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POST GRADUATE DEPARTMENT OF ECONOMICS
SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR

Department of Economics
Sardar Patel University, Vallabh Vidyanagar

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BEHAVIOURAL INTENTION OF RESIDENTS ON THE ADOPTION OF ELECTRONIC VOTING MACHINE IN A SMALL ISLAND DEVELOPING ECONOMY - A CASE STUDY

Soujata Rughoobur-Seetah* **Loga Devi Balla Soupramanien****

Abstract

This study attempts to evaluate the Technology Acceptance Model (TAM) in the context of assessing the behavioural intention of residents in Mauritius to adopt and use the Electronic voting machine. The introduction and acceptance of E-voting machine has always been a subject of debate in many countries and especially for Small Island Developing States (SIDS). Mauritius, is a country where most of the governmental services are being provided online and this study will aim at assessing the citizens perceptions in terms of the acceptance and adoption of the E-voting machine. This study also included the trust construct as it deals with a sensitive subject matter which is the fundamental right of citizens to vote. Variables like perceived usefulness, perceived ease of use, attitudes towards using and behavioural intention to use has been included in the proposed framework. A survey was administered to the residents of Mauritius through online surveys and 224 participants responded positively to the questionnaire sent. A Partial Least Square Structural Equation Modelling (PLS-SEM) was conducted where a clear positive response regarding the adoption of Electronic voting (E-voting) machine was concluded. The theoretical and practical implications have been discussed. Some limitations have also been highlighted.

Keywords: *Electronic Voting machine, Technology Acceptance Model (TAM), Trust, Behavioural Intention to use, Mauritius*

Introduction

Technology in today's world is regarded as a necessity. From small businesses to large corporate sectors, the adoption of technology is everywhere. Technology has facilitated a lot of tasks and information management. More so, the usage of technology has led to the success of many enterprises and acts as a competitive advantage (Turban et al., 2008). The revolution of information technology has often been called "The Third wave" (Toffer et al., 1980). In simple terms, information technology can be defined as a medium that allows the storage, processing and communication of a large amount of information quickly and cheaply. It can be said to assemble various functions of different operating machines like the television, typewriters, and telephone amongst others on a single device. With the impact of COVID-19, the adoption of technology in the routine lives of people has been the new normal (Jílková & Králová, 2021). People are making their purchases through E-commerce, paying their monthly bills and also working from home. The acceleration towards the fourth industrial revolution is now a reality and individuals have recognized the growing importance and reliability of technology.

Both voting and elections are regarded as the lifeblood of a democratic country (Goodman & Gabel, 2020). It is important that an election is conducted in a fair and transparent manner for its outcome to be considered credible and therefore, reflect the choice of the voters. During the elections the voters should freely vote for their chosen representative. Voting is also seen as the "simplest means of participation in a democracy" as it necessitates minimum effort (Goodman & Gabel, 2020, p.90). Over the years, many countries have

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increasingly used technology to improve several aspects of their electoral systems by having the voters cast their votes electronically, also known as electronic voting or E-voting. E-voting can be defined as "a mechanism through which voting processes are produced and delivered to citizens utilizing web-based internet applications" (Alomari, 2016, p.527). It is considered to be the adoption of electronic channels to support or manage the electoral process including the voters' registration, the casting and counting of the ballots as well as the communication of the results (Essex & Goodman, 2020).

According to Bokslag & De Vries (2016), E-voting offers numerous advantages like fast counting, reduction of the number of labour needed to do the counting process, cheaper method and accessibility. Apart from these benefits, E-voting through the reliance on electronic voting machines also assists in enhancing the integrity of the election process. The Ace Electoral Knowledge Network (n.d.) indicates that there are 4 types of electronic voting machines: (i) Direct Recording Electronic voting machines enable the electors to either cast their votes by pressing buttons or through touch-sensitive screens. (ii) Optical Mark Recognition Solutions requires the electors to record their choice on a distinct ballot paper which is later read via a scanner. (iii) Electronic Ballot Printers (EBP) which resembles the direct recording electronic voting machine except that the ballot papers are printed and arranged in either ballot boxes or a different scanner. (iv) Internet voting systems enable electors to vote through computers connected via the internet to the servers of the election management bodies.

The reliance on electronic voting machines by countries around the world was mainly aimed at minimizing errors and accelerating the counting process. Developing countries have also shown considerable interest in relying on electronic voting machines when holding elections. It has been reported that they have a more rapid adoption of electronic voting systems compared to developed countries (Hapsara et al., 2017). These systems are considered a remedy to the difficulties faced with traditional paper elections such as the need for a trusted election instrument, an approved organiser and cumbersome processes; require considerable time and resources and are vulnerable to electoral fraud (Risnanto et al., 2020; Liu & Zhao, 2018). Research has revealed that the adoption of electronic voting machines in India resulted in an important decrease in electoral fraud; empowerment of the weaker sections of the population to vote; and a reduction in the vote shares for the winning party (Ravi et al., 2017). The shift from the traditional paper ballot has made the elections in India more credible and fair with less manipulation by the incumbents (Ravi 2019; Somanthan, 2019).

Although Small Island Developing States (SIDS) have been reported to have greater success in attaining democracy and transparency, nevertheless studies have revealed that the smallness of states does not necessarily translate into electoral democracy (Veenendaal, 2015; Erk & Veenendaal, 2014). Veenendaal (2015) argued that the microstate politics that operate in these states compromises the proper operation of democracy. This is further reflected in the poor governance of the public service sector in terms of corruption, nepotism, absence of impartial institutions, amongst others. In situations where the integrity of the elections can be prone to being infringed, especially in SIDS, E-voting can serve as an important tool in ensuring that the results are not subject to any form of irregularity.

Problem Statement

Various studies have demonstrated that Small Island Developing States (SIDS) are consistently adopting technology and keeping pace with every single advent of the same (Park, Roman, Lee & Chung, 2009). As such governments in SIDS are adopting the E-government where government services are being put at the disposition of its citizens. Nevertheless, when discussing technology adoption, it has been observed that the government parties in SIDS are quite reluctant to adopt the E-voting services. The right to vote is a fundamental right of a citizen in a democratic country (Ratcliffe, 2013). Most of the SIDS are still using the paper-ballots method of voting which carries a lot of risks, and a lot of anomalies are being noted (eg. Aljarrah, Elrehail & Aababneh 2016; Bhim, Von Strokirch & Garnett, 2021). These anomalies in a certain way give rise to numerous doubts about the countries' voting system, thus creating an unhealthy atmosphere for its citizens. Being a fundamental

right for citizens, people need to start trusting the mechanism and E-voting might be a way to help citizens to gain more trust.

Study Context

This study focuses on Mauritius, an island located in the Indian Ocean, more precisely on the eastern coast of Africa. Mauritius has around 1,266,030 citizens (Statistics Mauritius, 2020). Mauritius obtained its independence in 1968 and it follows the Westminister Parliamentary System. As a democratic country, the general election in Mauritius is held periodically, that is, after 5 years. Over the past years, more precisely during the last election held in 2019, the country has experienced a lot of hurdles and anomalies related to the counting of the ballots (Darga, 2021). The handling and transportation of paper ballots are questionable and risky and at the same time, the human intervention in the counting process gives room to errors. Mauritius has already adopted the E-government services where the citizens can do a lot of transactions by sitting at home. E-voting might be another milestone that might help Mauritius in becoming more open to technology adoption.

Electoral System of Mauritius

Mauritius has a unique electoral system which is underpinned by the First-Past-The-Post (FPTP) and the Best Loser System (BLS). The section 31 of the Constitution of Mauritius provides for a parliament, consisting of a president of the National Assembly and the election of 70 members. Furthermore, the Representation of the People Act 1958 also caters for local government elections and the Rodrigues Regional Assembly Election. The 70 members are elected by both the FPTP and the BLS. Under the FPTP system, 62 members (3 members from each 20 constituencies in Mauritius and 2 members for Rodrigues) are elected by universal suffrage in a secret ballot. Up to a maximum of 8 seats are allocated under the BLS for a fair ethnic representation in the National Assembly. The section 28 of the Constitution specifies that the parliament must elect the President following a motion of the Prime Minister. The motion must receive the support of a majority vote of all the members. Moreover, the Constitution under section 44 guarantees the right to vote to citizens (registered voters). Under the current paper-based election, the ballot paper must be stamped with the Electoral Supervisory Commission's stamp in front of everyone present and given to the voter. The confidentiality of voting must also be upheld through voting booths for appropriate privacy. After voting the ballot paper must be folded to avoid revealing the vote prior to the voter dropping it into the transparent ballot box. Voting in Mauritius is a complex process and it can be said that studying and assessing the impact and implication of the adoption of Electronic voting machine will help to gain better insights. This study will assess the adoption of Electronic voting machine from two theoretical perspectives, namely the Theory of Reasoned Action and the Technological Acceptance Model. The Technology Acceptance Model (TAM) (Davis, 1989) is one such framework designed to assess the level of technology acceptance of individuals.

Theory of Reasoned Action

The theory of reasoned action has long been studied and evaluated by various scholars (Hale, Householder & Greene, 2002; LaCaille, 2020; Ng, 2020). The prime aim of this theory is to assess the intention of an individual engaging in voluntary actions based on attitudes and subjective norms which ultimately guides behavioural intention and action (Hale, Householder & Greene, 2002). Attitude plays a very important dimension in guiding behavioural intention and action of an individual through his positive or negative attitudes towards a matter will help them to determine whether they will intend and act or not (Hale, Householder & Greene, 2002). Subjective norm is another dimension where an individual's behaviour is guided by others' opinions on whether he/she should act in a particular way. The theory of reasoned action has been one of most researched theories when it comes to predicting human behaviour. Researchers have acknowledged the contribution of this theory in helping forecast human behaviours (Xiao, 2020; Ajzen & Kruglanski, 2019). This study is exploring the acceptance of citizens of the E-voting machine in Mauritius and thus it is always enriching to accompany the theory of reasoned action with the technology acceptance model.

Technology Acceptance Model (TAM)

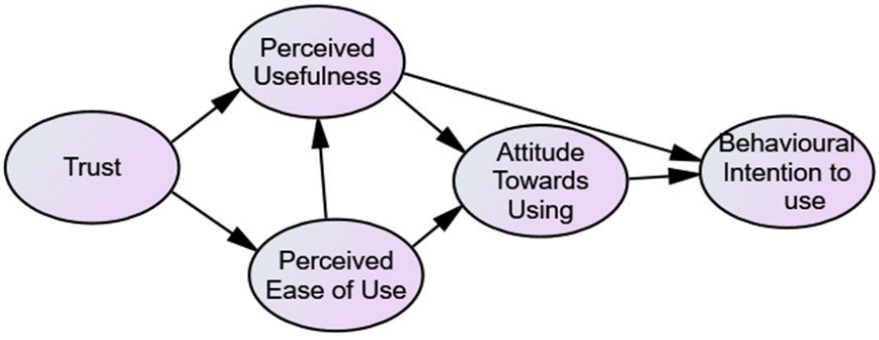
TAM dates to 30 years where the theory has as background the Theory of Reasoned Action (Davis, 1989). When it comes to the evaluation of user acceptance to the adoption of information technology, TAM has been the most widely used and tested model, more so when the adoption and acceptance of E-voting system are being assessed (e.g. Pleger & Mertes, 2018; Fuster & Grandón, 2021). Davis's (1989) TAM, is able to capture the adequate degree of the actual user usage through the perceived usefulness construct and perceived ease of use construct. Perceived usefulness can be defined as the extent to which an individual believes that using a specific construct will help them to increase his/her performance (Davis, 1989) and perceived ease of use is the extent to which an individual believes that using a particular system can free them from any effort (Davis, 1989). Therefore, based on past evidence TAM is deemed the most appropriate framework to use so as to forecast and understand the degree of user acceptance when E-voting is being evaluated.

The Proposed Conceptual Framework and Contribution of Study

The proposed framework is inspired from the theory of reasoned action and TAM where at the end the user's behavioural intention to use the E-voting machine is evaluated. The proposed framework assesses the level of the user's trust, perceived usefulness, perceived ease of use, attitudes toward using and the behavioural intention to use the E-voting machine. The user's level of trust was an important construct to include and analyze as the right to vote and the medium of voting require the citizens to trust the application provided to them. They need to feel secure and trust that no tampering will be done with their voting rights, medium and choices. The credibility of the E-voting machine is of great significance for the citizens. The voting right is the sacred right of an individual and to digitalize this right requires acceptance. The researcher acknowledges that there are numerous studies on E-voting in Small Island Developing States, Yet, it has to be taken into consideration that not a single study has been conducted for the case of Mauritius where the behavioural intention of citizens to use the E-voting machine was evaluated. This study is a groundbreaking study to analyze the extent to which Mauritians trust and will be likely to adopt the E-voting machine by using two theories: the theory of reasoned action and TAM.

Figure 1 is a diagrammatical representation of the proposed framework.

Figure 1: The Proposed Model



Review of Literature

Attitude towards using and Behavioural Intention to use

According to the theory of reasoned action, a person's behaviour is shaped by the latter's intention to execute this behaviour while the person's intention is determined by the person's attitudes and subjective norms (Ajzen & Fishbein, 1972). Defining behavioural intention to use as an estimate of the probability that the application would be embraced by a person, Ntale & Ngoma (2021) argue that it might be an effective measure of user readiness. Notwithstanding the significance of attitude in determining a person's behaviour, studies on technology

adoption have principally disregarded the influence of attitude when resolving technology acceptance behaviour (Tao et al., 2020a; 2020b). The population's attitudes concerning technology change are considered an important construct when examining the adoption of E-voting (Adeshina & Ojo, 2014). This view has also been noted in several studies with regards to the considerable impact of attitudes when analyzing E-voting as an advancement in society (Adeshina & Ojo, 2014; Manolopoulos et al., 2013). The more positive attitudes the citizens have, the higher would be their intention to embrace E-voting (Alomari, 2016). A positive attitude regarding information technology is a crucial element to develop voters' trust in E-voting systems and therefore, considerably influences the adoption or use of such a system (Chiang, 2009). Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between attitude towards using and behavioural intention to use the E-voting machine

H1: There is a positive relationship between attitude towards using and behavioural intention to use the E-voting machine

Perceived usefulness and Attitudes towards Using

Various studies have revealed that perceived usefulness impacts both the intention to utilize and actual employment of numerous technologies (Omotoya & Adekunle, 2020). Perceived usefulness refers to the extent to which a person thinks that the adoption of a specific system will improve his or her performance of a particular task (Davis, 1989). Prospective users first assess the consequences of their adoption behaviour in line with the continuing desirability of the usefulness obtained from the technology prior to using them (Das, 2020). Existing studies on information system adoption expounds that if a system fails to assist people to achieve their tasks, prospective users will have a negative attitude with regards to that system. Thus, the adoption or use of technology is proportionate to the extent to which they consider it useful to execute their tasks. Perceived usefulness is an indicator of attitude, intention and actual behaviour and it incentivises citizens to adopt E-voting and other self-service technologies that offer higher autonomy in executing voting processes and collecting voting perceptions (Pikkarainen et al., 2004). The higher the perceived usefulness of E-voting services, the higher the positive attitude towards usage which thereupon, leads to greater readiness to adopt and accept E-voting (Polatoglu & Ekin, 2001; Mensah, 2016). Perceived usefulness is therefore considered an influential means to enhance the acceptance and usage of new E-voting technologies (Lopez & Manson, 2007).

Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between perceived usefulness and attitudes towards using the E-voting machine

H2: There is a positive relationship between perceived usefulness and attitudes towards using the E-voting machine

Perceived Usefulness and Behavioural intention to use

Several studies on information systems have revealed the considerable influence of perceived usefulness on adoption and use (Abu-Shanab et al., 2010; Chen et al., 2013; Lin et al., 2007; Mensah, 2017; Ngatchu et al., 2018). A significant link between perceived usefulness and intention to use as well as the actual use of E-voting systems has also been found (Alomari, 2016; Anagreh & Abu-Shanab, 2017; Mensah, 2017; Ali et al., 2015). Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between perceived usefulness and behavioural intention to use the E-voting machine

H3: There is a positive relationship between perceived usefulness and behavioural intention to use the E-voting machine

Perceived Ease of Use and Attitudes towards Using

Perceived ease of use is defined as the extent to which a person thinks that reliance on a specific system is without effort (Davis, 1989; Dholakia & Dholakia, 2004) or ease to learn or use (Davis, 2009). This might include the nature of the complexity of a system and level of effort that the user might be required to apply. It is believed that perceived ease of use contributes to positive attitudes and execution whereas its absence may lead to frustration, negative attitude, and thus, impedes the espousal of innovations (Davis, 1989; Venkatesh, 1999; Venkatesh & Davis, 2000). Perceived ease of use is a key indicator of attitude towards use and adoption of new technology. In other words, the easier it becomes for a user to interact with a system, the greater the probability that he or she will perceive it to be useful (Thong et al., 2004). Research has discovered a significant and positive correlation between perceived ease of use and attitudes to adopt or utilize an E-voting technology (Yusoff et al., 2009). Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between perceived ease of use and attitudes towards using the E-voting machine

H4: There is a positive relationship between perceived ease of use and attitudes towards using the E-voting machine

Perceived Ease of Use and Perceived Usefulness

It is believed that perceived ease of use has a significant positive impact on the readiness to use E-voting where such a system is less burdensome to adopt (Mensah, 2017; Abu-Shanab et al., 2010). The relationships between PEOU and intention to use and actual use of E-voting technologies have been observed in several studies (Abu-Shanab et al., 2010; Mensah, 2017; Ngatchu et al., 2018; Zada et al., 2016). Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between attitude towards using and perceived usefulness

H5: There is a positive relationship between attitude towards using and perceived usefulness

Trust

The adoption of E-government is dependent on the element of trust, that is, trust in the internet and in the government (Alomari et al., 2012). It has been revealed that trust in the internet and trust in government determines the citizens' intentions to adopt E-government services (Carter & Belanger, 2005) and initiatives such as E-voting (Schaupp & Carter, 2005). The citizens' perception of the trustworthiness of both the technology system and the authorities is crucial when adopting E-voting systems. Investigating the impact of various factors including trust in the internet and trust in E-voting in developed countries, Powell et al. (2012) discovered that although trust in the internet has a major impact on E-voting adoption, but this does not apply to trust in the government.

Trust and Perceived Ease of Use

Research in the context of E-commerce has revealed that the level of trust in E-commerce would be higher if the system is easy-to-understand and therefore, decreases asymmetric information (Chen & Barney, 2007; Koufaris & Hampton-Sosa, 2004; Kuo et al., 2004). It has been argued that a good interface strengthens the creation of consumer trust. Akin to interpersonal attraction, a relatively higher degree of trust is placed into entities such as websites or systems that bear an initial attractive outlook (Fung & Lee, 1999). The factor of usability acts as an indication of the quality and the potential of the system to attain its objective (McKnight et al., 2002). Since, the perceived ease of use is considered a major component of trust in technology as it is one of the expectations users have when they develop their trust in technology (Lippert, 2007).

Trust and Perceived Usefulness

The probability of adopting E-government services such as E-voting is influenced by trust in the system and the authorities (Carter & Bélanger, 2005; Powell et al, 2012). It has been asserted that the trust in the internet, trust in the government, attitudes, beliefs, computer and internet skill confidence as well as website design together affect the adoption of E-voting across countries (Alomari et al., 2012). Another study found users' attitudes, difficulty, perceived usefulness and trust in E-government as notable determinants of the adoption of E-voting (Alomari, 2016). Initial trust is believed to influence perceived usefulness (Amin, Rezaei & Abolghasemi, 2014). Studies on social networking websites have discovered trust and usefulness as major indicators of users' intention to use and those on mobile commerce (Lee & Jun, 2007) have found that perceived usefulness and perceived ease of usefulness as crucial predictors of clients' trust. Again, the deciding and actual intentions and behaviours of citizens are guided by the Theory of Reasoned Action where the citizens evaluate whether to use the system or not.

Based on the above the below hypothesis is proposed:

H0: There is not a significant relationship between trust and perceived ease of use

H6: There is a positive relationship between trust and perceived ease of use

H0: There is not a significant relationship between trust and perceived usefulness

H7: There is a positive relationship between trust and perceived usefulness

Methodology

Research Design

Adopting a quantitative approach, this study made use of the Technology Acceptance Model (TAM) proposed by Davis, 1989) to test the behavioural intention of citizens to adopt the E-voting machine in Mauritius. Being a reliable and highly tested framework, it was interesting to test it in the Mauritian context.

Model Specification

The proposed framework has as its basis the TAM where the user's behavioural intention to use the E-voting machine is evaluated. The proposed model takes into consideration various dimensions like the level of the user's trust, perceived usefulness, perceived ease of use, attitudes towards using and the behavioural intention to use the E-voting machine. The adoption of E-voting system has never been examined in the Mauritian context and the dimensions of the TAM can be said to provide much reliability and validity to the results obtained. Thus, it will help the researchers to understand the context and to what extent the Mauritian citizens will be likely to adopt the E-voting machine. The results obtained will also demonstrate the extent citizens are willing to adopt technology. The items to measure perceived usefulness, perceived ease of use, attitudes towards using and the behavioural intention to use the E-voting machine have been borrowed from Davis (1989) which have been slightly amended. Seven items have been borrowed and slightly amended from Jian, Bisantz & Drury (2000) to measure trust.

Instrument

A questionnaire was designed using the 5-point Likert scale which has been strongly recommended by various scholars (e.g. Joshi et al., 2015). The 5-point Likert scale provides room for the researchers to better understand the perceptions of participants by having a more generalized interpretation of the subject matter. Studies in social sciences are now making intensive use of the 5-point scale as it is a well-founded technique that has widely gained acceptance. Being an ordinal scale, its mid-value is calculated through its composite score, thus providing more clarity of the results obtained.

Data Analysis

This study followed the two steps approach as proposed by Anderson & Gerbing (1988), that is, the Confirmatory Factor Analysis (CFA) followed by the Partial Least Square Structural Equation Modelling (PLS-SEM). Before directly proceeding to the two steps method, the researchers ensured that data collected is free from missing values. There were 5 missing values obtained while screening the data and the researchers used the mean value of that construct to replace the same. All the constructs were reflective ones and the SmartPls 3.0 was used to run the data analysis. The PLS-SEM approach has been used as several scholars believed that the results obtained through PLS-SEM tend to be more robust and reliable (Hair et al., 2019). The causal-predictive approach of the PLS-SEM makes it appealing to a lot of researchers as it allows them to better interpret the results and allows theory development (Rughoobur-Seetah, Nunkoo & Teeroovengadum, 2021). Therefore, TAM will be better explored and understood through the use of PLS-SEM.

Data Collection & Population

The designed questionnaire was administered online and was sent to 500 citizens of Mauritius; that is; anyone above 18 years were allowed to participate in the survey. Mauritius comprised of around 1,219,187 citizens and around 969,778 citizens are adults, that is, above 18 years (Statistics Mauritius, 2021). The researchers chose the online medium as the data was collected when Mauritius was under lockdown with the COVID-19 pandemic. A response rate of (N=224) was received. Citizens were asked to provide their opinions whether they trust and would like to adopt the E-voting mechanism in Mauritius. It has to be taken into consideration that Mauritius is an island growing rapidly with the advance in technology. In 2020, the number of mobile phone subscriptions was 1,912,900 and the number of mobile internet subscriptions was 1,324,700 (Statistics Mauritius, 2021). This demonstrates that the Mauritian society is a society which is progressing with the advance of technology and people are heavily using technology as a tool for communication and other related tasks. Therefore, this is a strong indication that degree of acceptance of the E-voting system in Mauritius.

Findings of the Study and Discussion

Confirmatory Factor Analysis (CFA)

The study followed the 2 steps approach proposed by Anderson & Gerbing (1988). The CFA was firstly carried out followed by the structural model. The measurement model was analysed by taking into

Construct measured using a reflective scale	FL	CA	CR	AVE	VIF
Perceived usefulness of E-voting		**0.868**	**0.904**	**0.654**	

consideration the factor loadings, reliability test through Cronbach Alpha scales (>0.70) as prescribed by Nunally (1978) and the Average Variance Extracted (AVE) (>0.50) (Hair et al., 2019). The Variance Inflation Factor (VIF) values were also reported to ensure that the framework is free from collinearity issues. Purwanto & Sudargini (2021) argued a VIF value lower than 5 is considered acceptable. Table 1 is the representation of the CFA results and all mentioned criterias have been fulfilled.

Table 1: Measurement Model

Using E-voting machine can help me to vote quickly	0.805				2.271
Using E-voting machine can make it easier to vote	0.842				2.537
Using E-voting in a country can increase the productivity of a country	0.783				1.985
Using E-voting can enhance my effectiveness in voting	0.785				2.023
I find E-voting useful for my country	0.829				2.052
Perceived ease of use		**0.894**	**0.919**	**0.654**	
Learning to use the E-voting machine will be easy for me	0.771				1.957
I am likely find it easy to get what I need from the E-voting machine	0.819				2.295
My interaction with the E-voting machine is believed to be clear and understandable	0.838				2.524
I believe that the E-voting machine will be flexible to interact with	0.818				2.245
I believe that it will be easy for me to become skillful at using the E-voting machine	0.796				2.049
I believe the E-voting machine will be easy to use	0.807				2.087
Attitude towards E-voting machine		**0.801**	**0.882**	**0.715**	
I believe it will be interesting to interact with the E-voting machine	0.845				1.725
Using the E-voting machine will be beneficial to me and to my country	0.912				2.317
I believe all citizens will enjoy using the E-voting machine	0.773				1.669
Behavioural Intention to use the E-voting machine		**0.938**	**0.952**	**0.8**	

I will always recommend to use E-voting machine for any election in Mauritius	0.889				3.226
I will always try to use the E-voting machine in as many instances that I can	0.882				3.006
I plan to use E-voting machine in the future in there is an opportunity	0.891				3.556
I intend to start using the E-voting machine in the future	0.921				4.584
I expect my use of E-voting machine to continue in the future	0.89				3.427
Trust		**0.905**	**0.933**	**0.777**	
I am confident of the E-voting machine	0.845				1.968
The E-voting machine will provide security	0.856				2.7
The E-voting machine is believed to be reliable	0.905				4.054
I can trust the E-voting machine	0.918				3.96

Discriminant Validity

Following the CFA, the Heterotrait-Monotrait (HTMT) was carried out as part of the discriminant validity. Henseler et al. (2015) argued that the results obtained from the HTMT tends to be more reliable and more specific. This study followed the guidelines as proposed by Henseler et al. (2015), that is, the HTMT scores should not be > 0.85. Table 2 is the representation of the HTMT discriminant validity.

Table 2 : HTMT Discriminant Validity

	Attitudes towards Using	Behavioural intention to use	Perceived Ease of Use	Perceived Usefulness	Trust
Attitudes towards Using					
Behavioural intention to use	**0.817**				
Perceived Ease of Use	0.757	**0.726**			
Perceived Usefulness	0.748	0.823	**0.753**		
Trust	0.681	0.688	0.545	**0.628**	

Partial Least Square Structural Equation Modeling (PLS-SEM)

After the evaluation of the measurement model which achieved both its reliability and validity, the second step of Anderson & Gerbing (1988) was followed. The PLS-SEM was carried out where the results of the path coefficients, t-values, P-values, f^2 and R^2 were reported. All proposed hypotheses were accepted, that is, p-value < 0.05. The results are discussed in the next section.

Table 3 : Structural Model

Path Relationships	ß	t-value	P-Value	f^2	R^2
Attitudes towards Using					**0.652**
Behavioural Intention to Use					**0.772**
H1: Attitudes towards Using and Behavioural intention to use	0.47	7.494	0	0.417	
H2: Perceived Usefulness and Attitudes towards Using	0.413	5.824	0	0.212	
H3: Perceived Usefulness and Behavioural intention to use	0.475	7.675	0	0.433	
Perceived Ease of Use					**0.297**
H4: Perceived Ease of Use and Attitudes towards Using	0.438	6.414	0	0.237	
H5: Perceived Ease of Use and Perceived Usefulness	0.585	9.254	0	0.657	
Perceived Usefulness					**0.634**
Trust					**0.011**
H6: Trust and Perceived Ease of Use	0.545	11.11	0	0.423	
H7: Trust and Perceived Usefulness	0.309	5.311	0	0.183	

Discussion

The results obtained for H1 (ß=0.47, p-value=0.000) confirmed a positive relationship between attitudes towards using and behavioural intention to use the E-voting machine which is in line with the studies of Ntale & Ngoma (2021). The more positive attitudes the citizens have, the higher would be their intention to embrace E-voting (Alomari, 2016). If citizens create positive attitudes towards the use of the E-voting system, they will more likely intend to use it which is in line with the Theory of Reasoned Action and TAM. A positive relationship was recorded between perceived usefulness and attitudes towards using the E-voting machine, H2 (ß=0.413, p-value=0.000). The more the citizens find the E-voting system to be beneficial to them, the more they will intend using the same.

The results obtained for H3 (ß=0.475, p-value=0.000) demonstrate also that if citizens perceive E-voting to be a useful tool, they will be more likely to use the E-voting machine as they will find it easy and reliable. The result of H3 confirms the study of Mensah (2016) and Lopez & Manson (2007). Perceived usefulness is a strong indicator to see to which extent the citizens will intend to use the E-voting machine. The higher the perceived usefulness of E-voting services, the higher the positive attitude towards usage which leads to greater readiness to embrace E-voting (Polatoglu and Ekin, 2001).

The findings revealed a positive relationship between perceived ease of use and attitudes towards using the E-voting machine, H4 (ß=0.438, p-value=0.000). This demonstrates that if citizens perceive the E-voting machine to be easy to use, this will shape positively their attitudes to use the E-voting machine. Perception is a very strong indicator of shaping citizens' attitudes to use the E-voting machine. A positive relationship was obtained between perceived ease of use and perceived usefulness, H5 (ß=0.585, p-value=0.000) which is in line with various studies (eg. Ngatchu et al., 2018). Perceiving something to be easy to use somehow helps citizens perceive the E-voting system to be useful to them. Citizens do not use difficult mechanisms. Being part of the digital world where touch screens are the new normal and user-friendly, it is important for the E-voting machine to be as easy as using their smartphones.

A positive relationship was recorded between trust and perceived ease of use of the E-voting machine, H6 (ß=0.545, p-value=0.000) and between trust and perceived usefulness, H7 (ß=0.309, p-value=0.000). Trust is a very important element as E-voting is about the fundamental rights of individuals and it must be taken into consideration that a lot of countries had voting issues where E-voting was applied. Electing your preferred political party to run the government is the fundamental right of any citizen who lives in a democratic country. If citizens trust the E-voting process and system, they are more likely to perceive the E-voting machine as easy to use. Trust also leads to citizens perceiving the E-voting machine as useful for them and more importantly the results obtained are reliable.

The results demonstrate that citizens residing in Mauritius are welcoming the introduction of E-voting system. This shows that Mauritius is a country that is progressing at a fast pace in terms of technology adoption and the acceptance of E-voting can be related to this aspect. It is important to take note that despite Mauritius being a remote country, the citizens are very positive towards the introduction of a new platform where the process will be much easy and accessible to everyone. Trust is another fundamental factor that citizens appear to be taking into consideration when the adoption of E-voting system is taken into account. It is important for the E-voting system to be robust and reliable. Citizens should be trusting the mechanism put in place. The level of security to ensure a proper mechanism and process of the E-voting remains a fundamental aspect in the whole process.

The whole findings reported the acceptance of the adoption of the E-voting system in the context of Mauritius. Citizens are very positive with regards to the implementation of the E-voting process which also demonstrates the level of technology acceptance despite dealing with a sensitive matter like E-voting. Despite being a remote island in the Indian Ocean, citizens in Mauritius through this study have demonstrated that they

are ready for a new step towards digital modernization of the country where voting rights can be digitalized. The results also show that Mauritius has emancipated a lot where people want the voting system and elections to be done in a more civilized and modern manner. Nevertheless, this study does acknowledge that implementing the E-voting system requires major precautions from the government to be taken when it comes to the security aspect. Security can be said to be one of the major elements that will influence trust of citizens and ultimately accept the E-voting system.

Theoretical Implication

The use of two theories has helped in better understanding and evaluating the citizens' perceptions on using and adopting the E-voting system. The theory of reasoned action has helped in better understanding the process of perceiving and deciding upon adopting a technological tool. TAM has enabled better understanding of the factors that help people in deciding whether to or not to use a technology. Subjective norms and attitudes are significant together with the perceived usefulness, ease of use, attitudes and behavioural intention to use a technology. Both theories have helped in better understanding and evaluating the degree of adoption of E-voting in Mauritius.

Practical Implication

By implementing the E-voting mechanism in Mauritius can be said to be a huge step towards modernization and digitalization. It will make the voting and counting process faster and avoid grouping of people which can lead to hassles. The issues that took place during the last elections in 2019 have raised several questions as to how the elections were held. These included the inexperience of the electoral staff, placement of computers in counting centres devoid of any consultation with relevant stakeholders. Furthermore, around 7,000 voters could not vote since their names did not feature on the registration roll while marked ballots were recovered outside counting centres (Kasenally, 2020). In light of these controversies, a well-executed E-voting system through the use of electronic voting machine would assist in making the election process more effective and lead to an enhanced confidence of voters' in the system. The implementation of an E-voting system in Mauritius would be a huge and crucial step towards the modernization of the present archaic paper-based voting system. The adoption and therefore, use of electronic voting machine is certainly not without challenges. This calls for the necessary technology infrastructure (including security), training and development of technical skills and competences, as well as mass mobilization on the use of technology-oriented platforms aimed at promoting electoral democracy. As a starting point, electronic voting machines could be used during the local elections and eventually extend their use could be extended to the general election.

From a legal perspective there is also a need for the implementation of policies and regulations to support and regulate this new voting mechanism. It is also important that existing laws be amended to ensure that the adoption of such machines is not unconstitutional. At present, the Constitution of Mauritius specifically provides that the elections must be held through ballot paper. As such unless there is a change, the use of electronic voting machine might be challenged for being unconstitutional. Further aspect to be mindful of is whether transparency is preserved with the use of these machines. For instance, the Federal Constitutional Court of Germany in 2009 was concerned with the lack of transparency due to the possibility of errors and premeditated fraud through the use of electronic voting machines. Notwithstanding that the Federal Electoral Act allows the use of these machines, the court decided that their function and use was unconstitutional for breaching the requirement of the public nature of elections under the Basic Law of the Federal Republic of Germany (Fitzpatrick & Jöst, 2022).

Limitations of study

This study is a cross-sectional study and the data has been collected purely online as the data was collected during the COVID-19 pandemic. Thus, the respondents for this research consisted only of people

who had access to the internet. Future studies can conduct a longitudinal study and also administering the survey both online and using the paper and pen approach so as to gain more respondents, particularly those who do not have access to the internet. Future studies can make use of other additional theories to further evaluate the framework. Other variables could also be included in the proposed model. Since the current study did not emphasize on a particular election mechanism in Mauritius, it would be interesting to investigate if there are variations in the citizens' perceptions of E-voting adoption for the different types of elections (General Assembly Elections, Rodrigues Regional Assembly Elections, Municipal Elections and Village Council Elections). This would further enhance the generalization of the results.

Conclusion

To conclude, this study is one of the first study conducted in Mauritius where a sensitive issue like adoption and acceptance of E-voting has been addressed and evaluated. The Theory of Reasoned Action and the TAM have been used to theoretically support the study. The findings revealed that the citizens of Mauritius are willing to accept the introduction of the E-voting system. Their level of perceptions in trust, ease of use, usefulness, attitudes towards using and overall behavioural intentions was positive. This study has unfaceted a modern feature of the country where despite being remote in the Indian Ocean, citizens are optimistic on the introduction and usage of the E-voting system in Mauritius. Citizens can be said to be quite at ease and agile in using technology even when voting is concerned.

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FINANCIAL MORAL IDENTITY AND ITS SIGNIFICANCE IN PERSONAL FINANCE MANAGEMENT

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Abstract

Purpose: *Morality and money (personal finance/PF) are oxymorons due to their explaining perspectives on human behavior. Morality is other-regarding, whereas PF is self-regarding. Whether the self-interested act is not moral? A novel construct, financial-moral identity (FMI), is conceptualized in this paper to address this conflict through the theoretical congregation of motivation from self-interest (SI) and moral identity (MI) in the context of daily and future financial goal aspirations. The study is under the over-arching theoretical guidance of self-determination theory (SDT) and its basic assumption of intrinsic (IM) and extrinsic (EM) motivation for financial behavior.*

Methods: *The construct is conceptualized through inductive and deductive processes. The items are finalized based on experts' opinions from relevant fields and a pre-study. Henceforth, a survey is conducted online to collect data from Indian nationals. A decent number of respondents (n=1059) have voluntarily participated in the survey. After data collection, several statistical tests (factor analysis-exploratory and confirmatory; parallel analysis; correlation matrix) are applied to validate FMI and its properties.*

Findings -*FMI has emerged as a reliable and valid instrument yet distinct from MI, Moral Integrity, and Money Attitude (MES).*

Originality: *This study explores whether morality is salient in the PF domain through identity and its implication in daily and future morality in goal aspirations. FMI contributes to the literature as an antecedent of personal finance management behavior driven by morality.*

Keywords: *Self-Interest$_1$, Personal-Finance$_2$, Moral-Identity$_3$, Self-Determination-Theory$_4$, Money Attitude$_5$, Financial Moral Identity$_6$.*

Introduction

The primary concern for traditional rationalists to include morality in the self-interest (SI) framework is incommensurability. How precisely could a behavior be explained without maximizing utility? Formulating the universal model is difficult (Huettel & Kranton, 2012). However, because of simplicity, self-interest is centered on explaining human behavior. On the other hand, morality has always talked about something beyond the self, and it should be other-regarding. That is why they are separated academically. However, rationality (instrumental) may be based on the narrower representation of self-interest rather than practical rationality(PR). PR is rooted in the ancient philosophical view of part-whole logic, a peaceful synchronization of self-interest (prudence) and morality (Plato, 1994) [c. 370BC], (Gauthier, 1987). Sen famously said that a rational agent would become a social moron or, rather, a "rational fool" without considering real-life issues. According to the reconciliation model [RM], morality, and self-interest coexist peacefully (Frimer & Walker, 2009). RM argues that though inherited tension exists between these two in the motivational system, there is a synergy between the two. The association may be weak for one, leading to tension, or intense for another, which leads to a mutually advantageous connection. The RM explains the transitional phase from independence to interdependence through balancing

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the disequilibrium (inner conflict) one may experience with self and morality in a given context. The explaining power of RM is not restricted to morally relevant behavior only; it has reached real-life difficulties. However, RM has not explained when co-occurrences and inter-relations happen between self and morality. The perspective suggested a hierarchical relationship between agency (means) and communal (ends). The precise explanation for how people behave with these two remains a scientific debate as there is no systemic ranking for preferences (Sen, 1999). Studies have validated that self-interest (materialistic value/ self-appeal) and communion (ethical consumption/other's appeal) are not competitors; in fact, they coexist (Mathur, 2013);(Ryoo et al., 2020). The materialists who are sensitive to value-oriented schema related to possession (Cleveland & Chang, 2009) engaged in ethical behavior due to egoistic motivation (Cialdini et al., 1997) and being instrumental in self-definition (Shrum et al., 2013). Human nature is complex; therefore, a more flexible, integrative, multidisciplinary approach is required to address the judgment-action (Walker, 2004) and ontological gaps (Ellertson et al., 2016). The gap may be narrower with the help of the transformation from homo-economicus to homo-virtuous as self and society are synchronized at a reflexive level (Carter & Mangum, 2020).

Based on these assertions, we assume that self-interest and morality do not exist in extreme points, not even in the hierarchical frame; they coexist, merge into a common area, and become singular while making real-life decisions based on practical wisdom. Self-interest is viewed here as a contemporary outlook beyond selfishness and instrumental in harmonizing motive (Rocha & Ghoshal, 2006) instead of maximizing benefit. In sync with the fundamental notion of moral identity theory, a novel construct, the Financial-Moral Identity (FMI), is formulated and validated through this study, which may help people live ethics instead of learning ethics (de Rond, 1996) or develop common sense over rationality as the Aristotelian Virtuous man can make rational decisions more efficiently (Morgan & Thiagarajan, 2009). The FMI depicts one's self-conception concerning morality based on motivation while achieving short-term and long-term financial goals while elucidating utility.

Theoretically, self-interest and morality generally belong to opposite extremes of the continuum or hierarchical positions in the agentic view, and their successful integration is still debated. On the other hand, morality concerning moral identity is researched predominantly into two schools of thought: dispositional (Trait perspective/TP) and situational (Socio-Cognitive Perspectives/SP) [Please refer for details (Shao et al., 2008)]. Their combination is needed to address real-life issues like reducing dissonance in every moral decision. Moreover, self-efficacy has specific characteristics, and defining moral identity has yet to be explored concerning moral identity in the personal finance domain. Furthermore, executive function is a cognitive skill essential for financial decisions, but it needs to be explored in the frame of moral identity regarding Personal Finance. These openings in theoretical literature motivate us to conduct this study for academic integration of these fragmented concepts based on Self-Determination Theory (SDT).

Ultimately, the study's findings align with the existing literature that morality is universal, and the personal finance domain is no exception. Moral identity is salient in money management in daily (short-term) and future (long-term) goal aspirations. FMI emerged as a valid instrument for measuring self-view concerning moral identity in personal Finance. This study extended the morality into general personal finance management and financial-moral identity in daily and future personal finance management.

The study strives to make a conspicuous contribution to the existing literature in profuse ways. Firstly, it implies motivation in the self-interest framework by adopting a broad self-interest perspective in personal Finance. Secondly, it formulates an identity perspective based on morality in the metric-oriented field of personal Finance. Thirdly, it offers an integrative view of various moral identity theories and their application in personal Finance. Finally, it extends the application of SDT as an overarching theoretical application in the personal finance domain. In a nutshell, this study combines the key concepts from different doctrines under the umbrella of SDT to explain human behavior in personal finance management.

Review of Literature:

Guiding Theory : Self-Determination Theory (SDT)

The present study is guided by the "Self-Determination Theory" (Deci & Ryan, 1985, 1991, 2000; Ryan & Deci, 2000). This theory's foundation is based on the Aristotelian view of human quality. The theory is distinct from all other motivational theories in that it explains motivation into categories rather than unitary concepts. The SDT builds the continuum with two extremes: amotivation (the preceptor can change nothing) on one extreme, intrinsic motivation on another, and extrinsic somewhere between them. Amotivation (no intention or motivation existed) grows due to inconsistency between behavior and outcomes (Seligman, 1975) or lack of competence (Deci, 1976). Internalization (integrated) of the SDT (Deci et al., 1994) can be compared with goal acceptance (Gagné & Deci, 2005) of the goal-setting theory of Latham, Erez, and Locke (Latham et al., 1988) for optimal human functioning. The extrinsic motivation gets internalized (autonomous) in the process (Gagné & Deci, 2005), becomes depositional, and contributes to fulfilling psychological needs- autonomy, relatedness, and competence. Intrinsic motivation is a dispositional and empirically strong predictor of human behavior through the fulfillment of psychological needs. Autonomy is inevitable if the behavior needs to be transformed from goal-directed to self-determined (Deci & Ryan, 2000). Internalization of motivation happens from extrinsic to intrinsic (Rosli & Saleh, 2022).

Identity:

Though SDT does not directly explain the identity, its assumptions are extended to explain a similar conceptual framework (Koen Luyckx et al., 2009);(Soenens & Vansteenkiste, 2011);(Krettenauer, 2020). The research has validated that internal motivation increases as we age compared to external motivation (Krettenauer et al., 2016);(Krettenauer & Victor, 2017; Sheldon et al., 2005). It also looks similar to the refined agency of the Self Model (Blasi, 2005). The socio-cognitive view of MI (Aquino & Reed II, 2002) depicts two dimensions (Krettenauer, 2020). They align with the Eriksonian self dimension [internalization & symbolization]. These two dimensions indirectly indicate intrinsic and extrinsic motivation. In the long run, extrinsic motivation becomes part of intrinsic motivation through internalization. These two motivations are distinctly linked to moral action. Furthermore, the internalization dimension is a stronger predictor than symbolization for moral conduct (Krettenauer, 2020).

Based on the motivational framework in SDT, the goal can be divided into two distinct motives: autonomous and controlled. The first goal motive is in sync with the assumption of intrinsic regulation, whereas the later goal motive depicts the presupposition of extrinsic underpinnings from external cues or internal constraints (Sheldon & Elliot, 1999).

In summary, identity is considered the goal of acting morally, and the desire to maintain identity is the internal motivation for moral action. The degree of intrinsic motivation variability defines the engagement of moral conduct based on SDT (Krettenauer, 2020). Moral salience's self-consistency or moral centrality leads to motivation for moral conduct (Aquino et al., 2009; Bandura, 2002; Blasi, 1983, 2005; Hardy & Carlo, 2005, 2011; Lapsley, 2010). An individual tries to keep identity consistency across various identities (content). MI defines identity centrality as maintaining the identity across situations, even in moral dilemmas. Self-interest act is also driven by motivation based on self-love (Aristotelian view on excellence). Considering all of these, we assume that identity (FMI) is one of the facets of motivation while explaining self-interested acts (personal finance management behavior).

Relevant Literature:

There are three assumptions to the present study. The abstract concept of financial-moral identity exists with these assumptions that (1) rational beings are in a Pareto-efficient market and (2) their basic needs from the "hierarchy of needs" (two bottom needs [Physiological, Security & Safety]; (Maslow, 1943)) get

fulfilled in the present. (3) they make decisions based on practical wisdom [An old idea known as "practical wisdom" is understanding what is best, right, or excellent under particular conditions. It began more than 2,400 years ago, and in Nicomachean Ethics, Aristotle made a distinction between it (phronesis) and other types of knowledge such as science or art.] but not on instrumental rationality. In this paper, we focus on construct development theoretically and empirically rather than the process of developing FMI in a person. The process of identity formation in the designated field will be of interest for future exploration.

Significance of Identity in Finance

Moral identity research has better explained power over the gap that existed between "moral judgment" and "moral action" (Walker, 2004). This academic gap refers to the deviation when one behaves wrongly, knowing that it is wrong to enact. Though the concept is contemporary, scholarly interest in moral identity is very ancient and grounded on virtue and character as a holistic concept presented from the Aristotelian perspective (Solomon, 1992). Moral identity is instrumental in explaining ethical and unethical decision-making in business ethics research (DeTienne et al., 2021). The moral identity research shows that moral identity is a notion-based psychological construct. It depends on the unique nature (dispositional values) of the possessor (trait perspective/ TP) and the environment (s)he is in (social-cognitive perspective/SP). Both perspectives (TP and SP) are similar and dissimilar in their rights (Shao et al., 2008). They are criticized for their standard limitation of lack of developmental phases (how moral identity developed). However, TP addresses this by explaining refined agency and SP flourishing towards saliency and heuristics.

However, from an economic perspective, identity is very afresh. Identity economics (Akerlof & Kranton, 2000, 2002, 2005, 2010) is based on an individual's many encouraging self-images regarding others' opinions while maximizing utility/value in selecting an identity framework (Akerlof & Kranton, 2000). Another school of thought on identity in economics is offered by Kirman and his associates (Kirman, 2006; Kirman & Teschl, 2004) based on the phenomenal /transparent self of Metzinger (Metzinger, 2004)) in an interactive social context. The tenet of their complexity model is the interactive nature of self-image and the social context; every aspect influences other aspects on an ongoing basis.

Sen's (Sen, 1999, 2004; Sen, 1977) perspective (commitment-oriented and welfare-centric) on self revolves around welfare and self in four aspects and a person's reasoning out of his/her capabilities. Sen's outlook of self is bi-dimensional in higher order because of its relevance towards self and other-regarding. The self-image of Akerlof and Kranton identity economics is subject to utility in a social context, and the situation determines the decision. The choice of identity makes the difference. They ignore real-life multi-selves-oriented individuality. At the same time, the self-image of the complexity model denotes representation processing in a continuously changing context; consciousness and context influence each other. This model needs to include the static aspect of identity due to the continuously changing nature of the self. Sen's model addresses the self-concept as endogenous and depends on self-scrutiny based on values and objectives. However, this model did not address how self-scrutiny happens or how reflexively this evaluation happens. However, the personal-identity model (Davis, 2004) is the best solution to address the multi-shelves argument. It predicts various kinds of behavior through "sub-objective function" to explain multi-selves in an individual and decision-making through "comparative value-objective evaluation" while simultaneously maintaining individual identity. His model needed to address how the sub-objective function distinguishes between pre-determined evaluation (pre-set decision) and dynamic evaluation (spontaneous decision). None of the economics theories address identity formation because of its complexity. Almost all echoed the idiosyncratic nature of individuality in social preferences.

Is there any Financial Moral Identity (FMI)?

Though material and self have been associated since the 19th century by James (James, 1891), who classified the self into pure ego, spiritual, social, and material, literature related to these concepts is scarce. Nevertheless, the process of identity has recently been addressed in Finance. It focuses on identity development

among emerging adults while considering the socialization factor and its relation to financial capabilities and predicted positive financial behavior (Shim et al., 2013). Real-world things are much more complicated than we can imagine. Sen has interestingly said there is no systematic way to rank/order the preferences (Davis, 2004). Kavka (Kavka, 1991) has remarked that 'intrapersonal individual choice' is as conflicting as 'interpersonal choice.' "conflicting demands are arising from different identities and affiliation" (Davis, 2004), p-15; quoted in Sen 1999, p-30). Having multiple identities leads to a rational being for numerous utilities towards free choice and determined choice. One specific identity that deals with personal resources (utilization/management) while balancing the identity payoff (no regret in the present and future/win-win situation over preferences) may represent a balanced economic/financial identity. When the regret element is absent from chosen preferences (voluntary or involuntary), no conflict arises, and no anxiety for the future from this experience of choosing the preference. For example, one loves to eat fruits; naturally, he/she chooses to eat fruits over junk food without regret. While doing so, voluntarily choosing preferences regularly(daily) may become long-term involuntary choosing preferences. We try to identify this state of conscious decision-making based on virtue ethics, which results from equilibrated self-identity, reducing "cognitive dissonance" (Festinger, 1962).

Morality also depicts a result of preferences (Ellertson et al., 2016). Whether one consciously knows it or not, this driving force (willingness to engage in altruism) for moral behavior (Hart et al., 1999) is present in all spheres of life. The moral self varies across ambits and attests advantageously, and most scholarly work emphasizes the moral self's universal characteristic (Jennings et al., 2015). Rational beings are in sync with their unique inner (mental) conception (image) while behaving (Kihlstrom & Klein, 1994). This inner conception (self-image) and identity may influence behavior in personal Finance.

The foundation of morality in money-related areas also ultimately resides within the individual. A person's psychology and cognition (Xiao et al., 2014) are internal factors for financial behavior (Hira, 2010).

Morality is part of the general self (Krettenauer, 2020). Morality is not necessarily other-regarding; it may have another neutral perspective (Maitland, 2002).

Rocha and Ghoshal (Rocha & Ghoshal, 2006) argued for harmonizing instead of maximizing utility. Frimer and Walker (Frimer & Walker, 2009) have argued for the synchronicity of agency and communion, and Krettenauer (Krettenauer, 2020) has argued for means of nature (TP) and nurture (SP) about the goal of action. Therefore, morality plays a role in managing personal resources that may be morally neutral/amoral/moral. As no such instrument is available, the study aims to design a self-evaluative measurement tool that assesses a rational person's Financial Moral Identity (FMI). It aims to measure one's relatedness to moral identity by utilizing resources in aspiring goals (personal Finance) in the short-term/daily (situational perspectives of moral identity) and long-term (dispositional perspective of moral identity). We have adopted the demarcation areas from a qualitative study on financial morality (Bates et al., 2014), not the items or method, because they have studied financial morality as a sub-component of financial literacy. However, they have argued for the universality and subjectivity of morality simultaneously. Moreover, this construct is left unexplored in this study as we believe financial-moral identity exists in oneself irrespective of a person's financial literacy; practical wisdom is considered in this case.

This study calls this moral dimension in money dealings in spontaneous (daily morality) and long-term (foresight morality) activities regarding goals by rational beings as financial-moral identity by extending the link between personal Finance and moral identity. The study will explore this linkage to observe whether there is a domain-specific moral identity to explain the money utility beyond prosocial spending (using money to benefit others)/charity giving. In reality, a person is neither an entirely rational agent nor a saint wholeheartedly and follows the means of virtue [(Aristotle (Aristotle et al., 1984) Nicomachean Ethics, Book 4] concerning deficiency and excess. For instance, liberality is a virtue that depicts giving generously but taking judiciously. According to Nicomachean ethics, money, wealth, and virtues are significant and follow the mean doctrine, which balances life

with the help of practical wisdom by setting the goal in the right direction (Karimova et al., 2020). A person is between these extremes (deficiency and excess) and tries to balance the equilibrium by fulfilling survival needs and being moral, aligning with life goals. The ethical aspects of judgment have evolutionary-natured circular properties believed to be ethical or how one belief becomes ethical either way round (Pelegrín-Borondo et al., 2020). In the same view, the virtuous agent chooses to love others for themselves (Mele, 1981).

In a more straightforward explanation, FMI is the self-perception in the frame of morality while making short-term (daily) and foresight financial goals (future) in Personal Finance. In summary, financial morality offers a penta-dimension; identity economics offers a uni-dimension; psychology and Sen's theory offers a bi-dimension of identity. Self and morality in the context of financial goals are not different from morality in other goals in life to a great extent. The true nature of self will be activated while making financial decisions in immediate and lasting goal-setting.

Therefore, the study aims to design a self-evaluative measurement tool that assesses a rational person's financial-moral identity. It is intended to measure one's relatedness to moral identity by utilizing one's resources (personal Finance) on the short-term/daily (SP of moral identity) and long-term (TP of moral identity) basis. Moreover, this financial literacy is left unexplored in the present study as we believe financial-moral identity exists in oneself irrespective of a person's financial literacy. Practical wisdom is considered in this case. The SDT is studied in the context of process identity (K. Luyckx et al., 2009), exercise identity (Vlachopoulos et al., 2011), and sportsmanship (Ntoumanis & Standage, 2009). SDT is also studied with ethical behavior (Arvanitis, 2017), the impact of anti-social attitudes among athletes (Bartholomew et al., 2011), and moral development (Ashrafi & Estaki, 2013).

Based on these arguments, the present study explores a fundamental question: Is there any morality-oriented identity in money-related fields? Since conception, capitalism has been moral; why not personal Finance? It is not one's choice to be moral in Finance, but a necessity for wellness at every level (micro, meso, and macro). Centered on the contention, we hypothesize that a rational being has a financial-moral identity.

Methodology:

The Method of the Study Conducted

A need for a convenient and easy-to-use tool for measuring morality in the personal finance domain is identified after exploring the literature. Primarily, self-interest is measured in trade-off studies, and morality is explored in experimental studies. The study aims to explore the construct through a survey method. Initially, brainstorming sessions are conducted to generate the items, then send them to experts from relevant disciplines and ask for their opinions. Once experts confirm items based on face validity, a prior study is designed due to the novelty of the construct based on convenience sampling; after that, the main study is conducted with random sampling.

Sample Selection

The study population is the online community. The sampling frame includes anyone who is above 18 years of age. Sample selection (Table. I) for the study is the most crucial aspect of any empirical research. The thumb rule of sample size is min(3)-max (20) per variable. After considering the variables in the study, the questionnaire is floated online for data collection through various social media and invitation mail. Besides, the requesting mail is sent to potential participants (roughly 11774) individually. Participation in the survey is voluntary. Participants are asked not to mention private information in the prescribed questionnaire to maintain anonymity and encourage more honest responses. They are instructed to think for a while (before replying) about an ideal moral person (themselves or someone they know) who is very efficient in money management. The one thousand fifty-nine (n=1059) responses received an 8.99% response rate throughout the year. The collected sample is prepossessed, processed, and assessed through various statistical tests for construct reliability and validity

(Table.1).

Table 1: Sample Selection

Nature of Analysis	Sample Details	Taken for Analysis	Reason for Selection
	Online Community		For operationalizing the scale in a more convenient way along with transparency in data collection.
Initial Dataset	Indian Population	36	Convenient sampling for pre-testing the items.
Main Study Dataset	Indian Population	1059	Random participation by respondents through online mediums.
Refined Dataset	1059	1051	After discarding the unengaged responses and missing values for all responses.
Sample for Exploratory Factor Analysis	1050	525 (A) out of 1050*	Randomly split the database equally to explore the factor structure as the sample is sufficient for the measured variable.
Sample for Confirmatory Factor Analysis	1050	525 (B) out of 1050*	Randomly split the database equally for exploring the factor structure as the sample is sufficient for the measured variable.
Reliability Analysis	1051	525 (B) out of 1050	The reliability measurement is done by validating the sample.
Convergent and Discriminant Validity	1051	525 (B) out of 1050	The validation is done on the second portion of the dataset, as the first portion is used for exploring the construct.
**1 case is left to divide the sample into equal parts 525(A) & 525(B)*			

Source: Author's Compilation

Key Variables

Financial Moral Identity

This is not the ultimate measurement of all dimensions of personal Finance, but it gives a picture of the moral identity while designing with daily and long-term financial goals. The present study explores the cue from the overall moral identity perception and specific dimensions of personal Finance. The measurement tool assesses the latent construct of financial-moral identity as a self-evaluated perception in five sub-domains of financial morality. However, the moral identity measurement tools have been well-developed in the literature for quite some time by scholars (Aquino & Reed II, 2002; Frimer & Walker, 2009; Hardy & Carlo, 2005; Hart et al., 1999; Matsuba & Walker, 2004) but no domain-specific moral identity measurement tool is available for personal finance management in the literature.

The "financial-moral identity" is "a rational person's intimately accepted self-conception, which is in sync with own moral dimension while considering resources in the interactive environment." The working definition of FMI is "to measure self-evaluated "self-image" of Indian nationals while imagining the utilization of personal resources (Finance) in a given context concerning achieving short-term and long-term financial goals." Empirically, five areas are identified at the beginning of the study, namely-"helping others" as Generosity (GNR1), "using/ earning money without harming others" as Ethical Earning (EER2), "being financially responsible" as Financial Commitment (FCM3), "how one earns and/or spends money" as Money Management (MMM4), and "using/ earning money according to one's personal code of ethics or morals" as Morally Driven Earning Utilization (MDEU5)". These areas of personal finance management are influenced by the sub-areas of financial morality based on respondents' views (from Western and Eastern respondents) from a qualitative assessment of Eastern and Western samples (Bates et al., 2014). Then, items are generated on various sub-concepts (Please refer to table. II for details) through inductive and deductive processes.

Items Development

The construct, FMI, is not formulated for a traditional self-interest experiment or any psychological lab experiment; instead, it is the amalgamation of different sub-concepts explored and identified. After that, it is implemented in a survey. Experimental games (dictator's games/one-shot games/community games) have framing issues (Camerer & Thaler, 1995); responses are sensitive to the languages set for the options. The psychological experiment is not adopted as the FMI is constructed to measure as a real-life phenomenon. It is done through several stages, from generating a pool of items to finalizing the items for the main study. We predominantly adopted an inductive approach (Hinkin, 1998) over a deductive one during final stages of item developments (Zhang et al., 2020) as the area is not well-researched. After exploring the existing literature, the twenty-eight sub-concepts were shortlisted for expert opinions. The sub-concepts are, for instance, managing money concerning saving, borrowing, wise spending, prosocial spending, planning, value for money, and practical wisdom. Please refer to table two (2) for details [finalized sub-concepts]).

On the other hand, a brainstorming session was conducted to define the construct of "Financial-Moral Identity" and its components among research scholars (N=38) from a renowned institute. Both the outcomes were matched for selecting the items for measurement and comparing them in five areas. The pool of items is sent to a panel of experts (in the fields of psychology, economics, and Finance) for finalization. For increasing validity, the few items are in reversed coded (Schriesheim & Eisenbach, 1995). A self-evaluative structured questionnaire consists of demographic and psychological content based on collective inputs from the formulation process. Few construct items are partially adapted from (Curry et al., 2019) as they describe cooperation as the overarching objective of morality. Two independent observers finalize the items. After the finalization of items, a pre-study is conducted with a questionnaire (fifty-five items). The questionnaire has closed-ended and open-ended questions (please refer to table one). The open-ended question is dropped due to its negligible response rate (only two replies) in the collected data. The items are on "exploratory factor analysis (EFA)" to identify the significant factors for further study. Based on EFA and inter-items correlations, twenty-five items represent the areas well and are retained for the study.

Table 2: Initial Pool of Items of Financial Moral identity Scale

Sl.	Initial heads	Details	I/S	Interpreted Area
1	Managing Money (MM): Source of fund	My present monetary fund (*Pocket money/scholarship/earned money/borrowed money/saved money*) is a symbol of my hardworking nature.	S	EER2
2		My present monetary fund (Pocket money/scholarship/earned money/borrowed money/saved money) is a symbol of my organised nature.	S	EER2
3		I manage to save 20% from my present monetary fund (Pocket money/scholarship/earned money/borrowed money/saved money) for emergency needs.	I	FCM3
4		I have no morality (desire to do the right thing) if I do not have adequate fund for my basic expenses.	I	MMM4
5	Earning/Making	I do not believe in hardworking while making/earning money. (R)	I	MMM4
6	Money	I do not think of harming others while earning money.	I	EER2
7	Saving Money (Impulsivity control)	I have left with enough money in month end.	S	MMM4
8	Borrowing	I find difficulty (feeling uncomfortable) in borrowing money from others (from personal source/institutional source).	I	FCM3
9		No one rejects my request if I ever ask for borrowing.	S	FCM3
10	Cooperation: Kinship	I avoid borrowing from someone outside my family even in my financial hardship days (I run out of cash).	I	EER2
11	Planning	I enjoy the planning of my money	I	MMM4
12		I delay the planning of my money	S	MMM4
13	Managing Money	Managing money is my favourite	S	MMM4
14	(MM): General	I never shy away from my financial responsibility how tiny it may be.	I	FCM3
15		I am said that I manage my money well	I	MMM4
16		My family and friends find me responsible the way I manage my money.	S	FCM3
17		I know what to spend and when to spend it	I	MMM4
18		I understand the importance of saving	I	FCM3
19		I want to become self-sufficient	S	FCM3
20		the motivation to save even when it was difficult to do so	I	FCM3
21	MM: Spending: Wise Spending	I do wise spending (*Is it something you really need before you spend*) because of my evil experience of fund shortage.	S	MDEU5
22		I do wise spending (Is it something you really need before you spend) because of my habit. [Modified version- I spend wisely because of my habit]	S	MMM4
23	MM: Spending: Pro social spending	I do pro social spending (*charitable spending on others; either known or unknown*) because I feel for other's needs.	I	GNR1
24		I do pro social spending (charitable spending on others; either known or unknown) because I cannot avoid the situation.	S	GNR1
25		I prefer to spend time for volunteering for a good cause rather than pro social spending for the same good cause.	S	GNR1
26		I spend for others (charitable spending on others; either known or unknown) because I cannot avoid the situation.	S	GNR1
27		Helping others (volunteering or charity) makes me happy.	I	GNR1
28		I spend for others (charitable spending on others; either known or unknown) because I feel for other's needs.	I	GNR1
	Impulsivity	I feel little pain of paying my money	I	MMM4
30	Spending Money	I hate to stick to my budget	I	EER2
31		I love wise spending (spending money carefully with full awareness of consequences).	I	GNR1
32		I am willingly drowned to pro social spending (charitable donation/helping needy persons financially) at least once in six months	I	GNR1
33		I am into wise spending (spending money carefully with full awareness of consequences)	S	EER2

Sl.		Details	I/S	Interpreted Area
34		I am called a budget person by my friends	S	EER2
35		I am seen to participate in pro social spending (charitable donation/helping needy persons financially) at least once in six months		
36	MM: savings: Value for money	I value for money because of its magical power (*influential nature in negative perspective*) in this world.	I	EER2
37		I value for money because of its essentiality (*extremely important*) in this world.	I	EER2
38	Saving Money: Integrity aspect: Socialisation aspect	I value for earned money as my family puts lots of effort in it.	I	MDEU5
39	Practical Wisdom in finance	I definitely know what is right but I do what is the best in conflicting situation without any regret in future especially taking day-to-days financial decision. (For example: I know certain food is bad for my stomach but when I am hungry, I buy and eat whatever is best available to me as per my pocket by thinking avoiding stomach ache in near future.).	I	MDEU5
40	Self-control	I feel confident in my ability to know what to spend.	I	MMM4
42		I can save even when it was difficult to do so.	S	FCM3
43		I understand the importance of saving.	I	FCM3
44	Future Expectation towards financial goal based on	I want a moral peaceful life with adequate income (*presume that this earned money helps you to save 25% of it after meeting basic expenses*) in future.	I	MDEU5
45	anticipated Income and savings	I would love to enjoy luxury life in future even at cost of my morality (*desire to do the right thing). (R)*	I	MDEU5
46		I want to see myself as a moral human being (practicing which is righteous) irrespective of my financial situation in future.	I	MDEU5
47		I want to become financially independent near future (in next 5 years)	S	FCM3
48	Threat to identity	I hate myself when I acted immorally in the past.	I	MDEU5
49		It's acceptable to steal food if someone is starving. (R)*		MDEU5
50		It's ok to keep valuable items that someone finds, rather than try to locate the rightful owner. (R)*	S	MDEU5
51	Cooperation: Deference (Judgemental)	Society would be better if people were more honest*.		EER2
52	Cooperation: Fairness (Judgemental)	Everyone's financial rights are equally important. [Modified Everyone's rights are equally important] *.	S	EER2
53	Cooperation: Group (Judgemental)	I should try to be a useful member of society*.	S	EER2
54	Cooperation: Reciprocity (Judgemental)	I always return a favour if I promise to do so*.	I & S	GNR1
55	Original Question (Open ended)	Being financially moral means to you.	I & S	

*The items are guided by demarcation mentioned by a qualitative study using western and eastern samples conducted by Bates and Lucey's (2008) in interpretation of teacher and pre-service teacher conceptions of financial morality. The five areas are (1) Helping others; (2) Using/earning money without harming others; (3) Being financially responsible; (4) How one earns and/or spends money; and (5) Using/earning money according to one's personal code of ethics or morals. These areas are interpreted in present study as follows "helping others" as Generosity (GNR1), "using/earning money without harming others" as Ethical Earning (EER2), "being financially responsible" as Financial Commitment (FCM3), "how one earns and/or spends money" as Money Management (MMM4), and "using/earning money according to one's personal code of ethics or morals" as Morally Driven Earning Utilization (MDEU5)"; (I) represents Internalization (Personal Finance Management Domain); and (S) represents Symbolization (Personal Finance Management Domain); (R) is reverse coded items.; * represents the adapted items from O.S. Curry et al. (2019) & partially modified.*

Source: Author's Compilation

Interpretation of the Scale

The participants are requested to think and visualize for a while about a known morally ideal person who is an efficient key decision-maker in daily and future money-making before recording their responses. The items of the FMIS have five options on a "Likert-type scale" that vary between "1" ("totally disagree") to "5"

("totally agree"). The higher the score, the higher the sense of financial-moral identity exists. A few items are put in reverse to check the attentiveness of the respondents (Schriesheim & Eisenbach, 1995). The reverse-coded items are re-coded before analysis to maintain the symmetry of the scale.

Variables for Validity [Convergent and Discriminant]

Moral Identity

Moral identity is the parent construct for developing FMI in this study, so it may be possible that FMI is just a replication of MI. So, we adopted measuring moral identity along with FMI. A plethora of academic research assesses the 'moral identity' construct (Aquino & Reed II, 2002; Frimer & Walker, 2009; Hardy & Carlo, 2005; Hart, 2005; Lapsley & Narvaez, 2004; Pagano, 1991; Reynolds & Ceranic, 2007; Splitter, 2017). The widely validated scale of moral identity formulated by Aquino and Reed (2002) is adopted for the present study.

Moral Integrity (MIQIG)

According to the TP (Blasi, 2005), three elements are "willpower, moral desire, and integrity," forming the identity self-concept. All three components, along with the governing guidelines, help to predict considerable moral conduct. Research offers the measurement of integrity (Schlenker, 2008);(Black & Reynolds, 2016). We have adopted the "Moral Identity Questionnaire (MIQ)" developed by Black and Reynolds (2016) due to its integration with moral integrity. The items of moral integrity of MIQ (MIQIG) intend to assess the longing for purposeful, reliable action.

Money Attitude (MES): [Discriminant Validity and Instrumental Variable]

Money attitude is well documented in the literature while studying personal Finance. FMI, the construct, may be the same concept in different words. Hence, we have adopted the money attitude measurement to construct validity. The "money ethic scale" [MES; (Tang, 1992, 1995)] is widely popular (Mitchell & Mickel, 1999) to measure money attitudes. It is a systemic and well-designed measurement of money-related attitudes (Tang et al., 2002);(Tang & Chiu, 2003). The initial MES has thirty (30) items. In contrast, the shorter version of the same scale/'Short-MES'/SMES has twelve (12) items with three core dimensions: 'affective (Evil), cognitive (Budget), and behavioral (Success).' Broadly, money attitude measures the way people perceive money as a means. We have used the 'Short-MES' to measure people's attitudes regarding money irrespective of their working status.

Statistical Tests

Pre-Analysis

Pre-analysis of collected data is observed primarily for data-cleaning. It identifies cases with unengaged responses, missing values, and outliners. Furthermore, it assesses various data assumptions (normality, linearity, homoscedasticity, multicollinearity, and sufficiency). Henceforth, the data is ready for further analysis. The SPSS package is used for analysis.

The sample adequacy is evident from "KMO and Barlett's Test" [0.778]. The sample is split into equal parts randomly for "Exploratory Factor Analysis" (EFA) and "Confirmatory Factor Analysis" (CFA). Though it is best practice to use independent samples for EFA and CFA, it can be divided into two groups to analyze a large sample (Knekta (Knekta et al., 2019). The EFA is conducted with fifty- percent of the collected sample as it is always a better choice for verifying the factors (Knekta et al., 2019), along with "parallel analysis." Henceforth, the construct is tested for validity and reliability.

Demographic Profile of the Respondents

The study has a nationally representative sample (Table. 3) aged above 18. Three categories are framed in survey format (questionnaire) for gender specification, namely male (807), female (217), one who is not willing to specify gender (13), and the rest who did not opt for any option (14). Though we did not control the gender, the data is male-skewed. The data says 51 % of respondents are from the urban setting. However, the personal fund of the majority (56%) is below ?50000/ (monthly), which is a decent figure for living conditions in the Indian economy. The respondents are from a sound economic background, as the majority (59%) have no debt (monthly). The respondents have diverse demographic characteristics, as evidenced by Table III.

Table 3: Demographic Profile

Demographic Profile of Respondents [*N=1050]**			
Dimensions	Category	Frequency	Percentage
Gender	Male	807	76.9
	Female	217	20.7
	Not willing to Specify	13	1.2
	Did not Specify	13	1.2
Age (In years)	18-25	782	74.5
	26-30	163	15.5
	31-35	37	3.5
	36-40	20	1.9
	41-45	7	0.7
	46-50	8	0.8
	above 50	14	1.3
	Did not Specify	19	1.8
Home State	Andhra Pradesh	26	2.5
	Assam	17	1.6
	Bihar	63	6
	Chhattisgarh	14	1.3
	Gujarat	20	1.9
	Haryana	27	2.6
	Himachal Pradesh	10	1
	Jharkhand	61	5.8
	Karnataka	20	1.9
	Kerala	64	6.1
	Madhya Pradesh	36	3.4
	Maharashtra	80	7.6
	Meghalaya	2	0.2
	Odisha	82	7.8
	Punjab	14	1.3
	Rajasthan	45	4.3
	Tamil Nadu	29	2.8
	Telangana	22	2.1
	Tripura	2	0.2
	Uttar Pradesh	128	12.2
	Uttarakhand	15	1.4
	West Bengal	179	17
	Chandigarh	1	0.1
	Delhi	29	2.8
	Jammu and Kashmir	4	0.4
	Lakshadweep	2	0.2
	Did not Specify	56	5.3
	Non-Resident Indian	2	0.2

Residing Locality	Rural	155	14.8
	Semi Urban	311	29.6
	Urban	536	51
	Other	7	0.7
	Did not Specify	41	3.9
Dimensions	**Category**	**Frequency**	**Percentage**
Personal Fund (monthly) [In ₹]	Above 200000/-	5	0.5
	below 50000/-	589	56.1
	between 100001/- to 150000/-	21	2
	between 150001/- to 200000/-	9	0.9
	between 50000/- to 100000/-	73	7
	Nil	276	26.3
	Did not Specify	77	7.3
Debt (Monthly) [In ₹]	Above 200000/-	3	0.3
	below 50000/-	339	32.3
	between 100001/- to 150000/-	1	0.1
	between 150001/- to 200000/-	2	0.2
	between 50000/- to 100000/-	17	1.6
	Nil	615	58.6
	Did not Specify	73	7
Profession	Other	14	1.3
	Self Employed	12	1.1
	Student	871	83
	Working Professional	112	10.7
	Did not Specify	41	3.9
Education	Post Doctorate	4	0.4
	Doctorate	132	12.6
	Professional Degree	25	2.4
	Post-Graduation	313	29.8
	Graduation	510	48.6
	Other	48	4.6
	Did not Specify	18	1.7
** 1 case is missing for all parameters for demographic details.*			

Source: Author's Compilation

Missing Data Handling

Data was observed through frequency statistics (Table. 4). The missing data is dealt with via imputation as it is a constraint in the analysis. The imputation is done with a mean of two points nearby.

Table 4: Missing Cases

Variables	N		Mean	Std. Deviation
	Valid	Missing		
FMI	1049	2	4.155	0.487
MI	1037	14	6.812	1.199
MIQ	1030	21	2.112	0.756
MES	1032	19	3.259	0.589
My Personal Fund (monthly basis)	973	78	8.345	22.994
My monthly Debt (monthly basis)	977	74	7.730	22.824
Age	1031	20	3.038	11.856
Residing Locality	1009	42		
Profession	1009	42		
Gender	1037	14		
Education	1032	19		
Home State	1050	1		
Nationality	1050	1		
FMI-Financial Moral Identity MI-Moral Identity; MIQIG-Moral Integrity; MES-Money Ethics Scale.				

Source: Author's Compilation

Assumption Testing

As a prerequisite for statistical analysis, the necessary assumptions are tested- the descriptive statistics of key variables are observed.

Statistical Analysis

Exploratory-Factor-Analysis (EFA)

The EFA is conducted with a sample size of 525 (A) out of 1050. The "principal components analysis" (PCA) with "varimax rotation" is conducted in EFA (Table. 5) as it is always a better choice while identifying factors. The researchers identified factors based on extraction and determined them by interpretability, "parallel analysis," scree plot, and eigenvalue. The analysis (scree plot and eigenvalue) indicates a three-factor structure for the constructing scale. The scale factors comprise sixteen items with eigenvalues of 3, 2.06, and 1.17. Respectively, these accounted for 21.48%, 14.77%, and 8.40% of the variance, and, cumulatively, 44.65%. Once again, these factors are run with other constructs for better scale items. The nine items could not load well with the first three factors. The ethical (the moral and ethical are used here synonymously, though they differ technically) construct is complex to formulate (Schminke, 1997);(Love et al., 2020) and has issues with the ethics of quantification (Islam, 2022). However, a further factor analysis suggests the two-factor structure from the high loadings above .30 are selected from every factor (Yong & Pearce, 2013) as the sample is significant and repeat the analysis with loaded items. Comparing EFA and parallel analysis with items has suggested two-factor retention, but eigenvalue in EFA and scree plot have suggested three-factor retention.

Table 5: Exploratory Factor Analysis [N=525 (A) out of 1050]

No	Items	3-Factor			2-Factor		Content Area
		1	2	3	1	2	
1	I spend wisely because of my habit.	**0.770**	-0.021	0.055	**0.772**	0.011	MMM4_3
2	I can save even when it was difficult to do so.	**0.763**	-0.075	-0.025	**0.762**	-0.082	FCM3_4
3	My family and friends find me responsible the way I manage my money.	**0.731**	0.051	0.07	**0.731**	0.076	FCM3_5
4	I feel confident in my ability to know what to spend.	**0.724**	-0.066	0.08	**0.730**	-0.008	MMM4_2
5	I understand the importance of saving.	**0.657**	0.113	0.056	**0.653**	0.116	FCM3_3
6	I value for earned money as my family puts lots of effort in it.	**0.456**	**0.370**	0.170	**0.449**	**0.391**	MDEU5_1
7	Everyone's financial rights are equally important*.	0.018	**0.568**	0.267	0.010	**0.610**	EER2_4
8	I do not think of harming others while earning money.	0.057	**0.541**	-0.101	0.022	**0.358**	EER2_1
9	I always return a favour if I can*.	0.051	**0.523**	0.112	0.034	**0.477**	GNR1_5
10	I hate myself when I acted immorally in the past*.	-0.134	**0.496**	0.196	-0.143	**0.511**	MDEU5_3
11	I want to become financially independent in next 5 years.	0.173	**0.488**	-0.018	0.147	**0.367**	FCM3_1
12	It's ok to keep valuable items that someone finds, rather than try to locate the rightful owner* (R).	-0.072	**0.444**	0.052	-0.089	**0.379**	MDEU5_5
13	I spend for others (charitable spending on others; either known or unknown) because I feel for other's needs.	0.089	-0.129	**0.754**	0.153	**0.371**	GNR1_1
14	Helping others (volunteering or charity) makes me happy.	0.049	0.166	**0.747**	0.098	**0.596**	GNR1_4
15	I should try to be a useful member of society*.	0.231	0.287	**0.519**	0.256	**0.547**	EER2_3
16	I want to see myself as a moral human being (practicing which is right) no matter what would be my financial situation in future.	-0.040	**0.428**	**0.485**	-0.024	**0.638**	MDEU5_2
	Interpretability of Factor	*FMI(S)*	*FMI(I)*	*FMI(I)*	*FMI(S)*	*FMI(I)*	

Bold figures are major loadings in a single component.
Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 5 iterations.
*[*Items are partially adopted; sources are mentioned in methodology section] (R-reverse coded)*
Internalized dimension of Financial Moral Identity [FMI (I)]; Symbolized dimension of Financial Moral Identity [FMI (S)].

Source: Author's Compilation

Higher-Order FMI

As anticipated, the new scale items are assessed through EFA, which initially supported twenty-five items for five-factor retention. However, they do not form any five-subscale area-wise; instead, they mixed up. The three factors are identified in EFA based on eigenvalue and scree plot as PCA is conflated with other factors. Sometimes, EFA is conflated with PCA (Leandre et al., 2012), but comparison with parallel analysis suggests two factors and the correlation between factor two (2) and factor three (3) is high (r=0.776). The higher-order factor analysis supports two-factor retention for the scale. However, two items have double loadings with no significant difference (Table. 5); even after further analysis, one item remained loaded in both components. As the scale is reflective, that single item is dropped to avoid multicollinearity.

Furthermore, the area of financial morality is better distinguished by these dimensions. These areas of financial morality are interpreted as follows "helping others" as Generosity (GNR1), "using/earning money without harming others" as Ethical Earning (EER2), "being financially responsible" as Financial Commitment (FCM3), "how one earns and/or spends money" as Money Management (MMM4), and "using/earning money according to one's personal code of ethics or morals" as Morally Driven Earning Utilization (MDEU5)". MMM4 is loaded in a single factor in all factor analyses. On the other hand, items from GNR1, EER2, FCM3, and MDEU5 areas have contributed to both factors, representing the having side of identity. As a higher-order factor suggests, we have combined them and interpreted them as internalized or internalized versions of Financial Moral identity (henceforth IFMI/ FMI(I)). The items from MMM4 and FCM3 formed a single factor, representing the identity's doing side. We have interpreted them as Symbolized or symbolized versions of Financial Moral Identity (henceforth SFMI/FMI(S)). This finding is in sync with the SP of moral identity, which has two dimensions (internalization/ having and externalization/doing)-private and public.

"Internal Consistency" ("Reliability")

We have measured internal consistency as part of reliability through 'Cronbach's Alpha (?), McDonald's Omega (??), and composite reliability (CR) (Table. 6).' However, all subscales are not at par with the standard benchmark for reliability, except FCM3 and MMM4. The subscales of bi-dimensional FMI have an acceptable level of ? and ? scores independently and collectively. The composite reliability (CR) of the finalized version of the scale from the CFA sample is tested, and scores are above the benchmark (0.60 or above) (Fornell & Larcker, 1981; Hair, 2009; Hair et al., 2017). These statistics support the internal consistency of the construct.

Table 6: Reliability & Composite Reliability [N=1050]

Sub Scales	Items	Cronbach's Alpha (α)	MacDonald's Omega (ω)	Composite Reliability
Generosity (GNR1)	3	0.432	0.487	
Ethical Earning (EER2)	3	0.377	0.384	
Financial Commitment (FCM3)	4	0.619	0.713	
Money Management (MMM4)	2	0.631	*NA*	
Morally Driven Earning Utilization (MDEU5)	3	0.400	0.414	
FMI (I)-[Internalization]	10	0.646	0.624	0.758
FMI(S)-[Symbolization]	5	0.801	0.805	0.851
Financial Moral Identity (FMI)	15	0.701	0.636	

Source: Author's Compilation

In-Variance Test

Though we did not control any gender variable in this study and everyone has an equal chance to participate who are above 18 years of age and has online access, but our respondents are positively male-skewed. According to Miller and Schlenker (Miller & Schlenker, 2011) and Agerstrom, Moller, and Archer (Agerström et al., 2006), there is a possibility of the existence of gender differences in moral identity. Interestingly

this is the exact opposite situation of the study of Moral Identity by Aquino and Reed (Aquino & Reed II, 2002), which had predominately female participants while constructing the scale. There is a substantial difference in happiness among genders (male is happier than female) as far as income is concerned (Adelmann, 1987). It is always better to test variance across genders for the generality of the items. We cannot restrain ourselves from generalizing items for a balanced/women group due to our skewed male sample. We have addressed this issue by adopting an invariance test. The result of "Levene's test for equality of variances" [F (1, 972) =0.423, p=0.516] is insignificant. As we could explore only two categories in "Levene's test", and our existing categories are three in number, so adopted the "test of homogeneity of variance" which is based on mean, median, adjusted degree of freedom, and trimmed mean (Table.7), is also insignificant. All these confirm that the scale items are well understood by all.

Table 7: In-Variance Statistics

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
FMI	Equal variances assumed	0.423	0.516	0.978	972	0.328	0.03672	0.03755	-0.03697	0.11041
	Equal variances not assumed			1.005	330.889	0.316	0.03672	0.03654	-0.03517	0.10861
Test of Homogeneity of Variance		Levene Statistic	df1	df2	Sig.					
FMI	Based on Mean	0.223	2	997	0.800					
	Based on Median	0.197	2	997	0.822					
	Based on Median and with adjusted df	0.197	2	993.95	0.822					
	Based on trimmed mean	0.187	2	997	0.830					

Source: Author's Compilation

Confirmatory Factor Analysis

The deductive method of construct formation (literature review) suggests a uni-dimensional (economics-personal identity), bi-dimensional (psychology-internalization and symbolization of moral identity), and penta-dimensional (finance-financial morality in five areas) structure of identity. We propose bi-dimensional FMI, as is evident in EFA. The CFA is conducted to cross-validate the EFA result. The rest of the sample (EFA is not conducted on it) is used for CFA. Initially, no factor is identified, and all items are put as a "one-factor model" ("uni-dimensional"), then a "five-factor model" ("Penta-dimensional"), and a proposed higher-order "two-factor model" ("bi-dimensional"). In AMOS, the "Maximum Likelihood method" is used; interestingly, three factors are identified, but the SFMI is divided into two, and the IFMI is well merged into a single factor. Furthermore, the higher-order factor indicates the bi-dimensionality of FMI. The findings are mentioned in Table VII. The best fit model is the proposed bi-dimensional model [?2 (90, N=525) = 265.800, ?2/df=2.987 $p<0.05$, RMR=0.064, RMSEA=0.062, CFI=0.910, IFI=0.912, GFI=0.966, AIC=363.800]. The Akaike information criterion (AIC) test (Akaike, 1974) is conducted to compare the three models (Uni, Bi, and Penta), and the result indicates (Table.8) that the proposed model (bi) has the lowest value.

Table 8: Confirmatory Factor Analysis

Fitness Indices *[N=525 (B)]*								
MODEL	*CMIN/DF*	*GOODNESS*			*BADNESS*		*MODEL*	
		CFI	IFI	GFI	RMSEA	RMR	AIC	BCC
Penta	7.003	0.591	0.601	0.862	0.104	0.135	713.373	716.837
Bi	**2.987**	**0.910**	**0.912**	**0.966**	**0.062**	**0.064**	**363.800**	**366.886**
Uni	6.105	0.635	0.644	0.839	0.099	0.086	639.495	642.329

Source: Author's Compilation

Validity

The correlation matrix is considered to be one of the traditional yet convenient methods of offering convergent (CV) and discriminant (DV) validity (Campbell & Fiske, 1959). These validity measures show how constructs are conceptually similar yet empirically distinct. The correlation method is applied to assess validity (with conceptually similar constructs- moral identity and integrity and conceptually dissimilar constructs-components of money attitude) (Table. 9).

Convergent (CV) and Discriminant (DV) validity

Though statistical scores validated the anticipation concerning CV and DV, surprisingly, the budget dimension of MES has a statistically significant relationship with the symbolized version of FMI [FMI (S)], which partially contradicts the discriminant assertion. The rest of the MES components are neither statistically significant nor have any relationship with FMI. The internalized dimension of FMI [FMI (I)] is well correlated with MI and MIQIG and has no relation with MES and its components. FMI (I) has convergent and discriminant validity, which is evident from the correlational analysis. It has the highest (within) correlation coefficient (r=0.577) with its parent construct, followed by MI(I), MIQIG, MI, and FMI(S). The strength of these relationships is moderate, and directions are positive. FMI (I) does not correlate with components of MES (Success, Budget, and Evil). It defines FMI (I) as distinct from MES.

On the other hand, the symbolized version of FMI is well correlated with MI and MIQIG and, interestingly, with the budget component of MES, though not anticipated. The strength of this relationship is moderate and positive. The FMI (S) has the highest correlation coefficient (r=0.886) with its parent construct. Though the FMI (I) correlates moderately with each similar construct and no dissimilar construct as intended, FMI (S) has an interesting finding related to discriminant validity. Apart from correlational analysis, the discriminant validity of both the subscales of FMI is evident from CFA and composite reliability (CR) scores. The Convergent and discriminant validity and internal consistency statistics support the fact that FMI is a distinct construct.

Table 9: Correlation Matrix

Variables	FMI (I)	FMI(S)	FMI	MI(I)	MI(S)	MI	MIQIG	MES (S)	MES(B)	MES(E)
FMI (I)										
FMI (S)	.133**									
FMI	.577**	.886**								
MI (I)	.442**	.149**	.330**							
MI (S)	.169**	.208**	.251**	.194**						
MI	.375**	.234**	.368**	.712**	.828**					
MIQIG	.369**	0.056	.219**	.423**	-.133**	.147**				
MES(S)	-0.001	0.035	0.028	-0.015	0.074	0.045	.215**			
MES(B)	0.085	.626**	.560**	.192**	.186**	.243**	-0.003	.178**		
MES(E)	-0.05	-0.025	-0.044	-.095*	0.084	0.005	.182**	0.03	0.065	
MES	0.018	.324**	.277**	0.036	.179**	.149**	.204**	.572**	.643**	.659**

*NOTE: [N=525 (B) out of 1050] ** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). FMI(I)-FMI(Internalization); FMI(S)-(Symbolization); FMI-Financial Moral Identity; MI(I)-MI (Internalization); MI(S)-MI (Symbolization); MI-Moral Identity; MIQIG-Moral Integrity; MES (S)-MES (Success); MES (B)-MES(Budget); MES(E)-MES(Evil); MES-Money Ethics Scale*

Source: Author's Compilation

Findings from the Study & Discussion:

Validity

As part of construct validity, convergent validity signifies the items as highly intercorrelated and converging into one common (parent) construct (Davis, 1989). The Internalized [FMI (I)] and Symbolized [FMI (S)] dimensions of FMI are well converging into FMI (Table. VIII), which is evident from the correlation matrix. However, regarding convergent validity, FMI(S) scores better than FMI (I). This result indicates that FMI (I) is difficult to measure and should be explored further. The correlation coefficient (r=0.368) between MI and FMI is the highest among other validating variables and signifies those two constructs are moderately and positively related yet distinct. The relationship between MIQIG and FMI is moderate and in the positive direction, and the same is validated. Apart from this correlational analysis, the internal consistency scores (reliability) and inter-item correlation also support the convergent validity of FMI. These statistics validate the construct.

Discussion:

The FMI, the self-view in the morality frame while dealing with daily and future financial goals, has emerged as a distinct concept from MI, moral integrity, and money attitudes. The application of MI in PF is established through this construct. The EFA has confirmed the two dimensions of FMI, like its parent construct, MI, which is in sync with the motivational assumption of guiding theory, SDT. Initial EFA has three dimensions of FMI: SDT has amotivation, extrinsic, and intrinsic motivation, and amotivation leads to a neutral perspective.

Moreover, a few budget aspects of MES are loaded in the same factor as SFMI. This aspect may be due to purely neutral money management and amotivation better depicting it. Nevertheless, when the higher order factor analysis is done for data reduction and based on parallel analysis, there are two prominent factors in items of FMI. The emerged dimensions are interpreted as the internalization (intrinsic motivation guided) and symbolization (extrinsic motivation guided) version of FMI. These findings support the previous literature (Aquino & Reed II, 2002);(Krettenauer, 2020). The intrinsic motivation is inner guidance for conduct to be enacted, and it is similar to MI's internalization version.

Furthermore, extrinsic motivation is the environmental cues influencing the behavior's occurrence. This extrinsic motivation has a resemblance with the symbolization version of MI. Internalization of MI took place with time and merged into intrinsic motivation. This process echoes refined moral agency (Blasi, 2005) with age-even the integration of the dominant perspective of MI, SP, into CP in the long run. The study argues that daily morality leads to future morality, supported by this internalization process. The symbolization version of FMI reflects daily morality, and the internalization version of FMI represents the future morality in designing financial goals. In MI theories, the SP is more concerned with daily aspects of morality, whereas CP is focused on future morality (Shao et al., 2008). Moreover, financial morality defines the bi-dimension of money management, one respect for self and another related to others (Bates et al., 2014).

Here, self-regarding (narrower self-interest perspective) money management also defines the symbolization dimension of FMI. Furthermore, other-regarding (broader self-interest perspective) leads to the internalization dimension of FMI. The internal consistency and correlation coefficient score reveal the instrument's reliability and validity but the exciting fact of the complexity of dimension assessment. The score of SFMI is better than that of IFMI. Therefore, it is evident that IFMI is challenging to measure compared to SFMI, which aligns with the literature (Aquino & Reed II, 2002). The convergent and discriminant validity denotes the strength within the construct and empirical distinctness from other constructs. The validating variables (MI, MIQ, and MES) have proved to be distinct yet related if they share the same conceptual similarities or uncorrelated if there is no theoretical association. FMI is not the attitude toward money, evidenced though not having a correlation with MES except the success dimension.

FMI is positively correlated with MI and MIQIG in the expected direction and has no correlation with MES components but with the budget. Though the finding is contradictory concerning discriminant validity, it is apparent that it relates to the budgetary aspect. The FMI (S) is well convergent with the parent construct and discriminant with MES, except for the Budget component. No doubt, the budget has a role to play in personal Finance. FMI (S) is related to ethical components (Moral Identity and Integrity) with low to moderate intensity compared to FMI (I).

On the other hand, FMI (I) has better discriminant validity than FMI (S). This dimension is latent and difficult to measure, but the statistics show that it has components well-versed in the literature and distinct from its co-component. This dimension of FMI has no issue with convergent and discriminant validity. Regarding internal consistency, FMI (S) scores better than FMI (I). The FMI (I) is more complex than the FMI (S). FMI has predictive power on its various components. Therefore, it leads to righteous decisions.

Summary

Though construct development is a process that stabilizes over time, the findings of this empirical study contribute profoundly in two ways. Theoretically, it extends the link between self-interest and morality, which resulted in a bi-dimensional identity (morality-oriented) in personal finance management. Empirically, it catalyzes the achievement of present and future-oriented financial goals at an intrapersonal level.

Theoretical Contribution

Personal finance management has yet to explore identity, especially moral identity. Morality and self-interest seem to be oxymorons in conventional thought, or the general notion is that homo economicus is overpowering homo ethicus (Goslings, 1997). This study argues that morality is salient even when money is involved seriously beyond prosocial spending. The contribution of this study is multi-layered. Firstly, the personal finance domain explores the broader perspective of self-interest based on motivation. The basic human desire to achieve excellence in life leads to value-oriented identity saliency in Personal Finance (PF) despite the doctrine's value-neutral approach. It echoes the efficient frontier's utility in the long run as being moral while dealing with daily Finance. MI is considered a virtue (Krettenauer & Stichter); therefore, FMI holds the same assumption. As a virtue, FMI signifies the utmost component required for ethicality in Finance. Secondly, the moral identity concept is introduced in a metric-centered doctrine like Finance, as behavioral aspects are considered exogenous in the model formulation. It offers a straightforward solution to the complex problem of formulating a model by considering all factors related to the economy, market, and individual in experimental design (Huettel & Kranton, 2012). The study addresses the micro unit of the economy, the individual, and his/her inner space by explaining the motivation for outer consequences, as self-identity is crucial for ethical decisions even in highly competitive marketing frames (Lim et al., 2023). Thirdly, this study integrated the various schools of thought on MI and adopted an integrated view while conceptualizing the construct of FMI. Fourthly, the FMI contributes to Business Ethics literature by explaining MI as it is strongly linked to leadership (Xu et al., 2023), which is crucial for the growth of any organization. Lastly, SDT is an empirical meta-theory on motivation-oriented human behavior. It is integrated with MI and MIQ, but its application needs more exploration in the PF domain as far as our knowledge goes. Therefore, this study theoretically and empirically extended the application of SDT in the PF domain as its assumptions are considered in financial behavior (morally driven).

Empirical Contribution

This empiric-nomological extension aspires to be a building block for various knowledge gaps in terms of conceptual, methodological, and geographical limitations.

The conceptual gap is addressed by exploring independent foundational theories on critical variables. For instance, self-interest is explored in selfishness versus self-oriented perspectives and its assumption in the motivational framework (Rocha & Ghoshal, 2006). MI is explained by integrating daily morality and future morality (Shao et al., 2008) and its motivation for moral acts.

A methodological gap existed in the literature for self-interest assessment. Primarily, studies were designed in trade-off games to evaluate this construct. The method is so complicated and has limited options that respondents need help to escape the formulated option. The preference ranking is very tricky and needs a purely scientific evaluation method. Therefore, this study attempts to evaluate the self-interest perspective by adopting the survey method. Even MI has issues with measurement. There was a literary debate (Hardy & Carlo, 2011) about having a universal method for measuring this construct. Therefore, this study adopted a simplistic view when designing the FMI. The gap in selecting a sample is also addressed in this study. The scale for measuring MI, developed by Aquino and Reed (2002), became very popular. In their formulating study, the female respondents were purposively selected for their moral orientation/characteristics over their male counterparts. Here, the case is redundant. Though the study did not encourage gender-specific participation, the primary sample became male-skewed.

The gap in the selection of geographical areas also existed in the literature as predominantly studies conducted with Western countries. The generalization of those studies is with caution for other parts of the world. The present study has adopted the conceptual area for financial morality from the study (Bates et al., 2014), which uses the East (Japan) and West (US and Canada) samples to mitigate the issues of bias in culture. The collected data reflects the Indian sample, which tries to fill the geographical gap in the literature.

The Implication of the Study

Humans behave the way (s) they desire. The ultimate desire of any human being is to strive for excellence (Aristotelian Philosophy) or growth (SDT), self-interest (self-love/board self-interest), synergic existence of agentic and communal interest (RM theory on MI), or internalization of nature/content and nurture/context (CP and SP in MI). The prime implication of this study is to aid in designing financial tools to improve people's lives. Not all financial interventions or products will be incentivized (Extrinsic Motivation of SDT) due to a lack of resources at the policy level. Here comes the FMI, which confirms that morality does exist in the self-interested domain.

This study aims to advocate mechanisms for eradicating immorality from every sphere of the financial world- at the micro, meso, and macro levels. This study explains the critical role of one's motivation in designing daily and future-oriented goals in Personal Finance domain and indirectly suggests who is prone to vulnerability in goal failure. It also promises to be a solution for reducing financial stress as a ripple effect of the synchronized inner self with the outer world, as all self-interested acts are not selfish (Maitland, 2002). Specifically, while designing the policy to address unethicality in the financial world, policymakers will have the awareness that drives the successful implementation of the policies. FMI suggests a preference for living the values, not the preaching values applicable at every level (micro, meso, and macro). It also explains leadership indirectly, as MI is significantly linked to leadership (Xu et al., 2023), which is crucial for the growth of any organization. FMI suggests an integrative model for harmonious growth to self and society for the proximal and distal future. Instead of addressing many ill issues like corruption, bribery, unethical reporting, insider trading, principal-agent problems, and over-indebtedness, one common issue is people's tendency to encourage immorality by directly engaging or bearing the pain. These issues at the individual or collective level can be handled effectively by the ethicality of each stakeholder. This study offers the solution of the micro level, which will have a ripple effect on meso and macro levels as the same individual and his/her motivation work on a universal principle (basic assumption of SDT). Suppose basic psychological needs are thwarted, and financial stress may reach optimum. Mental health issues are skyrocketing worldwide (Knapp & Wong, 2020), and no nations have adequate infrastructure to deal with these patients (Health et al., 2005). FMI suggests the prevention approach over cure one. FMI suggests one-size-fits-all in the PF ecosystem while addressing daily and future goal accomplishment.

Lastly, today's world advances incentivization in everything. Most consumers are drawn naturally to incentives and become habitual receivers of incentives. The incentivizing process magnetizes consumers persistently;

then, it has negative consequences in the long run by becoming a norm for doing business. In this context, if extrinsic motivation (money, incentive, social pressure, and prestige) is internalized and becomes intrinsic motivation through various policies and interventions, no more external cues can motivate one to engage in ethical conduct in any domain. This assumption is extended in the PF context through FMI.

Limitations and Avenues for Future Research

The instrument only includes some areas of personal Finance (based on experts' opinions and preliminary exploration) due to management and applicability issues, as many items are not desirable for the reflective scale. There is a limitation in the study design as it is not longitudinal, experimental, or mixed methodological. This study is online-based, so offline data collection is not included. The global population is not accessed as the internet connectivity service has its limitation. Though the intention was to collect data worldwide to mitigate cultural biases, it ended up with the Indian population. The sample is skewed to the younger generation; this may be due to their techno-savvy nature. They are not in the stage of active income generation, so they may not enjoy economic independence and lack real exposure to money management at great length.

At the theoretical level, different perspectives (the philosophical, sociological, and behavioral sciences) are left unexplored while formulating the construct. The FMI remains a psychological construct limited to self-assessment; therefore, it is subjective. The challenge is to measure this construct accurately, as context is one of the significant determinants of predicting moral conduct. Lastly, this is a tiny step towards collaborating morality and self-interest at the intra-level. However, its development could be another arena for further exploration of its determinants and antecedents.

By considering the limitations at the practical level, we suggest the following future agenda for this research. The study does not have a global sample at the operational level, though it has a nationally representative sample (non-westernized) and non-resident participants (minimal). Precautions should be taken, and culture must be considered to generalize the assumption. The participants of this study are younger than those of aged one. This kind of participation may be due to participants' familiarity with technology. Hence, more aged participants would have added value to the dimension through their life experiences as the refined agency grows with age. We suggest that interested scholars explore this area by using an offline and qualitative method for research design. The study may be replicated with the global sample, high-net-worth individuals versus poverty-stricken people; then, the result may be generalized. The construct may be explored in longitudinal, experimental, and qualitative study designs. They may conduct a cross-country study to eliminate the effect of culture. They may take this construct at the macro level.

The comprehensive study based on life narratives for the same construct may be a topic for future exploration. The symbolized version of the construct may be explored in the assessment from the observers' viewpoint on an experimental basis, preferably the qualitative one, because humans may overestimate their perspective concerning morality.

The conceptual framework of this study may be enriched by including the well-being aspects of Finance and financial stress. Another interesting perspective of studying FMI is looking at it from an oppositional, unethical, or immoral perspective.

Conclusion:

This study explores moral identity in the personal finance domain with daily and future goal aspirations. The Financial Moral Identity is conceptualized to measure the same. FMI may contribute to human beings' psychological, physical, and economic growth toward excellence in the near and distant future. This growth is not restricted to the intra-personal level. It applies to interpersonal (for instance, leadership/prosocial spending) and societal(for instance, anti-corruption/ corporate social responsibility/ethical consumption) levels, as morality and motivation have impactful significance in eradicating immorality. In other words, FMI emerges as an antecedent

of personal finance management behavior (driven by morality), which is also crucial for business ethics.

'Data Availability Statement'

Data is with the authors, and it will be shared upon request.

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DIGITAL TRANSFORMATION IN EDUCATION: A BIBLIOMETRIC ANALYSIS

Ankita Singh[*], Priyanka Dalmia[**] and Nitin Garg[***]

Abstract

Over the past two decades or more, new educational technologies have brought about a technical transformation in India's educational institutions in India. The goal of this article is to look into the effects that new technologies have on students attending educational institutions in India, namely those attending schools, universities, and colleges. The study's overarching goals are to determine how heavily students are utilizing new educational technologies, determine whether or not new educational technologies use is influenced by the financial nature of the institution, and analyze the outcomes of new educational technologies use. This study is based on the education system and new technology integration in primary and higher education so that it will facilitate all the students in their understanding, accessibility, and learning of new resources and technological terms. The bibliometric study was conducted using data from available literature concerning India.

Keywords: *Technology, India, education, digitalization.*

Introduction

The growth of digital natives and the shifting nature of education throughout the globe have put unprecedented demands on teacher preparation programs as they become ready to instruct students in the twenty-first century (Zaidi et al., 2021). In this age of technological infusion, integrating information and communication technology (ICT) into teacher education curricula and prospective teachers' teaching practices is a complex and challenging problem (Grover et al., 2021). Trainee teachers must be e-teachers in order to be effective. This indicates that, in addition to modifying the pedagogy and employing ICT as a tool for pedagogic enrichment, they should be able to use digital tools, resources, and technology [UNESCO] (Pandit & Agrawal, 2022). In order to better understand how prospective teachers see this important subject, and in light of the constantly evolving and growing needs of the modern world, the researcher has started this study (Sahu et al., 2022). Therefore, the purpose of this research is to investigate how preservation instructors see the use of ICT in teacher education programs and how this connects to their instructional practices (Mena et al., 2020).

Higher education institutions (HEIs) are undergoing a digital transformation in every aspect of their operations as a result of the Industrial Revolution 4.0's flood of technology breakthroughs in recent years (Wang et al., 2023). The debate in India about technology integration in education has changed from a yes-or-no approach to a focus on how to use technology to benefit students. The conversation on technology in education has undoubtedly altered due to the COVID-19 outbreak (Raja & Kallarakal, 2021). The integrated approach to technology in education for teachers in secondary (grades 5 to 10) government schools in India was built on project-based learning with technology (PBLT) (Singh, 2021). Technology integration problems still revolve around infrastructure availability in India's lower socioeconomic educational settings, albeit the emphasis now is more on gaining access to digital resources and content (Singh, 2021). For the first time, the Indian National Education Policy 2020 placed an emphasis on educational technology that went beyond digital literacy and infrastructural support (Charania et al., 2023).

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As a consequence of the proliferation of new educational opportunities made possible by technological advancements, the teaching profession is quickly becoming one of the most difficult to succeed in (Amballoor & Naik, 2021). Due to the development of new theories of education, newly certified instructors are expected to have the same level of literacy as the digital native students they would be instructing. Because of the significant part that it will play in the classrooms of the future, pre-service teachers should have no qualms about confidently embracing the ever-evolving world of technology. The acquisition of technological abilities relevant to the 21st century by candidates for teaching positions is of the utmost significance during all stages of preparation (Sahu et al., 2022).

Literature Review

The importance of education in a person's life cannot be overstated. It is a very social activity, and traditionally, competent teachers who spend a lot of time getting to know their students personally have been connected with excellent teaching (Shinde & Prasad, 2019). The way students are taught has changed dramatically in recent years. Students would benefit greatly from the new educational technology as improved education results in skills that are in line with the demands of the market (Grover et al., 2021). Universities are being forced to adapt to the newest technological developments in education as a result of the ongoing expansion of digital technologies and their use (Zaidi et al., 2021). The impact of educational technology on the teaching and research operations of higher education institutions has been tremendous. E-classrooms and other similar online technologies facilitate communication between educators and their students. It is possible that a lecturer is not physically present on campus (K. Wang et al., 2023). Students get the chance to engage with the presenter in an online Q&A session at the end of the presentation. Satellites might be used by the many institutions in this network. The Indian government has long advocated for this strategy of information sharing.

A prime example is the launch of the EDUSAT spacecraft, which was created specifically for educational reasons (Lal & Paul, 2018). A form of technology-supported learning (TSL) known as "e-learning" uses computers as the primary teaching tool. E-learning can take place on a network, intranet, COROM, or the Internet. Text, music, video, animation, and virtual environments are all options (Grover & Mathew, 2022). Among the phrases sometimes used interchangeably with "e-Learning" are online learning, online education, remote learning, technology-based training, web-based training, and computer-based training (Wang et al., 2023). There are two types of new technology in education. The first is internal usage (standalone and local area network systems), while the second uses networked technology to access classes from a distance. The second type of technical system makes it possible to democratize education (Lal & Paul, 2018).

There are two types of education in India: formal education and informal education. Moreover, many technologies, such as artificial intelligence, cloud computing, and information technology, facilitate improving the Indian education system in many ways, such as practical implications and real-time experience.

Cloud Computing: One must increase the students' capacity for mental rotation by producing content if one is to raise and maintain the caliber of students from diverse disciplines. The people and the institutions of higher learning are prepared to change with the times (Wang et al., 2023). Teachers and educators in higher education sectors now operate differently thanks to the use of cloud computing technology. The educational cloud's cost-effectiveness and collaborative nature contribute to a slow but steady rise in adoption. The Internet and cloud computing technologies motivate the anticipation of a learning structure that makes use of cloud technologies to back up the simplicity of learning resources and to report the issues of conventional educational systems.

Cloud computing facilitates both collaborative and remote education. Education institutions have shifted their primary focus to include the cloud computing environment. It helps students, faculty, and researchers in the higher education sector enhance their academic outcomes at a reasonable cost. One major advantage of cloud computing is that it enables the easy distribution of educational resources across institutional boundaries (Mary

& Rose, 2020). Cloud computing seeks to emphasize the relevance, classification, and rationale for its implementation in higher education. Gonge and Ghatol (2013) indicated that many factors and frameworks of cloud computing need to be considered while implementing cloud computing in the classroom.

Web-based learning: When it comes to education, web-based learning refers to any approach that makes use of the Internet as a means of delivering teaching. It is a method of teaching and learning that takes place entirely online, without any in-person contact between the teacher and the students (Nurninawati et al., 2022). Alternatively, it could be described as a hybrid approach, in which teachers sometimes hold in-person classes and other times use online tools to educate their students. Web-based education can function either as a replacement for or a supplement to more conventional forms of education. It is a method of learning in which information is shared via online discussions between instructors and students (Veeramanickam et al., 2023).

Online courses have effectively captured the interest of both instructors and students, and many are now using them as their primary source of education (Pandit & Agrawal, 2022). Scholars who are unable to physically attend conferences but still want to deliver their papers have the option of doing so through video conference or by emailing a recording of their presentation. Simultaneously, a researcher can follow the conference live via various social media sites (Das & Bhattacharyya, 2023). Web-based education encompasses any educational activity conducted over the Internet or a private intranet by combining different materials, including music, motion, text, and narration, into one presentation. Gathering relevant data from multiple sources and allowing students to make their own network by providing materials and their use in research help them to strengthen bonds with the students. Web-based learning also allows students to identify and utilize resources all over the world regardless of distance (Vekli & Calik, 2023).

Since all of the materials for a given online course are housed in a single area, it is legitimate to classify web-based learning as a type of online learning process, often known as e-learning (Shinde & Prasad, 2019). Forming groups, pages, etc., on various social networking sites can serve as discussion forums online. Web-based courses offer the option of downloading several printed course materials in PDF format in addition to offering an HTTP link that might bring a learner to the course. In addition to gaining access to the course materials, the reader may also find a hyperlink, which, when clicked, will open a new window and take them to additional related publications (Chatterjee et al., 2019).

Information and Communication Technology: The incorporation of information and communication technologies (ICTs) and their integration into teacher education programs is a method of improving and reinforcing the quality of teacher education programs at both the pre-service and in-service levels (Mena et al., 2020). Applications based on information and communications technology (ICT) and their integration with content, method, and pedagogy have the potential to be powerful catalysts for students' meaningful learning in the field of teacher education (Nasreen & Chaudhary, 2018). It is the responsibility of professionals affiliated with institutions of teacher education to provide them with the tools necessary to create their educational system and to educate teachers for the future of society (Pandit & Agrawal, 2022).

The Massive Open Online Courses: Massive Open Online Courses (MOOCs), with their creative programming, had been the ultimate disruptor. The new narrative takes advantage of artificial intelligence, social media, smartphones, cloud computing, virtual reality, and other technologies to provide the tools who need to really experience and feel what they are learning, as opposed to just regurgitating what their teachers say (Raja & Kallarakal, 2021). The incorporation of digital technologies into learning has developed and formulated the concept of Learning 4.0. such innovation has transformed teachers into more mentors, friends, philosophers, guides, orchestrators, invisible hands, and facilitators than all-knowing teachers who will absorb all knowledge and humiliate students regardless of their preferences, interests, capacity to grasp subjects, moods, and so on. The driving elements behind Learning 4.0 are digital networks, platforms, and gadgets (Amballoor & Naik, 2020).

Education 4.0: One of the most significant outcomes of the Industrial Revolution is Education 4.0, which accelerated the education system's development for enhancing learning abilities and recognizing new knowledge trends. Learners may be mentored, coached, and instructed more effectively by using the Education 4.0 strategy (Singh, 2021). The practice of digital learning (DL), which is outcome-based, enhances the learner's capacity for learning. For the purpose of boosting educational practices, DL may be accomplished by utilizing a variety of DL instruments (Mena et al., 2020). With DL, learning may take place at any moment without interfering with the timetable that has already been set. As a result, a lot of students are turning to digital learning methodologies.

DL has advanced dramatically during Covid-19 (Zaidi et al., 2021). It made it possible for people to connect from various backgrounds and professional specialties in order to connect and study the same ideas. For successful learner engagement, DL has made it possible to use mixed, personalized, and flipped learning. These new platforms have been developed to offer new tools and platforms for studying and evaluating things (Raja & Kallarakal, 2021).

Web-based Learning: Considering that the database contains all of the online course materials, "web-based learning" is viewed as a form of the "online learning process" (e-learning). Online discussion groups can be established by establishing pages, groups, etc., on existing social networking sites. Course materials for web-based courses can be accessed in PDF format, and students can be directed to the course using a http link. When a student clicks on a link, they are taken to a new online page where they have easy access to the assigned readings and, in some cases, additional readings and resources.

Objectives of the Study

- To recognize and comprehend how Indian prospective teachers discover the infrastructure that is currently in place for ICT integration.
- To identify and recognize the prominent authors in the area of digital transformation of education.
- To identify and recognize the frequently used keywords by the authors.
- To identify and recognize the collaboration between the prominent organizations.

Methodology

With the goal of analyzing the growing trends and characteristics in the academic field of digitalization in the education world, Bibliometric analysis, including citation and co-citation analysis, was performed on published articles. Bibliometric analysis has been shown to be an effective method for discovering common terms and changing ideas throughout time. Following an objectivist paradigm, bibliometric analysis applies quantitative measures and examination of textual documents (Sun et al., 2023).

Citation and co-citation analysis can indicate emerging trends and the effect of various journals, authors, comparable keywords, and shared ideas. Trends and features can be extracted from written documents using this method. It substantially facilitates the process of exploring, articulating, and organizing past work on the topic (Sahabuddin et al., 2023; Vlase & Lahdesmaki, 2023).

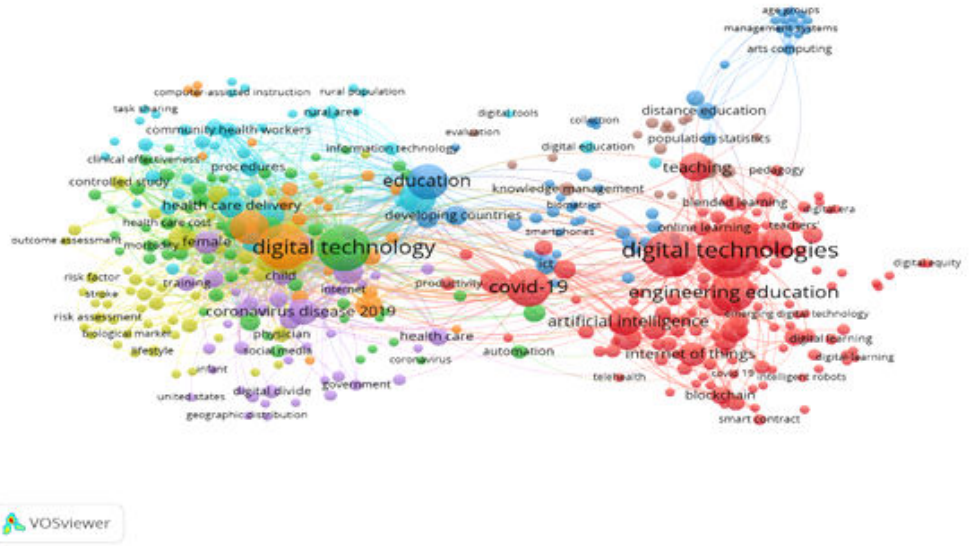
Results

This section summarises the findings of performance analysis and scientific mapping analysis. It represents the graphical presentation of the quantitative scale.

Co-occurrence of keywords analysis

The Scopus database was used to create a map of the most commonly used words in the research article's abstract. It is expected that background information-related keywords will be heavily utilized. Figure 1 presents the usage of numerous keywords.

Figure 1: Co-occurrence of keywords



Co-authorship analysis

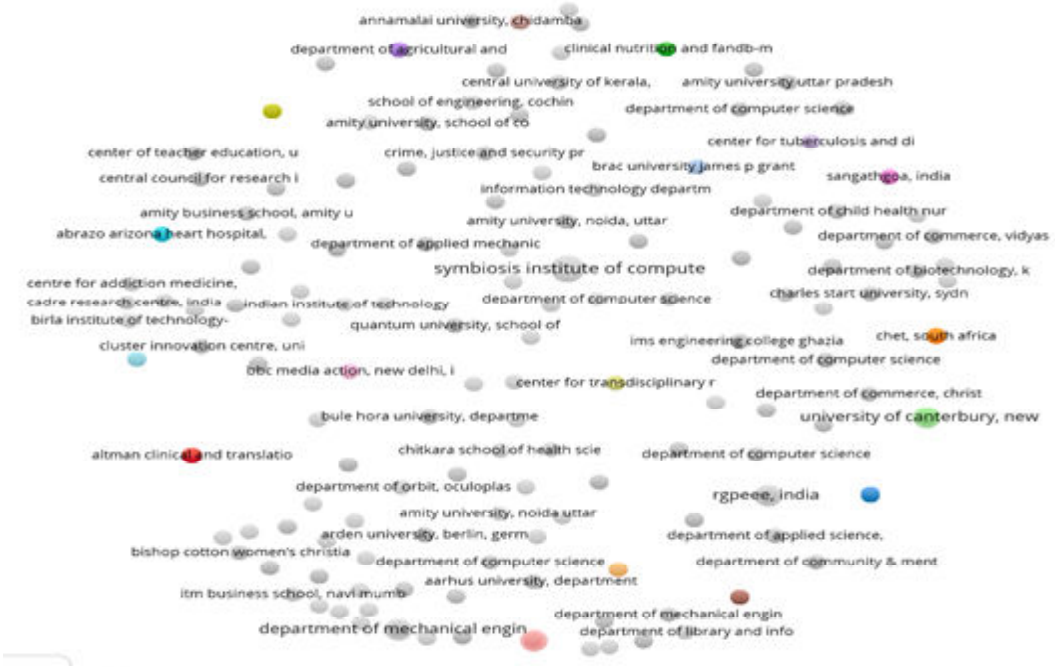
Figure 2 represents the collaboration of authors to conduct the study. It also reflects the joint efforts and teamwork required to carry out research.

Figure 2: Co-authorship analysis at the author level

Co-authorship of Organization

Bibliometric analysis has also revealed collaboration between authors from various organizations in several nations. Figure 3 represents the formation of groups of organizations to conduct the study. Here, the authors engaged with the organizations and collaborated with the other authors engaged with other organizations.

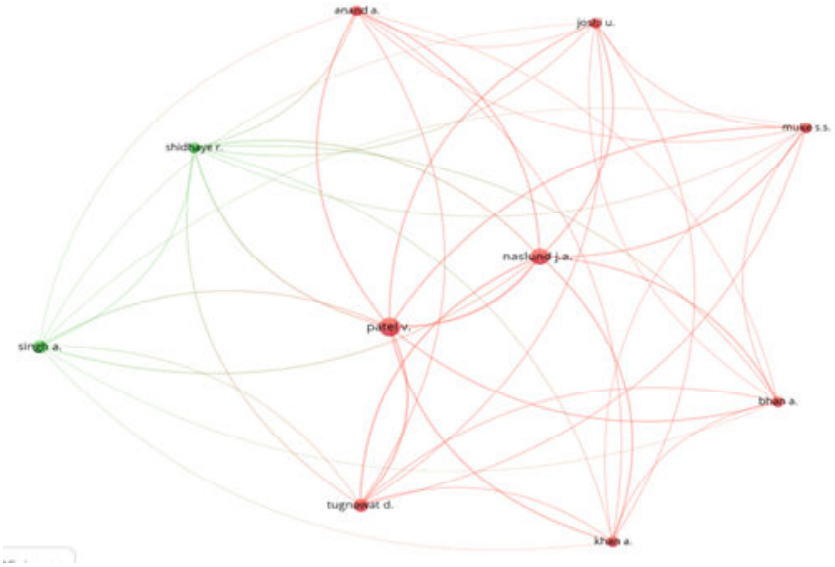
Figure 3: Co-authorship of organization



Top Contributing Authors

Bibliometric analysis also identified the most contributing authors who have worked significantly in the given area. Figure 4 represents the 10 most contributing authors in the field of digitalization in the education field.

Figure 4: Top 10 contributing authors



Discussion & Conclusion

This study offers the results of a bibliometric analysis of research papers on the topic of digitalization and education. We have used the Scopus database to find the relevant articles published in the given field. After employing the inclusion and exclusion criterion, we have finalized 233 pertinent articles for the study. Using the freeware software VOS Viewer and Cite Space, various outputs have been generated to conclude the chosen area of study.

This research conducted the bibliometric analysis in the area of digitization, took place in the area of education, and has been developed as a new field of study. The study's primary goal is to determine its present level of development, prominent authors, keywords, author co-authorship, and organization co-authorship. This study reveals that education has incorporated various technologies, including cloud computing, web-based learning, ICT Technology, MOOCS, and Education 4.0.

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DYNAMICS OF ASSET OWNERSHIP: AN SHG-BLP PERSPECTIVE

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Abstract

Objective: This paper determines the impact of Self-Help Group (SHG) participation on improvement in asset formation for beneficiary households. Improvement in assets is explored in the form of both tangible and intangible assets.

Methodology: The study is based on primary data collected from a multi-stage stratified random sample of 126 SHG households being promoted by 7 carefully selected banks in India. Probit models have been applied to bring out the drivers of asset improvement in ownership of tangible assets. Seemingly Unrelated Regression Models are applied to explain portfolio diversification in ownership of some tangible, financial and intangible assets.

Findings: The study finds out that only 32 % of households have recorded an improvement in ownership of landed assets, while the improvement in ownership of animal assets is 42%. Improvement in ownership of non-farm assets is of the order of 80%. Overall productive assets, household assets, savings and investment assets, and categories of insurance have recorded an average diversification of the order of 52%, 58%, 28%, and 39% respectively. Familiarity and social networking of SHG members have shown an average portfolio diversification to the extent of 50%, and 12% respectively.

Originality /Value: Existing literature has investigated different economic and social empowerment effects of SHG-BLP. This paper analyses all four types of assets - productive, financial, household, and intangible. Existing literature explores social capital and networking at the group level. This paper adds a less explored dimension in the formation of individual-specific social relationships and networking.

Keywords: *Women Empowerment, Economic Development, Asset ownership, Self Help Group Bank Linkage Program, Microfinance, Credit Access*

JEL Classification: G 21, O 1, I 3, I 38

Introduction

The Self-Help Group Bank Linkage Program (SHG-BLP) in India is a very significant intervention toward the goals of women's empowerment and development. It has proved to be an efficient intervention in providing financial services to unserved and unprivileged households. The beginnings of this program can be traced to a pilot program linking 500 SHGs to banks in the year 1992-93. At present, in terms of client base and outreach, it has become the largest microfinance program in the world. Earlier literature on SHG-BLP has highlighted SHG membership's impact on income, earnings, and empowerment. For instance, Pitt et al (2006), note that microcredit interventions enhance women's empowerment. Panda D K (2009) finds that the socio-economic parameters of income, employment, saving, migration reduction, literacy, household decision-making, and participation in Panchayati Raj Institutions are affected positively by SHG participation. Banerjee et al (2015) examined the impact on monthly per capita consumption, and the effect on health, education, and empowerment. In the literature, considerably less emphasis has been laid on asset formation and especially on asset diversification. So, in this paper, we have tried to fill in this gap. We study the impact on improvement in major physical assets like land, animal, and non-farm assets. We examine portfolio diversification in overall

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productive assets, household assets, savings, insurance, household familiarity, and social networking. We have applied the Bruesch-Pagan (BP)[1] test to check whether the errors in equations are correlated. When they are not correlated we have applied the probit models to bring out the drivers of improvement. Otherwise, we have applied Seemingly Unrelated Regression models to bring out drivers of diversification in assets.

The rest of the paper is organized as follows. Section 2 presents the literature review. Section 3 explains the methodology. A summary table (Table 1) brings out the important dimensions of the explained variables. Section 4 constitutes the findings from the study and discussion. Section 4.1 attempts to bring out the drivers of improvement in landed, animal, and non-farm assets of households after joining SHG by applying probit models. Section 4.2 attempts to bring out the drivers of diversification in items of overall productive assets, household assets, savings and investment, categories of insurance, familiarity, and social networking. The paper ends with Section 5, which is the concluding section. Various characteristics of households, villages, and SHGs that influence the ownership of assets of different categories are explained in Appendix Table 15.

Review of Literature

As our paper has attempted to estimate the impact of microfinance on both tangible and intangible asset formation, to be consistent, we have picked up in the literature review, papers dealing with either tangible assets and income or dealing with intangible assets.

Chen and Snodgrass (1999), in their study found that when clients receive micro-enterprise development services, there are improvements in housing and related facilities. These improvements include legal ownership of houses and upgradation in household sanitation and other facilities, ownership of gold, silver, and bicycles.

Puhazhendhi and Satyasai (2001) in their study found a higher improvement in social aspects of SHG households as compared to economic aspects.

Mahmud (2003) noted contrasting results in studies assessing the impact of participation by women in microcredit programs and their empowerment. While some researchers report participant women's economic and social empowerment, others report greater subordination of women as a result of the reinforcement of patriarchal norms and behaviours.

Study by Copestake et al (2005) concluded that the Village Banking Program had a significant effect on income, household income, asset ownership, and risk-coping capability, but there was no effect on parameters of employment business, sales, profit, etc.

Pitt et al (2006) in their study confirmed the notion that there is an increase in women's empowerment as a result of participation in micro-credit programs. These programs resulted in their increased influence in household decisions, higher access to financial and economic resources, and improvement in social networks and mobility.

F. Nader (2008) investigated whether micro-credit is positively linked to women's socio-economic well-being. Study results demonstrated that obtaining credit is associated with an average increase of assets of 13.14 USD compared to those who do not benefit from micro-credit.

Study by Panda DK (2009) found a positive impact of SHG on economic indicators like income, employment, and savings as well as on others including the development of enterprise.

Sultana and Hasan (2010) explored the outcomes of micro-credit availability on rural women's economic empowerment. It was found that women involved with the BRAC (Bangladesh Rural Advancement Committee) microcredit program owned more assets (approx. 196.15 USD) than non-BRAC women (155.93 USD).

[1] Breusch, T. S.; Pagan, A.R. (1979) , Ä Simple Test for Heteroscedasticity and Random Coefficient Variation" Econometrica. 47(5);1287-1294

Bhanot et al (2012) in their paper found that education, income, awareness of self-help groups (SHGs), lesser distance from the Post Office, and financial information from various sources helped to increase financial inclusion.

Datta et al (2013), in their study, analyzing the impact of Bandhan micro-finance on asset formation at both household and enterprise levels, found a significant rise in the value of consumer durables and a positive impact in the quality of life. Increase in annual household net income from all sources was noted, in addition to an annual increase of full-time employment and an improvement in the value of non-farm business assets. In terms of client empowerment in family matters , the analysis found mild trends in some parameters and significant improvement in intra-family relations.

Study by Nilkantan et al (2013), investigating dimensions of women empowerment revealed that increased access to microfinance had negative empowerment effects on economic dimensions like enterprise management, credit decisions, and expenditure decisions. At the same time, it positively influences empowerment in child-related decisions.

Study by Goto (203), revealed that there is no positive impact on the agricultural income of SHG micro-credit beneficiary households. The study finds that longer SHG membership duration increases food expenditure. The study noted benefits for poor participants in terms of asset accumulation and consumption smoothening by micro loans, as well as by the formation of risk-sharing networks.

Lavoori and Paramanik (2014), in their study, demonstrated a positive impact of family size, SHG member and her husband's income, and number of meetings attended by member on participation and decision making. It was inferred that policy-level efforts like an increase in the frequency of SHG meetings, more training programs, higher loan amounts as well as effective loan utilization will improve women's empowerment.

Banerjee et al (2015) in their experimental study found no significant difference in monthly consumption. A significant positive change was observed in the purchase of non-durables. The study noted that micro-credit seems to have no apparent effect on education, health, or women empowerment.

The study by Chaudhary (2015) , noted that 4.5% of respondents had a good increase in assets and wealth after joining SHG. The study also noted more improvement in psychological and social empowerment as compared to economic empowerment.

Nayak (2015), found that women's participation in SHG led to their securing and enhancing three types of social capital that are bonding, bridging, and linking. Bonding refers to solidarity among members, bridging refers to capital generated because of group participation, and linking refers to interaction with external institutions in the community. The study noted that SHG-related involvement necessitated members' association with banks, block offices, panchayats, and people like Sarpanch, political leaders NGO representatives, and other market entities.

Khobarkar et al (2016), in their study exploring socio-economic empowerment, concluded that SHG helped in earning on average 177.91 USD per year to each member through daily enterprise and 240.02 USD through goat rearing.

Atieno (2017), delved into the impact of SHG on household asset allocation. The study found that all respondents received at least one asset by being an SHG member.

Sheshie Nasser and Oduro (2018) in their study noted possibilities of curtailing poverty and enhancing economic growth by policy measures leading to higher investment in the size of women-owned businesses.

Esmaeil et al (2018) in their study concluded that having micro-credit access influenced the lives of rural women significantly. It was found that access to financial services enhanced savings, and income. The

results exhibited that microcredit facilities not only instilled a sense of confidence and self-esteem in women beneficiaries but also led to their social and financial empowerment.

Ban et al (2020) in their study reported that the SHG program led to a significant increase in households with savings, saving levels, and livestock. However, consistent evidence of enhancement of livelihoods, increased civic engagement and social capital could not be found.

Methodology

Primary data for this paper has been collected as a part of a NIBM study (Bhattacharya et al, 2015) which was focused on understanding the viability of SHG-BLP models of different banks. The NIBM study team expanded the domain of this study to view things from the demand side. A distinctive characteristic of this study is to look at things from the perspectives of SHG members. In this paper, we are concentrating on understanding the dynamics of improvement in asset ownership as experienced between the time a household became a member of SHG and at the time of its interview (March 2015).

A multi-stage stratified random sample of 126 SHG households promoted by 7 carefully selected banks (2 public, 2 private, 1 RRB, and 2 DCCBs) across 6 different states representing North, South, East, West, and North-East parts of the country, was used to collect the primary data for this paper. Public Sector banks selected were Punjab National Bank and Indian Bank, Private Sector Banks were HDFC Bank and ICICI Bank and Regional Rural Bank was Assam Gramin Vikash Bank, while DCCBs were Nadia DCCB and South Canara DCCB.

The paper studies improvement in multiple dimensions of assets of SHG households touching upon both tangible and intangible assets in domains of agriculture, animal husbandry, non-farm business, overall productive activities, household assets, financial assets, and social status of SHG households.

The paper explores various exogenous factors like demographic characteristics, SHG characteristics, features of credit availed by SHG, SHG households' village characteristics, etc. which can potentially explain the behavior of these dependent variables. A summary table (Table 1) brings out the important dimensions of the explained variables. We attempt to bring out the drivers of improvement in landed, animal, and non-farm assets of households after joining SHG by applying probit models. We also attempt to bring out the drivers of diversification (specifically percentage improvement) in items of overall productive assets, household assets, savings and investment, categories of insurance, familiarity, and social networking. Seemingly Unrelated Regression models are applied to explain percentage improvements in items/categories of these assets. The Breusch-Pagan test is performed to test the independence of errors in these equations.

Table 1: Summary Statistics of Asset Variables

Variables	*Mean*	*Std Dev*
Improvement in landed assets (IMPLAND) (0 - 1)	0.33	0.47
Improvement in large and small ruminants (IMPANI) (0 - 1)	0.43	0.50
Improvement in non-farm business (capital assets including building and equipment) (IMPNFARM) (0 -1)	0.81	0.39
Greater diversification in items of overall productive assets (PCIMPAST) (0 - 100)	52.12	26.83
Greater diversification in items of household assets (PCIMPHHAST) (0 - 100)	58.47	25.01
Greater diversification in items of savings /investment (PCIMPSAV) (0 - 100)	28.57	17.23
Greater diversification in availing categories of insurance (PCIMPINSUR) (0 -100)	39.28	32.62
Greater diversification in the status of familiarity with important persons in the village (PCIMPFAM) (0 - 100)	50.20	19.22
Greater diversification in social networking (membership in important village organizations) (PCIMPNET) (0 - 100)	12.70	18.62
n = 126		

Source: Authors' calculations

Descriptive statistics of these explained variables show that only 33% of households have recorded an improvement in ownership of landed assets. Landed assets refer to agricultural-owned land, ownership of allied sector assets like water bodies, orchards, farms and forests, and farm implements including plough, tractor, sprayer, power tiller, pump-set, tube well, dug well, drip, sprinkler, etc.

Improvement in ownership of animal assets is a bit larger - of the order of 43%. Animal assets refer to large ruminants like cows, buffalos, etc., and small ruminants like sheep, goats etc. Another positive finding is that 81% of households report an improvement in ownership of non-farm assets. Non-farm assets refer to transportation vehicles like bicycles, carts, vans, rickshaws, motorcycles, scooters, cars, jeeps, etc., and non-farm business indicating the area covered and the current value of all capital assets including buildings, equipment, etc. On average, 52% diversification is observed in overall productive assets which include agricultural assets, large and small ruminants, and non-farm business as experienced by these households after having SHG membership. An average 58 % diversification is experienced in items of household assets like home renovation and reconstruction, upgradation of the washroom, having own drinking water facility, having an improved energy source for cooking, and adding/upgrading furniture, kitchen utensils, etc. The average diversification in terms of savings and investment (crop hoarded at home or in cold storage, ornaments, post office/bank savings, private company deposits, informal group deposits, shares, bonds, and mutual funds) is 29%, while the average diversification in availing different categories of insurance (life, crop, cattle, health, property, and accident) is 39%. Familiarity of SHG members means recognition of members by important persons in village like Member of Legislative Assembly (MLA), Member of Parliament (MP), Sarpanch, Agriculture Extension Officer, Gramsevak, Officer in charge of Police, Block Development Officer, Veterinary Doctor, Head Master of the local school, Bank/Cooperative employees, other SHG /NBFC /Microfinance employees. On average, SHG members report familiarity diversification of the order of 50%. In social networking, which includes membership in village organizations like Panchayat/ Municipality, cooperative society, the managing committee of the local school, Non-Governmental Organizations (NGO), forest protection/ecological development committees, and any other social or political organization, observed diversification is considerably less, of the order of 12%.

Table 2: Normality Test (Student's t - Test) of Asset Variables

Explained Asset Variables	*Mean*	*Student's t*	*p*
Improvement in landed assets (IMPLAND)	0.32	7.76	0.0000***
Improvement in large and small ruminants (IMPANI)	0.42	9.68	0.0000***
Improvement in non-farm business (capital assets including building and equipment) (IMPNFARM)	0.80	23.04	0.0000***
Greater diversification in items of overall productive assets (PCIMPAST)	52.11	21.80	0.0000***
Greater diversification in items of household assets (PCIMPHHAST)	58.46	26.23	0.0000***
Greater diversification in items of savings /investment (PCIMPSAV)	28.57	18.60	0.0000***
Greater diversification in availing categories of Insurance (PCIMPINSUR)	39.28	13.51	0.0000***
Greater diversification in familiarity with important persons in the village (PCIMPFAM)	50.19	29.31	0.0000***
Greater diversification in social networking (membership in important village organizations (PCIMPNET)	12.69	7.65	0.0000***
n=126			

Note: * means significance at 10% level, ** means significance at 5% level *** means significance at 1 % level for a two-tailed test.
Source: Authors' calculations

Table 3: Paired t-test to examine the impact of age in SHG membership on ownership of Assets

Explained Asset Variables	*Age Groups*		
	Mean Newer Groups[2]	Mean Older Groups	p
1. Improvement in landed assets (IMPLAND)	0.06	0.36	0.0011***
2. Improvement in large and small ruminants (IMPANI)	0.20	0.45	0.0383**
3. Improvement in non-farm business (capital assets including building and equipment) (IMPNFARM)	0.60	0.83	0.0984*
4. Greater diversification in items of overall productive assets (PCIMPAST)	28.89	55.26	0.0003***
5. Greater diversification in items of household assets (PCIMPHHAST)	52.22	59.30	0.4038
6. Greater diversification in items of savings /investment (PCIMPSAV)	27.92	33.33	0.1539
7. Greater diversification in categories of insurance (PCIMPINSUR)	43.33	38.73	0.5406
8. Greater diversification in the status of familiarity with important persons in the village (PCIMPFAM)	41.66	51.35	0.0390**
9. Greater diversification in social in social networking (membership in important village organizations (PCIMPNET)	7.61	13.38	0.1717
n =126			

Note: * means significance at 10% level, ** means significance at 5% level and *** means significance at 1 % level for a two-tailed test.
Source: Authors' calculations

Paired t-test examines whether the age of membership has any explanatory power or not. We find out that percentage improvement in items of household assets (PCIMPHHAST), savings/investment (PCIMPSAV), percentage improvement in categories of insurance (PCIMPINSUR), and percentage improvement in social networking (PCIMPNET) are not significant. Age of membership apparently has no explanatory power for these variables.

Findings from the Study and Discussion

Findings on Improvement in Ownership of Landed,

Animal and Non-farm Assets

In this section, we attempt to explain the drivers of improvement in ownership of land, animal, and non-farm assets after joining SHG. Breusch- Pagan (BP) test is performed (table-4) to test the independence of errors in the three equations pertaining to improvement in landed, animal, and non-farm assets of households after joining SHG. Results of BP test indicate that errors are not correlated, so these three equations are independent. Therefore, we have estimated the Probit models to bring out the drivers for improvement in landed, animal, and non-farm assets of households after joining SHG.

[2] If age of SHG membership of household is up to 4 years, then it is a newer group, and if it is above 4 years, it is an older group.

Table 4: Paired t-test to examine the impact of age in SHG membership on ownership of Assets

	IMPLAND	*IMPANI*	*IMPNFARM*
IMPLAND	1.0000		
IMPANI	0.0887	1.0000	
IMPNFARM	- 0.0004	- 0.0937	1.0000
Breusch – Pagan test of independence: Chi2 (3) = 2.098, Pr =0.5524			

Source: Authors' calculations

Table 5: Probit Model to Explain Improvement in Landed Assets (IMPLAND)

Improvement in Landed Assets (IMPLAND)		
Parameter	***Estimate***	***Pr > Z***
Intercept	-0.77	0.212
Access to formal sector loans before joining SHG (FORB)	0.692	0.035**
SHG membership in years (INMEMYR)	0.796	0.044**
The amount outstanding as a percentage of the corpus (GROSCORP)	0.001	0.008***
Internal group loan per member per annum (GRILN)	.0001	0.000***
Percentage of students in family before joining SHG (PCSTUDB)	-0.012	0.046**
Percentage earning members before joining SHG (PCEARNB)	-0.024	0.003***
Rural/Urban (RU) (1-2) (Rural =1 ,Urban=2)	-1.383	0.005***
Minimum distance of SHG from Educational Institutions (in Km) (MINEDU)	-1.093	0.007***
Pseudo R Square = 0.2988		
Likelihood Ratio = 47.51 , Pr>Chi Sq = 0.0000		
Log likelihood = -55.734713		
n =126		

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 5 can be explained as follows. The regression coefficient of household's access to formal sector loans before joining SHG is positive and significant. It means households having access to formal sources of credit prior to joining SHG seem more likely to invest in landed assets. Such households seem to be in a better position to utilize land assets and also improve them. As SHG membership duration increases, land assets are found to be improving. SHG credit support in case of contingencies and other needs helps retain land assets. As the amount outstanding as a percentage of corpus increases, it creates a more conducive situation to improve land assets. It means the higher the availability of credit in households, the better the availability of resources for better farming and utilization of land assets. Groups where members have higher internal loans are more likely to invest in assets including land. Thus, access to formal sector credit, longer duration of SHG membership, outstanding loan amount as a percentage of the corpus, and internal loan facilities are complementary to landed assets improvement. The regression coefficient of the percentage of students in the family before joining SHG is negative and significant. It means households with more students seem less likely to invest in land assets, as if land and human assets are alternative channels of investment. Again, when the number of earning members in households is higher, such households seem to invest less in land assets. The reason seems to lie in the household's greater interest in investment in other income-generating activities (both present and future) by family members. SHGs located in rural rather than urban areas are more likely to invest in land assets. In rural areas, other avenues of income generation and small-scale entrepreneurial activities are less. Lack of suitable raw materials and training in other productive activities, difficulty in marketing outputs, and transportation of goods seem to discourage such activities. Thus, investment is largely made in landed assets.

Greater distance from educational institutions and thus greater difficulty in human capital investment seem to be encouraging investment in landed assets.

Table 6: Probit Model to Explain Improvement in Animal Assets (IMPANI)

Improvement in Animal Assets (IMPANI)		
Parameter	***Estimate***	***Pr > Z***
Intercept	-2.366	0.002***
Whether living in an extended family (EXNB) (0-1) (Extended 1, Nuclear 0)	0.712	0.054**
Percentage of students in family before joining SHG (PCSTUDB)	0.011	0.076*
Use of credit for agriculture and allied activities (AGRDUM)	1.261	0.004***
Whether lead, local, and promoting bank are the same (SAMEBANK)	0.901	0.075*
SHG membership in years (INMEMYR)	0.099	0.073*
Percentage irrigated land per net sown area in beneficiary village (PCIRRI)	0.024	0.000***
Minimum distance of SHG from financial institutions (in Kms) (MINFIN)	0.273	0.007***
Percentage of SHG members involved in labor activity (PCLABO)	-0.008	0.106
Age of SHPI in years (SHPIAGE)	-0.069	0.010**
Whether any standard operating procedures that the NGO follow in managing the SHGs? (SOP) (0 1)	-0.911	0.016**
Pseudo R Square = 0.4105		
Likelihood Ratio = 70.64, Pr>Chi Sq = 0.0000		
Log likelihood = -50.724651		
n=126		

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 6 can be explained as follows. Households having extended families are found to be investing more in animal assets. The availability of more people in households to share the work of animal rearing seems to explain this. In households with students, there is more likelihood of ownership of animals. Probably, the urge to provide animal protein to students in families helps explain this tendency. Households involved in agriculture are more likely to invest in acquiring animal assets especially to take advantage of the close complementarity between the two activities. When the lead bank, local bank, and promoting bank are the same, members are found to invest more in animal assets. Better coordination across these banks and synergized efforts by them to provide livelihood credit which includes training in animal rearing, medication, and animal husbandry facilities, sharing of knowledge on ways to improve animal products and selling opportunities, encourages this. Older SHGs are found to be more likely to invest in animal assets as they tend to appreciate the relative stability of this income-earning opportunity. Members having more irrigated land within the net sown area seem more likely to invest in animal assets. The complementary nature of agriculture and animal husbandry seems stronger for irrigated lands, thus reinforcing this relationship. More distance from financial institutions generally means a thinly populated area, characterized by reduced labour work opportunities, lesser scope for the supply of inputs for production, as well as lesser sales avenues discouraging investment in other income generation activities. Such a scenario tends to encourage investment in animal husbandry. Where a greater number of members are involved in labour activity, which keeps them engaged therein, there is less likelihood for SHG members to invest in animal assets. More time spent in labour work, at probably different locations leaves less time available for taking care of animals. The older the Self-Help Promoting Institution (SHPI), the members are less likely to invest in animal assets. This is because as SHPI matures and understands the regional and SHG dynamics, it can explore other avenues for productive work for SHGs and encourage them to take up diverse activities. Standard Operating Procedures (SOP) bring a certain kind of discipline to the activities of SHGs. SOPs ensure that the group is given regular training on finance-related issues, knowledge of banking and borrowing,

training in income generation, and management of SHG accounts in standard formats. All these ensure that group members take up credit for income generation activities and diversify in non-farm business. The financial discipline, repayment capabilities, and group cohesion as a result of better SHG management reduce the likelihood of investment in traditional and perceived to be a less skill-oriented activity of rearing animal assets.

Table 7: Probit Model to Explain Improvement in Non-Farm Assets (IMPNFARM)

Improvement in Non-Farm Assets (IMPNFARM)		
Parameter	***Estimate***	***Pr > Z***
Intercept	1.366	0.076
Percentage of caste other than SC-ST in the village by Census (PCGCASTCEN)	0.022	0.029**
The minimum distance of SHG village from the market (MINMARK) (in Km)	1.081	0.038**
Cumulative loan amount received per member per annum (INCUMLN)	-0.00003	0.014**
SHG membership in years (INMEMYR)	-0.028	0.552*
Net sown area per hectare in beneficiary village (in hectares) (PNSA)	-3.300	0.000***
Population density of village (POPDEN)	-0.033	0.002***
Pseudo R Square = 0.3095		
Likelihood Ratio = 37.98, Pr>Chi Sq = 0.0000		
Log likelihood = -42.360408		
n=126		

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 7 can be explained as follows. Improvement in non-farm assets seems to be more, when there are greater number of people belonging to the non-SC -ST category in the village. Comparatively higher exposure, networks, resources of skill development, and subsequent utilization of these in income generation by the members may be the reason. Higher distance of the SHG village from market facilities including the nearest town, retailers for agricultural input, regular market, haat, etc. seems to have a positive effect on improvement in non-farm assets. To procure essential goods and availing of these market facilities, vehicles may be a primary requirement. In the absence of competition, there is an opportunity in the village for products and services like small grocery, tailoring, etc. When the cumulative loan amount received per member per annum is higher, less improvement is found in non-farm assets. Higher cumulative loans availed may be indicative of significant investment by members in combined (group) income generation activities, and the possibility of handholding by Self Help Group Promoting Institution (SHPI). This may lead to lesser investment in owning individual capital assets, equipment, etc. Members associated with SHG for a longer duration are found to exhibit lesser improvement in non-farm assets. The longer duration of SHG membership perhaps provides several benefits to the household like BPL cards and other government welfare facilities and subsidies. There may be a lesser inclination for such households to overburden themselves with non-farm business activities. In villages where per household net sown area is more, lesser improvement is found in non-farm assets. More land with the household means that there is less need for non-farm business. SHGs in villages with higher population density are less likely to have an improvement in non-farm assets. As the market is near, non-farm products and services are available. If the markets were far, there would be opportunities for developing non-farm businesses.

Findings on Percentage Improvement (i.e. Diversification) in Several Tangible and Intangible Assets

This Section attempts to bring out the drivers for greater diversification in items of overall productive assets, greater diversification in items of household assets, greater diversification in items of savings and investment, greater diversification in categories of insurance, greater diversification in the status of familiarity with important persons in the village and greater diversification in social networking. Breusch- Pagan (BP) test is performed

(Table 8) to test the independence of errors in these six equations. Results of the BP test indicate that the residuals of these equations are correlated. So, Seemingly Unrelated Regression models (Table 9-14) are applied to explain percentage improvement (greater diversification) in items /categories of overall productive, household, savings and investment, insurance, familiarity and social networking assets.

Table 8: Correlation Matrix of Residuals

	PCIMPAST	PCIMPHHAST	PCIMPSAV	PCIMPINSUR	PCIMPFAM	PCIMPNET
PCIMPAST	1.0000					
PCIMPHHAST	0.0090	1.000				
PCIMPSAV	0.1693	0.3695	1.0000			
PCIMPINSUR	0.0657	0.1015	0.1150	1.0000		
PCIMPFAM	0.1667	0.2348	0.2568	0.2582	1.0000	
PCIMPNET	0.0291	0.2512	0.0472	0.2211	0.4055	1.0000
Breusch-Pagan test of independence: Chi2 (15) = 86.708, Pr = 0.0000***						

Source: Authors' calculations

Table 9: Greater Diversification in Items of Overall Productive Assets (PCIMPAST)

Greater Diversification in Items of Overall Productive Assets (PCIMPAST)			
Parameter	***Estimate***	***Pr > |z|***	***Z value***
Intercept	44.79	0.0000***	6.69
Caste and religion parameter (NCREL) (0-1) (1 = Hindu general, 0 = others)	11.67	0.021**	2.31
SHG membership in years (INMEMYR)	1.01	0.068*	1.82
Average distance from markets (AVNMARK)	1.92	0.000***	4.50
Population density of village (POPDEN)	-0.38	0.009***	-2.62
Percent net sown area per household in the beneficiary village (PNSA) (in Hectares)	-34.73	0.000***	-3.58
Pseudo R square 0.24			
Chi sq 39.88, p = 0.000***			
n=126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level, and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 9 can be explained as follows. In Hindu SHG households, greater diversification in items of overall productive assets like agricultural assets, large and small ruminants, and non-farm businesses are found. When SHG membership duration is longer, more diversification is observed in overall productive assets. Longer years of association and related benefits of income generation training, access to markets, networks, etc. mean that members invest in different categories of productive assets. SHGs at a greater distance from market facilities like haats, provision stores, input suppliers, etc. seem to have more diversification in overall productive assets. In the absence of market facilities, there is a need and opportunity to provide a variety of products and services as the competition and substitutes for the same are not easily available. Higher population density of the village is associated with lesser improvement in items of overall productive assets. More competition may be the reason for lesser diversification in productive assets. In villages with higher net sown area per household lesser diversification in overall productive assets is observed. Greater land availability for agriculture ensures concentrated efforts in agriculture and less investment in other productive assets.

Table 10: Greater Diversification in Items of Household Assets (PCIMPHHAST)

Grater Diversification in Items of Household Assets (PCIMPHHAST)			
Parameter	***Estimate***	***Pr > |z|***	***z value***
Intercept	63.41	0.0000***	14.03
Percentage students in family before joining SHG (PCSTUDB)	0.16	0.032**	2.14
Minimum distance of SHG from educational institutions (MINEDU)	3.34	0.296	1.05
SHG bank loan amount per member per annum (GRBLN)	-0.00	0.007**	-2.71
Average distance of SHG from the market (AVNMARK)	-0.94	0.006***	-2.77
Branch based or vertical-based support system (BVBASED) (0 -1) Branch=1, Vertical = 0	-10.73	0.021**	-2.32
Pseudo R square = 0.20			
Chi sq = 32.91, p = 0.000***			
n=126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 10 can be explained as follows. When more students in the family are there before joining SHG, there is more likelihood of diversification in items of household assets. With education and probably higher education over the years, these students might have joined the workforce, additional income thus motivates improvement in lifestyles and may lead to increased expenditure by SHG households in improving household assets. For those households located near educational institutions (if the distance from educational institutions decreases) there is increased improvement in items of household assets. This may be because if the distance is greater, it becomes costlier for parents to send their wards to school, thus affecting the quick employability of their children when they grow up, and possibly leading to a decline in additional monetary resources for acquiring and improving household assets. When the bank loan amount per member per annum is higher, there is less improvement in items of household assets. Higher bank loan per member indicates consistent investment in entrepreneurial activity, and possibly members foregoing less necessary household improvements and reinvesting in their income generation activity. When the bank branch is more involved, there is a lesser diversification. Branch involvement means minute monitoring in which they do not encourage household asset formation.

Table 11: Greater Diversification in Items of Saving and Investment (PCIMPSAV)

Greater Diversification in Items of Saving and Investment (PCIMPSAV)			
Parameter	***Estimate***	***Pr > |z|***	***z value***
Intercept	4.65	0.86*	0.39
Number of earning members in the family before joining SHG (EARNB) (0-5)	4.13	0.011**	2.55
Maximum education among females before joining SHG (EDUFB) (0-6) (0= nil, 1=can sign, 2= up to primary, 3= up to matric, 4= up to secondary, 5= up to graduate/diploma, 6= Beyond Graduation	1.17	0.184	1.33
Access to formal sector loans before joining SHG (FORB)	5.62	0.031**	2.16
Use of credit for agriculture and allied activities (AGRDUM)	7.48	0.038**	2.07
Whether lead, local, and promoting banks are same (SAMEBANK)	20.38	0.000***	5.93
Frequency of group bank loan per annum (GRFREQBLN)	8.64	0.003***	2.93
Bank branch distance from SHG place in the village (Kms) (DVILL)	-0.25	0.221	-1.22
Percentage of BPL in SHG (PCBPLO)	-0.17	0.000***	-5.25
Pseudo R square = 0.28			
Chi sq = 55.15 , p = 0.0000***			
n=126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 11 can be explained as follows. In SHG households with a greater number of earning members, a greater diversification is seen in items of savings and investment. Additional income tends to be saved and different earning members will have diverse access to, and interest in saving instruments, and types of investments. Better-educated females are more likely to be working for income generation activity rather than staying at home. Such women more actively avail saving opportunities and investment possibilities. Access to formal bank credit reflects financial discipline and financial literacy. Thus, these members avail more savings and investment options, possibly with assistance from formal financial institutions. Credit utilization for agriculture and allied activities implies working capital requirements for agriculture to be reasonably fulfilled by credit access. Thus, robust agricultural activities, yield sufficient additional income for savings and investment. This encourages availing more savings and investment options. When lead, local, and promoting banks are the same, there is a likelihood of higher diversification in items of saving and investment. With better coordination across the agencies, there seem to be more focused efforts on financial literacy, suggestions on suitable products for members, and guidance for better management of finances. Thus, familiarization with savings and investment products provided seems to encourage greater diversification in items of savings and investment. A higher frequency of group bank loans per annum may be indicative of consistent group involvement in income-generation activities with a reasonable profit. This encourages availing of diverse saving and investment propositions. With a higher distance of the bank branch from SHG village, there is lesser diversification in items of savings and investment. Distance restricts visits and interactions with banks, and households tend to avail fewer bank saving options. Awareness of types of available investment products and their access is also constrained by greater distance from bank branches. More people in SHG from the BPL category means members seem to have fewer additional resources, and a BPL card may provide the required basic living facilities, discouraging the exploration of options for income generation. Thus, they may not have additional inclination and resources to save or invest.

Table 12: Greater Diversification in Categories of Insurance (PCIMPINSUR)

Greater Diversification in Categories of Insurance (PCIMPISUR)			
Parameter	***Estimate***	***Pr > |z|***	***z value***
Intercept	-3.92	0.735	- 0.34
Maximum education among females before joining SHG (EDUFB) (0-6)	6.00	0.000***	3.76
Access to formal sector loans before joining SHG (FORB)	22.46	0.000***	4.66
Whether lead, local, and promoting banks are the same (SAMEBANK)	21.35	0.000***	3.52
Percentage of general class members in SHG (PCGENO)	0.27	0.000***	4.19
Cumulative internal loans per internal borrower (GRIL)	9.18	0.024**	2.26
Percentage irrigated land per net sown area in beneficiary village (PCIRRI)	0.13	0.062*	1.87
Frequency of loans taken by a member per annum (INFREQLN)	-5.28	0.070*	-1.81
SHG membership in years (INMEMYR)	-1.54	0.024**	-2.26
pseudo R square = 0.39			
Chi sq 83.29 , p = 0.0000***			
n=126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** mean significance at 1 % level for a one tailedtest .
Source: Authors' calculations

The estimated equation in Table 12 can be explained as follows. Higher-educated females tend to have a better understanding of the importance of insurance as well as the availability of categories of insurance. Thus, households with higher levels of female education exhibit greater diversification in availing categories of insurance. Access to formal sector loans before joining SHG is indicative of credit history and investment of credit in productive activities. This familiarity with formal financial institutions and productive activity possibly encourages the adoption of insurance categories like crop, cattle, etc. for risk mitigation. When the lead, local,

and promoting banks are the same for the member household, there seems to be better counselling on the importance of risk mitigation and the choice of formal options available. Well-coordinated inclusive finance efforts also encourage income generation/ productive activities, which necessitate the adoption of risk mitigation by availing more types of insurance. A higher number of general class members in SHG means more awareness, and active involvement in diverse productive activities. These members also are familiar with the importance of risk mitigation and available options for the same. It seems that as the member takes more loans per annum, insurance diversification increases. Perhaps unstable cash flows or consumption loans are the reasons for frequent loans. In the absence of consistent income from farm, animal, or non-farm-based activities there seems to be a less felt need for insurance. Older SHG membership is associated with less diversification in categories of insurance. Insurance is risk perception oriented. In a shorter time, risk perception is higher. As the members learn the tricks of the trade, they invest less in insurance because the group itself provides insurance.

Table 13: Greater Diversification in Status of Familiarity with Important Persons in Village (PCIMPFAM)

Greater Diversification in Status of Familiarity with Important Persons in Village (PCIMPFAM			
Parameter	***Estimate***	***Pr > |z|***	***Z value***
Intercept	90.89	0.000***	7.78
Maximum education among females before joining SHG (EDUFB) (0-6)	1.84	0.063*	1.86
Use of credit for agriculture and allied activities (AGRDUM)	5.89	0.118	1.56
SHG membership in years (INMEMYR)	1.33	0.001***	3.28
Percentage of general class members in SHG (PCGENO)	0.10	0.013**	2.48
Percentage of literates in the village from Census (2011) (PCLITCEN)	-0.68	0.000***	-4.47
Percent net sown area in the village (PCNSA)	-0.18	0.001***	-3.33
Percentage of SHG members involved in labour activity (PCLABO)	-0.10	0.012**	-2.51
Whether government-supported SHPI (SHPIGOV) (0-1)	-3.68	0.0265**	-1.11
Whether NGO promoted SHPI (0-1) (SHPINGO)	-6.05	0.147	-1.45
Pseudo R square = 0.25			
Chi sq 48.63 , p = 0.000***			
n=126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level, and those with *** mean significance at 1 % level for a one-tailed test.
Source: Authors' calculations

The estimated equation in Table 13 can be explained as follows. The higher education level of females before joining SHG is positively associated with greater diversification in the status of familiarity with important persons in the village. Educated females are more likely to opt for participation in income generation and community-related work outside the home, thereby having more interaction and familiarity. When a higher credit amount is deployed in agriculture and allied activities, there is possibly consistent involvement of male counterparts in the family in farm activities. Due to this, the women in the family may have more mobility and participation in activities at the village and community level, thus having more familiarity. SHG membership exposes members to government welfare facilities, NGO activities, healthcare awareness programs, etc. Households having longer SHG membership duration are thus more likely to be having higher diversity in familiarity. General class members tend to have greater mobility, networking, and, representation in community organizations and the village social ecosystem. Accordingly, these households have more familiarity. A higher number of literates in the village seems to have a negative impact on the diversification of familiarity. Literacy seems to serve as a substitute for familiarity. An alternate argument could be as follows. Literacy levels are high means people are more likely to join the service sector and seek urban job opportunities, thereby reducing familiarity within the village. More land utilization in agriculture in the village is associated with lesser diversification in familiarity. More agricultural land may serve

as a pseudo collateral, providing access to informal sector loans. Such households may have less interaction and familiarity with officials in the formal organizational setup of the village. When more SHG members are involved in labour activity, there is lesser diversification in familiarity as labour activity may leave lesser spare time and opportunities for increasing familiarity. When SHPI is supported by the Government or NGO, familiarity with government officials or NGO officials acts as a substitute for familiarity.

Table 14: Greater Diversification in Social Networking (membership in important village organizations) (PCIMPNET)

Greater Diversification in Social Networking (membership in important village organizations (PCIMPNET)			
Estimate	***Estimate***	***Pr > |z|***	***z value***
Intercept	20.22	0.000***	6.59
Percentage of general class members in SHG (PCGENO)	0.12	0.003***	3.01
Average distance of SHG from financial institutions (in Kms) (AVFIN)	0.35	0.006***	2.76
Frequency of loans taken by a member per annum (INFREQLN)	-6.06	0.000***	-3.97
Irrigated land per household in the beneficiary village (in hectares) (PIRRI)	-35.79	0.000***	-4.17
Pseudo R square = 0.23			
Chi sq 44.52 , p = 0.000***			
n = 126			

Note: Coefficients with * mean significance at 10% level, those with ** mean significance at 5% level and those with *** means significance at 1 % level for a one one-tailed test.
Source: Authors' calculations

The estimated equation in Table 14 can be explained as follows. A higher percentage of general class members in SHG is associated with higher networking as there is higher education, awareness, and community representation among these members. Distance from financial institution, is associated with greater diversification in networking. Increased distance of SHG from financial institution means areas with less organizational (NGO, Government, bank branch, lead bank, etc.) led handholding and social as well as vocational support. In the absence of these support systems, households actively participate in village organizations to access necessary support and facilities. A higher frequency of loans taken by a member per annum is associated with lesser diversification in networking. More number of loans per annum seems to be an indicator of instability in income from vocational activities and possible consumption loans. Such members may be less involved in networking. More irrigated land per household means higher involvement in agriculture. Agricultural land possibly serves as pseudo collateral for facilities from informal organizations. This may give less time and intent for diversification in networking.

Conclusion

SHG membership has brought about significant changes in the lives of women in rural areas. While the literature has not very much addressed the impact of SHG on various asset formation, this paper has tried to fill in that gap by examining the empowerment of women in terms of improvement in asset ownership. The paper looks at the improvement in asset ownership in terms of tangible, financial, and intangible dimensions. All kinds of individual asset types have improved significantly. In this context we have also studied the major drivers of improvement in these assets. The major drivers of changes in physical assets are access to formal sector loans before joining SHG, duration of SHG membership, access to SHG credit and internal loans, higher group loans, use of loans for agriculture and allied activity, the same bank acting as lead, local and promoting bank for the household, female education levels, the number of earning members and students in the household, the distance of SHG village from market facilities, and availability of agricultural land. The major drivers of changes in Financial assets are the number of earning members in the family, female education levels, access to formal

sector loans before joining SHG, in addition to the use of credit for agriculture and allied activities, the same bank acting as lead, local and promoting bank, frequency of group bank loans, cumulative internal loans, and land available for agriculture. The major drivers of changes in intangible assets are female education before joining SHG, credit utilization for agriculture and allied activities, duration of SHG membership, distance of SHG from financial institutions, and general class members' percentage in SHG. With the limited-sized data collected, an attempt has been made to probe into the very important aspect of women's empowerment and development which is tangible, financial, and intangible asset improvement. Studies with a larger data set can be useful for getting more insights into this aspect.

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Appendix

Table 15: Summary Statistics of Possible Explanatory and Exogenous Variables

Variables	*Mean*	*Std Dev*
a. Demographic Characteristics		
Caste and religion parameter (NCREL) (0 -1)[3]	0.23	0.42
Whether living in an extended family (EXNB) (0 -1)[4]	0.18	0.38
Maximum education among females (EDUFB) (0-6)[5]	2.63	1.47
Percentage of students in family before joining SHG (PCSTUDB) (0 -100)	33.03	23.45
Number of earning members before joining SHG (EARNB) (0- 5)	1.75	0.755
Percentage of earning members before joining SHG (PCEARNB) (0 -100)	39.70	20.30
b. Access to Formal Credit Sources and Credit Utilization Variables		
Access to formal sector loans before joining SHG (FORB)[6] (0 -1)	0.37	0.48
Use of credit for agriculture and allied activities (AGRDUM) (0 1)	0.16	0.37
Use of credit for shop, business, trade related activities (TRDDUM) (0 1)	0.4	0.49
c. SHG Characteristics		
Percentage of general class members in SHG (PCGENO) (0 100)	20.37	35.05
Whether lead, local, and promoting banks are the same (SAMEBANK) (0 1)	0.74	0.44
Percentage of SHG members involved in labour activity (PCLABO) (0 100)	32.86	36.2
Percent of Below Poverty Line (BPL) members in relevant SHG (PCBPLO) (0 100)	53.22	43.52
SHG membership in years (INMEMYR)[7] (0.25 22)	8.49	3.77

[3] Hindu General =1, Other =0

[4] Extended =1, Nuclear =0

[5] 0=nil, can sign =1, up to primary =2, up to matriculation=3, up to secondary=4, up to graduate/diploma =5 , Beyond graduation=6

[6] Formal sources of credit refer to Scheduled Government Commercial Bank, Private Sector Bank, Regional , Rural Bank, Cooperatives, Primary Agricultural Credit Societies (PACS0, Land Development Banks and multipurpose cooperative societies (yes=1, No=0)

[7] SHG membership in years (since joining SHG up to March 2015)

Minimum distance of SHG from educational institutions (MINEDU)[8] (0 2) (in km)	0.31	0.59
Minimum distance of SHG from the market (MINMARK)[9] (0 2) (in km)	0.33	0.56
Average distance of SHG from the market[10] (AVMARK) (0 28.25)	6.10	5.51
Average distance of SHG from Financial Institutions (AVFIN)[11] (0 43.75) (in km)	7.48	10.93
Whether Government supported Self Help Promoting Institution (SHPIGOV) (0 -1)	0.38	0.48
Age of Self-Help Promoting Institution in years (SHPIAGE) (3 -36)	12.06	6.99
Whether Non-Governmental Organization promoted SHPI (SHPINGO) (0 1)	0.19	0.39
Whether NGO follows any Standard Operating Procedures in managing the SHGs (SOP) (0 1)	0.48	0.50
Branch or Vertical based SHG support system (BVBASED) (0 1)[12]	0.28	0.45
a. Features of Credit Availed by SHG		
SHG corpus per member per annum (GRCORP) [13] (1.47 90.41) (in USD.)	17.11	17.16
Amount outstanding as a percentage of corpus (GROSCORP)[14] (0 19.20) (in USD)	2.92	3.38
Internal group loan per member per annum (GRILN) (0 407.78) (in USD.)	77.04	86.59
Cumulative internal loan per internal borrower (GRIL)	1.100	0.60478
Frequency of loans taken by a member per annum (INFREQLN)[14] (0.11 8)	1.01	0.93

[8] Distance of SHG village from nearest educational facilities (0 if located inside village)

[9] Minimum distance of SHG village from market facilities like nearest town, agriculture input retailer, farm machinery provider, Agricultural Produce Market Committee (APMC) sub yard, regular market, village haat, fair price shop and provision store (o distance if located inside village)

[10] Average distance of SHG village from market facilities like nearest town, agriculture input retailer, farm machinery provider, Agricultural Produce Market Committee (APMC) sub yard, regular market, village haat, fair price shop and provision store (o distance if located inside village)

[11] Average distance of SHG from financial Institutions like commercial bank branch regional rural bank branch, cooperative bank branch and Non-Banking Finance Company (NBFC) branch (0 distance if located inside village)

[12] Branch =1, Vertical =0

[13] GRCORP = Cumulative corpus/(SHG age in years *members per SHG)

[14] GROSCORP = Amount outstanding/cumulative corpus (savings +grants+donation+voluntary savings)*100

[14] INFREQLN = cumulative number of loans taken/SHG membership age in years

Cumulative loan amount received per member per annum (INCUMLN)[15] (24.31 2939.05) (in USD)	201.61	300.15
SHG bank loan per member per annum (GRBLN)[16] (11.96 1810.67) (in USD)	135.64	270.38
Frequency of group bank loan per annum (GRFREQBLN)[17] (0.13 2.4)	0.65	0.44
e. **SHG Household's Village Characteristics**		
Population density in village (POPDEN)[18] (2.16 83,.37)	12.06	15.76
Percentage of a caste other than SC-ST in village by the census (PCGCASTCEN) (26.06 100)	76.08	22.59
Rural/Urban (RU) (1 2) Rural =1, Urban =2	1.14	0.35
Bank branch distance from village (DVILL) (0 30) (in Km)	4.51	6.69
Percentage of literates in the village from census year 2011 (PCLITCEN) (40.84 100)	67.9	9.67
Minimum distance of SHG from Financial Institution (MINFIN)[19] (0 10) (in Kms)	1.07	2.23
Net sown area per hectare in beneficiary village (PNSA) (0 1.19) (in Hectares)	0.31	0.26
Percent net sown area in the beneficiary village (PCNSA) (0 100)	41.57	28.33
Irrigated land per household in the beneficiary village (PIRRI) (0 0.72)[20] (in Hectares)	0.18	0.16
Percentage irrigated land per net sown area in beneficiary village (PCIRRI)[21] (0 100)	46.15	34.89
N = 126		

Source: Authors' calculations

[15] INCUMLN = cumulative loan availed/SHG membership in years
[16] GRBLN = Total cumulative bank loan taken by the group/(SHG age in years*members per SHG)
[17] GRFREQBLN= Number of Bank loans/SHG age in years
[18] POPDEN = Total population of village/Geographical Area
[19] MINFIN = Minimum distance of SHG from commercial bank branch, regional rural bank branch, cooperative bank branch and nbfc branch
[20] PIRRI = Area irrigated in village(in Hectares)/Number of households in village
[21] PCIRRI = 100* Area irrigated in village Hectares/Net sown area in Hectares

CRYPTOCURRENCY, AND CONSUMERS: AN EXPLORATION OF BELIEFS AND EXPECTATIONS

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Abstract

This study examines the state of cryptocurrency in India from multiple angles, including the perspective of the government, the judiciary, common people, and media. Cryptocurrencies are decentralized digital assets that use cryptographic techniques for security, have experienced considerable growth globally. Yet, their volatility and high-risk nature make them a contentious investment avenue. Regulatory stances vary significantly across nations, with countries like the US and Japan favoring regulation and acceptance, while others like India and Brazil lean towards restriction.

The research conducts an extensive quantitative survey to understand consumer behavior towards cryptocurrency investment, revealing valuable insights into the reasons and demographics of various investor categories and their risk tolerance.

The analysis indicates that while interest in cryptocurrency is growing in India, especially among the tech-savvy youth, challenges such as regulatory uncertainties, a lack of public understanding, and high-risk volatility persist. Despite the existing challenges, effective marketing communication and further investments in crypto education and awareness can contribute to a more robust cryptocurrency ecosystem in India.

Keywords: *Cryptocurrency,, India, Consumer behavior, Investment risk, Crypto education, consumer beliefs*

JEL Classification: E42 - Monetary Systems, G11 - Portfolio Choice, G18 - Government Policy and Regulation, O33 - Technological Change, D83 - Search

Introduction

Cryptocurrency, is a digital asset that operates on a decentralized and distributed basis across multiple computer networks (Nakamoto, 2008). Despite some viewing it as a potential replacement for traditional currency, it is primarily a digitally secured currency through cryptographic techniques (Böhme et al., 2015). Unlike traditional financial systems, cryptocurrencies operate without a centralized authority like banks or governments and instead utilize peer-to-peer (P2P) networks made possible by blockchain technology (Narayanan et al., 2016)

According to a report by coinmarketcap.com on February 11, 2023, there are currently over 22,500 cryptocurrencies and 546 Crypto-Exchanges with a market capitalization of $1.08 trillion (Coinmarketcap, 2023). Despite the notable expansion attracting numerous investors, the volatile nature of these investments often leads to illiquidity and represents a high-risk, high-reward investment scenario (Bouri et al, 2018).

Following the COVID-19 pandemic, the global cryptocurrency market gained significant traction in 2021 with Bitcoin and Ethereum largely leading the market. The market's peak was recorded at $2.9 trillion in November 2021, but a significant downturn afterward resulted in a lot of investors losing their investments within the following thirteen months (CNBC, 2022).

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Regulations and legalizations surrounding cryptocurrency vary across countries due to factors such as extreme price volatility, potential for money laundering, and threat to central currencies (Hileman & Rauchs, 2017). While some countries like the US, Canada, and Japan favor regulation and acceptance, others like India and Brazil maintain a more restrictive approach. This regulatory disparity creates uncertainty and weakens investor confidence, with many viewing cryptocurrencies as high-return investments rather than a payment currency (Tapscott & Tapscott, 2016).

Literature in the Field:

The intersection of consumer beliefs, traits, and expectations and the cryptocurrency market form a potent arena of research, particularly given the rise and growing global acceptance of digital assets. As the novel blend of technology, finance, and social dynamics, cryptocurrency offers a unique environment to probe the interplay of these elements. Studying consumer beliefs, traits, and expectations is fundamental to understanding and forecasting market trends. It deciphers consumer behavior, or identifies market segments, and aids in designing strategic marketing and communication initiatives.

Importance of Exploring Consumer Beliefs and Expectations.

Understanding consumer behavior, which encompasses their beliefs, traits, and expectations, is fundamental for effective marketing strategies and customer satisfaction (Solomon, 2014). It offers insights into consumer decision-making processes, providing valuable inputs for brand positioning, advertising, and product development (Kotler et al., 2018).

Consumer Beliefs

Consumer beliefs significantly influence their perception of products, services, and brands. Fishbein and Ajzen's (1975) Theory of Reasoned Action posits that consumer beliefs affect their attitudes towards behaviors, subsequently impacting their behavioral intentions and actions. This theory has been widely applied in marketing research to understand consumer buying behavior (Sheppard et al. 1988). A more recent study by Qiao et al. (2022) reiterated this by highlighting the importance of aligning product attributes with consumer beliefs to enhance brand image and loyalty.

Consumer Expectations

Consumer expectations play a vital role in their post-purchase evaluation and satisfaction (Oliver, 1980). Zeithaml et al.'s (1993) research demonstrated that discrepancies between consumer expectations and perceived performance affect their satisfaction and loyalty. More recent research by Kaura et al. (2015) further supported this, showing that meeting or exceeding consumer expectations directly influence customer satisfaction and loyalty.

Cryptocurrency Market Studies

Cryptocurrency, an innovative financial technology, has attracted considerable interest in both academic and practical fields. Market sentiment, which can significantly influence trading and pricing in traditional financial markets, has been studied extensively in the context of cryptocurrency.

Crypto Market Sentiment

Market sentiment analysis in cryptocurrency primarily involves the analysis of online discussions, social media posts, and news articles. Studies have found a significant correlation between social media activity, especially on platforms like Twitter and Reddit, and cryptocurrency prices (Kim, et al., 2020). Similarly, news sentiment has also been identified as a strong influence of cryptocurrency prices (Dung, et al., 2019).

Impact of Investor Sentiment

Investor sentiment, as a subset of market sentiment, has shown a profound influence on cryptocurrency

markets. A study by Feng et al. (2018) indicates that investor sentiment can predict future returns on Bitcoin. Additionally, investor sentiment was found to have a direct effect on the volatility of cryptocurrency prices (Bouri, et al., 2018). However, investor sentiment on social media websites is not the correct proxy for gauging cryptocurrency prices (Sakunia and Parida, 2023).

Cryptocurrency, markets, particularly Bitcoin, have been subject to speculative bubbles. Cheah and Fry (2015) argued that these bubbles were driven by a diffuse sense of enthusiasm and overly optimistic sentiments. Market sentiment has also been connected to the 'fear of missing out' (FOMO) effect in cryptocurrency investments (Delfabbro, et al., 2021).

User Acceptance

Study by Sakunia and Parida (2024) suggests that mitigating risks and promoting responsible trading practices in India's upcoming cryptocurrency markets by implementing strategies centered around social influence, convenience, compatibility, and learning and training would lead to greater user acceptance of cryptocurrencies. Specifically, this involves engaging influential individuals to foster adoption, enhancing user convenience, ensuring compatibility with existing financial systems, and providing adequate education and training to promote responsible and informed use of the technology.

Cryptocurrency in India

The journey of virtual currency in India began as far back as 2012, with the earliest adopters conducting modest Bitcoin transactions (Gupta, 2017). By 2021, businesses such as Kolonial restaurant in Mumbai and Ardor restaurant in Delhi started accepting cryptocurrency payments (Patni, 2021). Pioneering crypto exchanges and trading services in India included B TC XIndia, Unocoin, Coinsecure, with the likes of Zebpay, Koinex, and Bitcoin-India soon joining the race. This led to the Reserve Bank of India (RBI) issuing its first cautionary statement on cryptocurrencies, highlighting potential risks and security vulnerabilities (Reserve Bank of India, 2017).

Government of India

In 2016, the Indian government's demonetization move, which effectively made around 86% of the country's paper currency obsolete, inadvertently stimulated digital transactions and encouraged more cryptocurrency investments (Kumar, 2017). This development raised concerns, leading the R BI to release a circular in 2017 outlining apprehensions about virtual coins. In March 2018, the Central Board of Digital Tax (C BD T) proposed a plan to the finance ministry to outlaw cryptocurrencies (Central Board of Direct Taxes, 2018). In response, the RBI prohibited banks, N BF Cs, and payment system providers from engaging with virtual currencies or offering services to cryptocurrency exchanges.

By January 2021, the Indian government introduced a bill to establish a sovereign digital currency (The Lok Sabha, 2021). By November 2021, a decision was made not to ban cryptocurrencies but to regulate them in India (Press Information Bureau, 2021). A 30% tax on cryptocurrency gains was introduced in 2022 by Finance Minister Nirmala Sitharaman (Ministry of Finance, 2022). As the chair of G20 nations in 2023, India has been advocating for an urgent regulatory framework for crypto assets. The Indian Finance Ministry recently brought virtual digital assets under the scope of the Prevention of Money Laundering Act (P MLA) (The Lok Sabha, 2023).

Judiciary

In 2020, the Supreme Court of India lifted the ban on cryptocurrency trading imposed by the R BI, arguing that banning cryptocurrency would deprive people of their legal right to trade. Despite this ruling, the R BI has maintained its stance. Cryptocurrency, exchanges were instructed to adhere to Know Your Client (KYC), Anti-Money Laundering (AML), Combating of Financing of Terrorism (CFT), and Foreign Exchange Management

Act (FEMA) laws, and it was declared that cryptocurrency was not legal tender (Supreme Court of India, 2020).

Common People

The introduction of the Cryptocurrency, & Regulation of Official Digital Currency Bill, 2021, which aims to foster an environment conducive to the creation of a digital currency issued by the R BI, has generated mixed reactions among Indian investors. The 2022 Union Budget brought a glimmer of hope with the proposed 30% tax on crypto gains and 1% T DS. However, the suspension of rupee deposits on platforms like Coin Switch Kuber, Wazir X, and Coin DC X through Unified Payments Interface (U PI) created further uncertainty among investors (The Economic Times, 2022).

Media

Celebrity-endorsed advertising during IPL 2022 boosted interest in the cryptocurrency market. The Indian government, in response to the significant trading volumes, introduced advertising regulations for virtual digital assets (The Times of India, 2022). The Advertising Standards Council of India (ASCI) issued guidelines in February 2022 for advertising virtual assets like cryptocurrencies and non-fungible tokens (NFTs). The guidelines are meant to curb "irresponsible" advertising of cryptocurrencies by social media influencers and celebrities (Advertising Standards Council of India, 2022).

This research intends to examine India's stance on cryptocurrency with a focus on the Reserve Bank of India's (RBI) position and the advertising communication from crypto exchanges in India. An in-depth study on investor attitudes towards investing or not investing in cryptocurrencies in India will be conducted through a qualitative survey and structured interviews.

Research Gap:

Major research gaps are because of the emerging nature of the field, the decentralization of most platforms, and the complexity of consumer behavior within this domain. A brief description on these gaps is mentioned below:

- **Rapid Evolution:** Cryptocurrency, as a field, is rapidly evolving. New coins, platforms, and technologies are being introduced at a fast pace, which makes it difficult for researchers to keep up and thoroughly study each aspect. Thus, our understanding of consumer behavior, their beliefs, traits, and expectations, within the cryptocurrency market is still limited and fragmented.
- **Decentralized Platforms:** Most cryptocurrency platforms are decentralized, which makes data collection and analysis a challenging task. Unlike traditional financial systems, which are centrally regulated and easier to study, the inherent decentralization of cryptocurrencies poses significant barriers to researchers.
- **Complex Consumer Behavior:** Cryptocurrency, consumers comprise a diverse range of individuals with varying levels of knowledge, risk tolerance, and investment goals. Understanding this complexity and diversity presents a challenge that hasn't been sufficiently tackled yet.

These gaps point to a significant need for comprehensive and multi-dimensional research to better understand consumer behavior in the cryptocurrency market. Most research done so far lack coherence and studies around user sentiments and beliefs in Indian context for Cryptocurrencies is missing.

Methodology:

A substantial research study was performed using an extensive survey designed to understand consumer behavior. The research was split into two phases and aimed to understand consumer behavior around cryptocurrency and high-risk investments in India.

Phase I focused on cryptocurrency investment decisions. The survey began by collecting demographic information of the respondents, such as gender, age, and annual income. Respondents were then asked whether they had invested in cryptocurrencies before and whether they planned to in the future.

The survey then moved on to explore the factors that contributed to the respondents' investment decisions and the platforms they used for gathering information and educating themselves about cryptocurrencies. For those who had not invested or did not plan to invest in cryptocurrency, the survey examined the reasons for non-acceptance and potential factors that could lead to future acceptance. The survey concluded with questions about alternative investment options.

Phase II delved into high-risk investments. After collecting similar demographic information, respondents were asked to rate various investment options (including cryptocurrency, gold and silver, stock market, etc.) based on their risk appetite. Lastly, they were asked to rank various factors such as technical knowledge, government support, and tax reduction, etc., that might have increased investor confidence towards crypto investments.

Findings from the Study and Discussion

Table 1: Investment Wise Risk Profiling

	Cryptocurrency	Gold & Silver	Stock Market	Real Estate	Startup Investment	Bonds	NFTs	Mutual Funds
Risk Profile	2.49	1.08	2.29	1.73	2.45	1.34	2.22	1.64
STDEV	0.70	0.63	0.65	0.75	0.73	0.65	0.83	0.72
Variance	0.49	0.40	0.43	0.56	0.53	0.43	0.69	0.52

Source: Author's Own Work

Table 2: Gender Wise Risk Profiling

Gender Wise Risk Profiling			
Investment Type	**Male**	**Female**	**Prefer Not to Share**
Bonds	1.34	1.57	1
Cryptocurrency	2.50	2.61	2.5
Currency Investment	2.16	1.74	2.5
Gold and Silver	1.34	1.3	1
Invoice Discounting	2.14	2.04	2.5
Mutual Funds	1.5	1.52	1
NFTs	2.43	2.04	2.5
NPS, PPF and FDs	1.3	1.3	1
P2P Lending	2.32	2.22	2.5
Penny Stock	2.5	1.96	2.5
Real Estate	1.8	1.57	1
Startup Investment	2.66	2.39	2
Stock Market	2.27	2.35	2

Source: Author's Own Work

Table 3: Investment Wise Risk Profile and Standard Deviation

Investment Type	Risk Profile	STDEV
Cryptocurrency	2.74	0.31
Startup Investment	2.55	0.43
Real Estate in Metaverse	2.54	0.46
Penny Stock	2.32	0.43
NFTs	2.29	0.59
P2P Lending	2.29	0.44
Stock Market	2.29	0.27
Invoice Discounting	2.12	0.31
Currency Investment	2.03	0.44
Physical Collectibles	1.91	0.49
Real Estate	1.70	0.51
Mutual Funds	1.64	0.41
Bonds	1.41	0.36
Gold & Silver	1.32	0.28
NPS, FDs and PPF	1.29	0.30

Source: Author's Own Work

Table 4: Parameters for Investment Decisions

Parameter	1st Rank	2nd Rank	3rd Rank	4th Rank	5th Rank	6th Rank	Total
Family/ Friends Acceptance	3	1	3	8	12	42	69
Government's Support	13	16	13	15	6	6	69
Legal Payment System	17	15	19	11	1	6	69
Price Stability	7	9	15	11	22	5	69
Tax Reduction	11	9	9	13	20	7	69
Technical Knowledge	18	19	10	11	8	3	69

Source: Author's Own Work

Table 5: Weighted Order Calculations of the Parameters for Investment Decision

Order	Weighted Order Calculation	
1	Technical Knowledge	2.72463768
2	Legal Payment System	2.73913043
3	Government's Support	3.04347826
4	Tax Reduction	3.62318841
5	Price Stability	3.68115942
6	Family/ Friends Acceptance	5.1884058

Source: Author's Own Work

Table 6: Income Wise Risk Profiling

Income Wise Risk Profiling (In INR)									
Investment Type (In INR)	**Up to 3 Lacs**	**3 - 6 Lacs**	**6 - 9 Lacs**	**9 - 12 Lacs**	**12-15 Lacs**	**15 - 20 Lacs**	**20 - 30 Lacs**	**30 - 50 Lacs**	**Above 50 Lacs**
Cryptocurrency	2.78	2.25	2.71	3.00	3.00	2.50	2.63	3.00	2.75
Startup Investment	2.52	2.75	2.86	2.67	2.83	2.80	2.63	1.50	1.75
NFTs	2.43	1.75	2.71	2.33	2.67	2.60	1.88	1.50	1.50
Stock Market	2.22	2.00	2.57	2.67	2.50	2.30	2.13	2.25	2.25
P2P Lending	2.35	2.50	2.14	2.67	2.17	2.50	2.38	1.75	1.75
Penny Stock	2.26	1.75	2.29	1.67	2.83	2.50	2.38	2.00	2.75
Currency Investment	2.00	1.75	2.00	2.33	2.00	2.00	1.88	2.00	2.50
Invoice Discounting	2.22	1.75	2.00	2.33	1.83	2.10	2.00	2.25	2.50
Real Estate	1.83	2.25	1.86	1.33	2.00	1.50	1.38	1.25	1.50
Mutual Funds	1.65	1.75	1.71	2.33	1.83	1.60	1.38	1.25	1.50
Bonds	1.43	1.50	2.14	1.00	1.17	1.40	1.25	1.00	1.25
Gold and Silver	1.52	1.50	1.14	1.33	1.17	1.30	1.13	1.00	1.25
NPS, PPF & FDs	1.39	1.25	1.43	1.33	1.00	1.30	1.13	1.00	1.50

Source: Author's Own Work

Conclusion

Cryptocurrency was found to be the riskiest investment, while government bonds and precious metals like gold & silver were perceived as the safest. This perception varied by gender and income level. Males and those earning 20-30 Lacs saw cryptocurrency as riskier compared to females and those in other income brackets.

Cryptocurrency, is experiencing dynamic shifts in India, as outlined below. There's burgeoning enthusiasm towards this digital asset, especially among the younger, tech-savvy demographic in the country. This group is open to embracing innovative financial advancements, and the current buzz around cryptocurrency only serves to heighten their eagerness for ownership. One cannot overlook the significant number of unbanked individuals in India; they stand to achieve financial inclusivity via cryptocurrencies. As educational efforts expand, a sector of highly educated investors in India is displaying a growing inclination towards high-risk investments. Additionally, the potential of blockchain, the backbone of cryptocurrency, stretches beyond mere investment; it can address challenges in diverse sectors like supply chain management, healthcare, and land registration.

However, there are evident weaknesses tempering this potential. The Indian cryptocurrency landscape is marred by regulatory uncertainties, often compounded by contradicting governmental statements. The dearth of clear guidelines for exchanges and investors poses a considerable challenge. Moreover, the acceptance of cryptocurrency remains limited, with a vast number of merchants and businesses still skeptical about its reliability as a payment method. Concerns regarding the illicit usage of cryptocurrencies, such as for money laundering or terrorism financing, further cast a shadow on its prospects.

But India isn't without opportunities in this domain. The nation boasts a vast reservoir of talented programmers, and given the government's supportive stance towards tech companies, India could emerge as a pivotal hub for blockchain-centric innovations. The burgeoning sector of Decentralized Finance (De Fi) introduces new avenues, potentially revolutionizing lending, borrowing, and a plethora of other financial services. Furthermore, should the Indian government decide to cooperate with key cryptocurrency stakeholders, a well-rounded regulatory framework could be established, one that strikes a balance between innovation and consumer safeguarding.

Nevertheless, threats loom on the horizon. Increasing regulatory actions, especially if cryptocurrencies are perceived as conduits for criminal endeavors or destabilizers of financial ecosystems, might arise. The inherently

volatile nature of cryptocurrency investments could repel risk-averse investors. Furthermore, the entrenched competition from other digital payment modalities, notably the omnipresent mobile wallets in India, might impede the widespread adoption of cryptocurrency.

Cryptocurrency, marketing in India faces significant challenges due to a lack of regulatory clarity and limited technical knowledge among the populace. Government restrictions on cryptocurrency usage and advertising make it difficult to reach potential customers.

In addition to these hurdles, there is a lack of public understanding about cryptocurrencies. Many people are either unaware or lack comprehensive knowledge of cryptocurrencies, making it challenging to design persuasive advertising campaigns.

The volatile nature of cryptocurrencies also poses a problem. The association of cryptocurrencies with high-profile scams adds to the difficulty in promoting them as a trustworthy investment option.

To address these issues, the government should clarify regulations on advertising cryptocurrency-related products and services. This will help marketers in crafting effective campaigns. Further investments in crypto education and awareness will help individuals understand the risks and benefits of cryptocurrencies, leading to a more informed and proactive investor community.

Despite these challenges, effective marketing communication can contribute to the growth of a robust cryptocurrency ecosystem in India. With the right strategies, advertisements can educate and convince consumers to invest in cryptocurrencies while highlighting potential risks and rewards. As a result, the investor community will be more knowledgeable, active, and ready to make investment decisions.

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