

Investigating the Influence of Fintech Solutions on Pension Fund Savings Growth in Mexico

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Investigating the Influence of Fintech Solutions on Pension Fund Savings Growth in Mexico

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Abstract

The objective of this research is the factors that influence the adoption of Financial Technology (Fintech) solutions for retirement savings in Mexico. Using a mixed methods approach, data was collected through electronic surveys distributed through social media platforms. Analysing demographic variables, participant perceptions of benefits and ease of use, social influence, and prior use of technology. Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model, chi-square tests and factor analysis were performed to reveal correlations and latent factors. The results confirm the importance of perceived benefits and ease of use in driving Fintech adoption. Social influence and the use of existing technology were also found to affect participants' intention to voluntarily contribute to pension funds. The factor analysis revealed two factors: "Technology in retirement savings management" and "Savings management", showing attitudes and behaviours. The findings contribute to understanding and adopting strategies for Fintech technology and retirement savings in Mexico's evolving financial landscape.

1. Introduction

Pension systems are built on the core idea of giving people financial stability after their working years. Several nations have implemented a range of pension schemes to achieve this goal. Pay-as-you-go, sponsored, and hybrid systems are the three major categories into which these systems may be generally divided. Pay-as-you-go systems rely on payments from current employees to cover the pensions of current retirees. In contrast, funded systems build up savings in individual accounts to pay for future benefits. In the context of pension programmes, voluntary saving is essential for boosting retirement savings. The term "voluntary saving" describes those who actively choose to make additional, voluntary contributions to their pension accounts. It helps people attain more financial stability and fill up any income shortfalls during retirement. Planning successful tactics to increase the growth of voluntary contributions in pension funds requires an understanding of the elements that affect this behaviour.

The pension systems of different countries and regions can differ greatly. In many countries, the government has a significant role in providing retirement benefits, leading to primarily public pension systems. A hybrid system, which mixes public and private elements, has been adopted by several nations, enabling people to pay into private pension funds in addition to receiving benefits from the state. Private pension systems provide people with more options over their retirement funds, such as employer-sponsored pension plans or individual retirement accounts, which are also common in numerous other countries. In addition, people are now more aware of the value of voluntary saving because they want to supplement their retirement income beyond what is provided by mandated pension plans. People can increase their contributions to their retirement accounts through voluntary saving through employer-

sponsored retirement plans or personal savings instruments. As a result, people might make an effort to protect their financial future, making voluntary saving a crucial component of retirement planning.

FinTech solutions have the potential to improve the accessibility, transparency, and effectiveness of pension systems as a result of this innovation, which would increase retirement savings. The Department for Work and Pensions in London (DWP), for instance, claims that the policy has led to a 73% drop in significant events throughout its IT estate. Due to the reduction in user hours wasted from 2% to just 0.03%, a nearly two-orders-of-magnitude gain, the Department has already saved more than one million user hours (IBM, 2021). Additionally, both in the user interface and back-office procedures, Fintech product developments demonstrate faster connections and information processing. which cutting-edge technology will benefit all parties by collaborating with banks. According to Saphyra, Zahra, and Noerlina (2021) "digital finance" refers to a broad range of sophisticated financial products, corporate financing, instruments for managing funds, and contemporary communication techniques like mobile applications.

In this sense and according to the Finnovista Banco Interamericano de Desarrollo BID Invest, (2022), Latin America and the Caribbean have grown 112% since publishing a previous version of the sector analysis in 2018 that shows more easily acclimatise to technological advances. Furthermore, according to the Government of Mexico, the protection and financial security of employees throughout their retirement years are significantly influenced by the pension system. Both the public and private sectors are represented in Mexico's pension system, which is made up of many pillars. The regulations governing pensions for employees connected to the formal and public sectors are managed by the Mexican Institute of Social Insurance (IMSS) and the Institute of Security and Social Services for State Employees (ISSSTE), respectively. Additionally, the System of Retirement Savings (SAR) offers formal sector employees the opportunity to accumulate savings through personal accounts managed by Retirement Fund Administrators (Afores), (Instituto Nacional de Estadística y Geografía (INEGI), 2016).

In this study, the pension system will be examined but emphasising the Mexican scheme, focusing on how the use of fintech solutions may help increase retirement savings. The opportunities and challenges that result from the adoption of financial technology in the pensions industry will be explored. Furthermore, the effect of fintech solutions on participant accessibility, transparency, and participation in the planning and management of their retirement savings will be examined. With the aid of this study, valuable information is sought to promote more financial security for workers entering their golden years and improve the Mexican pension system.

1.1. Research problem and objective

The retirement and pension sector is evolving, moving away from company and government-based retirement planning strategies and towards individual financial responsibility. Government, company, and private pensions were three distinct, non-transferable sources of revenue for its participants up until recently. There is an increasing demand for intelligent wealth management services to augment state benefits because of individuals living longer, healthier lives, younger generations not contributing to private pension systems and insufficient state pensions. Most national government pension programmes are in crisis as a result of this situation. Traditional models, which are mostly defined benefit or final salary

plans, were developed at a period when pensioners were only anticipated to live for roughly ten years after retirement. The industry must assist the end user, the person building and safeguarding his or her retirement assets, when public systems fail, and corporate plans become transferable.

The main problem raised in this pension scheme is the insufficiency of extending contributory pension scheme coverage to meet the needs of the current and soon-to-be elderly populations. Regardless of the goal of boosting coverage, a short-term increase in labour force coverage rates would not offer adequate support for people nearing retirement age. Contributory systems require decades of participation to create reasonable levels of income in old life, and even universal coverage would not allow individuals nearing retirement age to build enough cash for adequate pensions overnight. As a result, new programmes that decouple pension transfers from previous contribution histories are needed to offer improved coverage and poverty protection for the elderly without relying primarily on long contribution periods.

In this context, voluntary savings is an alternative that you make on top of your individual AFORE account that can be used towards a future purchase or investment, or it can increase the amount of money you have set aside for retirement, depending on your goals and priorities using new technology such as digital canals (app, website) where it is possible to see contributions are being made as intended (Comisión Nacional del Sistema de Ahorro para el Retiro, 2022).

To assess the overall effectiveness and long-term viability of fintech-driven pension fund management, more research is required to explore the precise mechanisms by which these solutions affect savings growth, pinpoint the variables that affect participant behaviour and engagement, and identify the factors that influence participant behaviour and engagement. Although current industry and legislative activities have concentrated on financial literacy and educational initiatives, some research indicates that education may not be enough to modify people's financial behaviour (Hentzen, Hoffmann and Dolan, 2021).

Even though financial education can help people manage their daily expenses, more specialized knowledge is needed to make investment and retirement decisions. In this sense, it is necessary to complement retirement education with technological financial tools to ensure that people acquire the knowledge and skills necessary to plan their financial future. However, our findings suggest that the key to understanding what motivates consumers to commit to retirement is to consider their perceptions of their abilities. For this purpose, Fintech has the potential to help pension plans with a variety of governance challenges, including choosing an investment strategy, evaluating, and supervising asset managers, managing member communications, and ensuring that plan records are correct (Hadass, 2021).

1.2. Research questions

This project is research intent to answer the following question:

What factors of Fintech solutions influence the growth of savings in pension funds in Mexico?

To provide an understanding of these variable constructions, the unified theory of acceptance and use of technology (UTAUT) model will be integrated. Hence, this study is structured as

follows: section 2 examines the existing literature; Section 3 describes the methodology; Section 4 explains the Design, 5 Implementation, 6 Evaluation, 7 Discussion and lastly Conclusion and future work.

2. Related Work

2.1. Overview of Fintech and Pension Funds

The pension system structure is based on private pension plans that may be funded by pension funds, pension insurance policies, book reserves, or other instruments (managed funds by banks or investment firms). Personal pension plans and professional pension plans are two different types of pension schemes. Personal pension plans are based on agreements between individuals and private pension providers; occupational pension plans are linked to employment. In many countries, funding pension arrangements will become more crucial to ensuring retirement income security, and as the investment of pension assets will become more influential on stock markets in the coming years, the accessibility of accurate, complete, comparable, and updated information will become increasingly important (OECD, 2019).

Hentzen (2021) mention the rapid development of smartphones and apps has made managing one's finances more convenient. Still, it has not yet been thoroughly explored how these advancements can help people with retirement planning or how technology can improve individual business connections. However, the industry has been slow to respond to this call for help with retirement planning. In recent years, fintech has gained significant traction across various sectors, including the realm of pension funds. The financial industry has developed into the best use of information and communication technologies. However, something significant happened in the interaction between money and technology, the key issue appears to be creating a unique ecosystem for banks and nonbank providers that is adequately managed and overseen. Participants can now instantly contact and interact with digital technology. Because Fintech is a strategy to reduce marginal costs and increase production (Saphyra, 2021).

While Paklina (2018) cites that is crucial to keep in mind the global and cross-sectoral characteristics of financial services when discussing the application of cutting-edge technology in the financial industry. The expansion of globalisation and interconnectedness in the financial industry is facilitated by financial innovations. They demand a coordinated strategy for supervision as a result, both domestically and globally.

2.2. Traditional Approaches to Pension Fund Management

In many nations, the ageing population is becoming a major issue since it reduces the labour force, increases family responsibilities, and even threatens macroeconomic stability. On average, currently, elderly people are living around 80 years of age and older. Therefore, the government should offer more subsidies to encourage private businesses to enter the pension industry (Jiang, 2021). Generally, retirement income is generally low and retirement savings are insufficient. In the past, incumbents have provided pre-packaged, "buy-and-forget" private pension solutions. New fintech start-ups are increasingly making inroads into the private pension planning industry with more appealing offerings that combine cutting-edge financial products with user-focused digital applications that encourage users to manage their pension funds in daily life (Finnovista Banco Interamericano de Desarrollo BID Invest, 2022), in the analysis of Hadass (2021) reference the cost of traditional financial advice from

a financial advisor typically costs around 100 basis points per year of assets under management (AUM). This cost is comparable to roughly twenty-five basis points or less for robo-advisers.

Regarding the pension system in Mexico, it is based on an individual allocation and capitalization strategy. The following list outlines the key elements of Mexico's pension system:

Table 1. Mexican Pension System

Program	Description
Mexican Social Security Institute (IMSS)	Provides social security services, including pension coverage, for affiliated employees.
Law of the Institute of Security and Social Services for State Employees (ISSSTE)	Provides social security services to Mexican public sector employees.
System of Retirement Savings (SAR)	An individual capitalization system in which employees contribute to their own retirement savings accounts. Accounts are managed by AFORE (Admin. of Funds for Retirement), a private financial organization authorized by the government.
AFORE (Administrators of Funds for Retirement)	Private financial organizations are responsible for managing individual retirement savings accounts. Employees choose an AFORE to handle their savings, and AFOREs invest funds to generate returns.
Consideration for Unemployment in Advanced Age and Third Age	Benefit accessed when reaching legal retirement age and meeting contribution requirements. Pension is calculated based on the worker's average annual salary and years of contribution.

2.3. Fintech Solutions in the Context of Pension Funds

Fintech solutions have emerged as potential game-changers in the pension fund industry, providing solutions aiming to enhance accessibility, transparency, and user experience for pension fund participants. The Department for Work and Pensions in London (DWP) has laid the Pensions Dashboards (digital services such as apps, websites, or other tools) as part of the regulation. All the projects included in the scope must link by October 31, 2026, according to a new staging schedule that will be outlined in the advice. The staging timetable will show the sizes and types of schemes that are planned to link at what times. Thus, Dashboards are designed to assist users in making retirement plans by helping them locate their different pensions, reconnect with any missing pension pots, and comprehend the worth of their pensions in terms of an expected retirement income (Pensions Regulator, 2023).

Fintech could be of help, Robo's advisors, for example, could build financial retirement plans for members in the future. Likewise, Blockchain technology is another tool implemented in Fintech, which improves security and transparency by creating a public and immutable record (financial ledger) of all donations, dividend distributions, fees, and expense payments (Hadass, 2021). In the same context, the benefit of blockchain-based settlement technology is a quicker and more flexible settlement, but there is also the potential for manipulation where players may purposefully fork the chain to prevent trade losses (Chemmanur, 2020).

Regarding Latin America, according to an analysis made by (Finnovista Banco Interamericano de Desarrollo BID Invest, 2022), Argentina, Brazil, Chile, Colombia, Mexico, and Peru led the Latin American fintech scene in 2019. Brazil distinguished out as the largest fintech market in terms of investments, alternative finance volume, and deal volume. Digital banks and companies that provide payment services received the majority of fintech investment in Brazil. Different categories had different second-place finishes. The second-highest amount of investment was made in Colombia, while the second-highest number of

transactions was made in Mexico. In terms of the amount of alternative financing, Chile was in second. In the same stage, financial inclusion was the primary advantage stated. More competition, more efficiency, and reduced prices were other advantages. Contrarily, the risks connected with fintech's financial stability are strongly related to the dangers that come with technology use in general, such as cyber hazards and data security. Other concerns, such as those related to operational risk and consumer protection, are not exclusive to fintech but apply to other financial institutions as well. These risks include those related to AML/CFT (anti-money laundering and countering the financing of terrorism)

2.4. Impact of Fintech on Savings Growth in Pension Funds

Fintech is quickly growing thanks to improvements in internet technology that make it possible to reach a growing number of users at a cheap cost. This has led to a growth in the number of individuals using fintech services (Mulyono, 2022). The accessibility offered by mobile phones provides a competitive advantage over the traditional market and may even drive the traditional market. On the other hand, Sarker and Datta, (2022) describe high administrative costs continue to be a major problem for the contribution and defined benefit pension sectors worldwide. In addition, many countries continue to experience administratively low returns on retirement savings and slow asset growth, which have a negative impact on both pension accumulation and plan participant participation rates.

Hence, Agnew and Mitchell mentioned that robo-advisor algorithms offer recommendations on how much money to save when to file for Social Security, which Medi-care plan to purchase, and—most importantly—how to handle smart distributions throughout the decumulation stage of life (Agnew and Mitchell, 2019). In addition, Chemmanur (2020) cited that the development of new technologies may eliminate the need for existing intermediaries, resulting in lower search and verification costs, and more economical and secure information transfer.

Furthermore, as part of this new technology, Blockchain has effectively automated business processes, improved productivity, and lowered operational costs across the banking, financial services, insurance, securities trading, supply chain management, healthcare, international trade, taxation, and public administration domains (Chang, 2020). Financial incentives in the tax and pension systems are having major effects on deciding to retire. As mentioned in Sarker and Datta (2022), a plan for an extreme digital transformation of the pension industry based on new technology is presented. This plan combines all key pension participants (pension regulator, employees, fiduciaries, and their commercial partners) in a single blockchain network. This network would promote real-time collaboration and boost operational efficiency across all pension services (inscription, contribution, transference, withdrawal, and customer service). Consequently, the market is growing in the influence of cybersecurity which may have an impact on the consumers' funding and saving decisions in the FinTech industry (Rahardja, 2022).

2.5. Factors Influencing Participant Engagement and Savings Behaviour

The term "retirement commitment" refers to a person's interest in and active planning for retirement. This includes actions such as selecting suitable pension fund providers, investment portfolios and insurance plans, tracking employer contributions and making additional voluntary contributions, and evaluating portfolio performance and management or fees account (Hentzen, 2021). Furthermore, understanding the factors that influence

participant engagement and saving behaviour is critical to assessing the effectiveness of fintech solutions in pension funds. Factors such as financial education, risk perception, trust in technology, and demographic characteristics significantly shape participants' savings behaviour and their willingness to adopt fintech solutions.

The concern for voluntary savings to have a decent retirement has been an issue analysed for a long time, as mentioned by Dorfman and Palacios (2012) who mention that encouraging younger and poorer workers to save for retirement will be a challenge. It is also necessary to have reliable organizations that protect the contributions, that is, they must have incident response strategies. These strategies must consider the many forms of cyberattacks. Furthermore, transaction costs must be kept low.

Encouraging voluntary participation could potentially help reduce the coverage gap, which refers to the proportion of the population that is not covered by the pension system (Dorfman and Palacios, 2012). Authorities frequently see the creation of digital interfaces by pension providers and companies, including mobile applications, web platforms, self-service kiosks (customer portals), online consolidators, and simulators. The development of their digital tools for affiliates and pension beneficiaries shows that pension regulatory agencies are also involved in this market. As mentioned by Paklina, (2018) the use of such tools is seen as a potential strategy to help people understand and participate in private pensions, as well as to support decision-making and raise awareness and information about private pensions. and facilitate retirement savings. Retirement savings are considered a complex issue, which could be solved with state-of-the-art technologies.

On the other hand, a whole remote solution attracts demographics, such as the young population (Lumpkin and Schich, 2019). To improve their services and member engagement through digital methods, pension plan providers are increasingly transforming their online services into mobile applications (apps) or web platforms in a growing number of jurisdictions. In this regard, pension calculators are often found on Internet resources or mobile applications. The primary goal of these electronic tools is to provide savers with access to essential pension information online, which could result in significant cost reductions for participants and plans. The role and initiatives of pension supervisory authorities in raising awareness and developing their digital tools to enable members to keep track of their current retirement contributions and savings, as well as to better plan for retirement, must be focused on the context of digital transformation in the private pension sector. The Mexican regulator CONSAR's mobile app AforeMóvi and the MPFA's applications from Hong Kong, China, are two notable examples.

2.6. Critiques and Challenges of Implementing Fintech in Pension Funds

Currently, people rely on their income and personal preferences to choose the pension plans offered by these providers (Jiang, 2021). According to Agnew and Mitchell (2019), twelve major market players point to additional difficulties faced by retirees, such as increased uncertainty and the need to make quick decisions that have significant consequences despite having little or no experience from which they draw. recourse and not being able to learn from their mistakes. Financial planning for retirement requires a very comprehensive look at the circumstances of older people, considering all relevant assets (such as possible social security and pension income) and liabilities (such as mortgages), as well as many other aspects. quantitative and qualitative.

In this sense, Mexico was the first country in Latin America to enact an exclusive and comprehensive law on fintech (Finnovista Banco Interamericano de Desarrollo BID Invest, 2022). An online portal (e-SAR), mobile applications and unique electronic identity files to replace paper files are just some of the legal modifications that have been made in Mexico to allow the use of these technologies. To support the creation of a digital ecosystem and facilitate regulatory compliance (RegTech), CONSAR is building a consolidated regulatory framework for the Mexican pension fund system in 2018. This framework will allow the use of technological innovations and the participation of third parties (like FinTech). The Mexican financial industry offers a regulatory framework for FinTech, including pension regulations, since the new law governing financial technology institutions was published on March 9, 2018, called the Law to Regulate Financial Technology Institutions (Law to Regulate Financial Technology Institutions).

There are several obstacles that regional fintech startups must overcome to expand. The first major obstacle is the lack of a framework for digital identity and the low level of financial inclusion. This makes it difficult for consumers to access fintech goods and services. Second, further development of the infrastructure required to enable frictionless cross-border transactions and to enable digital payments is required. Additionally, protecting consumer privacy becomes a critical concern at a time when society and technology are increasingly intertwined and huge volumes of data are collected. Fintech companies have a difficult challenge ahead: finding the ideal balance between protecting customer information and exploiting the data for their benefit. For the development and implementation of fintech solutions in the area to be successful, several obstacles must be overcome.

2.7. Regulations Approaches to FinTech.

When it comes to fintech, regulators are taking a careful, technocratic approach, monitoring trends, and making small changes. Recognizing the complexity of these technical advances, they want to prevent them from limiting innovation. The current inclination towards regulation at the micro level and the goal of supporting private business innovation are reflected in this passive attitude; Furthermore, privacy and cyber security concerns are also growing as the amount of digital data increases. The idea of “smart” regulation emerges, emphasizing the customization of regulations to specific fintech products and activities. This method complements the current legal framework and is transaction-oriented, influenced by the technological preferences of private actors. In general, regulators work to keep up with fintech through context-specific adaptations that allow them to tailor their reactions to developments in technology (Omarova, 2020).

FinTech is exempt from the rules that have been in place for Bank Holding (BHC) companies for decades, which can benefit FinTech and IT companies in some ways. Chemmanur (2020) point out that this problem is for financial regulators, such as the Fed and the Navigate group at the Federal Reserve Bank of San Francisco (FRBSF) where regulation and innovation are something of a balancing act. On the other hand, the Bank for International Settlements (BIS) has presented the "Innovation 2025" strategy, which outlines its medium-term goal to integrate technology and analytics into its supervisory tasks (Bank for International Settlements, 2019). To balance risk and reward in technological innovation in the financial sector, the Hong Kong Monetary Authority (HKMA) created the FinTech Facilitation Office (FFO) in Asia. Its goal is to enable Hong Kong banks and FinTech companies to create innovative products while ensuring consumer safety and financial stability. In the UK, the Financial Conduct Authority (FCA) and the Bank of England (BoE) have taken a leading role

in fostering FinTech innovation, project Innovate was launched by the FCA in 2018 with the intention of offering guidance and regulatory assistance to FinTech companies. The BoE, on the other hand, acknowledged the increasing digitization of UK banks and increasing investment in artificial intelligence (AI) and stated its aim to increase the use of sophisticated technology and data analytics.

Also, Mexico was the first nation in Latin America to pass a full and exclusive fintech law. The primary goal of the bill was to give consumers, investors, and other players in the fintech sector regulatory clarity. The protection of customer data, cyber security, privacy issues, money laundering, and financing of illegal activities were also covered. The law was created in collaboration with the Bank of Mexico, the Ministry of Finance, the National Banking and Valuation Commission (CNBV), the National Insurance and Financial Supervisory Commission (CNSF), and the National Savings and Retirement System Commission (CONSAR). It becomes effective on March 1st, 2018 (Finnovista Banco Interamericano de Desarrollo BID Invest, 2022).

2.8. Proposal Model and Hypothesis

This research project uses the UTAUT framework to better understand the factors that influence the adoption and usage of technology, including mobile apps and fintech solutions. This idea has been used in many situations and has shown to be a useful tool for understanding these components. In the context of the survey on the elements of fintech solutions that influence the growth of savings in pension fund balances in Mexico, Venkatesh's UTAUT proposal (Venkatesh, Thong, and Xu, 2012) offers a sound theoretical foundation for analysing the acceptance and adoption of financial technology in the context of Mexican users. The expectation of performance, the expectation of effort, the social impact, and facility conditions are the four dimensions that Venkatesh suggests determining a person's intention to use or actual usage of technology. However, the Technology Acceptance Model (TAM), one of the earliest information system models, has been demonstrated to be less reliable than other theories like the TAM since it has been unable to account for all user variations. The UTAUT model has been built using concepts from the Motivational Model (MM), the Model of Personal Computer Use (MPCU), the Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT) among others (Venkatesh, 2003).

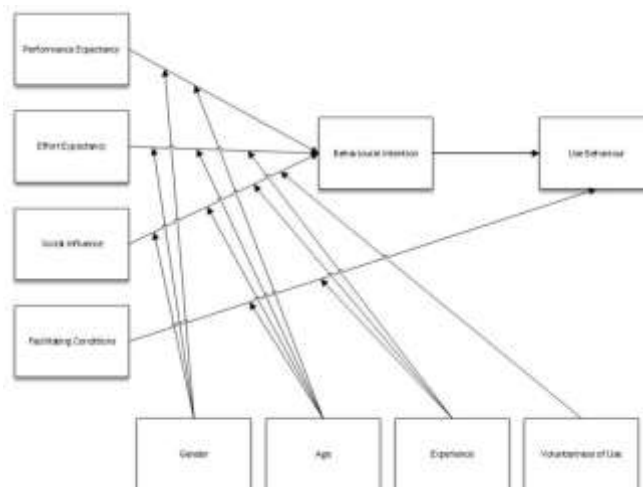


Figure 1. Research Model UTAUT Venkatesh, (2003).

2.8.1. Hypothesis.

Expectation of Performance.

Performance expectancy, according to UTAUT, is an assumption believed by consumers that using technology will enable them to accomplish their objectives more quickly and successfully. In the context of this study, H1 suggests that people are more likely to make voluntary contributions to their retirement savings fund if they believe using fintech apps or platforms will result in positive outcomes, such as higher investment returns, better control over your retirement savings, or more convenient and efficient management of your funds

H1:

- a. There is no significant association between the expectation of performance (the perceived benefits and advantages of using Fintech solutions) (Question 8) and the intention to make voluntary contributions to the retirement savings fund (Question 7).
- b. There is a significant association between the expectation of performance (the perceived benefits and advantages of using Fintech solutions) (Question 8) and the intention to make voluntary contributions to the retirement savings fund (Question 7).

Expectation of Effort.

In UTAUT, the term "expectation of effort" alludes to consumers' expectations that using technology will be simple and obvious. H2 suggests that participants will be more inclined to utilise the mobile apps to manage their retirement savings if they find the mobile apps for making voluntary contributions to the AFORE simple to use and navigate.

H2:

- a. There is no significant association between the perceived ease of use of mobile apps for making voluntary contributions to the AFORE (Question 7) and the intention to use such apps (Question 6).
- b. There is a significant association between the perceived ease of use of mobile apps for making voluntary contributions to the AFORE (Question 7) and the intention to use such apps (Question 6).

Social Influence.

The effect of society, one of the fundamental ideas of UTAUT, discusses how outside factors affect people's propensity to accept new technology. According to H3, if consumers show a strong intention to use mobile apps for AFORE contributions, they are more likely to follow through on their stated intentions to do it.

H3:

- a. There is no significant association between the factor considered most important when choosing an AFORE (Question 4) and the intention to use technology for managing retirement savings (Question 6).
- b. There is a significant association between the factor considered most important when choosing an AFORE (Question 4) and the intention to use technology for managing retirement savings (Question 6).

Facility Conditions.

Usage behaviour is a term used in UTAUT to describe the extent to which users' behaviour has already absorbed technology into their daily lives. According to H4, people are more likely to have donated voluntarily to their AFORE using these cutting-edge channels if they have previously used platforms or applications to manage their AFORE funds.

H4:

- a. There is no significant association between groups of participants who are more likely to use any technological tools (mobile app or web page) (Question 5) and the intention to make voluntary contributions to the Pension Fund (Q6).
- b. There is a significant association between groups of people who use any technological tools (mobile app or web page) and the intention to make voluntary contributions to the Pension Fund

Behavioural Intention.

This hypothesis looks at how the perception of new technology's influence relates to one's intention to accept it. According to H6, participants are more likely to express a willingness to use technology (i.e., mobile apps) to manage their retirement savings if they think that new technical tools will help their retirement savings increase.

H5:

- a. There is not a significant association between the new technological tools on the growth of retirement savings (Question 9) and the intention to use technology for managing retirement savings (Question 7).
- b. There is a significant association between the new technological tools on the growth of retirement savings (Question 9) and the intention to use technology for managing retirement savings (Question 7).

3. Methodology

3.1. Data collection, Preparation, and analysis methods

The study used primary data which employs a quantitative and qualitative approach. As part of the data collection, it was obtained via an electronic survey through Google Forms and most of the responses were obtained via social media (such as LinkedIn, WhatsApp, Facebook, and Instagram). Data preprocessing included identifying missing values and renaming columns for visualisation needs.

The target population are within the age range of 18 to 55 and above years old. The sample size is 210 responses. The survey was developed in Spanish and the Mexican population can be divided into two main parts, the 1st. to collect demographic information; and the 2nd. to measure all the relevant variables with the majority using various answers according to the questions. It was decided to use the Snowball Sampling Technique for data collection, which allowed reaching a wide range of participants in different regions of the country. To conduct this study, a perception survey was conducted in Mexico.

3.2. Data Analysis

The data set was first pre-processed by changing some of the measured variables. The data was then examined for missing values. Pertinent survey questions were selected, excluding questions on age and city, as these are demographic variables and are not part of the factor analysis. The remaining questions will be coded accordingly for analysis. Since the respondents' choices fall into different categories, the data for the variables must be categorical. Response options such as "Yes" or "No" and closed answers for other inquiries should be expressed as nominal or ordinal data. Criteria The questions were designed to foster impartiality and discourage bias in order to avoid biasing answers on one side or the other. Finally, respondents who did not use a web or mobile application did not make voluntary saves and did not fulfil the criteria for the study's target sample were filtered to create a subsample for the remainder of the research.

The data is then transformed into a correlation with rows of criteria (for example, Voluntary Savings (Yes/No)) and columns for Investment Factors (for example, Profitability, Quality of Service, Web/Mobile Application). Determine the frequencies for each cell and compare them to the actual frequencies using the Chi-square test of independence, which is a statistical technique for establishing the relationship between two categorical variables.

In the following stage and context of this research, it also does an exploratory factor analysis to investigate the underlying variables that may influence the use of Fintech applications for pension fund management.

4. Design Specification

The UTAUT model has been utilised in several research studies on Fintech uptake for retirement savings. Savi and Peterac (2019), for example, employed the UTAUT model to examine mobile banking uptake in Serbia. Msweli and Mawela (2020) investigated the factors that influence Enablers and Barriers to Mobile Commerce and Banking Services Among the Elderly in Developing Countries using the UTAUT model. Furthermore, Sahi (2021) employed the UTAUT model to investigate the factors that influence Fintech acceptability among Indian customers. We can gain important insights into the key drivers that influence individuals' behavioural intention to use Fintech solutions for retirement savings in Mexico by using the UTAUT model in the study.

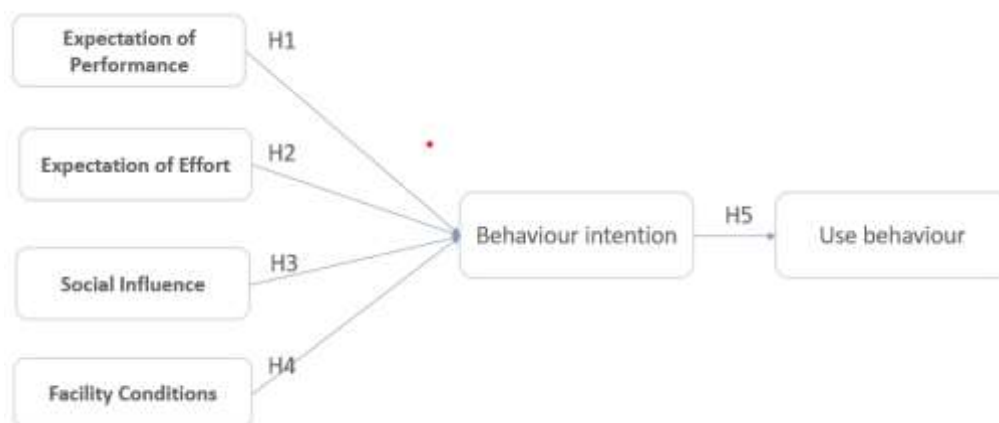


Figure 2. Research Model UTAUT

5. Implementation

Using descriptive statistics, chi-square testing, factor analysis, and data preparation are all part of the project's implementation. Before analysis, the survey data were transformed and examined for missing values. The respondents' demographics were described with descriptive data, and potential correlations were found through graphical research. Chi-square tests were used to analyse the relationships between categorical variables, such as age groups and usage of Fintech applications. Finding latent variables associated with Fintech uptake and saving behaviour required factor analysis of underlying structures. With the use of the proper statistical methods, hypotheses were created and tested. To present the study's main conclusions, plots and graphs were used. The study offered an understanding of the factors influencing Fintech adoption and saving habits in Mexican pension funds.

6. Evaluation

6.1. Demographics

Age and City are two demographic factors considered in this research. The distribution of respondents' ages is shown in the first table together with the corresponding frequencies (Count.Freq) and percentage (Freq). Hence, it shows that 14 respondents fall in the age group of 18-25, which represents approximately 6.67% of the total respondents. Regarding to City, 123 respondents are from Ciudad de México, constituting around 58.57% of the total respondents. As we observe in Table 1.

Table 2. Demographic data

Attribute	Item	Count	Frequency	Cumulative frequency
Edad	18-25	14	0.066667	0.066667
	25-34	57	0.271429	0.338096
	35-44	76	0.361905	0.700001
	45-54	26	0.12381	0.823811
	55 y above	37	0.17619	1.000001
City	Ciudad de México	124	0.590476	0.59047619
	Edo de Mex	13	0.061905	0.652380952
	Monterrey	13	0.061905	0.714285714
	Puebla	12	0.057143	0.771428571
	Guadalajara	11	0.052381	0.823809523
	Mérida	7	0.033333	0.857142856
	San Luis Potosí	7	0.033333	0.890476189
	Chihuahua	5	0.02381	0.914285713
	Cancun	2	0.009524	0.923809523
	Hidalgo	2	0.009524	0.933333333
	Leon	2	0.009524	0.942857143
	Oaxaca	2	0.009524	0.952380953
	Aguascalientes	1	0.004762	0.957142858
	Celaya	1	0.004762	0.961904763
	Guanajuato	1	0.004762	0.966666668
	Lagos de Moreno	1	0.004762	0.971428573
	Metepec	1	0.004762	0.976190478
	Michoacán	1	0.004762	0.980952383
	Morelia	1	0.004762	0.985714288
	Morelos	1	0.004762	0.990476193

Queretaro	1	0.004762	0.995238098
Saltillo	1	0.004762	1.000000003

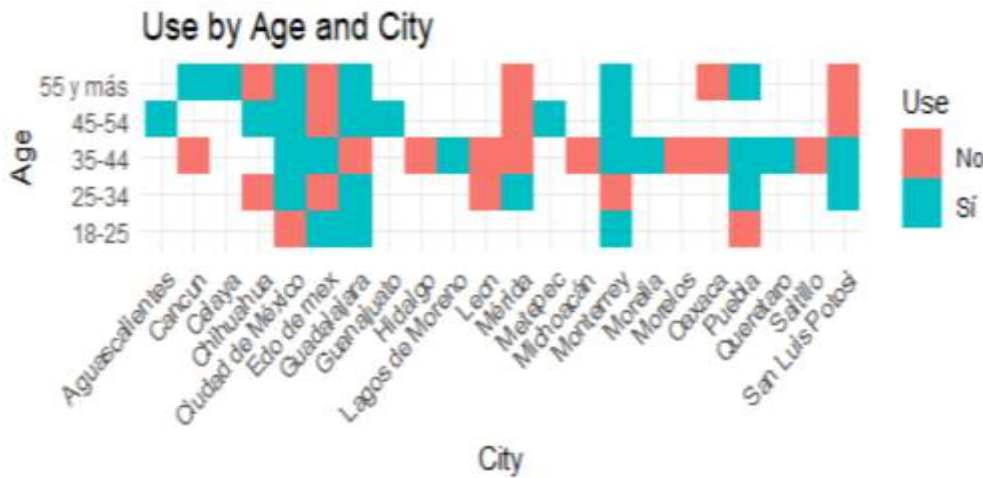


Figure 3. Use by age and City.

This heat map (Figure 2) shows the relationship between cities, age and the frequency of use that Fintechs have. We can see that Mexico City stands out with the highest frequency of Fintech use with 59%, while Edo de Mex (Estado de México) and Monterrey have lower frequencies with around 6%.

6.2. Chi-Square test.

A p-value less than a predetermined level of significance (generally 0.05) indicates that there is sufficient evidence to reject the null hypothesis and conclude that the data do not fit the theoretical distribution. A p-value greater than the level of significance, on the other hand, suggests that there is insufficient evidence to reject the null hypothesis, implying that the data are properly distributed theoretically.

Table 3 H1

Chi-squared	Degree of Freedom	P-value
30.061	20	0.06887

Table 4 H2.

Chi-squared	Degree of Freedom	P-value
91.319	16	1.43E-12

According to Table 3 H1, there is no relationship between the desire to make voluntary contributions to the retirement savings fund and the expectation of return on investment (the advantages and benefits of employing Fintech solutions). The perception of how simple it is to utilise mobile applications to make contributions to the AFORE and the intention to use these applications also significantly correspond, as shown by Table 4 H2.

Table 5 H3.

Chi-squared	Degree of Freedom	P-value
27.423	20	0.1238

Table 6 H4.

Chi-squared	Degree of Freedom	P-value
9.8457	4	0.04311

As shown in Table 5, there is no correlation between the intention to use technology to manage retirement funds and the factor that is most important when selecting an AFORE. Although there is a moderate association in H4 between the groups of participants who use a technological tool (such as a mobile application or a website) and their intention to make voluntary contributions to the Pension Fund.

Table 7 H5.

Chi-squared	Degree of Freedom	P-value
11.929	4	0.01789

Finally, the intention to use technology to manage retirement savings (Question 7) and the growth of retirement savings (Question 9) are significantly correlated.

6.3. Factor Analysis.

This project uses Exploratory Factor Analysis (EFA) to explore the relationships among the variables of retirement savings behaviour. To calculate the correlation among the variables as we can observe in Figure 4.

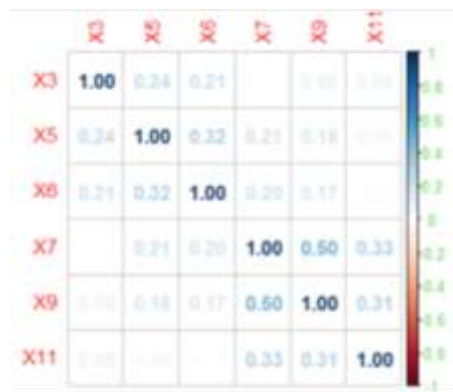


Figure 4. Correlation Matrix.

Before proceeding with factor analysis, KMO testing is required to determine whether the sample is adequate for the analysis. To determine the percentage of variance among variables that may be due to underlying causes. According to Kaiser (1974) rating of 0.6 or 0.7 or above is typically regarded as satisfactory.

Table 8. KMO Test

Overall MSA =	0.65					
MSA for each item =	X3	X5	X6	X7	X9	X11
	0.59	0.68	0.64	0.62	0.66	0.67

In addition, a correlation between two variables is tested to see if it significantly differs from an identity matrix using Bartlett's test. According to the p-value is significant the variables are sufficiently connected to allow for valid factor analysis.

Table 9. Bartlett's Test of Sphericity

chi. square	149.675
p.value	2.80E-24
df	15

To obtain a latent structure within a data set it is looking to it only searches for variables that contribute significantly to the explanation of the variation in the data. The next plot (Figure 5) shows the amount of variation of these eigenvalues, a general rule of thumb is that factors whose eigenvalues are greater than 1 (Kaiser criterion) Higher eigenvalues indicate that these factors explain a greater proportion of the variance in the original data. Therefore, is consider using the first two factors, since their eigenvalues are greater than 1. Furthermore, table 10 represents the largest eigenvalues indicating the amount of variation explained by the factors.

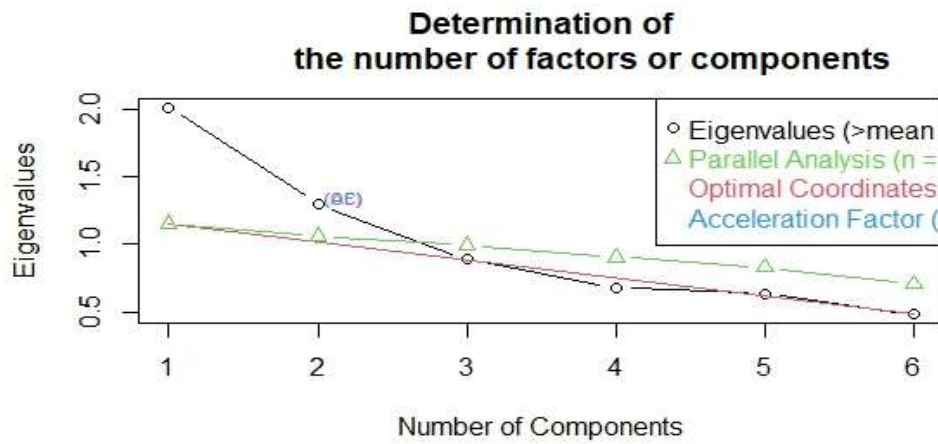


Figure 5. Parallel Analysis

Table 10. Factor Matrix

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
2.017508	1.297734	0.887438	0.68254	0.632127	0.482654

Furthermore, table 10 represents the largest eigenvalues indicating the amount of variation explained by the factors. These are the first 2 factors as we can observe in Figure 6.

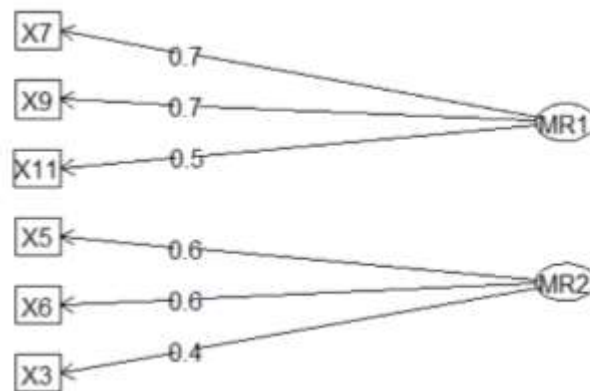


Figure 6. Rotated Factor Analysis

Variable X7 and X9 have a positive factorial charge of 0.7 in Factor MR1. This is interpreted as positive. This factor is associated with those corresponding to the probability of considering the use of a mobile application for voluntary contributions to the AFORE and the positive perceptions about the impact of new technological tools on the growth of retirement savings. are related to this factor. Finally, X11 shows a positive weight of 0.5, indicating that recommendations on the use of technology to manage pension fund savings are also related to this factor. Therefore, given the positive attitudes and perceptions, the MR1 can be called "Technology in the management of retirement savings". On the other hand, corresponding to the MR2, X5 and X6 factors, it has a positive charge of 0.6 on the use of applications or platforms to manage AFORE savings. and similarly, X6 indicates that voluntary contributions to AFOREs are associated with this factor. And last, the variable X3 has a positive charge of 0.4, which implies that an AFORE also has a relationship with this element. According to this interpretation, the MR2 factor will henceforth be referred to as MR2 "Savings" as it appears to be connected to behaviours and activities associated with managing funds and taking part in AFORE.

7. Discussion

The focus of the study was on the "Factors that Drive the Adoption of Fintech Solutions for Retirement Savings in Mexico." Building on earlier research, the initiative demonstrates Mexican consumers' readiness to accept fintech as a financial solution in their pension savings strategy (Chawla and Joshi, 2019). This illustrates the widespread transition to digital financial services and emphasises how fintech has the capacity to fill the gaps left by traditional pension fund management.

The main finding of the research is how perceived usability influences an individual's decision to use financial technologies. According to Ariffin (2021), this supports earlier findings. This implies that the platform's simplicity and ease of use have a significant impact on people's motivation to use fintech solutions. How quickly savings may be automated with little labour on your side and how simply you may use the platforms appear to be key factors in determining consumer acceptance of fintech in retirement savings practices. The study's results contradict Shahzad (2022), which deviate from conventional thinking and demonstrate a strong negative influence of performance expectations on behavioural intentions to use fintech solutions.

Additionally, it emphasises the potential of Fintech solutions to close the gap between conventional pension fund management and technological advancements. The results provide a detailed view of how financial technology might enhance the pension savings experience in Mexico by highlighting the relevance of simplicity of use, exposing assumptions about performance expectations, and emphasising the significance of favourable conditions. This is consistent with current worldwide trends in the modernization of financial services and highlights the need for a well-balanced strategy that uses technology to support the expansion of pension savings while addressing performance and security concerns (Sarker and Datta, 2022).

8. Conclusion and Future Work

The main objective of this project is to identify the impact of the use of financial tools such as Fintech on the growth of pension funds in Mexico. To do this, the relationship between the adoption of Fintech and the behaviour of retirement savings in the Mexican context was examined, using both quantitative and qualitative methodologies. therefore, we can infer that people are more likely to make voluntary contributions to their pension funds if they see greater benefits and advantages of using retirement savings solutions. however, it is notorious that it is important to know the advantages of using technology and the different alternatives that we have today to facilitate the use of these technologies in terms of profitability and simplicity.

In addition, it can be observed that the component analysis suggests two fundamental factors that affect the retirement savings behaviour of the participants. The first element, which is characterized by favourable feelings towards Fintech technologies, represents the psychological aspect of technology adoption. This is consistent with the opinions and pleasant attitudes regarding the influence of technology on the growth of savings that stimulate its use. The use of Fintech applications to manage the withdrawal of savings AFOREs, make voluntary contributions and have one in real-time is, on the other hand, the second factor that comes to mind. This element draws attention to the concrete steps people take to manage their pension savings, highlighting the ways in which technology can support and enhance these efforts.

Furthermore, we can highlight that as part of the findings, Fintech developers and pension funds can focus on educational and outreach initiatives to highlight the tangible benefits and ease of use of these tools, which will be reflected in further promotion and adoption. However, the study is not without limitations. derived from confidence in the data can introduce response bias and social desirability effects, influencing participants to respond in a certain way. Regarding the size of the sample, although it is representative, it may not capture all the diversity within the Mexican population. Furthermore, the research focused mainly on quantitative methods, leaving aside qualitative insights that could provide a deeper understanding of participants' motivations and barriers. In the constantly moving environment, there are also many potential directions for further research, such as the long-term effects of Fintech adoption on retirement savings growth. A deeper understanding of the underlying motivations of the participants could be enhanced by examining the impact of cultural and regional differences.

Finally, this study highlights the roles of perceived benefits, ease of use, social impact, and specific behavioural savings while highlighting the need for further study to motivate people to think about their future using technological advances. therefore, in plans for retirement and financial technology.

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