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Acceptance of internet banking services: The role of demographic factors as moderating variables

Ellen Theresia Sihotang^{a*}, Dewi Murdiawati^b

^a Faculty of Economic and Business, University of Hayam Wuruk Perbanas, Surabaya, Indonesia;
ellen@perbanas.ac.id*

^b Faculty of Economic and Business, University of Hayam Wuruk Perbanas, Surabaya, Indonesia;
dewi.murdiawati@perbanas.ac.id

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ABSTRAK

Tingkat persentase penggunaan layanan internet banking yang belum sama dengan layanan mobile banking menjadi penting untuk mengetahui faktor-faktor apa saja yang mempengaruhi niat berperilaku pada penggunaan internet banking. Studi ini bertujuan untuk menganalisis determinasi penggunaan internet banking dengan demografi sebagai moderasi terhadap perilaku niat dalam rangka merancang strategi pemasaran internet banking berdasarkan keinginan dan kebutuhan pelanggan. Studi ini menggunakan teknik judgement sampling dengan jumlah sampel 282. Teknik pengolahan data menggunakan SPSS 23 dan WarpPLS 6. Faktor-faktor yang mempengaruhi penggunaan layanan internet banking adalah kegunaan, kemudahan penggunaan serta keamanan dan privasi. Gender, usia dan tingkat pendidikan hanya memoderasi keamanan dan privasi terhadap niat berperilaku. Pria lebih cenderung memperhatikan keamanan dan privasi dibandingkan wanita. Usia tua lebih mempertimbangkan keamanan dan privasi daripada usia muda, sedangkan tingkat pendidikan sarjana/pasca sarjana dan non sarjana keduanya mempertimbangkan keamanan dan privasi. Implikasi studi ini adalah pada peningkatan sistem keamanan dan penetapan pasar sasaran layanan internet banking dengan mempertimbangkan elemen demografi sebagai salah satu strategi mempertahankan sekaligus meningkatkan penggunaan internet banking.

ABSTRACT

Understanding the percentage of internet banking service usage, that is inferior to the percentage of mobile banking usage, has been important to observe factors affecting behavioral intention to use internet banking. The purpose of this study is to analyze the determinants of internet banking usage by applying demographics as a moderator of intentional behavior to design the internet banking marketing strategies based on customer needs and wants. This study

*Corresponding Author

employs a judgment sampling technique with a sample size of 282 respondents processed by SPSS 23 and WarpPLS 6.0. The factors affecting the use of internet banking services are perceived usefulness, perceived ease of use, as well as perceived security and privacy. However, demographic elements variables (gender, age and education level) are the moderation of perceived security and privacy on behavioral intentions in using internet banking. In addition, men are more focus to on security and privacy than women. Moreover, older people are more concern with considering security and privacy more than younger people. Undergraduate/postgraduate and non-graduate people consider safety and privacy. The implication of this study is to improve the security system and determine the target market of internet banking by considering demographic elements factors as the strategy to maintain and to as well as increase the use of internet banking.

INTRODUCTION

Banking's industry has been in the digital banking era. It is proven by the increase number of diverse digital-based banking services in Indonesia. One of them is internet banking which operate through bank's website (Otoritas Jasa Keuangan, 2015). Internet banking is a bank service channel using Wi-Fi technology, a website and the internet to enhance productivity and customer satisfaction which can be accessed anytime (Shanmugam *et al.*, 2015; Sharma *et al.*, 2020). The internet banking services development in Indonesia can be identified from several surveys conducted by certain institutions and associations. A survey of the banking industry in Indonesia using 660 respondents (DI-Marketing, 2017) revealed that the internet banking usage penetration in Indonesia was 34 percent in 2017 (?). In this survey, the majority of the respondents were male (52 percent), in the young age category ranging from 18 to 25 years old (54 percent), and 29 percent of the respondents works as employees. In terms of demographic factors, the most prominent variables used in this survey were gender, age, and education level. Digital banking's survey by PricewaterhouseCoopers Indonesia (2018), stated that the digital banking strategy is currently targeting the customer segment in bulk by concern in the element demography. The result of that survey revealed that 68 percent respondents still use internet banking. However, the internet banking users in the second level after mobile banking users. Some of customers still use internet banking even though the bank has marketed the various digital services. This means that the current digital banking strategy has bulk customer segmentation by focusing on demographic factors. Nevertheless, a survey undertaken by Asosiasi Penyelenggara Jasa Internet Indonesia/Association of Indonesian Internet Service Providers (2020) discovered that the percentage of internet banking usage as an online payment was only three percent, whereas mobile banking usage as an online payment reached five point seven percent..

Technology Acceptance Model (TAM) has been used in many studies of technology adoption, including the banking information system and technology. The

model construction of TAM predicts the use of technology through attitude and behavior intentions (Davis, 1989). The model measures online bank acceptance by using basic constructs of perceived usefulness and ease of use. These basic constructs can combine with perceived security and privacy as determinants of internet banking usage in order to establish appropriate marketing strategies (Alshurideh *et al.*, 2021; Marakarkandy *et al.*, 2017; Patel & Patel, 2018). The further study considers customer characteristics based on demographic elements such as gender, age, education, income, and marital status. Gender and age are the most often demographic factors used in research. Both of them have moderate behavior on mobile banking and internet banking services (Chawla & Joshi, 2020; Merhi *et al.*, 2021; Yousafzai & Yani-de-Soriano, 2012). However, studies above did not evaluate the effect of education level on an individual's ability to use online banking services. A high level of education enables individuals to use internet banking services easier (Alwan & Al-Zubi, 2016; Giordani *et al.*, 2014; Jiménez & Díaz, 2019; Teo *et al.*, 2012). Chawla & Joshi (2020) suggest that differences in gender, age and education level as demographic factors make sense to be the factor that influences the formation of attitude and behavioral intentions to use technology.

The demographic characteristics of users' online banking service are important because it is related to market segmentations as one of the bank's strategies to retain its customers (Alkhalidi & Kharma, 2019). According to several previous surveys, the percentage of internet banking users are not as many as the percentage of mobile banking users. In contrast, several studies have not sufficiently considered the role of demographics as the determinant of internet banking usage based on customer perceptions. Customer perceptions on several factors that encourage the use of internet banking services based on customer needs and wants (Li & Lai, 2011; Shanmugam *et al.*, 2015) are essential to know why the usage of internet banking does not as high as its development (Shanmugam *et al.*, 2015). In addition, demographic factors are employed to determine internet banking market segmentation to be the appropriate target market as the part of the internet banking marketing strategy. Based on the percentage use of internet banking, which is not comparable to the percentage use of mobile banking, the research questions in this study are what factors affecting the use of internet banking services and what demographic characteristics strengthening those factors. According to the research questions, this study aims to analyze behavior intention to use internet banking services through demographic moderation, which includes gender, age and education level, to maintain and increase the internet banking users based on customer needs and wants.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The Technology Acceptance Model (TAM) is the main development result of the Theory of Reasoned Action (TRA) by Fishbein & Ajzen (1975). This development,

TAM, elaborates Perceived Usefulness (PU) and Perceive Ease of Use (PEOU). The model explains that both constructs, in terms of attitude and influence behavior intention, relate to the use of technology. At the same time, it is believed that perceived usefulness and perceived ease of use are comparable effects.

Perceived Usefulness

The perceived usefulness on TAM's concept states that using a particular system will release people from various efforts and assist them to perform their job correctly (Venkatesh & Morris, 2000). Based on the previous studies, the tendency for behavior intention to use internet banking services prevails when customers understand the benefits (Chandio *et al.*, 2017). Other studies also reveal that the perceived usefulness has a positive influence on behavior intention to use a technology (Abdinoor & Mbamba, 2017; Ahmed & Phin, 2016; Alshurideh *et al.*, 2021; Chawla & Joshi, 2020; Glavee-Geo *et al.*, 2017; Marakarkandy *et al.*, 2017). Therefore, the first hypothesis is described as follow:

H1: The perceived usefulness has a positive influence on behavior intention to use internet banking services.

Perceived Ease of Use

The construction of perceived usefulness is defined to be hassle free, effortless, and efficient at work (Davis, 1989). The evaluation of the perceived ease of use construct on behavior intention has a direct positive influence (Alalwan *et al.*, 2017; Alshurideh *et al.*, 2021; Chuchuen, 2016; Marakarkandy *et al.*, 2017). Therefore, the second hypothesis is:

H2: The perceived ease of use has a positive influence on behavioral intention to use internet banking services.

Perceived Ease of Use on Perceived Usefulness

The perceived ease of use indirectly has a positive influence on the perceived usefulness (Davis, 1989). The perceived ease of use will increase its functions as a driving factor which also increase the behavior intention on actual use of certain technologies (Alshurideh *et al.*, 2021; Giovanis *et al.*, 2012; Li & Lai, 2011; Marakarkandy *et al.*, 2017). Based on these previous studies, the third hypothesis is:

H3: The perceived ease of use has a positive influence on perceived usefulness on the actual use of internet banking services.

Perceived Security and Privacy

Security and privacy, which are two interrelated elements, are the most important customer concerns in using internet banking services (Nasir *et al.*, 2015) because these factors contain financial risk. In the context of banking, security and privacy become the protection and authentication of customer information from either the unauthorized access or customer data theft (Chiu *et al.*, 2017). Security and privacy are also related to the risk of customer's personal information leakage when doing financial transactions such as fraud and hack (Alshurideh *et al.*, 2021; Patel & Patel, 2018), especially financial transactions through electronic channels (Singh & Srivastava, 2018). Previous studies analysing the importance of security and privacy related explicitly to internet banking services find a positive influence on behavior intention (Marakarkandy *et al.*, 2017; Nasir *et al.*, 2015; Patel & Patel, 2018; Salem *et al.*, 2019; Singh & Srivastava, 2018). The hypothesis is defined as follow:

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H4: The perceived security and privacy have a positive influence on behavioral intention to use internet banking services.

Demographic Moderations towards The Perceived Usefulness and Behavior Intention

Previous studies suggest that gender moderates the perceived usefulness on behavioral intentions for the technology acceptance. Men tend to pay more attention to the perceived usefulness than women (Abdinoor & Mbamba, 2017; El-Masri, 2020; José Liébana-Cabanillas *et al.*, 2014; Marakarkandy *et al.*, 2017; Sahni & Mann, 2018; Venkatesh *et al.*, 2012). Other studies reveal that the usefulness tends to affect women (Chawla & Joshi, 2020; Li & Lai, 2011; Suki, 2016). However, some studies find that gender does not moderate perceived usefulness on behavioral intentions to use internet banking (Alshurideh *et al.*, 2021; Chawla & Joshi, 2020).

The relationship between perceived usefulness and behavioral intention is moderated by age that is classified as old and young (Alkhaldi & Kharma, 2019; Chawla & Joshi, 2020; El-Masri, 2020; Marakarkandy *et al.*, 2017). Perceived usefulness is more likely affecting the old people (Alkhaldi & Kharma, 2019; El-Masri, 2020; Faqih & Jaradat, 2015). The education level has a moderating effect in the relationship between perceived usefulness and behavioral intentions to use technology, especially higher education levels, including undergraduate and postgraduate degrees (Alkhaldi & Kharma, 2019; Marakarkandy *et al.*, 2017; Teo *et al.*, 2012). The hypothesis is defined as follow:

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H5: Gender, age and level of education moderate the relationship between perceived usefulness and behavior intention; the impact is higher for male, elderly and highly educated people.

Demographic Moderation on The ² Perceived Ease of Use and Behavior Intention

Gender as a demographic factor moderates the relationship between the perceived ease of use and behavioral intention which conveys that women are dominant on perceived ease of use (Alshurideh *et al.*, 2021; Marakarkandy *et al.*, 2017; Sahni & Mann, 2018; Wang *et al.*, 2016). Age moderates the relationship between the perceived ease of use and behavioral intentions which is dominant in the younger group (Chawla & Joshi, 2020; Marakarkandy *et al.*, 2017). Education level moderates the relationship between the perceived ease of use and behavioral intentions, and is more likely to influence lower educated people (Marakarkandy *et al.*, 2017; Vuković *et al.*, 2019). Hence, the hypothesis is defined as follow:

H6: Gender, age and education level moderate the relationship between perceived ease of use and behavior intention; the impact is higher for females, younger and lower educated people.

Demographic Moderation on Perceived Security and Privacy toward Behavior Intention

Gender moderates the relationship between perceived security and privacy and behavioral intentions to use technology (Aboobucker & Bao, 2018; Lee, 2019). Men tend to pay more attention to security and privacy factors (Lee, 2019), while Aboobucker & Bao (2018) stated that there is no differences between men and women regarding the perceived security and privacy on behavioral intentions to use internet banking services. Previous studies also revealed that age moderates the relationship between perceived security and privacy and behavioral intentions. The older group pays more attention to security and privacy than the younger group (Aboobucker & Bao, 2018; Giovanis *et al.*, 2012). Education level moderates the relationship between perceived security and privacy and behavioral intention. Perceived security and privacy factors are more likely to be considered by graduate respondents as the highly educated group (Marakarkandy *et al.*, 2017). The hypothesis is defined as follow:

H7: Gender, age and education level moderate the relationship of perceived security and privacy towards behavior intention; the impact is higher for males, elderly and highly educated people.

Behavioral Intentions toward The Usage of Internet Banking Services

Cognitive attitudes are the basis of behavioral intention to technology usage decisions. The TAM's concept explains that behavioural intension has a direct effect on the decisions to use technology, mainly based on cognitive decision making (Bagozzi *et al.*, 1992). Furthermore, the behavioral intention directly has a positive effect on the usage of internet banking services (Afshan *et al.*, 2018; El-Masri, 2020; Marakarkandy *et al.*, 2017; Venkatesh *et al.*, 2012). The hypothesis is defined as

follow:

H8: Behavioral intention has a positive influence on ⁴ internet banking services usage.

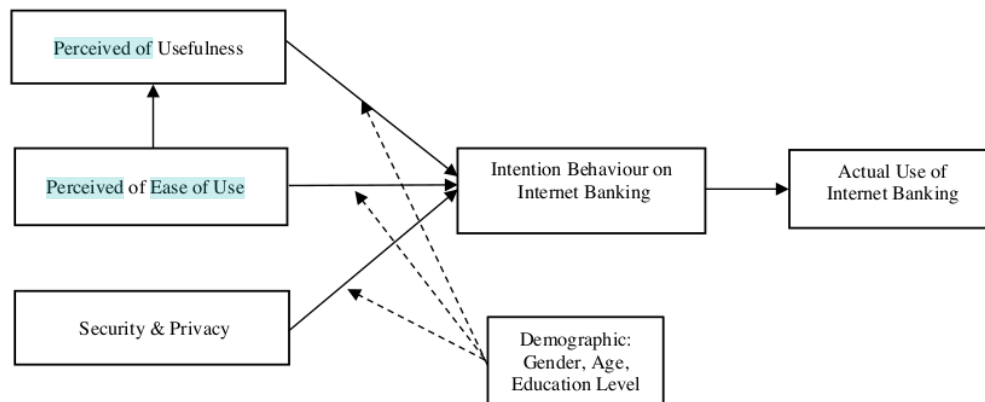


Figure 1
Research Framework

RESEARCH METHOD

Research Design

This study is an explanatory study with a quantitative method. Focus Group Discussion (FGD) is conducted as the preliminary study of internet banking acceptance and the basis for developing the instrument adapted from previous studies. Furthermore, the face validity test is carried out to test this instrument. This research instrument uses likert scale to measure the variables. Then, this research instrument is distributed manually to the respondents in Surabaya. The respondents of this study are the customers of conventional and Islamic banks who use internet banking services. This study uses the judgement sampling in which the respondents are the individual savings and loan customers, and have made financial transactions through internet banking services for at least six months. The data processing in this study uses the Statistical Package for the Social Science (SPSS) version 23 and Warp Partial Least Squares (WarpPLS) version 6.0. The minimum sample size required in the WarpPLS 6.0 software is from 146 to 160, according to inverse square root and gamma exponential method with a significant level of path coefficient in the model 0.05 (Kock, 2017). In accordance with the provisions and formulations, the number of respondents who are acceptable to this criteria is 282 people.

The instrument validation test is Bartlett's Test of Sphericity and Kaiser Meyer Olkin Measure of Sampling Adequacy (KMO MSA) with a value more than 0.50. The reliability test is based on Cronbach Alpha with an acceptable limit from 0.60 to 0.70 (Hair *et al.*, 2017).

Operational Definitions

Perceived usefulness ³ in this study is defined as the benefits of using internet banking for at least six months. The perceived ease of use is described as the customers' experiences on saving and borrowing using internet banking services. Meanwhile, security and privacy are the security risk of making transactions, and the privacy is associated with actual operations of using internet banking services based on the customers' experiences.

The demographic variables measured in this study are gender, age, and education level. The gender is classified as male and female. The age classification is referred to the Ministry of Health of the Republic of Indonesia in 2009 ranging from late adolescence to old age (17-65 years old) and divided into two categories, namely adolescents (17-45 years) and elderly (46-65 years old). Education level is the last education completed by the respondents, from high school to the higher level of education. Educational level categories refer to the Act of the Republic of Indonesia number 12 of 2012 concerning Higher Education. According to this regulation, the higher educational level categories are vocational, undergraduate and postgraduate, specialist and professional program. Elementary schools up to high schools are categorized as lower educations (Republik Indonesia, 2012).

Analysis Data Technique

The descriptive analysis in this study employs SPSS 23, which provides an overview of the characteristics and behavior of respondents. WarpPLS 6.0 in this study is used to predict the latent variables as the linear combination of the studied indicators. The path relationship in the structural model between the construct and model based on the standard beta regression analysis is determined from the path coefficients (Hair *et al.*, 2017). The p-value is used in the structural assessment. The probability of error is to assume that the path coefficient is significantly different from zero. Thus, this value can be used to test the hypothesis with significance level 5 percent (Hair *et al.*, 2017). However, testing the interaction between independent and moderator variables in PLS must consider multi collinearity (Kock, 2013).

Moderation variables are measured through multi-group analysis to determine any differences among the moderating variables with the method of pooled standard error Satterthwaite. The formula to calculate the combined standard error is given as follows:

$$S_{12} = \left(\sqrt{\frac{(N_1-1)^2}{(N_1+N_2-2)^2} x S_1^2 + \frac{(N_2-1)^2}{(N_1+N_2-2)^2} x S_2^2} \right) x = \left(\sqrt{\frac{1}{N_1} + \frac{1}{N_2}} \right) \dots\dots\dots 1$$

N1 and N2 are the standard error of the path coefficients of each model. S1 and S2 are absolute differences of standard errors assumed not different from zero. Furthermore, the formula for Satterthwaite method is given as follows:

$$S_{12} = \sqrt{S_1^2 + S_2^2} \dots\dots\dots 2$$

After the calculation using the pooled standard error method is obtained, the next process is to calculate the critical value $T_{12} = (\beta_1 - \beta_2) / S_{12}$. The difference of $\beta_1 - \beta_2$ was the difference of path coefficients between the two models. After obtaining the T_{12} value, the P-value can be obtained to test the significance of the path coefficients' difference between the two groups.

RESULT AND DISCUSSION

Respondents Profile

The most of respondents are female, 167 people (59.20 percent). In term of education level, respondents are dominated by young people whose undergraduate or postgraduate degrees are presented by 199 people (70.57 percent). These facts imply that the most respondents of this study belong to the educated group. Therewith, based on the occupation types, most of the respondents are employees with average income ranging from three to six million per month. For more details, respondents' demographic information are listed in Table 1.

Table 1
Demographic Characteristic of Respondents

Information	Frequency	Percentage
Gender		
Man	115	40.80%
Woman	167	59.20%
Age		
Younger (17-45 years old)	251	89.00%
Older (>45-56 years old)	31	11.00%
Education Level		
Non Graduate (High School)	83	29.43%
Undergraduate & Postgraduate	199	70.56%
Occupation		
Student	79	28.00%
Employee	105	37.20%
Manager/Supervisor/Director	18	6.40%
Entrepreneur	24	8.50%
Professional	55	19.50%
Household	1	0.04%
Income		
Less than Rp 3 million	78	27.70%
Rp 3-6 million	118	41.80%
Rp 6-9 million	51	18.10%
Rp 9-11 million	12	4.30%
More than Rp 11 juta	23	8.20%

Source: Data Processing with SPSS 23

The most of the respondents have been using internet banking for more than five years. The most frequently used internet banking service via smartphone is to transfer the money among either the same or different banks. The details of the respondents' behavior characteristics can be seen in Table 2.

Table 2
Behavioural Characteristics of Respondents

Information	Frequency	Percentage
Usage Period		
Less than 1 year	39	26.60%
≥1-2 tahun	3	2.80%
≥2-3 tahun	40	48.60%
≥3-4 tahun	47	22.00%
≥4-5 tahun	27	9.60%
More than 5 years	126	44.70%
Internet Banking Features		
Balance Check	42	14.90%
Transfer	236	83.70%
Bill Payment	1	0.04%
Others	3	1.1%
Tools/Media for Access		
Computer	20	7.10%
Smartphone	216	76.60%
Tablet	46	16.30%

Source: Data Processing with SPSS 23

Model Test

The fulfilment of convergent validity is undertaken by using the *outer loading* indicators, which should be more than 0.70 (Hair *et al.*, 2017). The result of convergent validity test contains one question item (PEU12) which has an outer loading 0.558. Thus, this question is excluded from the convergent validity test.

Discriminant validity test uses Average Variance Extracted (AVE) with the fulfilment of a value greater than 0.50 (Hair *et al.*, 2017). The five variables used in this study meet this requirement. The AVE values of the five measured variables are listed in Table 3 given below.

Table 3
Discriminant Validity

	PU	PEU	PSP	BI	UIB
PU	0.745				
PEU		0.823			
PSP			0.828		
BI				0.821	
UIB					0.785

Source: Data Processing with WarpPLS 6.0

The composite reliability value and Cronbach's Alpha coefficient as a construct reliability test has to be greater than 0.70 (Hair *et al.*, 2017). The instrument reliability test fulfilled these requirements which is listed in Table 4 below.

Table 4
Reliability Test

Variable Measurement	Composite Reliability	Cronbach's Alpha	Explanation
PU	0.882	0.838	Reliable
PEU	0.912	0.879	Reliable
PSP	0.929	0.907	Reliable
BI	0.911	0.878	Reliable
UIB	0.906	0.875	Reliable

Source: Data Processing with WarpPLS 6.0

The requirement of collinearity value through Average Full Collinearity VIF (AFVIF) value is less than or equal to five. The accepted ideal limit is less than 3.3 (Hair *et al.*, 2017). The AFVIF value in this study is 2.369, with an Average Block VIF (AVIF) value of 1.445. This means that there is no multi collinearity because the interaction conditions among variables meet the moderation model requirements.

The value of R-square (R^2) in the relationship between behavioral intentions and the use of internet banking is 0.790, which means that the contribution of behavioral intention to use internet banking services is 79.00 percent. The contribution of perceived usefulness, perceived ease of use, as well as security and privacy to behavioral intentions is 46 percent. Nevertheless, the rest is influenced by other variables. The perceived usefulness construct has a contribution to behavioral intention of 37.20 percent. Thus, there is still 62.60 percent variations from other variables outside this study.

Hypothesis Test

Perceived usefulness has a positive influence on behavioral intentions to use internet banking with a coefficient of 0.27 and p-value less than 0.01. Perceived ease of use has a positive effect on behavioral intention directly. Indirectly, perceived ease of use on perceived usefulness has a positive effect with a coefficient value of 0.61 and p-value less than 0.01. Perceived security and privacy also have a positive effect on behavioral intention with a coefficient 0.32 and p-value less than 0.01. In conclusion, there is enough evidence to accept hypothesis H1 to H4.

The measurement of demographic moderation, including gender, age, and education level in the construct perceived usefulness on behavioral intentions to use internet banking services, has a negative coefficient 0.04 but not statistically significant (p-value = 0.23). The value of the demographic moderation coefficient on the relationship between perceived ease of use and behavioural intentions is 0.01 and not statistically significant (p-value = 0.41). Likewise, the measurements of gender, age and education level do not have a moderating effect on the relationship of perceived usefulness and perceived ease of use. To conclude, there is not enough evidence to accept hypothesis H5 and H6.

The moderating of gender, age, and education level on the relationship between

perceived security as well as privacy and behavioral intentions are positive (0.16) and statistically significant at 1 percent significance level. Hence, there is enough evidence to accept H7. Based on this test, gender, age and education level only moderate the relationship between security as well as privacy and behavioral intentions to use internet banking.

The direct effect of behavioral intention to use internet banking has a coefficient of 0.89 at 1 percent significance level, which indicates positive effect that is statistically significant. Thus, it can be concluded that there is enough evidence to accept H8. The detail information of hypothesis testing is summarised in Table 5.

Table 5
Hypothesis Test Results

Hypothesis	Measurement Variables	Path Coefficient	p-Value	Explanation
H1	Perceived Usefulness → Behavior Intention	0.27	0.01	Accepted
H2	Perceived Ease of Use → Behavior Intention	0.19	0.01	Accepted
H3	Perceived Ease of Use → Perceived Usefulness → Behavior Intention	0.61	0.01	Accepted
H4	Perceived Security and Privacy → Behavior Intention	0.32	0.01	Accepted
H5	Perceived Usefulness*Demographic → Behavior Intention	-0.04	0.23	Rejected
H6	Perceived Ease of Use*Demographic → Behavior Intention	0.01	0.41	Rejected
H7	Perceived Security and Privacy*Demographic → Behavior Intention	0.16	0.01	Accepted
H8	Behavior Intention → Use of Internet Banking	0.89	0.01	Accepted

Source: Data Processing with WarpPLS 6.0

Calculation of pooled standard error and Satterthwaite moderation of gender and age on perceptions of security and privacy to behavioral intentions are significantly different at 5 percent significance level. Based on the coefficient, security and privacy have more effect on men ($\beta=0.51$; $p < 0.01$), while the effect women is 0.29 at 1 percent significance level. The old ages ($\beta=0.71$; $p\text{-value} < 0.01$) is more concerned to security and privacy rather than young ages ($\beta= 0.71$; $p\text{-value} < 0.01$). However, the coefficient of education level is not significantly different from zero. Both groups of highly educated people (undergraduate and postgraduate) and less educated people in this study show indifferent results

Discussion

Perceived Usefulness Has a Positive Significant on Behavioral Intentions

Perceived usefulness directly has a positive and significant on behavioral intentions to use internet banking services. This result is in line with the basic concept of TAM. The higher the perceived usefulness of internet banking, the higher the behavioral intention to use internet banking. On the other words, when customers feel that internet banking services are valuable, then the intention to use internet banking

services increases. (Marakarkandy *et al.*, 2017; Vuković *et al.*, 2019). The results of this study are in accordance with previous studies done by Abdinoor & Mbamba (2017); Ahmed & Phin (2016); Alshurideh *et al.* (2021); Chawla & Joshi (2020). The results are supported by the characteristics of respondents who believe that internet banking is a system that is able to assist complete financial and non-financial banking transactions (Chandio *et al.*, 2017). Respondent's knowledge about the benefits of internet banking is gathered from a set of measurements in the form of questions. In particular, the statement that internet banking helps to perform banking transactions (PU4) has the highest loading factor that is 0.817. Based on this finding, it seems that respondents in this study understand the usefulness of internet banking. This means that understanding the function of internet banking is one of the factors that encourages behavioral intentions to use internet banking.

Perceived Ease of Use Has a Positive Significant on Behavioral Intentions

The construct of perceived ease of use in this study focuses more on the easiness of internet banking operation. This is based on the highest value of loading factor in the statement, "*Internet banking services are easy to understand*" (PEU 8) of 0.888. The easiness of using internet banking is inseparable from obvious information regarding operational stages, especially those relating to concentrations as a part of marketing communication strategies (Marakarkandy *et al.*, 2017).

Indirectly, the relationship between perceived ease of use and perceived usefulness has a positive and significant effect on behavioral intention to use internet banking services supported by the results of previous studies (Alshurideh *et al.*, 2021; Giovanis *et al.*, 2012; Marakarkandy *et al.*, 2017). Perceived usefulness is influenced by perceived ease of use. The easier it is to use, the more customers feel the benefits which influence the intention and continuity to use (Marakarkandy *et al.*, 2017). This indirect relationship has the highest coefficient value ($\beta = 0.62$), meaning that customers realize that the internet banking service is convenient to operate. The difficulty of using internet banking service requires effort and wastes customer's time. Therefore, the bank management needs to pay attention to the function of internet banking services (Yuan *et al.*, 2016).

Perceived Security and Privacy Has a Positive Significant Effect on Behavioral Intention

Security and privacy have a positive and significant relationship with behavioral intention. This result is in line with the previous studies (Singh & Srivastava, 2018). The measurement of this construct produces a loading value of 0.881 on the statement "*Processing financial transactions through internet banking services is secure*" (PSP 14). This means that the behavioral intention to use internet banking is influenced by the guarantees of customer security and privacy. In particular, the bank's internal management should pay attention to improve the security and privacy of the bank's internet network connected to the bank's website.

Demographic Moderation of Perceived Usefulness and Perceived Ease of Use towards Behavior Intention

Gender does not moderate the direct relationship between perceived usefulness and perceived ease to use on behavioral intentions to use the internet banking. The result is in line with previous studies (Vuković *et al.*, 2019; Yuan *et al.*, 2016). Age also does not moderate the relationship between perceived usefulness and perceived ease of use. These results are not supported by previous studies (Chawla & Joshi, 2020; El-Masri, 2020; Marakarkandy *et al.*, 2017; Wang & Sun, 2016). Additionally, education level does not moderate the direct relationship of perceived usefulness and perceived ease of use on the behavioral intention which is in line with the study of Wang *et al.* (2016). The demographic factors including gender, age and level of education do not directly strengthen the relationship between perceived usefulness and perceived ease of use. Hence, these three demographic factors have no impact in the perceived usefulness and ease of use.

Demographic Moderation on Perceived Security and Privacy Towards Behavior Intention

In this study, gender moderates the relationship between security as well as privacy and behavioral intentions which is in accordance with the study done by Aboobucker & Bao (2018). Based on the previous study, perceived security and privacy perform no different finding between men and women. Both men and women pay attention to the importance of security and privacy in operating internet banking services (Aboobucker & Bao, 2018). In this study, however, the gender which moderates the relationship between perceived security as well as privacy and behavioral intentions is more likely to be noticed by males than females. This finding is related to gender behavior where men tend to prioritize consideration, to act on themselves, and to be more independent and confident (Meyers-Levy & Sternthal, 1991).

Age significantly moderates the relationship between security as well as privacy and behavioral intention to use internet banking services. This finding is supported by previous studies (Aboobucker & Bao, 2018; Giovanis *et al.*, 2012; Marakarkandy *et al.*, 2017). The old respondents pay more attention to security and privacy, meaning that their level of concern is higher than the young respondents'.

Education level moderates the relationship between security as well as privacy and behavioral intentions to use internet banking. This result is in line with the study done by Marakarkandy *et al.* (2017). The level of education is divided into two groups. The first group is undergraduate and postgraduate, while the second group is non-graduate (Republik Indonesia, 2012). Nevertheless, the previous studied by Marakarkandy *et al.* (2017) categorizes the education level into two groups, namely postgraduate as higher educational level and undergraduate as lower education level. Marakarkandy *et al.* (2017). states that in a multi-group analysis, education differs

significantly. Customers with higher education level tend to pay more attention to security and privacy factors. However, in this study, the level of education is not significantly different in the moderation. Both higher and lower education levels have the same perception about the importance of security and privacy in the use of internet banking services.

The direct relationship between security and privacy on behavioral intention has a higher coefficient than the relationship using demographic moderation. Bases on this phenomenon, the demographic factors are still considered as moderation variables, which are the factors of using internet banking services and encouraging them to continually use the services (Yuan *et al.*, 2016), that is an opportunity for marketing management of the banks.

Behavioral Intention Has a Positive and Significant on Behavior of Using Internet Banking Services

Directly, behavioral intention has a positive and significant effect on the behavior of using internet banking services. Higher behavioral intentions affect the behavior of internet banking usage (Marakarkandy *et al.*, 2017). In this study, the behavioral intention is influenced by three cognitive attitudes, perceived usefulness, ease of use, and also perceived security and privacy. On the contrary, several previous studies ignored the direct relationship of behavioral intention on the usage of internet banking services (Alshurideh *et al.*, 2021; Vuković *et al.*, 2019; Yuan *et al.*, 2016). However, this study proves that there is a significant direct effect of behavioral intention on the usage of internet banking services and in line with previous studies (El-Masri, 2020; Marakarkandy *et al.*, 2017; Sharma *et al.*, 2020).

CONCLUSIONS, SUGGESTIONS AND LIMITATIONS

Conclusions

Perceived usefulness, ease of use, security and privacy have a positive and significant effect on behavior intentions to use internet banking. The indirect relationship between perceived usefulness and perceived ease of use has a positive and significant effect on behavior intention. There is no moderating effect of gender, age and education level on the relationship between perceived usefulness and behavior intentions, and between perceived ease of use and behavior intentions to use internet banking. Gender, age and level of education only moderate the relationship between perceived security as well as privacy and behavior intentions. Behavior intention has a positive and significant effect on internet banking usage behavior.

The factors influencing behavior intention to use internet banking services in this study consists of perceived usefulness, ease of use, and also security and privacy. In direct relation to behavior intentions, perceived security and privacy are the important factors. These three perceptions predict the behavior intentions to use

internet banking services. However, the indirect relationship between perceived ease of use and usefulness on behavior intention is the most important factor in using internet banking services. The ease of operating internet banking services leads customers to realize the benefits. The easier it is to perform internet banking services, the more benefits obtained from these services.

Gender, age and education level as demographic factors do not moderate the relationship between perceived usefulness as well as perceived ease of use and behavior intentions. These three demographic factors only moderate the perceived security and privacy on the behavior intention. Multi-group test results for gender and age differ significantly, but not significant for education level. Furthermore, men tend to pay more attention to security and privacy than women.

Based on the age, security and privacy are more likely to be the main concern for the older group as a financial risk than for the younger generations, especially when financial transactions are done through internet banking. Meanwhile, the level education does not differ significantly between the higher and lower levels of educations. Both of them pay more attention to the importance of security and privacy in the use of internet banking services.

Suggestions and Limitations

Based on the conclusions, the implications of this study theoretically prove that the TAM construct, both directly and indirectly, has a significant on behavior intentions to use internet banking services. The TAM construct can be modified by improving security and privacy due to the customers' consideration when using internet banking services. The most important construct in this study is the ease of operating internet banking services due to its benefits. The indirect relationship that is perceived ease of use is the important factor. Thus, the basic TAM construct modified by security and privacy factors is proven to be able to measure behavior intentions to use internet banking services. This study also evaluates the demographic elements of gender, age and education level as moderating variables. Demographic characteristics can only moderate the relationship between security and privacy on behavior intentions.

The practical implication regarding the model test is that banks should create more accessible systems to operate internet banking through websites with accessible navigation, as a part of technological innovations. The interface of the website must be user friendly in terms of contents and visuals. Another factor to consider is the security and privacy of the internet banking platform and website network, which should be updated from time to time to minimize the risks associated with financial transactions. Furthermore, the marketing management must encourage prospective customers to use internet banking by doing cross-selling and informing security systems. In order to form a reliable image and trust, it is necessary to ensure and convince the potential customers that the internet banking is not risky.

Regarding security and privacy, the role of demographic factors in determining the marketing strategy of internet banking services need to be more considered. Banks must prioritize the security and privacy of the customers in the use of internet banking especially male customers. Moreover, customer service staffs must explain and convince the male customers about the security guarantee of internet banking services more detail. In terms of age, older people tend to pay attention to security and privacy. Hence, the marketing strategies rely more on the ability of customer service officers to provide social contacts, including continuous assistance from both the bank and customers.

Most of the respondents in this study have experienced the use of internet banking. It would be better for future studies to consider measuring the experience of internet banking services based on the length of use. In addition, this study cannot be generalized because the study area is limited to the city of Surabaya. Further study can be developed by adding several major cities in Indonesia.

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APPENDIX

Table 6
Factor Loading

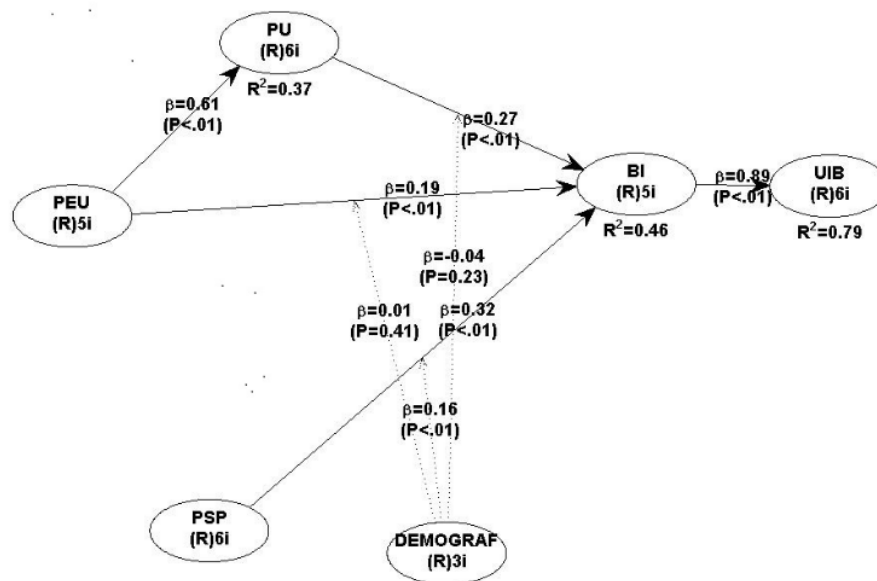
Variables	PU	PEU	PS	BI	UIB
PU1	0.796				
PU2	0.703				
PU3	0.731				
PU4	0.817				
PU5	0.705				
PU6	0.709				
PEU7		0.866			
PEU8		0.888			
PEU9		0.825			
PEU10		0.744			
PEU11		0.782			
PS13			0.875		
PS14			0.881		
PS15			0.828		
PS16			0.829		
PS17			0.779		
PS18			0.768		
BI19				0.809	
BI20				0.900	
BI21				0.828	
BI22				0.818	
BI23				0.743	
UIB24					0.807
UIB25					0.781
UIB26					0.809
UIB27					0.773
UIB28					0.736
UIB29					0.799

Source: Processing Data *WarpPLS* 6.0

Table 7
Demographic Multi Group Moderation Test

Perceived Security and Privacy → Behavior Intention			Pooled Standard Error		Satterhwaite
Gender					
N ₁ (Male)	115	Tm	1.99	Tm	2.00
N ₂ (Female)	167				
Beta ₁ (β_1)	0.51	Pm	0.02	Pm	0.02
Beta ₂ (β_2)	0.29				
SE ₁	0.082	Pm'	0.04	Pm'	0.04
SE ₂	0.073				
Old					
N ₁ (Younger)	251	Tm	-2.18	Tm	-2.73
N ₂ (Older)	31				
Beta ₁ (β_1)	0.33	Pm	0.01	Pm	0.00
Beta ₂ (β_2)	0.71				
SE ₁	0.06	Pm'	0.03	Pm'	0.00
SE ₂	0.13				
Education Level					
N ₁ (Non-graduate)	83				
N ₂ (Undergraduate & Postgraduate)	199	Tm	-0.44	Tm	-0.44
Beta ₁ (β_1)	0.51	Pm	0.33	Pm	0.33
Beta ₂ (β_2)	0.29				
SE ₁	0.082	Pm'	0.66	Pm'	0.66
SE ₂	0.073				

Source: Processing Data WarpPLS 6.0



Source: Processing Data with WarpPLS 6.0

Figure 2
Study Result

2022 - Acceptance of Internet (JEB)

ORIGINALITY REPORT

6%

SIMILARITY INDEX

8%

INTERNET SOURCES

10%

PUBLICATIONS

1%

STUDENT PAPERS

PRIMARY SOURCES

1

ejournal.uksw.edu

Internet Source

1%

2

dspace.lboro.ac.uk

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