IMPROVING RISK AND CUSTOMER MANAGEMENT INFORMATION SYSTEM - A CASE OF VIETNAM COMMERCIAL BANK

Dinh Van Trung 1
Phan Huy Duong 2
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To Hien Tha4

ABSTRACT

**Purpose:** The purpose of this paper is to delineate strategies for enhancing the risk and customer management information system (MIS) within Asia Commercial Bank (ACB), a prominent Vietnam-based commercial bank. Through a blend of qualitative methods involving synthesis, analysis, and inductive reasoning alongside quantitative approaches such as econometric modeling employing Ordinary Least Squares (OLS) regression, this study aims to offer actionable insights. It underscores the necessity for ACB to adopt a flexible approach in implementing the proposed methodologies.

**Methods:** The study employs a combination of qualitative and quantitative methodologies. Qualitative techniques involve synthesis, analysis, and inductive reasoning to discern patterns and extract insights. Quantitative methods entail the development of an econometric model employing OLS regression to analyze systematic factors influencing stock returns within the observed period. The synthesis of these methodologies enables a comprehensive understanding of the factors affecting the efficacy of the MIS within ACB.

**Results and Discussion:** The intelligent implementation of the data collection, management, exploitation, and utilization processes within the 4th Industrial Revolution technology platform promises enhanced convenience in data analysis and processing for banks, including ACB. Furthermore, the recognition of systematic factors influencing stock returns over the observation period underscores the significance of refining the organization of the MIS system within ACB. The results obtained from both qualitative and quantitative analyses serve as a foundation for informed discussions regarding the optimization of risk and customer management within ACB’s operational framework.

**Implications of the Research:** The findings of this research carry significant implications for the strategic direction of ACB’s risk and customer management practices. By embracing flexible implementation strategies and leveraging advanced technologies inherent to the 4th Industrial Revolution, ACB stands poised to streamline its data processing capabilities and enhance decision-making processes. Moreover, the recognition of systematic factors influencing stock returns underscores the importance of fine-tuning the organization of ACB’s MIS system to accommodate dynamic market conditions.

**Originality/Value:** This study contributes to the existing body of knowledge by offering novel insights into the optimization of risk and customer management information systems within the banking sector, with a specific focus on ACB. By synthesizing qualitative and quantitative methodologies, the research provides a nuanced understanding of the challenges and opportunities inherent to MIS enhancement. The practical implications derived from this study serve as a valuable resource for banking institutions seeking to augment their operational efficiency and strategic effectiveness in an increasingly complex financial landscape.

**Keywords:** Risk Management, MIS, Customer Management Information System, Commercial Bank.

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MELHORAR O SISTEMA DE INFORMAÇÕES DE GERENCIAMENTO DE RISCOS E CLIENTES - UM CASO DO VIETNAM COMMERCIAL BANK

RESUMO

Objetivo: O objetivo deste documento é delinear estratégias para aprimorar o MIS (Sistema de Informações de Gerenciamento de Riscos e Clientes) dentro do Asia Commercial Bank (ACB), um importante banco comercial com sede no Vietnã. Através de uma mistura de métodos qualitativos envolvendo síntese, análise e raciocínio indutivo ao lado de abordagens quantitativas, tais como modelagem econométrica empregando regressão de mínimos quadrados ordinários (OLS), este estudo visa oferecer insights acionáveis. Sublinha a necessidade de a ACB adotar uma abordagem flexível na aplicação das metodologias propostas.

Métodos: O estudo utiliza uma combinação de metodologias qualitativas e quantitativas. Técnicas qualitativas envolvem síntese, análise e raciocínio indutivo para discernir padrões e extrair insights. Os métodos quantitativos implicam o desenvolvimento de um modelo econométrico que empregue a regressão OLS para analisar os fatores sistemáticos que influenciam as devoluções de estoque no período observado. A síntese dessas metodologias permite uma compreensão abrangente dos fatores que afetam a eficácia da MIS dentro da ACB.

Resultados e Discussão: A implementação inteligente dos processos de coleta, gerenciamento, exploração e utilização de dados na 4ª plataforma tecnológica da Revolução Industrial promete maior conveniência na análise e processamento de dados para bancos, incluindo o ACB. Além disso, o reconhecimento de fatores sistemáticos que influenciam a rendibilidade das unidades populacionais ao longo do período de observação sublinha a importância de aperfeiçoar a organização do sistema MIS no seio do ACB. Os resultados obtidos a partir de análises qualitativas e quantitativas servem de base para discussões informadas sobre a otimização da gestão de risco e de clientes dentro da estrutura operacional da ACB.

Implicações da Pesquisa: Os resultados desta pesquisa trazem implicações significativas para a direção estratégica das práticas de gestão de risco e clientes da ACB. Ao adotar estratégias flexíveis de implementação e alavancar tecnologias avançadas inerentes à 4ª Revolução Industrial, a ACB está posicionada para otimizar seus recursos de processamento de dados e aprimorar os processos de tomada de decisão. Além disso, o reconhecimento de fatores sistemáticos que influenciam a rendibilidade das ações sublinha a importância de aperfeiçoar a organização do sistema MIS da ACB para acomodar condições de mercado dinâmicas.

Originalidade/valor: Este estudo contribui para o acervo de conhecimentos existente, oferecendo novas perspectivas para a otimização dos sistemas de informação de gestão de riscos e de clientes no setor bancário, com um enfoque específico no BCC. Ao sintetizar metodologias qualitativas e quantitativas, a pesquisa fornece uma compreensão matizada dos desafios e oportunidades inerentes ao aprimoramento do MIS. As implicações práticas decorrentes deste estudo servem como um recurso valioso para as instituições bancárias que procuram aumentar a sua eficiência operacional e eficácia estratégica num cenário financeiro cada vez mais complexo.

Palavras-chave: Gestão de Risco, MIS, Sistema de Informação de Gestão de Clientes, Banco Comercial.

MEJORA DEL SISTEMA DE INFORMACIÓN SOBRE GESTIÓN DE RIESGOS Y CLIENTES - UN CASO DE VIETNAM COMMERCIAL BANK

RESUMEN

Propósito: El propósito de este artículo es delinear estrategias para mejorar el sistema de información de gestión de riesgos y clientes (MIS) dentro del Banco Comercial de Asia (ACB), un prominente banco comercial con sede en Vietnam. A través de una combinación de métodos cualitativos que involucran síntesis, análisis y razonamiento inductivo junto con enfoques cuantitativos como el modelado econométrico que emplea regresión de mínimos cuadrados ordinarios (OLS), este estudio tiene como objetivo ofrecer información procesable. Subraya la necesidad de que el ACB adopte un enfoque flexible en la aplicación de las metodologías propuestas.

Métodos: El estudio emplea una combinación de metodologías cualitativas y cuantitativas. Las técnicas cualitativas implican síntesis, análisis y razonamiento inductivo para discernir patrones y extraer conocimientos. Los métodos cuantitativos implican el desarrollo de un modelo econométrico que emplea regresión OLS para analizar los factores sistemáticos que influyen en los retornos de las acciones dentro del período observado. La síntesis de estas metodologías permite una comprensión integral de los factores que afectan la eficacia del MIS dentro del ACB.
**Resultados y discusión:** La implementación inteligente de los procesos de recopilación, gestión, explotación y utilización de datos dentro de la plataforma tecnológica de la Cuarta Revolución Industrial promete una mayor comodidad en el análisis y procesamiento de datos para los bancos, incluido ACB. Además, el reconocimiento de los factores sistemáticos que influyen en los rendimientos de las existencias durante el periodo de observación pone de relieve la importancia de perfeccionar la organización del sistema MIS dentro del ACB. Los resultados obtenidos de los análisis cualitativos y cuantitativos sirven como base para debates informados sobre la optimización de la gestión de riesgos y clientes dentro del marco operativo de ACB.

**Implicaciones de la investigación:** Los hallazgos de esta investigación tienen implicaciones significativas para la dirección estratégica de las prácticas de gestión de riesgos y clientes de ACB. Al adoptar estrategias de implementación flexibles y aprovechar las tecnologías avanzadas inherentes a la Cuarta Revolución Industrial, ACB está preparada para optimizar sus capacidades de procesamiento de datos y mejorar los procesos de toma de decisiones. Además, el reconocimiento de los factores sistemáticos que influyen en los rendimientos de las acciones subraya la importancia de ajustar la organización del sistema MIS de ACB para adaptarse a las condiciones dinámicas del mercado.

**Originalidad/Valor:** Este estudio contribuye al acervo de conocimientos existente al ofrecer nuevos conocimientos sobre la optimización de los sistemas de información de gestión de riesgos y clientes dentro del sector bancario, con un enfoque específico en ACB. Al sintetizar metodologías cualitativas y cuantitativas, la investigación proporciona una comprensión matizada de los desafíos y oportunidades inherentes a la mejora del SIM. Las implicaciones prácticas derivadas de este estudio sirven como un recurso valioso para las instituciones bancarias que buscan aumentar su eficiencia operativa y eficacia estratégica en un panorama financiero cada vez más complejo.

**Palabras clave:** Gestión de Riesgos, MIS, Sistema de Información de Gestión de Clientes, Banco Comercial.

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1 **INTRODUCTION**

Nowadays it is important for banks to enhance their risk and customer management information system.

Next, Maskay and Chapman (2007) obtained results supporting hypotheses about money supply effect on risk premium and stock returns. The findings of the research reveal that most of macroeconomic variables can be used to explain the short term stock returns. However, industrial production remains the only variable which explains the stock return for even longer periods. (Chou et al, 2007).

In this paper we mainly focus on using reliable internet data in comparing and evaluating beta CAPM and cost of equity of 2 banks in Vietnam: Sacombank (STB) and Asia commercial bank (ACB).

Established in 1993, ACB has made breakthrough developments. A series of milestones can be mentioned: this is the first private bank in Vietnam to issue MasterCard and Visa
international credit cards. In 1997, a two-year training program on banking operations taught at ACB by experts from international banks helped the bank to proactively apply the most modern banking methods available at that time.

ACB has also signed an agreement with Standard Chartered Bank of the UK for comprehensive technical support. The bank was also awarded two Labor Medals by the Vietnamese government (in 2006 and 2008), as well as recognized by many prestigious organizations as a good financial institution in Vietnam.

Hence we choose this topic:

“IMPROVING RISK AND CUSTOMER MANAGEMENT INFORMATION SYSTEM - A CASE OF VIETNAM COMMERCIAL BANK”.

2 LITERATURE REVIEW

Then, We summarize previous studies as follows:

Table 1

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Contents, results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karim, A.J</td>
<td>2011</td>
<td>Management Information Systems (MIS) is the key factor to facilitate and attain efficient decision making in an organization.</td>
</tr>
<tr>
<td>Espinosa et al</td>
<td>2012</td>
<td>The incidence of mathematics being utilized in economics has undoubtedly increased, and nowadays an advanced knowledge in mathematics is a basic need for any economist willing to go beyond the undergraduate level.</td>
</tr>
<tr>
<td>Gomes</td>
<td>2012</td>
<td>Economics is a fascinating field of knowledge, essentially because it is capable of applying rigorous notions and tools from the exact sciences to the understanding of human behavior and of social relations, realities that clearly involve relevant traces of unpredictability.</td>
</tr>
<tr>
<td>Tularam</td>
<td>2013</td>
<td>The mathematical reasoning patterns, thinking, explanations, simplifications required in transfer of knowledge to students is effectively taught if experts in the field are explicating or presenting proofs. The essence of the conceptual development of models and their assumptions and solutions requires training beyond those of the nonmathematics personnel, mainly due to their lack of years of time spent on such mathematically work</td>
</tr>
</tbody>
</table>
Improving Risk and Customer Management Information System - A Case of Vietnam Commercial Bank

Yang 2017  Financial mathematics is the product of applying mathematics to portfolio selection theory and option pricing theory. With the rapid development of the economic situation, the products and derivatives of the financial industry are constantly optimized and innovative, and new financial products and services are gradually increasing. The operation of financial markets, the design and pricing of financial derivatives, and the analysis and management of risk become very important, and the research and development of financial mathematics is becoming more and more important.

Giebe et al 2019  a progressive tool for providing customer-oriented services and products, in the banking sector, is currently defined as "Big Data & Analytics".

Johnson 2020  highlights the significance of financial practice in establishing mathematical criteria relating to judgement in the presence of uncertainty. When applied to physical systems, mathematics passively represents those systems whereas when mathematics is applied to social systems it can actively direct those systems. Finance provides an example of this effect and this paper considers the role of finance in the development of mathematical approaches to judgement under uncertainty.

Huy D.T.N., Nhan V.K., Bich N.T.N., Hong N.T.P., Chung N.T., Huy P.Q 2021  Used an equation with regression Eviews to measure effects of macro indexes on stock price of a real estate firm. They found out:

\[
\text{Stock price}_\text{VIC} = -245.13 \times \text{Inflation}_\text{CPI} + 815.06 \times \text{Rf}_\text{rate} \times \text{USD}_\text{VND}_\text{rate} + 0.07 \times \text{SP500} - 372.08 \times \text{Inflation}_\text{US},
\]

\[
R^2 = 0.84, \text{SER} = 19.7
\]

source: prepared by authors (2024)

3 METHODOLOGY

This study mainly use combination of quantitative methods (OLS econometric model) and qualitative methods including synthesis, inductive and explanatory methods. And it emphasizes again important roles of risk management in sustainable modern bank management.

For quantitative analysis, the study is supported with OLS regression.
4 RESULTS AND DISCUSSION

4.1 DATA MANAGEMENT AT THE BANK

In order to do a good job of managing customer data at banks flexibly and intelligently on the basis of taking advantage of the current technology platforms of the industrial revolution 4.0, banks must comply with the following procedures: strict custom. Or have to apply flexibly the steps. The intelligent implementation of the process of collecting, managing, exploiting and using customer data using the technology platform of the 4th Industrial Revolution will make it more convenient for banks to analyze and process data.

Figure 1

Customer data management process at the bank

<table>
<thead>
<tr>
<th>Work</th>
<th>Assign responsibilities to perform the work</th>
<th>Sequence of work</th>
<th>Supporting document</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Employee of customer transaction office</td>
<td>Collecting customer information</td>
<td>Form for collecting information about customers</td>
</tr>
<tr>
<td>2</td>
<td>Employee of customer transaction office</td>
<td>Categorize and organize customer information</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Employee of customer transaction office</td>
<td>Analyze and process customer information</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Head of Customer Service Department</td>
<td>Check and verify the accuracy of information</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Functional departments at the bank</td>
<td>Exploiting and using information</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Employee of customer transaction office</td>
<td>Store and control customer information</td>
<td>Customer management software</td>
</tr>
</tbody>
</table>

source: prepared by authors (2024)
Step 1: Customer transaction office staff collect information related to customers.

Step 2: Customer transaction office staff classify and arrange information related to customers.

Step 3: Staff of the customer transaction office organizes the analysis and processing of information related to customers. After the customer's information has been classified by the Customer Service Department Officer, it will be processed in accordance with each type of information. Correctly select the appropriate information channel to ensure the efficiency and quality of the information processing.

Step 4: Head of Customer Transaction Department checks and verifies the accuracy of customer-related information. Once the information has been processed, they need to check the accuracy of the information to have a customer care policy suitable for each service package at the bank. If the information is wrong or incorrect, the Customer Service Department officer needs to re-determine the information to be processed to see if it is correct.

Step 5: Functional departments exploit information related to customers to perform transactions and take care of them when necessary.

Step 6: Customer transaction office staff store and control information related to customers. When the information has been checked, it will then be aggregated according to primary and secondary information sources; sources inside and outside the organization; new and old sources; important and less important sources; official and unofficial sources; text and non-text resources; Sources of information gathered from reality and through direct exchange. On that basis, the Customer Service Department officer stores information data into the data warehouse and transfers information to the bank's leaders when necessary.

4.2 RISK/COST DATA MANAGEMENT AT THE BANK

First we will make data analysis for risk/cost of equity (9COE) of a typical bank, ACB as follows:

For instance, we Looking at descriptive statistics below (fig 2, 3, 4), we see that:

- standard dev of exchange rate higher than trade balance
- standard dev of IM higher than GDP growth
- standard dev of cost of equity ACB higher than STB
Figure 2

*ACB stat descriptive for external elements*

<table>
<thead>
<tr>
<th></th>
<th>COEACB</th>
<th>EX_RATE</th>
<th>SP500</th>
<th>TRADEBA...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.439350</td>
<td>22394.20</td>
<td>2245.493</td>
<td>-95.16000</td>
</tr>
<tr>
<td>Median</td>
<td>0.341500</td>
<td>22700.00</td>
<td>2138.720</td>
<td>-125.0000</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.407000</td>
<td>23230.00</td>
<td>3793.060</td>
<td>498.0000</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.062000</td>
<td>20618.00</td>
<td>1292.280</td>
<td>-1162.000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.310924</td>
<td>837.4044</td>
<td>685.2655</td>
<td>418.3204</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.523717</td>
<td>-0.853154</td>
<td>0.365308</td>
<td>-0.550716</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>5.714908</td>
<td>2.379814</td>
<td>2.307065</td>
<td>3.302168</td>
</tr>
</tbody>
</table>

Then we can compare to another bank Sacombank’s STB data:

Figure 3

*STB stat descriptive for external elements*

<table>
<thead>
<tr>
<th></th>
<th>COESTB</th>
<th>EX_RATE</th>
<th>SP500</th>
<th>TRADEBA...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.115500</td>
<td>22394.20</td>
<td>2245.493</td>
<td>-95.16000</td>
</tr>
<tr>
<td>Median</td>
<td>0.065000</td>
<td>22700.00</td>
<td>2138.720</td>
<td>-125.0000</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.640000</td>
<td>23230.00</td>
<td>3793.060</td>
<td>498.0000</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.680000</td>
<td>20618.00</td>
<td>1292.280</td>
<td>-1162.000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.293410</td>
<td>837.4044</td>
<td>685.2655</td>
<td>418.3204</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.578698</td>
<td>-0.853154</td>
<td>0.365308</td>
<td>-0.550716</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.036518</td>
<td>2.379814</td>
<td>2.307065</td>
<td>3.302168</td>
</tr>
</tbody>
</table>

source: author analysis with Eview
Figure 4

ACB stat corr matrix for external elements

| Correlation Matrix | BETAAPCB | EX RATE | SP500 | TRADEBA...
|---------------------|----------|---------|-------|------------
| BETAAPCB           | 1.000000 | 0.189232| 0.219021| 0.230202 |
| EX RATE            | 0.189232 | 1.000000| 0.720764| 0.028404 |
| SP500              | 0.219021 | 0.720764| 1.000000| 0.375469 |
| TRADEBA...         | 0.230202 | 0.028404| 0.375469| 1.000000 |

source: author analysis with Eview

Comparing 2 banks STB and ACB:

Table 2

Effect on Cost of equity of 2 banks in 3 factors model

<table>
<thead>
<tr>
<th></th>
<th>Coefficient - ACB</th>
<th>Coefficient - STB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta ACB</td>
<td>0.24</td>
<td>-0.02</td>
</tr>
<tr>
<td>R</td>
<td>-0.35</td>
<td>-0.45</td>
</tr>
<tr>
<td>MRPremium</td>
<td>0.68</td>
<td>0.67</td>
</tr>
<tr>
<td>C</td>
<td>-0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.74</td>
<td>0.62</td>
</tr>
<tr>
<td>SER</td>
<td>0.17</td>
<td>0.19</td>
</tr>
</tbody>
</table>

source: prepared by authors (2024)

We see that Market risk premium has almost same positive impact on cost of equity of 2 banks, while beta has positive impact on ACB cost of equity (but negative impact in case of STB cost of equity).

During post crisis period 2011-2020:

Negative impact: Beta, CPI, G, IM, Market return have negative cor with cost of equity STB.

Whereas CPI, IM, Rf, Market risk premium have negative impact on cost of equity ACB.

Positive impact: R, Market risk premium, Rf, tax rate and VNIndex have positive impact on cost of equity STB.

Whereas Beta, G, Market return, R, tax rate, VNIndex have positive impact on cost of equity ACB.
5 CONCLUSION

Because Negative impact: Beta, CPI, G, IM, Market return have negative cor with cost of equity STB. Whereas CPI, IM, Rf, Market risk premium have negative impact on cost of equity ACB. Hence, we suggest increase CPI and IM to reduce cost of equity of banks.

Positive impact: R, Market risk premium, Rf, tax rate and VNIndex have positive impact on cost of equity STB. Whereas Beta, G, Market return, R, tax rate, VNIndex have positive impact on cost of equity ACB. Hence, we suggest to reduce R and tax rate to reduce cost of equity of banks.

Mukhamadeev et al (2019) stated that the role of information systems for entrepreneurship education in developing countries on the example of the Azerbaijan education system and Internet banking.

Then, Eddy et al (2019) found that there is difference of systematic factors influence to stock return in three observation period. Increased market risk and economic growth, increase stock returns. High inflation and interest rates cause investors to reconsider the investments they have made. The strengthening of the rupiah against the US dollar is a positive signal for market participants where they still have confidence in Indonesia's economic condition.

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Thank you editors, friends to assist this publishing.

LIMITATION OF RESEARCH

We can expand our research model for other industries and other markets.

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