

Mobile Payments in India: Drivers and Inhibitors

Mona Sinha

Rajan Saxena

Hufrish Majra

Dr. Mona Sinha is Assistant Professor of Marketing, Kennesaw State University, 1000 Chastain Rd, Kennesaw, GA 30144 (Phone: 470-578-2997; Email: msinha1@kennesaw.edu).

Dr. Rajan Saxena is Vice Chancellor and Distinguished Professor of Marketing at SVKM's NMIMS University, V. L. Mehta Road, Vile Parle (W), Mumbai V. L. Mehta Road, Vile Parle (W), India (Phone: 91-22-42355555; Fax: 91-22-26114512; Email: vc@nmims.edu).

Dr. Hufrish Majra is Assistant Professor at SVKM's NMIMS University, V. L. Mehta Road, Vile Parle (W), Mumbai 400 056, India (Phone: 91-22-42355555; Fax: 91-22-26114512; Email: hufrish.majra@nmims.edu).

Abstract

India prospered following its economic liberalization in 1991. However, millions remained poor and lacked access even to basic financial services like banking. Banks turned to self-service technologies (SST) technologies like ATMs and online banking to expand reach. However, these SSTs were not very successful in overcoming infrastructural, socio-economic and geographical constraints for reaching consumers at the bottom of the pyramid and especially in rural areas. Given the penetration level and pan-India spread of mobile phones, a number of mobile payment systems had recently been launched, which could potentially be a precursor to adoption of mobile banking in the future. This research examines the factors that drive and inhibit adoption of mobile payments systems in India. We draw upon extant research on technology and SST adoption to identify antecedent variables based on the Unified Theory of Acceptance and Use of Technology (UTAUT) (viz., performance expectancy, effort expectancy, social influences, and facilitating conditions). Technology readiness and technology inclination are examined for their moderating impact on consumers' adoption of mobile payments. A multi-language consumer survey was conducted across four large and mid-size Indian cities to examine consumers' attitudes towards technology in general and mobile payments in particular. Data analysis is currently in progress. We hope to contribute to theory, practice and government policy, while also igniting research interest in emerging markets like India.

Takeaways:

1. Mobile payments can help countries like India achieve financial inclusion.
2. Mobile payments adoption must consider consumers' technology readiness and inclination.
3. Mobile payments adoption depends on expectations of technology's performance and effort required.
4. Mobile payments adoption also depends on social influences and facilitating conditions.
5. Further research on technology adoption by consumers from emerging markets like India is required.

India's rise since its economic liberalization in 1991 has been dramatic. Resilient enough to weather the 2008 global economic downturn, India grew at 9.3%, elevating millions from poverty. Its' 1.2 billion population was predominantly young (60% in 15-59 age range) (Census India: India at a Glance, 2011), literacy rates had risen to 73% and the burgeoning middle class was changing the income pyramid from a triangle to a diamond. However, by 2013, growth dropped to five percent (Reserve Bank of India: Database on Indian Economy, 2014), largely seen as a consequence of slowing foreign investment due to structural, regulatory and market-based roadblocks. One such barrier was the failure to achieve inclusive growth – India ranked a low #81 for financial inclusion. Despite rising incomes and savings rate of nearly 81%, nearly 41% of the population was unbanked and in rural areas this was as high as 61% (Niyogi & Niyogi, 2012). Unsurprisingly, nearly 36% kept their savings at home (Business World, 2010).

Post-liberalization, the entry of private banks had increased competition and improved service, spurring government banks to transform. But rural penetration of banking services continued to be a problem. Of the 100,000 pan-India bank branches, just 5 percent were in rural areas (Sen, 2014). With limited reach into the 70 percent of India that still lived in its' villages, access to financial services remained constrained for most of the Indian population. Moreover, even in urban areas, disproportionately large segments of the population were low income or lived in poverty, and many were migrant laborers. Although they had access to banks they would likely not have the documentation required to set up bank accounts and/or the skills required to operate them. This situation was not unique to India. Despite the rise of technological solutions its' penetration and effectiveness remained limited, and nearly ninety percent of the world's population struggled without access to banking. They stored money at home, used friends and

family to move cash, and had to resort to unreliable, expensive or even usurious means to save, borrow or move money (Beshouri & Gravråk, 2010).

Both domestic and multinational banks were being pushed by the Indian government to provide banking services for lower socio-economic groups and rural populations but the cost of establishing branches in remote and rural hinterlands was too high. Moreover regulatory and/or banking policies meant that even the urban poor had trouble accessing such services. Many self-service technologies (SSTs) in banking, such as ATMs or Internet banking, were seen as a panacea for many of these challenges and they also offered cost savings. Transaction costs were Rs.50 (about \$0.83) at a bank branch, Rs.15 (about \$0.25) at an ATM, and only Rs.4 (about \$0.06) online (Gupta & Gupta, 2008). However, even these technologies had not proved to be effective.

Thus, the world was turning its attention to the millions of poor who had no access to financial services and this was from a profitable business model perspective not just a philanthropic one. Yet small deposits and loans, or far-flung infrastructure set-up was not profitable for traditional banking channels, and current technologies had failed to live up to the mark. In such a scenario mobile technology appeared to offer a potential solution because mobile deliveries reduces costs by 50 to 70 percent and thus is lucrative for providers (Beshouri & Gravråk, 2010). Additionally, mobile penetration and usage had been a significant success story all over the world. M-Pesa, a mobile payment system in Kenya, had successfully penetrated across socio-economic groups and geographies drawing attention to mobile as an enabler of financial services. Though M-Pesa was a payment system and not a complete banking solution, it fulfilled many of the immediate needs of people at the bottom of the pyramid such as the safety and convenience associated with cashless payments, and ease of money transfer. Indeed, mobile

payments can be seen as an interim step towards eventual adoption of more comprehensive mobile banking solutions.

Adoption of technology, including SSTs, has been studied extensively in the developed world. However, given the social, economic and cultural differences in other countries, especially emerging markets like India, the need for expanding such research to a global context was compelling and urgent. In particular, encouraged by the success of payment solutions like M-Pesa, our research goal was to examine the drivers and inhibitors of mobile payment adoption in India.

Mobile Payments in India

In the quest for rural expansion, many Indian banks, especially public ones, experimented with innovative ATMs to overcome usage and availability constraints by using local languages, technologies such as voice enablement (Union Bank of India, 2015), providing biometrics enabled access (Outlook, 2009), powering the ATM with solar energy (Rao, 2009), and enabling multi-usage (e.g., railway ticket bookings, cell phone recharge cards, and a variety of information such as news/sports/movie/weather/agribusiness prices (Banknet India, 2007)). Yet, by 2014 there were just 150,000 ATMs. The cost of setting bank branches and ATMs were too high in rural areas even though rural consumers were becoming wealthier and rural spending was compared favorably to urban spending (Jetley, 2014). Internet banking was also not a solution because it required more skills than just mere literacy and moreover Internet penetration languished at 19.7% in India (Internet World Stats: Internet Users in Asia 2014 Q2, 2015).

However, India had an impressive 930.2 million mobile phone subscribers (compared to 27.41 land line subscribers) of which 41% were in rural areas. Broadband penetration was higher

for mobile devices (60.19 million subscribers) than for land line subscribers (15.13 million) (TRAI, 2014). India was the sixth largest mobile market and in 2013-2015 its growth rate was expected to be 459.7% pushing it to third position globally (Azevedo, 2014). Mobile had long surpassed land line technology for communication and entertainment and was now beginning its foray into payments and potentially other financial services.

Mobile technology was showing promise in achieving what banks had not been able to so far despite their adoption of technologies for both back-end as well as front-end processes. Kenya had demonstrated that financial inclusion could be achieved with mobile payments, a non-banking model. M-Pesa launched by Safaricom (a division of Vodafone) in 2007, had turned simple cell phones into a financial services tool and airtime into currency, enabling deposits, withdrawals, payments, and money storage in e-accounts. By 2011-2012, M-Pesa had over 14 million subscribers in Kenya, easing money circulation, remittances, business transactions and sales, and lowering transaction costs for vendors (Tiwari, 2013). Nearly 70% of the adult population used it and 50% of those were poor, unbanked and rural, and so unsurprisingly 25% of Kenya's gross national product (GNP) flowed through M-Pesa (Amberber, 2014). Mobile payments enabled access to financial services, lowered cost of sending and receiving money, improved safety and security, and provided increased convenience (Beshouri & Gravråk, 2010).

Mobile payment solutions similar to M-Pesa were proliferating across the globe including in other emerging markets, such as SmartMoney and GCash in the Philippines. Banks, financial institutions and a host of unlikely contenders such as telecom companies and even post offices had begun offering solutions for banking, payments and other financial services. For example, the Mexican government was using its state owned Diconsa stores to provide savings and

insurance products as well as transfer government payments to households (Chaia, Schiff, & Silva, 2010). Both bank and non-bank led payment models were being launched.

Mobile money/payments opportunities varies across countries, and lack of access to financial institutions and land lines, had placed many emerging markets in Asia and Africa ahead of this curve as compared to the developed world. In a global survey, the proportion of respondents stating no intention of using mobile money transfer was lower in India (24%) than in the US (57%). Indeed, mobile money transfer usage was already 31% in India, 30% in Russia, 29% in China, but just 14% in Sweden. In India, 14% of respondents used money transfer and mobile payment at location services regularly (several times a week) while 17% used it occasionally (once a week or less). Globally, usage was higher amongst younger (25-30 age group) and urban populations, and some inhibitors to adoption were concerns about privacy and security as well as lack of relevance to needs and fear of over-spending (EY, 2014). However, for this to trickle down to lower socio economic groups in both urban and rural areas, much more had to be done. Research in India for mobile payments was in its nascent stages and mostly proprietary in nature. More academic or publicly available research would spur the launch and success of mobile payment solutions that were entering the Indian market.

India's payment industry, ranked fifth in the world, has been expanding rapidly with the 2009 estimate being \$14 billion in revenues and \$9 trillion in total payments, but this was still a fraction of the total potential given that the population was 1.2 billion strong. Payments can be made via banking channels, credit cards, cash or paper. The rise of electronic payments is mostly in the business to business space, while among consumers, payments flows and options are largely limited to the affluent and urban (top 30 cities) and only 48% of payments are electronic. Indeed, in 2009, only 20% of the 110 million debit cards issued and 50% of the 27 million credit

cards issued were active, so the base is small even though growth rates are expected to be around 43% and 33% respectively. Although increasing numbers as well as usage of credit/debit cards is a possibility for the future, the far wider prevalence and usage of mobile phones may well lead to a leapfrogging of technology in India's nascent consumer payments arena (Kamal, Thomas, & Tinaikar, 2009). Already, about 87 million transactions worth \$1.3 billion have been via various mobile payments modes including m-wallets and mobile banking (Kamal & Tripathi, 2013) but the potential is far larger.

Anticipating that mobile technology would become the key instrument for bridging gaps between the developed world and emerging markets, urban and rural areas, and also different socio-economic groups, a number of players have entered the Indian market. Eyeing a repeat of its Kenya experience, Vodafone launched M-Pesa in India in 2013 but managed to convert just 0.37 million active users (2.1 million registered users) by 2014 despite using 79,000 sales agents and marketing muscle to woo its subscriber base of 170 million. Similarly, Bharti Airtel's Airtel Money launched earlier in 2011 had an active base of 1.7 million by 2014 (Vikas, 2014). The players and market shares in the mobile telephony market were: Vodafone (18.69%), Idea (15.43%), Reliance (11.84%), Bharti (22.74%) and a host of smaller players (TRAI, 2014). The largest government bank, State Bank of India, had set up Eko, a mobile wallet, and Idea Cellular, the third largest telco in India, had launched its' own M-Wallet too.

Although mobile technology had proliferated across India for communication, its' use for financial services, had not yet become popular, despite its' demonstrated economic benefits (Anyaso & Otubo, 2009) and its immense potential for transforming the rural Indian economy. Mobile handsets were largely low end devices and not Internet enabled. Mobile banking regulations had been announced by the Reserve Bank of India only in 2008 and mobile payment

solutions had to be offered in collaboration with banks. For mobile banking, including payments, to gain traction, use of Internet enabled phones needed to dramatically increase or alternate systems would need to be adopted. Minus expensive smart phones and Internet plans, using text (SMS) for getting account information or conduct transactions seemed more realistic for increasing mobile banking penetration (Vinayagamoorthy & Sankar, 2012).

With mobile banking struggling to gain a foothold in India, the emergent view was that even an initial focus on mobile payments would be a huge contribution for achieving financial inclusion goals. Unlike banks that enable savings, mobile payments simply focuses on spending and transfers but its' impact is enormous. Adoption of mobile payments in India has been slower than in Kenya primarily due to a general lack of awareness of how the system works (Tiwari, 2013). The expectation is that adoption must first kick-start in metropolitan and tier 1 cities and then flow to tier 2 or tier 3 cities and eventually to rural India (Sen, Inclusion by Mobile, 2014).

Insights from Prior Research

Consumers' attitudes and emotions towards technology have been studied primarily in the developed world, with very little research on Indian consumers that could help understand factors that influence adoption of mobile payment systems. Research on adoption of SSTs in the Unites States indicated that interacting with technology rather than service personnel can impact consumers' perception of service quality, value, and loyalty (Parasuraman & Grewal, 2000). Benefits such as customization, flexibility, and greater effectiveness in delighting customers as well as recovering from service failures (Bitner, 2001; Meuter M. , Ostrom, Roundtree, & Bitner, 2000; Bitner, Brown, & Meuter, 2000), all help to build customer equity and loyalty (Rust & Kannan, 2003).

Adoption of technology depended on its usefulness, convenience, ease of use, need or avoidance of service employee, and social influence (Dabholkar & Bagozzi, 2002; Davis, Bagozzi, & Warshaw, 1989; Meuter M. L., Ostrom, Roundtree, & Bitner, 2000). Adoption of SSTs which entailed consumers participating in the service co-production (Bendapudi & Leone, 2003) also depended on consumers' attitudes (Curran, Meuter, & Suprenant, 2003) and emotions (Mick & Fournier, 1998), that contributed to their 'readiness' to adopt technology (Parasuraman, 2000). Further, while evaluating efficacy of SSTs, heavy users relied on their attitudes towards that specific SST while light users relied more on their overall attitude towards SSTs (Curran, Meuter, & Suprenant, 2003).

Ever since the 'Technology Acceptance Model' (TAM) (Davis, 1989) was proposed consumer acceptance of technology had been actively researched both by academics as well as firms, though mostly in developed countries. However, consumers varied in their degree of comfort with technology. Segmenting on the basis of consumer's degree of comfort with using technology for home or work, a Technology Readiness Index (TRI) has been developed (Parasuraman, 2000).

Although prior research has provided insights into technology including SST adoption, how it might be different in the Indian context remained an important knowledge gap with critical theoretical and managerial ramifications. Some recent research has emerged in related areas and in other emerging markets that can shed light on mobile payments adoption in India. For example, one study on adoption of online banking by Mexican consumers identified ease of use, compatibility, trust and human contact as key antecedents (Mansumittrchai, 2011). Also, availability, reliability, privacy and security concerns were critical for mobile banking but there

was little understanding of privacy needs and security concerns of Indian consumers (Vinayagamoorthy & Sankar, 2012). In Malaysia, (Amin, 2009) found that online banking adoption also depended on perceived provider credibility (security and privacy) and social norms for technology adoption (e.g., for displaying personal and social identity). Several studies on adoption of mobile payments in India have used small, convenience samples in limited number of Indian cities and found the impact of factors from the Technology Acceptance Model such as performance expectancy, effort expectancy, social influence and facilitating conditions (Thakur, 2013) and security, reliability, and user friendliness (Singh, 2014). Clearly more comprehensive and larger empirical studies were required to examine Indian consumers' attitudes and beliefs towards technology in general and mobile payments specifically, to identify the factors that influence the adoption of this technology.

Model Development and Hypotheses

This research aims to fill a critical gap in knowledge of emerging markets and mobile payments. In order to examine the factors that impact adoption of self-service technologies such as mobile payments by Indian consumers we draw upon previous extant research in technology acceptance primarily in the developed world, as well as some recent insights from emerging markets. In the rest of this paper we present a brief literature review of key antecedents that we propose would impact the adoption of mobile payments and the accompanying hypotheses, followed by our proposed model. Although data collection has been completed, data analysis is still in progress.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Technology Acceptance Model (TAM) comprising of perceived usefulness and perceived ease of use has been traditionally used to test adoption propensity (Davis, Bagozzi, & Warshaw, 1989). However, some TAM studies outside the U.S. have proposed extensions to the TAM by factoring in the impact of culture (Bandhopadhyay & Fraccastoro, 2007). Moreover, many alternate models and explanations for technology adoption have been offered since TAM. In response, (Venkatesh, Morris, & Davis, 2003) developed UTAUT a model that integrates elements from eight models –Theory of reasoned action, technology acceptance model (TAM), motivational model, theory of planned behavior, model of PC utilization, innovation diffusion theory and the social cognitive theory. The final UTAUT model included performance expectancy (i.e., expectation that the technology will improve performance), effort expectancy (i.e., ease of using the technology), social influence (i.e., degree to which others’ believed the technology should be adopted), and facilitating conditions (i.e., extent and type of support provided for adopting the technology). Based on the UTAUT, we propose:

H1a: Performance expectancy will positively impact consumers’ adoption of mobile payments.

H1b: Effort expectancy will negatively impact consumers’ adoption of mobile payments.

H1c: Social influences will positively impact consumers’ adoption of mobile payments.

H1d: Facilitating conditions will positively impact consumers’ adoption of mobile payments.

Readiness and Inclination to Use Technology

‘Technology Readiness,’ an individual’s propensity to embrace and use new technologies for accomplishing goals at home or at work, is based on two contributors (optimism and

innovativeness) and two inhibitors (discomfort and insecurity), that helped cluster five types of technology customers in the U.S: explorers (16%), pioneers (27%), skeptics (21%), paranoids (20%) and laggards (14%) (Parasuraman, 2000; Parasuraman & Colby, 2001). However, category types and sizes can vary by country (Rogers, 1995) (Lee, Choi, Jim, & Hong, 2007). For example, in China three segments identified were unconvinced (50%), responsive (29%) and adventurous (21%) (Elliott & Meng , 2009). In India where technology is a fairly new introduction, technology inclination i.e., willingness to fulfill life's needs with technology enabled methods rather than traditional methods, has been proposed as an important consideration. When customers have to give up traditional ways and use a technology-based option, then the availability and ease of alternatives and even their daily interaction with the technology may impact their comfort level. Based on this, we propose:

H2a: Technology readiness will ...

- (i) ...enhance the positive impact of performance expectancy on consumers' adoption of mobile payments.*
- (ii) ...enhance the positive impact of social influences on consumers' adoption of mobile payments.*
- (iii) ...enhance the positive impact of facilitating conditions on consumers' adoption of mobile payments.*
- (iv) ... reduce the negative impact of effort expectancy on consumers' adoption of mobile payments.*

H2b. Technology inclination will ...

- (i) ...enhance the positive impact of performance expectancy on consumers' adoption of mobile payments.
- (ii) ...enhance the positive impact of social influences on consumers' adoption of mobile payments.
- (iii) ...enhance the positive impact of facilitating conditions on consumers' adoption of mobile payments.
- (iv) ...reduce the negative impact of effort expectancy on consumers' adoption of mobile payments.

Consumer Demographics

We also propose the moderating influence of demographic factors such as age, gender, education and income. Findings from various technology readiness studies conducted have shown that young, male, educated and high income consumers tend to be more comfortable with technology, and accordingly we propose their moderating influence below.

H3 a-d: Consumer demographics moderates the impact of UTAUT variables on adoption of mobile payments as follows:

H3a. The impact is more negative for older than younger consumers.

H3b. The impact is more positive for males rather than female consumers.

H3c. The impact is more positive for more rather than less educated consumers.

H3d. The impact is more positive for higher rather than lower income consumers.

Based on the above, we present our proposed model in Figure 1.

[Insert Figure 1 about here]

Research Plan

We conducted a four city survey in India (Tier 1 and Tier 2 cities) in June 2015, and obtained a sample of 600 adult consumers of socio economic groups that closely reflect the general population. A paper and pencil survey was administered in multiple language options (English, Hindi and the local state language) by researchers from a local market research agency, and the responses were translated. We are currently in the process of analyzing the data and therefore cannot include the findings at the time of submission of this paper. We look forward to presenting the results at the time of the conference.

Potential Academic and Managerial Contribution

Mobile payments can transform payment systems across the socio economic spectrum, so that lower socio-economic groups can also become an intrinsic part of India's growth story. By identifying factors determining the adoption of mobile payments in India and providing a theoretical framework, we aim to contribute to the growing body of knowledge in adoption of self-service technologies especially in a global context. Our work will also inform the adaptation of scales such as the Technology Readiness Index for international applicability. The research findings would enable mobile operators, banks and other companies in offering mobile payment solutions to consumers for safe, convenient and accountable transactions. In particular, we hope that this research will inform policy decisions in India for using mobile payments as a route towards achieving its financial inclusion goals.

Future Research

As India prospers, the promise of technology in facilitating market expansion will continue to attract domestic and international companies from a variety of industries. Yet, even amongst Asian economies, India has been known to show certain distinctiveness. Thus, any study of Indian consumers must take into account the large diversity of the Indian population, its historical and culture roots, and value systems. Further, this understanding must be viewed in the context of India's geographical expanse, infrastructural constraints, and socio-economic realities for which perhaps ethnographic studies may be particularly useful. For businesses, addressing the financial, technological, and social challenges posed by India's diversity requires a concerted research agenda and innovative thought. The mobile payments industry is the context of our current work because it plays a critical role in the socio-economic development of India and financial inclusion at low cost can only happen by leveraging technology (Indian Express 2008). Global research indicates that technology based services should provide the same high level of service as a human interaction (Bitner 2001). Further, along with the inherent amenability of the technology to adoption, consumers' attitude towards technology must also be taken into consideration.

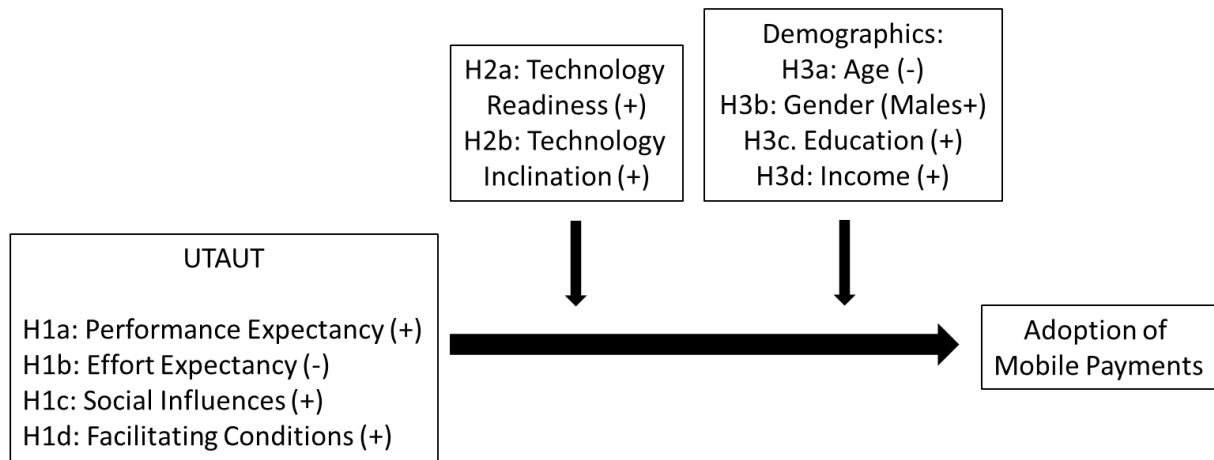
The immense diversity of the country added several layers of complexity to our task of obtaining a representative sample from across India. We emphasize a compelling need for more concerted research focus on Indian consumers' attitudes and beliefs about technology in general

and mobile payments in particular for extending banking and other financial services such as payments to areas and socio-economic classes with hitherto unbanked consumers.

By developing a model and to explain Indian consumers' the drivers and inhibitors of mobile payments adoption and offer propositions, we hope to spur further research into this area of critical importance not just in India but also in similar emerging economies. We also hope to spark research interest in how the consumption behavior of Indian consumers compares to that of their counterparts in other markets. In doing so we would also address the issue of limited information and data availability on India, in the public domain, which is a key limitation of our work as well. Although in this paper we focus on payments our line of thought could be applied not just for banking and financial services, but to any industry competing in India or in other emerging markets which uses mobile technology as a mode of delivery.

We believe that studying consumers' attitude towards and usage of mobile payments in India will yield valuable insights that likely differ from those gleaned from other parts of the world. With this research we want to contribute to academic knowledge in the domains of adoption of technologies such as mobile, and consumer behavior in emerging markets. We believe this work will also strategically prepare businesses in building long-term, mutually beneficial relationships with Indian consumers. Most importantly, it will help the India 'bank the unbanked' to fulfill its financial inclusion goals.

Figure 1: Drivers and Inhibitors of Mobile Payments Adoption



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