The Effect of M-Banking Use and Transaction Security on Customer Investment Decisions with Financial Behavior as an Intervening Variable at BNI Bank in Bukittinggi City

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This study aims to examine the influence of mobile banking usage and transaction security on customer investment decisions, with financial behavior as an intervening variable at Bank BNI in Bukittinggi City. Data collection was conducted through a survey and questionnaire distribution, with a sample of 100 respondents. The analysis method used was structural equation modeling using SmartPLS. The results showed a significant influence of mobile banking on financial behavior. Transaction security significantly impacted financial behavior. M-banking significantly impacted investment decisions. Transaction security significantly impacted investment decisions. Financial behavior significantly impacted investment decisions. Financial behavior mediated the influence of mobile banking on investment decisions. Financial behavior mediated the influence of transaction security on investment decisions.
Keywords: Mobile Banking, Transaction Security, Financial Behavior, and Investment Decisions

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1. Introduction

Planning an investment in personal financial management is crucial for every individual today. This is because investment is a form of capital investment of a certain amount of money made with the aim of obtaining financial gain in the future. Investment decision-making is the stage for formulating or making decisions regarding various issues or problems between two or more investment options. The average investor in making investment decisions only looks at and considers accounting information factors and traditional analysis tools to achieve their investment goals. This is comparable to the efforts of the Padang city government which continues to increase and encourage the community to invest.

Investment decisions are related to a person's voluntary interest in setting aside their current funds in an investment asset in the hope of generating future profits. Similarly, an entrepreneur needs to invest if they want to generate greater returns than they currently have. A trader's investment can be in the form of the amount or nominal amount they spend on the business itself. However, in making these investment decisions, there are also other factors, namely non-financial measures related to the individual's own attitude. This individual attitude can be the entrepreneur's own desires, which will encourage them to seek information related to the decision they will make.[1].

BNI, a state-owned bank, has developed an M-Banking service that continues to enhance its features and security systems. In Bukittinggi City, the use of BNI M-Banking has grown in line with increasing digital literacy. However, there are still differences in the level of digital service utilization and investment decisions among customers. This suggests that in addition to technology availability, financial behavior and perceived security also influence customer investment decisions.The number of customers in 2020 was 15,857 people, with 12,832 active customers and 12,832 inactive customers.3,025person. In 2021 there will be

16,653 people with 12,908 active information and 12,908 inactive people3,745person. In 2022 there will be 17,985 people with 11,023 active information and 11,023 inactive people6,962person. In 2023 there will be 18,311 people with 12,137 active information and 12,137 inactive people6,174person. In 2024 there will be 18,937 people with 12,867 active information and 12,867 inactive people6,070person.From this, it can be concluded that customer investment decisions are not optimal, allegedly caused by the use of m-banking and transaction security through financial behavior.

Every individual certainly has goals they wish to achieve, and these goals vary. However, fundamentally, everyone desires a decent and good life. Furthermore, entrepreneurs share the same goal: prosperity within their businesses. Prosperity is derived from the income earned by entrepreneurs, which is sufficient to meet their living needs, both short-term and long-term. To help improve this prosperity, entrepreneurs are expected to set aside a portion of their income for investment. This investment typically takes the form of purchasing equipment to expand the business, which can ultimately increase future income. Therefore, it is important to recognize the importance of investing in order to improve future prosperity.[2].

The investment decision involves the decision to buy, sell, or maintain stock ownership. Five factors can influence investors in making investment decisions, including heuristics, risk aversion, financial instruments, and company-level corporate governance. An investment decision is a person's voluntary intention to set aside their current funds in an investment asset in the hope of generating future profits. Similarly, an entrepreneur needs to invest if they want to generate greater returns than their current holdings. A trader's investment can be in the form of the amount or nominal amount spent on the business itself. However, in making these investment decisions, there are also other factors, namely non-financial measures related to the individual's own attitude. This individual's attitude can be the entrepreneur's desire, which will encourage them to seek information related to the decision to be made.[1].

Planning is essential for determining investment decisions. Investment planning is crucial for financial management, as choosing the right investments can provide a sustainable source of income for a business or individual. With planning, an individual can avoid uncertainty and have a clear direction in making investment decisions. Planning also allows for more informed investment decisions and avoids losses.[3].

One of the variables influencing investment decisions is financial knowledge. Financial knowledge consists of financial skills and financial tools. Financial skills are the means by which decisions are made in financial behavior. Meanwhile, financial tools are the facilities used in decision-making. Financial knowledge is a person's understanding of the financial world, including financial skills and financial tools. Someone with good financial knowledge will have good financial behavior. Financial knowledge is a way to determine decision-making in financial behavior. Financial knowledge includes preparing a budget, choosing investments, creating insurance plans, and credit. Good financial knowledge will have an impact on a person's financial behavior. For example, paying bills on time, recording monthly expenses, and having savings.[4].

One factor influencing investment decisions is risk perception. Risk perception is how individuals assess and respond to potential dangers or uncertainties in their lives. Each person has a different perception of risk, depending on their experience, knowledge, cultural values, and the information they receive. This perception is often not entirely based on objective facts but is influenced by subjective factors such as emotions, fear, and trust in the source of information.[5].

Factors that influence investment decisions are financial behavior, Pfinancial behavior isability to understand, analyzeand managing finances to make the right financial decisions to avoid financial problems. Financial behavior is the level of an individual's or household's ability to manage financial resources, including planning for earning money, managing and controlling finances, and related practices. Cash and

credit management refers to a state of mind, opinions, and judgments about finances. It relates to how a person organizes and utilizes available financial resources. Financial behavior also involves a person's financial responsibility in managing their finances effectively.[6].

2. Method

Structural Equation Modeling (SEM) Analysis

This study used the Structural Equation Modeling (SEM) analysis tool using the SmartPLS program. SmartPLS is a component-based approach for testing structural equation models, commonly called SEM. SmartPLS is based on the idea of having two iterative procedures that use least squares estimation for single and multi-component models. By applying these procedures, this algorithm aims to minimize the variance of all dependent variables, therefore the cause and direction between all variables need to be clearly defined. SmartPLS is divided into measurement models and structural models. SmartPLS is a powerful method because it is not based on many assumptions. Data does not have to be multivariate normal distribution (indicators with categorical, ordinal, interval, and ratio scales can be used in the same model). SmartPLS is also more efficient with algorithmic calculations that are capable of estimating larger and more complex models with hundreds of latent variables and thousands of indicators.[17].

Measurement Model Test (Outer Model)

In data analysis techniques using SmartPLS, there are three criteria for assessing the outer model: Convergent Validity, Discriminant Validity, and Composite Reliability. Convergent validity of a measurement model with reflective indicators is assessed based on the correlation between item scores or component scores estimated using SmartPLS software. An indicator is considered to have good reliability if it has a value above 0.7. We can see this figure by referring to the Outer Loading table in SmartPLS.[18].In this composite reliability test, there are two tables that must be observed: the values contained in the Composite Reliability table and Cronbach's Alpha, which must be greater than 0.7. For the Discriminant Validity test, it can be seen from the cross-loading value. The correlation value of the indicator to its construct must be greater than the correlation value between the indicator and other constructs. There is another way to test Discriminant Validity by comparing the root value of the Average Variance Extracted (AVE) for each construct with the correlation between the construct and other constructs.

1. Measurement Modelor Validity
   There are three criteria for using data analysis techniques to assess the outer model: Convergent Validity, Discriminant Validity, and Composite Reliability. In the development stage, a correlation of 0.50 to 0.6 is considered acceptable. In research, the limit for convergent validity is above 0.7.
2. Reliability
   Once the data validity level is known, the next step is to determine the level of data reliability or the level of reliability of each construct or variable. This assessment is done by looking atComposite reliability value and Crombach alpha value. A construct is said to be reliable if it provides a Crombach alpha value > 0.70.
3. R-square
   Next, as explained previously, the inner model assessment will be evaluated through the R-Squared value, to assess the influence of certain exogenous latent constructs on endogenous latent constructs to see whether they have a substantive influence.

Path Coefficient and Hypothesis Testing

Testing the inner model or structural model is conducted to examine the relationship between variables, the significance value, and the R-square of the research model. Model assessment using PLS begins by

examining the R-square for each dependent latent variable. Changes in the R-square value can be used to assess the influence of a particular independent latent variable on the dependent latent variable and whether it has a substantive effect.

3. Results and Disccusion

Research Description

Table 1. Calculation of Questionnaire Distribution Results

No.	Questionnaire	Amount	Percentage%
1	Distributed questionnaires	100	100
2	Unreturned questionnaires	0	0
3	Incorrectly filled out (defective or damaged) questionnaire	0	0
4	Questionnaires suitable for data processing	100	100

Source: Survey Results, 2026

Research Data Analysis

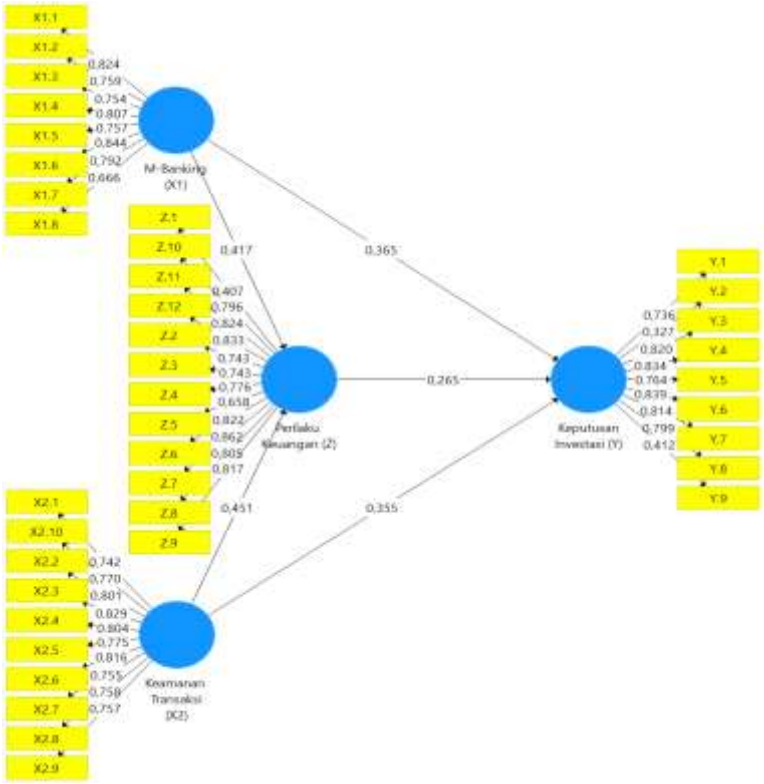
The data processing technique in this study uses the SEM method based on Partial Least Square (PLS) which requires two stages for the assessment of a research model: the outer model and the inner model. The outer model assessment aims to assess the correlation between item or indicator scores and their construct scores, which indicate the level of validity of a statement item. Outer model testing is carried out based on the results of questionnaire trials that have been conducted for all research variables. There are three criteria in the use of data analysis techniques to assess the outer model: Convergent Validity, Discriminant Validity, and Composite Reliability. In the development stage, a correlation of 0.50 to 0.6 is considered adequate or acceptable. In research, the limit for convergent validity values is above 0.7.

Outer Model Testing (*Measurement Model*) Before Elimination

Testing of the outer model (measurement model) before elimination was conducted to assess the validity and reliability of indicators for each construct in the study. Analysis using SmartPLS software showed that correlation values (outer loadings) between statement items and latent variables still varied. Some indicators met convergent validity criteria with loading values above 0.70, while others fell below the recommended limit. Furthermore, evaluation of the Average Variance Extracted (AVE) and Composite Reliability values indicated that not all constructs met the established standards. Therefore, a process of eliminating invalid indicators was necessary to improve the quality of the measurement model.
Based on the resultsTesting the outer model using SmartPLS, obtained the correlation values between the statement items of the research variables as follows:

ISSN 2809-8587

Figure 1. Outer Loadings Before Elimination



In data analysis techniques using SmartPLS, there are three criteria for assessing the outer model: convergent validity, discriminant validity, and composite reliability. Convergent validity of a measurement model with reflective indicators is assessed based on the correlation between item scores or component scores estimated with PLS software. Indicators are considered to have good reliability if they have a value above 0.7. There are three criteria in the use of data analysis techniques to assess the outer model: convergent validity, discriminant validity, and composite reliability. In the development stage, a correlation of 0.50 to 0.6 is considered adequate or acceptable. In research, the limit value of convergent validity is above 0.7.

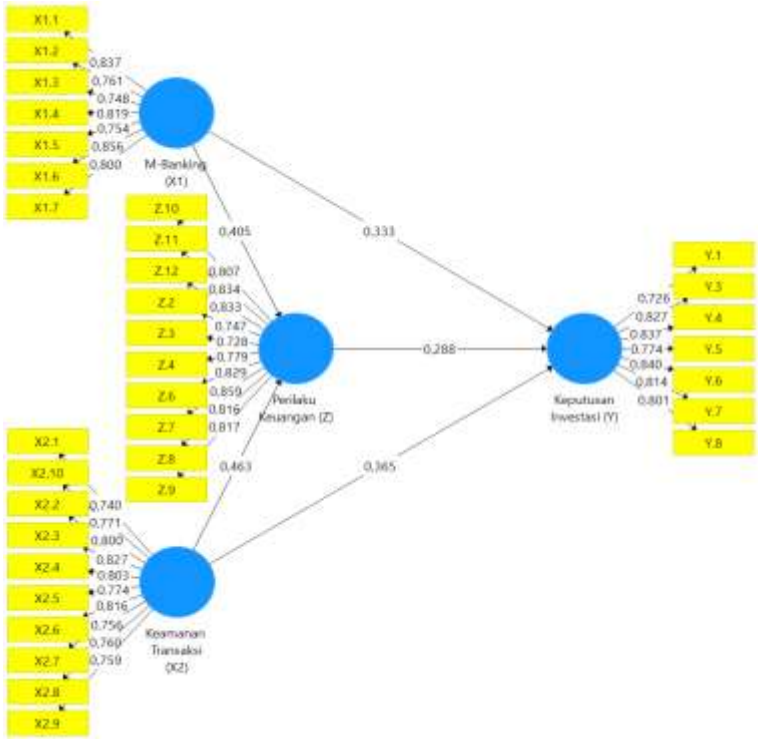
In this study, the convergent validity value limit is above 0.7. Several indicators were eliminated from the research variables, as can be seen in the discussion of the outer model testing. All retained indicators have met the convergent validity criteria, so it can be concluded that the constructs of M-Banking (X1), Transaction Security (X2), Financial Behavior (Z), and Investment Decisions (Y) have been validly measured by the remaining indicators.

Outer Model Testing (*Measurement Model*) After Elimination

Based on the resultsTesting the outer model using SmartPLS, obtained the correlation values between the statement items of the research variables as follows:

 ISSN 2809-8587

Figure 2. Outer Loadings After Elimination



Average Variance Extracted (AVE) Assessment

The validity criteria for a construct or variable can also be assessed through the Average Variance Extracted (AVE) value for each construct or variable. A construct is considered to have high validity if its value is above 0.50. The AVE values for all variables are presented below.

Table 2. Average Variance Extracted (AVE) Value

	Average Variance Extracted (AVE)
Investment Decision (Y)	0.646
M-Banking (X1)	0.636
Transaction Security (X2)	0.610
Financial Behavior (Z)	0.649

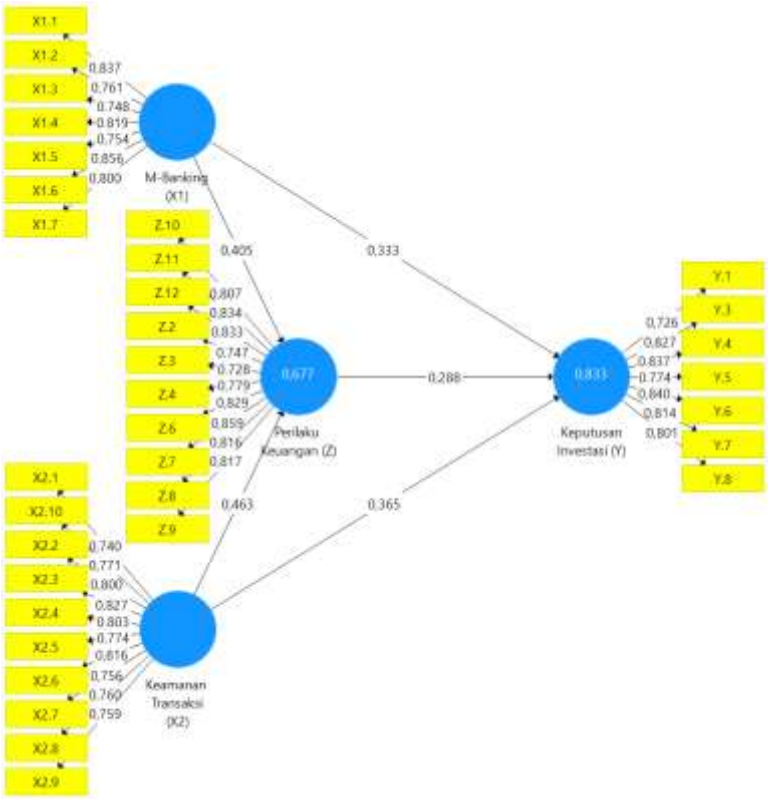
Based on Table 2, it can be concluded that all constructs or variables above meet good validity criteria. This is indicated by the Average Variance Extracted (AVE) value above the recommended 0.50 criterion.

Outer Model Testing (*Measurement Model*)

The next testing process is testing the outer model or model.*measurement* which aims to determine the relationship between hypothesized constructs. The structural model is evaluated by observing the R-Square value for the endogenous construct from the influence it receives from the exogenous construct.

 ISSN 2809-8587

Figure 3. *Measurement Outer Model*



Based on the image above, the model*measurement* above, the following model equation can be formed:

a. Equation Model I, is a description of the magnitude of the influencem-banking constructAndtransaction security against financial behaviorwith the existing coefficients plus the error rate which is an estimation error or which cannot be explained in the research model.

$$Z = 0.405X1 + 0.463X2$$

b. Equation Model II, is a description of the magnitude of the influencem-banking construct, transaction securitydanfinancial behaviortoinvestment decisions with each coefficient for each construct plus an error which is an estimation error.

$$Y = 0.333X1 + 0.365X2 + 0.288\ Z$$

Next, as explained previously, the inner model assessment will be evaluated through the R-Squared value, to assess the influence of certain exogenous latent constructs on endogenous latent constructs to see whether they have a substantive influence. The following is the R-Square estimate:

Table 3. Evaluation of R Square Value

	R Square	*R Square Adjusted*
Investment Decision (Y)	0.833	0.827
Financial Behavior (Z)	0.677	0.670

Source: SmartPLS Outer Model Test Results, 2026

In the table above, the R-Square value of the investment decision variable is 0.833 or 83.3%, so the contribution of the m-banking variable is 0.833 or 83.3%.,transaction securitydThe influence of financial behavior on investment decisions is 83.3%, the remaining 16.7% is influenced by other variables outside this research.such as motivation, interest rates and inflation movements.

The R-Square value of the financial behavior variable is 0.677 or 67.7%, so the contribution of the m-banking and transaction security variables to financial behavior is 67.7%, the remaining 32.3% is influenced by other variables outside this study.such as motivation, interest rates and inflation movements.

PenHypothesis test

Hypothesis testing in this study can be assessed by comparing the t-statistic or calculated t-value with the t-table of 1.96 at 5% alpha. If the t-statistic/calculated < t-table of 1.96 at 5% alpha, then Ho is rejected. If the t-statistic/calculated t-value > t-table of 1.96 at 5% alpha, then Ha is accepted. The following SmartPLS output results illustrate the estimated output for structural model testing.

Table 4. Results for Inner Weights Direct Affect

	Original Sample (O)	*Sample Mean (M)*	*Standard Deviation (STDEV)*	*T Statistics (|O/STDEV|)*	*P Values*
M-Banking (X1) -> Financial Behavior (Z)	0.405	0.399	0.107	3,780	0,000
Transaction Security (X2) -> Financial Behavior (Z)	0.463	0.464	0.102	4,548	0,000
M-Banking (X1) -> Investment Decision (Y)	0.333	0.345	0.093	3,572	0,000
Transaction Security (X2) -> Investment Decision (Y)	0.365	0.365	0.093	3,925	0,000
Financial Behavior (Z) -> Investment Decision (Y)	0.288	0.278	0.074	3,909	0,000
M-Banking (X1) -> Financial Behavior (Z) -> Investment Decision (Y)	0.117	0.109	0.037	3,166	0.002
Transaction Security (X2) -> Financial Behavior (Z) -> Investment Decision (Y)	0.134	0.130	0.048	2,772	0.006

4. Conclusion

There is a significant influence of m-banking on financial behavior. There is a significant influence of transaction security on financial behavior. There is a significant influence of m-banking on investment decisions. There is a significant influence of transaction security on investment decisions. There is a significant influence of financial behavior on investment decisions. Financial behavior mediates the influence of m-banking on investment decisions. Financial behavior mediates the influence of transaction security on investment decisions.

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