

## Determinants of Students' Interest in Using BSI Cardless Withdrawal: Evidence from FEBI UINSU

Saibarani Nabila<sup>1</sup>, Nurwani<sup>1</sup>, Laylan Syafina<sup>1</sup>

<sup>1</sup> Universitas Islam Negeri Sumatera Utara, Indonesia

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### Abstract

Despite the growing adoption of digital banking services in Indonesia, empirical studies on the determinants of cardless withdrawal usage particularly within Islamic banking contexts remain limited. This study examines the influence of efficiency, convenience, and security on students' interest in using the BSI Cardless Withdrawal feature, grounded in the Technology Acceptance Model (TAM). Using a quantitative survey approach, data were collected from 100 FEBI UINSU students selected through accidental sampling. Multiple linear regression analysis revealed that efficiency and security positively and significantly influenced students' interest, while convenience did not yield a significant effect. Simultaneously, all three variables collectively had a significant positive impact. These findings contribute to the Islamic digital banking literature by highlighting that perceived security and operational efficiency are the primary drivers of cardless withdrawal adoption among young Muslim banking users, offering actionable insights for BSI in prioritizing service improvements.

### Keywords

Cardless Withdrawal; Digital Banking; Efficiency; Islamic Banking; Security; Technology Adoption; TAM

### Corresponding Author:

Saibarani Nabila

Universitas Islam Negeri Sumatera Utara, Indonesia; saibarani657@gmail.com

## 1. INTRODUCTION

The development of information technology has driven the transformation of the banking industry in providing digital-based services to improve the quality of service and customer satisfaction (Salsabila et al., 2025). The use of technology in banking services enables customers to carry out various transactions quickly, accurately, and efficiently without being limited by time and place, thus encouraging banks to continue to innovate in providing more effective digital services (Nurhayani et al., 2023). This transformation is realized through electronic services such as ATMs, internet banking, mobile banking (Iskandar, 2022), and cardless withdrawal features, which are designed to increase efficiency while minimizing banking crime risks associated with physical card use, thereby broadening public access to digital financial services (Nabila et al., 2023).

One of the banks that has used the Cardless Withdrawal feature on its mobile banking is Bank Syariah Indonesia (BSI) (Y. Putri et al., 2025). At Bank Syariah Indonesia (BSI), the cardless withdrawal



feature was introduced in July 2021 through the BSI Mobile app. This feature is part of BSI's efforts to improve Sharia-compliant digital banking services (Nihayah & Purnama, 2024). The purpose of this service is to provide convenience, efficiency and flexibility for customers in withdrawing cash, while reducing the risk of losing, damaging or having their ATM card swallowed by an ATM machine (Henderianto et al., 2025).

Cardless Withdrawal, or more literally, cash withdrawals without a card, are transactions that require no card at all, using only a PIN and the account holder's fingerprint (Marlina et al., 2020). Cardless withdrawal services allow customers to withdraw funds without using an ATM card by utilizing a transaction code or authentication through an mobile banking application. Conceptually, this service offers convenience, flexibility, and efficiency in transactions (Kurnia & Rahman, 2025). However, a number of studies have revealed that the implementation of cardless withdrawal services still faces various obstacles, such as low user understanding, as well as dependence on internet network stability, which ultimately hinders the adoption rate of this technology (Napitupulu & Cahyadi, 2024). In fact, in some cases, risk and security factors are actually the main obstacles rather than drivers of technology adoption (Raj et al., 2024).

A preliminary survey among FEBI UINSU Islamic Banking students revealed that while approximately 60% were aware of the BSI Cardless Withdrawal feature, fewer than 35% had actively used it. Key barriers among non-users included procedural complexity (~45%), internet connectivity dependence (~38%), and personal data security concerns (~52%), concerns heightened by the 2023 BSI ransomware cyberattack that caused operational disruptions and eroded customer trust in digital banking systems (A. A. Putri & Yusuf, 2025). This gap between feature availability and actual usage underscores the need for empirical investigation into the determinants of cardless withdrawal adoption.

This study employs the Technology Acceptance Model (TAM), introduced by Fred Davis in 1986 as a modification of the Theory of Reasoned Action (Samsudin et al., 2024), as its theoretical framework. The three study variables are mapped onto TAM constructs: Efficiency corresponds to perceived usefulness, Convenience to perceived ease of use, and Security to an extended trust construct reflecting users' confidence in system reliability and data protection (Ummi Nurhalim Harahap & Anggraini, 2023). Based on TAM, efficient, easy-to-use, and secure services should increase user interest (Seputri et al., 2023); however, the uneven adoption observed among FEBI students indicates a gap between theoretical expectations and empirical reality, necessitating further testing.

Several prior studies have examined factors influencing cardless withdrawal adoption with inconsistent findings. (Khalfi et al., 2024) found that efficiency, convenience, and security positively and significantly influence customer interest both partially and simultaneously, while (Gasperz & Lekatompessy, 2024) found that security had a negative effect in a conventional banking context (Riasati

& Supriyadi, 2025) and (Firly Adrienne & Nuraeni, 2025) confirmed positive influences of convenience and security through the *Living by Mandiri* application, and (Anwari & Narimawati, 2025) similarly found positive effects of security and convenience on students' interest. These inconsistencies, particularly regarding the role of convenience and the contrasting security findings between Islamic and conventional banking contexts, alongside the limited studies integrating all three variables in an Islamic banking setting, constitute a research gap this study seeks to address.

Several studies have examined the factors influencing interest in using cardless withdrawal services, particularly efficiency, convenience, and security (Nihayah & Purnama, 2024). Efficiency, defined as the ability of a system to deliver optimal output with minimal time, energy, and cost, has been shown to significantly influence user interest (Pramadani et al., 2023). Convenience, or perceived ease of use in TAM (Mukhtisar et al., 2021), refers to the degree to which a system can be used without considerable effort, and has been found to have a significant positive effect on students' interest in using cardless cash withdrawal services (Nurhayati et al., 2026). Security, as the system's capacity to protect user data from threats such as hacking and data misuse, also plays a critical role in shaping customer decisions toward cardless withdrawal adoption (Ong & Nuryasman, 2022). Collectively, (Khalfi et al., 2024) confirmed that efficiency, convenience, and security risks simultaneously and significantly influence students' interest in using cardless cash withdrawal services. However, despite these individual findings, studies specifically examining the combined influence of these three variables on students' interest in using Bank Syariah Indonesia's cardless withdrawal feature remain limited, leaving a theoretical gap that this study seeks to address.

The novelty of this research lies in combining efficiency, convenience, and security within a single empirical model specifically applied to BSI's cardless withdrawal feature, with FEBI UINSU students as the focus population given their relevance to digital Islamic financial literacy development. This study therefore expands TAM's application in the Islamic banking context while providing practical contributions to BSI's digital feature adoption strategies. Ultimately, this study aims to analyze the influence of efficiency, convenience, and security on FEBI UINSU students' interest in using BSI's cardless withdrawal feature, with findings expected to inform bank digital service policy formulation and enrich the scientific literature on digital banking adoption in Indonesia. Based on the theoretical framework and prior findings, this study positions Efficiency (X1), Convenience (X2), and Security (X3) as independent variables and Interest in Using (Y) as the dependent variable, with the following hypotheses proposed.

## 2. METHODS

This study employed a quantitative research design with a cross-sectional survey approach to examine the causal relationships between Efficiency, Convenience, and Security on students' interest in using the BSI cardless withdrawal feature through numerical measurement and inferential statistical analysis (Rukminingsih, 2020). The population consisted of 4,555 active FEBI UINSU students (SI-PANDAI 2025), with samples drawn using accidental sampling due to its practicality in reaching students on campus, though findings should be interpreted cautiously given its inherent selection bias risk (Sukwika, 2023). Sample size was determined using the Slovin formula with a 10% margin of error, yielding 100 respondents who met three criteria (Sukwika, 2023):

$$n = \frac{N}{1 + N(e)^2} = \frac{4.555}{1 + 4.555(0,10)^2} = 97,8$$

Based on the results of the sample calculation using the Slovin formula, a total of 97.8 respondents were obtained, rounded up to 100. The sample was determined based on the following criteria: (1) active students of the Faculty of Economics and Business, State Islamic University of North Sumatra, (2) using BSI mobile banking, and (3) knowing or having used the cardless withdrawal feature.

Primary data were collected via self-administered questionnaires using a five-point Likert scale, with indicators adapted from established studies: Efficiency from Mukhtisar et al. (2021), Convenience from Ong & Nuryasman (2022) and Riasati & Supriyadi (2025), Security from Prayoga & Darna (2023), and Interest from Alimah et al. (2022):

**Table 1. Operational Definition of Variables**

Variable	Definition	Indicators	Scale
Efficiency (X1)	The ability of the BSI cardless withdrawal system to deliver fast, accurate, and practical transactions that save time and effort (Mukhtisar et al., 2021)	Transaction speed; time savings; minimal effort; system performance; practical process	Likert 1–5
Convenience (X2)	The degree to which students perceive the cardless withdrawal service as easy to understand and use without requiring significant effort (Riasati & Supriyadi, 2025)	Ease of learning; ease of use; accessible interface; step clarity; minimal complexity	Likert 1–5
Security (X3)	The perceived ability of the BSI system to protect users' personal data and financial transactions from unauthorized access or misuse (Prayoga &	Data protection; authentication reliability; privacy assurance; system trustworthiness; risk perception	Likert 1–5

Interest in Using (Y)	Darna, 2023)	Students' intrinsic motivation and behavioral intention to use the BSI cardless withdrawal service, driven by positive evaluation of its features (Alimah et al., 2022)	Willingness to use; intention to recommend; curiosity; preference; repeated use intention	Likert 1-5
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Data analysis using SPSS 25 proceeded in four stages: validity testing (Pearson correlation) and reliability testing (Cronbach's Alpha) to ensure instrument quality; classical assumption tests comprising normality (Kolmogorov-Smirnov), multicollinearity (Tolerance and VIF), and heteroscedasticity (Glejser); multiple linear regression following the equation  $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$  to model the simultaneous and individual effects of all three independent variables; and the coefficient of determination ( $R^2$ ) to quantify the proportion of variance explained by the model.

### 3. FINDINGS AND DISCUSSION

#### 3.1. Validity Test

Validity testing was conducted to assess the feasibility of each questionnaire item, with an item considered valid if its Pearson r value exceeds the r-table threshold of 0.1966 at a 5% significance level (Machali, 2021):

**Table 2. Validity Test**

Question Items	R count	R table	information
X1.1	0,907	0.1966	Valid
X1.2	0,909	0.1966	Valid
X1.3	0,891	0.1966	Valid
X1.4	0,887	0.1966	Valid
X1.5	0,859	0.1966	Valid
X2.1	0,845	0.1966	Valid
X2.2	0,925	0.1966	Valid
X2.3	0,889	0.1966	Valid
X2.4	0,896	0.1966	Valid
X2.5	0,869	0.1966	Valid
X3.1	0,893	0.1966	Valid
X3.2	0,903	0.1966	Valid
X3.3	0,850	0.1966	Valid
X3.4	0,908	0.1966	Valid
X3.5	0,869	0.1966	Valid
Y.1	0,843	0.1966	Valid
Y.2	0,885	0.1966	Valid
Y.3	0,819	0.1966	Valid
Y.4	0,855	0.1966	Valid
Y.5	0,882	0.1966	Valid

Source: Output Results, SPSS 25, 2026

All 20 items across four variables yielded  $r$  values ranging from 0.819 to 0.925, substantially exceeding the 0.1966 threshold, confirming that all items are valid in measuring their respective constructs. While sufficient for confirmatory purposes at the exploratory stage, future research is encouraged to employ Confirmatory Factor Analysis (CFA) or Exploratory Factor Analysis (EFA) to more rigorously verify the factorial structure and discriminant validity of the instrument, particularly given the conceptual overlap between Efficiency and Convenience within the TAM framework.

### 3.2 Reliability Test

Reliability testing using Cronbach's Alpha assessed the internal consistency of each variable, with a value above 0.6 considered reliable (Machali, 2021):

**Table 3. Reliability Test**

Variables	Cronbach Alpha Value	Number of Items	Information
Efficiency (X1)	0,934	5	Reliabel
Convenience (X2)	0,928	5	Reliabel
Security (X3)	0,929	5	Reliabel
Interest (Y)	0,908	5	Reliabel

Source: Output Results, SPSS 25, 2026

The reliability test results confirm that all four variables yield Cronbach's Alpha values well above the 0.6 threshold: Efficiency ( $\alpha = 0.934$ ), Convenience ( $\alpha = 0.928$ ), Security ( $\alpha = 0.929$ ), and Interest ( $\alpha = 0.908$ ). These values indicate high internal consistency, meaning the items within each construct consistently measure the same underlying dimension. The instrument is therefore reliable for use in this study.

### 3.3. Normality Test

The Kolmogorov-Smirnov test was used to verify that regression residuals are approximately normally distributed, with Asymp. Sig. (2-tailed)  $> 0.05$  as the decision criterion:

**Table 4. Normality Test**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		100
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	1.56538171
Most Extreme Differences	Absolute	.082
	Positive	.080
	Negative	-.082
Test Statistic		.082
Asymp. Sig. (2-tailed)		.098 <sup>c</sup>

a. Test distribution is Normal.

- b. Calculated from data.
- c. Lilliefors Significance Correction.

Source: Output Results, SPSS 25, 2026

The Asymp. Sig. (2-tailed) value of 0.098 exceeds 0.05, confirming that the regression residuals are normally distributed. This satisfies the normality assumption for multiple linear regression.

### 3.4. Multicollinearity Test

The multicollinearity test assessed inter-correlations among independent variables using Tolerance (> 0.1) and VIF (< 10) as acceptable thresholds:

**Table 5. Multicollinearity Test**

		Coefficients <sup>a</sup>				Collinearity Statistics		
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
		B	Std. Error	Beta				
1	(Constant)	1.498	.844		1.775	.079		
	Efficiency	.259	.085	.272	3.044	.003	.207	4.838
	Convenience	.092	.079	.104	1.163	.248	.206	4.845
	Security	.558	.097	.574	5.736	.000	.165	6.071

a. Dependent Variable: Interest Using Cardless Withdrawal

Source: Output Results, SPSS 25, 2026

The multicollinearity results show that Tolerance values for Efficiency, Convenience, and Security are 0.207, 0.206, and 0.165, respectively, and their corresponding VIF values are 4.838, 4.845, and 6.071 all within the acceptable thresholds of Tolerance > 0.1 and VIF < 10. The regression model is therefore free from severe multicollinearity. However, it is worth noting that the VIF value for Security (6.071) is relatively elevated, which may indicate moderate inter-correlation between Security and the other predictors. This is an expected finding given the conceptual proximity of these constructs within the TAM framework, and is acknowledged as a limitation of this study. Researchers are advised to interpret individual regression coefficients with some caution, as moderate multicollinearity can inflate standard errors and reduce the precision of partial effect estimates.

### 3.5. Heteroscedasticity Test

The Glejser test was used to detect unequal residual variance, with significance values > 0.05 indicating no heteroscedasticity.

**Table 6. Heteroscedasticity Test**

Model		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.412	.531		2.661	.009
	Efficiency	-.017	.053	-.071	-.315	.753
	Convenience	.027	.050	.120	.536	.593
	Security	-.020	.061	-.080	-.320	.749

a. Dependent Variable: Abs\_RES

Source: Output Results, SPSS 25, 2026

The Glejser test results confirm that all independent variables yield significance values above 0.05 (Efficiency: 0.753; Convenience: 0.593; Security: 0.749), indicating no heteroscedasticity. The model meets the homoscedasticity assumption.

### 3.6. Multiple Linear Regression Analysis

Multiple linear regression was employed to model the effects of Efficiency (X1), Convenience (X2), and Security (X3) on students' interest (Y), following the equation  $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$ . The following table shows the results of the multiple linear regression test:

**Table 7. Multiple Linear Regression Test**

Model		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.498	.844		1.775	.079
	Efficiency	.259	.085	.272	3.044	.003
	Convenience	.092	.079	.104	1.163	.248
	Security	.558	.097	.574	5.736	.000

a. Dependent Variable: Interest Using Cardless Withdrawal

Source: Output Results, SPSS 25, 2026

$$Y = 1,498 + 0,259 + 0.092 + 0,558 + e$$

Based on the regression output, the estimated model is:  $Y = 1.498 + 0.259X_1 + 0.092X_2 + 0.558X_3 + e$ . The constant value of 1.498 indicates the predicted baseline level of student interest when all three predictors are held at zero. The regression coefficient for Efficiency ( $\beta_1 = 0.259$ ) indicates that a one-unit increase in perceived efficiency is associated with a 0.259-unit increase in interest, holding other variables constant reflecting that students value the practical time-saving benefits of cardless withdrawal. The coefficient for Convenience ( $\beta_2 = 0.092$ ) is positive but relatively small, suggesting that while ease of use contributes positively, its marginal effect is limited in this sample. The coefficient for Security ( $\beta_3 = 0.558$ ) is the largest among the three predictors, meaning that a one-unit increase in

perceived security is associated with a 0.558-unit increase in interest underscoring that trust in system protection is the most critical driver of adoption. The standardized beta for Security ( $\beta = 0.574$ ) further confirms it as the dominant predictor, consistent with the heightened risk awareness among young digital banking users following recent cybersecurity incidents in the Indonesian banking sector.

### 3.7. t-test (Partial Test)

The t-test assessed the individual significance of each predictor, with  $t > t\text{-table}$  (1.984) and  $\text{sig.} < 0.05$  as the acceptance criteria. The following table 78 shows the results of the t-test:

**Table 8. t-Test Results**

		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.498	.844		1.775	.079
	Efficiency	.259	.085	.272	3.044	.003
	Convenience	.092	.079	.104	1.163	.248
	Security	.558	.097	.574	5.736	.000

a. Dependent Variable: Interest Using Cardless Withdrawal

Source: Output Results, SPSS 25, 2026

The partial t-test results are summarized as follows. Efficiency:  $t = 3.044 > t\text{-table}$  (1.984),  $\text{sig.} = 0.003 < 0.05$ ; H1 accepted, significant effect. Convenience:  $t = 1.163 < t\text{-table}$  (1.984),  $\text{sig.} = 0.248 > 0.05$ ; H2 rejected, no significant effect. Security:  $t = 5.736 > t\text{-table}$  (1.984),  $\text{sig.} = 0.000 < 0.05$ ; H3 accepted, significant effect. These results indicate that Efficiency and Security individually contribute significantly to students' interest in using the BSI cardless withdrawal feature, while Convenience does not reach the threshold of significance in this sample.

### 3.8. F Test (Simultaneous)

The F-test evaluated the joint significance of all predictors, with  $F > F\text{-table}$  (2.70) and  $\text{sig.} < 0.05$  as the criteria:

**Table 9. F Test**

		ANOVA <sup>a</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1287.448	3	429.149	169.826	.000 <sup>b</sup>
	Residual	242.592	96	2.527		
	Total	1530.040	99			

a. Dependent Variable: Interest Using Cardless Withdrawal

b. Predictors: (Constant), Security, Efficiency, Convenience

Source: Output Results, SPSS 25, 2026

The simultaneous F-test yields  $F = 169.826 > F\text{-table} (2.70)$ , with a significance value of  $0.000 < 0.05$ , confirming that Efficiency, Convenience, and Security jointly have a significant effect on students' interest in using the BSI cardless withdrawal feature. This simultaneous significance is theoretically meaningful: even though Convenience is not individually significant in the partial test, it still contributes to the joint explanatory model. This is consistent with TAM's proposition that perceived usefulness (Efficiency), perceived ease of use (Convenience), and trust-related constructs (Security) function as an integrated system of perceptions users do not evaluate features in isolation but form holistic impressions. The finding suggests that BSI must simultaneously maintain efficiency, convenience, and security to sustain student interest; a decline in any one dimension may erode the overall attractiveness of the service, even if that dimension is not independently decisive.

### 3.9. R<sup>2</sup> Test (Coefficient of Determination)

**Table 10. Results of the Determination Coefficient Test**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.917 <sup>a</sup>	.841	.836	1.58965

a. Predictors: (Constant), Security, Efficiency, Convenience

b. Dependent Variable: Interest Using Cardless Withdrawal

Source: Output Results, SPSS 25, 2026

The Adjusted R<sup>2</sup> of 0.836 indicates that 83.6% of the variance in students' interest is collectively explained by Efficiency, Convenience, and Security, with the remaining 16.4% attributable to factors outside this model such as subjective norms, habit, or perceived risk. While this explanatory power is high, it likely reflects sample homogeneity all respondents share similar academic backgrounds and Islamic banking familiarity as FEBI UINSU students which reduces residual variance and inflates R<sup>2</sup>. Future studies with more diverse samples are encouraged to verify the robustness of these findings.

### 3.10. Discussion

#### The Effect of Efficiency on Interest Using Cardless Withdrawal at Indonesian Sharia Banks

Based on Table 7, Efficiency significantly influences students' interest in using the cardless withdrawal feature, with  $t = 3.044 > t\text{-table} (1.984)$  and  $\text{sig.} = 0.003 < 0.05$ , so H1 is accepted.

The significant effect of Efficiency on students' interest ( $t = 3.044$ ,  $\text{sig.} = 0.003$ ) aligns with the TAM's core construct of perceived usefulness, which posits that the more users perceive a system as improving their task performance, the stronger their intention to adopt it. In the context of cardless withdrawal, efficiency manifests concretely: students can complete transactions without physically carrying an ATM card, saving time in urgent or everyday situations. Critically, this finding also reflects

a broader behavioral pattern among university students, who routinely prioritize speed and practicality in their use of mobile services. The fact that efficiency emerges as a significant though less dominant than security predictor suggests that while functional value matters, trust concerns remain paramount for this demographic. From a managerial perspective, this implies that BSI should continue optimizing transaction speed and reducing steps in the cardless withdrawal process to sustain and grow its student user base. Efficiency, in the context of this research, can be defined as a form of perceived usefulness (Khairani, 2020). The TAM model explains that individuals are more likely to adopt and utilize technology if they believe it provides concrete positive contributions to their activities, including time savings and procedural simplification.

This result is consistent with (Gasperz & Lekatompessy, 2024) and (Mukhtisar et al., 2021), both of whom found that efficiency positively and significantly influences adoption interest.

### **The Effect of Convenience on Interest Using Cardless Withdrawal at Indonesian Sharia Banks**

Based on Table 7, Convenience does not significantly influence students' interest, with  $t = 1.163 < t\text{-table} (1.984)$  and  $\text{sig.} = 0.248 > 0.05$ , so H2 is rejected.

The insignificance of Convenience ( $t = 1.163$ ,  $\text{sig.} = 0.248$ ) is theoretically notable and warrants deeper behavioral explanation. While TAM posits that perceived ease of use is a fundamental driver of technology adoption, this relationship may be moderated by user familiarity and technological habituation. FEBI UINSU students, as digital natives who regularly navigate mobile banking applications, may have already internalized the usability of BSI Mobile to the point where ease of use is no longer a differentiating factor it is taken for granted as a baseline expectation rather than a motivator. In this condition, the marginal psychological value of additional convenience is diminished. This phenomenon is consistent with the concept of "technology domestication," wherein repeated use transforms a novel feature into a routine tool, reducing its perceived novelty and the salience of ease as a decision criterion. Furthermore, the proliferation of alternative payment modalities particularly QRIS and e-wallets may have raised the convenience benchmark to a level that cardless withdrawal's interface-based steps no longer exceed. This finding does not contradict TAM per se, but rather highlights the importance of contextualizing perceived ease of use within users' broader digital usage environment.

The results of this study align with research conducted by (Nardin & Larum, 2024) who similarly found that convenience has no significant effect on adoption interest.

### **The Influence of Security on Interest Using Cardless Withdrawal at Indonesian Sharia Banks**

Based on Table 7, Security is the strongest predictor of student interest, with  $t = 5.736 > t\text{-table}$  (1.984),  $\text{sig.} = 0.000 < 0.05$ , and standardized  $\beta = 0.574$ , so H3 is accepted.

This prominence is consistent with TAM's theoretical extension incorporating trust as a critical determinant of digital service adoption (Ummy Nurhalim Harahap & Anggraini, 2023), and is contextually attributable to heightened security awareness among FEBI UINSU students following the 2023 BSI ransomware cyberattack. Students academically engaged with Islamic finance are likely more attentive to data vulnerabilities than the general population, making security perceptions especially salient in their adoption decisions. Notably, this positive security effect appears conditional on existing institutional trust in BSI as a Sharia-compliant institution as (Gasperz & Lekatompessy, 2024) demonstrated, security can negatively affect adoption in conventional banking contexts where distrust outweighs perceived benefits. Future studies should examine whether this finding holds across different institutions, age groups, and risk tolerance profiles.

This research is in line with previous research conducted by (Riasati & Supriyadi, 2025) and (Anwari & Narimawati, 2025) both of whom found security to significantly influence adoption interest.

### **The Effect of Efficiency, Convenience, and Security on Interest Using Cardless Withdrawal at Indonesian Sharia Banks**

Based on the results of the simultaneous test (F-test) in Table 8, it shows that the variables Efficiency, Convenience, and Security have a significant influence on interest in using cardless withdrawal services at Bank Syariah Indonesia. This decision-making process is based on the calculated F-value  $> F\text{-table}$ , which is  $169.826 > 2.70$ , with a significance level of  $0.000 < 0.05$ .

This simultaneous significance aligns with TAM's holistic logic, wherein adoption decisions are shaped by a constellation of perceptions rather than any single determinant. Even where Convenience is individually insignificant, its co-presence with Efficiency and Security contributes to the overall service attractiveness a "gestalt" effect wherein multiple positive perceptions collectively reinforce adoption intention. Theoretically, Convenience appears to function as a baseline contextual factor rather than an active motivator, contributing to the joint model without independently driving adoption. This nuance supports more integrative frameworks such as UTAUT2, which may better capture convenience-related effects in highly digitized student samples.

These results align with previous research conducted by (Khalifi et al., 2024); (Alimah et al., 2022) and (Damayanti et al., 2024), all of whom found that efficiency, convenience, and security simultaneously influence adoption interest.

#### 4. CONCLUSION

This study finds that Efficiency ( $\beta = 0.259$ , sig. = 0.003) and Security ( $\beta = 0.558$ , sig. = 0.000) each have a positive and significant partial effect on FEBI UINSU students' interest in using the BSI cardless withdrawal feature, while Convenience ( $\beta = 0.092$ , sig. = 0.248) is positive but not individually significant. Security is the dominant predictor, indicating that trust in data protection is the primary adoption driver in this context. Simultaneously, all three variables jointly exert a significant influence ( $F = 169.826$ , sig. = 0.000), explaining 83.6% of the variance in student interest (Adjusted  $R^2 = 0.836$ ), supporting the TAM-based proposition that functional and security-related perceptions collectively shape technology adoption behavior among young Islamic banking users.

These findings carry several practical implications for BSI. Regarding Security — the dominant predictor BSI should prioritize transparent security communication through in-app notifications confirming encryption status and authentication logs, and publish accessible post-incident recovery reports to directly address student concerns following events such as the 2023 ransomware attack. For Efficiency, BSI should streamline the cardless withdrawal process, targeting under 15 seconds from code generation to cash dispensing, while ensuring system stability during peak academic periods such as tuition payment cycles. Although Convenience is not individually significant, BSI should not disregard it; simplifying the interface and embedding short instructional videos within BSI Mobile can lower the cognitive barrier for first-time users. Additionally, targeted digital literacy programs for university student segments, particularly within Islamic higher education institutions, would help convert awareness into active feature usage.

This study has several limitations. The model is restricted to three TAM-based predictors, leaving 16.4% of variance unexplained by constructs such as subjective norms, habit, hedonic motivation, and perceived risk. Accidental sampling limits generalizability beyond FEBI UINSU, while sample homogeneity likely inflates  $R^2$  and may not reflect adoption dynamics in more diverse populations. The cross-sectional design cannot establish causal direction or track adoption intent over time, and moderate multicollinearity (VIF up to 6.071) may slightly reduce coefficient precision. Future research should address these limitations by: (1) extending the model with UTAUT2 constructs or trust and perceived risk as mediating variables; (2) employing probability sampling across faculties or BSI customer cohorts; (3) adopting longitudinal designs to track how convenience salience evolves with repeated use; and (4) conducting multi-group comparisons between conventional and Islamic banking users to test whether security perceptions are moderated by institutional trust and Sharia compliance context.

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