FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

THE FACTORS CONTRIBUTING TO RETAIL INVESTOR INTENTION TO INVEST IN TOKENIZED REAL ESTATE ASSETS IN THE UNITED STATES

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To: Dean William G. Hardin
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This dissertation, written by Negar Sangtarash, and entitled The Factors Contributing to Retail Investors' Intention to Invest in Tokenized Real Estate Assets in the United States, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Florida International University, 2024

DEDICATION

To my dear husband, who has been my safe haven throughout the ups and downs of this journey. You have made me stronger than ever, enabling me to overcome all the challenges and reach this milestone.

To my beloved Mom and Dad, whose love, support, and sacrifices have shaped me into the person I am today. Your confidence in me has been my source of strength, propelling me to pursue everything I have desired in life.

To my brother and sister, who have been my constant sources of inspiration and encouragement. Your belief in me has motivated me to push beyond my limits and achieve my goals.

To my family and friends, who have supported and encouraged me throughout this journey. Your unwavering faith and love have been my guiding light, helping me stay focused and determined.

This dissertation is not just a reflection of my academic journey; it is a testament to the love, support, and unwavering faith that you all have in me. I dedicate this achievement to you all, my pillars of strength, as a token of my deepest gratitude and love.

I hope I have made you proud.

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ABSTRACT OF THE DISSERTATION

THE FACTORS CONTRIBUTING TO RETAIL INVESTOR INTENTION TO INVEST IN TOKENIZED REAL ESATE ASSETS IN THE UNITED STATES

by

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Florida International University, 2024

Miami, Florida

Professor George Marakas, Major Professor

This study aimed to identify key factors that influence retail investors' intention to invest in tokenized real estate (TRE) assets in the United States. Data from 110 eligible respondents were collected via an online survey on the Cloud Research portal and analyzed using multiple linear regression modeling with SPSS software.

While Real estate investment can be profitable, it presents several challenges for retail investors such as poor liquidity, high costs, information asymmetry, market inefficiencies, often restricting investment to a small group with sufficient resources. Blockchain-based asset tokenization could address these issues by enhancing liquidity, increasing transparency, and reducing costs, although it hasn't been widely embraced by mainstream investors yet. The successful adoption of tokenization could greatly benefit the real estate sector.

The proposed research model is grounded on the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Theory of Reasoned Action (TRA), enhanced by adding three constructs: Trust, Perceived Risks, Perceived Blockchain Benefits, which capture the understanding of blockchain technology features by potential investors in TRE

assets. Additionally, this research examined the effect of Minimum Investment on behavioral intentions of retail investors towards TRE assets. Moreover, the moderating effects of demographic features, including gender, age, education level, and income level, along with personality traits on risk tolerance were tested.

Trust, perceived risks, social influence, and facilitating conditions of TRE investment platforms were found to have significant effect on retail investors' intentions to invest in TRE assets. The benefits of blockchain, including quality customer service, reduced costs, efficiency, security, secure remittances, and regulatory compliance, positively impact investment intentions. This suggests that investors with a greater understanding of blockchain are more inclined to invest in TRE assets. Investment levels affect engagement, with both low and high minimums being attractive, indicating that platforms should target a broad range of investors. Finally, while personality and demographic factors moderate these relationships, education and income levels appear to be less significant.

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CHAPTER I: INTRODUCTION

Problem Statement

Real estate is one of the most substantial and unique asset classes, attracting individuals who seek steady and moderate returns through rents or asset appreciation. Despite its potential for lucrative returns, real estate investment presents challenges that can deter retail investors. One such challenge is a lack of liquidity (Gupta A. et al., 2020), along with the intrinsic lumpiness of real estate assets. Traditional real estate investments also incur high direct and indirect costs, including notary and administrative fees, consultancy charges, legal expenses, valuation services, and taxes. Additional impediments include long settlement times, asymmetric information, lack of market efficiency, and restricted access to real estate projects for retail investors (Chow & Tan, 2021). These obstacles mean that only a small segment of retail investors are able to invest in property and create diversified portfolios with lower risks.

Asset tokenization offers a potential solution to enhance liquidity in real estate assets, improve the risk-return profile of diversified asset portfolios, reduce transaction costs, expedite payments, increase transparency, and boost market efficiency. Tokenization occurs on a blockchain, where tokens can be issued to represent ownership rights in real estate assets, facilitated by smart contracts (Baum, 2021; Laurent et al., 2018). Tokenization occurs on a blockchain, where tokens can be issued to represent ownership rights in real estate assets, facilitated by smart contracts (Baum, 2021; Laurent et al., 2018). Blockchain technology is a subset of distributed ledger technology that emerged with the launch of the first and most famous cryptocurrency, Bitcoin, in 2009 by Satoshi Nakamoto.

Decentralization, immutability, transparency, and auditability are significant features of blockchain that have led to its tremendous expansion across numerous other industries (Monrat et al., 2019). One application and capability of blockchain that has been trending since 2018 is the tokenization of real assets (Sazandrishvili, 2020). Through tokenization, asset rights are converted into digital tokens that support fractional ownership, which can be bought, sold, and traded by investors on blockchains. Additionally, these tokens are encoded with information regarding the identity of the token holder and detailed benefits derived from the real estate asset, including ownership, revenue, profit, etc. Investing in tokenized real estate (TRE) assets, enables investors to own more affordable shares and decrease their financial risks by creating a diversified portfolio. This means that even those with modest capital can gain exposure to the real estate market, which leads to enhanced liquidity as the tokens representing property shares can be easily traded on secondary markets. Moreover, the transparency characteristic of blockchain technology increases confidence and trust in transactions, providing a safeguard against fraud and ensuring the clear recording of ownership rights. Finally, using smart contracts increases automation, simplifies investment processes, and makes the investment more efficient by providing an agile vehicle for investment.

Despite the advantage and numerous benefits of investing in TRE assets, there is a considerable hesitation and reluctance among retail investors when it comes to investing in TRE assets. This reluctance can be attributed to the inherent complexities of blockchain technology, the uncertainty of a developing market infrastructure, and the perceived risks associated with digital transactions. In addition, the lack of a clear regulatory framework further could amplify investor hesitation. This study investigated the factors and reasons

behind this uncertainty and proposed solutions and strategies to incentivize investors to embrace blockchain technology and invest in TRE assets.

Significance of the Problem

Asset tokenization presents a viable solution to overcome challenges such as illiquidity, lack of transparency, and high transaction costs when investing in real estate properties. Yet, mainstream retail investors have not fully embraced it. According to Lee, Lim, V. S. H., & Ng, C. J. K. (2022), only a small percentage of consumers utilize financial services on FinTech platforms, citing a lack of knowledge and understanding as the primary barriers for non-adoption. Understanding why investors are reluctant to invest in TRE assets is essential for multiple reasons. Acquiring this knowledge enables TRE platforms to refine their offerings, thereby providing enhanced security, a better user experience, and ensuring that TRE adapts to the evolving needs and changing preferences of the investment community. Furthermore, policy makers and regulators can develop comprehensive and reassuring legal frameworks that protect retail investor's interest and make the investment environment more secure. Also, by identifying knowledge gaps and recognizing the specific risks that concern investors, policy makers can create suitable educational programs and craft robust risk mitigation strategies. These efforts aim to enhance retail investors' knowledge about investment in tokenized real estate (TRE) assets, thereby making it a more attractive option for them. The wider adoption of TRE could increase capital inflow from a diverse range of investors, including those with less capital, thus enriching the real estate sector. Additionally, it can help to increase market efficiency by streamlining the transaction processes and reducing the need for intermediaries.

Moreover, it grants easier access for international investors to enter the market, enabling them to diversify their investment portfolios, which can lead to reduced risks and more equitable wealth distribution.

Considering the extensive benefits associated with investing in TRE assets, it is essential to understand the factors influencing investment decisions within this emerging sector. Effectively address the concerns and obstacles that prospect investors may face will facilitate greater acceptance and participation in real estate tokenization platforms.

Research Gap

The emergence of blockchain technology and tokenized real estate (TRE) platforms presents a disruptive innovation in real estate market, yet many retail investors are hesitant to invest in these digital opportunities. Existing literature provides limited insights into the reluctance of retail investors to invest in TEE asset, underscoring a research gap that this study aims to fill.

The Unified Theory of Acceptance and Use of Technology (UTAUT) model has been a robust model for understanding technological adoption, but it falls short on addressing the influence of blockchain technology on retail investors' investment decisions. In addition, the model does not sufficiently examine user privacy constructs, including perceived risks and trust. Also, only a limited existing literature explores the influence of minimum investment threshold and the moderating effects of demographic features and personality traits of retail investors on their investment decision. Nevertheless, risk and trust are the potential factors that may impact behavioral intention to invest in TRE assets. In addition to these, project-specific characteristics such as the required minimum

investment, alongside the demographic attributes and personality traits of retail investors, may significantly influence their behavioral intention to invest in TRE assets.

To bridge these gaps, this research not only used the Technology Acceptance model but also examined the impact of factors used in the theory of Reasoned Action and Trust Risk Behavioral model. In addition, it examined the effect of minimum investment threshold on TRE platforms, and perceived blockchain benefits by retail investors on their behavioral intention to invest in TRE assets. It also tested the moderation effects of demographic characteristics of prospect retail investors including their age, gender, income and education levels, and retail investors' personality traits on their investment decisions.

Research Question

What are the factors contributing to retail investors' intention to invest in tokenized real estate assets in the United States?

Research Contributions

This research analyzing the factors influencing the intention to invest in tokenized real estate assets has made significant contributions to several key areas, benefiting the designers of TRE investment platforms, policymakers, and retail investors.

By extending the Unified Theory of Acceptance and Use of Technology (UTAUT) to incorporate blockchain-specific features within the context of TRE assets, this study has enriched the theoretical understanding of technology adoption. This research has provided a framework that integrates constructs from behavioral theories, tailored to the unique features of blockchain technology and tokenized assets. Furthermore, the research findings have supplied TRE platforms with actionable insights to enhance their interfaces, security

features, and overall user experience. Grasping the reasons of hesitations and preferences of retail investors when investing in TRE platforms enables the designers of these platforms to better align their websites and investment opportunities with prospective investors' needs and expectations, making these platforms more enticing and reliable.

Additionally, recognizing the risks from the perspective of retail investors has led to the development of more effective risk communication and management strategies, resulting in increased adoption of this investment type.

This research has also provided guidance for policymakers by highlighting retail investors' concerns and motivations, helping them to develop regulatory frameworks that protects investors' interests while encouraging innovation in the real estate market. The revealed results about the effects of investors' psychological traits on their investment decisions have made valuable contribution to the field of behavioral finance focused on tokenized real estate assets. This knowledge can inform market segmentation and targeting marketing strategies.

Overall, the insights into the potential risks, opportunities, and market trends from retail investors' perspective provided by this study have the potential to shape the real estate market and influence the behavioral intentions of retail investors to invest in this market, empowering them to make informed decisions on how to structure their TRE investments. Finally, the findings of this research help retail investors to comprehend the advantages and opportunities of TRE projects, enabling them to make sound investment choices and potentially gain greater profits from their investment in tokenized real estate assets.

CHAPTER II: BACKGROUND LITERATURE REVIEW AND THEORY

The underlying model of this study is mainly based on the Unified Theory of Acceptance and Use of Technology (UTAUT), which was originally developed by Venkatesh et al. in 2003. This theory primarily addresses individual and societal factors that influence the adoption and use of a new technology. UTAUT is an extended version to cover the limitations identified in the Theory of Reasoned Action (TRA) (Fishbein, 1980), the Theory of Planned Behavior (TPB) (Ajzen, 1991), and the Diffusion of Innovation (Rogers, 1995). Additionally, the research model proposed in this research, amalgamates factors from the Technology Acceptance Model (TAM) offered by Lee et al. in 2003, the Personal Computer Utilization model (Thompson, Higgins, & Howell, 1994), and the integrated model of Technology Acceptance and Planned Behavior (Venkatesh et al., 2003).

The Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated with four central determinants of intention and use of technology, including 'Performance Expectancy,' 'Effort Expectancy,' 'Social Influence,' and 'Facilitating Conditions.' This theory uses gender, age, experience, and voluntariness of use as moderators of the relationships between theses core constructs and ‘Behavioral intention.’ This theoretical framework provides managers with a tool to predict the likelihood of the successful adoption of new technology among their employees. By clarifying the motivations for technology acceptance, they can tailor targeted training and marketing strategies to enhance technology uptake.

In this research, Social Influence (SI) and Facilitating Conditions (FC) are derived from the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Within

UTAUT framework, social influence is demonstrated as the degree to which individuals perceive that their important others (e.g., family, friends, peers) believe they should use a new technology. To tailor this construct for the domain of investment in tokenized real estate, this study redefines it as the extent to which retail investors perceive that their significant others endorse the blockchain technology and consider tokenized real estate as legitimate asset to invest.

Furthermore, the same theory characterizes facilitating conditions as individuals' perceptions of the resources and support available to perform a behavior (Venkatesh et al., 2003; Brown and Venkatesh, 2005). Drawing inspiration from the UTAUT theory, this research interprets facilitating conditions as retail investors' perceptions of the availability and accessibility of the required infrastructure, resources, and support for investing in tokenized real estate assets. This encompasses the existence of secure and user-friendly tokenized real estate (TRE) platforms, the compatibility of TRE assets with other investment types, the availability of training and educational resources to learn about TRE investment, and the accessibility of technical support when investors encounter difficulties in their investment processes.

The subsequent theory incorporated in this study is the Theory of Reasoned Action (TRA). This theory was first proposed by Fishbein and Ajzen (1975) to extend the Theory of Planned Behavior (Ajzen, 1991) and to enhance the Information Integration Theory (Anderson, N. H., 1971), which are other models for understanding human behavior. TRA posits that system usage is predicted by behavioral intentions, which in turn are determined by subjective norms and individuals' attitudes. Thus, beliefs, attitudes, and intentions are the central focus of the Theory of Reasoned Action (TRA). Fishbein and Ajzen found that

subjective norms, perceived behavior, and attitude are the primary determinants of human intentions, leading to varying human behaviors. This study draws upon the Theory of Reasoned Action (TRA) by examining the influence of retail investors' attitudes toward tokenized real estate (TRE) on their behavioral intention to invest in TRE assets. In this context, attitude refers to the positive and negative evaluations and thoughts of retail investors about TRE investment, encompassing their overall beliefs about the advantages and disadvantages, and the benefits and risks of such an investment opportunity.

Subjective norms are defined within the Theory of Planned Behavior as sensing social pressure to perform or not perform a behavior. This includes the personal perception of expectations from significant others regarding a behavior, which can either encourage or deter the individual from taking action. Social influence is considered to be conceptually similar to subjective norms in the Theory of Perceived Behavior (Venkatesh and Davis, 2000; Tarhini et al., 2016; Slade et al., 2013). However, social influence, as utilized in this research, examines a broader context by considering the direct or indirect, as well as the intentional or unintentional influences by others that can shape behavior.

The Unified Theory of Acceptance and Use of Technology (UTAUT) has been widely applied to explore the factors that influence the adoption of different concepts in financial technology known as FinTech. For example, a study by Abdullah, E. M. E., et al. (2018) on the adoption of mutual fund investments identified a significant influence of social influence and facilitating conditions on behavioral intention and factors such as. Likewise, research by Khazaei, H. (2020) into the adoption of blockchain technology by Malaysian SMEs highlighted a significant impact of social influence on the technology's adoption.

These findings are consistent with those of Dewi, E. K., and Rahadi, R. A. (2020), who explored the adoption of online mutual funds, and Fernando, E., et al. (2021), who found that social influence, facilitating conditions, and trust significantly influence the intention to use online investment applications. Similar conclusions were drawn in studies on investor behavior in the cryptocurrency markets (Shah, V., 2021), the adoption of blockchain technology in the banking sector (Jena, R. K., 2022), and the adoption of insurance services (Kim, J. P., & Song, E., 2018). These studies collectively underscore the importance of social influence, alongside other factors, in the adoption of financial technologies.

Furthermore, the Theory of Planned Behavior (TPB) has been frequently utilized in previous research to define consumer behavior in different financial sectors, such as the adoption of artificial intelligence or smart cards for making financial investments (Belanche et al., 2014, 2019), and the adoption of mobile payment technology (Flavian et al., 2020). In these studies, attitude was found to be the key determinant of the adoption of new technology.

While the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Theory of Reasoned Action (TRA) are prevalent models for evaluating users' reactions to new technologies in the realm of tokenized real estate (TRE) investment, they do not address the role of blockchain benefits nor security-related constructs such as perceived risks and trust factors by users, which can influence their intentions to invest in TRE assets. To bridge this gap, the current research extends the UTAUT and TPB frameworks by incorporating three additional variables including Trust, Perceived Risks, and Perceived

Blockchain Benefits. Trust has been identified as a significant factor that influencing investors' intentions to invest in online platforms (Maziriri et al., 2019). This is in alignment with findings by Abdullah et al., (2020), who found a significant effect of trust on intention to accept e-Wallet among Malaysians. Interestingly, perceived risks found to have positive and significant impact on intention to invest in stock market and online trading platforms (Maziriri et al., 2019; Shehata et al., 2019). Whereas some other studies identified a negative significant effect of perceived risks on behavioral intention to adopt a new system (Moghavvemi et al., (2021), Kim et al., 2008; Widyanto et al., 2021). Thus, this research tests the role of perceived risks in the context of investment in TRE assets.

Blockchain technology is distinguished by numerous benefits and unique features that contribute to its uniqueness. The blockchain benefits that are center of attention in this study include quality customer services (including transparency, trust, data accuracy, reduced risks), reduced costs (including reduced transaction, administrative, operational, and intermediary costs), efficiency and security (including tracking real time transactions, increase transaction speed and efficiency, enhance security, and integrity of investing in TRE assets), secure remittances (including possessing immutable audit trail, provide fast and secure payment process, enhance robustness, traceability of transactions, and control on data), and regulatory compliance by potential investors in TRE assets (including prevention from financial fraud and tempering in investment, ensure data protection, improve regulatory compliance, reduce error and reconciliation in TRE investments, and immutable business rules). Previous research has investigated the technological benefits of blockchain and identified a significant impact on the acceptance of this technology in the insurance sector (Kim, J. P., & Song, E., 2018). However, this research concentrates on the

perceived blockchain benefits by retail investors and examines how this influence their intention to invest in TRE assets.

Additionally, this study investigates the impact of “Minimum Investment” on the investment intentions of retail investors in TRE assets. Minimum investment is one of the factors to consider before making an investment decision (Maharani, A., & Saputra, F., 2021). The role of minimum investment has been the center of attention in numerous scholarly articles (Wardani & Komara, 2018; Haidir, 2019). According to these studies, a lower minimum investment threshold tends to heighten an individual's interest in investing.

Behavioral finance suggests that psychology and personality characteristics of individuals play a crucial role in their investment decisions. Personality defines the specific way of thinking and behavior of an individual (Allport, 1961). Depending upon the psychological characteristics of the investors, their brains can refrain or encourage them to make investments (Durand et el., 2008, 2013, 2019). Personality is one of the psychology sub-disciplines that play an important role in investor decisions in the stock market (Ahmad, 2020; Aren et al., 2021). As Pak and Mahmood (2015) define, personality traits consist of personal thinking patterns, feelings, attitudes, and behaviors that distinguish one individual from another and mirrors their reactions in a specific manner under a specific situation.

Among different approaches that aimed to define and measure personality traits, the BigFive model that includes extraversion, agreeableness, neuroticism, and conscientiousness is known as the classical approach Goldberg (1990) and has provided the most comprehensive findings in personality psychology literature (Jayawickreme et al., 2019).

The influence of personality characteristics such as personality traits, emotions, and risk tolerance on investment decision-making has been tested in many pieces of literature (Mishra et al., 2010; Young et al., 2012; Chitra and Sreedevi, 20122).

Sachdeva, M. and Lehal, R. (2023) reported that extraversion, agreeableness, conscientiousness, and neuroticism significantly affect investment decision-making through financial satisfaction in North India. In another research, Oehler. A. et al., (2017) found a significant influence of individuals' extraversion and neuroticism level on their financial decision making. According to their findings, while investors with higher level of extraversion tend to buy more financial assets when they are overprices, individuals with higher level of neuroticism tent to keep less risky assets in their financial portfolios.

Wang, H. I., & Yang, H. L. (2005) tested the role of personality traits in UTAUT model. They explored the effect of personality traits both as external variables and moderators on the relationship between social influence and facilitating condition, and the intention to adopt online stocking. Based on their findings, personality traits play more important roles as moderators than as external variable. Similarly, this research investigates the moderating role of personality traits, but not only on the relationships between social influence and the behavioral intention to adopt the new technology (investment in TRE assets), but also the effect of personality traits on the relationship between trust and perceived risks in investing in TRE assets, and also the relationship between attitude towards investing in TRE assets and retail investors' behavioral intention to invest in these assets.

According to the existing literature, demographic characteristics can be used as a moderating factor that impacts the financial risk tolerance of individuals that eventually

affects their attitude towards accepting a new technology (Ahmed, Sawan, Ali & Tabasum. 2011. P.1880). Yao & Hanna (2005) reported that demographic features have significant effects on financial risk tolerance. Moreover, previous literature revealed that investment decision process is influenced by demographics (i.e., gender, age, education level, and income level) (Bali et al., 2019; Hallahan et al., 2003; Ozmen and Sumer, 2011; Mayfield and Shapiro, 2010). For example, based on the results of the research on digitalization in German real estate, younger investors are more flexible to accept digital changes and adopt digital technologies (Kootala, S., 2022). Previous literature also reported that women are more risk-averse than men when investing in financial markets (Bajtelsmit & Bernasek, 1996; Yuh & Hanna, 1996; Sung, 1997; Bajtelsmit & VanDerhei, 1997). Similarly, education and income level have significant positive influence on risk tolerance and investment in risky assets (Guiso, Jappelli, and Terlizzese, 1996).

Thus, the moderating role of demographic characteristics such as age, gender, education level and salary level on the relationship between perceived risks in TRE assets, and retail investors' behavioral intention to invest in these assets is also tested in this study.

CHAPTER III: RESEARCH MODEL AND HYPOTHESES

In this study, the research model incorporated six independent variables, including "Trust in TRE assets", "Perceived risks in investing in TRE assets", "Social influence in TRE investing", "Facilitating conditions to invest in TRE assets", "Perceive Blockchain Benefits" and "Minimum investment in TRE assets". Among which "Perceive Blockchain Benefits" broken down into five sub-constructs, which are quality customer services, reduced costs, efficiency and security, secure remittances, and regulatory compliance by potential investors in TRE assets.

"Attitude towards investing in TRE assets" mediated the relationship between "Trust in TRE assets" and "Perceived risks in investing in TRE assets" to the dependent variable "Behavioral intention to invest in TRE".

Furthermore, the research model evaluated two moderating factors: "Demographics" including "Gender", "Age", "Education level", and "Income level", and "Personality" including the Big Five Personality Traits of Openness, Agreeableness, Extraversion, Conscientiousness, and Neuroticism will play the moderation role.

Conceptual Research Model

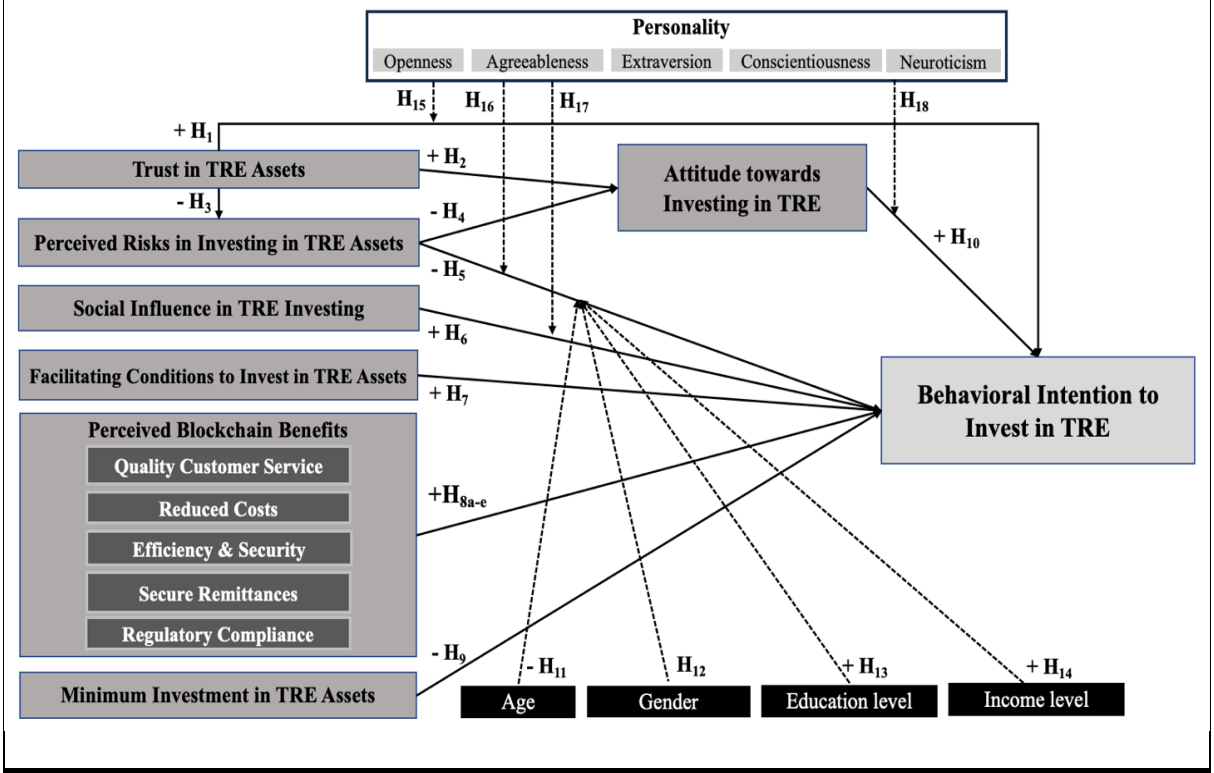

Figure 1 The Conceptual Research Model

Constructs and Hypotheses

Behavioral Intention to invest in TRE (BI)

Behavioral intention is defined as an extent to which an individual formulates conscious plans about performing a specific future behavior (Chai et al., 2014). It was also defined by Jaccard and King (1977, p. 328) as "a perceived relation between oneself and some behavior".

In this research, behavioral intention is the dependent variable, and it shows an extent to which investors tend to and are ready to invest in tokenized real estate assets. The ultimate goal of this study is to identify and examine the factors impacting behavioral intention to invest in TRE. Therefore, we focused on behavior and the ways to measure

and predict it. This helped us to find the major reasons behind the retail investors' behavioral intention towards investing in TRE assets.

Trust in TRE Assets (TR)

Trust is defined as the degree to which individuals feel confident that a new technology, such as blockchain, operates according to its expected key features on a consistent basis (Lee et al., 2019). According to Lee et al. (2019, p.9), trust is the major means of control in a virtual environment, and it matters even more in virtual environments compared to physical environments. Also, Gefan et al. (2003) define trust as a significant catalyst in transactional relationships that distinguishes the nature of businesses and social structures. In this study, we simplified the definition of trust as de degree to which a retail investor expects that investment in TRE is trustworthy.

Trust has always been a major factor in influencing user behavior, and it was shown in many previous studies that it has a positive effect on behavioral intention to use a new technology (Gefen et al., 2003; Harris et al., 2019; Gefen et al., 2002; Jarvenpaa et al., 2000; Romita, T, 2001). Also, some studies on the use of blockchain technology showed that trust has a significant positive effect on behavioral intention to use blockchain technology (Latif and Zakaria, 2020; Liang et al., 2021). Nonetheless, trust was found to have no significant effect on behavioral intention to use blockchain technology when it was examined in supply chain management (Wong et al., 2020). Therefore, this study intends to find the relationship between trust and behavioral intention in investing in TRE assets.

Furthermore, Attitude and behavior can be stimulated by users' high levels of trust (Anderson & Narus,1990; Schurr & Ozanne,1985). For example, some previous studies found trust has a positive effect on user attitude toward using a new service (Lee et al.,

2019, Liang et al., 2021). Also, Macintosh and Lockshin (1997) found a positive and significant relationship between customer's trust in a store and customer's attitude toward that store.

Trust and risk are linked together closely, and both are contingent on perceptions (McAllister, 1995; Hawes et al., 1989). Trust has been proven to influence perceived risks (PR) negatively (Widyanto et al., 2021; Lu et al., 2011; Kim et al., 2008). According to Ganesan (1994), increased trust decreases perceived risks by customers on seller's opportunistic behavior.

Hence, based on the previous findings mentioned above, this study assumed the following hypotheses:

H_1: *As the retail investor's trust in TRE assets increases their behavioral intention to invest in TRE assets will increase.*

H_2: *As the retail investor's trust in TRE assets increases their attitude towards investing in TRE assets will increase.*

H_3: *As the retail investor's trust in TRE assets increases their perceived risks of potential negative outcomes of TRE investment will decrease.*

Perceived Risks in Investing in TRE Assts (PR)

Perceived Risks is a level of uncertainty that users of a new technology feel regarding their ability to get the expected results and the possible losses that might occur due to a mismatch between a new technology and user demand (Hassan and Wood, 2020; Mortimer et al., 2015). In other words, perceived risks show investor's belief about the potential uncertain negative outcomes of the investment. In previous studies, perceived risks have been counted as antecedents of behavioral intention (Pavlou, P. A., 2003; Faqih, K. M.,

2013). These risks can be categorized into six groups, including financial, physical, social, performance, psychological, and time loss risks (Jacoby, J., & Kaplan, L. B. (1972). According to Van de Ven's classification, perceived risks were also divided into two groups, including environmental risks that derive from the underlying infrastructure of the technology and relational risk dealing with behavioral uncertainty of trading partners (Ring et al., 1994). With regards to investing in TRE assets, the relevant risks in this research was considered financial and environmental risks including the potential for fraudulent activities, technology risks.

According to the literature, the more excessive perceived risks by people, the more they have concerns about the technology and, therefore, will avoid using virtual services (Moghavvemi et al., 2021). Furthermore, many previous studies have supported the negative influence of perceived risks on the behavioral intention of using a new system (Kim et al., 2008; Widyanto et al., 2021).

The negative effect of perceived risks on attitude toward doing an action has been found in many pieces of literature. For example, Ariff et al. (2014) found a negative impact of perceived risk on online customers' attitudes toward online shopping in Malaysia. This result is consistent with the findings of Shih, H. P (2004) and Van der Heijden et al. (2003).

In accordance with the previous findings discussed above, we hypothesized as follows:

***H_4**: As perceived risks of the potential negative outcomes of investment in TRE by retail investors increases their attitude towards investing in these assets will decrease.*

***H_5:** As perceived risks of the potential negative outcomes of investment in TRE by retail investors increases their behavioral intention to invest in these assets will decrease.*

Social Influence in TRE Investing (SI)

As defined by Venkatesh et al. (2003), social influence is a degree of influence that a person perceives from their important others to use a new technology. This construct depicts the effect of environmental factors such as family, friends, and colleagues in shaping an individual's behavior. Several previous studies have extensively investigated the impact of social influence on determining an individual's behavioral intention to adopt or use technological innovations. The relationship between social influence and behavioral intention to use a new technology has already been tested in internet banking (Alalwan et al., 2017), mobile wallets Patil et al., (2020), mobile commerce (Shaw N, Sergueeva K., 2019), wearable technologies (Lunney et al., 2016) mobile banking (Merhi M et al., 2019), etc. For matters of new technologies and services, social influence can play a crucial role in their early stage. This influence can be even more when there is not enough information available on the new technology (Adapa A. et al., 2018). This positive effect was validated by many previous studies (Venkatesh and Davis, 2000; Martins et al., 2014). For example, it was found by Nseke P. (2018) when investigating the influence of social influence on behavioral intention to use Bitcoin by Africans. In another study, the positive impact of SI on Behavioral Intention was found in m-payment (Ariffin et al., 2020; Li & Li,2020).

Based on the above arguments, this study assumed the following hypothesis:

H_6: *As the social influence perceived by retail investors from their important others to invest in TRE assets increases, their behavioral intention to invest in TRE assets will increase.*

Facilitating Conditions to Invest in TRE Assets (FC)

Facilitating conditions is defined as a degree to which a person believes that resources and technical infrastructure exist to support the use of the new technology (Venkatesh et al., 2003). In other words, facilitating conditions examine if a retail investor has the required knowledge and resources, such as technical support, software, or hardware availability, to invest in TRE assets (Lallmahomed, 2013). Many empirical studies have supported the positive influence of facilitating conditions on behavioral intention (Hew et al., 2015; Wong et al., 2020; Zhou et al., 2010; Kim et al., 2016; Huang, 2017). Consequently, the following hypothesis is suggested:

H_7: *As the facilitating Conditions (FC) to invest in TRE assets increases, the retail investor's behavioral intention to invest in TRE assets will increase.*

Perceived Blockchain Benefits (PBB)

Blockchain has been growing rapidly in the last few years (Kshetri, 2017) and has been applied in various sectors such as healthcare, transportation, risk management, media, financial and social services (Du et al., 2019). Moreover, Asset tokenization, as the center of attention in this study, is another accomplishment of blockchain that provides fast, liquid, accessible, and transparent investment in the financial environment. Despite the vast application of blockchain in different industries due to the many specific advantages and characteristics of this technology, still questions remain unanswered about how users perceive blockchain features and how they value the services provided by this technology.

For instance, some of the values of blockchain include decentralization, security, privacy, and transparency, but how these features can trigger user behavior in investing in

TRE is not clear. To make blockchain service a user-centered service, it is crucial to understand how retail investors perceive the qualities of blockchain technology, how these qualities provide user motivations, and what heuristic dimensions this technology possesses that make people eager to use it (Velasco, 2016). Although the previous literature has examined the factors driving users to adopt and use technologies in general, research on blockchain affordance in tokenized asset services and user cognition about blockchain features in this context is scarce. Therefore, this study aims to measure the perceived benefits of blockchain by retail investors in the TRE context and will examine the influence of these perceived benefits on retail investors' intentions to invest in TRE assets.

According to Dai and Vasarhelyi (2017), the most noticeable affordance of blockchain is that there is *no need for a trusted third party* in this technology. Another feature of blockchain technology is its high *security*. Unlike centralized systems in which a central party can control and change information independently and without the agreement of others, blockchain protocols are decentralized and controlled by the whole community (Kshetri, 2017), which provides more security for the users. Cost efficiency and low transaction costs are other benefits of blockchain that were mentioned frequently (Andoni et al., 2019; Hassani et al., 2018)). Also, blockchain provides more *privacy* by hiding users' real identities or not giving access to those who are not involved in a transaction. According to Carmen and Lopez (2018) and Buchanan et al. (2007), privacy is a user's ability to control the terms by which their personal information is gathered and used. In addition, blockchain provides more *transparency*, *reliability*, and accurate *traceability* (Shin, D., & Hwang, Y., 2020). Traceability is defined as the extent to which one can find out the resource of information and its route following in a distribution chain

(Shim, 2019). Automation is another unique feature of blockchain, letting multiple parties interact with each other and making the processes faster by removing extra time-consuming tasks.

Perceived benefits of implementing blockchain technology in the banking sector has been measured in the previous literature (Garg P. et al., 2021), but to date, no academic literature has examined the influence of blockchain perceived benefits on retail investor intention to invest in TRE projects. We already know from previous research that the perceived benefits of blockchain significantly affect consumers' intention to adopt blockchain-based applications (Raddatz, N et al., 2021). Hence, this study assumed that perceiving the unique features of blockchain technology by retail investors increases their intention to invest in TRE assets.

H_8: *As blockchain benefits perceived by retail investors increase, their behavioral intention to invest in TRE assets will increase.*

$H_{8,a}$: *As quality customer service of blockchain increases, retail investor's behavioral intention to invest in TRE assets will increase.*

$H_{8,b}$: *As reduced costs provided by blockchain technology increases, retail investor's behavioral intention to invest in TRE assets will increase.*

$H_{8,c}$: *As efficiency and security provided by blockchain technology increases, retail investor's behavioral intention to invest in TRE assets will increase.*

$H_{8,d}$: *As secure remittance provided by using blockchain technology increases, retail investor's behavioral intention to invest in TRE assets will increase.*

$H_{8,e}$: *As regulatory compliance of blockchain increases, retail investor's behavioral intention to invest in TRE assets will increase.*

Minimum Investment in TRE Assets (MI)

The minimum investment in this research is the minimum US-Dollar amount investors can invest in TRE assets. Minimum capital is one of the factors that investors consider before deciding on their investment. According to Hallen et al. (2016) a higher minimum investment usually deters potential investors from funding a project. In another research, Mehrani et al. (2021) claimed that the less required minimum investment provides more interest to invest because it acts as a discount at department stores. Many previous studies widely investigated the role of minimum investment in investment decisions (Haidir, 2019; Wardani & Komara, 2018). For example, Li Y. et al. (2018) and Gigante, G., & Cozzio, G. (2022) investigated the success factors of equity crowdfunding projects and found that minimum initial investment amount significantly impacts the willingness of investors to invest in crowdfunding projects. According to the literature mentioned above, a lower minimum investment motivates investors to invest in the capital market. Based on the previous results, this research suggests that a higher minimum investment is associated with a lower intention to invest in TRE assets.

H_9: *As minimum investment in TRE assets increases, behavioral intention of retail investors to invest in TRE assets will decrease.*

Also, to test the effect of each minimum investment range on the behavioral intention oif retail investors to invest in TRE assets, the following sub-hypothesese were defined:

$H_{9,a}$: Minimum investment level less than $100 increases the behavioral intention of retail investors to invest in TRE assets.

$H_{9,b}$: *Minimum investment level between $100 and $500 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,c}$: *Minimum investment level between $500 and $1000 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,d}$: *Minimum investment level between $1000 and $1500 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,e}$: *Minimum investment level between $1500 and $2000 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,f}$: *Minimum investment level between $2000 and $2500 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,g}$: *Minimum investment level between $2500 and $3000 increases the behavioral intention of retail investors to invest in TRE assets*

$H_{9,h}$: *Minimum investment level more than $3000 increases the behavioral intention of retail investors to invest in TRE assets*

Attitude Towards Investing in TRE Assets (AT)

Attitude is defined as the individual's positive or negative feelings and thoughts toward the new technology (Davis,1989; Davis,1985, Davis,1993). The theory of planned behavior (TPB) and the theory of reasoned action (TRA) assume that an intention to do an action determines volitional behavior (Bagozzi, 1981; Ajzen, 1985; Ajzen and Fishbein, 1980). Therefore, the primary reason behind intentions is the individual's attitude toward the behavior.

According to Davis (1989), user attitude toward information systems affects an individual's behavioral intention. Previous research has approved the positive relationship between attitude and behavioral intention (Ajzen, I., & Fishbein, M., 1977; Huda et al., 2017). For instance, Jarvenpaa, S. L et al. (2000) found that the favorable attitude of consumers toward an internet store leads to their willingness to purchase from it. Also, Pichet (2017) identifies that the attitude toward purchasing cryptocurrency, especially Bitcoin, motivates buyers. This result was also supported by Kamble S. et al. (2019). Thus, we assume a positive relationship between attitude toward investing in TRE assets and willingness to invest in them.

H_{10}: *As retail investor's attitude towards investing in TRE assets increases, their behavioral intention to invest in these assets will increase.*

Demographic Factors

In this research, demographic factors include Gender, Age, Education Level, and Income level. According to Lewellen et al. (1977), age, sex, education, and income level have major influence on investors' investment decisions. Moreover, Al-tamimi and Kalli (2009) found that income, job type, and income level of investors affect their investment decision. In the following part, each demographic factor and their moderating effects are explained.

Age

According to Charles, M. A., & Kasilingam, D. R. (2013), investor's age is a significant factor influencing investor's investment behavior. The relationship between age and risk aversion was studies in much previous research. Wang H. and S. Hanna, (1997) revealed that risk tolerance increases with age. This conclusion is in accordance with the

findings of Morin and Suarez (1983), who investigated the effect of age on investment decision in risky assets including stocks, mutual funds, bonds, and real estate. However, some other researchers (Tekce and Yilmay, 2015; Chiu et al., 2021; Schere, 2017), who studied the role of age in investment behavior, found that older investors become more risk averse and demonstrate less tendency to invest in risky assets. Although there are inconsistent results about the effect of age on investment behavior, we consider the fact that it is easier for younger generations to adopt new technologies (Hauk et al., 2018), because they grow up in a digital world with easier access to information (Brenner, 2020). Therefore, they tend to be more up to date and are more ready to adopt and invest in Fintech assets such as tokenized real estate. Accordingly, we assume the following hypothesis:

H_{11}: *Retail investor's Age will influence the relationship between retail investor's perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in TRE assets, so that younger retail investors perceive less risk and intend more to invest in TRE assets.*

Gender

Researchers have found that gender plays a significant role in financial perception, investment and spending behavior, and financial satisfaction (Hira & Mugenda, 2009). Based on several previous studies, women are usually more risk averse than men when they make investment decisions (Hinz, McCarthy, and Truner, 1997; Bernasek and Shwiff, 2001; Powell & Ansic, 1997). Also, Wood and Zaichkowsky (2004) found that female investors tend to be more conservative and are less tolerant to risk than male investors. According to Hanna and Lindamood (2005), risk tolerance of women considered to be less even in marriage, as they have less tendency to take investment risks. Also, in situations

that the feedback is ambiguous e.g., in stock markets, number of men investors is significantly higher than women investors (Estes & Hosseini, 1988). Based on the previous findings, we assumed the following hypothesis:

H_{12}: *Retail investor's Gender will influence the relationship between retail investor's perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that men perceive less risk and intend more to invest in TRE assets.*

Education Level

Many pieces of literature investigated the effect of financial literacy on investment behavior. Amari (2015) and Astuti and Trinugroho (2016) concluded that the higher level of literacy leads to more engagements in banking and formal financial institution. Moreover, Lusardi and Mitchell (2007a) found that people with lower literacy tend less to invest in stocks. This result was also supported by Al-Tamimi (2016), who conducted an empirical study in the UAE and by Van Rooij et al. (2011), who measured financial literacy in Nederlandsche Bank (DNB). According to Bhatt, K. A., & Bhatt, K. (2012) illiterate investors have less knowledge, income, and risk-taking capacity. Risk tolerance is also affected by level of education, so that higher educated investors have more risk tolerance (Bhandari and Deaves, 2006; Lewellen, Lease, and Schlarbaum, 1977; Schooley and Worden, 1999). Based on the mentioned findings, we postulated the following hypothesis:

H_{13}: *Retail investor' Education level will influence the relationship between their perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that higher educated retail investors perceive less risk intend more to invest in TRE assets.*

Income Level

Availability of capital and funds is fundamental to make an investment. According to Arianti, B. F. (2018) income has a significant effect on investment behavior. The same result was also declared by Jain, D., & Mandot, N. (2012). Also, a study done by Kusumawati (2013) reveals that income is a crucial factor in making investment decisions. According to previous findings, investors with higher level of income have more tendency to invest in volatile portfolios composed of riskier assets (Barber and Odean, 2001; Schlooley and Worden, 1999). Thus, higher income investors are more likely to take risks and invest more compared to those investors earning less. This suggests that income level of people influences their intention to invest their income.

H_{14}: *Retail investor' Income level will influence the relationship between their perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that higher income-level retail investors intend more to invest in TRE assets.*

Personality

While demographic factors such as age, gender, income level, and education level may influence behavioral intention to invest in TRE assets, they do not fully explain the observed variations and heterogeneity (Gomes, Haliassos, and Ramadorai, 2021). Based on many pieces of literature, the psychological characteristics play a significant role in affecting investors' decision toward risk and market (Chang,2008; Kourtidis et al., 2011, Young et al., 2012). It has been evidenced that in uncertain situations, personality characteristics lead investors' decision-making behavior (Back and Seaker, 2004). Also, many previous pieces of literature have revealed that personality traits have significant

effect on life outcomes including health, marital and profession success, and economic decisions such as purchasing, and investment behaviors (Becker, Deckers, Dohmen, Falk, and Kosse, 2012). Therefore, this research uses a set of individual characteristics to shed light on the moderation effect of personality traits on investment decision-making. Because behavioral intention to invest in TRE assets represents a form of investment decision, it is expected that it will be moderated by personality traits. Personality traits are defined as personal feelings, attitudes, thinking patterns and behaviors distinguishing a person from another person and showing their reactions under certain conditions (Pak and Mahmood, 2015). The Big Five Factor model has been commonly used to measure personality traits including Agreeableness, Openness, Conscientiousness, Neuroticism, and Extraversion (Digman, 1990; Lee and Ashton, 2004; Weller and Thulin, 2012). Accordingly, we incorporate the Big Five model to investigate their moderating effect on retailors' behavioral intention to invest in TRE assets. The Big Five model, which is also called Five-Factor Model (FFM) has been widely incorporated to understand and measure personality traits. To measure personality traits, we will use the model developed by Goldberg, L. R. (1992) due to its' predictive power, flexibility, and comprehensive framework. This model has is a structural framework that assesses and compare individual differences.

Personality traits could directly or indirectly affect investor's behavior. For instance, personality concepts such as Neuroticism and Conscientiousness may influence investment decision by affecting the forces behind investment decision such as risk aversion and time preference behavior. Also, investors with high Neuroticism or less openness are more risk averse. In addition, there is more possibility that investors high on Neuroticism and Extraversion adopt a type of investment that is used often by their surrounding people.

Jiang, Z., Peng, C., & Yan, H. (2023) find that retail investors that are high in openness tend to take more risks. Similarly, Durand et al., 2013b find that people with high openness tend to take higher risks and are more open to trade and are more successful in their financial and business initiatives (Mayfield et al., 2008; Ahmad, 2020).

Agreeableness relates to altruism, avoiding conflicts, being helpful and optimistic about human nature (Costa and McCrae, 1992; Mayfield et al., 2008). According to Tauni et al., (2017), more agreeableness makes individuals rely more on judgments and opinions of their surrounding people instead of their own, thus they trade more in financial markets. These individuals are willing to take higher risks as they accept other investors' suggestions and show more positive attitude towards investing in financial markets (Pak and Mahmood, 2015).

Extraverted individuals have high levels of optimism, sociability, assertiveness, and self-confidence (Oehler et al., 2018). These types of people have more information because of their connections and wide social networks. Therefore, they are willing to trade more (Tauni et al., 20171, b) and take higher risks (Ahmad, 2020). Investors higher in extraversion are interested in social interaction and seek more excitement (McCrae and costa Jr, 1997).

People high in conscientiousness have advanced cognitive abilities, strong will, and success seeking orientation (Mayfield et al., 2008; Durand et al., 2008; Tauni et al., 2017a, b). Due to their cognitive skills, these people have more access to reliable and accurate information (Tauni et al., 2017b), thus tend to take higher risks (Ahmad, 2020). Also, these people show more positive attitude toward investment, as they put their maximum efforts to achieve results (Rajasekar et al., 2022; Durand et al., 2013b).

Trusting problem, weak impulse control, and anxiety are common features of neuroticism (Mayfield et al., 2008). Because individuals with high neuroticism are emotionally unstable (Oehler et al., 2008), have lack of confidence and suffer from difficulty in making decisions (Aren et al., 2021) they avoid uncertainty by avoiding investment decisions (Fachrudin et al., 2022).

Based on the mentioned findings, we hypothesized the following statements:

H_{15}: Retail investor's personality will serve to moderate the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets.

H_{15a}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher openness have more trust in TRE assets and invest more in these assets.*

H_{15b}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher agreeableness have more trust in TRE assets and invest more in these assets.*

H_{15c}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher extraversion have more trust in TRE assets and invest more in these assets.*

H_{15d}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher Conscientiousness have more trust in TRE assets and invest more in these assets.*

H_{15e}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher Neuroticism have less trust in TRE assets and invest less in these assets.*

H_{16}: *Retail investor's personality will serve to moderate the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets.*

H_{16a}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher openness perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*

H_{16b}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher agreeableness perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*

H_{16c}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher extraversion perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*

H_{16d}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher conscientiousness perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*

H_{16e}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher neuroticism perceive more risk in investing in TRE assets and have lower attitude towards investing in these assets.*

H_{17}: *Retail investor's personality will serve to moderate the relationship between their social influence in TRE investing and behavioral intention to invest in these assets.*

H_{17a}: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher openness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*

H_{17b}: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher agreeableness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*

H_{17c}: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher extraversion receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*

H_{17d}: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher conscientiousness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*

H_{17e}: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher neuroticism receive less social influence in TRE assets and have less behavioral intention to invest in these assets.*

H_{18}: *The personality of retail investor will serve to moderate the relationship between retail investor's attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets.*

H_{18a}: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher openness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*

H_{18b}: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher agreeableness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*

H_{18c}: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher extraversion have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*

H_{18d}: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher conscientiousness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*

H_{18e}: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher neuroticism have lower attitude towards investing in TRE assets and have lower behavioral intention to invest in these assets.*

CHAPTER IV: RESEARCH METHODOLOGY

Participants and Procedure

The data for this study was collected through a voluntary response sampling method, involving 110 participants in the United States via an online survey. The survey for the pilot study, created and designed using Qualtrics, was initially published on online forums, LinkedIn and Facebook groups targeting individuals interested in real estate investment and blockchain. However, for the main study, the data collection was conducted through publishing the survey on Connect by Cloud Research. Therefore, this study used quantitative data collection methodology via survey, with individual retail investors serving as the unit of analysis.

The survey aimed to measure the core research constructs including the dependent variable “Retail Investor’s Intention to Invest in TRE Assets”, and independent variables of “Trust in TRE Assets”, “Perceived Risks in Investing in TRE Assts”, “Social Influence in TRE Investing”, “Facilitating Conditions to Invest in TRE Assets”, “Perceived Blockchain Benefits”, and “Attitude Towards Investing in TRE Assets”. Additionally, moderating variables were gathered in two sections: the first covering demographic characteristics ("Age," "Gender," "Educational Level," and "Income Level"), and the second measuring the Big five Personality Traits of respondents.

To ensure the relevance and reliability of the survey measurements in addressing research questions, the factor analysis was conducted through the pilot study. For both pilot and the main study, the research participants were asked initially to answer the consent form outlining the compensation they would receive for completing the survey. Subsequently, they were asked to provide information on demographic characteristics

before responding to questions related to each construct outlined in the research model. Moreover, they responded to the screening questions in the beginning of the survey, so that only the eligible respondents for this study were selected and could complete the survey.

Measurements

The measurement items for each latent variable in the research model proposed in this study are mainly selected from the prior validated literature and were modified to fit the TRE context. The resources of the measurement models used in this research are summarized in the following table and were validated in the pilot study.

No.	Constructs	Resource
1	Behavioral Intention to Invest in TRE (BI)	Lee, J. C., & Chen, X. (2022)
2	Trust in TRE Assets (TR)	Hassan, H.E. and Wood, V.R. (2020)
3	Perceived Risks in Investing in TRE (PR)	Hassan, H.E. and Wood, V.R. (2020)
4	Social Influence in TRE Investing (SI)	Hassan, H.E. and Wood, V.R. (2020)
5	Facilitating Conditions to Invest in TRE Assets (FC)	Lee, C. C., Kriscenski, J. C., & Lim, H. S. (2019)
6	Perceived Blockchain Benefits (PBB)	Garg, P. et al. (2021)
7	Minimum Investment in TRE Assets (MI)	Self-developed based on the existing minimum investment amounts on TRE platforms in the US.
8	Attitude Towards Investing in TRE (AT)	Kamble, S., Gunasekaran, A., & Arha, H. (2019)
9	Personality (P)	Goldberg, L. R. (1992)

Table 1 Summary of Research Constructs and the Resources

The exact indicators for each construct can be found in Appendix A.

Research Design

This research was carried out in two stages: the pilot study and the main study. The pilot study served as the initial phase to test the measurement instruments. Based on the results in this phase, the instruments and the research model were adjusted, and improved, ensuring they were refined for the subsequent round to test the hypotheses.

Pilot Study

The objective of the pilot study was to validate the survey measurements, identify the correlation between variables and ensure survey questions are clear and that the completion time was appropriate for participants. The survey was designed in Qualtrics and was posted on LinkedIn and Facebook groups aligned with real estate investment, which were likely to attract qualified respondents for this study.

Participants varied in gender, education, and income levels, all being over 18 years of age, with at least a basic understanding of blockchain technology, and an interest in or experience with investment. The eligible participants were selected by asking them three screening questions regarding their age category, knowledge of blockchain technology, and their interest or had experience in real estate investment. Only those who were over 18, had some familiarity with blockchain, and had an interest or experience in real estate investment were allowed to proceed with the questionnaire. Conversely, those under 18, without knowledge of blockchain technology, or no interest in real estate investments were deemed unqualified for this survey.

After data cleaning and removing those respondents who selected “I do not consent” on the consent form, or who were disqualified for not correctly answering the screening

questions or for completing the survey in less than 5 minutes (the minimum reasonable time to complete the survey), we obtained 30 valid responses. The demographic characteristics and the level of familiarity with blockchain technology of these 30 participants in the pilot study are summarized in Appendix 2.

The data from the qualified respondents were transferred to SPSS and after conducting the factory analysis for each construct, as well as overall independent constructs, a several measurements with low loadings in Component Matrix (<0.6) were eliminated.

Main Study

Following a comprehensive review of the pilot study, analyzing the collected data and making the necessary adjustments to the questionnaire based on the pilot study factor analysis results, the raw data for the main study was collected using Connect, a platform facilitated by Cloud Research. To refine participant selection aligned with the study's criteria, strategic filters were applied on the platform. The specified filters restricted participation to individuals who met specific criteria, including being over 18 years old, possessing experience or interest in real estate investment, and demonstrating a foundational understanding of blockchain technology. This strategic approach was employed to ensure that only participants meeting the predefined criteria engaged in responding to the research questions. Each qualified participant that completed the survey was paid $2.00 for their time. The data was collected and transferred to Qualtrics when each survey response ended. The data cleaning process included removing any errors, unqualified participants based on the answers to the screening question, and meticulously eliminating responses deemed unreliable such as those finishing survey in a very short time, or exhibiting consistent identical response to all the questions, and ensuring that data is in

a correct format for transferring to SPSS and conduct the analysis. Following the data cleaning, 110 qualified answers were recorded.

CHAPTER V: RESULTS

Descriptive Statistics

After collecting and cleaning the data, the excel file was transferred to SPSS and the following demographics statistics as well as the familiarity level of the qualified participants were summarized in the table below:

Variable		No.	(%)
Gender	Male	83	75.5
	Female	27	24.5
Age	18-25	7	6.4
	26-35	51	46.4
	36-50	44	40.0
	51 or older	8	7.3
Education Level	High school	3	2.7
	Diploma	8	7.3
	Bachelor's degree	46	41.8
	Master's degree	141	37.3
	Doctorate/PhD or higher	12	10.9
Income Level	$0 - $50,000	11	10.0
	$51,000 - $100,000	40	36.4
	$101,000 - $150,000	27	24.5
	$151,000 - $200,000	19	17.3
	$201,000 - $300,000	8	7.3
	$300,000	5	4.5
Familiarity Level with Blockchain Technology	Slightly familiar	22	20.0
	Moderately familiar	40	36.4
	Very familiar	32	29.1
	Extremely familiar	16	14.5

Table 2 Main Study Descriptive Statistics

According to the descriptive statistics table, the majority of respondents were male, accounting for 75.5%. The most common age group was between 26 and 35 years old,

representing 46.4% of participants. In terms of education level, a significant portion of participants held a master's degree, at 37.3%. As for income level, the largest group reported an annual income between $51,000 and $100,000, making up 36.4% of respondents. Additionally, the predominant level of familiarity with blockchain technology among survey completers was moderate, also at 36.4%.

Hypotheses Testing

This research focused on finding the factors influencing the retail inventors' intentions to invest in tokenized real estate assets. In the next step, to test and validate the hypothesized model, we did exploratory factor analysis (EFA), and T-test by employing SPSS software. In addition, we used SPSS to conduct scale reliability, and validity tests, descriptive statistics, and multiple regression analysis to test the hypotheses.

In the following table, the findings of the study based on the conducted tests and linear regression analysis are summarized:

Hypothesis	Beta (standardized Coefficients)	R^2	Adjusted R^2	F	Sig.	t	Sig.	Result
H_1: *As the retail investor's trust in TRE assets increases their behavioral intention to invest in TRE assets will increase.*	.881	.776	.774	374.398	<.001	19.349	<.001	Significant
H_2: *As the retail investor's trust in TRE assets increases their attitude towards investing in TRE assets will increase.*	.892	.796	.795	422.607	<.001	20.557	<.001	Significant
H_3: *As the retail investor's trust in TRE assets increases*	-.841	.706	.704	259.925	<.001	-16.122	<.001	Significant

their perceived risks of potential negative outcomes of TRE investment will decrease.								
***H_4**: As perceived risks of the potential negative outcomes of investment in TRE by retail investors increases their attitude towards investing in these assets will decrease.*	-.841	.707	.705	261.126	<.001	-16.159	<.001	Significant
***H_5:** As perceived risks of the potential negative outcomes of investment in TRE by retail investors increases their behavioral intention to invest in these assets will decrease.*	-.856	.733	.731	296.868	<.001	-17.230	<.001	Significant
***H_6:** As the social influence perceived by retail investors from their important others to invest in TRE assets increases, their behavioral intention to invest in TRE assets will increase.*	.736	.541	.537	127.409	<.001	11.288	<.001	Significant
***H_7:** As the facilitating Conditions (FC) to invest in TRE assets increases, the retail investor's behavioral intention to invest in TRE assets will increase.*	.688	.474	.469	97.220	<.001	9.860	<.001	Significant
***H_8:** As blockchain benefits perceived by retail investors increase, their behavioral intention to invest in TRE assets will increase.*	.728	.530	.526	120.770	<.001	10.990	<.001	Significant
***$H_{8,a}$:** As quality customer service of blockchain increases, retail investor's behavioral intention to invest in TRE assets will increase.*	.690	.476	.472	98.252	<.001	9.912	<.001	Significant
***$H_{8,b}$:** As reduced costs provided by blockchain*	.555	.308	.301	47.957	<.001	6.925	<.001	Significant

technology increases, retail investor's behavioral intention to invest in TRE assets will increase.								
$H_{8,c}$: *As efficiency and security provided by blockchain technology increases, retail investor's behavioral intention to invest in TRE assets will increase.*	.616	.380	.374	66.100	<.001	8.130	<.001	Significant
$H_{8,d}$: *As secure remittance provided by using blockchain technology increases, retail investor's behavioral intention to invest in TRE assets will increase.*	.609	.371	.365	63.650	<.001	7.978	<.001	Significant
$H_{8,e}$: *As regulatory compliance of blockchain increases, retail investor's behavioral intention to invest in TRE assets will increase.*	.509	.259	.252	37.757	<.001	6.145	<.001	Significant
H_{9}: *As minimum investment in TRE assets increases, behavioral intention of retail investors to invest in TRE assets will decrease.*	-	.603	.571	19.167	<.001	-	<.001	Significant
$H_{9,a}$: *Minimum investment level less than $100 increases the behavioral intention of retail investors to invest in TRE assets.*	-.04					-.299	.766	Not significant
$H_{9,b}$: *Minimum investment level between $100 and $500 increases the behavioral intention of retail investors to invest in TRE assets*	.527					2.978	.004	Significant
$H_{9,c}$: *Minimum investment level between $500 and $1000 increases the behavioral*	-.088					-.523	.602	Not significant

intention of retail investors to invest in TRE assets								
***$H_{9,d}$:** Minimum investment level between $1000 and $1500 increases the behavioral intention of retail investors to invest in TRE assets*	-.092					.401	.690	Not significant
***$H_{9,e}$**: Minimum investment level between $1500 and $2000 increases the behavioral intention of retail investors to invest in TRE assets*	.096					.420	.675	Not significant
***$H_{9,f}$:** Minimum investment level between $2000 and $2500 increases the behavioral intention of retail investors to invest in TRE assets*	.248					1.062	.291	Not significant
***$H_{9,g}$:** Minimum investment level between $2500 and $3000 increases the behavioral intention of retail investors to invest in TRE assets*	-.252					-.99	.324	Not significant
***$H_{9,h}$:** Minimum investment level more than $3000 increases the behavioral intention of retail investors to invest in TRE assets*	.434					2.967	.004	Significant
***H_{10}:** As retail investor's attitude towards investing in TRE assets increases, their behavioral intention to invest in these assets will increase.*	.930	.865	.864	690.834	<.001	26.284	<.001	Significant
***H_{11}:** Retail investor's Age will influence the relationship between retail investor's perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest*	-.252	.746	.742	157.470	<.001	-2.357	.020	Significant

in TRE assets, so that younger retail investors perceive less risk and intend more to invest in TRE assets.								
H_{12}: *Retail investor's Gender will influence the relationship between retail investor's perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that men perceive less risk and intend more to invest in TRE assets.*	-.196	.758	.753	167.250	<.001	-3.282	.001	Significant
H_{13}: *Retail investor' Education level will influence the relationship between their perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that higher educated retail investors perceive less risk intend more to invest in TRE assets.*	-.169	.742	.737	153.615	<.001	-1.870	0.64	Not significant
H_{14}: *Retail investor' Income level will influence the relationship between their perceived risks of the potential negative outcomes of investing in TRE assets and their behavioral intention to invest in these assets, so that higher income-level retail investors intend more to invest in TRE assets.*	-.063	.736	.731	148.897	<.001	-.990	.324	Not significant
H_{15}: *Retail investor's personality will serve to moderate the relationship between their trust in TRE*	.031	.776	.772	185.554	<.001	.199	.843	Not significant

assets and behavioral intention to invest in TRE assets.								
$H_{15,a:}$ *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher openness have more trust in TRE assets and invest more in these assets.*	-	-	-	-	-	-	-	Not tested
***H_{15b}**: Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher agreeableness have more trust in TRE assets and invest more in these assets.*	-	-	-	-	-	-	-	Not tested
***H_{15c}**: Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher extraversion have more trust in TRE assets and invest more in these assets.*	-	-	-	-	-	-	-	Not tested
***H_{15d}**: Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher Conscientiousness have more trust in TRE assets and invest more in these assets.*	-	-	-	-	-	-	-	Not tested

H_{15e}: *Retail investor's personality will influence the relationship between their trust in TRE assets and behavioral intention to invest in TRE assets, so that investors with higher Neuroticism have less trust in TRE assets and invest less in these assets.*	-	-	-	-	-	-	-	Not tested
H_{16}: *Retail investor's personality will serve to moderate the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets.*	.294	.743	.739	154.977	<.001	2.055	.042	Significant
H_{16a}: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher openness perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*	.351	.768	.764	177.227	<.001	4.012	<.001	Significant
$H_{16,b}$:*Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher agreeableness perceive*	.144	.738	.733	150.895	<.001	1.431	.155	Not significant

less risk in investing in TRE assets and have higher attitude towards investing in these assets.								
***$H_{16,c}$:**Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher extraversion perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*	0.091	.734	.729	147.654	<.001	.563	.575	Not significant
$H_{16,d}$: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher conscientiousness perceive less risk in investing in TRE assets and have higher attitude towards investing in these assets.*	0.65	.734	.729	147.710	<.001	.589	.557	Not Significant
$H_{16,e}$: *Retail investor's personality will influence the relationship between their perceived risks in investing in TRE assets and attitude towards investing in TRE assets, so that investors with higher neuroticism perceive more risk in investing in TRE assets and have lower attitude towards investing in these assets.*	.155	.736	.731	148.964	<.001	1.008	.316	Not Significant

H_{17}: *Retail investor's personality will serve to moderate the relationship between their social influence in TRE investing and behavioral intention to invest in these assets.*	.354	.549	.541	65.108	<.001	1.352	.130	Not Significant
$H_{17,a}$: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher openness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested
$H_{17,b}$: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher agreeableness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested
$H_{17,c}$: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher extraversion receive more social influence in TRE*	-	-	-	-	-	-	-	Not tested

assets and have higher behavioral intention to invest in these assets.								
$H_{17,d}$: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher conscientiousness receive more social influence in TRE assets and have higher behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested
$H_{17,e}$: *Retail investor's personality will influence the relationship between their social influence in TRE investing and behavioral intention to invest in these assets, so that investors with higher neuroticism receive less social influence in TRE assets and have less behavioral intention to invest in these assets*	-	-	-	-	-	-	-	Not tested
H_{18}: *The personality of retail investor will serve to moderate the relationship between retail investor's attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets.*	.112	.866	.863	345.223	<.001	.901	.369	Not Significant
$H_{18,a}$: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest*	-	-	-	-	-	-	-	Not tested

in TRE assets, so that investors with higher openness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.								
$H_{18,b}$: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher agreeableness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested
$H_{18,c}$: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher extraversion have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested
$H_{18,d}$: *Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors*	-	-	-	-	-	-	-	Not tested

with higher conscientiousness have more attitude towards investing in TRE assets and have higher behavioral intention to invest in these assets.								
***$H_{18,e}$:** Retail investor's personality will influence the relationship between their attitude towards investing in TRE assets and their behavioral intention to invest in TRE assets, so that investors with higher neuroticism have lower attitude towards investing in TRE assets and have lower behavioral intention to invest in these assets.*	-	-	-	-	-	-	-	Not tested

Table 3 Summary of Hypotheses Testing and Results

As indicated in the table, the sub-hypotheses of H15, H17, and H18 were not tested because the omnibus hypotheses were not significant.

According to the regression results, the first part of H12, which hypothesizes the moderating effect of gender on the relationship between perceived risks and behavioral intention to invest, was found to be true, with the moderating effect being significant.

To further test this moderating effect, the data was segmented into two sub-samples, one for women and one for men. The table below presents the results of separate linear regressions for men and women for the hypotheses $H_{12,a}$, and $H_{12,b}$:

Hypothesis	Beta (standardized Coefficients)	R^2	Adjusted R^2	F	Sig.	t	Sig.	Result
$H_{12,a}$: Men perceive less risk and intend to more invest in TRE assets.	-.891	.795	.792	313.612	<.001	-17.709	<.001	Significant
$H_{12,b}$: Women perceive more risk and intend to invest less in TRE assets.	-.745	.555	.537	31.137	<.001	20.557	<.001	Significant

Table 4 Summary of Gender Moderation Effect

Based on these results, we can conclude that there is a statistically significant difference in the relationship between the perceived risk and the intention to invest for men and women.

Specifically, the relationship is stronger (higher beta) and more significant (higher t-value) for women compared to men. Thus, as **$H_{12,b}$** was supported.

The following research model (Figure.2), demonstrates the results of hypotheses testing in one picture:

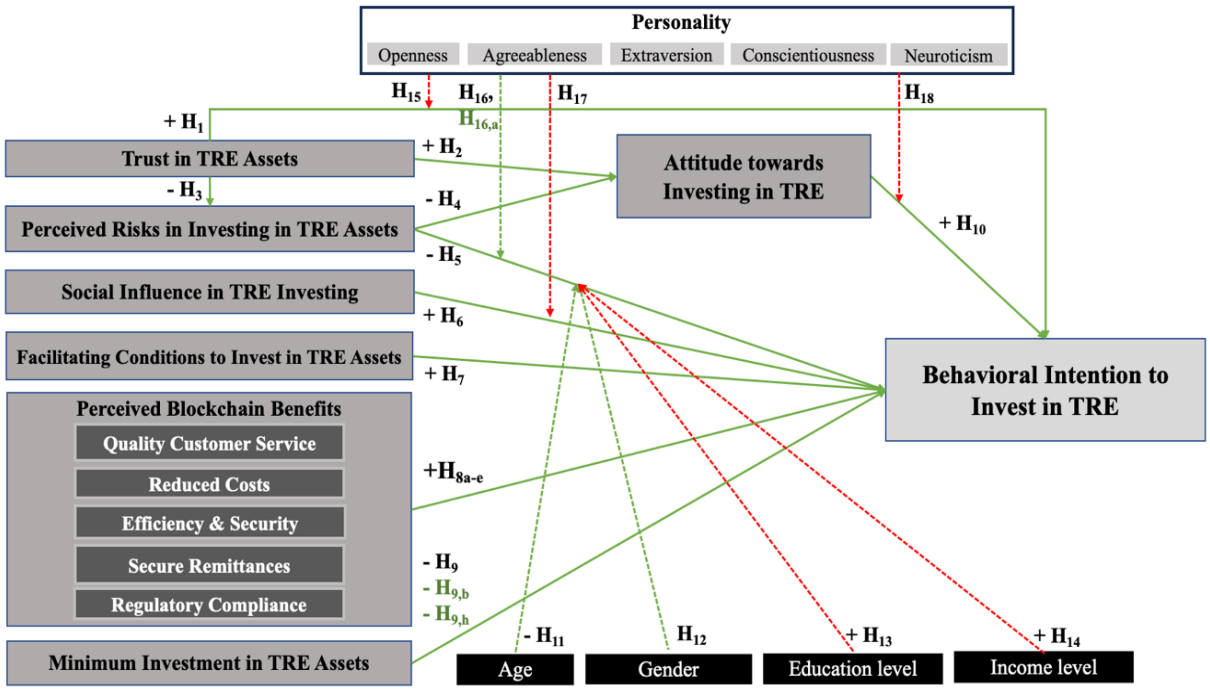

Figure 2 Summary of Test Results on the Conceptual Research Model

CHAPTER VI: DISCUSSION AND CONCLUSIONS

One of the primary challenges encountered during conducting this research was the recruitment of eligible participants for the survey, which was due to the specialized and emerging nature of the topic among most retail investors in the United States. To collect data for the pilot study, the survey was posted in facebook and LinkedIn groups dedicated to real estate investment, blockchain and asset tokenization. Despite these efforts, the response rate was disappointingly low. To address this issue and improve the engagement, the survey was then published via the Research Cloud online portal, where participants were incentivized with getting paid upon completion of the survey at least within 7-8 minutes. Posting the survey on the Research Claud platform enabled the targeting of specific interest groups by using filters to refine the selection of respondents. Despite these adjustments and the use of tools to reach the appropriate audiences, the number of eligible respondents was notably lower than expected.

The shortfall in respondent numbers could largely be due to the emergent nature of asset tokenization and investment in tokenized real estate assets, compounded by the participants' limited experience with such investments. It highlights that a significant portion of retail investors still lacks adequate knowledge in this domain and there is substantial potential to educate investors about the benefits of investing in tokenized assets and the potential returns they can gain from such investments.

Research Limitations

Novelty of the Subject:

Given that blockchain technology and tokenized real estate assets are rather new subjects, there is limited body of literature for addressing in this research. This led to challenges in building a comprehensive theoretical background and find relative theories.

Measurements and Constructs:

This study is among the few research topics that have investigated the relationship between various factors and retail investors' intention to invest in TRE assets. Although the questions to measure the construct were inspired from prior related research, significant modifications were needed. The constructs utilized in this research were largely self-developed and adjusted to the concept of tokenized real estate, therefore they have been not tested widely. However, the accuracy of these constructs was tested through the pilot study.

Data Availability:

Blockchain, tokenized real estate, and investing in these types of assets are relatively new topics that have begun to gain traction in the recent decade. Consequently, only a small fraction of people and investors are acquainted with this form of investment, making it challenging to locate experts in this field. Despite using filters on Connect Cloud Research to target more qualified participants, these filters had their limitations, and connecting with eligible individuals who have knowledge of blockchain and tokenized real estate proved difficult.

Sample Representativeness:

Due to the specialized nature of this research topic caused difficulties to find participants with enough knowledge about blockchain and tokenized real estate, which could affect the generalizability of the research's findings to the broader population of investors.

Regulatory Uncertainty:

The laws and regulations governing tokenized real estate are in a state of flux and vary across different countries. This evolving landscape, coupled with potential regulatory adjustments and the continuous stream of news published during the research period, might have introduced bias, and influenced retail investors' intentions to invest in TRE assets.

Conclusions

According to the findings of this study, trust in tokenized real estate assets plays a crucial role in making investment decisions. This is particularly important in less developed markets like TRE, where trust can reduce the perceived risks of investment. Given the positive effect of education on trust (Oskarsson et al., 2017), these result underscores the importance of educating potential investors about TRE to increase their willingness to invest. Ejdys (2018) suggests that when users become more familiar with new technology, understand its usefulness, and recognize its benefits, they tend to trust the technology more.

Additionally, trust can be fostered through transparent communication by TRE portals about their operations, the rights of token holders, and the protection measures against fraud and financial loss provided on their websites. It is also recommended for TRE portals to build trust by offering reliable and transparent information to their investors. Addressing investors' potential concerns and implementing marketing strategies that

underscore the platform's credibility can also enhance investors' trust, leading to a more favorable attitude toward investing in TRE assets on those platforms.

The negative correlation between trust in TRE assets and perceived risks of investing in these assets, as well as the negative correlation between perceived risks and investors' intention to invest, suggest that bolstering trust through increased transparency, investor education, and the development of a clear regulatory framework for TRE assets can alleviate perceived risks and enhance their willingness to invest.

Furthermore, the positive correlation between social influence in investing in TRE assets and the intention to invest emphasizes that investment decisions are not made in isolation. This reveals valuable opportunities for TRE platforms and financial advisors. For instance, revealing the experiences of current investors and promoting endorsements from influential investors can serve as powerful social proof, demonstrating that investing in TRE assets is a judicious choice. Additionally, TRE platforms can encourage potential investors by fostering online communities where they can share experiences. Providing opportunities for users to engage in group investments alongside their peers can further motivate them to invest in TRE assets.

This research has identified the positive relationship between perceived blockchain benefits by retail investors and their intention to invest in tokenize real estate assets. This result points to the value of educating retail investors and platform users about blockchain benefits, thereby informing them about the added value this technology offers. The more blockchain is understood and trusted by platform users, the more likely they are to engage with these assets. Policymakers may also develop clear regulations to showcase the benefits of blockchain technology transparently. Marketing strategies and clear communication can

foster positive perceptions of blockchain technology among retail investors, ultimately improving their investment intentions.

This study found a cultural shift in investment habits, illustrating a growing preference among investors for digital and technology-driven investment options over more traditional ones. The blockchain benefits highlighted in this research include quality customer service, reduced costs, enhanced efficiency and security, secure remittances, and regulatory compliance. Given these benefits and their influence on retail investors' willingness to invest in TRE assets, TRE platforms should focus on leveraging the facilities that blockchain can offer to their customers. Automating services and enhancing the investor experience using smart contracts, streamlining operations by emphasizing fast blockchain transactions, and boosting security features like immutability and encryption to protect investors from fraud and unauthorized transactions are aspects that tokenized real estate asset platforms should consider to increase users' investment intentions.

The role of facilitating conditions in investing in tokenized real estate assets is crucial for retail investors' intention to invest. Understanding this role can help TRE platforms financial educators and policymakers in creating an environment that enhances investors' experiences and assisting them in adopting this type of investment. Tokenized real estate assets platforms should pay special attention to improving their user experience by enhancing their platforms interfaces, transactions processes, and providing support that fosters investment intentions. They should also ensure that they provide access to necessary resources such as market data, expert advice, etc., for their investors. Furthermore, offering training and informational resources, along with a clear and supportive regulatory framework that elucidates their rights and responsibilities, can expand investors'

knowledge about investing in TRE assets and enhance the skills required to invest effectively. As tokenized real estate is a relatively new investment option that traditional investors may not be familiar with, integrating TRE opportunities with traditional investment options is another strategy TRE platforms can adopt to reinforce investors' intentions to invest in their assets.

Another significant finding relates to the minimum investment level in TRE platforms. The results suggest that retail investors' engagement increases when the entry barrier, in terms of minimum investment, is set between $100 and $500 or higher than $3000. This indicates that TRE platforms could structure their minimum investment levels to be attractive to both retail investors looking for lower entry points and accredited investors who are not sensitive to higher thresholds. Apparently, risk-averse investors tend to invest at lower minimums, while more affluent investors are inclined to allocate more funds to TRE projects. Offering investors both low and high minimum investment opportunities allow them to invest more in TRE assets and diversify their portfolios. A broad spectrum of investment possibilities can help build a more vibrant investment landscape in tokenized real estate portals.

The investors' attitude toward TRE assets also plays a critical role in their investment behavior. Recognizing the importance of this factor helps TRE platforms make efforts to improve the overall sentiment and perception of TRE. Providing pleasant experiences and testimonials from current investors on these platforms, offering comprehensive educational resources to dispel misconceptions about TRE, creating a sense of community among platform users, and emphasizing the benefits of TRE investments are some of the ways to enhance overall attitudes toward investing in TRE.

The findings related to the moderating role of demographics including age, gender, education level, and income level in this study provide valuable insight for market segmentation and development of strategic solutions at encouraging potential investors to invest in these platforms.

The age of investors plays a moderating role when they invest in TRE assets so that younger generations tend to perceive less risk and thus invest more in these assets. This is a valuable point for TRE platforms to consider. This result suggests that TRE investment platforms may focus more on targeting younger demographics, who are open to new opportunities, have more familiarity with technology, and are more inclined toward innovative and riskier investment opportunities. Providing services to young investors who are comfortable with digital platforms can make them more receptive to the concept of blockchain, which is a strategy that can be used to increase investments in TRE platforms.

In this study, a significant difference in the relationship between perceived risk and the intention to invest between men and women was shown. It means that women may perceive more risks when investing in TRE assets, which affects their intention to invest negatively compared to men. This necessitates TRE platforms to employ strategies that address the risk concerns of women more effectively and provide them with tailored communications and in-depth information on risk management. This includes offering more comprehensive support services to women and designing the platforms in a way that resonates with women by focusing on the secure aspects of investment and the long-term nature of such investments. Financial advisors should also understand the different needs and perceived risks of women and provide them with tailored advice that aligns with their investment concerns.

This research indicates that education and income are not significant factors in the relationship between perceived risks and the behavioral intention to invest in tokenized real estate (TRE) assets. This suggests that TRE assets could appeal to a broad range of investors, irrespective of their income and education levels. Therefore, platforms can consider more complex factors such as psychological traits, cultural backgrounds, or personal experiences when targeting potential investors. These platforms may not need to categorize investors based on their education and income levels; instead, they should better focus on characteristics that address investor needs and risk management.

Personality traits played a non-significant role in the relationship between trust and the behavioral intention to invest in TRE assets. This finding implies that efforts to build trust in TRE should not necessarily be tailored to investors with various personality characteristics but should instead emphasize the reliability and security of TRE to all potential investors. The same principle applies to the role of personality traits in the relationship between social influence in investing in TRE, attitudes towards investing in TRE assets, and the behavioral intention to invest in these assets.

However, the personality trait of openness did moderate the relationship between perceived risk and attitude towards investing in TRE assets. This indicates that individuals with higher levels of openness tend to perceive less risk and have a more positive attitude towards investing in TRE assets. TRE platforms can leverage this insight and consider segmenting their potential investors based on their personality traits to better address specific concerns and motivate investors with varying personality traits. These platforms can design their user interface in a way that appeals to investors with higher levels of

openness and provide features that resonate with those who have a greater propensity for openness.

Implications for Future Research

This research focused more on the psychological and behavioral aspects, facilities, and blockchain technological advantages that influence investors' decisions in the realm of Tokenized Real Estate (TRE). However, there is a vast opportunity to explore factors directly tied to the real estate properties featured on TRE platforms. Attributes such as the location, size, intended use, and the type of project can be influential factors that increase investors' interests and could be key in determining what makes investment opportunity in TRE more attractive. Additionally, market trends and the fluctuation of real estate prices are critical elements that may impact an investor's intent to engage with TRE assets. For example, if market prices increase, do investors prefer to invest more in TRE assets as they do not have enough liquidity to afford properties in traditional markets? Understanding how these property-specific factors and broader market movements affect investor behavior could provide deeper insights and drive strategic advancements in the TRE space.

Furthermore, this research investigated the moderating effects of certain demographic factors including age, gender, income, and educational level on the relationship between independent variables and the dependent variable. Future research could explore additional demographic factors, such as the geographic location and professional background of retail investors. Furthermore, examining how the economic conditions in various countries influence the behavioral intentions of retail investors to invest in Tokenized Real Estate (TRE) assets could yield valuable insights. Although general personality traits had a non-significant effect in this study, subsequent research

could examine other psychological characteristics, such as cultural attitudes towards investing and investors' risk tolerance.

Given the significance of a transparent environment and clear regulations, there is an imperative to study the impact of regulatory changes on the trust and investment behaviors of retail investors.

Additionally, considering that TRE investment is nascent and in its early stages, conducting longitudinal research in the coming years can provide insights into how retail investors' attitudes towards investing in TRE evolve over time.

Moreover, it is recommended to compare TRE assets with other investment options, especially traditional investments, to understand their relative appeal in the current dynamic market. And finally, Furthermore, with the growing interest in TRE assets across various countries, studying what drives retail investors' intentions to invest in TRE assets in diverse regions and countries could yield varied and insightful results.

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APPENDICES

Appendix A. Measurements of the Constructs

Behavioral Intention to Invest in TRE (BI)

To measure BI, this study adopts the measurement instrument developed and validated by Lee, J. C., & Chen, X. (2022) to measure adoption in the evolution of artificial intelligence mobile banking applications, using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

BI_1: If I have access to TRE investing platforms, I will invest in TRE assets immediately.

BI_2: If TRE assets become available, I would invest in them.

BI_3: I intend to invest in more TRE assets in the future.

Trust in TRE Assets (TR)

To measure retail investors' trust in TRE assets, we adapt the measurement items developed by Hassan, H.E. and Wood, V.R. (2020) using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

TR_1: I think that TRE assets are trustworthy.

TR_2: Investing in TRE assets protects investors' interests.

TR_3: I believe that TRE investing platforms provide a secure investment opportunity.

TR_5: I think it is safe to invest in TRE assets.

Perceived Risks in Investing in TRE assets (PR)

PR will be measured through the items developed by Hassan, H.E. and Wood, V.R. (2020), using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

PR_1: I feel that investing in TRE assets exposes my investment to potential fraud.

PR_2: I feel that investing in TRE assets may threaten the privacy of my information.

PR_3: I feel investing in TRE platforms subjects my investment to financial risk.

PR_4: I feel that my private information might be hacked when investing in TRE assets.

PR_5: I feel that investing in TRE assets could be a risky choice.

Social Influence in TRE Investing (SI)

To measure SI, we will use the questions developed and tested by Hassan, H.E. and Wood, V.R. (2020), using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

SI_1: People who influence me think I should invest in TRE assets.

SI_2: People who are important to me think I should invest in TRE assets.

SI_3: I would invest in TRE assets on the recommendation of my relatives and peers.

SI_4: People whose opinions I value prefer investing in TRE assets.

SI_5: My competitors prefer to invest in TRE assets.

Facilitating Conditions to Invest in TRE Assets (FC)

This study measures FC by adopting the measurement instrument used by Lee, C. C., Kriscenski, J. C., & Lim, H. S. (2019) to study the behavioral intention to use blockchain technology, using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

FC_1: I have the resources necessary to invest in TRE assets.

FC_2: I have the knowledge needed to invest in TRE assets.

FC_3: Investing in TRE assets is compatible with my other types of investment.

FC_4: I can get help from others when I have difficulties investing in TRE assets.

FC_5: I have access to resources that help me learn about investment in TRE assets.

Perceived Blockchain Benefits (PBB)

Perceived Blockchain Benefits in this research are categorized into five sub-factors including "Quality customer services", "Reduced costs", "Efficiency and security", "Security remittances", and "Regulatory compliance". These sub-factors and their measurement instruments are adopted and modified from the research by Garg, P. et al. (2021), using a 7-point Likert scale (1= Not at all important, 2= Slightly important, 3= Moderately important, 4=Very important, 5= Extremely important), as follows:

a. Quality customer services (QCS)

QCS_1: Blockchain technology will improve transparency in TRE investment.

QCS_2: Blockchain technology will increase trust in TRE investment.

QCS_3: Blockchain technology will increase data accuracy in TRE investment.

QCS_4: Blockchain technology will reduce the risk in TRE investment.

b. Reduced costs (RC)

RC_1: Blockchain technology will reduce transaction costs in TRE investment.

RC_2: Blockchain technology will eliminate intermediaries in TRE investment.

RC_3: Blockchain technology will lower down administrative costs in TRE investment.

RC_4: Blockchain technology will lower down operational costs in TRE investment.

c. Efficiency and security (ES)

ES_1: Blockchain technology will help in tracking real time transactions in TRE investment.

ES_2: Blockchain technology will increase speed of transaction in TRE investment.

ES_3: Blockchain technology will increase efficiency in TRE investment.

ES_4: Blockchain technology will enhance security in TRE investment.

ES_5: Blockchain technology will enhance the integrity of investing in TRE assets.

d. Secure remittances (SR)

SR_1: Blockchain technology will create an immutable audit trail in TRE investment.

SR_2: Blockchain technology will ensure a fast and secure payment process in TRE investment.

SR_3: Blockchain technology will enhance robustness in TRE investment.

SR_4: Blockchain technology will increase the traceability of transactions in TRE investment.

SR_5: Blockchain technology will increase the control on data in TRE investment.

e. Regulatory compliance (RC)

RC_1: Blockchain technology will prevent from financial fraud and tempering in TRE investment.

RC_2: Blockchain technology will ensure data protection in TRE investment.

RC_3: Blockchain technology will improve regulatory compliance in TRE investment.

RC_4: Blockchain technology will reduce the error handling and reconciliation in TRE investment.

RC_5: Blockchain technology will ensure immutable business rules.

Minimum Investment in TRE Assets (MI)

Minimum investment scales are chosen based on the range of existing minimum investment amounts on TRE platforms in the US. We will use a 5-point Likert scale from 1= Extremely unlikely to 5= Extremely likely to measure how likely survey participant are to invest in a TRE asset considering different required minimum investments.

MI_a: Less than $100

MI_b: Between $100 and $500

MI_c: Between $500 and $1,000

MI_d: Between $1,000 and $1,500

MI_e: Between $1,500 and $2,000

MI_f: Between $2,000 and $2,500

MI_g: Between $2,500 and $3,000

MI_h: More than $3,000

Attitude Towards Investing in TRE Assets (AT)

The questions used in this study to measure AT are developed by Kamble, S., Gunasekaran, A., & Arha, H. (2019), who validated a model for understanding the user perception of blockchain technology adoption using a five-point Likert scale of 1= Strongly disagree to 5= Strongly agree:

AT_1: In my opinion, it is desirable to invest in TRE assets.

AT_2: I think investing in TRE assets is a good idea.

AT_3: I like the idea of investing in TRE assets.

AT_4: Overall, my attitude toward investing in TRA is favorable.

Personality (P)

To measure the personality traits, we use the Big Five factor markers developed by Goldberg, L. R. (1992). In this part, participants will be asked to identify their different levels of personal characteristics on the following scale:

			Surgency/ Extraversion			
	Very	Moderately	Neither	Moderately	Very	
Introverted	1	2	3	4	5	Extraverted
Unenergetic	1	2	3	4	5	Energetic
Silent	1	2	3	4	5	Talkative

Unenthusiastic	1	2	3	4	5	Enthusiastic
Timid	1	2	3	4	5	Bold
Inactive	1	2	3	4	5	Active
Inhibited	1	2	3	4	5	Spontaneous
Unassertive	1	2	3	4	5	Assertive
Unadventurous	1	2	3	4	5	Adventurous
Unsociable	1	2	3	4	5	Sociable

Agreeableness

	Very	Moderately	Neither	Moderately	Very	
Cold	1	2	3	4	5	Warm
Unkind	1	2	3	4	5	Kind
Uncooperative	1	2	3	4	5	Cooperative
Selfish	1	2	3	4	5	Unselfish
Rude	1	2	3	4	5	Polite
Disagreeable	1	2	3	4	5	Agreeable
Distrustful	1	2	3	4	5	Trustful
Stingy	1	2	3	4	5	Generous
Inflexible	1	2	3	4	5	Flexible
Unfair	1	2	3	4	5	Fair

Conscientiousness

	Very	Moderately	Neither	Moderately	Very	
Disorganized	1	2	3	4	5	Organized
Irresponsible	1	2	3	4	5	Responsible
Undependable	1	2	3	4	5	Reliable
Negligent	1	2	3	4	5	Conscientious
Impractical	1	2	3	4	5	Practical
Careless	1	2	3	4	5	Thorough

Lazy	1	2	3	4	5	Hardworking
Extravagant	1	2	3	4	5	Thrifty
Rash	1	2	3	4	5	Cautious
Frivolous	1	2	3	4	5	Serious

Emotional Stability/Neuroticism

	Very	Moderately	Neither	Moderately	Very	
Angry	1	2	3	4	5	Calm
Tense	1	2	3	4	5	Relaxed
Nervous	1	2	3	4	5	At ease
Envious	1	2	3	4	5	Not envious
Unstable	1	2	3	4	5	Stable
Discontented	1	2	3	4	5	Contended
Insecure	1	2	3	4	5	Secure
Emotional	1	2	3	4	5	Unemotional
Guilt-ridden	1	2	3	4	5	Guilt-free
Moody	1	2	3	4	5	Steady

Intellect/Openness

	Very	Moderately	Neither	Moderately	Very	
Unintelligent	1	2	3	4	5	Intelligent
Imperceptive	1	2	3	4	5	Perceptive
Unanalytical	1	2	3	4	5	Analytical
Unreflective	1	2	3	4	5	Reflective
Uninquisitive	1	2	3	4	5	Curious
Unimaginative	1	2	3	4	5	Imaginative
Uncreative	1	2	3	4	5	Creative
Uncultured	1	2	3	4	5	Cultured
Unrefined	1	2	3	4	5	Refined
Unsophisticated	1	2	3	4	5	Sophisticated

Appendix B. Pilot Study Descriptive Statistics

Variable		No.	(%)
Gender	Male	20	66.70
	Female	10	33.30
Age	18-25	2	6.70
	26-35	14	46.70
	36-50	11	36.70
	51 or older	3	10.00
Education Level	High school	0	0.00
	Diploma	2	6.70
	Bachelor's degree	9	30.00
	Master's degree	13	43.30
	Doctorate/PhD or higher	6	20.00
Income Level	$0 - $50,000	5	16.70
	$51,000 - $100,000	12	40.00
	$101,000 - $150,000	5	16.70
	$151,000 - $200,000	4	13.30
	$201,000 - $300,000	2	6.70
	$300,000	2	6.70
Familiarity Level with Blockchain Technology	Slightly familiar	5	16.70
	Moderately familiar	13	43.30
	Very familiar	8	26.70
	Extremely familiar	4	13.30

Table 5 Pilot Study Descriptive Statistics

VITA

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