

Article

The Adoption of Robo-Advisory among Millennials in the 21st Century: Trust, Usability and Knowledge Perception

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Abstract: Robo-advisor has become the new personal wealth management and investment method. Nonetheless, certain predicaments are faced by robo-advisor companies as a tech-savvy young group of individuals seems to be less willing to adopt robo-advisory. This study investigates millennials' adoption of robo-advisory in terms of financial knowledge, trust and usability perception in the 21st century to enhance sustainability. This quantitative study focuses on individuals belonging to the millennial generation who were born between 1981 and 1996. The findings indicate that the millennials who possess financial knowledge, as well as perceived usability and trust have a significant positive effect on the willingness to embrace robo-advisory as a tool for wealth management. The higher the financial knowledge of an individual, the more likely they are willing to adopt a robo-advisor. Government may provide appropriate avenues to enhance financial knowledge, and credible and user-friendly platforms with resources to boost the millennials' usage of robo-advisors for their wealth management. With robust artificial intelligence, robo-advisory continues to support users, especially millennials, through three dimensions of sustainable development: environment, society, and economy.

Keywords: financial; FinTech; millennials; robo-advisory; technology



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1. Introduction

Technology has become the key to breaking the barrier of new entrants into the banking and financial services industry. Thus, the conventional banking industry is facing intensifying competition. Competition becomes more intense by having technology companies in the game plan, thus creating an intersection between finance and technology called 'FinTech' [1]. FinTech has built new business models that compete fiercely with established banking operations. The financial industry is undergoing substantial innovation because of technological novelty and digitalisation. With the transformation of investors' behaviours globally, not only millennials but older generational cohorts are embracing an unforeseen facility in all aspects of digitisation in everyday life. FinTechs are nearer to their clients and can commence from nothing. Compared to conventional banks, they are not burdened with regulatory requirements [1]. Reference [2] affirmed that FinTechs are young organisations and these organisations are still finding their base in the market space. The demand for flexible, personalised investment propositions such as goal-based investing (GBI) has caused robo-technology to become the mainstream supporting the goal-based decision-making process. Robo-advisors enable lay investors to make sustainable investments in a simple and convenient way [3].

People often rely on smart devices to communicate and stay connected nowadays. Robo-advisors (also spelt robo-adviser or robo-advisor) are digital platforms that provide automated, algorithm-driven financial planning services with little to no human supervision. A typical robo-advisor collects information from clients about their financial situation and future goals through an online survey and then uses the data to offer advice and automatically invest client assets [4]. Although robo-advisory is revolutionary, adoption has been slower than anticipated. This may be attributed to customers' doubts about the utility of robo-advisors, poor trust in banks, and high expectations of transparency, according to many studies, such as [1,4]. Robo-advisors are acknowledged as important disruptive trends in the asset and wealth management sector. Robo-advisor is a well-known buzzword with growth prospects, and it was projected that robo-advisors will be managing investments worth between USD 0.8 and USD 8.1 trillion by 2020 [5,6]. This is within 1–10% of the world assets being managed. Antecedently, in 2017, it was reported that the world assets comprised about USD 226 billion while the number of users was about 12 million [5]. During COVID-19, new account openings for robot advisors increased significantly. Wealthfront, a pioneer in robo, reported that since the recession started, account sign-ups had increased by around 68%. Users of robo-advisors exhibit a higher propensity for risk and trade more frequently than nonusers [7].

When the level of involvement of the investment is high, consumers tend to seek more personalised and tailored financial advice, and they may feel more comfortable consulting with a human financial advisor rather than relying solely on digital or automated advice, like robo-advisory [8]. On the other hand, according to [9], robo-advisor users in Sweden, Norway, and Finland who are less rich, female, and older aspire to become sustainable investors and have low risk tolerance and a short investment horizon. Nonetheless, their study excluded from the analysis other variables that might be relevant, such as financial literacy, digital literacy, and prior knowledge in investment.

The objective of this research is to investigate the relationship between financial knowledge, perceived usability, and perceived trust among millennials and their adoption of financial robo-advisors. In order to understand the factors that might affect the adoption of Malaysian millennials towards robo-advisors and gain insights on their willingness to robo-advisory, the following research questions are set forth: (1) Does having financial knowledge on financial robo-advisors affect the millennials' willingness to adopt them? (2) Do perceived usability and perceived trust of financial robo-advisors affect the millennials' willingness to adopt them?

This study contributes to the literature on the millennials' willingness to adopt robo-advisor by investigating their financial knowledge, perceived usability, and perceived trust. This study is noteworthy as the dynamic and ongoing revolution in Malaysia's FinTech sector has been attracting greater attention than ever before. The Malaysian Budget 2019 for the first time featured a financial technology project and e-wallet payment to promote digital inclusion, with an emphasis on millennials in particular. In Malaysia, there is a dearth of study concerning robo-advisors, notably on customer awareness and understanding [10] and the adoption of robo-advisors among Malaysian retail investors remains relatively low [11]. In this study, we conducted a Likert-scale survey encompassing 86 volunteers and used Pearson correlation and regression analysis to analyse the survey results. Millennials are frequently described as being more adaptable to change and technologically savvy than preceding generations [11]. The millennial generation comprises individuals who were born between 1981 and 1996 and are currently between the ages of 26 to 41 years old. It was observed that there is a paucity of academic literature in the context of Malaysia's FinTech space and the millennials' willingness to adopt them. Addressing this gap forms part of the study's motivation. Hence, this study attempts to bridge the gap by narrowing to three variables in investigating the adoption of robo-advisors among millennials. Furthermore, this study may aid robo-advisor providers to develop their business strategies together with assisting the government to improvise the blueprint for national financial inclusion. A central bank of Malaysia, namely, Bank Negara Malaysia via its Financial Sector Blueprint

2022–2026, specified the three key strategies to elevate financial well-being for Malaysian adults. One of the key strategies is to enhance financial capability and accessibility and promote effective use of financial services towards greater financial inclusion. Emerging financial service applications empowered by artificial intelligence, such as robo-advisory, are already gaining market acceptance; however, the percentage of financial knowledge of Malaysian adults is lower than 26 other countries [12].

The result of the study shall assist the robo-advisor providers and government on the millennials' financial knowledge, usability, and trust, as these three main areas are among the elements stated in the BNM Financial Sector Blueprint 2022–2026. The government and robo-advisor providers may develop appropriate advance programs to furnish millennials willingness to adopt a robo-advisor for managing their wealth. The higher the financial knowledge of an individual, the more likely the individual is willing to adopt robo-advisors. However, individuals with lower financial knowledge may require additional education and resources to fully understand how robo-advisors work and their potential benefits. Trust can be built through transparent information and disclosure, and perceived usability can be enhanced through a user-friendly interface and clear instructions. Users need to feel comfortable using the platform and understand how to navigate it to achieve their investment goals. Users need to trust the robo-advisor's recommendations and feel confident that the algorithms are reliable and will work in their best interest. Users may also trust robo-advisors that are backed by reputable financial institutions or have a strong track record in the industry. All three factors can play a crucial role in determining an individual's willingness to adopt a robo-advisor.

This part of our report, Section 1, discussed the background and the context of this study, the problem statement, the objectives, research gap, and its relevance and significance. A review of the literature pertaining to the constructs, the overview of robo-advisory, artificial intelligence in finance and FinTech, adoption intentions for robo-advisors, and the effect of COVID-19 on young, tech-savvy investors are all explained in Section 2. The proposed research framework and the development of hypotheses are presented in Section 3. The data analysis and findings are reported in Section 4. The discussion resulting from the analysis of this study is deliberated in Section 5. Section 6 outlines the recommendation to the government and robo-advisors' providers, and Section 7 identifies the limitations of the study and makes recommendations for future investigation. The overall conclusion of this study is presented in the final section.

2. Literature Review

The constructs of this proposed research framework are financial knowledge, perceived usability, perceived trust, and willingness to adopt robo-advisory. This chapter reviews related research on robo-advisory (Section 2.1), artificial intelligence in service (Section 2.2), adoption intention towards robo-advisors (Section 2.3), and the effect of COVID-19 on young tech-savvy investors (Section 2.4). The research context of the study refers to the millennials in Malaysia who are the growing demographic group and often known as the early adopters of new technologies and innovations. The state of COVID-19 has shown an increase in sign-up for robo-advisors as these young investors are finding ways to improve their financial wellbeing. Understanding their financial knowledge, usability, and trust perception towards robo-advisory services may provide important insights into the potential growth of this industry, and how it can best serve the needs of younger generations. The outcome from the study can aid robo-advisory providers to enhance their services and for the government to develop beneficial initiatives for this millennial group.

2.1. Related Research on Robo-Advisory

The growing trend of scholarly literature on FinTechs and robo-advisory, such as [3,13–17], indicates a fast pace of evolution. These scholars offer overviews that assist in navigating and provide a better understanding of the various business models and services skills associated with FinTechs and robo-advisor. Using 5-point Likert scale

questionnaires, a study on robo-advisory acceptance was undertaken by [15] with a focus on online, self-selected North American, British, and Portuguese adults who were born between 1946 and 1997. Willingness to use robo-advisors may be increased with positive emotions expected from use, while decreased by anticipated negative emotions, and that the relationship may be altered by inducing individuals' self-enhancement motives [15].

According to [18], Americans who used robo-advisor advice displayed a low level of financial literacy. Owing to their tech savvy, robo-advisor users are typically younger investors. These younger individuals choose robo-advisory because it is affordable and otherwise difficult to locate a trusting financial advisor, and they are less inclined to turn to human financial advisors for assistance [18–20]. Robo-advisor users are the most afraid to be victimised by investment fraud [18,21]. However, according to [22,23], investors using FinTech-related products have a lower level of financial literacy. In conformity with a study undertaken by [2], a household's inclination to convert to FinTech is influenced by its level of trust and comfort with new technology, financial literacy, and general transparency. They discovered that financial knowledge, preferences for transparency, and trust are germane variables for making decisions. Specifically, households with low levels of trust, good financial education, and preference for transparency are characterised by a higher probability of adopting FinTech. Robo-advisor users, especially those who are less rich, with low risk and a short investment horizon, may choose to become sustainable business owners [9].

Perceived usefulness and customisation do not directly influence the intentional behaviour, however, the easiness of use, trust, mobility, and customer involvement influences the behavioural intention of the customer to use technology in their purchasing [24]. The results from partial-least-square-structural-equation modelling (PLS-SEM) conducted by [10] revealed that there was lack of the usability in terms of productivity and the effectiveness in investment management. Their respondents were from all ranges of age above 18 years old, inclusive of three generations. It is worth mentioning that attitude was found to be the strongest predictor of behavioural intention to adopt robo-advisors, followed by perceived usefulness, subjective norms, perceived behavioural control, and, lastly, perceived risk [11].

2.2. Artificial Intelligence in Service

Artificial intelligence (AI), as used in the finance sector, includes chatbot assistants for fraud detection and task automation. Major financial institutions, especially banks, are aware of the possible advantages associated with AI. This assertion was corroborated by Insider Intelligence's AI in banking report [25]. Studies have shown that the decision for financial organisations to adopt AI is fully facilitated by digitalisation via technological innovation, increased user acceptance, and feasible regulatory frameworks. Banks that use AI could immensely enhance their client experience by offering uninterrupted 24/7 access to their banking activities and financial advisory services. Millennials are a generation that values convenience, customisation, and connection. The shift from conventional banking services to online and mobile banking via innovative technology is well accepted. Insider Intelligence projected that adoption of online and mobile banking services among United State of America consumers will rise to 72.8% and 58.1%, respectively, in 2024. This projection makes AI implementation and acceptance crucial for financial organisations, especially banks, to be reliable and competitive in this dynamic sector [26].

Information-based investments are rapidly growing, especially in the financial and banking sectors. Reference [27] discovered that the inclination of clients to use robo-advisors was associated with a decrease in their feelings of technological insecurity and an increase in their sense of technological optimism. The finance and banking sectors have become prototypical samples of the AI innovative technological revolution [28]. Thus, financial technology (FinTech) has revolutionised the banking sector by growing client value and organisations' incomes and revenues in the last decade [29,30]. However, the acceptance rate of robo-advisors among clients is poor [15,31]. Robo-advisors offer financial services advice with minimal human interference. This is one unique aspect of the concept.

From the client viewpoint, investing procedures via robo-advisors are modest [15]. The AI system generates individual investment portfolios and offers suggestions regarding the possible risk profile.

2.3. Adoption Intention towards Robo-Advisors

Robo-advisors were developed to advise or manage individual wealth and disintermediate conventional wealth executives by applying the digitisation advantage in daily life [32]. It is an automated investment process with lower overhead expenses [3]. Given their perceived market irrelevance because of millennials' average income, robo-advisors began by appealing rapidly to a broader public of investors, such as affluent and high-net-worth individuals. Human dialogues are highly involved during the traditional investment advisors' era, and it only caters to investors who can afford a full-service advisor. Now, robo-advisory is a kind of new investment tool that is becoming a great instrument to individuals, as presented in Figure 1 [33]. Information asymmetry is declining due to easier and faster access to information, reducing transaction overhead. Nowadays, fully automated investment vehicles, namely Algorithmic Trading or AlgoTrading, provide modern mediums to investors [3]. In the findings reported in [34], it was discovered that customers prefer excellent human financial managers with high financial proficiency to robo-advisors.

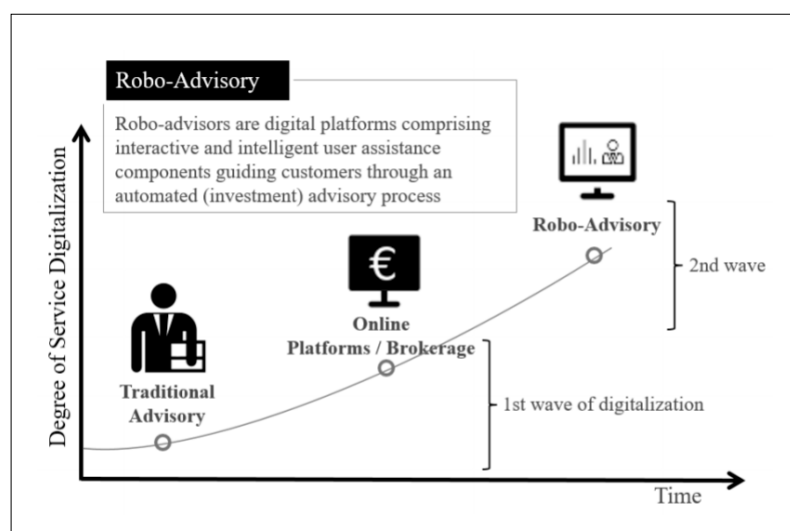


Figure 1. The digitalisation of financial advisory services towards a digital platform.

Reference [35] points out that individualisation is the most germane feature of robo-advisors compared to conventional (human) advisory services. It was resolved that investors' learning can be increased by using IT-supported advice-giving, which assists them in deriving further knowledgeable decisions related to financial products [36]. Implementation of robo-advisors is pertinent to maintaining existing customers and to capture new customers [15]. This study shows the usability of robo-advisories is in high demand. However, customers have low trust in banking services but a high expectation of transparency [37].

2.4. Impact of COVID-19 on Young Tech-Savvy Investors

Mobile-based platforms form an ease of use that assists wealthy millennials in investing rightly. This is because the operations including account opening, funding, and fund managing can be performed via phone [38]. Millennials of the United States are twice as likely as older conventional investors to consider using robo-advisors [39]. Even as COVID-2019 concerns have disembowelled the financial markets, especially the banking sector, for the past two years, there has been a new account opening surge regarding robo-investment. Reports from Bloomberg cited increasing numbers from numerous firms with

robo-offerings background. For example, in TD Ameritrade's automated investment, new account openings offering surged 150% from last year's period. Robo-pioneer Wealthfront affirmed that new account sign-up is about 68% higher since the downturn began [7]. This may be a welcome development for the financial industry.

In Malaysia, the COVID-19 lockdown stimulated a boost in retail investors. In April 2020, the digital equities platform Rakuten Trade reported 11,000 new accounts that were activated during the movement control order (MCO). The MCO was a government order to restrict persons' movement as a measure to prevent or mitigate the spread of the pandemic. About 64% of the new accounts were opened in Malaysia's first two weeks of the MCO. Innovation and technological advancements have changed how investors interact with the capital market within the Malaysian investors' population. The Malaysian industry advances to meet the diverse needs of investors in line with global best practices. One way the investors' diverse needs have been met is through digital-only brokers that can cater to investors searching for no-frills services, an algorithmic trading environment, and multi-asset brokers for erudite investors [40]. COVID-19 has drastically changed the decisions and behaviours of most investors. As the market began to slide in early 2020, people started saving more money and looking for easy investment alternatives. Thus, we can see the spike in the sign-up for robo-advisors as these young investors were finding ways to improve their financial wellbeing with the belief that robo-advisors can help them make better and wiser investment decisions [41].

Owing to COVID-19 and the associated restrictions, digital working methods are increasingly becoming the focus of domestic companies. Information technology is crucial for providing current and reliable data [42]. High-level information and customer services have the power to immediately boost trust and lower perceived risk. The COVID-19 pandemic and other disruptions have had a significant impact on the use of IT technologies [43].

3. Research Method

This chapter describes the research methodology and research design that have been employed in this study to achieve the research objective. The research activities are described in detail, including the population of interest, sampling frame, survey instrument, data collection procedures, and data analysis method.

3.1. Framework and Hypothesis

Based on findings and suggestions from the literature and related research, a conceptual model was developed. The model, which is illustrated in Figure 2, describes relationships hypothesised in the previous section. Measures were chosen and specified based on prior research that employed similar measures to understand the adoption and use of technology in a range of sectors. However, the variables of other studies are considered broader. Thus, this is the first study narrowing to three selected independent variables, which are financial knowledge, perceived usability, and perceived trust. These are depicted in the conceptual model shown in Figure 2.

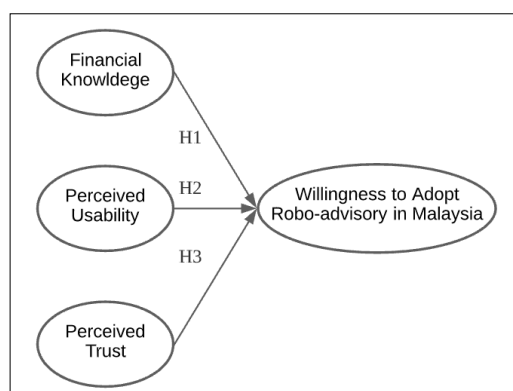


Figure 2. Conceptual model.

3.1.1. Financial Knowledge

Financial knowledge, also known as financial literacy, covers a basic understanding of the economy and how the economic decisions of households are taken in the context of the changing economic environment. 'Financial education,' 'financial literacy,' 'economic literacy' means 'the need possession of knowledge, skills, and behaviours of individuals' ability to make informed decisions about banking, lending and investment, to make daily decisions on managing and making competent and accurate decisions [44]. Robo-advisory was invented with a low fee structure to enable tech-savvy millennials without specialised financial knowledge to participate. The study discovered that financial knowledge has a significant influence on financial behaviours. For example, persons with sound financial knowledge were discovered to be more likely to engage or contribute to financial markets and invest in stocks [45]. Findings revealed that there is a relationship between financial knowledge and the adoption of robo-advisors. Financial knowledge is referred to as the consumer's self-assessed and perceived financial knowledge [45]. Thus, this study presents the following hypothesis:

H1. *There is a positive relationship between having financial knowledge of financial robo-advisors and the millennials' willingness to adopt them.*

3.1.2. Perceived Usability

The growth of robo-advisory will surge if potential customers perceive the system as advantageous and easy to use [46]. People will tend to start adopting new technologies in their life if they have a strong belief that the technologies provided will be able to assist them in any form. A distinguishing feature of robo-advisors is more 'personalisation' when compared with the existing method of traditional human advisory [35]. It was also mentioned by the previous study [36] that customers' understanding is increased by adopting robo-advisory, which also fastens their informed decision related to personal finance and investment [15]. As a result of technological advancement and digitalisation, the number of wireless internet-enabled gadgets has greatly expanded in tandem with the pandemic environment [24]. Based on these considerations, this study hypothesised:

H2. *There is a positive relationship between the perceived usability of financial robo-advisors and the millennials' willingness to adopt them.*

3.1.3. Perceived Trust

Trust is crucial regarding robo-advisors and AI service because they are self-service technologies [47]. Regarding self-service technology, developing social rapport and relationship building with clients are missing [48]. Nevertheless, when a new technology is not useful and seems highly risky to the system, it is improbable that it will be used except if it is promoted through specific measures that can change the users' perceptions towards it [49]. Trustworthiness of new technologies is important to ensure their monetary information is safe from security breaches during transmission and storage, as this financial information is highly personal and sensitive [50]. Moreover, reference [51] describes a positive relationship between trust and intention to adopt new financial technologies. The authors discovered that people who believe the new technology will fulfil its objectives and would be likely to develop positive perceptions towards it and therefore adopt it. Additionally, trust was discovered to be an important construct in the commercialisation of the internet for the adoption of online banking services [49]. Therefore, hypothesis 3 follows:

H3. *There is a positive relationship between the perceived trust of financial robo-advisors and the millennials' willingness to adopt them.*

3.2. Research Design

This study employed quantitative methodology and a non-probability sampling such as convenient sampling. Quantitative technique was used to test the hypotheses and subsequently answer the research questions. Non-probability sampling is suitable for gathering data from millennials who have heard about robo-advisory before or at the very least have some basic savings or investing experience. Online survey forms were distributed to Malaysian respondents who were born between 1981 and 1996 through groups on social media sites such as Facebook, Telegram, and WhatsApp. The data collection was conducted during the movement control order (MCO) due to pandemic COVID-19; therefore, social media was the best platform to reach out to respondents.

Non-probability sampling is a sampling technique where the researcher does not give an equal chance to all members of the target population to be part of the study. Nonetheless, non-probability sampling allows for the inclusion of individuals who may not be included in a random sample [52]. A sampling method known as convenience sampling, which was used in this study, involves selecting participants based on their ease of accessibility. In market research and other social science studies, researchers commonly use this sampling method in which participants voluntarily choose to take part in the study after the researcher has announced it [53]. The selection of participants for robo-advisory through convenience sampling entails choosing individuals who are readily available and willing to take part in the study. Potential respondents could comprise current customers of the robo-advisory service, individuals who have shown interest in it, or those recommended by current customers. Convenience sampling aims to acquire a sample of participants who can furnish valuable feedback regarding the robo-advisory service [54,55].

A total of 86 usable responses were obtained after filtering 100 responses, which 14 responses were not from the millennials category. Thus, this represents a response rate of 86% for the study. This sample size satisfied the minimum sample size based on G*Power, which was 77. The usage of power analysis for sample size calculation has been proposed by most of the studies [56,57]. G*Power estimates that the minimum sample size required for three predictors is 77 by using an effect size at 0.15 (medium effect), alpha (α) at 0.05, and power at 0.80, which were the input parameters [58]. This is the most common recommended setting for social and business science research [56].

Quantitative research assists the researcher to establish statistical evidence on the strengths of relationships between both exogenous and endogenous constructs. The self-administered questionnaires prepared in this study provide the option to the respondents to complete the questionnaires at their convenience. The respondents' ability to remain anonymous and be truthful in their responses is crucial when using this strategy [59]. The respondents in this study were between 26 to 41 years old and they must have had online banking experience. The questionnaire included a short description of a robo-advisor. For the respondents to comprehend the idea and functionality of the robo-application advisor's platform, a link to a two-minute video was provided. A few links of robo-advisor platforms were provided for the respondents if they wanted to assess without being bias of certain platform such as Wahed, AkruNow, Raiz, and StashAway.

The data of this study were compiled using Excel, and the analysis was completed by using by the Statistical Package for Social Sciences (SPSS). The measurement items used in designing the questionnaire consisted of close-ended multiple-choice questions on a 5-point Likert scale in which the respondents were asked to rate between 1 to 5, ranging from (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, to (5) strongly agree. The 5-point Likert scale is used to measure the strength of a person's agreement or disagreement with a statement. It is a widely used instrument in survey research to gauge respondents' attitudes, opinions, and perceptions. The 5-point scale is used because it provides good balance between the number of response options and the ability to differentiate between them. Additionally, it permits a more precise evaluation of a person's views than a 3-point scale. The 5-point Likert-type scale was used to increase response rate and response quality [60,61]. Means, standard deviations, item-item correlations, item-total

correlations, Cronbach's alpha, and factor loadings of distinct point of Likert scales do not significantly differ from one another in terms of internal structure [62].

From the literature review and conceptual framework, three independent variables were selected: financial knowledge (FK), perceived usability (PU), and perceived trust (PT), while willingness to adopt (WA) was a dependent variable. Five items were designed to measure each variable: financial knowledge, perceived usability, perceived trust, and willingness to adopt a robo-advisor. All the items were adapted from preceding research to fit well into the context of robo-advisors, as demonstrated in Table 1. Adapting an existing questionnaire allowed for improvements to be made to the instrument. The final version of the questionnaire was established after minor amendments were made following the pilot test with 33 respondents and reviewed by an academic expert and industry practitioner. Some changes were made to the wording of the questions to improve clarity and better capture the constructs of interest.

Table 1. Sources of questions used for each independent variable.

Variables	Sources
Financial Knowledge (FK)	[45,63,64]
Perceived Usability (PU)	[15]
Perceived Trust (PT)	[49,65]
Willingness to Adopt (WA)	[66]

4. Data Analysis and Findings

Table 2 shows that out of the 100 questionnaires collected, only 86 respondents are millennials aged from 25 to 40 years old. There are 48.8% (N = 42) female respondents, slightly lower than 51.2% (N = 44) male respondents. Most respondents, 51.2% (N = 44), possess a bachelor's degree, followed by 22.1% (N = 19) with high school qualification, 14% (N = 12) with a master's degree, and 12.8% (N = 11) with a Ph.D. or professional certification equivalent. Most of the respondents are full-time employed, 61.6% (N = 53), followed by self-employed at 15.1% (N = 13), and part-time employed at 12.8% (N = 11); 10.5% (N = 9) of the respondents are unemployed due to the COVID-19 pandemic. Concerning their monthly income, most respondents 45.3% (N = 39) have a monthly income that ranges from MYR 3000 to MYR 5000; 16.3% (N = 14) have a monthly income that ranges from MYR 10,001 to MYR 15,000; 7% (N = 6) have a monthly income below MYR 3000; and 2.3% (N = 2) have a monthly income more than MYR 15,000. The profile reveals that 68.8% (N = 59) of the respondents currently use robo-advisors, while 31.4% (N = 27) of respondents have never used robo-advisors.

Table 2. Respondent profile (N = 86).

		Frequency	Percent
Gender	Female	42	48.8
	Male	44	51.2
	Total	86	100.0
Education	High school	19	22.1
	Bachelor degree	44	51.2
	Master degree	12	14.0
	Ph.D./Professional Certification	11	12.8
	Total	86	100.0
Employment	Employed full-time	53	61.6
	Employed part-time	11	12.8
	Self-employed	13	15.1
	Not employed	9	10.5
	Total	86	100.0

Table 2. Cont.

		Frequency	Percent
Monthly Income	Below MYR 3000	6	7.0
	MYR 3000–MYR 5000	39	45.3
	MYR 5001–MYR 10,000	25	29.1
	MYR 10,001–MYR 15,000	14	16.3
	Above 15,000	2	2.3
	Total	86	100.0
Prior Experience	No	27	31.4
	Yes	59	68.6
	Total	86	100.0

4.1. Descriptive Analysis

It is found that perceived trust (PT) has the highest mean, 3.900, followed by financial knowledge (FK), 3.886, and perceived usability (PU), 3.818, while the mean of the dependent variable, willingness to adopt (WA), is 3.756. As presented in Table 3, perceived usability (PU) has the lowest standard deviation, 0.8212, 0.8448 for financial knowledge, and 0.871 for perceived trust. Willingness to adopt, which is the dependent variable (WA), has a standard deviation of 0.885.

Table 3. Descriptive statistics.

		Mean	Std. Deviation
FK1	I understood the concept of robo-advisors.	3.91	0.777
FK2	I understood my financial goal when investing with robo-advisors.	4.02	0.881
FK3	I understood my risk tolerance for investing with robo-advisors.	3.94	0.886
FK4	I am able to keep close track of my money affairs using robo-advisors.	3.58	0.913
FK5	I believe robo-advisors make investing easier.	3.98	0.767
	OVERALL	3.886	0.8448
PU1	I would find robo-advisors useful in managing investments.	3.84	0.824
PU2	I believe robo-advisors would improve my performance in managing investments.	3.80	0.823
PU3	I believe robo-advisors would improve my productivity in managing investments.	3.76	0.839
PU4	I believe robo-advisors would enhance my effectiveness in managing investments.	3.77	0.850
PU5	The advice offered to me is relevant based on my risk tolerance and goals.	3.92	0.770
	OVERALL	3.818	0.8212
PT1	I feel comfortable relying on the advice offered to me.	3.64	0.944
PT2	The advice offered to me has nothing to gain by being dishonest with me.	4.06	0.845
PT3	The advice offered to me has nothing but the client's interest.	4.06	0.845
PT4	I feel safer that there is an advisor that is making this financial decision with me.	3.86	0.948
PT5	I believe robo-advisory services can be trusted.	3.88	0.773
	OVERALL	3.900	0.871
WA1	I could imagine using a robo-advisor as a means of financial management.	3.81	0.805
WA2	I am willing to invest with a robo-advisor.	3.80	0.931
WA3	I could imagine using a robo-advisor instead of a human financial advisor.	3.76	0.894
WA4	I am confident to use robo-advisor to reach my financial goal.	3.64	0.932
WA5	I would recommend friends and family to try robo-advisors.	3.77	0.863
	OVERALL	3.756	0.885

4.2. Pearson's Correlation Analysis

Pearson correlation analysis was employed to identify the relationships between each variable. The correlation is used to measure the degree of the linear relationship between two variables and ranges from -1 to $+1$, where the negative coefficient represents a negative linear relationship between two variables, and the positive coefficient represents a positive linear relationship between two variables. Referring to Table 4, it can be concluded that the independent variables have a strong positive linear connection with the dependent

variable, which is a willingness to adopt (WA). Perceived usability (PU) shows the strongest relationship with a willingness to adopt (WA)—a correlation of 0.894, while perceived trust (PT) shows a positive relation of 0.858. On the other hand, compared to the others, financial knowledge (FK) shows the lowest correlation of 0.837 with a willingness to adopt (WA). Nonetheless, all three independent variables show a high positive correlation with the dependent variable, willingness to adopt (WA). All of the correlations between the four variables are positive, indicating that as one independent variable increases, the others tend to increase as well. This indicates that these variables have a strong causal relationship.

Table 4. Pearson’s correlations.

	FK	PU	PT	WA
FK	1	0.815 **	0.818 **	0.837 **
PU	0.815 **	1	0.848 **	0.894 **
PT	0.818 **	0.848 **	1	0.858 **
WA	0.837 **	0.894 **	0.858 **	1

** Correlation is significant at the 0.01 level (2-tailed).

4.3. Regression Analysis

Table 5 shows that the coefficient of determination (R^2) is 0.849. The R^2 indicates that 84.9% of the willingness to adopt (WA) for robo-advisors can be explained by the three independent variables used, which are financial knowledge (FK), perceived usability (PU), and perceived (PT). The standard error of the model, 0.32956, is relatively small. This reveals that the model’s spread is low and that the sample mean lies near the population mean.

Table 5. Result of multiple regression.

Variables	Standardised Coefficients	Statistical Significance Level
Financial Knowledge	0.227	0.006
Perceived Usability	0.492	0.000
Perceived Trust	0.255	0.005
F	42.84	0.000
R^2	0.849	
Adjusted R^2	0.844	

Note: dependent variable is willingness to adopt.

Based on the standardised coefficients beta, all independent variables move in the same direction as the dependent variable, willingness to adopt (WA), as all the betas are positive. All independent variables have significantly less than the probability, 0.05 (5%), which shows that financial knowledge (FK), perceived usability (PU), and perceived trust (PT) are significant variables for the model. The variance inflation factor (VIF) for all three independent variables showed that all of them are moderately correlated to one another, whereas VIF is best to be at 1, as it is not correlated to other variables. The regression analysis showed that all independent variables, financial knowledge (FK), perceived usability (PU), and perceived trust (PT), are significant to the dependent variable, willingness to adopt (WA) at a 5% significance level. Thus, all three hypotheses, $H1$ (FK), $H2$ (PU), and $H3$ (PT), are accepted as they are statistically supported.

Perceived usability (PU) has the strongest relationship with the dependent variable, as indicated by its highest standardised coefficient (0.492) and the lowest significance level (0.000). Financial knowledge (FK) and perceived trust (PT) also have a significant relationship with the dependent variable, although their coefficients are smaller than PU’s and their significance levels are slightly higher. F-test is very large (42.84) and significant at the 0.000 level, indicating that the regression model as a whole is significant and provides a good fit to the data. The results reach statistical significance at both the 0.01 level ($p > 0.01$) and at the 0.05 level ($p < 0.05$).

5. Discussion

The multiple regression analysis and reliability test have proven that the model studied is fit and all three independent variables, financial knowledge (FK), perceived usability (PU), and perceived trust (PT), have a significant positive relationship with the dependent variable, willingness to adopt (WA). There is a strong positive relationship between having financial knowledge of financial robo-advisors and the millennials' willingness to adopt them. Previous studies have also discovered that financial knowledge significantly impacts financial behaviours, especially when making economic decisions [46,49,65,67]. For example, persons with sound financial knowledge were discovered to be more likely to engage in financial markets and invest in stocks. Financial-savvy individuals tend to seek robo-advisors. Nonetheless, this finding contradicts the findings of [33], who discovered that clients prefer excellent human financial advisors. Users' financial knowledge, such as their understanding of investment concepts, risk, and financial products, can affect their ability to use robo-advisors effectively. Users with higher financial knowledge may be more likely to understand and trust the advice provided by robo-advisors, while those with lower financial knowledge may require more education or assistance to use the technology.

Perceived usability significantly impacts the millennials' willingness to adopt robo-advisors. The finding corroborates with [35,46,47], who found that the possibility of utilising robo-advisory increases for persons who observe that the serviceability of robo-advisory is better than human advisory. This is also conforms with the findings of [36], which concluded that IT-supported, advice-giving processes increase customers' learning, enabling them to make more informed decisions related to personal finance and investment. Adopting a system such as robo-advisory would increase if persons perceived the digital financial platform as helpful and easy to utilise. Users may be less likely to use robo-advisors if they find the technology difficult to navigate or understand. Understanding the usability of robo-advisors can help financial service providers design more effective and user-friendly platforms that increase consumers' engagement with the technology.

The finding demonstrated that the perceived trust predicted the millennials' willingness to adopt robo-advisors. This finding coheres with [50], who stated that the trustworthiness of new technologies is vital to ensure that the financial information is safe from security breaches during transmission and storage. Investigation conducted by [51] has revealed a favourable correlation between trust and the inclination to adopt new financial technologies. Their study indicates that the individuals who have faith in the new technology will accomplish its goals and are more likely to develop a positive attitude towards it and adopt it. This finding also parallels prior studies [46,47,54,63] that confirmed the growth and adoption of internet banking services are highly based on consumers' trust. When robo-advisory becomes more common in the future, more people will start to understand its concept, and thus begin to accept and adopt robo-advisory. When customers have high levels of perceived trust in a robo-advisor platform, they are more likely to use it for their financial planning and investment needs, and to continue using it over time.

6. Recommendations

The impact of COVID-19 and government initiatives that significantly boosted the adoption of technology-enabled financial services should be considered as one of the primary drivers for adopting robo-advisory in Malaysia and to gain a sound thoughtful of the intention of adoption. It would be more interesting to observe the adoption of robo-advisory in Malaysia for millennials and all age groups. This study was made by analysing the consumers' perception. Thus, it would be stimulating to examine the organisations offering robo-advisory and their perspective concerning consumer adoption, and how they could better fulfil the consumers' desires to receive a quicker adoption.

This survey assumed that the respondents were aware of the existence of robo-advisors. However, respondents may have varied understandings in terms of completeness and accuracy. A possible direction for future study is to offer a brief description of robo-advisors together with a visual aid or an interactive example to define and examine how

robo-advisors operate. This would ensure that all respondents have a similar thorough level of understanding of the robo-advisor before answering the survey.

This study has several limitations. Firstly, the sample size was relatively small, which may limit the generalisability of the results. Secondly, this study only focuses on the knowledge of millennials and does not consider the knowledge and experiences of other generations. Therefore, the findings of the study may not be applicable to other generations. Thirdly, the study ignores the perspectives of those with various cultural origins, which can provide different findings. Finally, this study does not address the issue of affordability for those who may not have the financial resources to pay for such services.

7. Conclusions

To conclude the study, the higher the financial knowledge of an individual, the more likely they are willing to adopt robo-advisors. Financial knowledge can be enhanced by keeping up to-date on the financial market information, and having financial goals and risk-acceptance. Trust can be built through transparent information and disclosure, and perceived usability can be enhanced through a user-friendly interface and clear instructions. All three factors can play a crucial role in determining an individual's willingness to adopt a robo-advisor. Robo-advisory is a novel innovation that aims to provide low-cost personal investment services for everyone by using algorithms.

In Malaysia, robo-advisory is still between the early adopter and early majority phases, where increasingly more people realised the importance of financial planning during the COVID-19 crisis and started to explore different kinds of investment or savings tools. Although it is proven that Malaysia is relatively slow in adopting robo-advisory compared to other countries such as the USA and China, COVID-19 has become a game-changer for almost all industries. It facilitates the adoption of technology in our everyday life, no matter at school or workplace. People started to realise the importance of personal finance and having an emergency fund to protect their loved ones, especially if they are the only wage earner in the family.

Based on the analysis conveyed, all three variables studied—financial knowledge, perceived usability and perceived trust—have a significant positive impact on the willingness to adopt robo-advisory as their wealth management tool. Robo-advisor providers may identify new market opportunities to millennials and stay competitive by keeping up with changing customer preferences, emerging technologies, and industry trends. Robo-advisor providers need to establish themselves as thought leaders in the industry, which can help to build brand recognition, attract new customers, and target underserved customer segments.

Governments may provide appropriate avenues to enhance financial knowledge, and offer credible and user-friendly platforms with resources to boost millennials' usage of robo-advisors for their wealth enhancement. As the country's economy continues to progress, wealth management tools such as robo-advisors are created for citizens to pursue life goals and achieve financial independence. Digital financial education programs which aim to increase the awareness of millennials should be covered nationwide. With robust artificial intelligence, robo-advisory continues to support users, especially millennials, through the three dimensions of sustainable development: environment, society, and economy.

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