

Over the next ten years (and beyond) we're set to see even faster changes in the payments landscape, and the emerging markets will be at the forefront of this payments transformation.

Emerging Markets Driving the payments transformation



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89% of payment executives in emerging markets believe their product development and go to market model needs to change in order to meet future customer expectations¹.

Executive Summary

The dynamic nature of emerging markets creates challenges that have never confronted the developed world, but also opens up opportunities for innovation and growth. Payments is an area where this dynamism is already well-established.

Over the next ten years (and beyond) we're set to see even faster changes in the payments landscape, building on the accelerating growth in electronic payments and the advent of new and disruptive market players. And the emerging markets will be at the forefront of this payments transformation.

Cutting-edge technology will reshape the next-generation payment systems, with both FinTech and established players driving innovation. The payments ecosystem will also be redefined by regulatory interventions, which are balancing the disruption of alternative payment service providers (PSPs) and the reliability of traditional players.

The growth in economic power within the emerging markets and their ability to leapfrog developments in mature markets will aid the creation of a state-of-the-art payments ecosystem, which will set the pace for markets worldwide. Payment platforms will evolve from being commoditised propositions to strategic solutions that complement and add value to people's lifestyles. While banks can often have a limited understanding of their customers and operate a vastly complex product set, the winners of 2030 will turn this on its head. They will develop a much more comprehensive understanding of their customers and dramatically simplify their product range. The result will be a significantly enhanced customer experience, with lower levels of operational risk and much more customer-centric business models. The key factors shaping this transformation will be the impact of technology, shifting customer expectations, changing global demographics, the rise of e-commerce and the growing impact of regulation.

In 2030, payments will be much more than just the movement of funds. PSPs will develop enhanced value propositions based on individual accessibility, coupled with customer convenience and changing lifestyles, while ensuring adequate levels of security and risk mitigation. The shift has already begun and is being led by the entry of non-traditional players, the emergence of new solutions, and the development of strategic partnerships that cross traditional industry boundaries. The transformation will be characterised by convergence across markets – convergence around products and solutions linked to payments, around technology platforms and even regulations – that will be global in nature and reach.

The young 'tech-savvy' populations of the emerging markets will lead the shift in payments expectations among retail and commercial consumers. The drive for innovation will also accelerate development in areas such as blockchain technology, which promises to simplify international remittances and reduce transaction times by more than half.

In this paper, we examine the current state of the payments industry across the emerging markets, identify key drivers and developments already underway and determine what is required to realise the market potential between now and 2030. A key focus of the paper is the steps being taken by merchants, customers, payment companies, regulators and PSPs towards creating a successful electronic payments infrastructure.

¹ PwC payments 2014. In 2014, PwC surveyed 353 senior leaders from global, regional, national and community banks as well as payment providers, processors and intermediaries across 18 markets on the possible future shape of the payments market in 2020. 116 of the participants came from emerging markets.

Setting the pace

1.1 Macro drivers for emerging markets

A combination of digital native expectations and governments' desire to boost financial inclusion and reduce the use of cash is fuelling rapid growth in electronic payment and bringing a new breed of mobile and FinTech innovators into the payments market.

1. Favourable demographics: The drivers of online payments

The emerging markets are home to 85%² of the global population. India and China's 2.5 billion people³ alone represent more than a third of the world's population, making even modest market developments in fast growing economies extremely significant. Customer expectations are driving a significant change in the payments industry in these countries.

Nearly 90% of people under 30 reside within the emerging markets⁴, and based on research in India, this is also the age segment that accounts for most online transactions (some 75 %)⁵. Given the demographics, these markets are currently finding themselves at a 'sweet spot' where population trends favour the growth of online transactions, which are in turn curtailing the black economy and stimulating economic growth.

Looking at the bulging age pyramids of India and Indonesia (see Figure 1), we can see that the main online transacting population (15–34 years) will move to the next age level over the next ten years and continue to transact online, thus increasing the percentage of active users by at least 15%. Other countries that have similar demographic trends include Brazil, Philippines, Malaysia, Turkey and South Africa⁶.



2 Euromonitor International: Reaching the emerging middle class beyond BRIC, 2014

3 World Bank resources – population figures, 2014

4 Euromonitor International from national statistics/UN, 2014

5 PwC: eCommerce in India, Accelerating growth, 2015

6 Columbia management perspectives, 2012

Figure 1: Age and gender pyramids for Indonesia and India



Source: CLSA/Hokenson and Co.

This 15–34 age group also has a strong appetite for new technologies. It is this tech-savvy generation that has transformed digital solutions from being a convenience to an essential part of how people transact. A tipping point is being reached, where over the next several years, the global middle class will expand dramatically, driving consumption to an all-time high. This will be one of the key drivers of the growth in electronic payments in the emerging markets.

Further drivers of growth include rapid urbanisation and rising literacy levels. The strong correlation between literacy and income levels has turned these economies into the powerhouses of middle-class consumer demand, which lays a solid foundation for the progress of digital payments driven by rising consumption.

It is the tech-savvy generation that has transformed digital solutions from being a convenience to an essential part of how people transact.

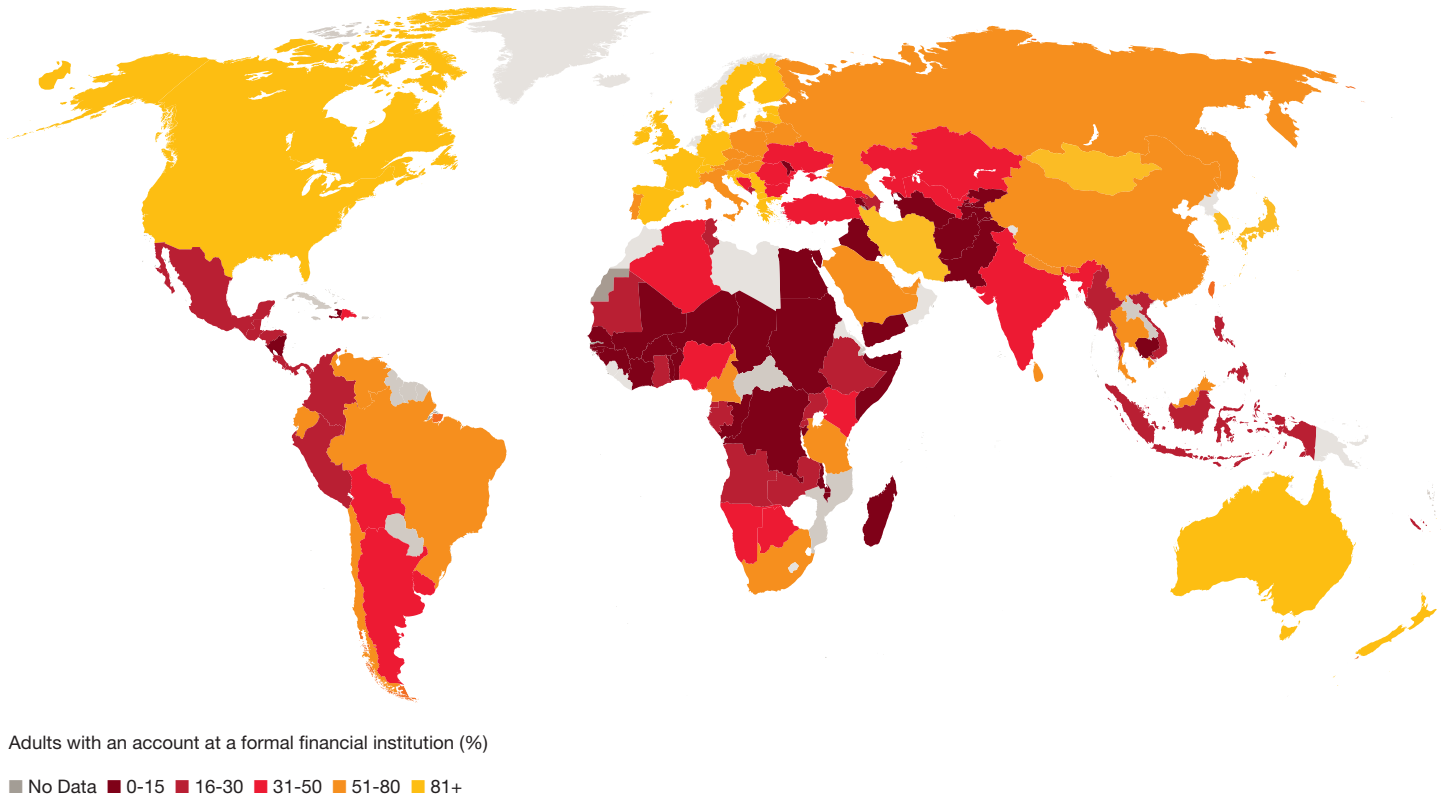


**2. The need for financial inclusion:
Driving new technologies and innovations**

Two billion adults worldwide are unbanked⁷ and some of the lowest rates of financial penetration are in emerging markets (see Figure 2). Traditionally, banks have been the primary means of accessing financial services. But given the problems of reaching branches in geographically remote communities, the question is how to deliver affordable and accessible financial services. Although literacy rates and urbanisation are on the rise, digital awareness and access to basic financial services still pose a major challenge in these economies.

To meet the need for financial inclusion, there has been a rapid expansion of new technologies and innovations, which are helping to make it more economically viable for banks to reach the ‘unbanked or ‘underbanked’ populations. Technology has leapfrogged from branch banking to e-banking and now mobile money, which has helped to create pockets of strength even amongst the less financially inclusive countries. Around a fifth of the adults in Vietnam and Thailand have savings at a financial institution, while around two-thirds of the adult population in Kenya make or receive payments using their mobile phones⁸. With the cost of serving customers considerably lower for automated teller machines (ATMs), interactive voice response (IVR), mobile and online banking (see Figure 3), these alternative banking channels have seen a massive increase in adoption both at the retailer and customer end.

Figure 2: Banking inclusion rates

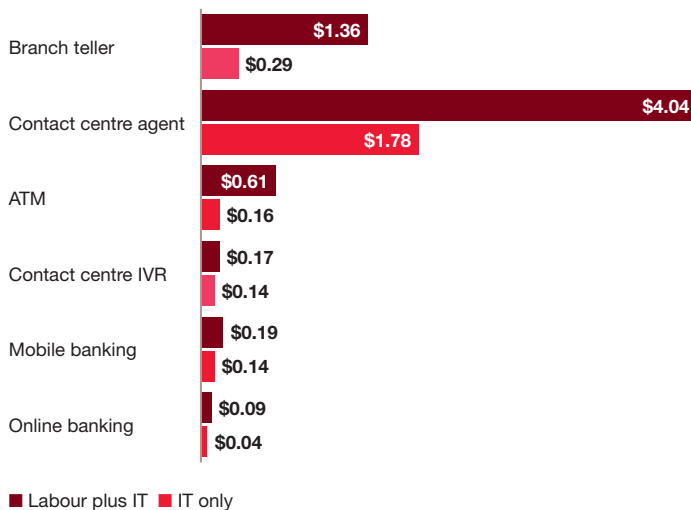


Source: World Bank, Global Findex (Global Financial Inclusion database), 2014.

7 World Bank media release, 15 April 2015

8 Standard Chartered: Financial Inclusion: Reaching the unbanked, 2014

Figure 3: Customer serving cost per channel (USD)



Source: CEB Insights

Several governments are also making financial inclusion an integral part of their national plans. The Indian government, for example, launched the 'Aadhaar' card programme. Aadhaar is a 12 digit individual identification number issued by the Unique Identification Authority of India on behalf of the Government and enables online and cost effective identification for every resident Indian. Innovations leveraging the 'Aadhaar' card are expected to assist the financially excluded segments with the explicit aim of removing financial untouchability. In Mexico, concerns about the high cost of credit and lack of competition in the banking sector have led to major financial reforms aimed at strengthening regulation, increasing competition and lowering the cost of borrowing.

Regulation – The key enabler for electronic payments

Regulators in emerging markets are now waking up to the huge costs, risks and inefficiencies that come with cash transactions. They recognise that economic growth is directly proportional to the increase in usage of electronic payment methods, as it acts as a tool to combat fraud and 'black' money (income illegally obtained or not declared for tax purposes) and also promotes access to formal credit and savings instruments thereby driving GDP growth. Hence, drastic measures are being taken to build a sustainable electronic payments ecosystem.

The desire to accelerate development has encouraged many governments to open their markets to non-bank players. Although full service banking is the dominant and preferred banking model across the globe, regulators in markets like Singapore, Hong Kong (China), and emerging markets like India and Indonesia have introduced a differentiated banking licence for both bank and non-bank players aimed at furthering financial inclusion. Other measures such as the regulation of e-money by the Central Bank of Kenya (CBK) can help to provide a clearer legal basis for market operations and encourage new entrants into the payments market. For example, e-money licenses which enable proportional KYC requirements to lower requirements for opening accounts.



BOLSA FAMÍLIA PROGRAMME (BFP), BRAZIL

BFP is one of the largest Conditional Cash Transfer (CCT) programmes in the world, benefiting some 11 million poor families. It provides financial aid through Citizen Cards which operate like a debit cards and are issued by a government-owned savings bank. The funds can be withdrawn at any of the bank outlets.

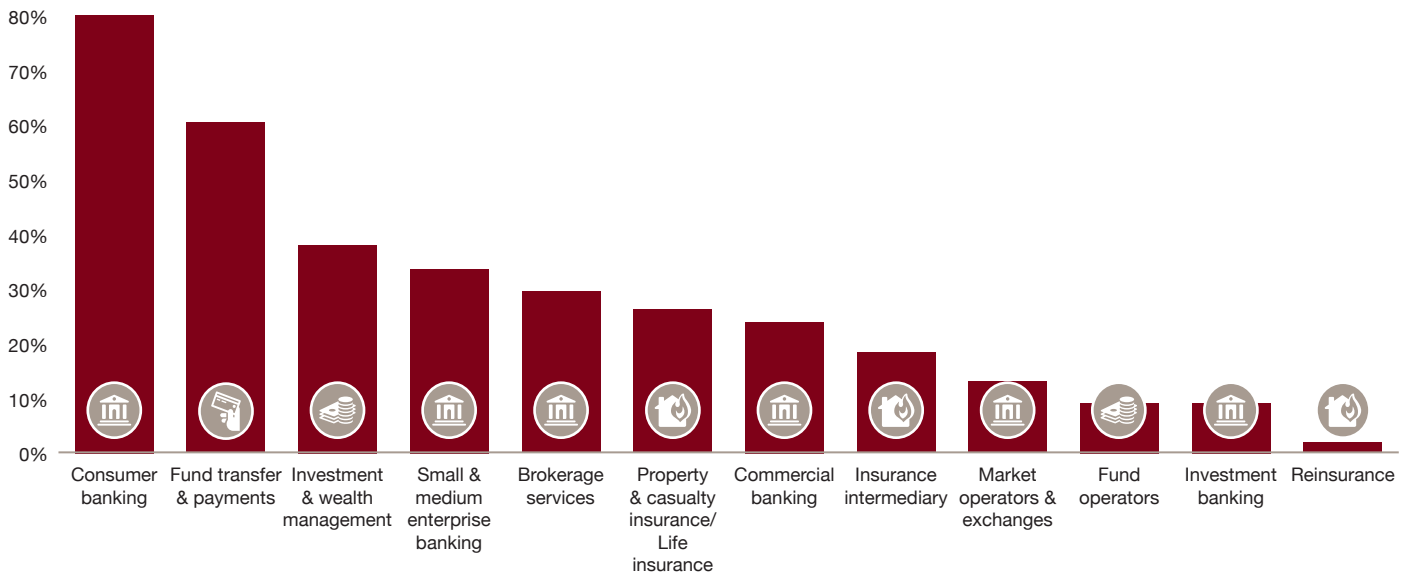
This practice has helped reduce corruption and leakage of funds by channelising the grant through an electronic medium leading to a reduction in the circulation of cash.

3. FinTech innovation promotes inclusion

Traditionally, banks have been the primary source of access to financial services, with services ranging from providing a secure account for payments transactions to borrowing and insurance. However, by opening up the banking market to non-bank players, regulators are bypassing the requirement for banking institutions to being able to provide a full spectrum of financial services. This has brought about what is increasingly being known as the 'FinTech Revolution'. Using innovative technology as a key enabler, regulators are encouraging FinTech firms to make financial services more secure and convenient for customers. From payments to wealth management, from peer-to-peer lending to crowdfunding, a new generation of start-ups is forging new and disruptive business models.

The funding of FinTech start-ups more than doubled in 2015 reaching \$12.2 bn, up from \$5.6 bn in 2014.⁹ Payments is one of the areas that is most likely to be disrupted (see Figure 4).





Figure 4: Which part of the financial sector is likely to be the most disrupted by FinTech over the next 5 years?



Source: PwC Global FinTech Survey 2016

⁹ Source : PwC Global Fintech Report, 2016

Figure 5: Payments infrastructure and modes in emerging markets

		Merchant	
		Card	Mobile
Customer	Card	 <p>POS, ATM</p> <ul style="list-style-type: none"> • Brazil Urban • India Urban • Mexico Urban • Nigeria Urban • South Africa 	 <p>mPOS, mobile wallets</p> <ul style="list-style-type: none"> • India Urban • China Urban • Brazil Urban (Stelo)
	Mobile	 <p>NFC, Contactless</p> <ul style="list-style-type: none"> • Brazil Urban 	 <p>Mobile remote</p> <ul style="list-style-type: none"> • Kenya • South Africa • Nigeria

Source: PwC Analysis

4. Improving acceptance infrastructure

The growth of electronic payments depends on an adequate acceptance infrastructure comprising ATMs, agent networks (MNO agents or retail agents) & POS (or Smart POS) terminals. Governments are promoting developments in card acceptance infrastructure, and in turn increasing debit and credit card usage in emerging markets. Branch and ATM growth rates from 2012–2014¹⁰ in countries including China, India, Indonesia, Malaysia, Thailand, Philippines, Taiwan and Hong Kong show a fall in the numbers of branches. Conversely, ATM growth in countries like Hong Kong, China and Indonesia demonstrate a growing shift to ATM channels (see Figure 5). The Reserve Bank of India (RBI) has allowed non-bank entities to set up ‘White Label ATMs’ (WLA) in smaller centres, which is leading to an annual

growth rate of around 25%¹¹ in the ATM network. In countries like Brazil where the absolute ATM penetration is higher compared to other emerging nations (12.9 ATMs per 10000 people¹²), which is almost double the number in South Africa and more than ten times that of Kenya and Nigeria, the utilisation is still low owing to low interoperability of the machines. The government is planning to issue guidelines to ensure interoperability of the ATMs for customer convenience. In Kenya, the number of ATMs increased from 2487 in 2013 to 2613 in 2014 owing to commercial banks business expansion strategies driven mainly by the need to increase card usage.¹³

¹⁰ The Asian Banker research report, December 2015

¹¹ IDRBT: Technology in banking, 2015

¹² World Bank ATM figures, 2014

¹³ Central Bank of Kenya, POS figures, 2016

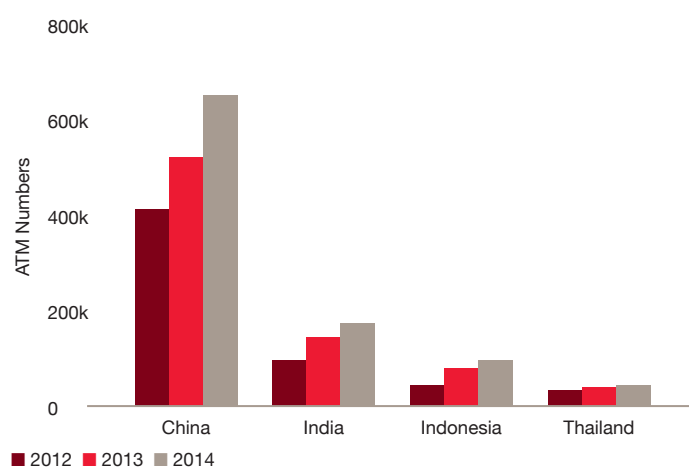
Point-of-sale (POS) transactions have also seen an increase with the rapid adoption of POS terminals by the large base of SMEs and micro-merchants in emerging markets. But in terms of reach, POS terminals are only able to do so much. For example, India has over 400 million credit and debit cards and 40 million retail outlets, but only one million terminals.¹⁴ POS density in Kenya is currently 58 machines per 100000 people (23095 machines), 2016¹⁵ limiting card usage avenues for shoppers. Brazil has almost 4.5 million POS terminals deployed in the country according to the Bank for International Settlements (BIS) but utilisations are low because of lack of interoperability among networks. To counter these problems, governments are looking to capitalise on growing smartphone penetration. As a result, the adoption of mobile devices for POS transactions or mobile POS is exploding worldwide, especially in emerging markets as retailers and consumers alike become more accustomed to making payments through mobile devices.

SMEs in emerging markets do not have high investment capital and hence are restricted in the ways they can accept payments from customers (most accept 'cash-only' payments). Here mobile POS platforms open up an affordable channel for them to accept non-cash payment from cards and mobile. Considering the growing market of mobile phones and tablets, mobile POS systems require less up-front investment and their maintenance is more economical than the conventional POS systems. The industry is also seeing the impact of the new smart POS bundle, which is creating high value for SMEs. Many merchants are seeking to replace the traditional fixed payment terminals and cash registers with tablets linked to mobile POS devices or smart POS. In Brazil, there are over 22 million SMEs¹⁶ and micro-businesses and a mobile penetration of upwards of 132%¹⁷, which has created a fertile ground for mobile payments. Integrating a mobile POS device to an Android/iOS app on a tablet to create a smart POS is much easier than integrating a traditional payment terminal with Windows-based electronic POS software. This allows the tablet based electronic POS vendors

to expand the reach of 'integrated payments' to a large volume of SMEs, a feat not easily achieved by traditional payment terminals. Brazil has seen the emergence of multiple mPOS system providers, which have contributed significantly towards developing the mobile infrastructure and hence increasing the volume of electronic payments in the country.

Although, penetration of POS (or mPOS and smartPOS) terminals is an important enabler for driving electronic payments, it is essential to note that the success of POS is dependent on card penetration. In countries with low card penetration but high mobile penetration, what might also turn out to be a feasible solution is to remotely push payments from customer to business through mobile phones.

Figure 6: Emerging markets show explosive growth in ATM infrastructure



Source: The Asian Banker research, December 2015

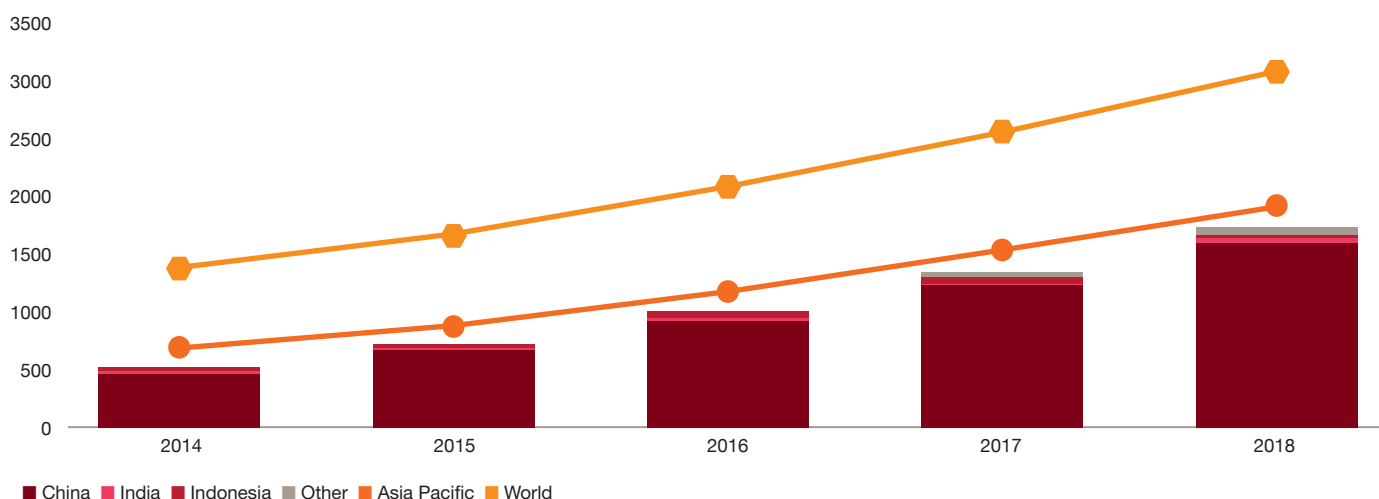
14 Inc42: DhanYojna Will Give A Fillip To Card Based Payments, 2015

15 Central Bank of Kenya

16 Banco Central do Brasil, 2014

17 Banco Central do Brasil, 2014

Figure 7: Retail e-commerce sales in Asia-Pacific countries 2014-2018E, \$Bn



Source: eMarketer, 2015

5. Customer adoption and rise in e-commerce

Increasing convergence and integration between e-commerce and mobile technology have radically changed the shape of the payments marketplace. Globally, e-commerce is a vast and rapidly growing market (see Figure 7). With the continued development of online purchase tools and increasing consumer acceptance and confidence, emerging markets are driving the ongoing global acceleration of e-commerce spending. One of the major drivers of this growth has been the proliferation of smartphones and tablets, internet/mobile access, which is serving as a convenient, cash-free and card-free financial transaction medium, and is helping to promote financial inclusion. There is an exponential growth in mobile phone penetration, which now exceeds 100% in countries like Brazil with 141 handsets per 100 people¹⁸; countries like South Africa, India and China with mobile penetration rates of 90%, 84.6% and 76%¹⁹ are following suit.

There is a rapid development of new payment concepts and business structures based on mobile infrastructure initiated by the online retailers and payment service providers. This has the potential to displace traditional cash with other electronic modes of payments by helping to make consumers more comfortable with making electronic payments.

While most transactions in emerging markets are still being made with cash, the shift to electronic and digital methods is happening rapidly with some countries moving away from cash faster than others. For instance, in Indonesia, only 31% of transactions are conducted using non-cash methods with the number of cashless transactions growing at an annual rate of 23%²⁰. Non-cash payments in emerging Asia are growing by 22%²¹ owing to increasing internet use and the adoption of mobile payments. Conversely, with an estimated 90% of transactions still being made in cash, electronic transactions are increasing at a comparatively modest rate in Mexico, with only 8% of Mexicans having used electronic payment methods in the past 12 months²².

18 World Bank – mobile phone penetration data, 2015

19 World Bank – mobile phone penetration data, 2015

20 MasterCard: Cashless journey spotlight, 2013

21 Firstdata: Non cash payments growing, 2014

22 Institute for Business in the Global Context Working paper: Cash Outlook, Mexico, 2013



69% of emerging market payment executives believe that their organisation is very prepared (28%) or somewhat prepared (41%) to roll out more technology-centric payment offerings. Participants in Europe and North America are less prepared²⁵

In India, debit card transactions have seen year-on-year growth of 43%, whereas the growth in credit card transactions has been along the same lines with 27%²³. The same upward trend can be seen in Brazil, with the number of debit and credit card transactions growing at 17% and 11% respectively²⁴, resonating with the trend of increasing card spend volume and transactions for both debit and credit cards in emerging markets.

1.2 Demystifying innovation in payments

The emerging markets are constantly innovating in the field of payments, from using low cost mobile money for remittances to enabling differentiated banks for financial inclusion. We are now set to see even bigger innovations in these economies. Whether measured by value or volume, the payments business in these markets is vast and will continue to expand between now and 2030. A number of factors and trends – some already impacting the industry – will play a critical role in shaping the nature of this expansion and driving innovation.

Here, we analyse, what is it that is driving these countries to develop new and unique payment propositions ranging from areas as varied as online commerce and local agricultural trade. Is it the high population of young and tech-savvy consumers in countries like Brazil, India and China which is raising the need for innovative products or is it the cutting edge technology which is driving easy to integrate customer centric business models?

The pace of technological development differs between established and emerging economies. With a lack of conventional payments infrastructure, and in the absence of a legacy technology, emerging markets are leapfrogging developed economies and coming up with cutting-edge technical platforms. But why are these economies able to innovate consistently, how are they able to overcome substantial barriers to change and yield business models that more often than not result in an overwhelming success?

A nation's competitiveness depends on the capacity of its industries to innovate, which in turn depends on the market conditions that each nation establishes for its industries. As Michael E. Porter discussed in *Patterns of National Competitive Success*, the playing field is based on four key factors or the diamond of national advantage as discussed below²⁶.

- *Factor conditions*

A nation's key factors of production are necessary to compete and challenge the status quo. Innovation or entrepreneurship being an important input factor is in abundance in emerging economies, driven by the pool of intellectually motivated young individuals that attract investments and create a cycle of economic growth.

- *Demand conditions*

Some three in five adults in emerging markets are unbanked and more than half of the transactions are still conducted in cash²⁷. This creates a huge gap between the supply and the demand for payments and financial services products. Governments are realising the potential economic benefits of a banked population, booming financial sector and the growing population of young-tech-savvy individuals who are willing to experiment with new business models in order to gain access to better products and services.

- *Market rivalry*

Governments in emerging markets tend to open up the market to non-bank players to widen access to financial services. This is creating a new breed of start-ups or FinTech companies who are challenging and evolving the existing business models, while developing new ones in the process. In India, for example, the funding for FinTech firms has grown over 70% in the last five years. In 2015 alone, the investments in FinTech related startups in India have crossed the billion mark.²⁸

- *Support industries*

The presence of competitive supporting industries boosts the chances that companies will be prepared to innovate by coming up with different business models. The booming smartphone market in emerging economies, availability of low cost infrastructure like mPOS, smartPOS and near field communication readers to replace traditional channels like ATMs, cashless drives from the Government and differentiated banking licences to non-bank players like telecoms are just a few factors that are supporting the growing innovations in developing markets.

²³ Worldline: India Card Payments Report 2014-15

²⁴ PwC research on card transactions, 2014

²⁵ PwC Payments Survey 2014

²⁶ 'Patterns of National Competitive Success' by Michael E. Porter, Harvard Business Review (<https://hbr.org/1990/03/the-competitive-advantage-of-nations>)

²⁷ World Bank: Who are the unbanked? 2012

²⁸ Track.IN funding tracker (<http://track.in/India-startup--investment-2015/funding>)

With innovations set to shape the new payments generation in emerging markets, discussed below are the emerging megatrends that are set to drive the change in the payments industry in the coming years.

A. Tech-savvy generation driving change

As many emerging markets have skipped steps taken in more developed countries like implementation of landlines, desktops and dial-up internet, the young and tech-savvy generation is adopting new technologies – including wireless, mobile and app usage, and mobile banking at a rapid rate. Indonesia is one of the largest smartphone markets in the world and there are currently more than 280 million mobile subscribers.²⁹ Kenya is leading the developing world in mobile payment technology, with transactions sent through the M-Pesa network, representing about 25% of Kenya’s GDP.³⁰

The millennials’ comfort with technology is driving businesses to provide new and more innovative ways of enabling transactions, reflecting the demands of this tech-savvy generation (see Figure 8).

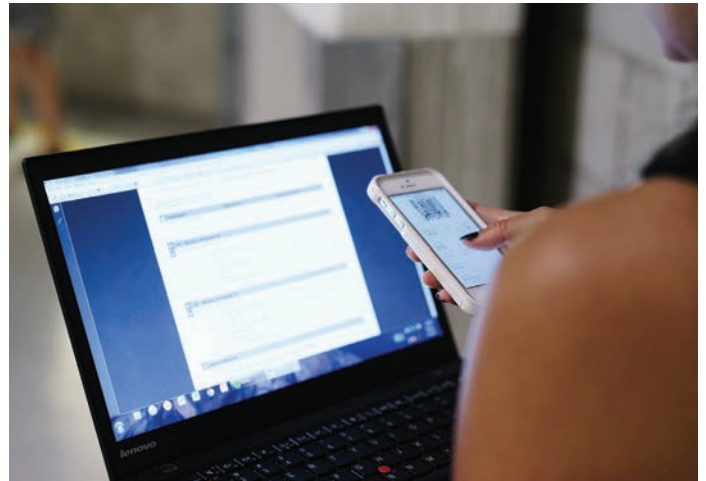
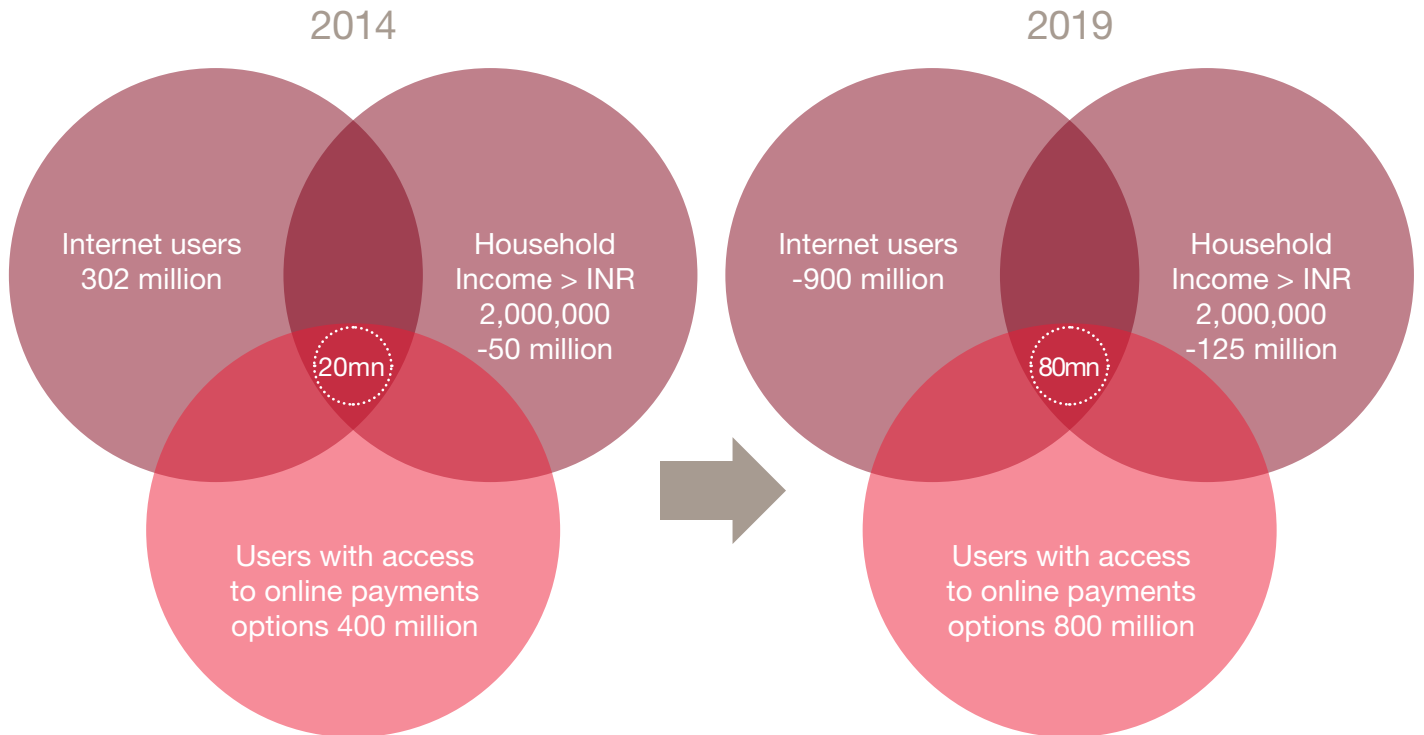


Figure 8: Online payment development in India



Users transacting over online channels

Source: PwC analysis on eCommerce trends, 2015

29 Huffingtonpost: Are the Emerging Markets Driving Innovation in Mobile Technology, 2015

30 NBER: The impact of mobile banking in Kenya, 2015

More than 50% of consumers in the age group 18-24 are likely to try new technology-enabled payment tools.³¹ Whether it's renting movies, purchasing coffee or reserving a rental car, providing an alternative payment option that caters to the increasingly digital lifestyle of the consumer has great potential for merchants to gain a new generation of loyal customers.

Much of the customer behaviour we're seeing today is being driven by experiences and innovations created outside financial services. Some of these are as follows:

- *Individual accessibility (anywhere, anytime, right now)*
Customers want it now not later. This is driving payments companies, financial institutions and even regulators to innovate and offer services like real-time fund transfer and express delivery.
- *Customised on-demand products/services*
No two customers are alike and people now want everything customised to their individual needs. Banks today are using customer intelligence and predictive analytics to deliver a customer experience that not only seamlessly flows between channels, but recognises and then adopts to each customer's unique needs.
- *Innovation driven by consumer lifestyle*
Digital natives want everything to suit their lifestyle and changing habits. A card scheme company is aiming to redefine the rules of the selfie with their new facial recognition technology that can be used to authenticate online payments. A financial services company recently piloted the feature that works through an app, which is linked to the card account. This promotes convenience as, instead of trying to remember yet another password, a user can simply verify the transaction with a selfie.

B. Customer-centric business models

The need for innovative and value-added payment services is leading to the emergence of a number of non-traditional business and operating models for enabling payment. Banks are facing growing pressure to overhaul their traditional operating models and focus on an approach that is more customer-centric.

The key to customer-centricity is a comprehensive understanding of customer needs and matching them with market offerings, which enables businesses to continually upgrade the customer experience. This is in contrast to the product-based approach traditionally followed. Customer-centricity will be the main driver for differentiation in the payments industry, and industry players must apply this thinking for their businesses to grow.



More than 50% of consumers in the age group 18-24 are likely to try new technology-enabled payment tools.



³¹ American Express : Consumers on the Future of Payments: Millennials to Lead Adoption & Security is King, 2012

The opportunity for banks and mobile operators is huge. There are more than two billion people in emerging economies who have access to mobiles but not banking.

Some of the disruptive business models that have emerged in emerging economies are discussed in the section below:

1) Mobile phones as a medium of customer acquisition and customer servicing

In emerging markets, formal banking reaches about 40% of the population,³² compared with a 90%³³ penetration rate for mobile phones. For every 10,000 people, these countries have one bank branch and one ATM³⁴. However, for the same number of people, there exists 9,000 mobile phones.

A new focus on bringing financial services to unbanked and underbanked consumers represents a strategic shift for mobile operators. Micro-deposits and loans held by underprivileged customers make it unprofitable for banks to use traditional delivery models. Mobile devices reduce the cost to serve customers by 50 to 70%³⁵, making it possible to offer financial services to a vast population once considered unprofitable.

Traditionally, banks have relied on last mile connectivity³⁶, calls and referrals to expand their customer base. However, with a lack of conventional payments infrastructure in significant portions of the emerging markets, banks have had to innovate and develop models based on mobile banking to address the fundamental need for financial inclusion by utilising mobile phones to acquire customers.

The opportunity for banks and mobile operators is huge. There are more than two billion people³⁷ in these economies who have access to mobiles but not banking. This could generate revenue from transaction fees for financial services and further earnings on loans and deposits.

In Kenya, the unprecedented success of M-Pesa is one that is widely known, but other examples of success in mobile payment implementations are now growing in numbers as well. Sixteen countries have more mobile money accounts than bank accounts. These include Burundi, Cameroon, the Democratic Republic of Congo, Gabon, Guinea, Kenya, Lesotho, Madagascar, Paraguay, Rwanda, the Republic of the Congo, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe³⁸.

2) Differentiated banking licences

Though the full service banking model is the dominant and preferred model across the globe, there are countries like Singapore, Hong Kong (China) and emerging markets like India and Indonesia that now offer differentiated banking licences in order to further financial inclusion in the economy. The criteria for differentiation could be based on either capital conditions, as is practised in Indonesia or to the activity as is the case in Singapore and Hong Kong. A successful differentiated banking model involves challenges including maintaining systemic stability, while encouraging the simultaneous operation of different kinds of banks, and making sure that no bank can indulge in regulatory arbitrage.

Differentiated licences can tap into the diverse opportunities that exist in the banking and financial landscape by promoting niche banking through specialisation, which can help make more efficient use of resources.

In India, the new payments banks (who cannot lend but can borrow up to a limit) are expected to start operations in 2016. They want to change the country's payments landscape by altering the way transactions take place. Since the focus of these banks will be solely on transactions, they will look at providing seamless transaction options for payments such as utility bills, mobile bills, and school or college fees, either electronically or through the banking touch points created by these players. At the core of this change will be technology, which in addition to maintaining current standards of reliability, is expected to also reduce transaction times, improve security, and – in the case of merchants – lower transaction costs. Depending on how quickly they develop their business models, payments banks are likely to be big disruptors in the near-term.

3) Consolidation of payments and banking infrastructure

Owing to the lack of interoperability in the bill payment process, as well as the lack of access to various modes of electronic payments by a vast majority of customers, the existing payment systems in emerging markets do not fully address the needs of consumers.

In India, the fragmented bill payments market is undergoing a major consolidation, with the central bank creating a centralised bill payment system that will allow customers to use a single website or outlet to pay all monthly or repeat bills. Each year, the top 20 cities are generating \$100 bn in bill payments³⁹. These transactions are still largely being carried out by cash or cheque. However, a large portion of the bill payments are expected to move online in the coming years through a layer of interoperability created between various bill payments platforms. The Bharat Bill Payment System (BBPS) is expected to serve as an efficient, cost-effective alternative to the existing options and, given the scale at which the integrated bill payment system will be launched, it will reduce costs for consumers.

32 World Bank resources – financial inclusion figures, 2015

33 World Bank resources – teledensity figures, 2015

34 PWC: Destination India – Banking Opportunities - Entry Strategy and the Road Ahead, 2010

35 The Essential Microfinance by A Ramesh Kumar and Moin Qazi, 2016

36 Refers to the connectivity between banking delivery network and the retail end customer especially in remote areas in a country.

37 World Bank resources – mobile phone penetration data, 2015

38 State of the Industry report on mobile financial, GSMA, 11 March 2015

39 RBI Committee to study the Feasibility of Implementation of GIRO research, 2013

52% of emerging markets payments executives believe that non-traditional players are a threat to established banks' payments operations. But 34% say that rather than being a threat to established banks, non-traditional players are a potential source of innovative partners⁴¹

C. Alternative payment systems

The payments business, traditionally dominated by banks, is witnessing increasing competition from new entrants, most of which are non-bank players. These include retailers, telecommunication providers, technology companies, start-ups and others players that specialise in niche value-added services in the payments processing chain. With the emergence of these payment systems, the PSPs are divided in to two main categories: 1) traditional players and 2) disrupters or alternative payment system providers. Traditional players' strengths include their range of offerings and an established reputation, which provide customers with a higher comfort level. On the other side, the disrupters are looking to develop faster, more versatile and easier-to-deploy payment options. As a result, alternative payment models are gaining increasing acceptance. Their transaction revenue accounts for \$212 bn of e-commerce payments globally and it is estimated that they will comprise 60% of all online transactions by 2017⁴⁰.

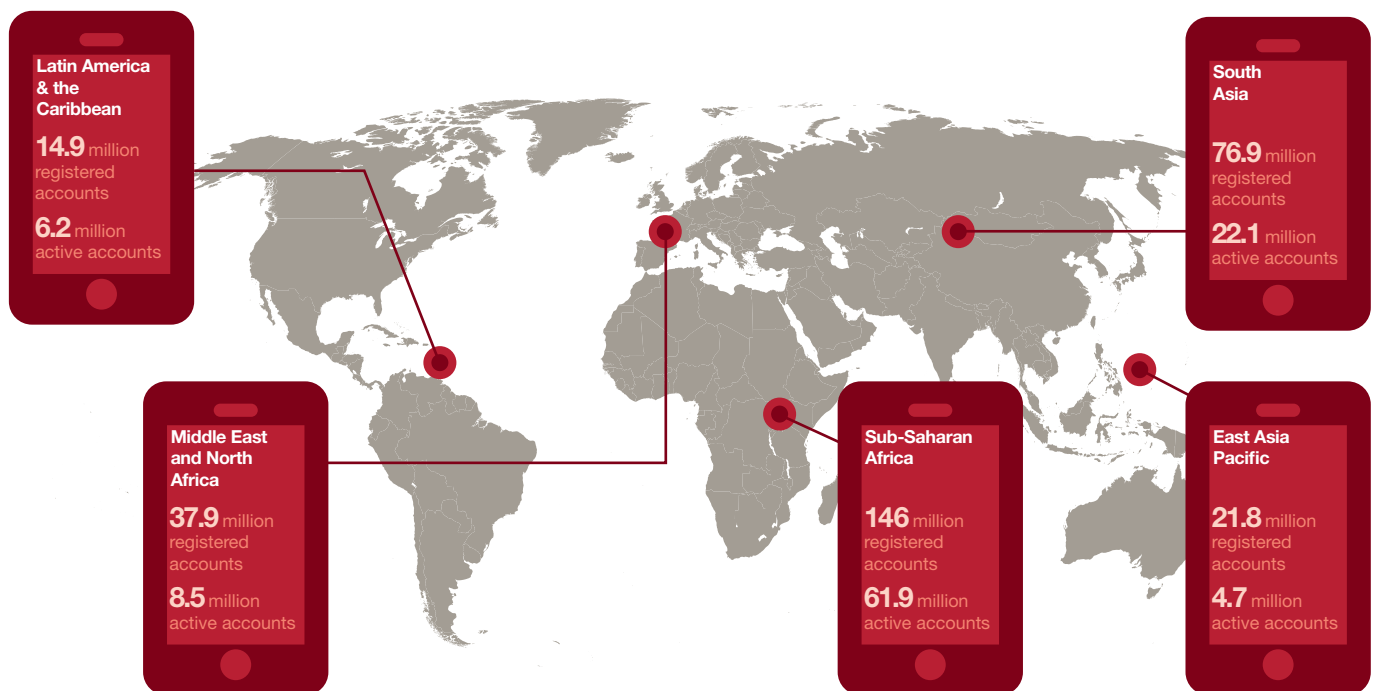
Alternative models

1) Mobile wallets

In markets such as India, China and Nigeria, the growth of mobile penetration has had a massive impact on financial inclusion, with people moving from no previous banking history to being able to make payments via a mobile phone. With a majority of the world's population living in the emerging markets, these economies will be at the forefront of innovation and the adoption of mobile technology for payments. Figure 9 below, which shows the number of mobile money accounts in emerging markets across the world, is a testament to this.

It is forecasted that over US\$130 bn in payments is likely to be made through PPIs in 2020. This is more than 12 times the volumes in 2013⁴².

Figure 9: Number of mobile money accounts in emerging markets



Source: State of the Industry report on Mobile Financial, GSMA 2015

⁴⁰ Crossborder e-commerce :Preferred Alternative Payment Methods in Asia Pacific, 2014

⁴¹ PwC Payments Survey 2014

⁴² Mahindra comviva: Driving Financial Inclusion Initiatives Using Mobile Technologies, 2015

Mobile financial technology providers are leveraging the familiarity of the mobile device across the emerging markets, coupled with the assurance of security and ease of use, to provide impetus to the growing cashless economy supported by regulators. Increasingly, companies are creating smartphone apps that not only significantly reduce reliance on traditional payment processes, but also provide a unique customer experience and increase engagement by smoothing traditional friction points in commerce (examples include taxi aggregator apps). With the advent of mobile wallets, remote areas with limited access to bank branches could soon see customers who don't have either a credit or debit card, transacting electronically through their smartphones.

2) AFC payments: new and innovative use cases for digitising payments

Technological advances in payments mean that transit agencies must find innovative ways to extend their services to their riders. To date, traditional financial and retail payment systems have not completely addressed the transit industry's requirements for speed, low cost and functionality.

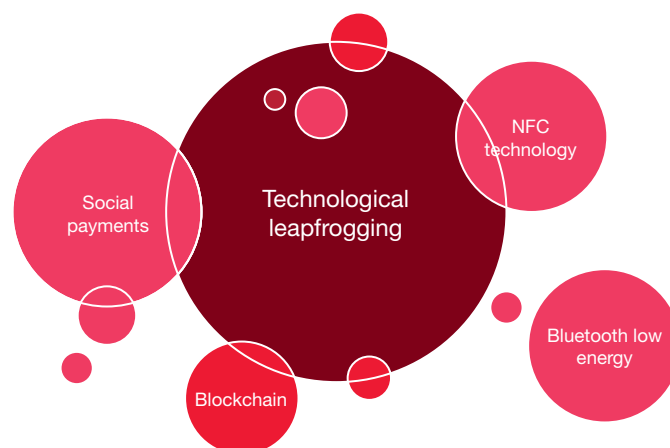
Open Payments and Automatic Fare Collection (AFC) offer one such alternative payment model to toll and transit agencies, enabling them to enhance customer service and reduce operating costs. A private sector bank in India has partnered with a state run metro rail system to create a co-branded card, which can be put to a variety of other uses apart from ticketing. This will be the first time that 'open-loop' smart cards will be used in a toll and transit payment system, opening opportunities to share in economies of scale by enabling use for non-transportation payments as well. This is a welcome change from the AFC systems in use until recently, which functioned as closed systems, in most cases specifically designed for each operator.

D. Leapfrogging in technological development

Emerging markets are spearheading some of the key developments in payments. Here we set out some of the technological advances and solutions that could change the face of payments if they turn out to be scalable, resource efficient and sustainable.

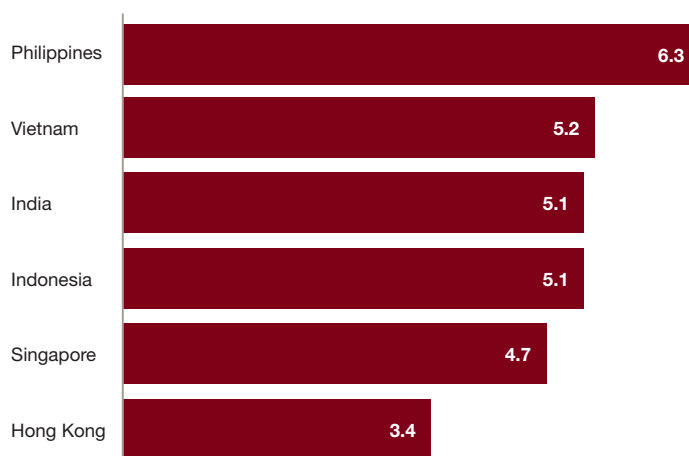
a. Social payments – Payments through social media

People aged under 25 account for 40% of the population of Asia⁴³ and constitute a sizable demographic that has been raised on social media. An average individual in these countries spends more than four hours a month on social media websites (see Figure 10).



Source: PwC analysis

Figure 10: Average number of hours spent by visitors on social media (Developed and emerging nations)



Source: GlobalWebIndex, Q4, 2014

OVER-THE-AIR CARD ISSUING, CHINA

Over the air (OTA) or remote card issuing is an emerging operating model in China, which uses host card emulation (HCE), trusted service manager (TSM) or magnetic secure transmission (MST) technology to store bank card information into phones, and make remote card issuing and mobile contactless payments.

OTA provides a means to load, activate and personalise a NFC payment application by leveraging the mobile phone wireless networks. A mobile phone user can initiate the OTA provisioning process from wherever he or she has network access. The source of the payment application requires specific authorisation from an issuer and the keys required to access the secure element on the phone.

43 United nations: World Population Prospects, 2015

OCBC PAY ANYONE, SOCIAL PAYMENTS IN SINGAPORE

In May 2014, OCBC launched a new micro-payment service that enables customers to transfer funds using social media, mobile and email. OCBC Pay Anyone, a new smartphone-based service, allows payments of up to US\$100 to any bank account in Singapore. The services use a G3 real-time payments system launched in 2013.

To make the most of this growing social media phenomenon, social networking sites are facilitating financial transactions by introducing their own alternative payment systems. The rapidly growing popularity of social networks such as Twitter allows an increasing number of customers to easily search for promotions, read reviews and make purchases. They could pay for a product or service not in money but through tweets. While traditional banking channels like bank branches and ATMs are still very relevant, customers can now have a more customised banking experience. This shift from banks to non-bank transaction providers could significantly change the shape of the payments and retail financial services markets, with potential regulatory outcomes likely to arise in the not too-distant future.

b. NFC technology

NFC technology is gaining popularity in emerging markets because of its safety, versatility and convenience. It provides a more secure mode of transacting as first it requires a PIN and it does not provide physical access to users' credit card information to retailers. Although the technology is primarily used for contactless mobile payments, it is also being adapted to cards. NFC is increasingly prevalent in countries like India, Nigeria, South Africa and China, although the adoption rates have been on the slower side mainly due to weak infrastructure.

c. Bluetooth Low Energy (BLE)

Retailers have started using BLE technology in shopping malls where the customer can receive offers in store through Bluetooth and can place an order without using the phone. BLE has a range of up to 50 metres and can be used indoors for payments and peer-to-peer fund transfers.



Some market participants expect such technology to either reduce costs or change how costs are distributed. On the other hand, participants who thrive on processing fees may see such developments as a threat. However, technological innovation is the way forward in payments and participants have to modify their ways to benefit from it.

d. Blockchain technology

Blockchain technology promises to transform the payments ecosystem by improving the efficiency of financial transactions around the world. Blockchain discards the traditional process of the ledger being owned and being accessible only by a single institution and puts in place a distributed ledger, which allows for a participatory model.

Banks and other financial institutions can implement blockchain to improve the efficiency of their legacy systems. For example, it can improve operational efficiencies in real-time fund transfers across borders by eliminating business correspondent inefficiencies. However, even though this technology promises big benefits, its scalability across huge volumes of transactions needs to be tested. As transaction volumes grow, the blockchain algorithms will be exposed to multiple participants, which increase the risks involved. Realising the potential will require significant investments from participants to ensure safety and transparency across transactions.

The regional perspective on payments

2.1 Market highlights

1. Payment – a dynamic arena

Payments is a dynamic arena. Different markets have distinctive growth patterns and development trajectories, and even among emerging markets, countries will grow at different speeds. Change will vary by market depending on macroeconomic factors and the competitive and regulatory landscapes. Here we discuss some of the key trends across markets.

China

The payments market in China is booming, with banks in China reporting US\$93 tn worth of e-payment transaction value in 2015, up 44% from last year. Debit and credit cards were the main drivers of growth, with the number of bank cards issued jumping by 21% to roughly five billion in 2014. The total value of mobile payment reached US\$4.19 tn in 2015, with an increase of 445% from the same period last year⁴⁴.

There will be several areas of innovative disruption in the future. In the past, only one company was permitted to provide clearing services for renminbi-denominated bank-card payments. However, in a move to open up the market, both domestic and foreign players are now able to apply for licences. Non-bank players have made strong inroads into payments with their e-marketplaces. E-wallets are trying to extend their acceptance in high volume apps like those of taxi aggregators.

Smaller cities that are underserved by local banks are the prime targets of major non-bank players, which are planning to offer online pay, mobile pay, O2O (online ordering and offline payment), and other products. China's central bank recently issued guidelines for transaction limits on online payments. As new regulations shape the competitive landscape, leading players are likely to drive further market consolidation.

⁴⁴ China central bank, 2015 data

⁴⁵ Source: Brazilian Association of Credit Card and Service Companies, 2014

⁴⁶ Source: Allpago international: Exploring the growing Mexican e-Commerce sector, 2014

⁴⁷ Source: World Bank, financial inclusion figures, 2014

Brazil

Payment cards are well-embedded within the Brazilian consumer market. Debit cards have gone well beyond the theoretical saturation point – where there is at least one debit card in issue per adult. Close to 40% of adults hold a bank-issued debit card, driving the volume of debit card transactions from R\$108 bn in 2008 to R\$353 bn in 2014. The growth of credit cards and the volume of credit card transactions has been similar, with 35% of adults holding credit cards and with the volume of transactions on an upward trajectory from US\$144 bn in 2010 to US\$272 bn in 2014.⁴⁵

Banks have taken the initiative in promoting payment digitisation and cash substitution with the aim of outcompeting new entrants. Some examples include m-wallets (such as Stelo), the launch of local payments schemes and investments to increase POS penetration – including NFC. In addition, the Government has been actively promoting e-payments by providing incentives like tax benefits, changing regulatory frameworks, and adopting social-transfer e-payments.

Mexico

Mexico is a market dominated by local payment methods. For a population of around 123 million people, credit card penetration is a mere 24%, with only 30 million cards in issuance. In comparison, with a penetration rate of about 35%, the number of debit cards in circulation is much higher than credit cards with a ratio of almost 4.5 debit cards for every credit card. However, credit cards are the leading mode of payments for online purchases with debit cards accounting for only 15% of ecommerce purchases⁴⁶. Another popular payment channel in Mexico is cheques. However, with regulators trying to replace paper-based payments with electronic alternatives, the use of cheques is decreasing.

Mexico has one of the lowest banking penetration rates among the Latin American countries, with a mere 38.7% (age +15)⁴⁷ of the population holding accounts. New regulations have been introduced to increase participation in formal financial services and promote electronic payments in an economy where an estimated 90% of

transactions are cash-based.⁴⁸ The regulations have improved both inclusion and the ease of doing business in the economy. Conditional cash transfer programmes like Oportunidades (Part of Pacto por México, which is a bold package of reforms to improve economic conditions, boost growth and reduce informality) is a step in this direction. This in turn has significantly changed the payment and settlement systems in Mexico.

India

The regulators in India have been among the first to innovate and promote financial inclusion initiatives. One of the key ones being, enabling biometric ID for all resident individuals in India under the Aadhaar programme which is smoothening a lot of government grants through online and cost effective beneficiary identification. Indian payment industry thus stands out and is driving above-average growth in non-cash payments. In 2014, the Prime Minister of India launched a financial inclusion campaign (PMJDY: Pradhan Mantri Jan Dhan Yojana) that generated 125 million accounts within six months⁴⁹. In addition, the RBI has established new guidelines for differentiated banks – institutions whose objective is to improve the state of financial access by providing basic banking and remittance services to migrant workers, low-income households, small businesses, and other underserved sectors. The RBI has ‘in principle’ approved more than ten such institutions.

Such initiatives have triggered the strong adoption of electronic payments and the rise of new market entrants. Mobile banking transactions tripled between 2012 and 2014, hitting 150 million in 2014⁵⁰. And mobile-wallet transactions have gone past m-banking transactions. Pre-paid payment instruments providers (which offer m-wallets) have been attracting growing interest from consumers and have motivated banks to invest in their own digital payment offerings.

South Africa

South Africa’s vast payments ecosystem has been growing and innovating at a world leading pace, while at the same time providing easier access payment solutions to poor and remote communities. South Africa has seen success in various forms of payment solutions. The first tier is bank branches and ATMs, which the major banks have dominated. The second tier is mobile money agents and remittance platforms. The third is merchant payments and cryptocurrency, which are gathering momentum.

The value of mobile money transactions in Sub-Saharan Africa as a whole reached \$656 mn in 2014, and is expected to more than double to \$1.3 bn in the next four years⁵¹. By teaming up with traditional banks, mobile money providers have been able to reduce the cost of transactions. Remittances is another area that has seen innovative technology changes over the last few years. There is a huge market for remittance platforms in South Africa, given it has traditionally been one of the most expensive remittance corridors and with the number of migrants estimated to be over four million in 2014, there is a huge scope for disruption⁵². As such, many low cost solutions have been offered, particularly to the unbanked, in order to enable international transfer.



48 Tufts: Cash outlook, Mexico, 2013

49 World Bank, 2014

50 Reserve Bank of India Statistics on mobile transactions, 2014

51 Frost and Sullivan report on African money transfer systems, 2014

52 The International Fund for Agricultural Development: Sending money home, 2013

With tele-density rates at 99% of the population, people have the potential to access banking and other essential services through mobile networks, making Nigeria an attractive market for the mobile payments industry.

Nigeria

The rapid adoption of innovative technology has led to payments systems in Nigeria making huge progress in increasing financial access and reducing the cost of transactions.

With a limited credit culture in Nigeria, the most common payment card is the debit card followed by pre-paid cards. Although these cards are predominantly used for ATM withdrawals, POS transactions and online banking are growing rapidly. However, most merchants still prefer cash and close to 60% of Nigeria's ATMs are located in just one region of the country. This has paved the way for mobile banking to be an immediate success in Nigeria⁵³. With tele-density rates at 99% of the population, people have the potential to access banking and other essential services through mobile networks, making Nigeria an attractive market for the mobile payments industry.

In 2015, the Central Bank of Nigeria (CBN) approved an industry-wide e-payment incentive scheme and awareness campaign, which aims to encourage Nigerians to embrace the usage of e-payments as a preferred means of payment for financial transactions. The scheme primarily focusing on rewarding users of e-payments, was initially met with a luke-warm response from the country but the central bank has decided to relaunch the same to see the potential benefits.

2. Convergence across markets

In the emerging economies, cash and paper-based payment instruments are still the main basis for retail transactions. With the advent of electronic payment instruments and systems, there has been a slow shift from cash to other e-payment models and channels like debit cards, credit cards, wallets, ATMs and electronic fund transfer systems (real time/non-real time). Some of the common trends that appear across the emerging world are discussed here.

Promotion of centralised fund transfer systems and retail electronic payment systems

There have been concerted efforts by different countries to introduce and promote retail e-payment instruments and systems and enhance the development of the acceptance infrastructure, in parallel with development of centralised fund transfer systems.

In India, a majority of the retail transactions are conducted through cash and paper instruments (currently at over 90%, though this has reduced from 98% in 2010⁵⁴). The change is due to the introduction and promotion of e-payment instruments systems like cards, Real Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT) and other innovative products like Immediate Payment Service System (IMPS). India is also seeing a huge drive to improve the acceptance infrastructure for electronic payments, mainly in the rural and financially excluded areas by usage of innovative technology like wallets, micro ATM/mobile POS technology, centralised online payment and authentication systems.

In Mexico, cards as a payment instrument have picked up recently – primarily debit cards – due to development of robust acceptance infrastructure like ATMs and POS terminals. However, only 15% of online purchase transactions are facilitated by debit cards.⁵⁵ Mexico has also seen a decline in paper-based payment instruments like cheques due to proliferation of retail electronic payment instruments and systems/technologies that have been introduced like Depósito, Administración y Liquidación (DALI) and SPEI for processing payments with low transaction amounts. In Nigeria, mobile payment systems are prevalent in addition to card as a payment mode for retail electronic payments.

53 Stanford Business: Mobile Banking takes on Nigeria, 2012

54 IBGC: Cash outlook India, 2013

55 Tufts, Cash outlook, Mexico, 2013

Usage of innovative payment instruments like wallets, mobile payments and one click payments

In Nigeria, usage of mobile-based payment systems has increased due to wide access to mobile phones as a payment form, both on the customer usage side and acceptance (merchant) side. In UAE, mobile and card-based tap and go payments have been introduced by specific banks at retail touchpoints. The National Payments Corporation of India (NCPI) has developed innovative payment instruments like the Immediate Payments Service (IMPS), Unified Payment Interface (UPI) and Bharat Bill Payment System (BBPS) to encourage greater consumer take-up and enhance ease of transactions for retail e-payments.

Revamping the technology system

The revamp of technology systems that manage retail e-payment instruments is a common trend across emerging countries. For example, in India, NPCI has revamped the central ATM switch for processing and promoting all retail ATM transactions. It is also upgrading the system to process standing instructions and recurring debits and has introduced the National Automated Clearing House (NACH). In the Middle East, efforts have been taken to revamp the centralised payment systems including the centralised ATM switch and introduction of new technology system like the UAE Direct Debit System (UAEDDS).

CASH-LESS POLICY: NIGERIA

The Central Bank of Nigeria (CBN) has introduced cash processing fees, licences for cash-in-transit companies, guidelines POS implementations to reduce the use of cash and promote the development and modernisation of the payment system, reduce the cost of banking services, drive financial inclusion and improve the effectiveness of monetary policy.

The CBN cash policy stipulates a daily cumulative limit of cash withdrawals and banks have discontinued cash-in-transit lodgement services rendered to merchant-customers.



3. The role of national regulators and industry associations

A key regulatory aim is building security and trust in the payments system by understanding, monitoring and, where necessary, intervening to protect the rights of retail and commercial customers. Payments has always been a crucial part of this and attention is now broadening into the e-payment arena:

1. Introduce and develop electronic payments products to promote cashless transactions
2. Develop frameworks, policies, guidelines and circulars to guide the operations of the industry players
3. Promote interoperability of these payment products and channels to ensure a seamless experience for customers
4. Develop and implement a strong monitoring and governance framework for all members and sub-members to minimise frauds and risks in the payments systems
5. Resolve disputes and customer complaints and ensure a robust mechanism is developed to facilitate this

Across various emerging markets, we have seen the regulatory bodies adopt some or all of these roles and objectives to promote the development of secure and efficient e-payments. Most emerging markets have also introduced a common set of legally enforced regulations.

In India, the RBI developed the Payment and Settlement System Act in 2007. The RBI was also at the forefront of the creation of the NPCI, which manages and governs all retail e-payment systems in the country.

The central bank in Mexico has introduced the Payment Systems Act (PSA) to provide electronic payment transactions and has developed the Sistema de Pagos Electrónicos Interbancarios, which is a near real-time hybrid settlement system for payments.

Nigeria's CBN has introduced the Payments System Policy and Oversight Office, which monitors existing and planned payments system and issues licences to PSPs.

Regulators have tended to follow a collaborative approach, in which they develop draft rules and policies in consultation with key members of the payment ecosystem. This provides a good way to improve acceptance and adoption of the new policies and regulations.

Overall, the key objective of the regulators has been to promote cash-lite economies. The resulting contribution of regulators to the development of retail e-payment systems across the emerging markets should not be underestimated. However, there is still a long way to go. Areas that regulators will need to focus on include developing the necessary infrastructure, broadening participation in the payments system, developing common and interoperable standards and boosting customer confidence and convenience.

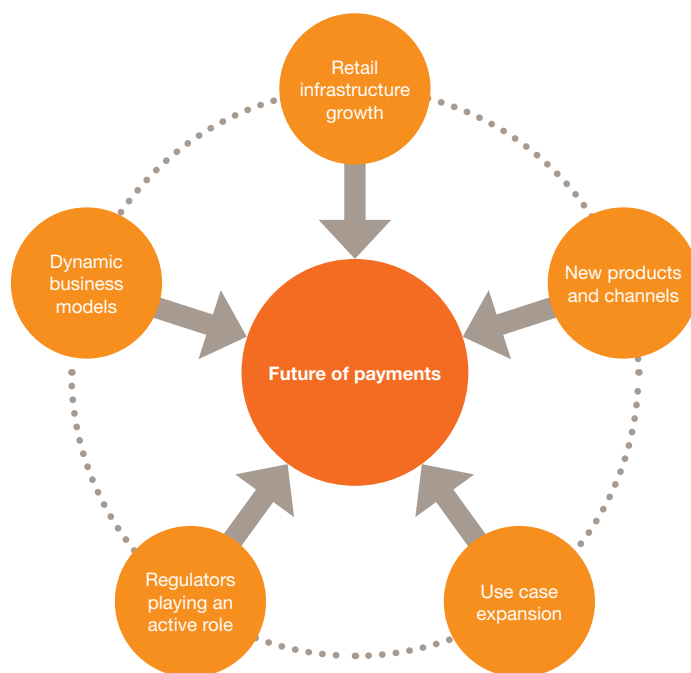
Enhancing customer service is the number one investment priority for emerging markets payments executives, just ahead of innovation⁵⁶

Realising the future potential

3.1 Opportunities, challenges and the way ahead

Looking at the innovations and growth drivers, it's clear that the payments market is dynamic and there are multiple opportunities for competitive development. However, emerging markets can be complicated and unpredictable, which will open up challenges along the way. In figure 11 below, we set out the developments that we believe will enable the market to realise its potential and help drive the emerging world towards a cashless world.

Figure 11: Payment dynamics



Source: PwC Analysis

Regulators playing an active role

Having realised that increasing electronic payments can accelerate economic growth (more so in emerging economies, where GDP growth has a close correlation with the growth of e-payments), regulators across the emerging world are taking calibrated steps to create the right environment for e-payments to develop. However, at the same time, they must also put in place measures to manage security and fraud on these new payment networks. As a result, policies will sometimes lean more towards security than convenience. For the e-payments ecosystem to survive and grow in the emerging markets, it needs regulators that can balance growth with security.

Since e-payments are mature in most developed countries, regulators in emerging markets can also take cues from developed markets to anticipate challenges and problems, such as data theft or credit risk, and be better prepared for that.

Unfortunately, at times, there are local restrictions that prevent multinationals from providing the best solutions. This can actually slow the progress of e-payments implementation if not managed carefully. Regulators across countries need to take notice of this fact and ensure there is a proper balance between protecting local interests and stimulating growth.

Retail infrastructure growth

Emerging markets are trailing their developed counterparts in the development of an effective payments acceptance infrastructure in areas such as ATMs and POS machines (even though the growth rates are surpassing that of the developed world). However, in a low margin business like payments, where each individual transaction yields only a couple of cents as profits, large scale infrastructure investment is hard to justify. The ability to generate high transaction volumes is the solution to this problem in emerging markets. Therefore, low ticket values must be offset by high transaction velocity. If we look at countries like Indonesia or the Philippines, where the populations are large but spread across many islands, it is difficult to provide access to the right kind of infrastructure to everybody. New market entrants, alternative payment players, governments and other relevant stakeholders

⁵⁶ PwC Payments Survey 2014



must work together, and coordinate their investment efforts and objectives to overcome these challenges inherent to the emerging world.

Mastering data analytics

Emerging market payment executives taking part in our 2014 payments survey see advanced data payment analytics as the most important trend in the market. In comparison to Europe and North America, emerging market businesses are the readiest to address the trend and the most likely to be making significant investments in this area, though harnessing the necessary funds remains a challenge for many firms.

They see analytics as a key source of differentiation, with early adopters able to master the potential.

Dynamic and viable business models

Growth in complex and often volatile emerging markets demands a viable and sustainable business model. Yet it can be unclear where eventual profits will stem from.

In emerging markets, the population is generally large and the average transaction size is small. This is the opposite of mature markets, which run on a completely different set of dynamics. Volumes would need to greatly increase to ensure that business models become sustainable.

New business models involving partnerships among PSPs, financial institutions and retail institutions are emerging. By leveraging the strengths of traditional players, including their range of offerings and an established reputation, along with the nimbleness and interoperability of new PSPs, these models could totally transform the dynamics of the payments industry and, if scalable, improve returns for players all along the value chain.

New channels and products

New PSPs and disruptive technologies are emerging all the time. Some of the developments, such as NFC, biometric authentication, pre-paid stored value cards or virtual cash and mobile card acceptance, are opening up new markets for financial institutions.

Smart cards and mobile phones are also providing new channels for reaching unbanked rural and urban households. Several government institutions are partnering with pre-paid card issuers and using smart cards to route payments to rural labour. Other industry players, which are looking to reach out to this largely untapped market, are piloting new products linked to mobile channels.

The growth of digital technologies has also accelerated new channels like e-commerce and m-commerce, which are opening up new ways for consumers to make purchases such as tapping their mobile phone or a wearable item (like a watch) onto a contactless

payment terminal or reading a quick response (QR) code. The adoption of these new innovations within emerging markets could help create new revenue channels and reduce overheads, positively impacting bottom lines for companies and governments alike. These unique experiences enable customers and industry players to explore new products and technologies that advance the payment experience in areas such as mobile, security and cloud-based payments, and contribute to the overall growth and development of the country.

Use case expansion

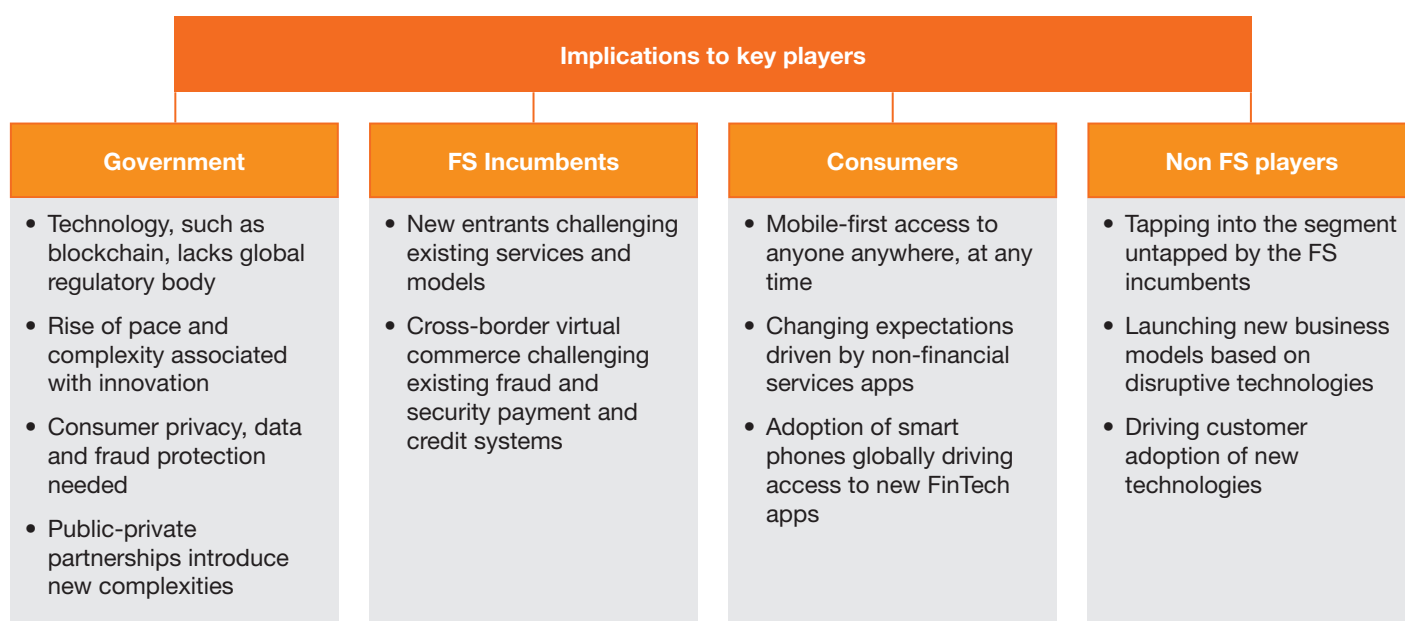
Regulatory support, advances in technology and accelerating customer adoption of these technologies have opened up new avenues for e-payments. Payment of fees for educational institutions, payment of taxes and fines to the government,

Emerging market payments executives see attracting customers as the biggest challenge they face, with a much higher proportion citing this as a concern than developed markets. Dealing with the impact of technology is seen as the second biggest concern⁵⁷

payments to merchants and retail institutions and toll and transit payments are among the options which can now be facilitated using a simple mobile app.

Growth and acceptance of taxi aggregator apps is based on the ease and convenience of payments offered by these apps. Customers today demand integration of all their payment needs onto a single device without the need to dig out cash or remember card details. Figure 12 highlights that we would require strategic collaborations between payment players and retail institutions to meet consumer demand and create revenue generating streams for banks and payments players.

Figure 12: Creating an effective e-payment ecosystem



Source: PwC Analysis

⁵⁷ PwC Payments Survey 2014

Appendix: Transforming the way you transact



4.1 Spotlight – Key project highlights

INDIA | Case Study 1

Leading private sector bank in India and state metro rail corporation partnership

Background

Urban mobility and transit payments are closely interlinked with the financial services offered to a number of customer segments such as large and mid-size corporates, agriculture and retail businesses, the former being continuously and seamlessly integrated into the latter. Financial institutions are increasingly looking towards mobility and transit payments as an area to further enhance presence amongst customers by offering convenient payment options.

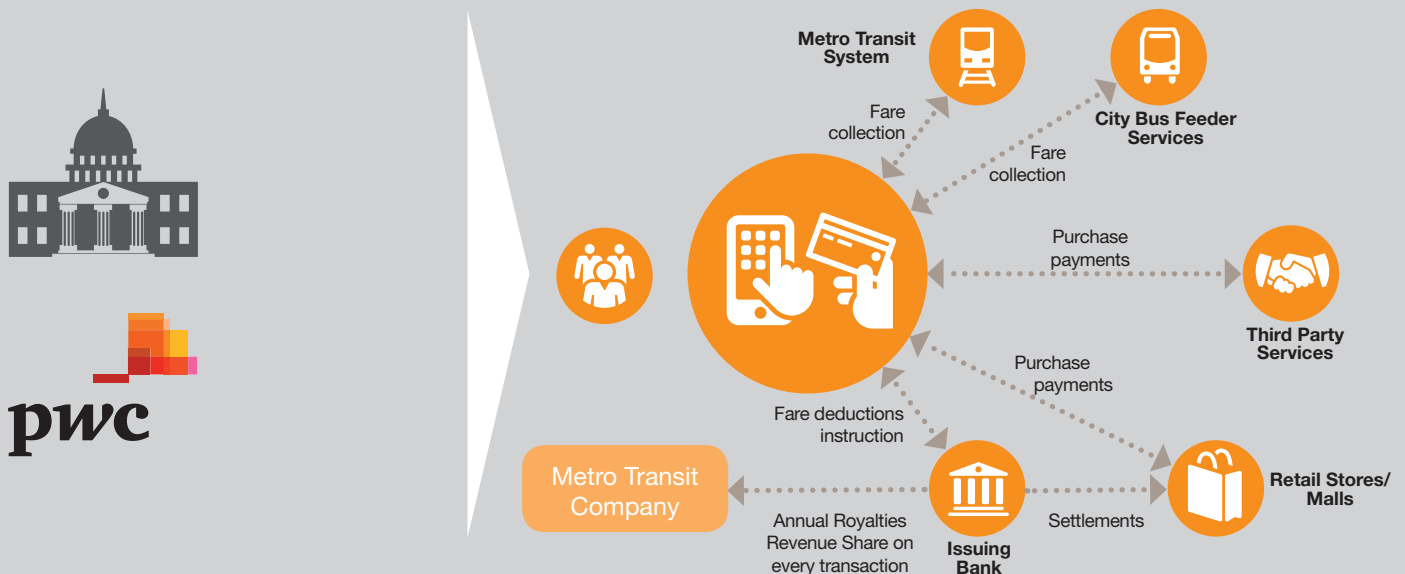
One of the largest private sector banks in India has been one of the earliest entrants into the transit payments market and is working with transportation corporations to offer convenient payment options. The idea was to create a unified and interoperable, multi-modal transport ticketing system for the Greater Kochi area (see Figure 13). With this end in view, the bank (along with a consortium of members that includes PwC India) has engaged with the state operated metro rail system to set up the Automatic Fare Collection (AFC) system.

The Payments Transformation (Advisory) team at PwC India is working with the consortium on the implementation of the project. Aligned with the consortium's aims to develop an open loop smart card based AFC system for the state operated metro rail system and other public transport systems of Kochi and Greater Kochi; the team has managed implementation through timely and efficient project planning right from solution designing through to mapping and evolving best practices in the area, to managing the procurement cycle and efficient supply chain planning. The team helped build the technology architecture, which includes the evolution of configuration parameters and systems testing, and providing seamless integration of the acceptance infrastructure with all service providers.

Significant outcomes

With support from PwC India's dedicated team, the consortium has been able to build and manage the entire passenger ticketing solution and issue EMV contactless smart cards for regular commuters of Kochi Metro, thus ushering in an era of payments transformation in the area of urban mobility.

Figure 13: Automatic Fare Collection System



Source: PwC

A leading private sector bank – Bill payments platform

Background

Developing innovative ways to improve the ease and efficiency of payments for customers can help banks to create a strong foothold in e-payments and compete with entrants. One of India’s largest private sector banks is looking at a range of ways to improve customer experience across the payments ecosystem.

Key initiatives include the development of a channel interoperable collections platform, catering to bill payments and other recurring payments like school fees. The proposed initiative was aimed at creating a comprehensive portal for paying different bills, as well as other recurring payments.

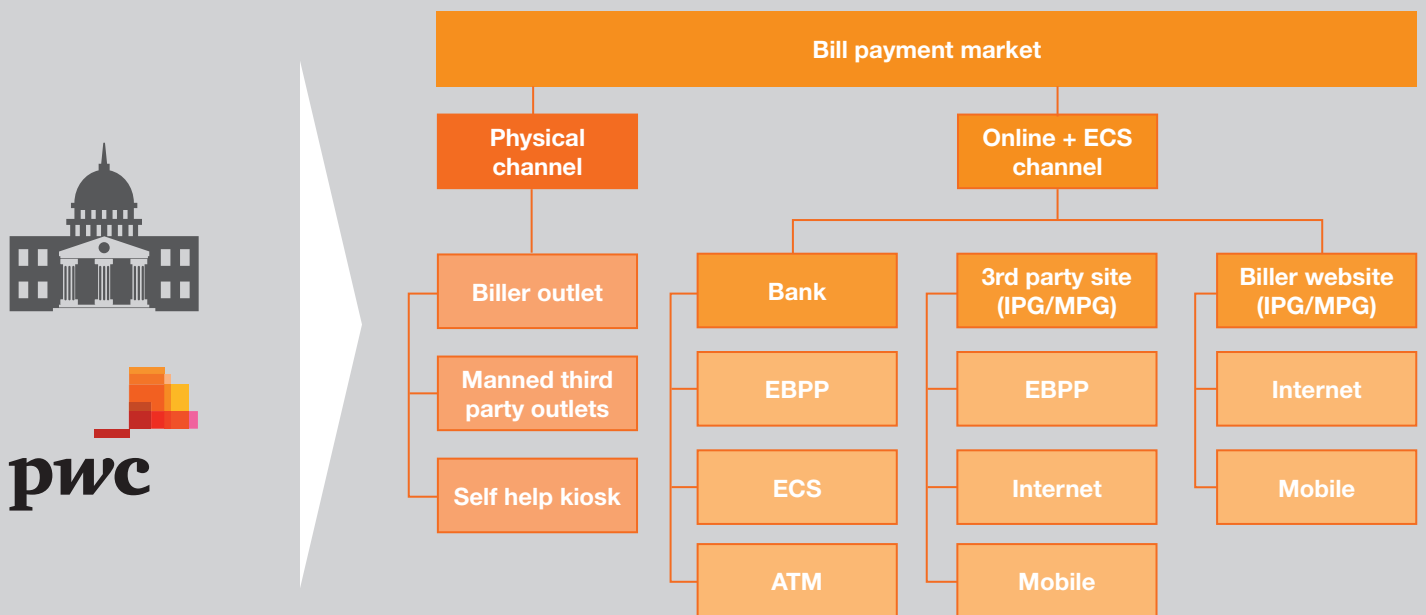
The Payments Transformation (Advisory) team at PwC India, which managed the project for the bank, has helped to develop the implementation roadmap for the project. This includes the development of processes for designing a product for bill collections, merchant identification and enrolment, merchant on-boarding and account closure, payments and reconciliation (see Figure 14).

PwC India also reviewed merchant agreements from business, operations, technology and regulatory aspects, as well as providing support for the bank team for solution testing and sign off. Operational risk identification and mitigation was also a key part of the project to ensure that stakeholder experience across the process chain didn’t suffer on account of technical failures.

Significant outcomes

The PwC India team successfully managed the development of the online payments and collections platform. The bank is currently getting the platform ready to go live.

Figure 14: A new bill payment model



ECS: Electronic clearing services MPG: Mobile payments gateway IPG: Internet payments gateway EBPP: Electronic bill payment and presentation
Source: PwC

Assistance with differentiated banking license applications

Background

Although reach and scope of banking in India has improved a lot, the huge demand for financial services remains unsatiated. Only about 53% of adults have formal bank accounts⁵⁸. The RBI is aware of this aspect, and committed to financial inclusion. It has explored various possibilities to foster inclusion of the unserved and under-served population and areas and facilitate provision of affordable financial services by increasing competition among the banks and encourage innovative approaches (including channels, products, interface, etc.). As a part of this innovative approach, the RBI introduced vertically differentiated banking licences in the form of payments and small finance banks where entities offer a limited range of services/products or function under a different regulatory dispensation.

What did PwC, India do?

To bring to reality the vision of RBI, PwC, India assisted a number of clients in applying for the licence with RBI. The list of clients spanned across the value chain including telecom players, pre-paid or e-money issuers, business conglomerates and NBFCs.

The PwC India payments team with their wide experience and knowledge helped clients draft the vision for the proposed payments/small finance banks, define target customer segments and design products targeted to the customer's needs. It has also helped to develop the technological architecture to support the proposed payments bank and the projected financials for the next five years including the profit and loss statements and possible cash flows.

Significant outcomes

A leading telecom major and a leading business conglomerate received licences from the RBI to operate as payments banks based on the application assistance received from PwC India's payments team.



⁵⁸ World Bank, Financial inclusion figures, 2015



BRAZIL | Case Study 1

Cateno – Operations Ramp up

Background

Cateno is a joint venture between Cielo (major Brazilian acquirer) and Banco do Brasil (Brazil's largest Bank) for processing all credit and debit card transactions issued by Banco do Brasil (BB). Cateno will be responsible for R\$200 bn in debit and credit card transactions. One of the main reasons for the BB's participation in the joint venture was to obtain flexibility and agility to focus on the core banking activities related to credit cards. Cielo is diversifying its portfolio of activities from its merchant acquiring core business.

Cateno has been able to leverage on its shareholders capabilities and structure, having ambitions of becoming a full service provider to other issuers in Brazil by creating a value proposition based on efficiency and innovation for new customers.

What did PwC Brazil do to assist them?

PwC Brazil is supporting Cateno to structure its own processes, systems and supporting structures, which are currently running in platforms owned exclusively by its shareholders. In this process, PwC Brazil has supported Cateno to:

- Map and evaluate existing processes, systems and organisational structure
- Identify and explore improvements and synergies to the model currently established through the proposition of a new model
- Leverage current capabilities within the new company
- Analyse and propose the appropriate organisational structure to support the entire business operation
- Recommend an operating model and processes that enable economies of scale and rapid expansion of the business
- Monitor and support the implementation of the new model
- Develop and implement a change management plan
- Support to main executives in the relationship to Brazilian Central Bank and provide advice on regulatory requirements
- Propose strategic guidelines and enforce the positioning of the new business to the market

Significant outcomes

- Structuring of a new operational model, exploring an innovative solution to address the management of payments in Brazil, through the establishment of more efficient and scalable processes, systems and platforms

ABECS – Payments Industry Benchmark and Study on the potential reduction of settlement times for credit cards, debit cards and pre-paid cards

Background

The Central Bank of Brazil asked the payments market (represented by its local association - ABECS) to evaluate the potential impacts of reducing the settlement period for credit cards, debit cards and pre-paid cards transactions. Currently, the average settlement period for credit card transactions in Brazil is D + 28, whereas in other countries the average settlement period is D + 2. For debit cards and pre-paid cards, settlements happen on D+2 and the assessment would involve a reduction to settlements happening on D+1 or on a real-time basis. The Central Bank of Brazil asked the association to formalise the fundamentals of the local model that would justify the existing settlement period and evaluate a potential change. It is worth noting that most of the revenues in the payment industry value chain (mainly for the issuer and acquirer) are generated as a result of the existing settlement period today, for example, through floating and charging merchants a fee for the prepayment of receivables.

What did PwC Brazil do to assist them?

PwC Brazil supported ABECS by preparing and presenting the following reports detailing the main characteristics of the payment cards industry value chain in Brazil as well as a potential impact of reducing the average settlement period:

- Credit card industry report in Brazil
- Credit card industry benchmarking (evaluated the credit cards industry value chain in eleven countries)
- Debit card industry report in Brazil
- Pre-paid card industry report in Brazil
- Ways to reduce the use of cash and checks in Brazil

Significant Outcomes

- The resulting report set out the main potential impacts of reducing settlement closing time



4.2 Glossary of terms

Terms used	Context in the report
AFC	An automated fare collection (AFC) system is the collection of components that automate the ticketing system of a public transportation network
E-Money	A digital equivalent of cash, stored on an electronic device or remotely at a server
FinTech	Financial Technology (or FinTech), is an economic industry composed of companies that use technology to make financial services more efficient
IVR	Interactive voice response is a technology that allows a computer to interact with humans through the use of voice and DTMF tones input via keypad
Mobile money	Payment services operated under financial regulation and performed from or via a mobile device
Mobile wallets	Mobile-based virtual wallet, where you preload a certain amount in your account created with the mobile wallet service provider, and spend it at online and offline merchants listed with the mobile wallet service provider
mPOS	mPOS or mobile point of sale is a portable mobile device with the ability to carry out a customer transaction
NFC	Near field communication (NFC) is a set of communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them in proximity
POS	Point of Sale terminal – POS system can include the ability to record and track customer orders, process credit and debit cards, connect to other systems in a network, and manage inventory
Tablets	A tablet is a wireless, portable personal computer with a touch screen interface. The tablet form factor is typically smaller than a notebook computer but larger than a smartphone
White label ATM	Non-bank entities that intend setting up, owning and operating ATMs. They provide banking services to the customers of banks in India, based on the cards (debit/credit/prepaid) issued by banks
Digital Native	A person born or brought up during the age of digital technology and so familiar with computers and the Internet from an early age
SME	Small and medium-sized enterprises are businesses whose personnel numbers fall below certain limits
smartPOS	A POS device integrated to an Android/iOS app on a tablet

Contacts

PwC wishes to acknowledge the following people for their generous commitment of time and contribution of insights to this report:

Financial Services Leaders

Hugh Harley

Global Emerging Markets
FS Leader, PwC Australia
+61 (2) 8266 5746
hugh.harley@au.pwc.com

Vivek Belgavi

India FinTech and Technology
Consulting Leader, PwC India
+91 9820280199
vivek.belgavi@in.pwc.com

Authors and Editors

Arif Khan

Director, PwC India
+91 9820126555
arif.khan@in.pwc.com

Mihir Gandhi

Director, PwC India
+91 9930944573
mihir.gandhi@in.pwc.com

Aarushi Jain

Senior Consultant, PwC India
+91 9833689858
aarushi.jain@in.pwc.com

Namrata Kacholia

Consultant, PwC India
+91 9764445609
namrata.kacholia@in.pwc.com

Additional contributions

Brazil

Oscar Pettezzoni de Almeida Neto

Director, PwC Brazil
+55 11 3674 3864
oscar.pettezzoni@br.pwc.com

Marcelo Baldin

Director, PwC Brazil
+55 11 3674 2760
marcelo.baldin@br.pwc.com

China

Yuqing Guo

Partner, PwC China
+86 (21) 2323 2655
yuqing.guo@cn.pwc.com

Indonesia

Jeffry Kusnadi

Senior Manager, PwC Indonesia
+62 21 5212901
jeffry.kusnadi@id.pwc.com

Korea

Kyoungkoo Kim

Director, PwC Korea
+82 (0) 2 709 0326
kyoungkoo.kim@kr.pwc.com

Mexico

Gonzalo Nuñez

FS Partner, PwC Mexico
+52 55 5263 6000
gonzalo.nunez@mx.pwc.com

Lorena Rodríguez

FS Partner, PwC Mexico
+52 55 5263 6000
lorena.rodriguez.chavez@mx.pwc.com

Nigeria

Lucia Nwanze

Manager, PwC Nigeria
+234 (1) 271 1700
lucia.nwanze@ng.pwc.com

South Africa

Ranesh Hariparsad

Partner, PwC South Africa
+27 (11) 797 5389
ranesh.hariparsad@za.pwc.com

United Arab Emirates

Prathit Harish

Partner, PwC Dubai
+971 4 3043 100
prathit.harish@ae.pwc.com

Madhukar Shenoy

Partner, PwC Dubai
+971 4 3043 3236
madhukar.shenoy@ae.pwc.com

Vietnam

Tran Quoc Dung

Partner, PwC Vietnam
+84 (8) 3823 07961603
tran.quoc.dung@vn.pwc.com

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For more information about the global Financial Services marketing programme, please contact Áine Bryn on +44 (0) 20 7212 8839 or aine.bryn@uk.pwc.com.

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