success. These functions hold paramount importance and offer substantial value in the pursuit of banks' goals and accomplishments. This division ensures the ultimate alignment of services with customer requirements while highlighting stipulations and terms.

The findings demonstrate that SOCBs in Vietnam employ the value chain as a sustainable competitive mechanism. The primary activities within this value chain are carried out extensively, exerting a notable impact on the operational



efficiency of the banks. The research also reveals that strategies concentrated on customers within individual departments can amplify their effectiveness, prevent redundancies, and foster a more integrated approach to furnishing customers with financial services and products. Adherence to all service supply agreements is pivotal to enhancing inter-departmental relationships within a bank and elevating overall efficiency. To secure a competitive edge over rivals, close-knit and harmonious relationships are imperative among a bank's departments and personnel.

To curtail operational expenses, the bank must establish well-defined objectives, facilitate collaborative teamwork, and ensure incentives align with its strategies, structure, resources, and the integration of resources across various departments. Specifically, within the banking sector, the retail department undertakes responsibilities related to diverse account types, loans, and additional financial offerings. For sustainable success in the banking realm, this department should escalate account initiations and augment the customer base, as this contributes to bolstering liquidity and the lending capacity of the banks. Moreover, the call center, acting as the intermediary between the bank and its clientele, deserves focused resource allocation from Vietnamese state-owned banks for its development and productivity enhancement.

In this study, the element associated with the marketing department within the value chain, representing marketing activities, is statistically insignificant. This implies that this department does not play a role in enhancing the operational efficiency of state-owned commercial banks in Vietnam. The results align with the practical scenario, wherein these banks overlook marketing and promotional strategies. Consequently, customers primarily recognize these banks through their long-standing operations under the state's sponsorship.

## **6- Declarations**

### ***6-1-Data Availability Statement***

The data presented in this study are available in the article.

### ***6-2-Funding***

The author received no financial support for the research, authorship, and/or publication of this article.

### ***6-3-Institutional Review Board Statement***

Not applicable.

### ***6-4-Informed Consent Statement***

Not applicable.

### ***6-5-Conflicts of Interest***

The author declares that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the author.

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## Appendix I: Questionnaire

Kindly rate the following of value chain affect bank efficiency in Vietnam with regards to your organization. Use the key: SD=strongly disagree, D=disagree, N=Neutral, A=agree, and SA=strongly agree.

No.	Observable variable	SD	D	N	A	SA
<b>Retail department (RD)</b>						
1.	The inputs services are performed with the highest benefit for customers (example provides the highest deposit interest rate).					
2.	The bank guarantees features and technology for input services.					
3.	The efficient system and effective process of counterfeit currency detectors in the received inputs (detection of counterfeit USD, VND, etc.).					
4.	In the output stage, banks and branches control and monitor the unauthorized provision of financial products and services.					
<b>Operation department (OD)</b>						
5.	Banks conduct the internal audits/ controls to ensure all operations are in line with required regulations/policies/ procedures.					
6.	Banks ensure their staffs in operation department are well trained to deal with customer issues.					
7.	Banks ensure that all income and expenses are always calculated and recorded on a daily, weekly, monthly, quarterly, and yearly basis accurately and comply with regulations.					
8.	Banks respond quickly and accurately to customer requests/questions					
<b>Back office (BO)</b>						
9.	Banks have network to serve customers nationwide efficiently.					
10.	Banks have a self-administered system to detect errors, collusions, and unauthorized transactions.					
11.	Banks have a secure and suitable technology system for storing work in progress and processing transactions for customers.					
12.	Banks operate output products at optimized level					
<b>Marketing department (MD)</b>						
13.	Marketing department contact and make the survey that aims to find out or predict the customer demands					
14.	Banks recognize, reward, and set up incentives for VIP customers					
15.	Banks participate in social activities, charity, fundraising to support the poor, the elderly.					
16.	Banks introduce and convince potential customers to use the financial services provided by the bank.					
<b>Call center (CC)</b>						
17.	Banks resolve customer issues and complaints effectively					
18.	Banks compliance the promissory in delivering the financial services to customer on time.					
19.	Get automated answers to some of the most common banking questions					
20.	Protect customers from fraud and scams with hotline numbers.					
<b>Bank efficiency (EFF)</b>						
21.	Retail department works efficiently.					
22.	Operation department works efficiently.					
23.	Back office works efficiently.					
24.	Marketing department works efficiently.					
25.	Call center works efficiently.					