Demonetization as a Trigger of Customer Adoption of Mobile Wallets in India: Developing an Integrated Framework

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ABSTRACT

On November 8, 2016, the Government of India took a rather intrepid decision to cease all old Rs. 500 and Rs.1000 Indian banknotes from being considered as legal currency, effectuated from the subsequent day (i.e. November 9, 2016). A preliminary evaluation of the trend in various consumer segments has revealed that the demonetisation drive has indeed triggered an upswing in digital transactions, especially in the ensuing months. The current undertaking is thus, an endeavour to examine the major factors that influence the decision of Indian consumers to adopt mobile wallets.

The study reveals that certasin factors significantly influence the behavioural intention of respondents towards the use of mobile wallets. Further, the impact of the 'trialability' dimension in the context of the 'perceived usefulness' of the m-wallet is validated in the study. It is established that 'subjective norm' and awareness have a positive correlation with the 'perceived ease of use' of mobile wallets by respondents. The adoption of mobile wallets in India offers valuable insights to major industry players and policy makers who seek to build consumer demand, resulting in the augmented usage of mobile wallets.

Keywords: Mobile Wallets; Technology Acceptance Model (TAM); Innovations Diffusion Theory (IDT); Demonetization

INTRODUCTORY STATEMENTS

With the expansion and commercial use of mobile wallets exhibiting immense promise over the last decade, an array of diverse industries ranging from transportation to telecommunications have adopted to such payment mechanisms (Traoré, and Everaere, 2012; Kanyaru and Kyalo, 2015; Yang, 2017). The initial demand for e-wallets began in India in the late 2000s, with the growing popularity of smartphones and advances in mobile internet technology (Tyagi, 2017). The volume of smartphone consumers rocketed from 48 crores in June 2012 to 68.4 crores in July 2016 with a CAGR of 9 percent. The number of users subscribing to internet services had a similar growth trajectory as it exhibited a growth from 13.7 crore active users in June 2012 to 46.2 crore users in July 2016 with a CAGR of 36 percent. The number of mobile internet users had also rocketed from 4.8 crores in June 2012 to 37.1 crores in July 2016 with a CAGR of 67 percent. The segment of users subscribing to mobile internet services, which was only 10 percent of total smartphone users in 2012, had significantly multiplied to 54 percent in 2016 (Jain, 2016).

A mobile wallet is typically a virtual wallet, which can be managed using a simple application on a smartphone. Users of such wallets can preload up

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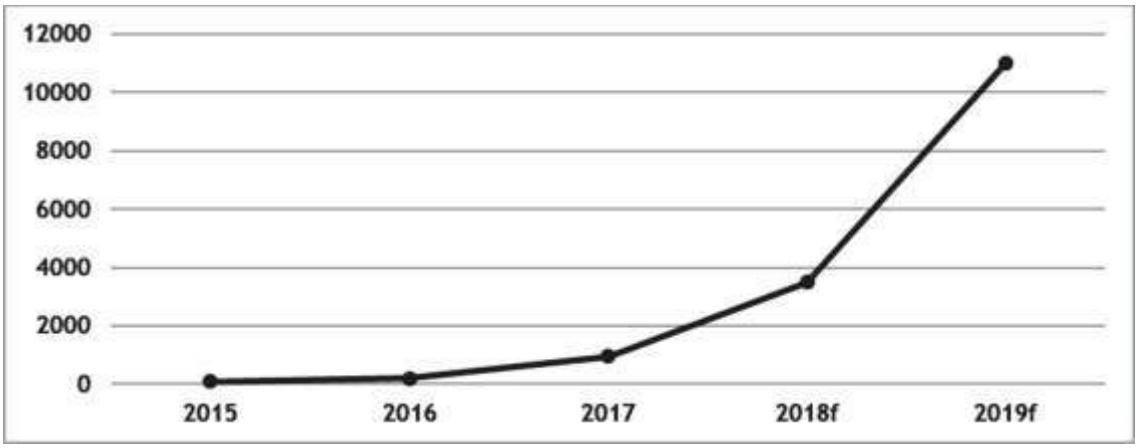

Figure 1: Total mobile wallet transactions in India (Source: Reserve Bank of India)

to a specified amount of money on their m-wallets by using debit cards, credit cards, internet banking or Bharat Interface for Money (BHIM-UPI). Such preloaded amounts can be expended at various merchants, mostly online-based. However, in the wake of the 'demonetization' drive in India, the scope of m-wallets have been expanded to include offline traders as well, who are listed with the mobile service provider. Some of the noted m-wallet service providers in India include Paytm, Freecharge and Mobikwik, among a host of others.

The Reserve Bank of India, in their study, testifies the massive upsurge in the adoption as well as consumption of mobile wallets as a favoured means of payment (Exhibit 1).

The above data exhibits a massive growth in the volume of transactions carried out via mobile wallets in India since 2012. According to a recent article published by The Economic Times (2017), GlobalData, a prominent data and analytics company, observed that the total transactions ensuing from mobile wallets in India would touch Rs. 800bn in 2017, which is essentially an escalation of 113 percent over the preceding year. The forecasted figures (represented by 'f' in Exhibit 1) for the transaction value of m-wallets in 2019 is pegged at Rs. 11,000bn and is expected to touch a massive Rs. 275,000bn by 2022.

As of February 2017, 40 percent of the smartphone users in India happen to use Paytm and currently, there exists over 40 active m-wallet services in India. Presently, multiple banks are also contemplating on having their own wallet services to challenge industry leaders such as Paytm and Freecharge. The State Bank of India (SBI) has an m-wallet known as 'SBI Buddy';

Table 1: Prominent M-Wallet Players and their User Base in Crores (Source: Companies' Press Release, 2015)

Mobile-Wallet Operators	Users (in Crores)
Paytm	12
ITZ Cash	4
Mobikwik	3
Citrus Pay	2.1
Oxigen	2
Vodafone M-Pesa	0.54
Airtel Money	0.17

ICICI Bank similarly has 'ICICI Pockets' and Punjab National Bank recently launched 'Kitty'. Technology-centric companies such as Amazon, Airtel, Ola, Samsung, Google, and Apple have also launched their own wallets. For example, Ola money can be used to pay for Ola cab rides in addition to making payments for a host of services such as electricity and other partner merchants. Similar services are also offered by Airtel Payments Bank. Tapzo, another mobile platform has its own digital currency called 'Tapzo cash', which can be used to

book cabs and pay for miscellaneous utilities and entertainment. Paytm has also initiated services to pay for education fees in select academic institutions. Some of the leading m-wallet operators in the country

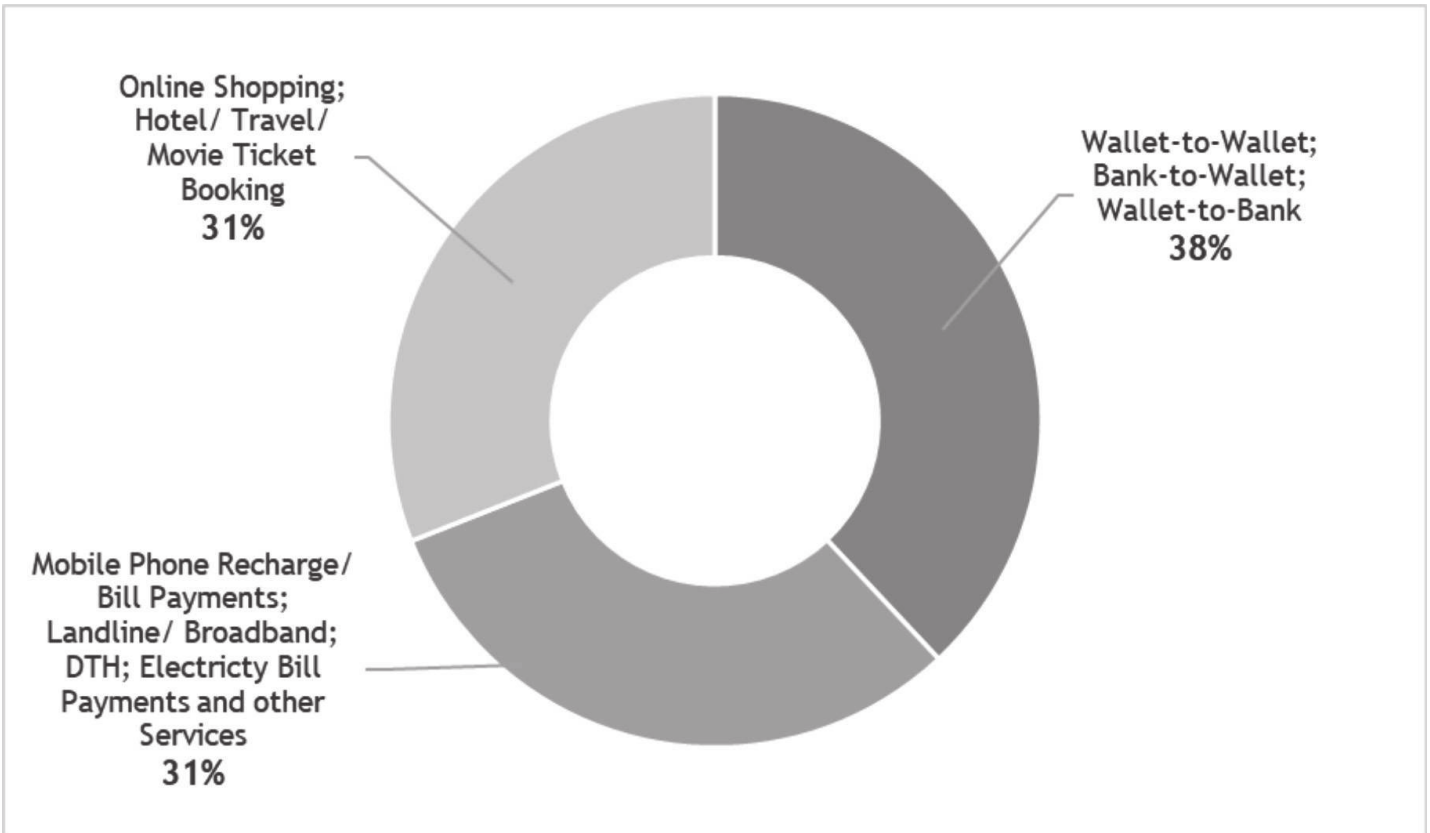

Figure 2: Usage of Mobile Wallets across diversified service categories (Source: Reserve Bank of India)

along with their user base is highlighted in Table 1.

Around 38 percent of mobile wallets transactions are predominately used for money transfers, 31 percent are used for recharges and bill payments, while the remaining 31 percent covers other miscellaneous services such as shopping for apparels, electronic items, online travel services, movies and entertainment, hotel bookings and other miscellaneous bookings (Exhibit 2).

According to Shrivastava and Variyar (2016), the adoption of mobile wallets in India can be regarded to be between the phases of early adoption and early majority in the adoption lifecycle, given the precipitous upsurge of m-wallets in the last couple of years and the typical psychographic traits of Indian consumers. The current article explains the versatile factors affecting the adoption of mobile-wallets in the backdrop of the Technology Acceptance Model developed by Davis (1989), which advocates a conceptual framework for examining the adoption of novel technologies from its perceived usefulness as well as perceived ease of use.

India currently occupies the 21st position in the Mobile Payments Readiness Index (MPRI) and boasts of a proactive government focussed on a digital revolution in the country. Notwithstanding, concerns such as inaccessibility of smartphones along with poor internet connectivity have weighed down the progress of digital payments in India. Out of India's 1.35 billion population, only a mere 23.93 percent of people are active mobile internet users, but a large population remain unwilling to participate in online transactions. Nonetheless, in the aftermath of the demonetization drive by the Indian Government, many people happened to opt for cashless transactions, and hence, the m-wallets have demonstrated remarkable growth in the country.

M-wallets, as a new concept, are not very widespread in India. Users of such wallets can be categorized into four broad categories. People using plastic cards form the first category, and they happen to be at ease whilst using such payment modes. The second category comprises of people who own plastic cards, but carry on preferring Cash on Delivery (COD) for their payment. The third category encompasses non-possessors of plastic cards, and such individuals are

compelled to use COD. The final category includes people who are desirous of using COD, but are handicapped by lack of delivery access to their pin codes. Mobile wallets address the issues of all the aforementioned four categories of people. It caters to the convenience of using such wallets over the use of debit or credit cards. With a profuse user base continuing to prefer the COD option while shopping, it poses a momentous challenge for m-wallet companies to influence such users to adopt the m-payment platform. Yet, the Indian m-wallet market has a noteworthy potential to flourish, and it is anticipated that its volume of existing users shall expand vastly in the course of the upcoming decade.

The term 'demonetisation' has become much more than a mere buzzword since the old Rs. 500 and Rs. 1000 notes was pulled out of circulation. Demonetization is a mechanism wherein the government announces to pull out from circulation the currency that is at present a legal tender and swap it with a new currency (Balamurugan and Hemalatha, 2016; Hari, 2016). It is a process where a series of currency notes cease to be legal tender. It occurs whenever there is a modification of national currency. Demonetization can be triggered by a multitude of factors in any economic setting, but the principal aim of the demonetization drive in India is to initiate a cashless economy (Veerakumar, 2017; Bansal; 2017)

The primary focus of the current endeavour is to probe into the principal factors that bear the greatest potential to have an impact on the consumer adoption of mobile wallets in India. The study is pillared on the technology acceptance models (TAM) and the innovation diffusion theory (IDT).

BACKGROUND LITERATURE

The current study uses the Technology Acceptance Model (TAM) to explicate the factors that influence the adoption of m-wallets among consumers in India. The TAM, introduced by Davis (1989), sought to expound and assess the behaviour of technology users. TAM is widely accepted and used by academicians and researchers to foresee the adoption of information technologies and intention to use by individuals (Taylor and Todd, 1995; Venkatesh, 2000). Various studies have indicated that TAM proves to be significant in predicting the discrete acceptance of several systems (Segars and Grover, 1993; Chin & Todd, 1995). The model advocates that perceived ease of use and perceived usefulness influence behaviour developed by the technology-user towards a host of information systems. This behaviour channelizes the intention of individuals and leads to acceptance (Özer et al., 2010). The TAM has become the most popular model to predict the use technology as well as intention to use (Lu et al., 2003).

The TAM proposes that two specific principles, namely, perceived usefulness (PU) and perceived ease of use (PEU), are the fundamental forces influencing technology acceptance (Davis, 1989). A host of researchers has utilized Davis's (1989) study to corroborate empirical evidence on the relationships between usefulness, ease of use as well as use of systems (Davis, 1989; Adams, Nelson & Todd, 1992; Hendrickson et al., 1993; Segars and Grover, 1993). TAM, in particular, has been frequently used to establish theoretical foundations for m-commerce matters (Lu, Wang, & Yu, 2007) and miscellaneous mobile services (Koivumaki et al., 2006; Chen, 2008) and the wireless internet (Yu, Liu, & Yao, 2003).

According to Sahin (2006), diffusion is the process by which an innovation is communicated through specific channels over a period among the members of a social system. An innovation is as an idea, exercise, or article that is perceived to be new by an individual or any other unit of adoption (Rogers, 2003).

The Innovations Diffusion Theory (IDT) encompasses five significant characteristics, namely, relative advantage, compatibility, complexity, trialability and observability. Relative advantage is a construct that highlights the degree to which an innovation is deliberated as a better alternative to the idea it substituted, and it effectively predicts the adoption of an innovation (Zhang et al., 2008). Compatibility is the degree to which innovation is observed to be consistent with the dominant values, preceding experiences, and the needs of potential consumers. In an empirical study on mobile ticketing service adoption, compatibility was found to have a significant impact on the intention to use (Mallat et al., 2008). Complexity is the perceived level of difficulty in understanding innovations of potential users and their ease of use. Augmented levels of complexity triggers greater degrees of intricacy in fathoming the use of a specific innovation. Hence, complexity has a negative association with the usage intentions (Rogers, 2003). In a previous study on adoption of mobile marketing, complexity has been observed to have a direct impact on the adoption intentions of users (Tanakinjal, 2010). Trialability relates to the degree to which various innovations can be verified on restricted foundations. Arts et al. (2011) argued that trialability enhances

consumer readiness and demonstrates a more robust impact on behaviour, thus having a negative influence on adoption behaviour. Observability is the degree to which the results of innovations can be visible by

The aforementioned constructs are conceptually defined and summarized as under.

Variables under Technology Acceptance Model (TAM)		
Variable	**Conceptual Definition**	**References**
Perceived Ease of Use (PEU)	The degree to which an individual entity believes that using a specific system would be free from effort	Davis (1986)
Perceived Usefulness (PU)	The degree to which an individual believes that using a specific system would enhance his performance	Davis (1986)
Attitude to Use (ATU)	The user's evaluation of the desirability of employing a given technology	Fishbien & Ajzen (1975)
Intention to Use (INT)	The likelihood of an individual employing a given technology	Fishbien & Ajzen (1975)

Variables under Innovations Diffusion Theory (IDT)		
Relative Advantage (ADV)	The more advantageous the new-fangled innovation, the more rapidly it will diffuse in a given social context	Rogers & Shoemaker (1971)
Compatibility (CPA)	It is the extent to which an innovation is perceived to be consistent with end user needs, values and beliefs, past ideas and experiences	Kaasinen (2005)
Complexity (CMP)	It is the degree to which an innovation is perceived as relatively difficult to understand and use	Roger (2003)
Trialability (TRI)	It is the degree of inspection of a novel innovation prior to actually adopting to it	Rogers & Shoemaker (1971)
Observability (OBS)	It is the ease with which the results of an innovation are perceptible and their communication to the prospective user is also recognized	Moore & Benbasat (1991)

other people. In a study on technological products conducted by Vishwanath and Goldhaber (2003), observability was seen to bear a significant influence on the usage intention. These characteristics are used to explain end-user adoption of innovations and the decision-making process (Agarwal et al., 2000). The theory of innovation adoption happens to be a robust model that expounds on the multifarious dimensions of innovative technology adoption (Henrichs, 1995).

Additionally, in terms of the complexity construct, TAM and IDT recommend that the development of users' intention is moderately determined by how challenging the innovation is to comprehend or use (Davis, et al., 1989; Rogers, 1995). Compatibility is associated with the fit of a technology with prior experiences, while the ability to try to observe are connected to the readiness of opportunities for appropriate proficiencies. These constructs relate to erstwhile experience with a given technology or opportunities for experiencing the said technology. Compatibility, and the ability to try to observe can be considered as external variables, which directly influence the constructs in the TAM. Post the preliminary level of adoption, the consequences of these three constructs could be contracted with unceasing experience and diminished over time (Karahanna et al., 1999).

RESEARCH OBJECTIVES

The current study primarily seeks to probe into the pace of adoption of mobile-wallets in a post-demonetized scenario in India. Using the Innovations Diffusion

Theory (IDT) and the Technology Acceptance Model (TAM) as a reference, the study seeks to determine whether consumers' intention to use mobile wallets have increased in the wake of demonetization.

Conceptual Modelling and Hypothesis Formulation

The current study relates to the five perceived dimensions of the IDT, namely relative advantage, compatibility, complexity, trialability and observability, which are known to reveal the

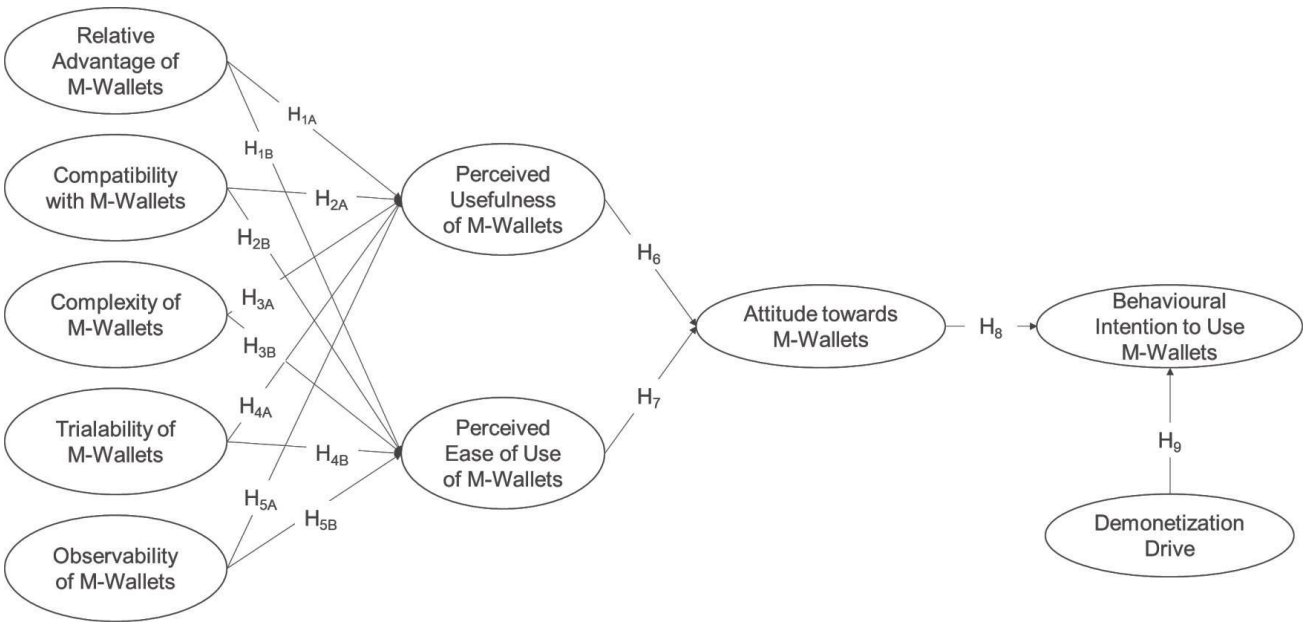

Figure 3: Proposed Research Model and Hypotheses Development (Source: Author's Own)

behaviour of respondents using mobile wallets.

The author proposes an integrated theoretical framework, which blends TAM and IDT theories and holds that the five innovative characteristics exert a momentous influence on the consumers' PU and PEU of mobile wallets. The validity and applicability of the proposed model was tested based on the following hypotheses. Exhibit 3 summarizes the model and hypotheses of the current study.

Relative advantage

In the context of studies pertaining to TAM and IDT, the associations among relative advantages, PU, and PEU are supported (Lee et al., 2011). When the users perceived greater relative advantages, they perceived a greater level of usefulness and ease of use of the systems. Accordingly, the current study hypothesises:

H_{1A}: Relative advantage (ADV) has a significant and positive impact on the Perceived Usefulness (PU) of mobile-wallets among respondents

H_{1B}: Relative advantage (ADV) has a significant and positive impact on the Perceived Ease of Use (PEU) of mobile-wallets among respondents

Compatibility

Agarwal and Prasad (1999) in their study asserted that the degree of prior experience with analogous technologies was favourably associated with an ease of use belief about a given technology innovation. They revealed a favourable liaison between an individual's preceding compatible understandings and the novel technology acceptance. Similarly, erstwhile researches have explored compatibility from diverse dimensions, ensuing in encouragement for its impact on both PU and PEU (Hardgrave et al., 2003). Pillared on former research, the following hypotheses have been proposed:

H_{2A}: Compatibility (CPA) has a significant and positive impact on the Perceived Usefulness (PU) of mobile-wallets among respondents

H_{2B}: Compatibility (CPA) has a significant and positive impact on the Perceived Ease of Use (PEU) of mobile-wallets among respondents

Complexity

Hardgrave et al. (2003) highlighted an association between complexity and PU. However, there is a dearth of adequate empirical evidence concerning the relationship between complexity and PEU. In the current study, the effect of complexity on PU and PEU was tested with the aid of the following hypotheses:

H_{3A}: Complexity (CPL) has a significant and positive impact on the Perceived Usefulness (PU) of mobile-wallets among respondents

H3B: Complexity (CPL) has a significant and positive impact on the Perceived Ease of Use (PEU) of mobile-wallets among respondents

Trialability

Like complexity, there is indeed a marked deficiency in the volume of research that aims to examine the affiliation among trialability, PU and PEU. Veloo and Masood (2013) observed that trialability and complexity had a positive effect on PEU, but a negative impact on PU. Yang (2007) stated that when the users perceived higher trialability, they perceived higher levels of usefulness, and ease of use of the information system. The present study sought to develop the following hypotheses with reference to the trialability dimension:

H_{4A}: Trialability (TRI) has a significant and positive impact on the Perceived Usefulness (PU) of mobile-wallets among respondents

H_{4B}: Trialability (TRI) has a significant and positive impact on the Perceived Ease of Use (PEU) of mobile-wallets among respondents

Observability

In former studies that joined TAM and IDT, employees exhibited a propensity to perceive the systems as more valuable and easier to use, when they perceived the arrangements as being easier to be observed or defined (Huang, 2004; Yang, 2007). Accordingly, it is proposed that observability would have an affirmative effect on PU and PEU, as noted below:

H_{5A}: Observability (OBS) has a significant and positive impact on the Perceived Usefulness (PU) of mobile-wallets among respondents

H_{5B}: Observability (OBS) has a significant and positive impact on the Perceived Ease of Use (PEU) of mobile-wallets among respondents

Attitude towards using M-Wallets

The TAM theorized that an individual's PU and PEU have a direct impact on their behaviour. Erstwhile literatures have evidenced a significant relationship between PU, PEU and attitude (Park, 2009; Ashraf, Thongpapanl & Auh, 2014). Thus, the study hypothesizes:

H_6: Perceived Usefulness (PU) has a significant and positive impact on the Attitude towards the use of mobile-wallets (ATU) among respondents

H_7: Perceived Ease of Use (PEU) has a significant and positive impact on the Attitude towards the use of mobile-wallets (ATU) among respondents

Intention to use M-Wallets

Prior research has contended that attitudes can be robust or frail (Priester et al. 2004) and, hence, can predict conforming behavioural trajectories either strongly or weakly. Park (2009) recommended a positive relationship between attitudes and the intention to use a system. The following hypothesis has been developed to test the hypothesis:

H8: Attitude towards the use of mobile-wallets (ATU) has a significant and positive impact on the Intention to use mobile-wallets (INT) among respondents

Demonetization Drive and the Intention to use M-Wallets

The Ministry of Finance (2017) noted that demonetization is an aggregate demand shock given that it reduces the supply of money and private wealth. D'Monte (2016) observed that 90 percent of all transactions in India are conducted in cash. Around 86 percent of cash in circulation (□17.7 lakh crores) was rendered invalid, and these notes had to be deposited in banks by December 30, 2016. The notes withdrawn comprised 86 percent, by value, of cash in circulation (MoF, 2017a). In addition to the absolute logistical experiment required to substitute a bulky volume of cash, a substantial proportion of the new currency notes had yet to be printed at the time of the announcement, causing weeks-long cash deficiencies. This, in turn resulted in major, government-authorized constraints on cash withdrawals. Despite these major impediments, public reactions to demonetisation were initially largely favourable (Beyes and Bhattacharya, 2017). This cash crunch coupled with the difficulty in cash withdrawal and undertaking seamless cash transactions have been identified in the present study as an independent variable labelled 'demonetization

drive'. This variable is developed keeping mind a customer perspective and does not consider macro-level economic changes or vicissitudes. This has been tested against the intention of respondents to use mobile-wallets and has been hypothesized as:

H_9: Demonetization drive (DMD) has a significant and positive impact on the Intention to use mobile-wallets (INT) among respondents

METHODOLOGY

The current study proposes the development of an integrated model to explicate the intention to use mobile-wallets among respondents in India. The integrated model is pillared on the Technology Acceptance Model (Davis, 1989; Davis et al., 1989), which is blended with the Innovations Diffusion Model (Rogers, 2003).

Data Collection and Sample

To this end, a large sample of 1,290 respondents were conveniently selected from the city of Kolkata and were administered a structured questionnaire, which sought to probe into the factors affecting consumers' behavioural intentions to use mobile wallets, in a post-demonetization scenario. Essentially, the respondents chosen in the study either have installed or have actively started to use the mobile wallet application in the aftermath of November 9, 2016. A non-probabilistic sampling technique (snowball sampling) was adopted to reach out to potential respondents in the study. The questionnaire was initially administered to 1,346 respondents. However,

Table 2: Demographic Profile of Respondents

Demographic Construct	Classification	Population Statistics	Percentage
Gender Classification	Male	685	0.53
	Female	605	0.47
	TOTAL	**1290**	**1.00**
Age Group	18-25	437	0.34
	26-35	309	0.24
	36-50	311	0.24
	Above 35	233	0.18
	TOTAL	**1290**	**1.00**
Occupation	Student	615	0.48
	Full-Time Employment (Service)	247	0.19
	Full-Time Employment (Business)	222	0.17
	Retired	123	0.10
	Not Employed Presently	83	0.06
	TOTAL	**1290**	**1.00**
Monthly Income	Below INR 25,000	34	0.03
	INR 25,001 – INR 50,000	137	0.10
	INR 50,000 – INR 75,000	304	0.24
	INR 75,001 – INR 1,00,000	487	0.38
	Above INR 1,00,000	328	0.25
	TOTAL	**1290**	**1.00**
M-Wallet Preference (Maximum Usage)	PayTM	576	0.45
	FreeCharge	322	0.25
	MobiKwik	167	0.13
	PhonePe	122	0.09
	SBI Buddy	61	0.05
	Others	42	0.03
	TOTAL	**1290**	**1.00**

only 1,290 samples could be retained (valid response rate of 95.8 percent) because of incomplete responses (57.1 percent), erroneous responses (26.8 percent), or the fact that respondents were not at all familiar with the concept of e-wallets (16.1 percent). The demographic profile of respondents is captured in Table 2.

Respondents in the study are shown to have strong usage tendencies towards PayTM, FreeCharge and a host of other similar services such as ITZCash, Momoe, PayUMoney and Oxigen Wallet, to name a few.

A specially designed structured questionnaire was developed in order to collect data and thereby measure the key constructs, as illustrated in the research model. This survey embraces psychographic questions that measures diverse variables on a five-point Likert scale. In the current study, a non-probabilistic sampling technique (snowball sampling) was adopted to reach out to potential respondents in the study.

Structural Equation Modelling (SEM) was conducted to test the fit between the proposed conceptual model and the acquired data. In the current study, IBM AMOS 23.0 was used to derive the results of the Confirmatory Factors Analysis (CFA) and validate the proposed causal models. A similar set of fit indices was used to examine the structural model. SEM and Path Analysis was selected for its ability to scrutinize a series of dependent relationships among variables simultaneously, especially when there are direct as well as indirect associations among the constructs within the model (Hair, et al., 2006).

DATA ANALYSIS

As captured in Table 2, a study of demographics has been conducted which shall facilitate a robust understanding of the chosen sample and their patterns of usage of the mobile wallets especially in the wake of demonetization.

The male-female ratio in our study is moderately balanced in the proportion of 53:47. The age group below 24, which comprises of respondents from 15 years to 24 years, has the maximum number of respondents (n=95; 39%). These respondents are largely expected to be students (n=83; 34%) and corporate executives or employees (n=70; 29%). Given their occupational attainment, the respondents mostly belong to the monthly income cluster of 'Below INR 10000' (n=93; 38%). The respondents, as noted previously, have been chosen from four specific clusters in Kolkata, with the maximum number of respondents hailing from South Kolkata (n=68; 28%). The demographic profile, in a nutshell, reflects that the proportion of the youth is far more significant than their older counterparts and is engaged in education or corporate jobs.

Instrument Reliability and Construct Validity

The descriptive analysis of the sample used in the current study has been represented in Table 3, in terms of the mean and standard deviation of each key variable. The table also captures the factor loadings for each item as well as the construct reliability and other relevant descriptive statistics.

Table 3 also highlighted the two subtypes of construct validity, namely convergent and discriminant validity. To establish convergent validity, it is necessary to indicate that measures that should be related are in reality related. A convergent validity analysis has been undertaken to establish whether the items converge to measure a construct or not. The convergent validity of the scale items were estimated by the respective factor loadings, composite reliability, and average variance extracted (Fornell and Larcker, 1981). It is apparent from Table 3 that the standardized CFA loadings for all scale items have exceeded the minimum loading criterion of 0.7, and the composite reliabilities of all factors have exceeded the prescribed 0.7 level. In addition, the Average Variance Extracted (AVE) values were all above the threshold value of 0.5 (Hair et al, 2006). Hence, all three conditions for convergent validity were successfully met by the above measurement models.

Further, the square root of AVE and the correlation coefficient matrix was used to test the discrimination validity of constructs, which determines whether the construct is truly distinct from another construct or not. The Fornell-Larcker criterion was used to assess discriminant validity. It is known to be a conservative approach, which compares the value of the AVE with the latent variable correlations. Specifically, the AVE should exceed the correlation with any other construct (Hair et al., 2013). The results of the discriminant analysis have been captured in Table 4:

The diagonal line in the above matrix represents the square root of AVE of the constructs, and other data present the correlation coefficient of the row construct and the column construct of the data. Discriminant validity was attained by comparing the shared variance between factors with the AVE

Table 3: Reliability Analysis, Convergent Validity

Construct	Items	Factor Loading	Mean	S.D.	Cronbach's Alpha	AVE	C.R.
ADV	ADV1	0.892	3.983	1.756	0.953	0.771	0.910
	ADV2	0.879					
	ADV3	0.863					
CPA	CPA1	0.922	4.321	1.983	0.972	0.856	0.947
	CPA2	0.934					
	CPA3	0.919					
CPL	CPL1	0.917	4.038	1.775	0.971	0.831	0.952
	CPL2	0.914					
	CPL3	0.902					
	CPL4	0.913					
TRI	TRI1	0.868	4.449	1.709	0.959	0.777	0.933
	TRI2	0.888					
	TRI3	0.878					
	TRI4	0.892					
OBS	OBS1	0.889	4.886	2.110	0.966	0.806	0.926
	OBS2	0.901					
	OBS3	0.903					
PU	PU1	0.922	4.553	1.872	0.966	0.835	0.953
	PU2	0.923					
	PU3	0.898					
	PU4	0.913					
PEU	PEU1	0.834	4.384	1.947	0.963	0.776	0.912
	PEU2	0.883					
	PEU3	0.924					
ATU	ATU1	0.938	4.643	1.964	0.983	0.886	0.959
	ATU2	0.963					
	ATU3	0.922					
INT	INT1	0.928	4.765	1.848	0.981	0.893	0.962
	INT2	0.943					
	INT3	0.964					
DMD	DMD1	0.892	4.665	1.823	0.964	0.805	0.926
	DMD2	0.887					
	DMD3	0.913					

from the individual factors (Fornell & Larcker, 1981). The current analysis revealed that the MSV and ASV between factors were less than the AVE for the individual factors. Square root of AVE was greater than inter-construct correlations. Hence, discriminant validity was assured.

Structural Equation Modelling

After the reliability and validity of the data have been established, Structural Equation Modelling (SEM) was performed to test the fit between the proposed research model and the obtained data. This technique was chosen for its proficiency in simultaneously examining a series of dependence relationships, especially when there were direct and indirect effects among the constructs within the model (Hair et al, 2006).

Table 4: Discriminant Analysis by the Fornell and Larcker Criterion

Construct	Inter-Construct Correlations									
	ADV	CPA	CPL	TRI	OBS	PU	PEU	ATU	INT	DMD
ADV	0.878									
CPA	0.865	0.925								
CPL	0.859	0.911	0.912							
TRI	0.872	0.912	0.910	0.881						
OBS	0.869	0.903	0.910	0.879	0.898					
PU	0.868	0.912	0.905	0.829	0.856	0.914				
PEU	0.872	0.915	0.906	0.824	0.848	0.904	0.881			
ATU	0.873	0.903	0.903	0.863	0.834	0.898	0.832	0.941		
INT	0.867	0.907	0.907	0.837	0.837	0.847	0.823	0.927	0.945	
DMD	0.869	0.906	0.909	0.848	0.864	0.833	0.837	0.932	0.924	0.897

The preliminary step in interpreting SEM results encompasses reviewing fit indices, which offer evidence on how robust the fit is between the obtained data and the proposed structural model. If the model fit is good, the feasibility of each path in the model is reviewed the by scrutinizing whether the weights are statistically as well as practically significant. Practical significance is evaluated based on whether the effect size estimation (the R2) regarding a given path in the models is large enough (Lee et al., 2011).

In this structural model, the CMIN/df= 3.129, CFI= 0.966, GFI= 0.947, NFI= 0.971 and RMSEA= 0.043. These fir indices provide evidence of adequate fit between the hypothesized model and the observed data (Byrne, 2010). The structural model fit as shown in Table 5, captures the results of the hypothesis tests. The p-values associated with each standardized path estimate are used to assess the significance at a threshold value of 0.05.

The significance and robustness of the hypothesized relationships in the research model have been scrutinized. The results of the structural model analysis, including path coefficients, path significances, and variance explained for each dependent variable presented in Exhibit 4.

The path validation diagram in Exhibit 4 captures the resulting path coefficients of the hypothesized research model. As indicated above, fourteen formulated hypotheses have been scrutinized and a summary of the subsequent path analysis results are recorded in Table 6. Five endogenous variables in the IDT model have been tested on the perceived usefulness of using mobile-wallets and the results reveal that

Table 5: Model Fit Summary

Goodness of Fit Measure	Recommended Value	Actual Value of Measures	Result of Model Fit
CMIN/DF	≤ 3.00	3.129	Good
GFI	≥ 0.90	0.947	Good
AGFI	≥ 0.90	0.935	Good
NFI	≥ 0.90	0.971	Good
CFI	≥ 0.90	0.966	Good
RMSEA	≤ 0.05	0.043	Good

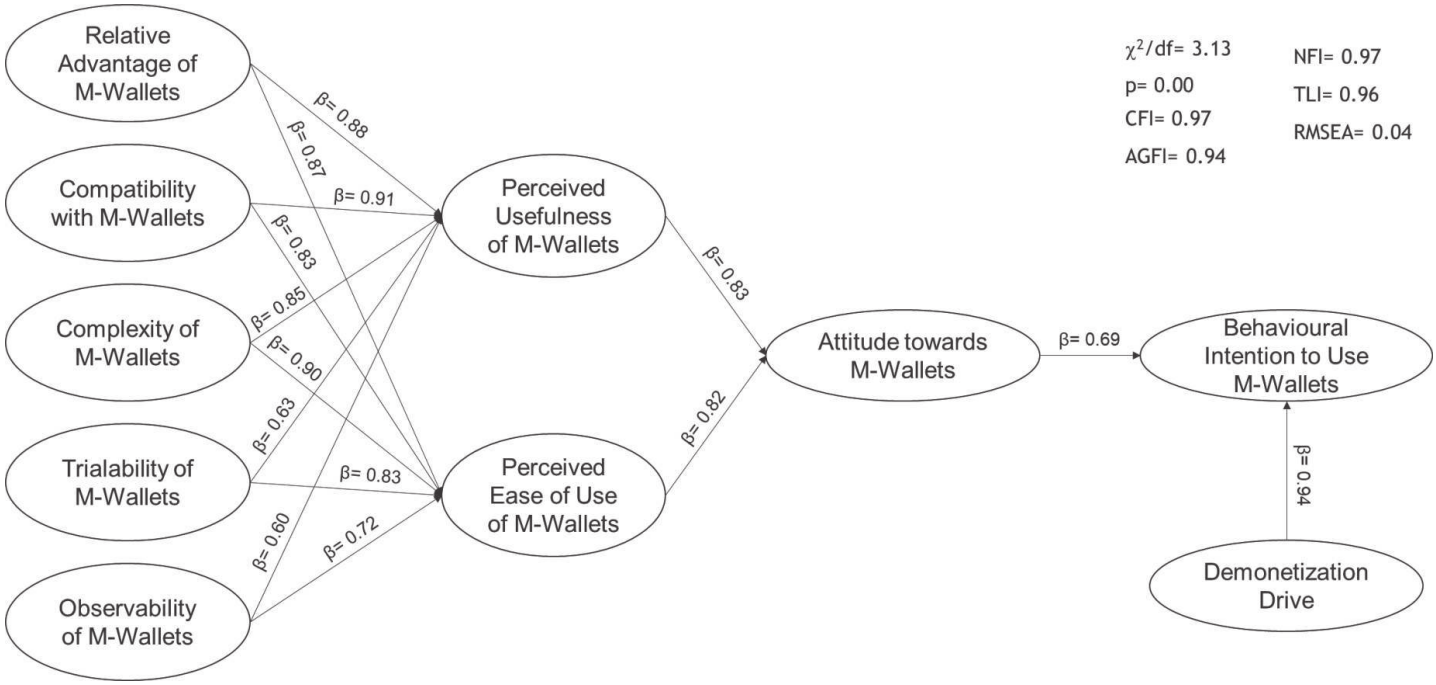

Figure 4: Path Test based on Hypothesized Research Model

relative advantage (β= 0.878, p<0.05), compatibility (β= 0.911, p<0.05), complexity (β= 0.852, p<0.05) and trialability (β= 0.626, p<0.05) significantly influence the perceived usefulness of m-wallets (PU). They are shown to support hypotheses H_{1A}, H_{2A}, H_{3A} and H_{4A} respectively. Only observability was shown to have an insignificant impact on PU (β= 0.604, p>0.05) in the path validation results. Hence, hypothesis H_{5A} was unsupported by the model.

Similarly, the aforementioned five exogenous variables were also tested on the perceived ease of using m-wallets (PEU). Just like in case of their impact on PU, observability proved to bear an insignificant impact on PEU (β= 0.722, p>0.05). All the other variables in the IDT proved to have a significant impact on PEU, namely relative advantage (β= 0.868, p<0.05), compatibility (β= 0.826, p<0.05), complexity (β= 0.901, p<0.05) and trialability (β= 0.827, p<0.05). This implies that hypotheses H_{1B}, H_{2B}, H_{3B} and H_{4B} have been supported in the present study while H_{5B} has been unsupported by the model.

There also exists favourable relationships between perceived usefulness (β= 0.829, p<0.05) and perceived ease of use on the attitude (β= 0.823, p<0.05) towards the use of mobile wallets. Attitudes towards the use of mobile wallets, in turn favourably influence the intention to use m-wallets (β= 0.687, p<0.05) among respondents. Further, the demonetization drive in the country also plays a significant impact on the intention to use mobile wallets (β= 0.941, p<0.05) among the chosen set of respondents. Accordingly, hypotheses H_6, H_7, H8 and H_9 have been validated in the current study. The structural path analysis results are captured in Table 6.

The above-derived results regarding the favourable and significant casual relations between perceived usefulness and attitude towards the use of mobile-wallets conformed to the findings of Chang (2004) and Hung et al. (2006). Compatibility has the strongest influence on the perceived usefulness of m-wallets, while observability has the least impact on PU. Complexity of the m-wallet has the strongest impact on the perceived ease of usage, while observability, again, has the least impact on PEU. Demonetization as a construct has a very strong influence on the respondent's intention to use the m-wallet.

CONCLUSIVE STATEMENTS

In the current study, an integration of the IDT and TAM was tested and validated through the proposed integrated model, which sought to investigate the factors that influence the intention to use mobile wallets among the respondents in the study. As suggested by the original TAM, external variables have a significant impact on PEU and PU (Davis et al., 1989). The study reveals that external variables such as relative advantage, compatibility, complexity and trialability have a significant impact on both PEU and PU. The relative advantage of using m-wallets is shown to offer potential ameliorations over existing traditional modes of payment, and offers economic

Table 6: Structural Path Analysis Results

Hypotheses	Path	Coefficient	Direction	Results
H_{1A}	ADV → PU	0.878	Positive	Supported
H_{1B}	ADV → PEU	0.868	Positive	Supported
H_{2A}	CPA → PU	0.911	Positive	Supported
H_{2B}	CPA → PEU	0.826	Positive	Supported
H_{3A}	CPL → PU	0.852	Positive	Supported
H_{3B}	CPL → PEU	0.901	Positive	Supported
H_{4A}	TRI → PU	0.626	Positive	Supported
H_{4B}	TRI → PEU	0.827	Positive	Supported
H_{5A}	OBS → PU	0.604	Positive	Not Supported
H_{5B}	OBS → PEU	0.722	Positive	Not Supported
H_6	PU → ATU	0.829	Positive	Supported
H_7	PEU → ATU	0.823	Positive	Supported
H_8	ATU → INT	0.687	Positive	Supported
H_9	DMD → INT	0.941	Positive	Supported

ADV: Relative Advantage of using m-wallets; CPA: Compatibility of m-wallets; CPL: Complexity of using m-wallets; TRI: Trialability of m-wallets; OBS: Observability of m-wallets; PU: Perceived Usefulness of m-wallets ; PEU: Perceived Ease of Use of m-wallets; ATU: Attitude towards Usage of m-wallets; INT: Behavioural Intention to Use; DMD: Demonetization Drive; $p<0.05$

as well as social viability to users. This is evidenced by the perennial upgradations in the applications, which are synced with the inherent needs of their target user groups. They develop their innovation in a way to persuade their target users by banking on their apparent advantages. Compatibility of the m-wallets is immensely important in shaping the perceived usefulness and perceived ease of use among respondents. Such m-wallets must be consistent with the existing values, social practices, past experiences and existing needs of target users. With the Digital India campaigns undertaken by the Indian Government, immense progress has been made already in this regard. Consumers are known to easily download and use the m-wallet application and make online payments with ease, given the seamless user interface. The marketing mix, especially in terms of price and promotion, are in tune with that of traditional stores. Consumers can easily connect with the specifications and norms of the given app and use it consistently and comfortably. Complexity of the m-wallets in India has a low score. Hence, they are known to have a strong influence on PU and PEU. In fact, most of the m-wallet interfaces are simple to understand and use. They often come in different regional languages to penetrate deep into the Tier-I and Tier-II markets in India. Payment portals, which was earlier a major cause of botheration and concern for users have become far more simplified than earlier in terms of their usage. Trialability is also shown to have a positive impact on both PU and PEU. Mobile wallets such as PayTM, MobiKwik and Airtel Money, to name a few, have made pertinent efforts in allowing users to try their technology before committing to use it (Sen and Jayadevan, 2018). For instance, PayTM recently announced a latest update to its mobile application with a revamp to the home screen, a new look to the Passbook tab, and a revamped Profile section (Chawla, 2018). They have also pushed towards usage of their Money Transfer service. The update is available on the Apple App Store as version 7.0 for iOS, and on the beta version of Android on Google Play. Other wallets also develop Beta (trial) versions of their applications; in addition to scouting for bugs, they serve as a very powerful tool in persuading target users. Observability was the only factor that proved to be insignificant in its influence on PEU and PU. The apparent logic is that the visibility of the results of the technology is not known to respondents. The tangible outcomes of such mobile wallets are not positioned clearly in the minds of non-users or aspiring users, which is why observability has an insignificant impact on both PU and PEU. Demonetization drive by the

Indian government also has a significant impact on the adoption of m-wallets in India. Indeed, disruptions in the digital space have not only revolutionised the manner in which respondents manage their finances, they have also made contactless and cashless transactions the preferred choice among them. With such mobile wallets, quick response (QR) codes, near field communication (NFC) technology, sound wave systems, virtual cards, unified payment interface (UPI) and Aadhaar Pay offering top-notch secure payments options, the smartphone has become the most sought after all-in-one device. Vasireddy (2017) noted that PayTM had registered a 3.5X surge in digital payments in 2017 and shall continue to add new online and offline use-cases, thereby enabling more consumers and merchants to experience the power of digital payments. Mobikwik currently has 65 million app users, which has more than doubled after demonetisation. Over the past one year, the industry has only grown over 55 per cent and has added 150 million users in the e-wallet platforms, along with 10 million merchants.

Managerial Implications

Mobile wallets and plastic cards have been regarded as the alternative to cash in the aftermath of demonetisation to cope with the cash crisis. There has been a growth in the adoption rates of m-wallets post-demonetisation. After cash circulation was back in the market, the peak of wallet usage has declined. However, it is almost 35 per cent higher than what it was pre-demonetisation (Sanatani, 2018). M-wallets have evolved as a radiating star in the horizon of Indian non-cash transactions. The growth of the m-wallet segment can be attributed to the conjunction of escalating smartphone usage and massive internet penetration in the nation. Further, demonetization in India has proved a lucrative opportunity for m-wallet players in the country. M-wallet companies are flooded with millions of transactions and double the number of users. The average wallet spend for retail which was about INR 500-700 prior to demonetization move, is expected to increase to approximately INR 2,000-10,000.

As demonstrated by erstwhile researches, the TAM, in the context of the current study, sought to provide researchers a theoretically robust and parsimonious model, which can be tapped in order to predict the acceptance of m-wallets. A notable finding of this result is that, overall, the integrative model encompassing the broad theories of TAM and IDT, mostly holds true for m-wallets in India. It is understandable that PU, PEU have positive liaisons with the attitude towards the use of m-wallets, while attitude is significantly shown to influence the intention of respondents to use it. Hence, it may be safely concluded that there is potential for application and development of m-wallets in the context of India. Thus, it is of paramount importance that the government, along with myriad private players, help consumers confirm and increase their perception positively through mobile wallets. Although the current research validates the theoretical models in the context of demonetization and intention to use mobile wallets, thereby contributing significantly to the existing literature, there are certain major limitations. Firstly, the measurements used in this research have been derived principally from earlier studies and were indicative of the constructs studied at large. This may trigger certain inadequacies that need to be addressed in subsequent research. Secondly, the researcher used the elimination method for deleting variables with insignificant impacts. Future researches could address this issue by expanding the number of observations or by analyzing the indirect impacts to retain the originally developed model.

Demonetization has unlocked multiple beginnings in the digital payment scenario across the country. The anxiety to try out new technology among people has reduced considerably, as they are becoming more contented with the digital world with time.

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