VILNIUS UNIVERSITY

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

BUSINESS PROCESS MANAGEMENT

Santa Damaševičiūtė

MASTER THESIS

Rizikos valdymo proceso ir kredito sprendimo priėmimo proceso sąveikos įtaka banko veiklos rezultatams	**The impact of the interplay between the risk management process and credit approval process on bank performance**

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INTRODUCTION

Keywords: Banking processes, impact on bank performance, the interplay between processes, risk management process, credit approval process.

Topic relevance. "The successful development of an economy is based on the effective and stable performance of commercial banks" (Ginevičius & Podviezko, 2013, p.1). Moreover, banking services encourage economic growth and public social security (Mahalawat & Sharma, 2018). Thus, bank performance has an impact on the whole country's development. "The banking system is prone to various risks, so risk management is vital in the sector" (S. Chen, 2023, p.1). Nowadays risk management and well-considered credit approval are becoming increasingly important in all banks. The Basel Accords have set guidelines for banks to implement effective risk management practices and to ensure a rigorous credit approval process (Basel Committee on Banking Supervision, 2018). Worldwide crises such as Covid-19, the war in Ukraine, and huge inflation lead to an increase in all kinds of risks. Thus, banks need to control and mitigate all risks by having trustful and effective risk management processes that lead to positive results in bank performance. A credit approval process is equally important to the risk management process. "The risk can be business loss by not approving the suitable candidate or financial loss by approving the candidate who is at bad risk" (Smith et al., 2017, p.1). Considering these two processes are vital to the banking sector there is a need to understand how the interplay between the key banking processes, i.e., the risk management process and the credit approval process, impacts banks' performance.

The research was undertaken in Lithuania a country that has faced numerous challenges, including the impact of the Covid-19 pandemic, economic repercussions resulting from the conflict in Ukraine, and sanctions imposed on Russia and Belarus. Compounded by its geographical proximity to potential aggressors such as Russia and Belarus, Lithuania confronts a challenging business environment and strained international trade relations. This increased geopolitical risk further amplifies the potential economic and business uncertainties for Lithuanian companies, especially those reliant on credit facilities, both currently and in the near future.

From a research perspective, this topic is pertinent for expanding the exploration and methodologies applied in understanding the assessment of the interplay between risk management and credit approval processes and its subsequent impact on bank performance.

Topic and research gap exploration level. To the best knowledge of the author of this thesis, this topic is barely explored. While there is scientific literature on each of these processes

individually, there has been limited research on how these processes interact with each other and their impact on bank performance. The interplay between processes analyzed and methodology provided by Aydiner et al. (2019), Gribovskis (2021), Kühn & Neu (2003), Robson (2004), Ulbinaitė & Gribovskis (2020). However, these methodologies were adapted for industrial companies, not banks. The risk management process and its performance was analyzed by Chan et al. (2009), Gitau Muigai (2018), Hallunovi & Berdo (2018), Rehman & Rosman (2009), Richard et al. (2008), Tursoy (2018). Credit approval process and its performance was analyzed by Bekhet & Eletter (2014), Chan et al. (2009), Chi & Hsu (2012), M.K.Jayanthi Kannan (2023), Majeske & Lauer (2013), Manikandan et al. (2015), Pušnik et al. (2019), Takyi (2020). Bank performance was researched by Almekhlafi et al. (2016), Anna et al. (2015), Bhattarai (2016), X. Chen et al. (2021), Kianto et al. (2013), Rahman & Akhter (2021). The interplay between credit approval and risk management was analyzed by Bao et al. (2019), Bekhet & Eletter (2014), Chi & Hsu (2012), Gitau Muigai (2018), Lalon (2015), Matthews (2013), Richard et al. (2008), Smith et al. (2017), Wu & Hsu (2012). The impact of the interplay between processes on bank performance has not been researched.

Research novelty/contribution to science. The framework developed in this research is adaptable for analyzing various bank processes. Notably, a gap exists in the scientific literature regarding research on the interplay between bank processes and their consequential impact on performance. The proposed methodology can serve as a valuable tool for further investigations into the interplay between different bank processes and their influence on overall performance. By identifying the main drivers within this interplay and understanding their effects on bank performance, financial institutions can implement strategies to optimize their processes effectively. Such enhancements can contribute not only to the individual bank's performance but also have broader implications for the national economy.

Research problem. What is the impact of the interplay between the risk management process and credit approval process on the bank's performance.

Research aim. To determine and assess the relationship between the risk management process and credit approval process, evaluate the impact of that interplay on Bank performance.

Research objectives.

1) To define and compare the concepts of risk management process, credit approval processes and bank performance and determine their evaluation metrics.

2) To compare the assessment of the interplay between processes methods and assessment of the impact of the interplay on bank performance assessment models.

3)   After the literature analysis to determine the hypothesis for the research.

4)   To form a model for the interplay between risk management and credit approval processes assessment and for the impact of their interplay on bank performance assessment.

5)   To investigate the relationship between risk management process performance and credit approval process performance.

6)   To investigate the relationship between risk management process performance and bank performance through the mediator variable of credit approval process performance.

7)   To investigate the relationship between credit approval process performance and bank performance through the mediator variable of risk management process performance.

Research methods. The primary data for the study was collected through a bank employees survey using a questionnaire.

Scales: The constructs are measured through five-point Likert scales.

Dependent variables: Bank's performance.

Independent variable: Risk management process performance and credit approval process performance.

Data analysis methods: Comparative and systematic analysis of scientific literature, descriptive statistics, confirmatory factor analysis (CFA), and structural equation modeling (SEM).

Master thesis structure.

In the first part theoretical analysis is done. The concept of process, its evaluation, and the interplay between processes are being analyzed. Moreover, the concept of bank performance and its evaluation metrics are being analyzed. The methodologies of the research are being analyzed. In the second part, the research methodology is formed and explained in detail. In the third part, the empirical research results and conclusion are provided.

1. THEORETICAL BACKGROUND FOR BANK INTERNAL PROCESSES AND PERFORMANCE

1.1. Conceptualization of internal processes

1.1.1. The concept of internal processes

There are two types of organizations: functional and process. A functional organization is characterized by focusing all attention on the specific function being performed, without analyzing the contribution of the environment, entities, or causes to the final product. In the process organization, attention is paid to the specific process and its components, at the same time, it is analyzed how the process will work in the entire system and what will be the result (product or service) not only of the process but also of the entire organization. Process analysis and evaluation are difficult to imagine in an organization that bases its activities on functions rather than processes (Gribovskis, 2021). According to Gribovskis (2021) in every organization, there are a lot of different processes, and Climent et al. (2009) state that organization activity is based on processes and their results or functions. Thus, it can be stated that all companies have processes, but it depends on the cultural environment whether employees and managers focus on processes, how to manage and improve them, or employees' functions. In process-focused organizations, process management can be more valuable than in functional organizations. Business process create value added, financial profit, create competitive advantage and improves company's performance. (Küng et al., 2005; Stravinskiene & Serafinas, 2020). Without processes the company would be in chaos and have an internal conflict. Processes create a structure for companies internal activities, bring clarity and order which reduces confusion (Stravinskiene & Serafinas, 2020).

„Business process is an agile, complex organizational unit with a logical and time-bound sequence of actions" (Stravinskiene & Serafinas, 2020, p.3). Thus, processes are constantly changing along with environmental changes. It is important to manage and update processes that would perform its function – improve the company's performance. Moreover, processes are complex as they are not only set of actions but also include roles, resources, and rules. According to the Reijers (2021) process has steps, people who perform these steps, information that is exchanged and processed during these steps and technologies invoked. Another concept of the process is a horizontal sequence of successive actions, operations, or activities during which inputs (raw materials) produce outputs (results) that satisfy the needs of customers and stakeholders. According to Gribovskis (2021) process of the organization consists of five parts:

1. Input source (can be previous processes).

2. Input (materials, energy, information, raw material, resources, requirements).

3. Activity.

4. Output/result.

5. Recipient of the result.

All concepts show that process is defined as a complex sequence of actions and has people that perform these actions. Also, process has input, information, and output.

Processes in the organization are happening constantly and are essential for the performance of organizational functions (Gribovskis, 2021). Considering that processes are essential for an organization to work; it can be stated that processes have a positive impact on companies' performance. In every organization, there are a lot of different processes that depend on organization activity, size, structure, or type of management (Gribovskis, 2021; Climent et al., 2009). Different processes have a different impact on organizational performance. However, professional process management can help to achieve better results.

To sum up, every organization has many different processes that depend on organizational activity, culture, and other metrics but all of them are essential for a company to reduce chaos, confusion and improve activity performance. Process is defined as a complex sequence of actions and has people that perform these actions, has input, information, and output. Processes are essential for the organization to work and have a positive impact on company performance.

1.1.1. Process metrics and measurement principles

Processes are essential for every organization and have a positive impact on company performance. To improve company performance there is a need to evaluate, analyze, manage, and improve its processes. Analyzing the company process possible to evaluate three aspects: evaluate the whole process, the process' different stages, or the final process product (output) (Ulbinaitė & Gribovskis, 2020; Gribovskis, 2021). There is also a possibility to look for connections between the second and third parts: between the steps and characteristics of the process and the result. Moreover, combining the evaluation indicators from each process stage can create a common assessment indication for the entire process (Gribovskis, 2021). To measure the process means judge the quality, value or effect of the process or determine the size or volume by comparing with others (Küng et al., 2005). There is more than one viable way to evaluate and analyze processes. The best evaluation method depends on the process that is going to be managed.

In scientific literature, there is no unified methodology for entire process evaluation. According to Zemguliene[1] & Valukonis[2] (2018), a process is described by a set of *quantifiable properties* (weaknesses, complexity, etc.) that can be used for process measurement. According to Küng et al. (2005), process evaluation is the determination of the performance of processes either measuring their quality quantitatively via a set of *key performance indicators (KPI)*. According to Climent et al. (2009), a process is a structured design of a system that establishes a *result or output* - indicator to measure the performance of the process. Business process activities provide the ability to convert process input to output (Zemguliene[1] & Valukonis[2], 2018). The output or result of the process is evaluated by the number of manufactured products or provided services, as well as by the compliance of the final product with the established product standards, and in the case of service provision, by the compliance of the provided services with the user's expectations (Gribovskis, 2021).

According to Gribovskis (2021), organizational processes are being evaluated by *measurements or metrics,* and process evaluation results are characterized by *efficiency and effectiveness*. Dimensions and metrics of the processes depend on the sector of the organization's activity, the type of organization, the size, the nature of the service or product, and other characteristics, and determining factors (Gribovskis, 2021). According to Ulbinaitė & Gribovskis (2020), process indicators are categorized based on the *factors of competitiveness and goal*. Factors of competitiveness are process duration, quality, flexibility, productivity, and environmental compatibility. Factors of goal are indicators of consumer satisfaction and internal resource management (Gribovskis, 2021).

According to Gribovskis (2021), for every metric, there are different criteria:

- Costs – activity and process costs, cost of creating a unit of production or service, used materials quantity or price per unit, number of workers, their working time, investments in their training by time or price, number, or price of work tools.
- Time – operation time, process cycle time, order time, production time per unit of time.
- Other financial metrics - cash flow, return on equity (ROE), return on investment (ROI), return on sales (ROS), margins, profit, etc.).
- The number of errors experienced in a specific process chain can also be included.

Table 1
Process evaluation metrics in the scientific literature

Author	Year	Process evaluation metric
Zemguliene & Valukonis	2018	Quantifiable properties
Küng et al.	2005	Performance indicators
Climent et al.	2009	Result or output of the process (performance)
Gribovskis	2021	Efficiency and effectiveness
Ulbinaitė & Gribovskis	2020	Factors of competitiveness and goal

Source: Created by the author based on Climent et al., 2009; Gribovskis, 2021; Küng et al., 2005; Zemguliene[1] & Valukonis[2], 2018.

There are many methods to evaluate processes, but not all of them apply to all processes. Which model to choose depends on the process type or goal. **Table 1** provides metrics that are mentioned in scientific literature. All metrics evaluate the process' performance using different ratios. Thus, to measure process performance every company needs to choose metrics that could apply to their process.

After process evaluation using the chosen method further actions are being taken. To manage the process and improve it all results can be compared to previous results, planned results, and competitors' results (Gribovskis, 2021). All dimensions or measures can be used to measure every process's efficiency, effectiveness, or in general – performance, to find out if there is a space for improvement. Also using measures or ratios it is possible to compare processes and identify process issues. Thus, it can be considered that process output can also be used to measure the process itself. Measuring or evaluating output KPIs can be created, and processes can be monitored and controlled. According to Küng et al. (2005), process measurement shows statistics of process data combined with business data. Thus, it can be stated that measuring processes can be valuable not only for process effectiveness identification but also it shows how the whole company is performing. Improving processes and the performance of the company can also be improved. This confirms that processes have an impact on company performance. If process management is weak and processes are not efficient or effective, it can cause worse company performance. If process management is strong and processes are constantly improving, it will have a positive impact on the company's performance.

To sum up, processes can be evaluated through their metrics. There are a lot of different processes in the organization and metrics are different depending on the process and organization

type. **Table 1** shows that there are a lot of different understandings of how a process can be evaluated, but one specification is common – process metric shows the performance of the process. Process measures are important in process comparison. Lastly, weak process management can cause decreasing company performance, thus process performance is closely related to bank performance.

1.2. Conceptualization of bank processes and performance

Financial institutions are crucial in any economy. They provide financial resources (information) for economic growth. Weakness in credit risk management is a large part of the reasons for bank difficulties, especially when there is inferior quality of loans. Often a problem begins at the loan application stage, and then increases at the loan approval, monitoring, and control stages (Richard et al., 2008). Before investing, the bank needs to evaluate the risk and decide whether it is appropriate. Risk management helps to detect the risk, analyze it, and resolve it. (S. Chen, 2023).

1.2.1. Conceptualization of credit approval process
Credit approval process stages

The credit approval process is a critical first step for a bank's performance. The profitability and stability of the bank mostly depend on the performance of the credit department which does the customer's financial history and background screening. Moreover, credit decisions are key determinants of the bank's success due to proper or wrong decisions made. Poor credit risk evaluation causes a loss of money (Bekhet & Eletter, 2014). The credit approval system helps to reduce the loss and provides loans only for eligible and solvent clients (M.K.Jayanthi Kannan, 2023). The credit approval process helps to identify whether a client will be able to repay the loan or not (Majeske & Lauer, 2013). To decide the credit approval process, credit specialists rely on personal and financial client information (M.K.Jayanthi Kannan, 2023). The credit approval process is one of the most complex processes in banks due to a vast variety of factors being taken into consideration. Banks collect credit purpose, account type, state, balance, guarantor, monthly income, collaterals, credit history, and other information to compare to the loan requirements options set by the bank (Takyi, 2020). To get bank approval for the loan, clients must fulfill bank credit policy, loan amount, loan purpose, and repayment ability requirements. Furthermore, financial statement analysis, business operating results, liquidity, previous business performance, and present/future business plans are considered during the credit approval process (M.K.Jayanthi

Kannan, 2023). Many attributes are considered, but the most important attributes to decide for credit approval are client income history, years of employment, the credit score (external ratio, based on previous credit history), and previous default information (M.K.Jayanthi Kannan, 2023). After careful information consideration specialist decides whether an applicant qualifies for the loan or not (Takyi, 2020). One of the main credit approval process steps is credit analysis. This step is necessary to predict whether the client will be able to repay the loan on time or whether there is a high probability of the client defaulting. Credit analysis can be done using the credit-scoring model. Credit-scoring model is a base for the credit approval process (Chi & Hsu, 2012). Banks must have a credit score model to avoid subjectivity in decision making which can cause losses (Bekhet & Eletter, 2014). This model helps to assign clients to diverse groups and decide if the client is likely to repay or is likely to default. Significant variables of the scoring model are age, occupation, debt-to-income ratio, purpose of mortgage, collateral area, number of 60+ days delinquent in last 12 months, terms to maturity of the mortgage, and original loan-to-value ratio (Chi & Hsu, 2012).

According to Pušnik et al. (2019), the credit approval process starts with the client choosing the bank, getting the necessary information, and choosing the loan type. Afterward, the bank does the informative calculations that are revised by the client and further, the client sends an application. Bank check document data, do credit assessments, and prepare contracts. After the client signs the contract, the process ends with the bank transferring funds. Manikandan et al. (2015) state that the credit approval process consists of getting client applications, getting external credit information, performing the internal credit inspection, doing the credit calculations, completing the examination, and archiving various loan application-related documents. One more credit approval process conception is provided by Barjaktarović et al. (2016): the process consists of six steps: client application provided to the bank, internal credit application subprocess, which is divided into document check and credit evaluation, next steps are credit specialist's decision, conclusion of the credit contract in case of positive previous decision, transfer money to client. The last step is loan monitoring. One more credit approval process provided by (Chan et al., 2009): the client submits a loan application, providing all necessary personal information. Afterwards, document evaluation is done, to make sure that all documents are provided. The next step is application analysis (risk assessment), which includes checking external sources and provided information, to evaluate the possible risk. Further steps are loan approval decisions and contract preparation. The last step is the client contract signature.

Table 2

Credit approval process activities

Author/Year Credit approval process steps	Pušnik et al. (2019)	Manikandan et al. (2015)	Barjaktarović et al. (2016)	Chan et al. (2009)	*Number of mentions (showing the importance of step):*
Client chooses the bank	+				*1*
Bank provides information about loans	+				*1*
Client selects type of loan	+				*1*
Bank does informative calculation	+				*1*
Client applies for a loan	+	+	+	+	*4*
Documentation check	+		+	+	*3*
Evaluation of the client (credit assessment)	+	+	+	+	*4*
Credit decision			+	+	*2*
Contract preparation	+			+	*2*
Contract review/ signature	+		+	+	*3*
Document archiving		+			*1*
Bank transfers money to account	+		+		*2*
Monitoring the loan			+		*1*

Source: Created by the author based on Manikandan et al., 2015; Pušnik et al., 2019

The credit approval process differs in every research or bank. The comparison of credit approval process steps in scientific literature is provided in **Table 2**. Considering **Table 2** results, the most used steps in scientific research are client loan application, documentation check, evaluation of the client and contract signature. Other steps such as credit decision, contract preparation and money transferring are possible to include. This process can be understood differently and there is not only one opinion on how it should look. Evaluating credit approval process steps such as the client choosing the bank, the bank providing information or the client's loan type selection are not important and will not provide a lot of important information about process efficiency. One step that is researched as an equivalent of the process is credit assessment. This step includes a lot of metrics that are taken into consideration while approving client credit. The detailed process developed according to the **Table 2** results is provided in **Figure 1.**

*S*ource: Created by the author based on Manikandan et al., 2015; Pušnik et al., 2019
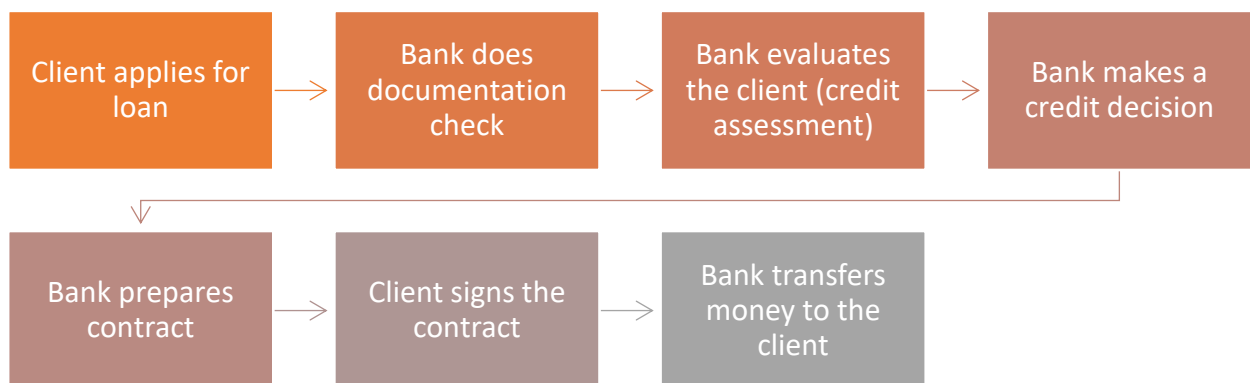
Figure 1
Credit approval process

To sum up, the credit approval process is an essential step for bank activity that affects bank profitability and stability. Poor credit approval decisions cause losses for a bank. While effective credit approval process helps to reduce the loss. During the credit approval process bank specialists analyze personal and financial client information. There are many attributes to be considered during the credit analysis, but the main attributes are client income history, years of employment, credit score, and previous default information. The most used steps of the credit approval process are client loan application, documentation check, evaluation of the client, and contract signature.

Credit approval process impact on bank performance

Credit scoring models have a great effect on the profitability of the bank (Bao et al., 2019). Having a credit scoring model installed into the credit decision process can help to achieve bigger accuracy which leads to approving better (healthy and not going to default) clients. This can result in increased profits and decreased losses – increased bank performance. Granting credit to clients with poor credit scores or poor credit history can result in significant losses for the bank, leading to negative profits and substantial financial losses. This not only poses a risk to the bank but to the entire financial system and country as well. (West, 2000). Credit approval process guidelines affect bank performance. A defined method based on best practices and tested activity is produced and delivered in the form of a guideline. If banks adhere to it and implement everything in the rules, it should increase bank performance by minimizing risk and losses (Gitau Muigai, 2018).

Credit approval process quality measurements

Ineffective indication of a high risk or with a high probability of default clients can lead to financial failure (Mahmoud et al., 2008). According to Kanungo et al. (2001), the quality of the credit approval process is high if the specialist's thoughts are structured and organized during the approval, the process is quick, and the specialist has an objective outlook. To assess the quality of the credit approval process, we must ask questions about organizing the assessment of proposals, the credit-approval process efficiency, and the objectiveness of a credit-approving person in their decision-making. Decision makers are key people in the credit decision process. Failures happen due to a lack of knowledge, weak credit risk assessment, and incompetence. Banks need highly competent experts in credit risk assessment, and they face challenges in finding them. To ease their job, systems help them identify potential problems, assess clients, and make better decisions. The credit scoring model is one of the credit approval process effectiveness indications (Mahmoud et al., 2008). Having a credit scoring model, a bank can reduce process costs, make the credit approval process faster, and help to monitor (it can be an indication of risk management process effectiveness) (West, 2000). Moreover, data mining techniques in application evaluation can result in credit decision effectiveness improvement as well as save analysis time and costs (Bekhet & Eletter, 2014).

The credit approval process is a complex process due to a wide variety of factors included in the credit assessment. This process helps to prevent the risk and possible losses by identifying clients with a high probability of default. The credit approval process is understood differently, and the most important part of the process is credit assessment. The key attributes in credit assessment are client income, years of employment, credit score, and client default information.

1.2.2. Conceptualization of risk management process
Risk management process stages

Every bank has many risks that must be managed and mitigated. Risks are related to provided credits, bank liquidity, earnings or revenues, costs, and trading. Commercial banks' risks are categorized into three groups: financial, operational, and strategic (Richard et al., 2008). To reduce risks, a bank must effectively manage them. Risk management in the banking sector is the implementation of a plan to deal with probable losses (Tursoy, 2018). In scientific literature, the most researched is credit risk (one of the financial risks).

The risk management process raises questions that show the importance of risk management implementation. These questions help to identify what activities can cause the losses and evaluate or measure to what extent is possible damage or loss. Furthermore, the risk management process helps to determine actions and activities that are going to be implemented to address and manage these potential hazards. After identification and planning the bank starts monitoring and reporting processes (Tursoy, 2018). Rehman & Rosman (2009) defined four steps of the risk management process: understanding risk management, risk identification, risk analysis and assessment, and risk monitoring. S. Chen (2023) states that risk management stages are identifying the risk by brainstorming sessions, assessing – analyzing, and evaluating the possible effect of the risk on the bank, response – developing solutions for risk mitigation and prevention in the future and the last step is monitoring – determine if the implemented method for risk mitigation and prevention works efficiently. According to Hallunovi & Berdo (2018), the risk management process consists of risk identification, risk analysis and assessment, and risk audit. According to Gitau Muigai (2018), the risk management process consists of two steps: risk source identification and the use of methods to quantify the risk.

Table 3

Risk management process metrics used in the scientific literature

Author/Year / Risk management process steps	Rehman & Rosman (2009)	Hallunovi & Berdo (2018)	Gitau Muigai (2018)	Tursoy (2018)	*Number of mentions (showing the importance of step):*
Understanding risk management	+			+	*2*
Risk identification	+	+	+	+	*4*
Risk analysis	+	+			*2*
Risk assessment	+	+	+	+	*4*
Risk management action identification				+	*1*
Risk monitoring	+			+	*2*
Reporting				+	*1*
Risk audit		+			*1*

Source: Created by the author based on Gitau Muigai, 2018; Hallunovi & Berdo, 2018; Rehman & Rosman, 2009; Tursoy, 2018

In **Table 3** four risk management process conceptions are compared. All researchers agree that risk management processes consist of risk identification and risk assessment. These two steps are the main part of the risk management process. The risk identification step allows the bank to identify possible loss sources. Effective identification is essential in preventing risk increases which can cause deteriorated bank performance. The risk assessment step allows banks to evaluate

possible losses and prevent them by forming provisions. Other steps such as: understanding risk management, risk analysis, and risk monitoring are additional and can be included in the risk management process as value-added steps. All other parts such as risk management action identification, reporting, and risk audit are not that important for an effective and efficient risk management process. After all process steps analysis, the risk management process has been developed and provided in **Figure 2**.

Understanding risk management	→	Risk identification	→	Risk analysis	→	Risk assessment	→	Risk monitoring
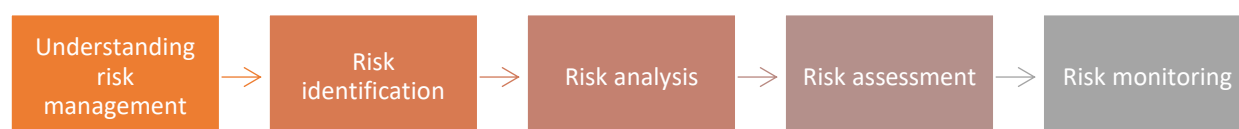
Figure 2
Risk management process

*S*ource: Created by the author based on Gitau Muigai, 2018; Hallunovi & Berdo, 2018; Rehman & Rosman, 2009; Tursoy, 2018

To sum up, the bank faces many risks that must be mitigated and managed. Risk management process consists of two essential steps: risk identification and risk assessment. Effective process allows banks to avoid possible losses and excess provisions.

Risk management process impact on bank performance

Risk can cause bank deficit thus risk management is a way to increase bank performance (Kakar et al., 2021). Financial, operational, and strategic risks have different impacts on bank performance (Richard et al., 2008). Research by Saiful & Ayu (2019) showed that credit, liquidity, and operational risk management have a positive influence on bank performance. If a bank has weak risk management processes, it can lead to losses and directly impact the bank's profit or performance (Tursoy, 2018). According to Hallunovi & Berdo (2018), credit risk has the most significant and negative impact on bank profitability. It means that if there are more default loans in a bank, there is less profit. Lalon (2015) found that credit risk management influences banks' profitability, thus effective credit risk management can be useful to increase the financial performance of a bank. Considering that improving the management of credit risk can result in increased bank performance and profitability. Credit risk evaluation is one of the possible ways to

manage credit risk. Reliable credit risk evaluation models are crucial for loss control and revenue maximization (Bao et al., 2019). Considering that credit risk is a part of all bank risks, it can be stated that the risk management process has a positive impact on bank performance, and an effective and efficient process is essential for improved bank performance. Better performance increases reputation and attracts more shareholders. The collection of a fund increases opportunities to increase the productivity of assets and increase bank return (Kakar et al., 2021). Rizwan Abbas, (2023) research showed that risk management efficiency has an impact on increased bank performance. This proves that banks must implement appropriate techniques to have better performance.

Risk management process quality measurements

Effective risk management reduces potential loss and mitigates the impact of the loss (Al Rahahleh et al., 2019). Appropriate risk management process helps to increase profitability and saves costs. The ability to save costs and achieve profits can show the performance of the process. If a bank chooses to invest only in not risky opportunities – to avoid risk, the risk management process is not working effectively, because the profit of this investment is insufficient. On the contrary, accepting risks can lead to big losses and the same insufficient profit. Thus, it should be a balanced process to be effective and efficient. If the bank identifies new risks, makes plans to mitigate and prevent them, or resolves a risk – the process is effective and efficient (S. Chen, 2023). Also, risk management is considered effective when a company has advanced IT storage and processing abilities. Having an effective IT system to perform effective risk management is a must (Saeidi et al., 2019).

Credit risk management effectiveness can be measured by the non-performing loan ratio. Credit risk management is effective when the non-performing loan ratio is less than 5%. Liquidity risk management is effective when the liquidity ratio is higher than 78% (Saiful & Ayu, 2019).

Moreover, Saeidi et al., (2019) identify a set of indications for effective risk management of a bank:

- If a company can determine its risk, weight, and consider it in all ways.
- If the organization has an effective risk management policy.
- If risk appetite is considered in strategy setting.
- If the organization considers external factors driving events that could affect the achievement of objectives (e.g., Economic, Natural environment, Political, Social, Technological).
- If the organization considers internal factors driving events that could affect the achievement of objectives (e.g., Infrastructure, Personnel, Process, Technology).

- If the organization's risks are assessed by using qualitative analysis methods (e.g., high, moderate, low).

- If the organization's risks are assessed by using quantitative analysis methods (e.g., percentages or probability charts, or using tools such as metrics and software).

- If the organization regularly reviews internal controls.

All banks face many risks that must be managed and mitigated. The risk management process has a positive impact on bank performance by preventing big losses. Effective and efficient risk management processes should be well-balanced, and include the identification of new risks, risk assessment to prepare for possible losses, and include risk monitoring.

1.2.3. Interplay between risk management and credit approval processes

There are opinions and research that risk management and credit approval processes are interrelated. According to the research, the interplay between these processes is mutual: the credit approval process has an impact on the risk management process and the risk management process has an impact on the credit approval process. According to Lalon (2015), the credit risk management process contains several elements such as credit processing, approval, monitoring, etc. It means that the credit approval process is a part of the risk management process and risk management starts at the credit approval stage. According to Matthews (2013, p.214), "Risk management practice can be thought of as part of a culture of loan approval". These two findings show that the interplay is between both processes.

Moreover, these two processes have some similarities. Firstly, the three credit analysis steps during the credit approval process are similar to the risk management process. It helps to recognize, assess, and reduce the possible risk. One of the main differences is that credit analysis focuses more on credit risk, while the risk management process includes other risks such as liquidity, market, etc. (Smith et al., 2017). Thus, these three steps are the identification of the interplay between credit approval and risk management processes. Secondly, credit risk assessment is the base of the loan decision process and at the same time is a base of credit risk management (Bekhet & Eletter, 2014). Credit risk assessment can be performed using a rating system or credit scoring model. Ratings are the base for loan approval and monitoring. At the loan approval stage rating helps to decide if the client is suitable and risk is appropriate. At the risk management stage (loan monitoring) the change of the rating can be a signal of client deterioration and increased risk for the bank. The scoring model is a credit-granting process tool that helps to achieve the purpose of risk control (Wu & Hsu, 2012). Credit scoring models are used to evaluate

new loan applications during credit approval and to monitor the risk levels of existing loans as a tool for risk management (Bao et al., 2019; Chhikara, 1989). For example, the scoring model not only helps to decide whether to grant credit but also helps to analyze existing customers' behavior to predict future risk increases (Chi & Hsu, 2012). Thus, these two credit risk assessment models are similar and are used in both processes. It can be considered that a rating system or credit scoring model is a part of risk management and credit approval processes and connects both. This means that the interplay between credit approval and risk management processes can be identified by analyzing the rating system or credit scoring model, its activity, effectivity, and efficiency. The credit approval process comes before the risk management process thus, whether the recognition, assessment, and reduction of the possible risk and credit risk assessment are performed effectively and efficiently in the credit approval process, it can result in a more fluent and improved risk management process.

According to Richard et al. (2008) and Gitau Muigai (2018), a clear credit approval process is extremely important in managing credit risk. Banks must have guidelines on the credit approval process and approval authorities. During the credit approval process, the probability of repaying the loan on time is measured. This measurement helps to mitigate the risk of incurring losses (Yengejeh, 2023). Customer screening (risk estimation) is one of the parts of the credit approval process parts and has an impact on reducing credit risk. Thus, credit risk evaluation is an essential part of the credit approval process and reduces manual errors (Bekhet & Eletter, 2014). Even a small improvement in the credit approval process can result in credit risk reduction as well as in future savings (Bekhet & Eletter, 2014). Poor credit approval decisions worsen the possibility of credit risk in the bank's future (Al Rahahleh et al., 2019). If the credit approval process mitigates the risk, it has a positive impact on the risk management process. An appropriate credit approval process helps to get a risk-balanced portfolio and the risk management process becomes more fluent and efficient. This proves the interplay between these two processes. To be more precise, the credit approval process has an impact on the risk management process.

A bank carries out two different essential roles: the role of a loan officer and a risk manager. The first one is focused on granting loans and the second one is focused on risks. Having both roles in credit decision process creates some tension and raises questions about whether a risk manager helps to increase bank performance. Berg's (2015) research shows that having risk management in a credit approval process reduces default rates by more than 50%. It can be stated that risk management integrated into a credit approval process can help to achieve improved bank performance. This shows that the risk management process can have an impact on the credit

approval process and the interplay between these two processes has a positive impact on bank performance.

To sum up, there is an interplay between the risk management and credit approval processes. There are opinions that the credit approval process has a positive impact on the credit risk management process by helping to mitigate the risk and the interplay between these processes has a positive impact on bank performance.

1.2.4.　　The concept of bank performance

In scientific literature and research mostly the return on assets (ROA) is used as an indicator of banks' performance (Almekhlafi et al., 2016; Bhattarai, 2016; Anna et al., 2015). ROA expresses the risk-taking of bank management in obtaining a satisfactory level of profit per unit of total resources. It shows the effectiveness of management in the utilization of the assets of a commercial bank (Bhattarai, 2016).

Bhattarai, (2016) found that performance measures are:

- Traditional measures of performance (ROA - return on assets, ROE - return on equity, cost to income ratio, net interest margin).
- Economic measure of performance (EVA- economic value added, RAROC- risk-adjusted return on capital).
- Market-based measure of performance (total share return, price-earnings ratio, price-to-book value, credit default swap).

According to Rahman & Akhter (2021), usually, the company's performance (financial and non-financial) is demonstrated by the items named effectiveness and efficiency. "Effectiveness indicates how the business achieves its goals. Efficiency indicates how the bank needs as least capital as possible to achieve its goals" (Rahman & Akhter, 2021, p.7).

Moreover, the measure of financial performance can be evaluated by the trend of the main financial indicator of the company's performance, revenues, over the last years. The percentage indicators of growth or decline can be used for assessment taking into consideration that the perceptions of the growth/decline significance might differ across industries and companies (Kianto et al., 2013).

Table 4

Bank performance measurement used in the scientific literature

Author (Year) / Bank performance measurement indicators	Almekhlafi et al. (2016)	Bhattarai (2016)	Anna et al. (2015)	Kianto et al. (2013)	*Number of mentions (showing the importance of indicator):*
ROA	+	+	+		*3*
ROE		+			*1*
Economic measure (EVA, RAROC)		+			*1*
Market-based measure (Total share return, Price-earnings ratio, etc.)		+			*1*
Revenue trend				+	*1*

Source: Created by the author based on Almekhlafi et al., 2016; Anna et al., 2015; Bhattarai, 2016; Kianto et al., 2013

As shown in **Table 4**, the most researched quantitative measurement of bank performance is the ROA ratio. However, some alternatives can be used to measure bank performance.

According to scientific literature more measurements can be used for bank performance evaluation. There is a possibility to evaluate performance by conducting a survey. X. Chen et al. (2021) in their research used bank performance-related items. Bank performance can be evaluated by identifying whether the financial service time was reduced by the time, whether the bank meets customers' daily business needs, whether the bank reduced the operational costs, whether the customers' satisfaction increased by the time, whether the customer base has increased by the time.

According to the Rahman & Akhter, (2021), bank performance effectiveness and efficiency can be measured by respondent answers to bank performance dynamics over the last three years. Effective and efficient performance can be defined by accomplished targets, which shows the productivity of the bank. Moreover, increased client satisfaction also can indicate effective bank

performance. Lastly, improved bank product development and service development indicates that the bank's performance is effective.

Kianto et al. (2013) used a 5-point scale to measure bank performance dynamic, with scale points being "significantly decreased (more than 15%)"," decreased (by less than 15%)", "remained stable", "increased (by less than 15%)" and "significantly increased (above 15%)". The rule of thumb in performance measurement suggests a 3–5-year period for evaluating such trends.

To summarize, bank performance is measured by effectiveness and efficiency measurements. These measurements can be financial, economic, or market KPIs or scale-based questions that lead to bank effectiveness and efficiency evaluation.

1.3. Previous research on interplay between internal processes and their impact on company performance

To the author's best knowledge, no empirical research has been conducted to assess the interplay between processes. Nevertheless, there have been literature analyses examining the evaluation of the interplay between processes. To determine the direct and indirect influence of processes on other processes there is a need to determine the relationships between process dimensions (quality, time, costs, etc.) (Gribovskis, 2021). The more specific approach to assess the interplay between processes provided by Ulbinaitė & Gribovskis (2020):

1.   Need to evaluate and assess every process dimension according to metrics specific to different processes.

2.   After metrics and index determination, the average of results is calculated. The calculated average shows the entire process performance result.

3.   Applying the model empirically there is an ability to evaluate the impact of one process on another process through their dimensions and metrics.

The performed comparative analysis in the 1.1.1 part of this research has revealed metrics of the processes. These metrics can be used for interplay between processes evaluation.

To the author's best knowledge, the impact of the interplay between processes on company performance was not empirically researched. However, theoretical model was proposed by Gribovskis (2021) to assess the impact of the interplay between processes on the company's performance:

1. There is a need to determine if each process individually has a positive influence on different processes,

2. Find if each process has a positive influence on the company performance,
3. Find if one of the organizational processes mediates the positive relationship between other processes and performance output.

Mediation effects in empirical research were analyzes by Abdullahi et al. (2022), Faliza (2023), Sulaiman et al. (2021).

Moreover, there are a few models for assessing the impact of different factors on company or specifically bank performance. Aydiner et al. (2019) proposed a model that examines process performance impact on business process performance. The research instrument employed is a questionnaire comprising various statements concerning process or company performance. Respondents are tasked with evaluating these statements using a 5-point Likert scale. The gathered data is subsequently subjected to analysis through structural equation modeling. Similar research has been conducted by Al-Shari & Lokhande (2023), Aslam & Jawaid (2023), Faliza (2023), Suandi et al. (2023), Suyanto (2021) focusing on the impact of various factors on bank performance. Most of these studies utilized questionnaires as a data collection tool, employing the structural equation modeling methodology for analysis.

To sum up, the interplay between processes can be evaluated by determining the relationship between each process dimension which is process performance metrics. However, to the author's best knowledge no empirical research was done using this method. To evaluate the impact of the interplay, there is a need to determine the relationships of every process separately and find if one of the processes is a mediator to the relationship with company performance. Most of the studies used questionnaires as a data collection tool and employing the structural equation modeling methodology for data analysis.

2. METHODOLOGY FOR RESEARCHING THE IMPACT OF THE INTERPLAY BETWEEN PROCESSES ON PERFORMANCE RESEARCH

2.1. Goal, objectives, and hypothesis of the research

The goal of the empirical research is to identify the impact of the interplay between the risk management process performance (RMP) and the credit approval process performance (CAP) on the bank's performance (BP) in Lithuania.

Scientific literature analysis reveals that a relationship between processes can be evaluated by assessing a relationship between processes' performance (Gribovskis, 2021). Thus, the first step of this research is checking the bidirectionality of relationship between the risk management process performance and the credit approval process performance. Next, to find the impact of the interplay between processes on bank performance, we follow two steps. Firstly, we check whether the first process performance mediates the relationship between the second process performance and the bank's performance. Secondly, we check for whether the second process performance mediates the relationship between the first process performance and the bank's performance. (Gribovskis, 2021).

Research objectives:
1. To identify the impact of the risk management process performance on the credit approval process performance.
2. To identify the impact of the credit approval process performance on the risk management process performance.
3. To identify the impact of the risk management performance on the bank's performance.
4. To identify the impact of the credit approval process performance on the bank's performance.
5. To identify whether the risk management process mediates the relationship between the credit approval process performance and the bank's performance process performance.
6. To identify whether the credit approval process performance mediates the relationship between the risk management process performance and the bank's performance.

Six hypotheses were considered:

H1: The risk management process performance has a positive impact on the credit approval process performance.

According to Matthews (2013, p.214), "Risk management practice can be thought of as part of a culture of loan approval". Moreover, Berg's (2015) research shows that having risk management in a credit approval process reduces default rates by more than 50%. It can be stated that risk management, integrated into a credit approval process, can help to achieve improved bank performance. This shows that the risk management process can have a positive impact on the credit approval process and the interplay between these two processes has a positive impact on bank performance.

H2: Credit approval process performance has a positive impact on the risk management process performance.

According to Lalon (2015), the credit risk management process contains several elements such as credit processing, approval, monitoring, etc. It means that the credit approval process is a client-profile-linked with the risk management process and risk management starts at the credit approval stage. Moreover, the credit approval process comes before the risk management process thus, whether the recognition, assessment, and reduction of the possible risk and credit risk assessment are performed effectively and efficiently in the credit approval process, it can result in a more fluent and improved risk management process. According to Richard et al. (2008) and Gitau Muigai (2018), a clear credit approval process is extremely important in managing credit risk. Furthermore, customer screening (risk estimation) is one of the credit approval process parts and has an impact on reducing credit risk. Even a small improvement in the credit approval process can result in credit risk reduction as well as in future savings (Bekhet & Eletter, 2014). Finally, poor credit approval decisions worsen the possibility of credit risk in the bank's future (Al Rahahleh et al., 2019).

H3: Risk management process performance has a positive impact on bank performance.

Risk can cause bank deficit thus risk management is a way to increase bank performance (Kakar et al., 2021). Research by Saiful & Ayu (2019) showed that credit, liquidity, and operational risk management have a positive influence on bank performance. If a bank has weak risk management processes, it can lead to losses and directly impact the bank's profit or performance (Tursoy, 2018). Lalon (2015) found that credit risk management influences banks' profitability, thus effective credit risk management can be useful to increase the financial performance of a bank. Considering that improving the management of credit risk can result in increased bank performance and profitability. Credit risk evaluation is one of the possible ways to manage credit risk. Reliable credit risk evaluation models are crucial for loss control and revenue maximization (Bao et al., 2019). Considering that credit risk is a biggest of all bank risks, it can be stated that

the risk management process has a positive impact on bank performance, and an effective and efficient process is essential for improved bank performance. Rizwan Abbas, (2023) research showed that risk management efficiency has an impact on increased bank performance. This proves that banks must implement appropriate techniques to have better performance.

H4: Credit approval process performance has a positive impact on bank performance.

Credit scoring models have a great effect on the profitability of the bank (Bao et al., 2019). Having a credit scoring model installed into the credit decision process can help to achieve bigger accuracy which leads to approving better (healthy and not going to default) clients. This can result in increased profits and decreased losses – increased bank performance. Granting credit to clients with poor credit scores or poor credit history can result in significant losses for the bank, leading to negative profits and substantial financial losses. This not only poses a risk to the bank but to the entire financial system and country as well. (West, 2000). Credit approval process guidelines affect bank performance. A defined method based on best practices and tested activity is produced and delivered in the form of a guideline. If banks adhere to it and implement everything in the rules, it should increase bank performance by minimizing risk and losses (Gitau Muigai, 2018).

H5: Risk management process performance mediates the relationship between the credit approval process performance and bank performance.

Risk can cause bank deficit thus risk management is a way to increase bank performance (Kakar et al., 2021). Reliable credit risk evaluation models are crucial for loss control and revenue maximization (Bao et al., 2019). Research by Saiful & Ayu, 2019 showed that credit, liquidity, and operational risk management have a positive influence on bank performance. Lalon (2015) found that credit risk management influences banks' profitability, thus effective credit risk management can be useful to increase the financial performance of a bank. Rizwan Abbas et.al (2023) research showed that risk management efficiency has an impact on increased bank performance. Berg's (2015) research shows that having risk management in a credit approval process reduces default rates by more than 50%. It can be stated that risk management integrated into a credit approval process can help to achieve improved bank performance. This shows that the risk management process can have a positive impact on the credit approval process and the interplay between these two processes has a positive impact on bank performance.

H6: Credit approval process performance mediates the relationship between the risk management process performance and bank performance.

Credit scoring models are used for the main part of the credit approval process – credit analysis - and have a great effect on the bank's profitability (Bao et al., 2019). The credit approval process helps to reduce the loss and provides loans only for eligible and solvent clients (M.K.Jayanthi Kannan, 2023). Having a credit scoring model installed into the credit decision process can help to achieve bigger accuracy which leads to approving better (healthy and not going to default) clients. This can result in increased profits and decreased losses – increased bank performance. Moreover, if the bank has a defined method based on best practices and tested activity for the credit approval process, adheres to it, and implements everything in the rules, it should increase bank performance by minimizing risk and losses (Gitau Muigai, 2018).

2.2. Model of the research

Following the six hypotheses, the main model was constructed (Figure 3). The model contains: two independent variables (risk management process performance and credit approval process performance) and one dependent variable (bank performance). Dotted lines represent indirect impact of the independent variable on dependent variable and not dotted lines represent direct impact of the independent variable on dependent variable.
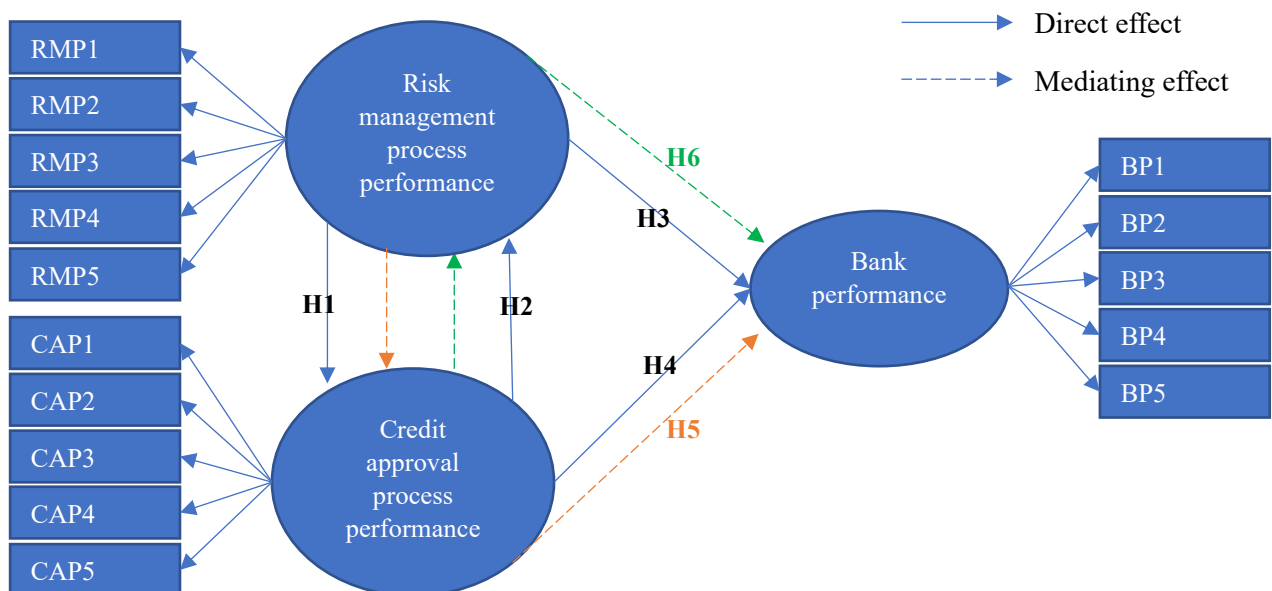
Figure 3
The impact of the interplay between risk management process and credit approval process on bank performance research model

Source: Created by the author

2.3.   Selection of the research methodology

To discern the relationship between processes, it is needed to find the relationship between those processes' performance metrics. The evaluation of process performance involves the utilization of quantitative key performance indicators. Scientific literature analysis indicated that qualitative process performance ratios can serve as effective tools for comparing and analyzing the interplay between processes. Moreover, to analyze the interplay between process performance and bank performance the interplay between performance ratios is evaluated.

Table 5
Research model comparison

Authors	Goal	Sample	Research method	Results
Aslam & Jawaid (2023)	To examine the impact of GBAP on banking performance, i.e. financial, operational and environmental performance.	360 respondents	The data was acquired from banking personnel using a five-point Likert scale questionnaire. Partial least square-structural equation modeling was used.	GBAP positively affects the environmental, operational and financial performance of the banks.
Faliza (2023)	the influence of organizational culture and organizational commitment on banking performance.	204 respondents	The research was performed on permanent employees of banking. The sampling method was a random sampling, through a questionnaire. The pls-SEM is a method of data analysis.	Organizational culture had a positive and important influence on Commitment and organizational activity that would affect banking activity.
Suandi et al. (2023)	To analyze the effect of entrepreneurial marketing on competitive advantage and bank performance with the moderating role of vigilant leadership.	205 respondents	Questionnaire, Smart-Partial Least Square (Smart-PLS) software.	Entrepreneurial marketing directly or indirectly (through competitive advantage) influences bank performance.
Cheng et al. (2020)	Explore the influence of credit risk, operational risk, and liquidity risk effect on bank profitability.	54 banks	Partial Least Squares Structural Equation Model	Credit risk has a significant positive association with bank profitability. Liquidity risk showed a positive and significant connection with bank profitability. indicated a negative affiliation with bank profitability.
Suyanto (2021)	To analyze the effect of bad credit and liquidity on bank performance with the mediation of capital adequacy.	-	Partial Least Squares (PLS)-Structural Equation Modeling (SEM).	The effect of bad credit and liquidity on bank performance is not significant.
Al-Shari & Lokhande (2023)	Explore the relationship between the risks of adopting FinTech in banks and their impact on performance	263 respondents	Data was collected through a questionnaire, model: Structural equation modeling PLS-SEM.	Cyber risks and operational risks of adopting FinTech have a negative impact on banks' performance.

Continuation of Table 5

Rizwan Abbas (2023)	Examine how several factors, including disclosure practices, risk management, and corporate governance, affect the growth of financial services sector.	210 respondents	Conduct interviews and surveys, partial least square method to model structure equations.	Increased corporate disclosure leads to improved overall performance in the banking industry. Efficient methods of risk management are directly responsible for the increased performance of the banking industry.
Aydiner et al. (2019)	Examines the effects of the business analytics adoption on business process performance and the mediating role that business process performance plays in the relationship between the adoption of business analytics and firm performance.	204 respondents	Cross-sectional postal survey using a questionnaire, structural equation modeling (SEM) using AMOS.	The adoption of business analytics positively influences business process performance. There is also a positive relationship between business process performance and firm performance. Finally, the results show that business process performance fully mediates the relationship between business analytics adoption and firm performance.
Jamal Ali & Anwar (2021)	The balanced scorecard's evolution as a strategic mechanism at banking sectors.	128 respondents	The study applied multiple regression analysis to measure the current study.	Internal process as balanced scored card has significant positive influence on strategic mechanism at 5% level. The

Source: Created by the author

Table 5 contains information on previous research that analyzed bank performance or process performance. Most of the researchers for impact on bank performance research used a questionnaire and partial least square structural equation modeling. The results of the comparison indicate that the chosen methodology is appropriate and can be used for data collection and hypothesis analysis.

2.4. Instrument development

The risk management process, credit approval process, and bank performance are evaluated by using performance data metrics. For this research, primary source data was collected by using a survey instrument (a questionnaire-based survey), which is based on previous studies in the relevant research area.

The research questionnaire is composed of three main constructs that represent latent variables: risk management process performance, credit approval process performance, and bank performance. Each of them is composed of 5 statements (observed variables) (see Table 6) that identify how good the performance of the processes and the bank in a particular bank is.

The questionnaire consists of four sections: four demographic / control questions, five risk management process performance questions, five credit approval process performance questions and five bank performance questions. Each observed variable is evaluated by a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5) (Aydiner et al., 2019; Tabouli et al., 2016).

Risk management process (RMP) performance metrics

If a bank chooses to invest only in not risky opportunities to avoid risk, the risk management process is not working effectively, because the profit of this investment is insufficient. On the contrary, accepting risks can lead to big losses and the same insufficient profit. Thus, it should be a balanced process to be effective and efficient (S. Chen, 2023).

RMP1 – The bank decides to invest in both high and low risks.

If the bank identifies new risks, makes plans to mitigate and prevent them, or can resolve a risk – the process is effective and efficient (S. Chen, 2023).

RMP2 – Bank does all of these steps: identify new risks, make plans to mitigate them, and resolve the risks.

Risk management is considered effective when a company has advanced IT storage and processing abilities. Having an effective IT system to perform effective risk management is a must (Saeidi et al., 2019).

RMP3 – Bank has advanced IT storage and processing abilities.

Credit risk management effectiveness can be measured by the non-performing loan ratio. Credit risk management is effective when the non-performing loan ratio is less than 5%. (Saiful & Ayu, 2019).

RMP4 – Bank non-performing loan ratio is less than 5%.

Saeidi et al., (2019) identify that effective risk management of a bank is indicated by risk appetite considered in strategy setting.

RMP5 – Bank has a risk appetite considered.

Credit approval process (CAP) performance metrics

According to Kanungo et al. (2001), the quality of the credit approval process is high if the specialist's thoughts are structured and organized during the approval and the process is quick.

CAP1 – Credit approval process is efficient – quick and smooth.

Many attributes are considered, but the most important attributes to decide for credit approval are client income history, years of employment, the credit score (external ratio, based on previous credit history), and previous default information (M.K.Jayanthi Kannan, 2023).

CAP2 – Bank analyzes all of this information during the credit approval process: client income history, years of employment, and client default information.

Decision makers are key people in the credit decision process. Failures happen due to a lack of knowledge, weak credit risk assessment, and incompetence. Banks need highly competent experts in credit risk assessment and they face challenges in finding them (Mahmoud et al., 2008).

CAP3 – Bank has highly competent experts in credit risk assessment.

Having a credit scoring model, a bank can reduce process costs, make the credit approval process faster, and help to monitor (it can be an indication of risk management process effectiveness) (West, 2000). Moreover, banks must have a credit score model to avoid subjectivity in decision making which can cause losses (Bekhet & Eletter, 2014).

CAP4 – A credit scoring model is in use at the bank.

Following scientific literature research, it was discovered that the credit approval process must involve client loan application, documentation check, evaluation of the client and contract signature steps to be appropriate.

CAP5 – Credit approval process includes all of these steps: client loan application, documentation check, evaluation of the client, and contract signature.

Bank performance (BP) metrics

According to the Rahman & Akhter (2021), bank performance effectiveness and efficiency can be measured by respondent answers to bank performance dynamics over the last three years. Effective and efficient performance can be defined by accomplished targets, which shows the productivity of the bank. Moreover, improved bank product development and service development indicates that the bank's performance is effective.

BP1 – Bank accomplished its targets during the last 3 years.

BP2 – Bank product and service development improved during the last 3 years.

Kianto et al. (2013) used a 5-point scale to measure bank performance dynamic, with scale points being "significantly decreased (more than 15%)"," decreased (by less than 15%)",

"remained stable", "increased (by less than 15%)" and "significantly increased (above 15%)". The rule of thumb in performance measurement suggests a 3–5-year period for evaluating such trends.

BP3 – The bank profit significantly increased during the last 3 years (above 15%).

According to X. Chen et al. (2021), bank performance can be evaluated by identifying whether the financial service time was reduced by the time and whether the bank reduced the operational costs.

BP4 – Bank financial service time was reduced during the last 3 years.

X. Chen et al. (2021) in their research found that bank performance can be evaluated by identifying whether the customers' satisfaction increased over time.

BP5 – Bank customer satisfaction with the bank has increased during the last 3 years.

Table 6
Latent variables and observed variables

Observed variable	Explanation	Author
Risk management process performance (RMP)		
RMP1	The bank decides to invest in both high and low risks clients (portfolio is diversified).	S. Chen (2023)
RMP2	Bank does all these steps: identify new risks, make plans to mitigate them, and resolve the risks.	S. Chen (2023)
RMP3	Bank has advanced IT storage and processing systems/programs (Secure, fast-performing, capable of processing large amounts of data, and user-friendly).	Saeidi et al. (2019)
RMP4	Bank non-performing loan ratio during last 3 years is less than 5%.	Saiful & Ayu (2019)
RMP5	In the bank's risk strategy, the risk appetite level is defined.	Saeidi et al. (2019)
Credit approval process performance (CAP)		
CAP1	Credit approval process is effective (quick, smooth and clear).	Kanungo et al. (2001)
CAP2	Bank analyzes all this information during the credit approval process: client income history (private, legal), years of employment (private), and client default information (private, legal).	M.K.Jayanthi Kannan (2023)
CAP3	Bank credit decision-makers possess high competence in assessing customer credit risk.	Mahmoud et al. (2008)
CAP4	A credit scoring model is in use at the bank.	Bekhet & Eletter (2014)
CAP5	Credit approval process includes all these steps: client loan application, documentation check, evaluation of the client, and contract signature.	Pušnik et al. (2019), Barjaktarović et al. (2016), Chan et al. (2009)

Continuation of Table 6

Bank performance (BP)		
BP1	Bank accomplished its targets during the last 3 years.	Rahman & Akhter (2021)
BP2	Bank product and service development improved during the last 3 years.	Rahman & Akhter (2021)
BP3	The bank profit significantly increased during the last 3 years (above 15%).	Kianto et al. (2013)
BP4	Bank financial service time was reduced during the last 3 years.	X. Chen et al. (2021)
BP5	Bank customer satisfaction with the bank has increased during the last 3 years.	X. Chen et al. (2021)

Source: Created by the author

2.5. Sample and data collection

A sample range of banks was selected according to the Lithuanian Bank information: in Lithuania, there are 13 banks and 5 foreign banks branches (Bank of Lithuania, 2023).

Prior to administering the questionnaire to the participants, the survey questionnaire was translated to Lithuanian since the target respondents are located only in Lithuania.

The targeted respondents for the survey are people working in banks based in Lithuania. According to the Bank of Lithuania, there are 16 banks that are working with credit approval process or risk management process, and their employees with relevant expertise can answer all 20 questions represent the target population. The current study employed a random sampling technique, consistent with the approach widely utilized in the relevant research area, as indicated in Table 5.

Considering that ~5 specialists can work in one department (Credit risk management or Credit approval), one bank can have ~10 specialists that can answer all 20 questions. In Lithuania, there are 16 banks (bigger and smaller ones), thus the number of credit risk and credit approval research representative specialists, who contribute to answering the questionnaire of this research, would be 160. A sample choice according to the previous similar research that used specific questionnaires sent to the bank employees provided in Table 5. The average of the random sampling (Table 5 and practical considerations) is **216 respondents**.

2.6. Pilot survey

Following the development of a questionnaire based on relevant scientific literature, interviews were conducted with three credit specialists employed in Lithuanian banks. To validate the questionnaire, these specialists were invited to share their insights, comments, and views,

drawing upon their field expertise, knowledge, and experience. The pilot survey involved three risk management specialists responsible for the development and performance of risk management processes. These specialists offered valuable insights into the questionnaire's questions and provided professional opinions based on practical process performance. Subsequently, the questionnaire was refined in accordance with the specialists' insights and recommendations.

<u>Insights and recommendations of the specialists:</u>

At first demographic questions were not designed with a commitment to maintaining a prominent level of confidentiality. To enhance privacy, the inclusion of the bank name was made optional. Additionally, positions within the bank were abstracted solely for control purposes, ensuring the identification of the respondent's qualifications while safeguarding sensitive information.

Question "The bank decides to invest in both high and low risks clients (portfolio is diversified)" has been revised to incorporate additional details on how risk can be assessed. As per specialist feedback, banks employ varied gradations and methodologies for evaluating client risk. Therefore, respondents are prompted to assess the risk they undertake based on their unique client risk groups or rating gradations. Furthermore, it is widespread practice for banks to accept clients with a low probability of default, emphasizing a preference for creditworthy individuals. Consequently, the responses to this question may indicate lower performance due to the inherent focus on more creditworthy clients.

Question "Bank non-performing loan ratio is less than 5%" has been supplemented by adding the timeframe of three years. This modification aims to capture the dynamic trend of the non-performing loan ratio over a period recommended in the literature analysis, providing a more comprehensive perspective on the performance indicator.

Question "Bank analyzes all this information during the credit approval process: client income history (private, legal), years of employment (private), and client default information (private, legal)." The question was enhanced with additional clarifications, specifically incorporating distinctions for both the "private" and "legal" segments. This refinement ensures that the question considers and considers responses about both individual/private clients and legal entities.

The question "Bank during the last 3 years reduced operating costs" was replaced in response to specialist feedback, acknowledging that a reduction in operating costs does not necessarily indicate good bank performance. Increased costs in a bank might be associated with

increased performance if those costs are incurred strategically to support growth, improve efficiency, or enhance services.

2.7. Data analysis

The survey data collected was analyzed using IBM SPSS (version 29) and SmartPLS (version 4) software. Analyzing research data analysis methods used:

- Descriptive analysis (respondent demographic characteristics, descriptive analysis of constructs).
- Pre-estimation test (multicollinearity).
- PLS-SEM path model results (measurement model assessment, individual item reliability, internal consistency, convergent validity).
- Examination of the main research Hypothesis of the model (path coefficient analysis, variance accounted for analysis, variance explained in the endogenous latent variables assessment, predictive relevance assessment, model fitness).

2.8. Difficulties and limitations.

1) The interplay between risk management process and credit approval process or the impact of that interplay on bank performance can be influenced by other bank internal factors such as other processes that are working in a bank, asset quality, capital adequacy, liquidity, management efficiency, number of customers, loans, etc. (Fani et al., 2018; Krumina et al., 2020) either external factors (GDP, crisis, inflation, stock market performance etc.) (Fani et al., 2018; Istan & Fahlevi, 2020). Thus, other factors that may affect processes or bank performance were not included in the research model and were not analyzed.

2) All research participants are from Lithuania and are working in banks that are based in Lithuania. Thus, results are based on only performance of based in Lithuania banks' and can differ from other countries results.

3) Many potential respondents refused to respond to the questionnaire, even though demographic questions were not mandatory, and respondents had "other" answer option to ensure complete confidentiality. Nearly half of the respondents filled the questionnaire only after additional reminder through the message. Respondents often display reluctance when it comes to filling out surveys, particularly when the questions are associated with their workplace. All collected information is sensitive and researchers must prove that results are entirely confidential, and the bank's data will not be published or disclosed. The study's reliance on a small number of

respondents (102), may limit the generalizability of the findings. The sample size might not fully represent the diverse range of perspectives within the broader banking industry.

4)   Finally, due to data sensitivity bank employees are intended to keep the true process or bank performance level secret and overvalue it which can have an impact on data reliability.

3. ANALYSIS OF THE IMPACT OF THE INTERPLAY BETWEEN RISK MANAGEMENT PROCESS PERFORMANCE AND CREDIT APPROVAL PROCESS PERFORMANCE ON BANK PERFORMANCE EMPIRICAL RESEARCH

3.1. Descriptive analysis

Respondent survey

The researcher distributed a total of 100 links to her research questionnaire directly to selected specialists in Lithuanian banks through the LinkedIn platform. The potential respondents were chosen based on their profile descriptions (involved in the credit approval process or risk management process, including credit risk management department managers/specialists and credit approval specialists). Additionally, surveys were sent to 14 bank HR specialists, requesting them to distribute the survey to the specific departments responsible for risk management and credit approval processes. The selection of HR specialists was based on their LinkedIn profile descriptions. The questionnaires were distributed and collected between November 22, 2023, and December 18, 2023.

In total, 102 questionnaires were successfully completed. All 102 questionnaires were complete, with no missing data identified. Consequently, all 102 filled questionnaires were verified and deemed suitable for conducting statistical data analysis.

Respondent demographic characteristics

First, an overview of the research respondents' demographic statistics is provided. The demographic profile of the respondents is provided in Table 7. Total respondents' number – 102.

Table 7
Respondents demographic statistics

Variable	Options	Frequency	Percentage
Education	Bachelor's or equivalent level	41	40.20%
	Higher education college type	1	0.98%
	Master's or equivalent level	60	58.82%

Responsibilities in the bank	I create or develop the bank's risk management process (credit, market, liquidity, etc.)	6	5.88%
	I create or develop the decision-making process for granting credit, I create or develop the bank's risk management process (credit, market, liquidity, etc.)	9	8.82%
	I participate in the bank's risk management process (credit, market, liquidity, etc.)	11	10.78%
	I participate in the bank's risk management process (credit, market, liquidity, etc.), I create or develop the bank's risk management process (credit, market, liquidity, etc.)	30	29.41%
	I participate in the decision-making process for granting credit	23	22.55%
	I participate in the decision-making process for granting credit, I participate in the bank's risk management process (credit, market, liquidity, etc.)	12	11.76%
	I participate in the decision-making process for granting credit, I participate in the bank's risk management process (credit, market, liquidity, etc.), I create or develop the decision-making process for granting credit, I create or develop the bank's risk management process (credit, market, liquidity, etc.)	11	10.78%
Age	20-30	20	19.61%
	31-40	51	50.00%
	41-50	29	28.43%
	51-60	1	0.98%
	>60	1	0.98%

Source: Created by the author

Table 7 shows that almost 60 % of the respondents have master's or equivalent level of education and 40.2% - bachelor's or equivalent level of education. Analyzing the responsibilities in the bank Table 7 shows that 29.4% of respondents participate in the bank's risk management process and create or develop the bank's risk management process. Moreover, 22.6% of respondents participate in the decision-making process for granting credit. Half of the respondents were aged between 31 and 40 (50%), and the majority of the other half were aged between 41 and 50 (28.4%) and between 20 and 30 (19.6%). The results shows that majority of the respondents

have higher education level and are older than 30, moreover, all respondents are responsible for at least one process which indicated that respondents are more experienced and their answers more likely valid.

Descriptive analysis of constructs

Descriptive statistics of observed variables were statistically analyzed. All 15 observed variables were analyzed to determine their minimum, maximum, mean and standard deviation values. Table 8 shows the descriptive statistics of observed variables.

Table 8
Descriptive statistics of observed variables

	N	Minimum	Maximum	Mean	Std. Deviation
Risk management process performance					
RMP1	102	3	5	4.12	0.493
RMP2	102	3	5	4.45	0.623
RMP3	102	3	5	4.38	0.646
RMP4	102	3	5	4.40	0.664
RMP5	102	3	5	4.41	0.619
Credit approval process performance					
CAP1	102	3	5	4.34	0.605
CAP2	102	3	5	4.39	0.662
CAP3	102	3	5	4.29	0.590
CAP4	102	3	5	4.37	0.644
CAP5	102	3	5	4.35	0.608
Bank performance					
BP1	102	3	5	4.30	0.594
BP2	102	3	5	4.42	0.620
BP3	102	3	5	4.32	0.616
BP4	102	3	5	4.29	0.639
BP5	102	3	5	4.30	0.594

Source: Created by the author using IBM SPSS

All three latent variables (risk management process performance, credit approval process performance and bank performance) were evaluated remarkably high: from 3 (neither agree nor disagree) to 5 (strongly agree). The mean of all three latent variables is higher than 4. Standard deviation for risk management process performance observed variables varies between 0.493 to

0.664, for credit approval process performance standard deviation varies between 0.590 to 0.662 and for bank performance standard deviation varies between 0.594 to 0.639. The analysis of descriptive statistics in Table 8 shows that processes in banks based in Lithuania are evaluated as well performing. Due to equivalent results of these processes' performance and bank performance evaluation, there is a potential significant impact on the empirical research analysis results. A strong correlation between variables may occur.

3.2.   Pre-estimation test
Multicollinearity

To check indicator robustness, there is a need to use correlation between indicators of the same construct (Bushashe, 2023). The Variance inflation factor (VIF) identifies similarities between independent variables and strength of that similarity (Sulaiman et al., 2021, p.15). VIF threshold value is <3.3, although, between 3.3 to 5 indicates the moderate similarity but this range is tolerated. (Bushashe, 2023; Damberg, 2023; Sulaiman et al., 2021)

Table 9
Variance inflation factor (VIF) results

Observed variable	VIF
BP1	2.420
BP2	3.161
BP3	2.540
BP4	2.678
BP5	3.169
CAP1	1.977
CAP2	2.634
CAP3	2.363
CAP4	3.168
CAP5	2.458
RMP1	2.286
RMP2	2.915
RMP3	3.178
RMP4	3.185
RMP5	2.552

Source: Created by the author using SmartPLS

In Table 9 the variance inflation factor (VIF) level across all fifteen observed variables is less than 5 which indicates that there is no existence of multicollinearity among observed variables of the research, and it is desirable for a good model.

3.3.   PLS-SEM Path model results

Structural equation modeling (SEM) is a method that leads to many statistical techniques used to analyze the data (path analysis, confirmatory factor analysis, structural regression models etc.) and provides two types of components – (1) measurement/outer model and (2) structural/inner model. Measurement model shows the relationships between the research dimensions and the questionnaire items/indicators. Structural model shows the relationship (direction and strength) between variables (Hussey & Eagan, 2007; Sulaiman et al., 2021). SEM is used for researches when model has observed variables within latent variable (D. S. Kanto, 2017). Thus, this method is suitable for this research model empirical research while latent variables have their observed variables: risk management process performance has RMP1-RMP5, credit approval process performance has CAP1-CAP5, and bank performance has BP1-BP5.

There are two structural equation modeling subtypes: Partial least squares (PLS-SEM) and Covariance-based (CB-SEM) (Bushashe, 2023). The PLS-SEM method is widely used in recent research, has more advantages, and fits better for this empirical research. PLS-SEM is suitable for small samples and does not require minimal sample, when theory of the research is limited, makes no assumptions about the data distribution (Aslam & Jawaid, 2023; Bushashe, 2023; Faliza, 2023). PLS-SEM was used in an empirical researches to find the influence on organizational or bank performance dimensions (D. S. Kanto, 2017; Faliza, 2023; Mulyana et al., 2023; Suandi et al., 2023). Considering that, the PLS-SEM method is suitable and reasoned for further empirical analysis. SmartPLS software is the most used in recent scientific literature, thus this software was chosen to use.
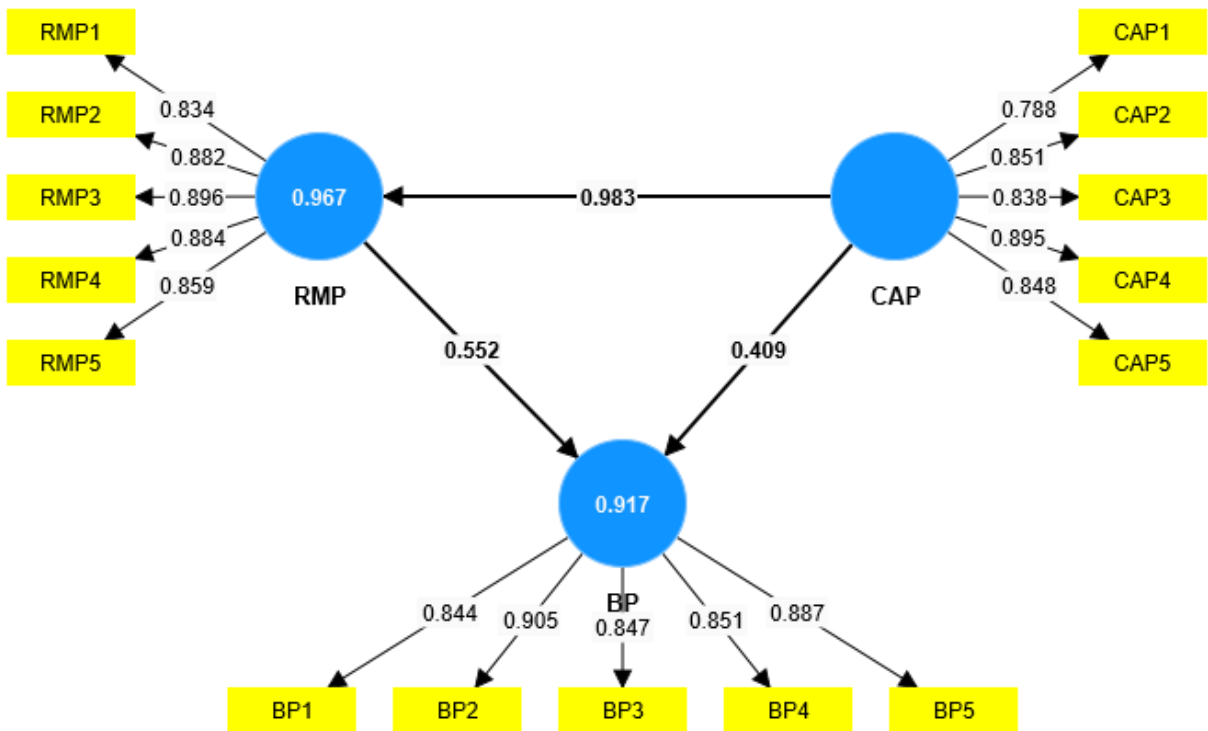
Measurement model assessment

In order to assess the measurement model, individual reliability, internal consistency of items, convergent validity and discriminant validity need to be conducted (Sulaiman et al., 2021).
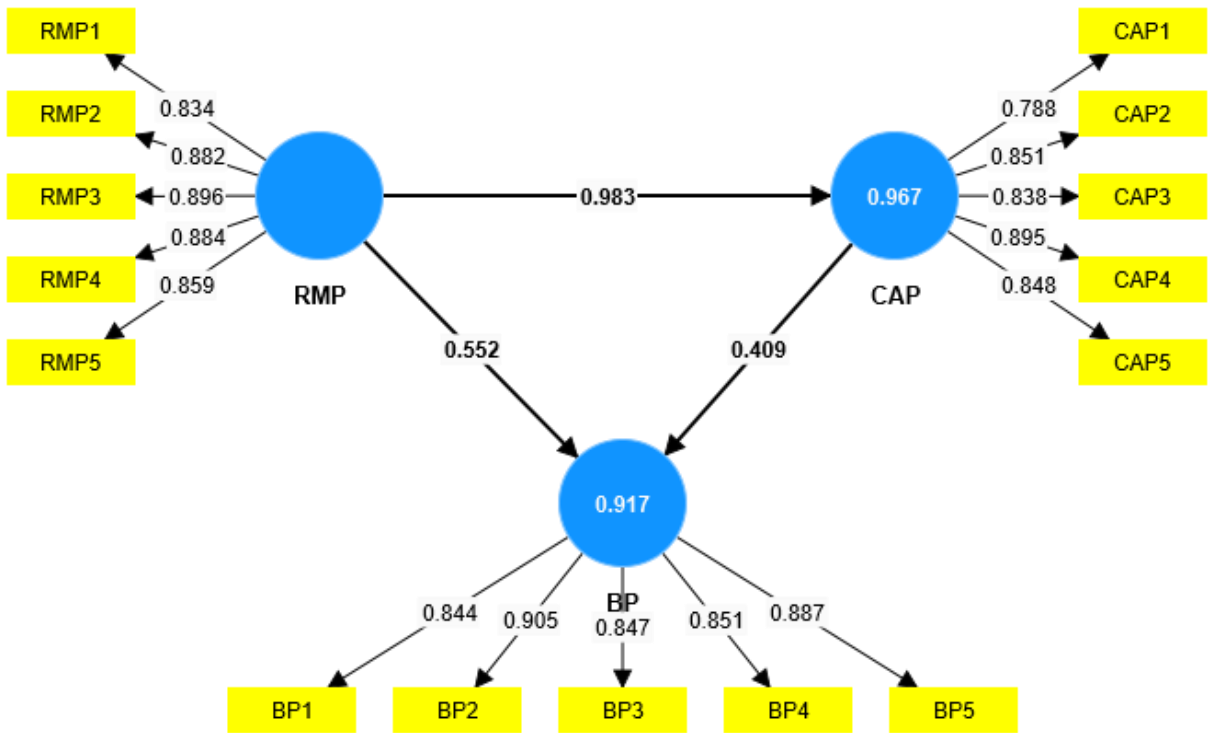
Figure 4
Measurement model RMP->CAP->BP

Source: Created by the author using Smart-PLS

Figure 5
Measurement model CAP->RMP-> BP

Source: Created by the author using Smart-PLS

Individual item reliability

Individual item reliability analyzes the observed variables outer loadings of latent variable. The threshold for loadings is >0.7 (Bushashe, 2023; Sulaiman et al., 2021). Figure 4 and Figure 5 show that all fifteen observed variables satisfy the threshold and none of them are deleted.

Internal consistency

Internal consistency of the constructs indicated whether observed variables measure the same latent variable. Composite reliability is the statistical measure for reliability in the interrelationship of observed item variables, shows the internal consistency and the existence of the correlation between observed variables and latent variable. (Bushashe, 2023; Sulaiman et al., 2021). Cronbach's alpha, rho_A and composite reliability are used for internal consistency analysis. All these three measures have to be higher than 0.7 to confirm the research scale suitability for empirical research. (Aslam & Jawaid, 2023; Bushashe, 2023; Damberg, 2023; Sulaiman et al., 2021).

Table 10
Individual Item Reliability, Internal Consistency Reliability and Convergent Validity

| Items	Factor loadings	Cronbach's Alpha	Rho_A	Composite reliability (pc)	Average variance extracted
Risk management process performance		**0.921**	**0.921**	**0.940**	**0.759**
RMP1	0.834				
RMP2	0.882				
RMP3	0.896				
RMP4	0.884				
RMP5	0.859				
Credit approval process performance		**0.899**	**0.902**	**0.926**	**0.714**
CAP1	0.788				
CAP2	0.851				
CAP3	0.838				
CAP4	0.895				
CAP5	0.848				
Bank performance		**0.917**	**0.918**	**0.938**	**0.752**
BP1	0.844				
BP2	0.905				
BP3	0.847				
BP4	0.851				
BP5	0.887				

Source: Created by the author using Smart-PLS

Table 10 shows the results of the internal consistency analysis. The Cronbach's alpha values of reliability for the underlying constructs of RMP, CAP and BP were 0.921, 0.899 and 0.917, respectively, Rho_A values for the underlying constructs of RMP, CAP and BP were 0.921, 0.902 and 0.918, respectively and composite reliability values for the underlying constructs of RMP, CAP and BP were 0.940, 0.926 and 0.938, respectively. These results indicate that the construct reliability and compatibility of scales are satisfactory since values are higher than 0.7.

Convergent validity

Convergent validity shows the extent to which observed variable represents its latent variable and correlates with other same latent variable observed variables. The threshold for AVE is >0.5 (Aslam & Jawaid, 2023; Bushashe, 2023; Damberg, 2023; Sulaiman et al., 2021). Table 10 shows that AVE values range between 0.714 to 0.759 and indicates that all values are above the criteria and can be accepted.

3.4.   Examination of the main research hypothesis of the model

The outer model examination indicated that data is reliable and acceptable to use in further empirical research. Next step is inner model examination applying standard bootstrapping procedure with a number of 5000 bootstrap samples and 102 cases to assess significance of the path coefficients (Aslam & Jawaid, 2023; Bushashe, 2023; Sulaiman et al., 2021). Model with help of bootstrapping is provided in Figure 6 and Figure 7.
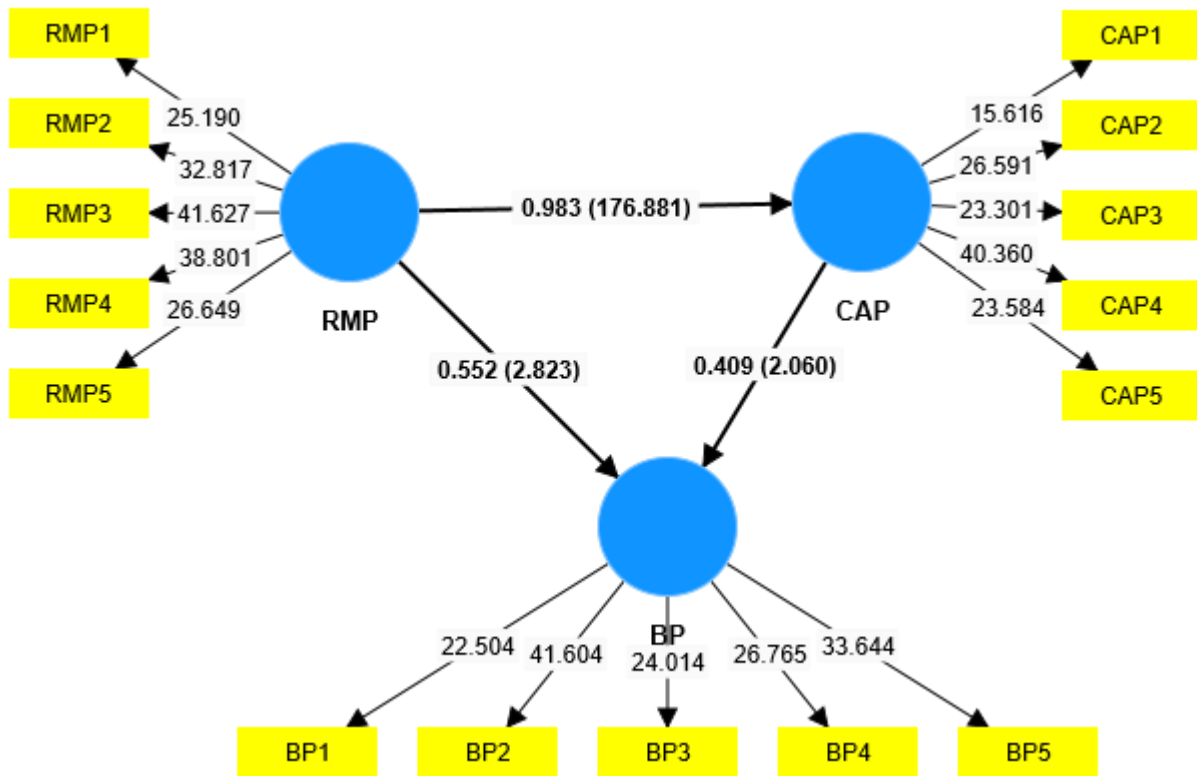
Figure 6
Model with help of bootstrapping RMP->CAP->BP

Source: Created by the author using Smart-PLS
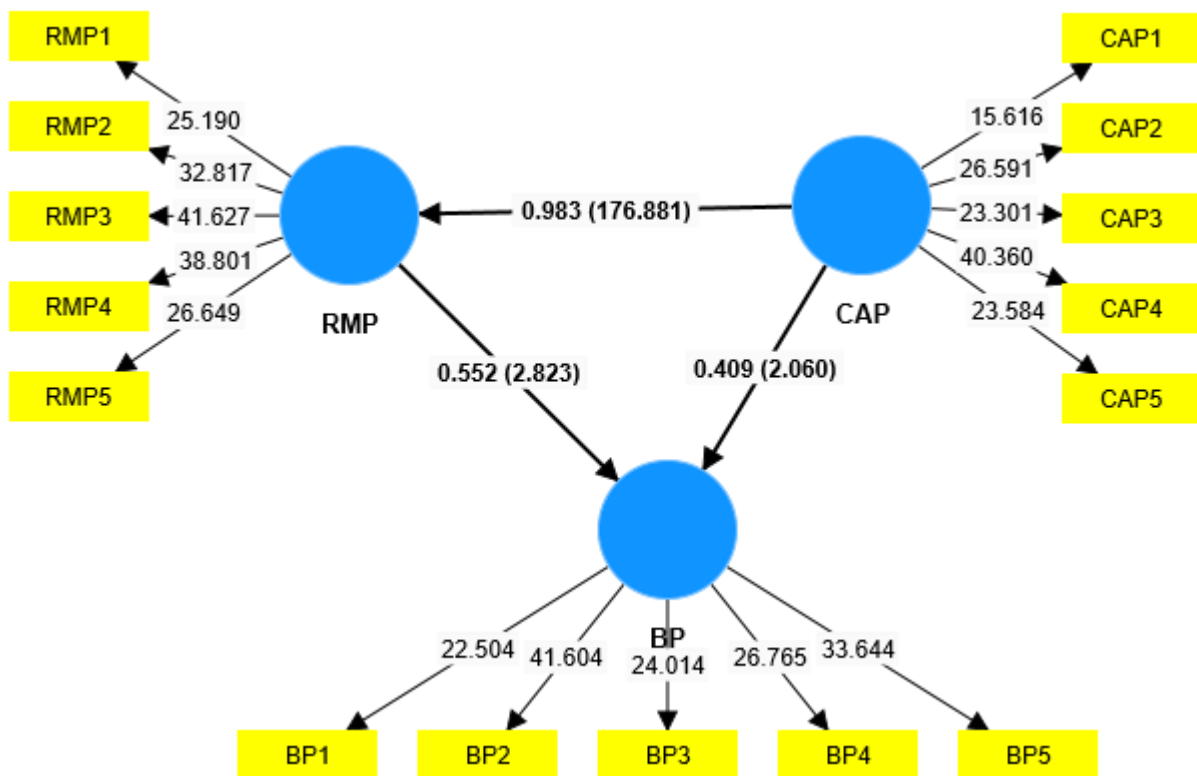
Figure 7
Model with help of bootstrapping CAP->RMP->BP

Source: Created by the author using Smart-PLS

Figure 6 and Figure 7 provide the graphical display of the standardized path coefficient (β) values and T- values of the hypothesis in this research. P value of the significance level 0.05 is used (T-value = 1.96) two-tailed. Table 11 shows the result of bootstrapping model values (standardizes path coefficient (β), T-values and confidence intervals) used in Sulaiman et al., (2021) research. Path coefficient >0.1 is relevant (Damberg, 2023).

Table 11
Direct and indirect relationships

Hypothesis	Relationship	Direct/Indirect	Beta	T-value	P- value	Description
1	RMP->CAP	Direct	0.983	176.881	0.000	Accepted
2	CAP->RMP	Direct	0.983	176.881	0.000	Accepted
3	RMP->BP	Direct	0.552	2.823	0.005	Accepted
4	CAP->BP	Direct	0.409	2.060	0.039	Accepted
5	CAP->RMP->BP	Indirect	0.543	2.808	0.005	Accepted
6	RMP->CAP->BP	Indirect	0.402	2.062	0.039	Accepted

Source: Created by the author using Smart-PLS

(H1): The risk management process performance has a positive impact on the credit approval process performance

Hypothesis one was researched, and Table 11 above shows the result. The result revealed that risk management process performance significantly affects credit approval process performance at 0.05 significance level with T-value of 1.96 two tailed (β = 0.983, T-value=176.881 and P-value= 0.000), hence the alternative hypothesis (H1) was accepted. Results revealed that the better performed risk management process, the higher credit approval process performance and, conversely, if risk management process is badly performed, credit approval process performance will be reduced. This empirical research finding corroborates with the finding of Yengejeh (2023), who states that during the credit approval process, the probability of repaying the loan on time is measured and this measurement helps to mitigate the risk of incurring losses (Yengejeh, 2023). Thus, credit approval process performance has a positive impact on risk management process performance by reducing potential work in that process. Moreover, empirical

research finding corroborates with the finding of Matthews (2013), that risk management is a part of credit approval, because the impact of the risk management process performances is remarkably high on credit approval process.

(H2): Credit approval process performance has a positive impact on the risk management process performance.

Hypothesis two was researched and Table 11 above shows the result. The result revealed that credit approval process performance significantly affects risk management process performance at 0.05 significance level with T-value of 1.96 two tailed ($\beta = 0.983$, T-value=176.881 and P-value= 0.000), hence the alternative hypothesis (H2) was accepted. Results revealed that the better performed credit approval process, the higher risk management process performance and, conversely, if credit approval process is badly performed, risk management process performance will be reduced. This empirical research finding corroborates with the finding of Richard et al. (2008) and Gitau Muigai (2018), that a clear credit approval process is extremely important in managing credit risk and Bekhet & Eletter, (2014) that even a small improvement in the credit approval process can result in credit risk reduction.

H3: Risk management process performance has a positive impact on bank performance.

Hypothesis three was researched and Table 11 above shows the result. The result revealed that risk management process performance significantly affects bank performance at 0.05 significance level with T-value of 1.96 two tailed ($\beta = 0.552$, T-value=2.823 and P-value= 0.005), hence the alternative hypothesis (H3) was accepted. Results revealed that the better performed risk management process, the higher bank performance and, conversely, if risk management process is badly performed, bank performance will be reduced. This empirical research finding corroborates with the finding of Saiful & Ayu (2019) whose research results showed that credit, liquidity, and operational risk management have a positive influence on bank performance.
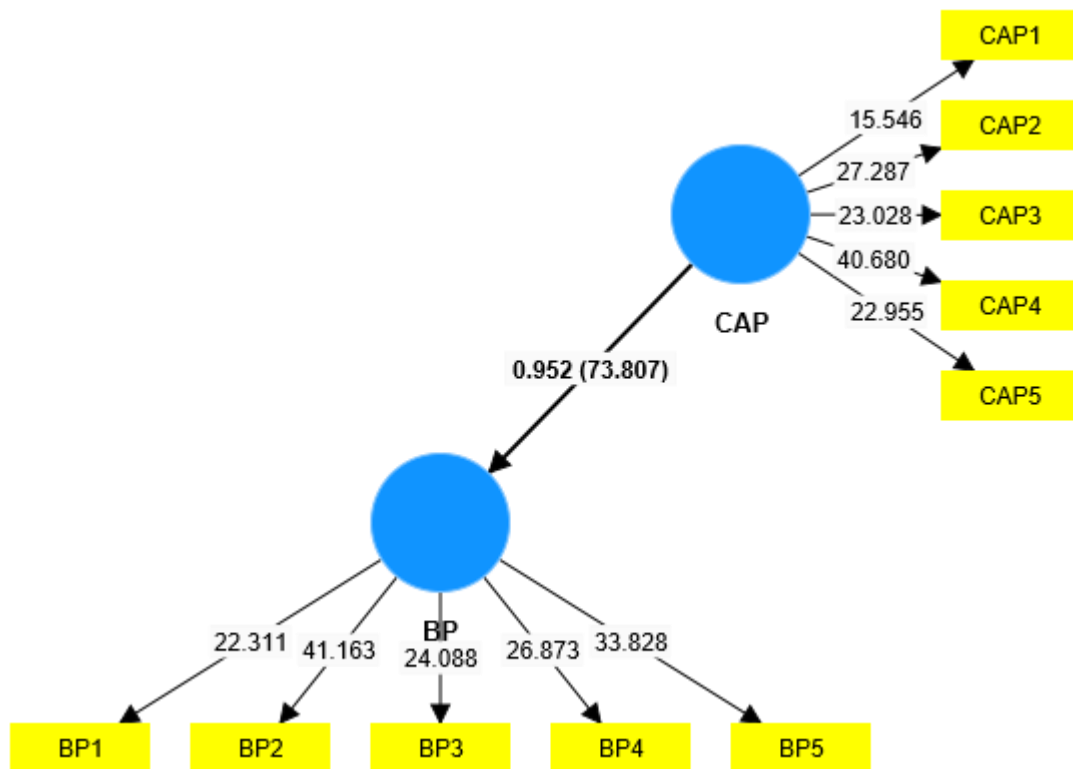
H4: Credit approval process performance has a positive impact on bank performance.

Hypothesis four was researched and Table 11 above shows the result. The result revealed that credit approval process performance significantly affects bank performance at 0.05 significance level with T-value of 1.96 two tailed ($\beta = 0.409$, T-value=2.060 and P-value= 0.039), hence the alternative hypothesis (H4) was accepted. Results revealed that the better performance of the credit approval process, the higher bank performance and, conversely, if the credit approval

process is badly performed, bank performance will be reduced. This empirical research finding corroborates with the finding of Bao et al., (2019) and West, (2000) who states that if a bank has scoring model and it has great predictive performance, this model can have a positive impact on bank performance.

(H5): Risk management process performance mediates the relationship between the credit approval process performance and bank performance

Mediating effect is identified when independent variable impact on mediating variable can be extended to dependent variable (Sulaiman et al., 2021). In this hypothesis the mediation of the risk management process performance is found analyzing the indirect effect of the credit approval process performance on the bank performance through a mediating variable risk management process performance. For this hypothesis, the same bootstrapping technique as for H1 – H4 was used. The main difference for mediation analysis is the total and indirect effect analysis of the SmartPLS result. This method was used by (Abdullahi et al., 2022; Faliza, 2023; Sulaiman et al., 2021). Table 11 shows the relationship between credit approval process performance and bank performance through the mediation of risk management process performance and this indirect effect is significant ($\beta = 0.543$, T-value=2.808 and P-value= 0.005). The standardizes path coefficient β of mediation effect can be found multiplying the path coefficient of the relationship among credit approval process performance and risk management process performance (0.983) and the path coefficient of the relationship between risk management process performance and bank performance (0.552) (0.983*0.552=0.543). Hence the alternative hypothesis (H5) was accepted. The research confirms that risk management process performance acts as a mediator among credit approval process performance and bank performance. The outcomes show that credit approval process performance can directly or indirectly influence bank performance. This indicated that a well performed credit approval process can improve bank performance and that well performed risk management process as a mediator among credit approval process performance and bank performance strengthens that relationship.

Figure 8
Model with help of bootstrapping CAP->BP

Source: Created by the author using Smart-PLS

The overall impact (0.952) is provided in Figure 8, which is a result of adding the direct and indirect impact between credit approval process performance and bank performance (0.409+0.543=0.952) (Tabouli et al., 2016).

Variance accounted for (VAF) is used in Sulaiman et al., (2021) empirical research to evaluate the extent effect of the mediating variable and it is a proportional effect of indirect effect in relation to the total effect. VAF formula provided by Sulaiman et al., (2021) is:

$$VAF = \frac{a * b}{a * b + c}$$

a= standardizes path coefficient β between independent construct and mediating construct,

b= standardizes path coefficient β between mediating construct and dependent construct,

c= standardizes path coefficient β between independent construct and dependent construct.

$$VAF = \frac{0.983 * 0.552}{0.983 * 0.552 + 0.409} = \frac{0.543}{0.952} = 0.57 = 57\%$$

The result indicated that 57% of the total effect has been explained by the mediating latent variable (risk management process performance) on the relationship between credit approval process performance and bank performance. In line with Sulaiman et al., (2021) provided classification (<20% - no mediation, between 20% and 80% - partial mediation, >80% - full mediation), it can be stated that there is a partial mediation effect of the risk management process performance. This empirical research finding corroborates with the finding of Berg's (2015) research that shows that having risk management in a credit approval process reduces default rates by more than 50%.

(H6): Credit approval process performance mediates the relationship between the risk management process performance and bank performance.

In this hypothesis the mediation of the credit approval process performance is found analyzing the indirect effect of the risk management process performance on the bank performance through a mediating variable credit approval process performance. Table 11 shows the relationship between risk management process performance and bank performance through the mediation of credit approval process performance and this indirect effect is significant (β = 0.402, T-value=2.062 and P-value= 0.039). The standardizes path coefficient β of mediation effect can be found multiplying the path coefficient of the relationship among risk management process performance and credit approval process performance (0.983) and the path coefficient of the relationship between credit approval process performance and bank performance (0.409) (0.983*0.409=0.402). Hence the alternative hypothesis (H6) was accepted. The research confirms that credit approval process performance acts as a mediator among risk management process performance and bank performance. The outcomes show that risk management process performance can directly or indirectly influence bank performance. This indicated that a well performed risk management process can improve bank performance and that well performed credit approval process as a mediator among risk management process performance and bank performance strengthens that relationship.
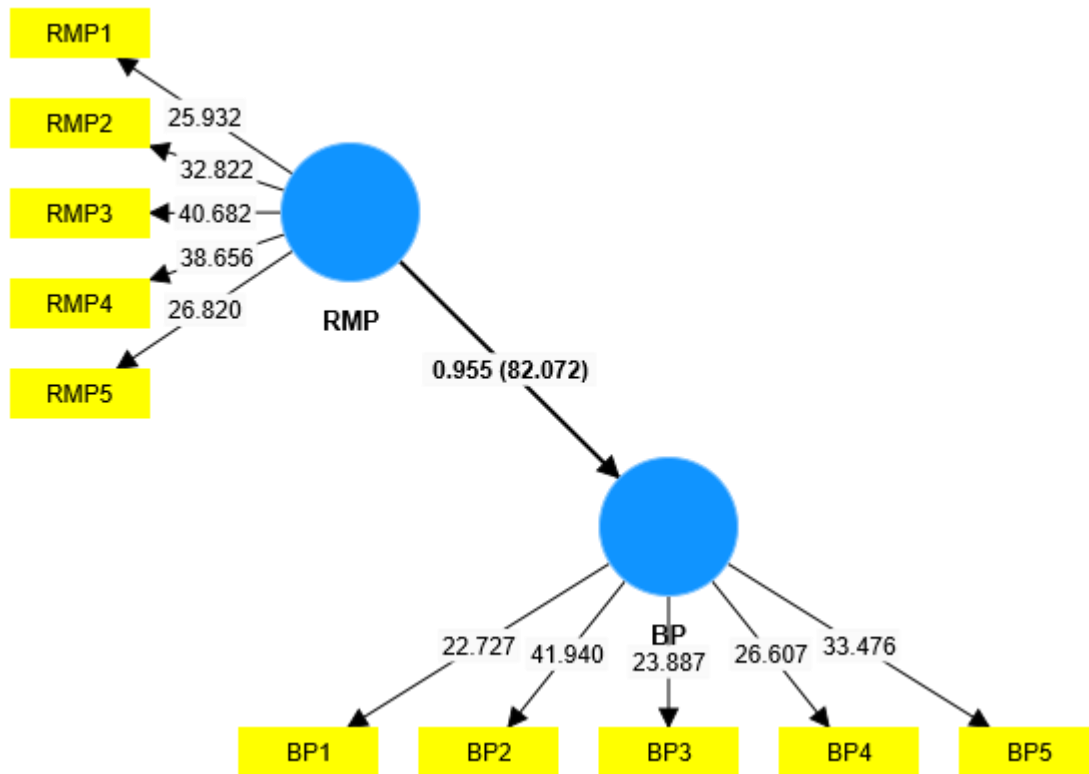
Figure 9
Model with help of bootstrapping RMP->BP

Source: Created by the author using Smart-PLS

The overall impact (0.954) is provided in Figure 9, which is a result of adding the direct and indirect impact between risk management process performance and bank performance (0.552+0.402=0.954) (Tabouli et al., 2016). The 0.001 difference between calculations and model provided in Figure 9 is due to rounding.

Variance accounted for (VAF) is used in Sulaiman et al., (2021) empirical research to evaluate the extent effect of the mediating variable and it is a proportional effect of indirect effect in relation to the total effect.

$$VAF = \frac{0.983 * 0.409}{0.983 * 0.409 + 0.552} = \frac{0.402}{0.954} = 0.42 = 42\%$$

The result indicated that 42% of the total effect has been explained by the mediating latent variable (credit approval process performance) on the relationship between risk management process performance and bank performance. In line with Sulaiman et al., (2021) provided classification (<20% - no mediation, between 20% and 80% - partial mediation, >80% - full mediation), it can be stated that there is a partial mediation effect of the credit approval process performance.

Comparing risk management process performance and credit approval process performance direct, indirect, and total effect on bank performance results show that risk management process performance has a higher direct effect on bank performance than credit approval process performance. Moreover, risk management process performance mediation between credit approval process performance and bank performance has a higher effect than credit approval process performance mediation. Finally, risk management process performance has a slightly higher (0.003) total effect on bank performance than credit approval process performance. In summary, comparison results suggest that risk management process performance has a higher significant impact on bank performance and risk management process integrated into the credit approval process could lead to enchased bank performance. The evaluation of risk management process and credit approval process performance do not show significant difference, indicating a high degree of interplay between them. These findings indicate the interconnected nature of these processes, emphasizing the importance of considering both in effective management strategies.

Variance explained in the endogenous latent variables assessment

Next step of the empirical research is the R-squared value determination which assess the validity of the structural model, clarifies the variance that exists in explaining endogenous variable as a result of exogenous variables and represents explanatory or predictive power of the dependent variable explained by independent variable (Aslam & Jawaid, 2023; Damberg, 2023; Sulaiman et al., 2021). The threshold of the R-square are: 0.19 – weak, 0.5 – moderate, 0.75 – strong (Damberg, 2023; Sulaiman et al., 2021).

Table 12
R-square results

Variable		Variance explained (R-squared)
BP	Dependent	0.917
CAP	Mediating	0.967
RMP	Mediating	0.967

Source: Created by the author using Smart-PLS

Table 12 results shows that in predicting the variation in mediating and dependent variable in the model findings revealed R-square of 0.917 of bank performance as a dependent variable, of

0.967 of credit approval process performance as a mediating variable and of 0.967 of risk management process performance as a mediating variable. Results in all three variables the R-squared are strong.

Predictive relevance assessment

Next step of the structural model evaluation is a predictive relevance using stone-Geisser's (Q^2). If $Q^2 > 0$, model has predictive relevance (Aslam & Jawaid, 2023; Damberg, 2023; Sulaiman et al., 2021).

Table 133
Predictive relevance (Q^2) statistics

Variable	Q^2
BP	0.907 (0.912)
RMP	0.967
CAP	0.967

Source: Created by the author using Smart-PLS

Table 14 provides Q^2 results of all three latent variables. Results revealed that for all three latent variables $Q^2 > 0$ and this signifies predictive relevance of the model. Bank performance variable has two predictive relevance values since there were two separate models: Figure 6 and Figure7. BP Q^2 result is 0.912 when CAP is mediating variable and 0.907 when RMP is mediating variable.

Model fitness

Sulaiman et al., (2021) used Standardized Root Mean Square Residual (SRMR) to examine the model fit of the research. SRMR threshold is ≤0.08.

Table 144
Model fit results

Test	Saturated model
SRMR	0.052

Source: Created by the author using Smart-PLS

The Good of fit (GOF) of the research is provided in Table 15. Results indicated that the mode has achieved threshold to establish that model and data fit into the research. The SRMR value is acceptable compared to the threshold provided by Sulaiman et al., (2021). This signifies an overall model fit as suggested by Sulaiman et al., (2021).

3.5. Comparison of obtained results with other studies

According to Richard et al. (2008) and Gitau Muigai (2018), a clear credit approval process is extremely important in managing credit risk. This research contains measurement "Credit approval process is effective (quick, smooth and clear).", which according to the research results defines credit approval process performance and credit approval process performance represents credit approval process, considering that this research found that credit approval process has a significant positive impact on risk management process it can be stated that Richard et al. (2008) and Gitau Muigai (2018) statements are in line with this research. Moreover, Bekhet & Eletter, (2014) states that even a small improvement in the credit approval process can result in credit risk reduction. This statement also is in line with this research that well performed credit approval process has a significant positive impact on risk management process performance, which is defined as risk management process.

Research by Saiful & Ayu (2019) showed that credit, liquidity, and operational risk management have a positive influence on bank performance. Since this research found that risk management process performance, which represents risk management process as a mutual for all risks in a bank, has a significant and positive impact on bank performance, Saiful & Ayu (2019) research results are in line with this research results. Moreover, Tursoy, (2018) states that if a bank has weak risk management processes, it can lead to losses and directly impact the bank's profit or performance. This study empirical research showed that risk management process performance has a positive impact on bank performance, however, bad, or weak risk management process performance can have a negative impact on bank performance. Considering this finding, Tursoy, (2018) findings are in line with this research results. Lalon (2015) found that credit risk management influences banks' profitability. Considering that credit risk is a main risk in bank and bank profitability is one of the bank performance indicators it can be stated that Lalon (2015) findings are in line with this research results. Lastly, Rizwan Abbas, (2023) research showed that risk management efficiency has an impact on increased bank performance. Considering that this research risk management performance indicators are identified as effectiveness and efficiency measures, it can be stated that Rizwan Abbas, (2023) findings are in line with this research findings

that risk management process performance has a significant and positive impact on bank performance.

Bao et al., (2019) and West, (2000) states that if bank has scoring model ant it has great predictive performance, this model can have a positive impact on bank performance. In this research one of the credit approval process performance measurements is "A credit scoring model is in use at the bank." And this measurement (observed variable) was considered as a defining credit approval process performance latent variable, which represents credit approval process. Since the empirical research results showed that credit approval process performance has a significant positive impact on bank performance it can be stated that Bao et al., (2019) affirmation is in line with this research results.

Finally, Berg's (2015) research shows that having risk management in a credit approval process reduces default rates by more than 50%. This finding is in line with this research results that risk management process performance is a mediating variable in the relationship between credit approval process and bank performance (as a reduced default rate is an indicator for improved bank performance) and has as significant indirect positive impact on bank performance. Thus, the impact of the interplay between risk management process and credit approval process has a positive impact on bank performance.

CONCLUSIONS

1.   The literature analysis showed that the credit approval system helps to reduce the loss and provides loans only for eligible and solvent clients (M.K.Jayanthi Kannan, 2023). The credit approval process helps to identify whether a client will be able to repay the loan or not (Majeske & Lauer, 2013). To define and compare the concepts of risk management process, credit approval processes and bank performance and determine their evaluation metrics. Considering literature research results, the most used steps in scientific research are client loan application, documentation check, evaluation of the client and contract signature. Credit scoring models have a significant effect on the profitability of the bank (Bao et al., 2019).

Risk management in the banking sector is the implementation of a plan to deal with probable losses (Tursoy, 2018). Literature analysis shows that risk management processes have two main steps: risk identification and risk assessment. Risk can cause bank deficit thus risk management is a way to increase bank performance (Kakar et al., 2021).

According to Rahman & Akhter (2021), usually, the company's performance (financial and non-financial) is demonstrated by the items named effectiveness and efficiency. Literature research results shows that the most researched quantitative measurement of bank performance is the ROA ratio to compare the assessment of the interplay between processes methods and assessment of the impact of the interplay on bank performance assessment models. According to the Rahman & Akhter, (2021), bank performance effectiveness and efficiency can be measured by respondent answers to bank performance dynamics over the last three years.

2.   To determine the direct and indirect influence of processes on other processes there is a need to determine the relationships between process dimensions (quality, time, costs, etc.) (Gribovskis, 2021). According to Gribovskis (2021), to assess the impact of the interplay between processes on the company's performance, there is a need to determine if each process individually has a positive influence on different processes, if each process has a positive influence on the performance outcome, if one of the organizational processes mediate the positive relationship between other processes and performance output. Many other researchers use the questionnaire as an instrument to collect performance data. This data is analyzed mostly using partial least square structural equation modelling.

3.   During the scientific literature analysis was fond that relationship between processes can be evaluated as a relationship between processes performance (Gribovskis, 2021). Thus, the first step of this research is to find the relationship between risk management process performance and credit approval process performance. To find the impact of the interplay between processes

on bank performance there are two steps. Firstly, to find if first process performance mediates the relationship between second process performance and company performance. Secondly, to find if second process performance mediates the relationship between first process performance and company performance (Gribovskis, 2021). Thus, to find the impact of the interplay between risk management process and credit approval process on bank performance six hypothesis were formed: (H1) The risk management process performance has a positive impact on the credit approval process performance, (H2) Credit approval process performance has a positive impact on the risk management process performance, (H3) Risk management process performance has a positive impact on bank performance, (H4) Credit approval process performance has a positive impact on bank performance, (H5) Risk management process performance mediates the relationship between the credit approval process performance and bank performance and (H6) Credit approval process performance mediates the relationship between the risk management process performance and bank performance.

4.   The empirical research results show that there is a significant correlation between the risk management process and credit approval process. Moreover, results proved that risk management process has a positive impact on credit approval process. Thus, strong support was found for H1 and this finding provides some additional support to an earlier research by Matthews (2013), Bekhet & Eletter (2014), Al Rahahleh et al. (2019). Additionally, empirical results proved that the credit approval process has a positive impact on the risk management process. Thus, strong support was found for H2 and this finding provides some additional support to an earlier research by Lalon (2015), Wu & Hsu (2012), Richard et al. (2008), Gitau Muigai (2018).

5.   Then the indirect effect of the credit approval process on bank performance is identified. In other words, the effect of credit approval process on bank performance through the mediating factor, risk management process. The research confirms that risk management process performance acts as a mediator among credit approval process performance and bank performance. The outcomes show that credit approval process performance can directly or indirectly influence bank performance. This indicated that a well performed credit approval process can improve bank performance and that well performed risk management process as a mediator among credit approval process performance and bank performance strengthens that relationship. Thus, dedicated support was found for H2.

6.   Then the indirect effect of risk management process on bank performance is identified. In other words, the effect of risk management process on bank performance through the mediating factor, credit approval process. The research confirms that credit approval process performance acts as a mediator among risk management process performance and bank performance. The outcomes show that risk management process performance can directly or

indirectly influence bank performance. This indicated that a well performed risk management process can improve bank performance and that well performed credit approval process as a mediator among risk management process performance and bank performance strengthens that relationship. Thus, dedicated support was found for H2.

7. Main findings of the empirical research that the interplay between risk management process performance and credit approval process performance has a positive impact on bank performance. Hence, these processes should be jointly managed with a high degree of collaboration between the credit and risk departments. Comparing risk management process performance and credit approval process performance direct, indirect, and total effect on bank performance results show that risk management process performance has a higher direct, indirect, and total effect on bank performance than credit approval process performance. The difference is minor, thus may indicate that the risk management process is more important to be managed to achieve better performance of the credit approval process and the whole bank.

RECOMENDATIONS

Managerial implications

Since there is an interplay between risk management process and credit approval process and these processes has a positive impact on each other, banks should ensure that these processes are not viewed in isolation and consider them as interconnected elements of broader risk management framework. Additionally, the research result implies that the effectiveness of the credit approval process alone or risk management process alone may not be sufficient for optimizing bank performance. The mediation effect of risk management process suggests that banks need to focus on not only making credit decisions efficiently but also managing associated risks effectively to realize the full potential impact on overall performance. The mediation effect of credit approval process performance suggests that banks need to focus on not only managing risks efficiently but also ensuring that credit decisions align with strategic objectives and contribute to the creation of a high-quality loan portfolio to realize the full potential impact on overall performance.

Moreover, since the risk management process and credit approval process are interrelated, to achieve better results of these processes collaboration and effective communication between credit and risk management department teams are essential. Banks should facilitate regular interactions and share knowledge to ensure enhanced results.

Whilst the risk management process and credit approval process have a significant and positive impact on bank performance, banks should invest in training and skill development programs for their employees involved in these processes. Strengthening the capabilities of employees in risk assessment, credit analysis, and overall risk management practices can contribute to improved overall bank performance. Additionally, investment in technology, automation and data analytics tools can help in quicker and more accurate risk assessment, leading to more informed credit decisions. Investment in technology can positively influence individual processes and overall bank performance.

Banks should implement continuous monitoring and evaluation mechanisms. This regular assessment of risk management and credit approval processes can help to identify areas for improvement and have an impact on enchased bank performance. Additionally, banks should consider setting performance targets and strategic planning with a focus on optimizing both processes for improved bank performance.

<u>Future research direction</u>

Considering the volume and time limitations of this study, future research should consider testing a model, using additional measures that may help more accurately reflect risk management process performance, credit approval process performance and bank performance.

Moreover, other processes or subprocesses and their performance measures may be integrated into the suggested research model.

This research can be expanded to other countries' bank analysis, especially to larger economies that have a considerable number of operating banks and an adequately higher number of employees who have expertise in credit approval and risk management. This would improve data reliability.

Research could additionally be supported by qualitative insights done by interviewing bank specialists who are responsible for these processes and are highly qualified in risk management and credit approval processes. This would mitigate the confidentiality problem as higher trust could be earned by a closer relationship with the interviewee. Moreover, this could supplement the research results with crucial practical aspects. Thus, the results would be more reliable, and this could add relevant and significant value to future research.

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SUMMARY IN LITHUANIAN

RIZIKOS VALDYMO PROCESO IR KREDITO SPRENDIMO PRIĖMIMO PROCESO SĄVEIKOS ĮTAKA BANKO VEIKLOS REZULTATAMS

Santa Damaševičiūtė

Magistro darbas

Verslo procesų valdymo magistro programa

Vilniaus universitetas, Ekonomikos ir verslo administravimo fakultetas

Darbo vadovas - Dr. Aurelija Ulbinaitė

SANTRAUKA

71 puslapiai, 14 lentelės, 9 paveikslai, 64 literatūros šaltiniai

Magistro baigiamajame darbe tiriamas rizikos valdymo ir kredito sprendimo priėmimo procesų sąveika ir šios sąveikos įtaka banko rezultatams. Magistro darbo mokslinį naujumą sudaro rizikos valdymo ir kredito sprendimo priėmimo procesų sąveika, procesų sąveikos įtaka banko rezultatams, nėra tyrimų apimančių šių procesų sąveikos empirinę analizę, nėra tyrimų apimančių banko procesų sąveikos įtakos empirinę analizė banko rezultatams. Mokslinio darbo tikslas yra nustatyti, kaip rizikos valdymo proceso ir kredito sprendimo priėmimo proceso sąveika daro įtaką banko rezultatams.

Mokslinės literatūros analizė parodė, kad rizikos valdymo procesas daro teigiamą įtaką kredito sprendimo priėmimo procesui, taip pat, kad kredito sprendimo priėmimo procesas daro teigiamą įtaką rizikos valdymo procesui. Taip pat mokslinės literatūros analizė parodė, kad šie procesai daro teigiamą įtaką banko rezultatams. Siekiant patikrinti šiuos ryšius buvo suformuotos 6 hipotezės.

Pasirinktas kiekybinis tyrimo metodas – anketinė apklausa. Apklausos anketa buvo išbandyta su 3 respondentais. Duomenys surinkti naudojantis "Google Forms" apklausos platforma, respondentų atrankos metodas – atsitiktinis. Gauti duomenys buvo apdorojami naudojant kompiuterinės programos paketus IBM SPSS (29 versija) ir SmartPLS (4 versija). Tyrimo modelis patvirtintas naudojant patvirtinančiąją kompozitinę analizę.

Tyrimo rezultatai parodė, kad: patvirtinančioji kompozitinė analizė patvirtino modelį, struktūrinių lygčių modeliavimas nustatė, jog rizikos valdymo procesas daro statistiškai reikšmingą teigiamą įtaką kredito sprendimo priėmimo procesui, taip pat ir kredito sprendimo priėmimo procesas daro statistiškai reikšmingą teigiamą įtaką rizikos valdymo procesui. Be to, tyrimo rezultatai parodė, jog rizikos valdymo proceso ir kredito sprendimo priėmimo proceso sąveika daro statistiškai reikšmingą teigiamą įtaką banko rezultatams.

Empirinio tyrimo rezultatai rodo, kad lyginant rizikos valdymo proceso rezultato ir kredito sprendimo priėmimo proceso rezultato tiesioginius, netiesioginius ir bendrus ryšius banko veiklos rezultatams, rizikos valdymo proceso rezultatai turi didesnę tiesioginę, netiesioginę ir bendrą įtaką banko rezultatams nei kredito sprendimo priėmimo proceso rezultatai. Skirtumas yra nedidelis, tačiau rezultatai gali rodyti, kad rizikos valdymo proceso valdymas yra sąlyginai svarbesnis siekiant geresnio banko rezultato.

ANNEXES

Annex 1. Questionnaire

The purpose of this study is, firstly, to determine the interplay between the risk management process and the credit approval process, and, secondly, to determine the impact of that interplay on bank performance. This study is being conducted by Santa Damaševičiūtė, a master's degree student from Vilnius University. This questionnaire contains questions about the bank risk management process, credit approval process, and bank performance effectiveness and efficiency. The questionnaire is intended for risk management and credit approval specialists or bank employees who work with these processes and are competent in evaluating them. The questionnaire is anonymous.

1.   Education:

☐ Primary education

☐ Secondary education

☐ Professional education

☐ Bachelor's or equivalent level

☐ Higher education college type

☐ Master's or equivalent level

☐ Doctoral or equivalent level

☐ Other

2.   Age

☐ Less than 20

☐ 20-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ More than 60

3.　　　　Bank name

☐ Swedbank

☐ SEB bank

☐ Revolut Bank

☐ Luminor bank

☐ Šiaulių bank

☐ OP Corporate bank

☐ Citadele bank

☐ Bigbank

☐ Medicinos bank

☐ PayRay Bank

☐ Mano bank

☐ GF bank

☐ AS Inbank

☐ European Merchant Bank

☐ SME Bank

☐ Fjord Bank

☐ Finora Bank

☐ Saldo Bank

☐ Other

4.   Responsibilities in the Bank

☐ I participate in the decision-making process for granting credit.

☐ I participate in the bank's risk management process (credit, market, liquidity, etc.).

☐ I create or develop the decision-making process for granting credit.

☐ I create or develop the bank's risk management process (credit, market, liquidity, etc.).

☐ Other

5.   Risk management process effectiveness and performance metrics

	1- strongly disagree	2- Disagree	3- Neither agree nor disagree	4-Agree	5- Strongly agree
The bank decides to invest in both high and low risks clients (the portfolio is diversified). (*Evaluate risk level according to the risk group/rating gradation in Your bank).	☐	☐	☐	☐	☐
Bank does all these steps: identify new risks, make plans to mitigate them, and resolve the risks.	☐	☐	☐	☐	☐
Bank has advanced IT storage and processing systems/programs (Secure, fast-performing, capable of processing large amounts of data, and user-friendly).	☐	☐	☐	☐	☐

Bank non-performing loan ratio during last 3 years is less than 5%.	☐	☐	☐	☐	☐
In the bank's risk strategy, the risk appetite level is defined.	☐	☐	☐	☐	☐

6.　　　　Credit approval process effectiveness and performance metrics

	1- strongly disagree	2- Disagree	3- Neither agree nor disagree	4-Agree	5- Strongly agree
Credit approval process is effective (quick, smooth, and clear).	☐	☐	☐	☐	☐
Bank analyzes all this information during the credit approval process: client income history (private, legal), years of employment (private), and client default information (private, legal).	☐	☐	☐	☐	☐
Bank credit decision-makers possess high competence in assessing customer credit risk.	☐	☐	☐	☐	☐
A credit scoring model is in use at the bank.	☐	☐	☐	☐	☐
Credit approval process includes all these steps: client loan application, documentation check, evaluation of the client, and contract signature.	☐	☐	☐	☐	☐

7.　　　　Bank performance metrics

	1- strongly disagree	2- Disagree	3- Neither agree nor disagree	4- Agree	5- Strongly agree
Bank accomplished its targets during the last 3 years.	☐	☐	☐	☐	☐
Bank product and service development improved during the last 3 years.	☐	☐	☐	☐	☐

The bank profit significantly increased during the last 3 years (above 15%).	☐	☐	☐	☐	☐
Bank financial service time was reduced during the last 3 years.	☐	☐	☐	☐	☐
Bank customer satisfaction with the bank has increased during the last 3 years.	☐	☐	☐	☐	☐

Thank you very much!