Role of Digital Financial Inclusion in Shaping Financial Autonomy and Sustainable Economic Behaviour of Older Adults

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Abstract

This study investigates the role of digital financial inclusion in shaping the financial autonomy and sustainable economic behaviour of older adults. As older adults increasingly engage with digital financial services, understanding the influential factors driving their adoption and the impact on their financial decision-making is essential for promoting their economic independence. The methodology employed a mixed-methods approach, including a survey of 300 older adults across various socioeconomic backgrounds, combined with in-depth interviews to explore both quantitative and qualitative data. The survey focused on key factors influencing the adoption of digital financial tools, such as internet accessibility, digital literacy, and trust in digital platforms. Statistical analyses were conducted to examine the relationship between digital financial inclusion and improvements in financial autonomy, while thematic analysis of interview data provided insights into the barriers and challenges faced by older adults in adopting these tools. Results indicated that digital financial inclusion significantly enhances the financial autonomy of older adults, allowing for greater control over savings, investment, and daily financial decisions. However, challenges such as lack of digital literacy, security concerns, and limited access to technology were identified as barriers to widespread adoption. The study recommends strategies for overcoming barriers, such as targeted digital literacy programs and improving accessibility, to facilitate greater participation in the digital financial ecosystem.

Keywords: *Digital Financial Inclusion, Older Adults, Financial Autonomy, Sustainable Economic Behavior, Digital Literacy, Barriers to Adoption, Economic Independence.*

Introduction

Technological advancements have significantly altered financial service models, introducing considerable convenience into daily activities [1]. M-banking, for instance, facilitates straightforward daily transactions and fund transfers via mobile devices, streamlining financial operations [2]. Yet, the adoption of m-banking is not universal, with a lower rate observed among silver generation (adults over 50) [3, 4]. Despite the positive impact of new technologies on elderly well-being, challenges

persist in their widespread acceptance and use [5]. As financial technology progresses, it is vital to develop strategies for the elderly to engage with and benefit from these Fintech innovations, preventing their exclusion from the digital era.

Researchers have already begun to explore older adults' digital banking experiences primarily focused on specific aspects of digital banking, such as the user experience of bank websites on desktop computers [6], strategies to build trust in internet banking [7], and the effect of self-efficacy and anxiety on internet banking [8]. A recent survey study took a step further to understand older adults' overall banking practices in light of recent technological development and found that although the majority of older adults still used physical banks, a small percentage of them started to adopt digital banking and digital payments [9]. However, this survey study mainly provided a quantitative overview of older adults' banking practices, and it remains largely unknown why and how older adults choose to use different baking platforms and the challenges they encounter.

Within the realm of technology adoption, older adults often require external motivation to recognize and utilize the benefits of new technologies [10]. This support can come from family recommendations or observed use by peers. Social influences are crucial as they affect how older adults think about and feel toward technology, influencing their digital engagement [11]. According to the life cycle theory, individuals' preferences for saving, consumption, and investment change across different stages of their lives. For elderly families characterized by limited income, their investment strategy tends to prioritize capital preservation and risk avoidance when allocating financial assets. Digital finance promotes financial inclusion, thereby reducing the financial exclusion that investors may face due to limited capital. With the digitization of financial transactions, the barriers to accessing financial services are progressively lowered, enhancing financial accessibility for elderly households.

Elderly families with higher levels of digital financial literacy can improve their access to financial services through the use of digital financial services. This, in turn, influences their behavior in allocating assets for retirement. According to the portfolio theory, expanded financial accessibility allows elderly families to transcend geographical limitations and minimum investment requirements. This enables them to access retirement financial instruments like target-date funds and long-term care insurance, thereby achieving risk diversification and ensuring a stable consumption pattern over time [12].

This research holds significant potential contributions as it offers a nuanced understanding of the factors that encourage the engagement with m-banking among the elderly, a critical aspect of financial technology. By identifying specific social influence mechanisms, the study can inform the development of more effective social interventions aimed at the elderly, addressing their unique needs. Furthermore, by emphasizing the importance of digital literacy, the research highlights the necessity for targeted initiatives that consider various levels of digital literacy among the elderly population, which is essential for their successful integration into the digital financial eco-system. This study could lead to the development of strategies that promote financial inclusion for the elderly, ensuring that they can fully participate in and benefit from the digital economy.

Statement of the Problem

The increasing reliance on digital financial services in contemporary society has transformed how individuals manage their finances, yet older adults remain at a significant disadvantage in accessing

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and utilizing these services. Despite the growing importance of digital financial inclusion, older adults face several challenges, including limited digital literacy, lack of access to technology, and concerns about security and privacy. These barriers hinder their ability to engage with digital financial tools, which are crucial for achieving financial autonomy and ensuring long-term economic sustainability. As a result, many older adults continue to rely on traditional, less efficient financial management methods, thus limiting their capacity for independent financial decision-making and hindering their ability to adapt to modern economic realities. The problem lies in the insufficient understanding of how digital financial inclusion can enhance the financial autonomy and sustainable economic behaviour of older adults. Moreover, the factors influencing digital financial adoption among the elderly population, as well as the barriers they face in embracing digital financial services, remain under-explored. Addressing this gap in knowledge is critical for developing targeted interventions and strategies to improve financial inclusion and empower older adults to take control of their economic well-being. This study aims to investigate these challenges, with a focus on identifying the key factors that influence digital financial adoption and the impact of digital financial services on the financial autonomy and economic behaviour of older adults.

Objectives of the Study

To investigate the influential factors of digital financial adoption among the elderly population.

To examine the impact of digital financial inclusion on the financial autonomy of older adults.

To analyse the role of digital financial inclusion in promoting sustainable economic behaviour among older adults.

To identify the barriers to digital financial inclusion for older adults.

Review of Literature

Influential Factors of Digital Financial Adoption among Older Adults

The elderly perceived use of m-banking services is significantly affected by social interactions, including WOMs from trusted source, peer tech engagement [13], and social norms [14]. WOMs can prompt elderly individuals to internalize the perceived usefulness of technology by underscoring its advantages and alleviating any apprehensions. This is especially relevant for those without extensive technological knowledge, who frequently depend on social endorsements to assess the applicability of m-banking services. Also, peer engagement acts as a significant catalyst in the social influence process known as identification, where individuals are influenced by observing and adopting the behaviors of others within their social networks [15]. Observing peers adopting mobile banking (m-banking) can assist

elderly individuals in overcoming their technological reservations and biases, leading them to perceive the technology as beneficial.

Furthermore, it can encourage older adults to view the service as essential for maintaining social alignment and capital, thereby enhancing its perceived value [16, 17], thereby increasing their perceived usefulness of m-banking services. Moreover, the perceived expectations of one's social circle, significantly shape the elderly's perspective on technology and prompt compliance with technological adoption. For the elderly population, the expectations and opinions of friends and family, as well as societal views, hold particular importance. When seniors believe that their community expects them to use m-banking, they may anticipate positive social outcomes, further amplifying the service's perceived use.

The access to suitable devices and a reliable internet connection is a fundamental enabler for the adoption of digital financial services. Older adults who have access to smartphones or devices capable of supporting digital financial applications are more likely to engage with these services [18]. Without the right device, many older adults are excluded from the opportunity to participate in digital finance. Additionally, the reliability of an internet connection is equally important. A stable internet connection is crucial for seamless transactions and a smooth user experience with digital financial services. Older adults in areas with unreliable internet may face difficulties in adopting and regularly using digital financial services, which can create a digital divide. Therefore, providing access to both the right devices and reliable internet is essential in facilitating the use of digital financial tools among older adults. Therefore, the following hypotheses are proposed:

H1: Perceived ease of use, social influence, access to access to proper devices and connectivity are positively associated with digital financial adoption among older adults.

Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults

Financial inclusion represents a crucial paradigm shift in the global economy, transcending mere access to financial services and encompassing the provision of secure, user-friendly, and affordable financial instruments tailored to the unique requirements of marginalised and vulnerable populations [19]. This includes low-income individuals, rural communities, and undocumented persons, who have traditionally been excluded from the formal financial sector. Improved financial inclusion represents a crucial avenue for enhancing the well-being of the elderly, providing access to essential financial services and fostering economic empowerment [20].

The ease and speed of contactless payments can significantly enhance the everyday financial experiences of older adults [21, 22, and 23]. Contactless payment methods can minimise the physical and cognitive demands associated with conventional cash and card transactions, making it easier for the elderly to manage their finances independently and improve their quality of life [24, 25]. The seamless and efficient nature of these digital payment solutions can help alleviate challenges faced by older adults, such as the difficulty of handling physical currency or inserting and removing payment cards. This enhanced accessibility and convenience can promote greater financial independence and improved quality of life for the elderly population [26, 27, and 28]. Their findings indicate that these technologies can significantly enhance financial independence for elderly users by providing a secure and convenient method of conducting transactions. The researchers emphasize the importance of

user-centered design and gradual integration of these technologies into daily routines to ensure successful adoption. Therefore, the following hypotheses are proposed:

H2: Digital financial inclusion positively impacts the financial decision-making autonomy of older adults.

Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults

Digital financial tools offer a range of features like expense tracking and real-time monitoring, which allow older adults to better manage their finances. According to recent studies, these tools help users keep track of their spending habits, creating awareness about unnecessary expenditures [29]. Digital banking and payment platforms have enabled older adults to gain better insights into their financial standing. With access to account balances, spending reports, and savings goals in real-time, they can stay informed about their financial health [30]. Such awareness leads to more responsible decision-making and reduces financial stress.

Digital financial inclusion plays a key role in transitioning older adults from cash to digital payment systems, reducing their reliance on physical cash. This transition offers greater convenience and security, especially in times of uncertainty like during the pandemic [31]. Many older adults now use digital platforms to plan and monitor long-term financial goals such as saving for retirement or healthcare expenses. Digital tools provide structured savings plans and investment tracking features that allow older adults to set, review, and achieve financial goals over time. This aligns with sustainable economic behavior, as they can proactively manage funds for future needs, including emergencies.

Digital platforms also facilitate the exploration of financial products such as insurance policies and savings schemes, which are critical for ensuring financial security in older age. Older adults can compare various options through apps or websites, enabling them to make informed decisions about products that help secure their future [32].

The availability of digital financial services can significantly motivate older adults to engage in more sustainable financial behavior. By offering access to educational resources and automated savings programs, digital platforms encourage older adults to make long-term financial decision [33]. This motivation fosters a mindset of planning for the future, contributing to greater financial stability and reducing the financial risks associated with old age. Therefore, the following hypotheses are proposed:

H3: Digital financial inclusion promotes sustainable economic behavior among older adults.

Barriers to Digital Financial Inclusion for Older Adults

Banking services are increasingly digitized with the development of information and communication technology (ICT) [34]. While digital banking could bring convenience to people who are adept at digital technology, such a rapid technological shift may pose challenges to people who are accustomed to traditional physical banking, such as older adults. Olson et al. conducted a survey study with 430 younger adults and 251 older adults and found that older adults tend to be frequent users of long-

standing technologies (e.g., telephone) and less frequent users of more recent technologies (e.g., Internet, ATMs) [35].

Possible reasons for this age difference could be the age-related health declines and the digital divide among older adults. Age-related perception declines like vision impairments may make it more difficult for older adults to perceive small icons when using technology devices [36, 37], and age-related physical declines like reduction in fine motor skills can cause older adults to encounter more motor issues such as tapping and scrolling when using mobile apps, and age-related cognitive issues, such as the reduced speed of learning and memory difficulties, may also slow down their learning of digital technologies [38].

Previous research found that older adults are concerned about security [39] and privacy [40] issues when they access digital technology such as smartphones and health monitor systems and they also experience challenges with managing online security behaviours and privacy settings on their own. Compared to general smartphone usage, digital banking is more sensitive to older adults with possible economic risks and privacy leaks, which may lead older adults to feel more anxious while using. Banking entities should pay more attention to security issues and further improve the mechanism of vulnerability patching (e.g., provide various channels to collect flaws reported by users) [41] to fundamentally alleviate older adults' anxiety about digital banking platforms. Therefore, the following hypotheses are proposed:

H4: Lack of digital literacy, physical and cognitive barriers, and security and trust concerns collectively act as significant barriers to digital financial inclusion among older adults.

Research Gap

Despite the growing importance of digital financial inclusion, there remains a significant gap in understanding the specific barriers faced by older adults in adopting and utilizing digital financial services. While previous research has explored individual barriers such as digital literacy, security concerns, and physical or cognitive limitations, few studies have examined how these factors interact and compound one another in the context of older adults. Moreover, there is limited exploration of the broader implications of these barriers on long-term financial behavior, decision-making autonomy, and economic sustainability among this demographic. Additionally, much of the existing literature primarily focuses on younger populations, leaving a gap in understanding the unique challenges older adults face in the digital financial space. Therefore, further research is needed to comprehensively address the complex and multi-dimensional barriers to digital financial inclusion for older adults and explore strategies to overcome them.

Research Methodology

Study Design: Descriptive

Data Acquisition

Primary data: Primary data was collected using structured questionnaires that include both closed-ended and Likert-scale questions.

Secondary data: Secondary data was collected from existing literature, previous studies, government reports, and published articles related to digital financial inclusion, barriers faced by older adults, and relevant financial behaviors.

Sampling design: Stratified Random Sampling

Sampling universe: The sampling universe consists of older adults aged 50 and above who are either currently using digital financial services or have attempted to use them in the past.

Sample size: 300 respondents.

Reliability of the Study

Sno	Dimensions	Number of items	Cronbrach Alpha value
1	Perceived Ease of Use	3	0.850
2	Social Influence	3	0.820
3	Access to Proper Devices and Connectivity	2	0.790
4	Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults	7	0.880
5	Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults	6	0.870
6	Lack of Digital Literacy	2	0.810
7	Physical and Cognitive Barriers	3	0.830
8	Security and Trust Concerns	3	0.840

Each dimension's reliability is assessed using Cronbach's alpha, and the values reflect acceptable to good reliability for all the dimensions considered in the study.

Tools used for the study: PA, Descriptive statistics, oneway ANOVA, Regression.

Limitations Of the Study

The study may be limited by cultural or contextual factors that influence older adults' attitudes towards technology and financial decision-making.

The study focuses only on a few specific barriers to digital financial inclusion.

Influential Factors of Digital Financial Adoption

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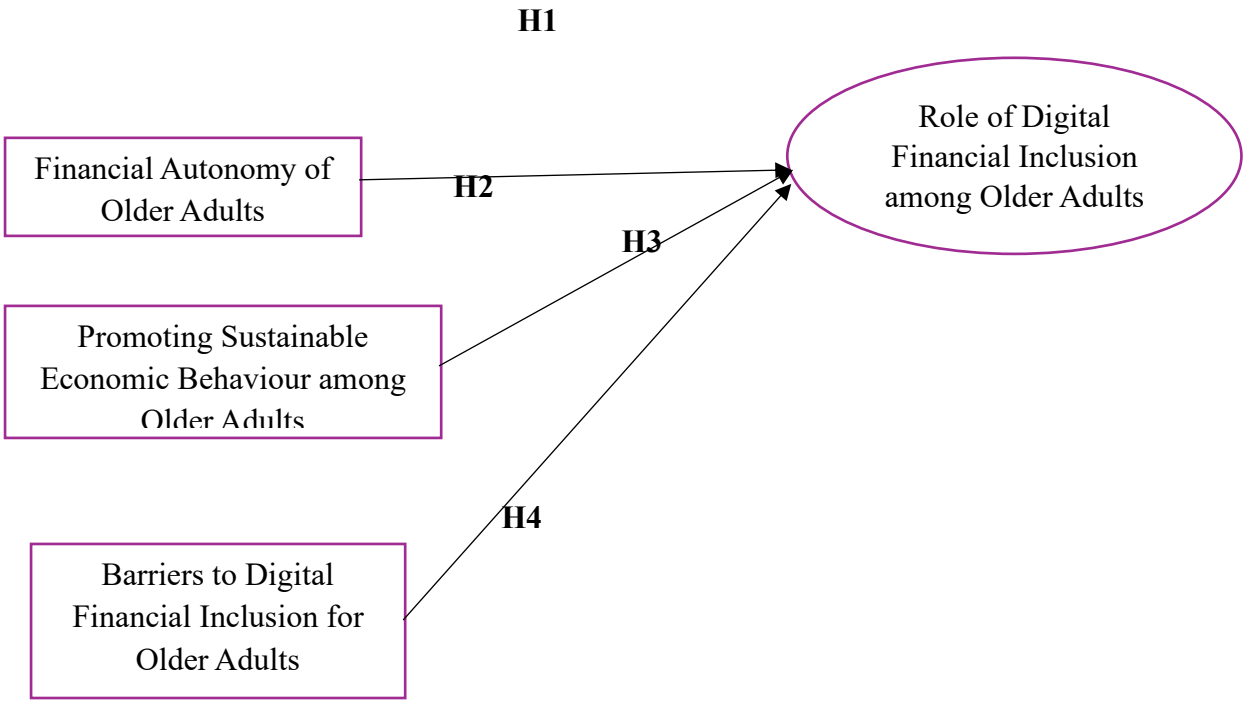

Analysis And Interpretation

Demographic Variables of the Respondents

Demographic Information	Particular	Frequency	Percent
Age Group	60-65 years	78	26.0
	66-70 years	71	23.7
	71-75 years	67	22.3
	Above 75 years	84	28.0
Gender	Male	136	45.3
	Female	164	54.7
Educational Qualification	No formal education	58	19.3
	Primary school	67	22.3
	Higher secondary / Diploma	52	17.3
	UG	58	19.3
	PG or higher	65	21.7

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Occupation Status	Government / Private sector employee	66	22.0
	Self-employed / Business	70	23.3
	Farmer	73	24.3
	Retired	50	16.7
	Others	41	13.7
Monthly Household Income (INR)	Less than Rs.10,000	87	29.0
	Rs.10,001 - Rs.25,000	89	29.7
	Rs.25,001 - Rs.50,000	34	11.3
	Rs.50,001 - Rs.75,000	53	17.7
	Above Rs.75,000	37	12.3
Place of Residence	Urban	69	23.0
	Semi-urban	82	27.3
	Rural	149	49.7
	Total	300	100.0

The total sample consisted of 300 respondents, with the demographic breakdown providing insights into various factors such as age, gender, education, occupation, income, and place of residence. The age distribution of the sample revealed that 28% were above 75 years of age, 26% in the 60-65 years age group, 66-70 years group represented 23.7% and 71-75 years group comprised 22.3%. The gender distribution indicated a slight majority of female respondents, accounting for 54.7% of the sample, while males made up 45.3% (n = 136).

In terms of educational qualifications, 19.3% had no formal education, 22.3% completed primary school, 17.3% had achieved higher secondary education or a diploma, 19.3% had undergraduate degrees and 21.7% had post-graduate qualifications or higher. 24.3% were farmers, 23.3% were self-employed or in business, government or private sector employees accounted for 22%, 16.7% were retired and 13.7% were identified with other occupational statuses.

Regarding household income, 29.7% reported a monthly household income between Rs.10,001 and Rs.25,000, 29% earning less than Rs.10,000, 17.7% earned between Rs.50,001 and Rs.75,000, 12.3% had a monthly income above Rs.75,000 and 11.3% earning between Rs.25,001 and Rs.50,000. 49.7% resided in rural areas, 27.3% living in semi-urban areas, and 23% residing in urban areas.

Sociographic Information of the Respondents

Sociographic Information	**Particular**	**Frequency**	**Percent**
Access to Digital Devices	Mobile phone (basic)	85	28.3
	Smartphone	148	49.3

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	Computer/Laptop	17	5.7
	Tablet	16	5.3
	None	34	11.3
Bank Account Ownership	Yes	189	63.0
	No	111	37.0
Use of Digital Financial Services (e.g., mobile banking, UPI, digital wallets)	Regularly	82	27.3
	Occasionally	101	33.7
	Rarely	42	14.0
	Never	75	25.0
Financial Dependence	Fully financially independent	55	18.3
	Partially dependent on family	177	59.0
	Fully dependent on family or others	68	22.7
Internet Access at Home	Yes	141	47.0
	No	159	53.0
	Total	300	100.0

The total sample consisted of 300 respondents, with sociographic information revealing varied access to digital devices, financial services, and resources. 49.3% reported having access to a smartphone, followed by those with a basic mobile phone (28.3%), 5.7% had access to a computer or laptop or a tablet (5.3%) and 11.3% having no access to any digital device. 63% reported owning a bank account and 37% did not.

Regarding the use of digital financial services, 33.7% indicated that they use these services occasionally, 27.3% reported using them regularly, 25% never use digital financial services, and 14% use these services rarely. In terms of financial dependence, 59% reported being partially dependent on family for financial support, 22.7% stated they were fully dependent on family or others and 18.3% described themselves as fully financially independent. In terms of internet access, 53% of the respondents reported not having internet access at home and 47% had internet access.

Descriptive Statistics for the Influential Factors of Digital Financial Adoption among Older Adults

Statements	N	Mean	SD
Perceived Ease of Use			
I find it simple to navigate through digital financial apps or websites.	300	2.03	1.351
Learning to operate digital financial tools does not require much effort.	300	1.88	1.208

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I am confident that I can use digital payment methods without assistance.	300	2.04	1.254
Social Influence			
My family members encourage me to use digital financial services.	300	1.91	1.269
Friends or neighbours who use digital finance motivate me to adopt these services.	300	2.03	1.272
I feel social pressure to adopt digital financial services to keep up with others.	300	2.12	1.276
Access to Proper Devices and Connectivity			
I have access to a smartphone or device that supports digital financial services.	300	2.05	1.333
The internet connection at my home is reliable for using digital financial applications.	300	2.03	1.268
Valid N (listwise)	300		

The above table indicates that the respondents disagree that it is simple to navigate through digital financial apps or websites (2.03), confidence in using digital payment methods without assistance (2.04), friends or neighbours who use digital finance motivating them to adopt these services (2.03), feeling social pressure to adopt digital financial services to keep up with others (2.12), having access to a smartphone or device that supports digital financial services (2.05), the internet connection is reliable for using digital financial applications (2.03) and strongly disagree with family members encouraging them to use digital financial services (1.91).

Descriptive Statistics for the Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults

Statements	**N**	**Mean**	**SD**
I feel more confident making financial decisions after using digital banking or payment apps.	300	2.11	1.410
Digital financial tools help me keep better track of my income and expenses.	300	1.94	1.193
Access to online financial services allows me to save money without relying on others.	300	1.91	1.268
Digital financial inclusion has reduced my dependence on family members for managing money.	300	1.91	1.269
I find digital financial services easy to use for my daily transactions and decision-making.	300	1.92	1.280

I trust digital financial services enough to conduct most of my financial activities independently.	300	1.92	1.273
Digital financial inclusion has empowered me to plan my finances better for the future.	300	1.91	1.269
Valid N (listwise)	300		

The above table indicates that the respondents strongly disagree with digital financial tools help to keep better track of their income and expenses (1.94), access to online financial services allows to save money without relying on others (1.91), digital financial inclusion has reduced dependence on family members for managing money (1.91), digital financial services are easy to use for daily transactions and decision-making (1.92), digital financial inclusion has empowered to plan their finances better for the future (1.91) and disagree with being more confident in making financial decisions after using digital banking or payment apps (2.11).

Descriptive Statistics for the Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults

Statements	**N**	**Mean**	**SD**
Digital tools assist me in budgeting and controlling unnecessary spending.	300	1.91	1.269
I feel more aware of my financial status since using digital banking and payment platforms.	300	1.91	1.269
Digital financial inclusion has helped me reduce dependence on cash transactions.	300	1.95	1.211
I use digital tools to plan and monitor my long-term financial goals such as retirement or medical expenses.	300	1.90	1.239
I use digital platforms to explore financial products (like savings schemes or insurance) that help secure my future.	300	2.68	1.472
The availability of digital financial services motivates me to plan my finances more sustainably.	300	2.44	1.452
Valid N (listwise)	300	1.91	1.269

The above table indicates that the respondents strongly disagree with digital tools assist in budgeting and controlling unnecessary spending (1.91), being much aware of financial status after using digital banking and payment platforms (1.91), digital financial inclusion helping to reduce dependence on cash transactions (1.95), using digital tools to plan and monitor long-term financial goals such as retirement or medical expenses (1.90). The respondents disagree with using digital platforms to explore financial products (like savings schemes or insurance) to secure their future (2.68) and availability of digital financial services motivates to plan their finances more sustainably (2.44).

Descriptive Statistics for the Barriers to Digital Financial Inclusion for Older Adults

Statements	N	Mean	SD

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Lack of Digital Literacy			
I find it difficult to understand how to use digital financial applications (like mobile banking or digital wallets).	300	2.43	1.390
I have not received proper training or guidance on how to use digital financial services.	300	2.37	1.354
Physical and Cognitive Barriers			
Poor eyesight makes it difficult for me to use digital devices for financial transactions.	300	2.51	1.457
I experience difficulty handling small buttons or screens on digital devices.	300	2.48	1.302
Remembering passwords, PINs, or security questions for digital financial apps is challenging for me.	300	2.61	1.462
Security and Trust Concerns			
Fear of online fraud or scams prevents me from adopting digital financial platforms.	300	2.59	1.454
I do not trust that digital financial service providers will keep my personal and financial information safe.	300	2.34	1.343
Security procedures for digital financial services seem too complicated and discouraging.	300	2.38	1.413
Valid N (listwise)	300		

The above table indicates that the respondents disagree with the difficulty in understanding how to use digital financial applications (like mobile banking or digital wallets) (2.43), not received proper training or guidance on how to use digital financial services (2.37), poor eyesight makes it difficult to use digital devices for financial transactions (2.51), experiencing difficulty in handling small buttons or screens on digital devices (2.48), challenges in remembering passwords, PINs, or security questions for digital financial apps (2.61), fear of online fraud or scams prevents from adopting digital financial platforms (2.59), not trusting digital financial service providers in keeping personal and financial information safe (2.34) and security procedures for digital financial services are too complicated and discouraging (2.44).

Comparison between the Demographic Variables (Educational Qualification) of the Respondents and Various Dimensions

H1: There is a significant difference the demographic variables (educational qualification) of the respondents and various dimensions.

Dimensions	Educational Qualification	N	Mean	SD	F	Sig.
Perceived Ease of Use	No formal education	58	1.06	0.251	18.736	0.000

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	Primary school	67	2.00	0.610		
	Higher secondary / Diploma	52	2.11	1.102		
	UG	58	1.98	1.025		
	PG or higher	65	2.69	1.666		
	Total	300	1.98	1.172		
Social Influence	No formal education	58	1.13	0.450	17.464	0.000
	Primary school	67	2.20	0.603		
	Higher secondary / Diploma	52	2.08	0.972		
	UG	58	1.95	0.930		
	PG or higher	65	2.64	1.666		
	Total	300	2.02	1.134		
Access to Proper Devices and Connectivity	No formal education	58	1.19	0.706	12.476	0.000
	Primary school	67	2.30	0.913		
	Higher secondary / Diploma	52	1.91	1.149		
	UG	58	2.02	1.147		
	PG or higher	65	2.65	1.745		
	Total	300	2.04	1.283		
Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults	No formal education	58	1.08	0.309	14.614	0.000
	Primary school	67	2.02	0.596		
	Higher secondary / Diploma	52	1.97	1.272		
	UG	58	1.93	1.184		
	PG or higher	65	2.64	1.722		
	Total	300	1.95	1.236		
Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults	No formal education	58	1.46	0.528	13.657	0.000
	Primary school	67	2.10	0.642		
	Higher secondary / Diploma	52	2.03	1.241		
	UG	58	2.10	1.166		
	PG or higher	65	2.89	1.500		
	Total	300	2.13	1.166		
Lack of Digital Literacy	No formal education	58	2.28	1.442		

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	Primary school	67	2.43	0.818	8.507	0.000
	Higher secondary / Diploma	52	1.99	1.247		
	UG	58	2.04	0.956		
	PG or higher	65	3.13	1.549		
	Total	300	2.40	1.292		
Physical and Cognitive Barriers	No formal education	58	2.21	1.448	14.312	0.000
	Primary school	67	2.35	0.696		
	Higher secondary / Diploma	52	2.81	1.148		
	UG	58	1.89	1.145		
	PG or higher	65	3.36	1.388		
	Total	300	2.53	1.290		
Security and Trust Concerns	No formal education	58	2.21	1.448	12.071	0.000
	Primary school	67	2.24	0.773		
	Higher secondary / Diploma	52	2.21	1.194		
	UG	58	2.07	1.173		
	PG or higher	65	3.35	1.367		
	Total	300	2.44	1.293		

There is no significant difference between perceived ease of use (0.000), social influence (0.000), and access to proper devices and connectivity (0.000), impact of digital financial inclusion on financial decision-making autonomy of older adults (0.000), role of digital financial inclusion in promoting sustainable economic behaviour among older adults (0.000), lack of digital literacy (0.000), physical and cognitive barriers (0.000), security and trust concerns (0.000) and the educational qualification of the respondents.

Perceived Ease of Use

Respondents with no formal education reported the lowest score (1.06), postgraduate or higher education reported the highest mean (2.69) showing that higher education is associated with higher perceived ease of use of digital financial tools.

Social Influence

Respondents with no formal education reported the lowest mean score (1.132), postgraduate or higher education had the highest mean score (2.64) suggesting that social influence, such as family or peer encouragement, is more impactful for those with higher levels of education.

Access to Proper Devices and Connectivity

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Respondents with no formal education reported the lowest mean (1.19), postgraduate or higher education had the highest mean (2.65) suggesting that access to digital devices and connectivity improves as education level increases.

Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy

The result reveals that higher education levels are linked to a greater positive impact on financial decision-making autonomy through digital financial services.

Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour

The result indicates significant differences, showing that higher educational qualifications are associated with more sustainable economic behavior enabled by digital financial inclusion.

Lack of Digital Literacy

The result highlights that educational attainment reduces the barriers posed by digital literacy, with those having higher education less likely to experience digital literacy challenges.

Physical and Cognitive Barriers

The result suggests that cognitive barriers might be perceived differently across education levels, with those with higher education experiencing more awareness of physical and cognitive limitations when using digital financial tools.

Security and Trust Concerns

The Security and Trust Concerns also showed significant variation, with no formal education respondents reporting a mean of 2.213, while those with postgraduate or higher education had the highest mean (3.35). The result indicates that concerns about security and trust in digital financial services are more pronounced among respondents with higher education.

Comparison between the Sociographic Variables (Access to Digital Devices) of the Respondents and Various Dimensions

H2: There is a significant difference the sociographic variables (access to digital devices) of the respondents and various dimensions.

Dimensions	Access to Digital Devices	N	Mean	SD	F	Sig.
Perceived Ease of Use	Mobile phone	85	1.54	0.985	9.796	0.000
	Smartphone	148	2.00	0.849		
	Computer/Laptop	17	2.00	1.500		
	Tablet	16	2.13	1.500		
	None	34	2.94	1.787		
	Total	300	1.98	1.172		
Social Influence	Mobile phone	85	1.75	1.069	6.751	0.000

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	Smartphone	148	1.97	0.765		
	Computer/Laptop	17	2.00	1.500		
	Tablet	16	2.13	1.500		
	None	34	2.88	1.742		
	Total	300	2.02	1.134		
Access to Proper Devices and Connectivity	Mobile phone	85	1.86	1.317	4.359	0.002
	Smartphone	148	1.94	0.991		
	Computer/Laptop	17	2.00	1.500		
	Tablet	16	2.13	1.500		
	None	34	2.87	1.781		
	Total	300	2.04	1.283		
Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults	Mobile phone	85	1.54	0.985	9.112	0.000
	Smartphone	148	1.92	0.999		
	Computer/Laptop	17	2.00	1.500		
	Tablet	16	2.13	1.500		
	None	34	2.97	1.812		
	Total	300	1.95	1.236		
Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults	Mobile phone	85	1.69	0.944	11.410	0.000
	Smartphone	148	2.11	0.973		
	Computer/Laptop	17	2.20	1.424		
	Tablet	16	2.44	1.348		
	None	34	3.17	1.541		
	Total	300	2.13	1.166		
Lack of Digital Literacy	Mobile phone	85	2.21	1.355	12.258	0.000
	Smartphone	148	2.14	0.974		
	Computer/Laptop	17	2.59	1.583		
	Tablet	16	3.06	1.436		
	None	34	3.62	1.387		
	Total	300	2.40	1.292		

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Physical and Cognitive Barriers	Mobile phone	85	2.04	1.290	11.511	0.000
	Smartphone	148	2.50	1.033		
	Computer/Laptop	17	2.59	1.583		
	Tablet	16	3.06	1.436		
	None	34	3.64	1.379		
	Total	300	2.53	1.290		
Security and Trust Concerns	Mobile phone	85	2.02	1.322	13.174	0.000
	Smartphone	148	2.31	0.979		
	Computer/Laptop	17	2.59	1.583		
	Tablet	16	3.06	1.436		
	None	34	3.68	1.408		
	Total	300	2.44	1.293		

There is no significant difference between perceived ease of use (0.000), social influence (0.000), access to proper devices and connectivity (0.002), impact of digital financial inclusion on financial decision-making autonomy of older adults (0.000), role of digital financial inclusion in promoting sustainable economic behaviour among older adults (0.000), lack of digital literacy (0.000), physical and cognitive barriers (0.000), security and trust concerns (0.000) and access to digital devices among the respondents.

Perceived Ease of Use

The ANOVA result highlights that access to better devices, such as smartphones and tablets, correlates with higher perceived ease of use.

Social Influence

Regarding Social Influence, those using mobile phones reported the lowest mean (1.75), while those with no access to devices reported the highest mean (2.88), suggesting that people without digital devices are more influenced by social pressure or encouragement to adopt digital financial services.

Access to Proper Devices and Connectivity

The result highlights that better access to devices like smartphones and tablets enhances access to proper devices and connectivity for digital financial services.

Impact of Digital Financial Inclusion on Financial Autonomy

Respondents with mobile phones reported the lowest mean (1.54), while individuals with no devices reported the highest mean (2.97). The result shows that access to digital devices,

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particularly smartphones and tablets, has a significant impact on financial decision-making autonomy.

Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour

The sustainable economic behaviour was most pronounced in individuals with no devices (3.17), indicating that the lack of access to digital devices might drive older adults to seek out alternatives for managing their finances sustainably. Respondents with mobile phones reported the lowest mean (1.69), while smartphone users reported a more positive role (2.11).

Lack of Digital Literacy

Lack of Digital Literacy was most significant in those with no devices (3.62), followed by tablet users (3.06), indicating that the absence of access or familiarity with digital tools leads to greater challenges in digital literacy.

Physical and Cognitive Barriers

Respondents with mobile phones reported relatively lower physical and cognitive barriers (2.04), while those with no devices reported the highest mean (3.64), indicating that the lack of devices may exacerbate physical and cognitive barriers to using digital financial services. The result shows that access to mobile phones, smartphones, and tablets helps mitigate physical and cognitive barriers.

Security and Trust Concerns

The result shows that access to smartphones and tablets reduces security concerns, whereas those without access to digital devices feel more vulnerable to online fraud and trust issues.

REGRESSION ANALYSIS

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.421[a]	.178	.155	1.226	.178	7.858	8	291	.000

a. Predictors: (Constant), Security and Trust Concerns, Access to Proper Devices and Connectivity, Perceived Ease of Use, Physical and Cognitive Barriers, Lack of Digital Literacy, Social Influence, Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults, Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults

b. Dependent Variable: Occupation Status

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A multiple regression analysis was conducted to evaluate the relationship between the independent variables and the dependent variable, revealing a moderate correlation ($R = 0.421$) and explaining 17.8% of the variance ($R^2 = 0.178$). The model was statistically significant ($F = 7.858$, $p = 0.000$), indicating that the predictors collectively contribute to explaining the dependent variable.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	94.446	8	11.806	7.858	0.000a
	Residual	437.220	291	1.502		
	Total	531.667	299			

a. Predictors: (Constant), Security and Trust Concerns, Access to Proper Devices and Connectivity, Perceived Ease of Use, Physical and Cognitive Barriers, Lack of Digital Literacy, Social Influence, Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults, Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults

b. Dependent Variable: Occupation Status

The results revealed a significant regression, with an F value of 7.858 and a p value of 0.000, indicating that the model significantly predicts the dependent variable. The total sum of squares was 531.667, with the regression sum of squares being 94.446 and the residual sum of squares 437.220, suggesting that a portion of the variability in the dependent variable is explained by the model.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.364	.188		12.598	0.000
	Perceived Ease of Use	.479	.251	.421	1.909	0.057
	Social Influence	-.300	.207	-.255	-1.454	0.147
	Access to Proper Devices and Connectivity	-.204	.150	-.196	-1.358	0.175

	Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults	.486	.415	.450	1.169	0.243
	Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults	-.528	.399	-.462	-1.325	0.186
	Lack of Digital Literacy	-.028	.148	-.027	-.191	0.848
	Physical and Cognitive Barriers	.841	.136	.814	6.207	0.000
	Security and Trust Concerns	-.575	.218	-.558	-2.643	0.009

a. Dependent Variable: Occupation Status

The constant term was significant (B = 2.364, p = 0.000), suggesting that when all predictors are zero, the baseline value of occupation status is 2.364. Among the predictors, perceived ease of use (B = 0.479, p = 0.057) had a marginally significant positive effect on occupation status, while physical and cognitive barriers (B = 0.841, p = 0.000) had a highly significant positive effect. Conversely, security and trust concerns (B = -0.575, p = 0.009) showed a significant negative effect, indicating that greater concerns with security and trust decrease the likelihood of being in certain occupation statuses. Other predictors, such as social influence and access to proper devices, did not show significant effects (p > 0.05).

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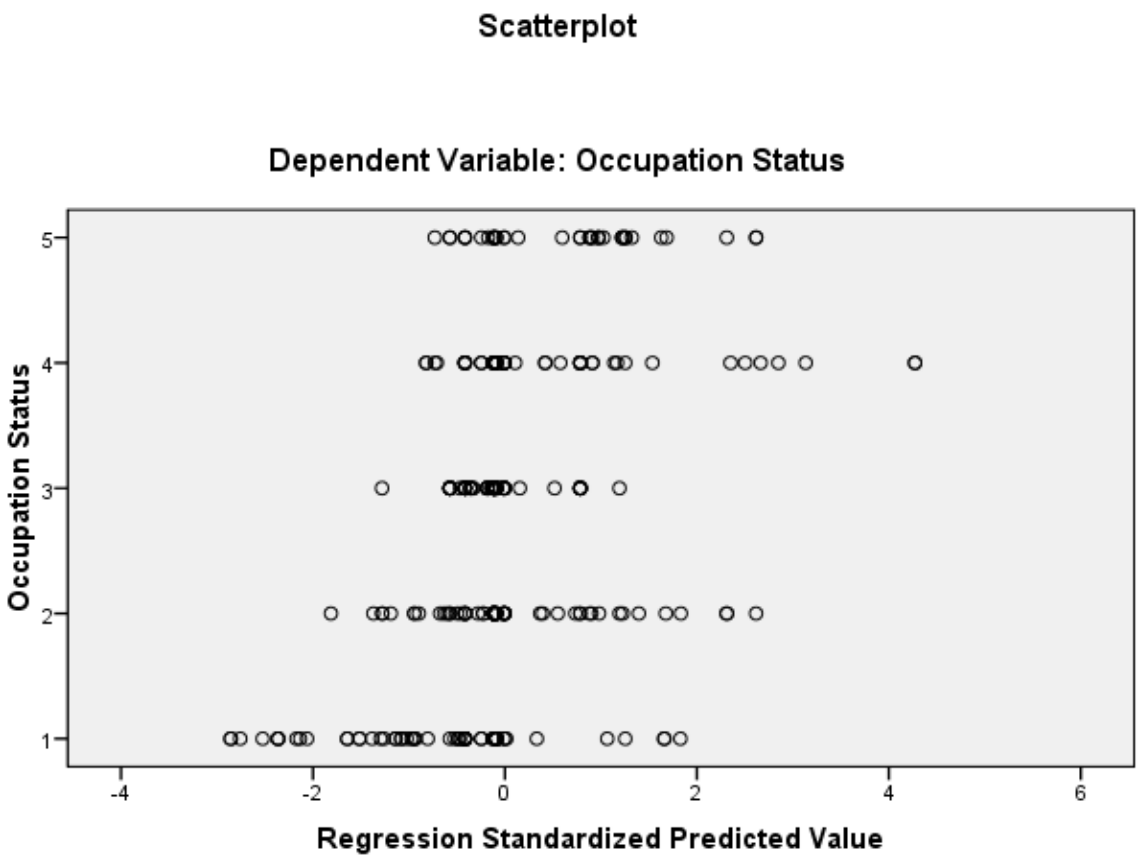

FINDINGS

Demographic Variables of the Respondents

Most of the respondents are more than 75 years of age. Most of the respondents are female. Most of the respondents completed their primary school education. Most of the respondent are involved in farming. Most of the respondents earning an monthly income of Rs.10,001-Rs.25,000. Most of the respondents residing in rural areas.

Sociographic Information of the Respondents

Most of the respondents are having access to digital devices like smartphones. Most of the respondents are having a bank account. Most of the respondents are partially dependent on their family and occasionally using digital financial services. Most of the respondents are not having internet access at home.

The Influential Factors of Digital Financial Adoption among Older Adults

The findings indicate that older adults generally find digital financial tools moderately easy to use, but there is room for improvement in simplifying these platforms. Social influence plays a moderate role

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in encouraging adoption, with family members and friends motivating some older adults to use digital financial services. While most respondents have access to digital devices and a reliable internet connection, the variability in confidence levels and device access suggests that targeted interventions could help increase adoption rates among older adults.

Impact of Digital Financial Inclusion on Financial Decision-Making Autonomy of Older Adults

The respondents report that digital financial tools help in tracking income and expenses, saving money independently, and reducing their reliance on family for money management, but with varying degrees of certainty. Despite these positive responses, the overall ease of use and trust in digital financial services for daily transactions and future financial planning remains somewhat moderate, suggesting potential for further improvement in user experience and trust-building initiatives.

Role of Digital Financial Inclusion in Promoting Sustainable Economic Behaviour among Older Adults

Older adults report that digital financial tools help them manage budgeting, reduce reliance on cash transactions, and feel more aware of their financial status, though these impacts are generally moderate. The use of digital platforms for long-term financial planning, such as for retirement or medical expenses, is also somewhat prevalent, but the adoption of financial products for future security (e.g., savings schemes or insurance) is more prominently reported.

Barriers to Digital Financial Inclusion for Older Adults

Physical and cognitive barriers, such as poor eyesight, difficulty handling small buttons or screens, and challenges with remembering security details like passwords or PINs, are also significant factors that hinder their use of digital financial tools. Additionally, security and trust concerns, including fear of online fraud and distrust in service providers' ability to protect personal information, pose notable barriers, with security procedures often perceived as too complicated to navigate, thereby discouraging adoption.

Practical Implications

The main reason for this study is that there seems to be a contradiction between the fact that technology-based services are becoming more available in India and the fact that older people do not use digital finance very much, especially considering the COVID-19 pandemic and in the future. Many of the factors that influence e-banking behavior among the elderly in India have been identified in the analysis. There is wide use of mobile telephony in both rural and urban landscapes, but the author argues that there is still reluctance and latent fear towards the use of digital platforms for banking and financial transactions. The majority of companies around the world are currently transitioning from physical to digital locations, making this hesitation counterproductive.

The study's empirical analysis supports findings from prior research suggesting that peoples' impressions of how safe and simple e-banking methods are may dampen their propensity to use them.

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This suggests that the elderly are especially vulnerable to fraud because of their heightened sensitivity to financial insecurity. This highlights the significance of providing elderly consumers with not only information about their rights when using digital finance but also the knowledge and skills to exercise those rights effectively. Previous research on the topic has confirmed that it is essential to reduce users' fears of and dissatisfaction with digital platforms and their service providers. Furthermore, elderly consumers' digital literacy and digital comfort can be significantly attuned to stronger behavioral intentions for e-banking if the knowledge base of the user is strengthened along with relevant support structures.

To achieve this goal, initiatives and financial literacy campaigns that target elderly consumers should be prioritized. During and after the COVID-19 pandemic, it is more important than ever to emphasize the correct way of disseminating technological innovations across all user cohorts, especially senior adults. Uniform dissemination of innovation knowledge in society can help spread positive word of mouth and significantly reduce the impact of misappropriation and instances of financial fraud. Given the rapid pace at which technology is evolving and being integrated into everyday life, it is believed that such managerial actions can also reduce the percentage of digital exclusion, especially among elderly users. The National Council on Ageing (NCOA) stresses the importance of further efforts to bridge the generation gap between senior adults and advanced technologies such as smartphones and tablets.

Conclusion

Digital financial inclusion plays a pivotal role in enhancing the financial autonomy of older adults. Through the adoption of digital banking tools, payment applications, and financial platforms, older adults experience a greater sense of independence in managing their finances. By enabling users to track their expenses, manage savings, and make informed financial decisions, digital tools provide older adults with the capacity to navigate financial challenges with increased confidence. This autonomy empowers them to make financial choices without being overly reliant on others, particularly family members, thereby promoting self-sufficiency.

Furthermore, digital financial inclusion has a substantial impact on encouraging more sustainable economic behaviour among older adults. The ability to plan for long-term financial goals, such as medical expenses, retirement, and other essential needs, becomes more accessible through digital platforms. As older adults gain better control over their financial status and expenditures, they are more likely to engage in responsible financial planning, leading to better economic stability. Digital financial tools also support the exploration of financial products like insurance and savings schemes, which are crucial in securing the future.

The role of digital financial inclusion extends beyond immediate financial autonomy to fostering long-term sustainable economic behaviour. By providing older adults with the tools to manage their finances independently and securely, digital financial services contribute to greater financial well-being and sustainability. However, for these benefits to be fully realized, efforts must be made to address barriers such as digital literacy, access to technology, and security concerns. Empowering older adults through accessible and user-friendly digital financial services will significantly enhance their economic resilience and overall quality of life.

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