

Global Cash Index™

a **CARDTRONICS** collaboration

AUGUST 2018



INDIA EDITION



15.6% Percentage of ATM withdrawals in 2016

17.1 Number of ATMs per 100,000 people

11.4 Number of bank branches per 100,000 people



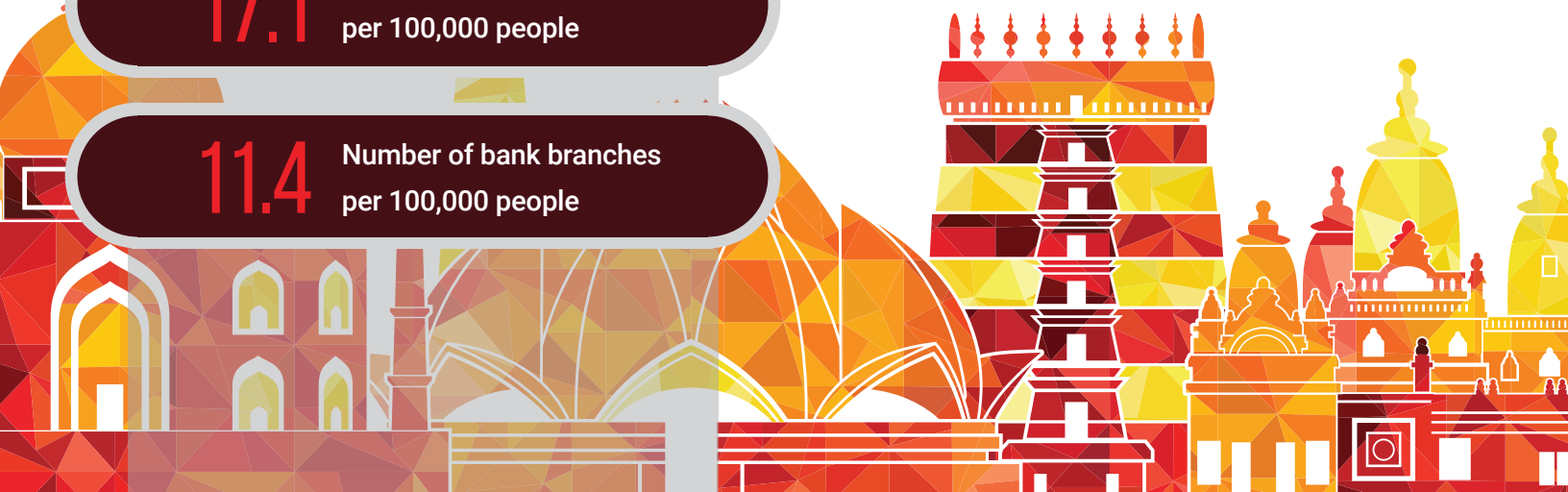
\$1,494 BILLION

Value of cash use in 2016



49.3%

Cash share in 2016



CASH USAGE IN INDIA: INTRODUCTION

The results are in. The Indian government's grand demonetization experiment has proven to be a bust, with cash continuing to thrive in the nation's economy.

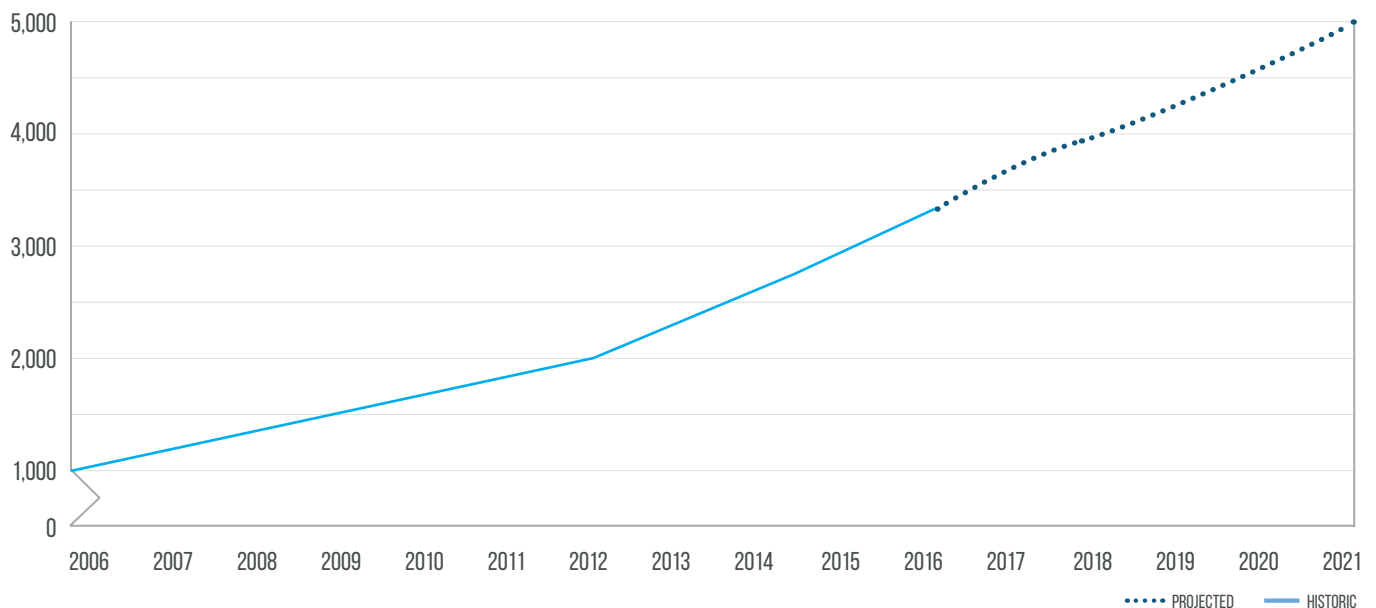
India's effort to go cashless began in November 2016 when the government, led by Prime Minister Narendra Modi, unexpectedly announced the demonetization of 1,000- and 500-rupee notes. The move removed roughly 86 percent of the currency in circulation, replacing it with 2,000-rupee notes and new versions of the 500-rupee note.

The policy aimed to crack down on India's black market, stamp out counterfeit cash operations, increase tax revenues

and transition to a digital economy by discouraging cash use. While it did help curb corruption and even drove digital payment adoption, to a certain extent, the demonetization was largely unsuccessful in breaking cash's grip.

Cash continues to maintain an imperative role in the Indian economy, the third-largest in the Asia Pacific region.¹ As illustrated in Figure 1, India boasted a gross domestic product (GDP) of more than \$3 trillion as of 2016. Its nominal GDP is expected to grow at a compound annual growth rate (CAGR) of roughly 11.9 percent between 2016 and 2021, too, reaching \$5.3 trillion by 2021.

FIGURE 1. HISTORIC AND PROJECTED GDP FOR INDIA, 2006-2021 (NOMINAL, IN BILLION DOLLARS)



¹ Author unknown. PYMNTS Cash Index Asia-Pacific region. PYMNTS. 2018. <https://www.pymnts.com/global-cash-index-asia-pacific-analysis-2018>. Accessed July 2018.

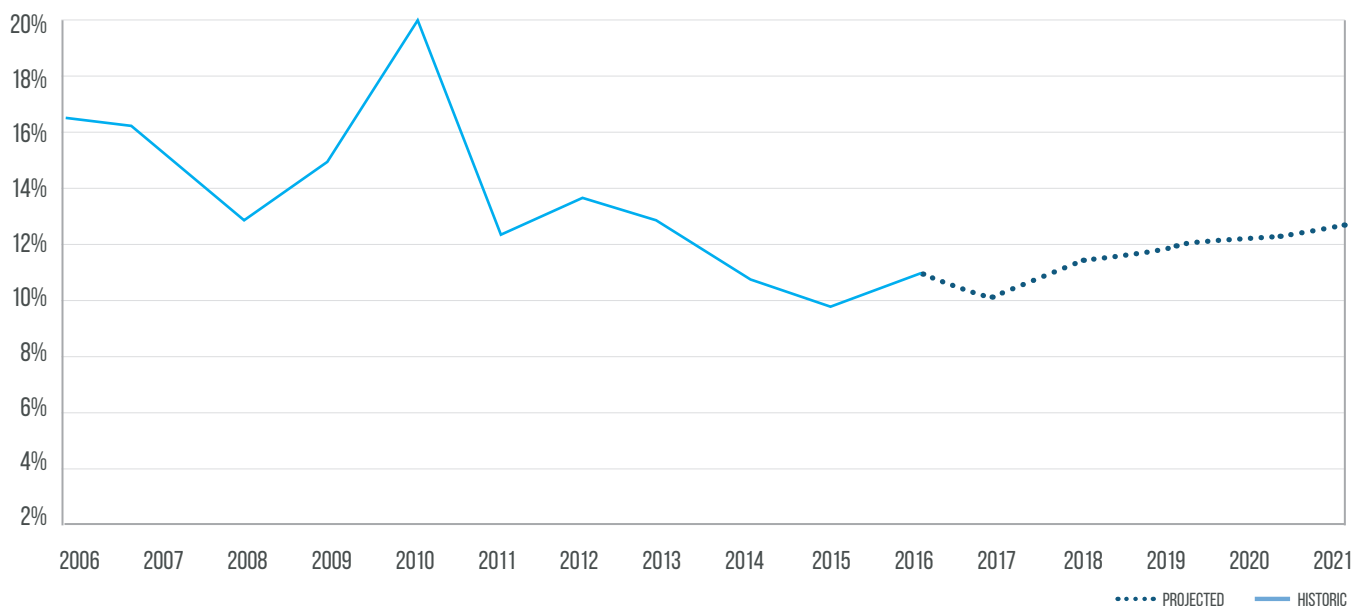
A recent overview of India's GDP growth indicates how strong the country's economy truly is. The nation has demonstrated steady increases since 2000, as outlined in Figure 2, and even the 2009 subprime crisis did not cause an economic downturn. India's GDP continued its upward trend in 2009, and is projected to climb through 2021.

While cash continues to maintain its hold, the Indian government is actively pushing for digital payments adoption. This will bring the country's vast informal economy into the tax fold, something that might be easier said than done. Several factors are working to keep cash in play, including India's large rural population – which falls outside digital banking infrastructure's reach – a thriving underground economy, low education levels and a general distrust of the banking system.

This edition of the Global Cash Index™ examines the continued role of cash in India and how it is set to evolve in the coming years.



FIGURE 2. HISTORIC AND PROJECTED GDP GROWTH FOR INDIA, 2006-2021



A STRONG, STEADY CASH SHARE

The cash share of India's GDP began to climb between 2006 and 2011, followed by a steady decrease. This drop is connected to a reduction in over-the-counter (OTC) transactions, as India's OTC share declined from 36.8 percent in 2011 to 33 percent in 2015. It rose slightly the following year, reaching 33.8 percent in 2016.

There's more to the story, though.

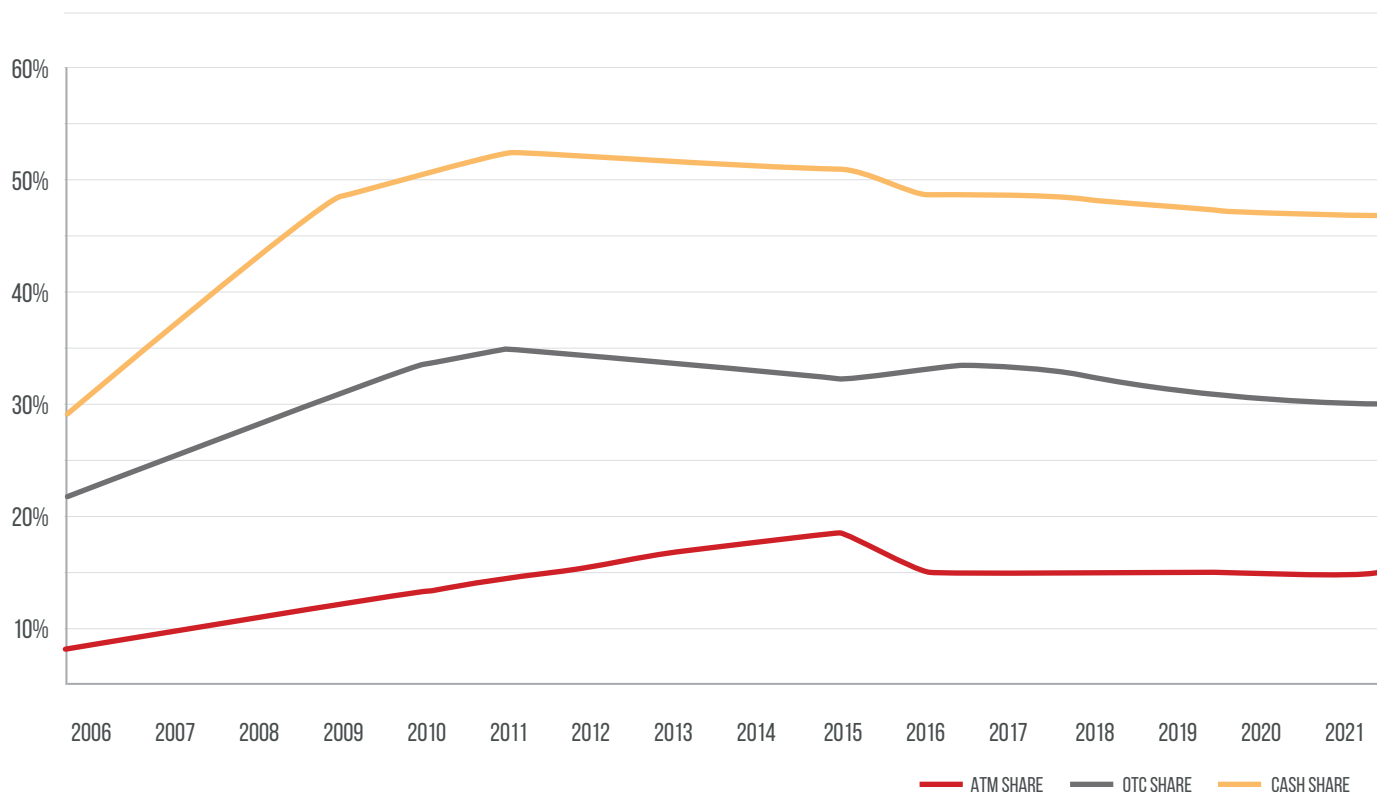
A closer look at the overall volume of ATM transactions reveals that India's population has seemingly shifted from accessing cash through OTC withdrawals to doing so through ATMs. India's ATM withdrawals as a share of GDP

grew from 6.9 percent in 2006 to 18.6 percent of the GDP in 2015, as outlined in Figure 3 and Table 1.

This data indicates that increasing ATM usage has protected India's cash share from further decline. In fact, more recent numbers show that cash usage is well-positioned to grow in the country. The number of ready-to-use ATMs grew from 107,498 in November 2016 to 110,196 in September 2017, for example — a 2.5 percent growth — and the number of active debit cards grew by 9.1 percent in the same period.²

² Author unknown. Bankwise ATM/POS/Card Statistics. Reserve Bank of India. 2018. <https://rbi.org.in/scripts/ATMView.aspx>. Accessed July 2018.

FIGURE 3. HISTORIC ATM, OTC AND CASH SHARE AS A PERCENTAGE OF GDP



GLOBAL CASH INDEX: INDIA EDITION

India's ATM share dropped slightly in 2016, dipping to 15.6 percent from the 18.6 percent registered in 2015. That's still more than double the share reported in 2006, however, indicating improved access to cash and growth in ATM usage throughout the Indian economy.

TABLE 1. GDP AND CASH USAGE DATA FOR INDIA (IN BILLION DOLLARS)

YEAR	NOMINAL GDP IN BILLION DOLLARS	CASH USAGE — BILLION DOLLARS			ATM SHARE	OTC SHARE	CASH SHARE
		ATM	OTC	TOTAL			
2006	856.9	58.9	192.0	250.9	6.9%	22.4%	29.3%
2007	995.1	87.4	263.9	351.3	8.8%	26.5%	35.3%
2008	1123.3	123.0	345.4	468.4	10.9%	30.7%	41.7%
2009	1292.5	169.4	443.8	613.2	13.1%	34.3%	47.4%
2010	1553.1	222.5	544.9	767.4	14.3%	35.1%	49.4%
2011	1743.1	279.5	641.1	920.6	16.0%	36.8%	52.8%
2012	1984.1	332.5	714.9	1047.4	16.8%	36.0%	52.8%
2013	2241.4	392.6	792.0	1184.6	17.5%	35.3%	52.8%
2014	2483.1	447.6	847.7	1295.3	18.0%	34.1%	52.2%
2015	2729.9	506.8	901.4	1408.2	18.6%	33.0%	51.6%
2016	3029.6	471.5	1022.5	1494.0	15.6%	33.8%	49.3%



DEMONETIZATION: A PROGRESS REPORT

While the Modi administration's demonetization policy is still relatively young, it has largely failed to take cash out of circulation nearly two years after its launch. The move set the stage for new payment methods to take hold, however, including some with the potential to compete with cash.

A lack of preparation has proven to be one of the most significant roadblocks in India's demonetization efforts. As analysts from Netherlands-based financial services firm Rabobank recently explained to PYMNTS in the Global Cash Index: Asia Pacific edition, one of the key reasons the policy has been unsuccessful is that the Indian government failed to lay the necessary foundation to prepare its citizens and businesses for the shift.³

Reducing cash usage wasn't the sole goal of the policy, as previously noted. Additional goals included stamping out corruption, reducing the underground economy's size, improving tax revenues and encouraging greater participation in the digital economy.

In terms of demonetization fighting corruption, the results have largely been bleak. The Indian government expected that roughly one-third of the notes being used by its underworld players would not be deposited into legitimate bank accounts because they were black market funds. This would have left the market with unusable bank notes, thereby decreasing cash's ability to thrive in the underworld economy.

The government failed to consider how money flows in such an economy, however. Cash is rarely stored long term, and is instead often used to buy assets like jewelry or property. In other words, black market operatives found ways around demonetization by legally exchanging their cash for these items.

On the other hand, digital payment tools' expansion has helped fulfill another policy goal. India's population is greater than 1.25 billion, but fewer than 30 million citizens file tax returns — an enormous tax revenue gap. In the first year of demonetization, however, income tax returns filed for 2016-2017 jumped by 25 percent.⁴

The efforts have so far failed to take cash out of circulation, but the demonetization policy appears to have succeeded in creating a fertile environment for new, modern payment methods to take root in India — and one day pose a challenge to cash's dominance.

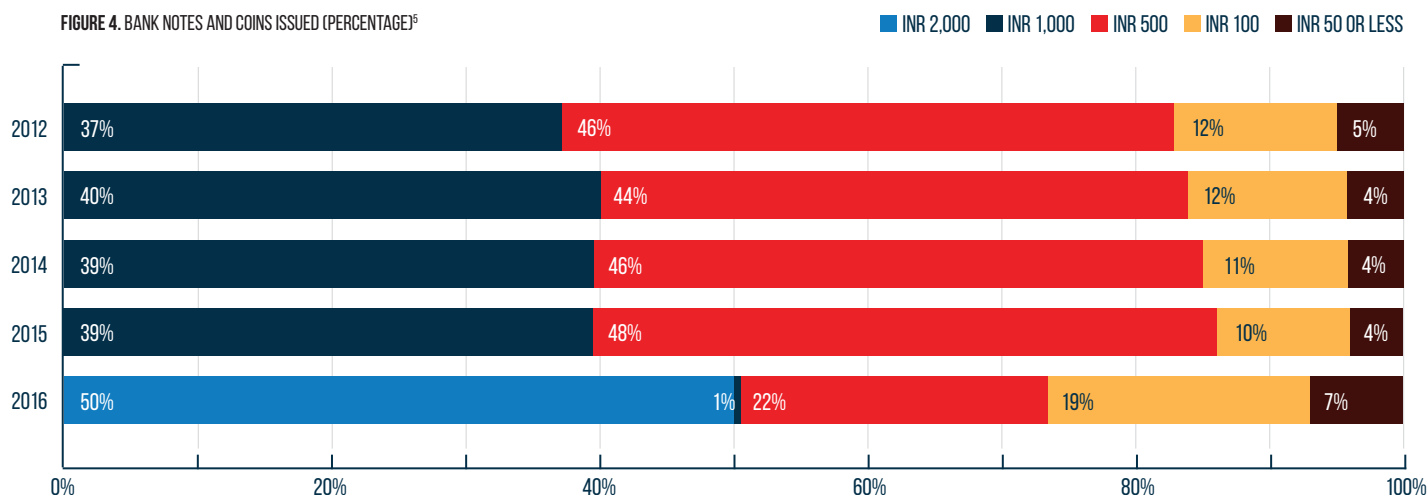


³ Author unknown. Despite demonetization, cash still thrives in India. PYMNTS. 2018. <https://www.pymnts.com/cash/2018/demonetization-cash-india/>. Accessed July 2018.

⁴ Dutt D'Cunha, Suparna. One year later, India's demonetization move proves too costly an experiment. Forbes. 2017. <https://www.forbes.com/sites/supamadutt/2017/11/07/one-year-later-indias-demonetization-move-proves-too-costly-an-experiment/#6c71b00f378a>. Accessed July 2018.

DEMONETIZATION CREATES OPPORTUNITY FOR MOBILE WALLET MARKET

FIGURE 4. BANK NOTES AND COINS ISSUED (PERCENTAGE)⁵



While India's demonetization hasn't rendered cash obsolete, it did open the path for alternative payment methods.

By some accounts, electronic payment solutions providers grew their reach in India following the demonetization news.⁶ Digital payments provider Paytm reportedly tripled its new users, onboarding 14 million accounts in November 2016 alone. Another electronic payment solutions provider, Oxigen Wallet, saw its average daily users increase by 167 percent in the first two months after the demonetization was announced.

India's online retailers could also further digital payment tools' adoption. Most of the country's online transactions were completed through cash on delivery (COD), which sees cash used to pay for a transaction when goods are dropped off, preferred by 70 percent of online shoppers.⁷

Online sales took a hit in the immediate aftermath of the demonetization policy, but online retailers used the change to invest in digital payments infrastructure. While cash is still widely preferred, online retailers' move to adopt digital payment solutions could create an opening for these tools to challenge its role in Indian eCommerce.

However, the Indian government has seen the nation's mobile wallet adoption rate as an opportunity to advance its demonetization agenda. Prime Minister Modi announced the launch of the Bharat Interface for Money (BHIM) app in December 2016, enabling users to make payments using India's real-time Unified Payment Interface (UPI).⁸

While the Modi administration might have neglected the preparations necessary to transition India's economy away from cash, it now appears to be playing catch up by pushing for mobile wallet usage.

⁵ Author unknown. Statistics on payment and settlement systems in the CPSS countries, figures for 2016. BIS. 2016. <https://www.bis.org/list/cpmi/index.htm>. Accessed July 2018.

⁶ Shepard, Wade. A cashless future is the real goal of India's demonetization move. Forbes. 2016. <https://www.forbes.com/sites/wadeshepard/2016/12/14/inside-indias-cashless-revolution/#702168e44d12>. Accessed July 2018.

⁷ Author unknown. How cash on delivery fueled e-commerce growth in India. HackerNoon. 2017. <https://hackernoon.com/how-cash-on-delivery-fuelled-e-commerce-growth-in-india-8ae66bea6cfe>. Accessed July 2018.

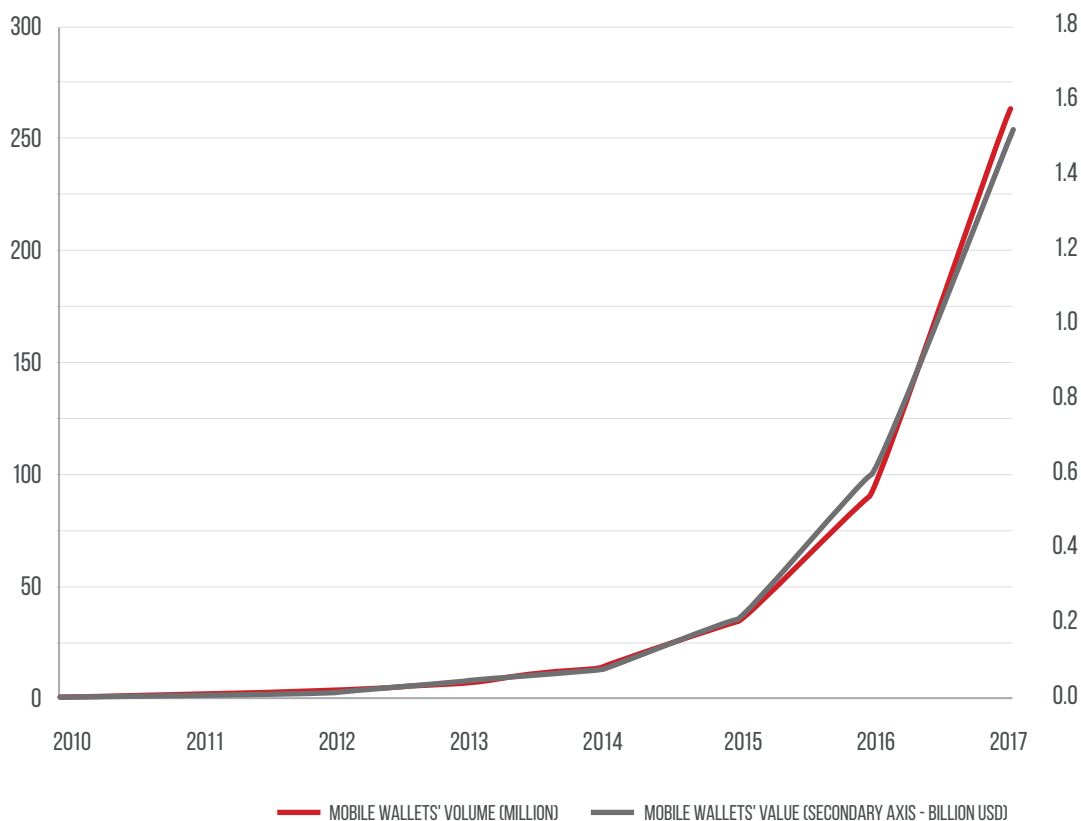
⁸ Pereira, Aaron. Narendra Modi's BHIM app – How to use it and all you need to know. Indian Express. 2016. <http://indianexpress.com/article/technology/tech-news-technology/narendra-modis-bhim-app-upi-how-to-use-it-and-all-you-need-to-know-4452026/>. Accessed July 2018.

NEW FORMS OF COMPETITION FOR CASH

A thriving mobile wallet market means new payment choices that could challenge cash's place as the top payment method in India.

The country's mobile wallet market is growing rapidly, as seen in Figure 5, and doing so in both value and volume. There were 46 million mobile wallets in use in 2015, 80 million-plus by 2016 and 245 million in 2017 — an increase of 433 percent in just two years. The value of that activity also skyrocketed, from \$300 million USD in 2015 to \$1.5 billion in 2017 during the same time period.

FIGURE 5. MOBILE WALLET'S EVOLUTION IN VALUE AND VOLUME, 2010-2017⁹

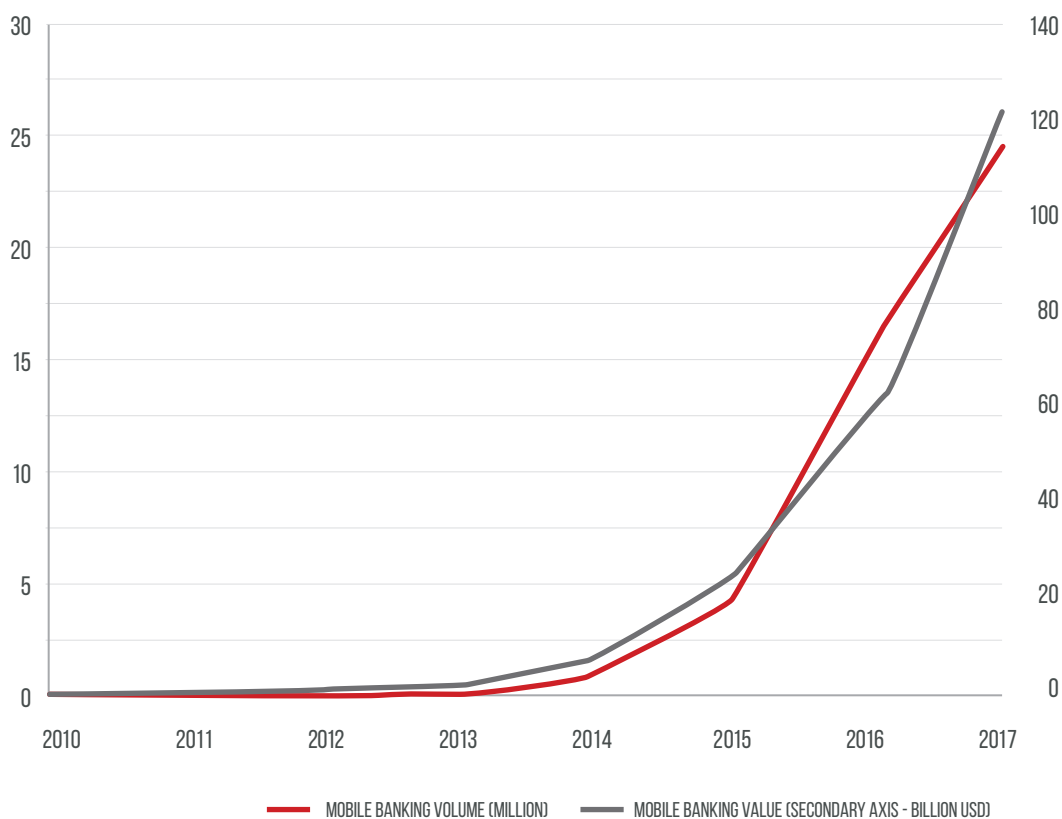


⁹ Author unknown. Database on Indian Economy, payment system indicators. Reserve Bank of India. 2018. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>. Accessed July 2018.



India also experienced an uptick in mobile banking activity during that two-year span, as outlined in Figure 6. The value of that mobile market was approximately \$700 million in 2015, then shot up to nearly \$26 billion by 2017.

FIGURE 6. MOBILE BANKING VALUE AND VOLUME (IN BILLION USD), 2010-2017¹⁰



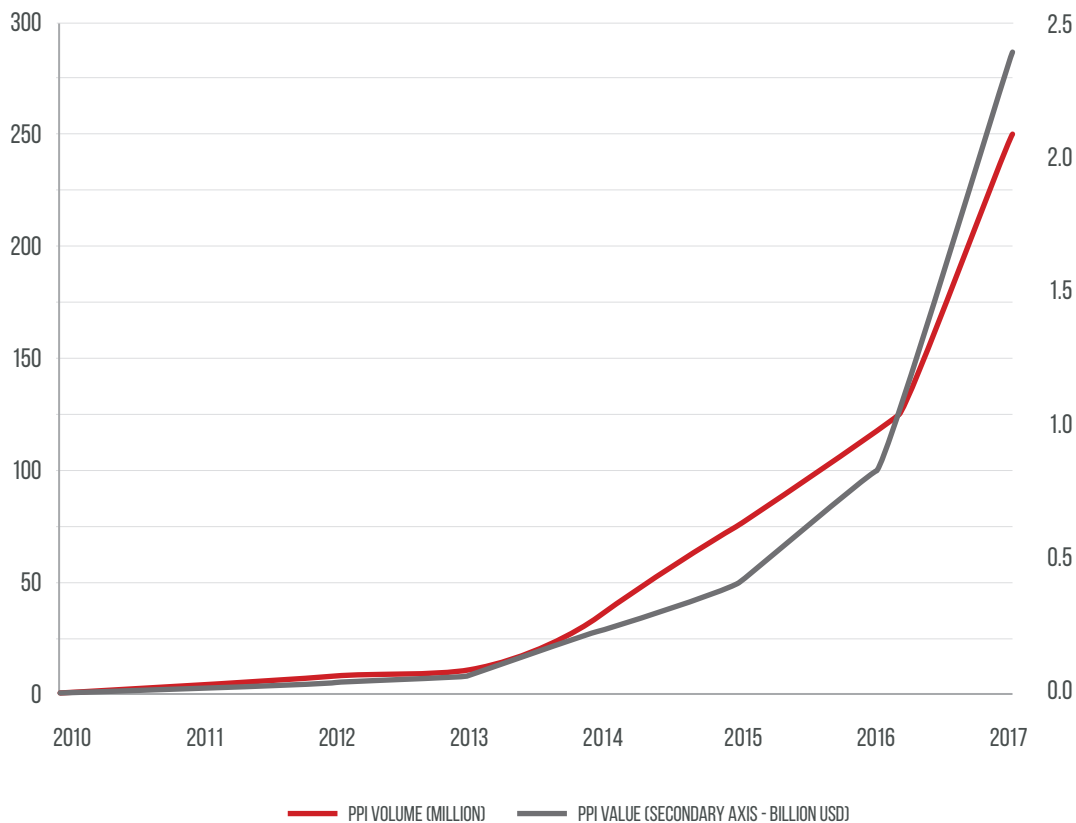
¹⁰ Author unknown. Database on Indian Economy, payment system indicators. Reserve Bank of India. 2018. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>. Accessed July 2018.



Prepaid payment instruments (PPI) rose rapidly during this period, too. The Reserve Bank of India (RBI) defines PPIs as including mobile wallets, PPI cards and paper vouchers, which can be used to pay for both purchases and utility payments. As seen in Figure 7, the broad PPIs category has been increasing since 2014, roughly doubling from \$1.1 billion in 2016 to \$2.1 billion in 2017.

India began seeing strong growth in mobile wallets, mobile banking and PPIs in the years prior to demonetization, meaning their increases cannot be completely attributed to the cashless-focused policy. Instead, efforts to bring more consumers into the nation's digital banking infrastructure likely fueled adoption before demonetization was implemented.

FIGURE 7. EVOLUTION OF PREPAID PAYMENT INSTRUMENTS, 2010-2017¹¹



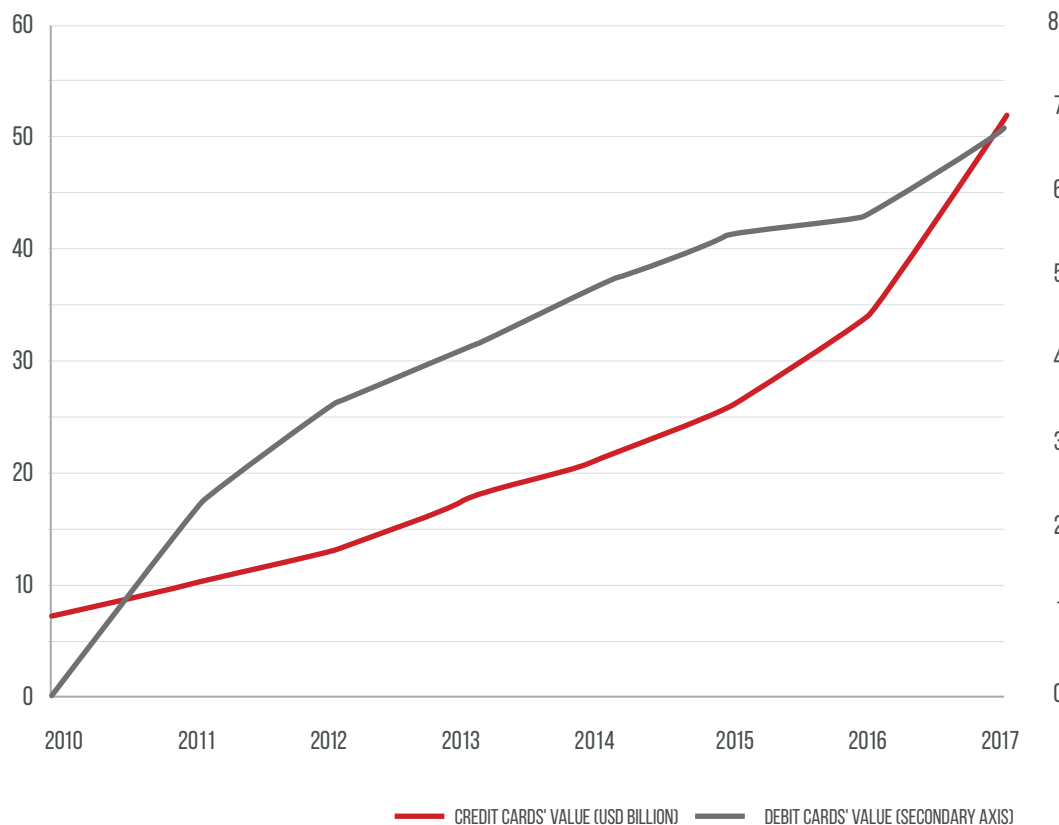
¹¹ Author unknown. Database on Indian Economy, payment system indicators. Reserve Bank of India. 2018. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>. Accessed July 2018.

Mobile technology and prepaid methods are not the only instruments gaining ground. Credit and debit card usage have also increased since the demonetization policy went into effect.

In fact, credit card payments' value has grown rapidly, as depicted in Figure 8. It accounted for \$3.7 billion in 2015, roughly doubling to \$7 billion following the demonetization rollout. While debit cards did not experience as dramatic an increase, their payments' value increased from \$43 billion in 2016 to \$51 billion in 2017.



FIGURE 8. CREDIT AND DEBIT CARDS' VALUE OF TRANSACTIONS IN BILLION USD, 2010-2017¹²

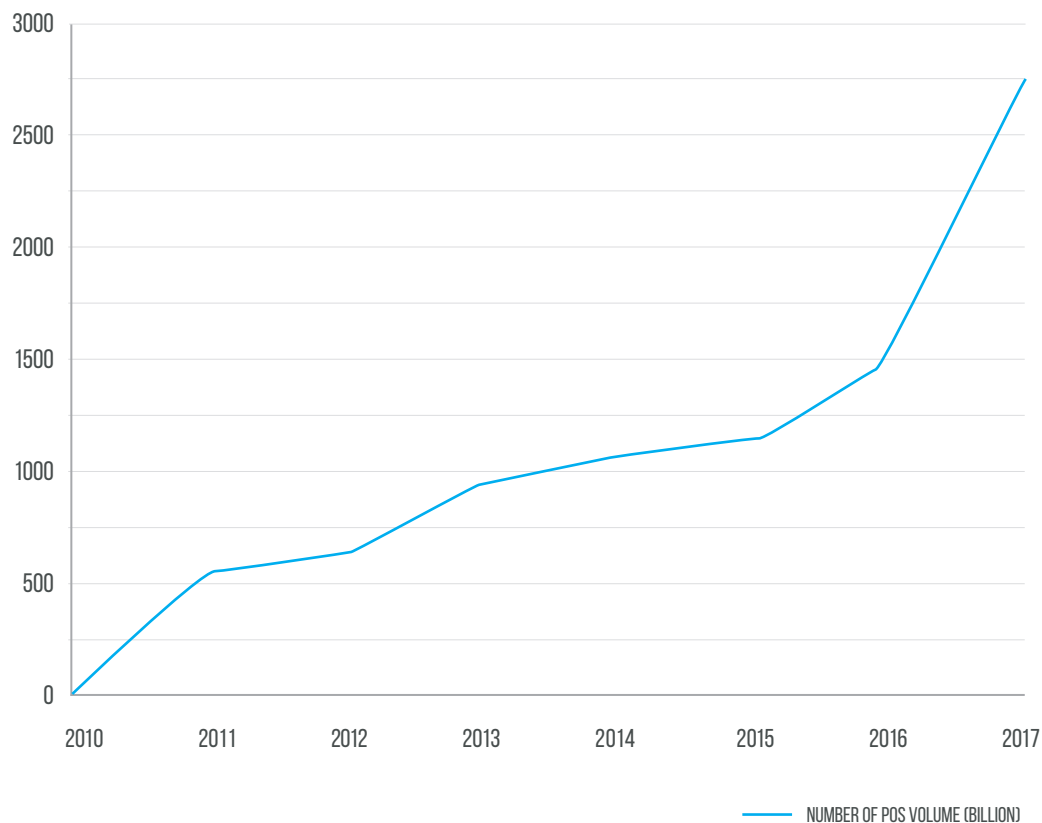


¹² Author unknown. Database on Indian Economy, payment system indicators. Reserve Bank of India. 2018. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>. Accessed July 2018.

The strong growth in payment cards reflects a notable shift in attitude. Both had low adoption levels in India as recently as 2014, and many could not be used because of a lack of point-of-sale (POS) terminal infrastructure.¹³

Demonetization appears to have prompted many Indian consumers to use credit and debit cards more often, however. As Figure 9 indicates, the number of POS terminals jumped from 1.46 billion in 2016 to 2.7 billion in 2017.

FIGURE 9. NUMBER OF POS, 2010-2017 (BILLION)¹⁴



¹³ Parker, Joe. How is demonetization affecting the eCommerce and other business sectors? Nowband. 2017. <https://www.nowband.com/blog/e-commerce-blog/how-is-demonetization-affecting-the-e-commerce-and-other-business-sectors/>. Accessed July 2018.

¹⁴ Author unknown. Database on Indian Economy, payment system indicators. Reserve Bank of India. 2018. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>. Accessed July 2018.

CASH'S REIGN CONTINUES

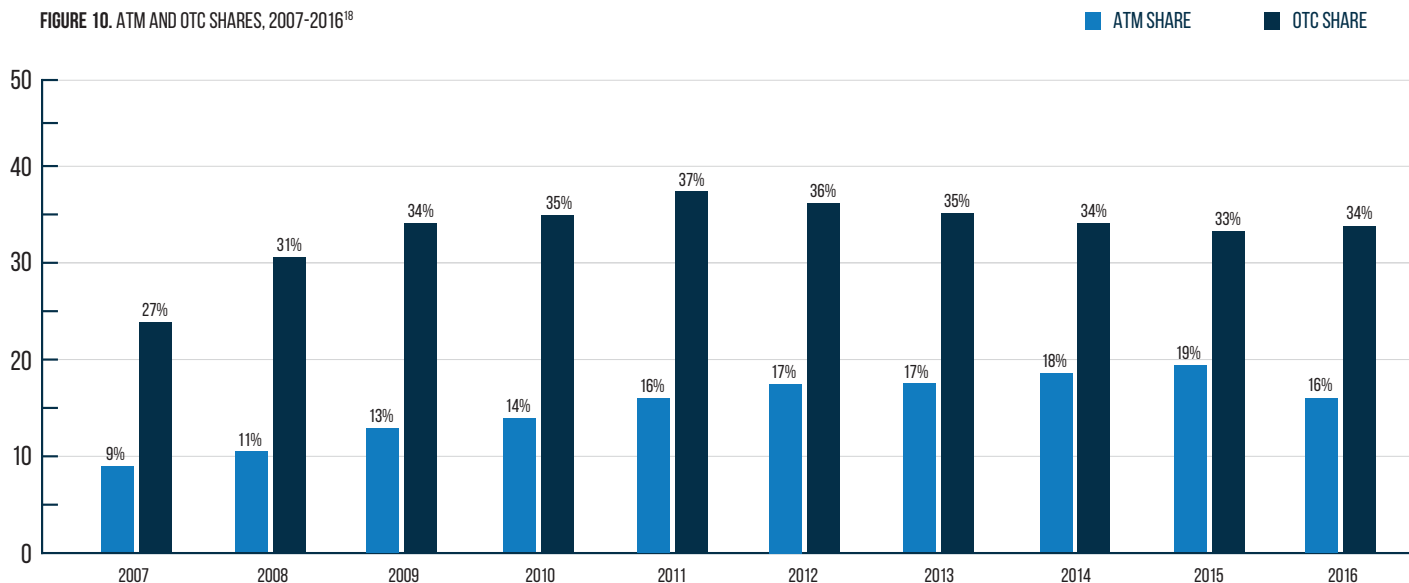
Despite alternative payment method use expanding in India, it is highly unlikely that the country's affinity for cash will dwindle any time soon. India is still home to a cash-driven society, and the preference is more about convenience. It is also deeply cultural and cannot be suddenly changed overnight.¹⁵

In other words, if taking India cashless was the Modi administration's goal, it has a long way to go before that can become a reality.¹⁶ Cash was used to complete 90 to 95 percent of all transactions in the country as recently as 2016, by some accounts.¹⁷

Retail purchases aren't the only ones that are heavily cash-dependent, either. Eighty-six percent of Indian employers paid their workers in cash in 2016, and only 40 percent of the population had a bank account, meaning cash was the only way they could pay or get paid.

A closer look at cash's share of the GDP indicates that while overall use slightly declined in 2016 compared to the previous year, it still powers close to 50 percent of transactions in the country, as shown in Figure 10. India spent some \$1.5 trillion in cash in 2016, one of the highest in the region.

FIGURE 10. ATM AND OTC SHARES, 2007-2016¹⁸



¹⁵ Author unknown. Despite demonetization, cash still thrives in India. PYMNTS. 2018. <https://www.pymnts.com/cash/2018/demonetization-cash-india/>. Accessed July 2018.

¹⁶ Osborne, Samuel. India to become 'cashless society', PM Narendra Modi hints. The Independent. 2016. <https://www.independent.co.uk/news/world/asia/india-cashless-society-banknotes-narendra-modi-ban-currency-a7442316.html>. Accessed July 2018.

¹⁷ Shepard, Wade. A cashless future is the real goal of India's demonetization move. Forbes. 2016. <https://www.forbes.com/sites/wadeshepard/2016/12/14/inside-indias-cashless-revolution/#702168e44d12>. Accessed July 2018.

¹⁸ Author unknown. Statistics on payment and settlement systems in the CPSS countries, figures for 2009, 2013, 2016. BIS. 2009, 2013, 2016. <https://www.bis.org/list/cpmi/index.htm>. Accessed July 2018.

It will be several years before a clear understanding of India's demonetization policy is available, but there are already signs that it is doing little to shake the economy's reliance on cash. They were evident a few months after the policy's implementation: A 9.1 percent month-over-month decline in electronic payments volume was reported in January 2017, and February saw an even greater drop of 21.3 percent — early signs that the population was not ready to so suddenly shift away from cash.¹⁹

More recent data sheds additional light on India's demonetization shortfall. The RBI recently reported that cash in circulation as a share of GDP is on track to return to

pre-demonetization levels. It rose by roughly \$293 billion in the first four months of 2018 — an annualized growth rate of approximately 40 percent — and the rate of “remonetization” is progressing faster than India's growth of nominal GDP, projected to see 10 to 12 percent growth in the 2018-2019 fiscal year.²⁰

Lack of trust in the nation's financial system also appears to be undermining the demonetization's effectiveness. Rumors that ATM cash deposits were not safe spread widely earlier this year, leading to hoarding of cash in some cases.²¹ The suddenness of the demonetization policy appears to have contributed to that erosion of trust.

ROADBLOCKS TO GOING CASHLESS

Indian citizens' distrust in the banking system is contributing to additional economic problems, leading many to hoard cash and causing a shortage. Public distrust is also hindering the broader adoption of digital banking solutions, with one of the top obstacles outlined by the *Economic Times* pointing to residents' security concerns and the lack of a reliable method to resolve disputes.²²

If digital solutions are intended to replace cash, then there are other roadblocks at play. London-based research firm Kantar NTS notes that only one-third of India's 1.3 billion residents have access to the internet and, of those who do, just 14 percent make mobile payments once per week.²³

Another issue in shifting from cash is that there is still confusion about how digital payment options work. Several

are available to consumers — including UPI, AadhaarPay, QR codes and BHIM, among others — meaning it is often more challenging for residents to pay digitally than to do so with cash.

Meanwhile, several financial players have observed that the rate of digital transactions has not demonstrated a significant increase since the policy took effect. Sara Quinlan, Mastercard's head of market insights, recently noted that digital transactions increased post-demonetization. The rates are still increasing, but they have dropped from the highs Mastercard observed immediately following the rollout. In fact, it could be another five to 10 years before India's cash usage reaches a tipping point, according to Quinlan.²⁴

¹⁹ Mukul, P and Singh, S. After demonetisation: As cash comes in, digital deals show sharp dip. The Indian Express. 2017. <https://indianexpress.com/article/india/demonetisation-digital-payments-online-transactions-cashless-economy-india-decline-in-electronic-transactions-4553410/>. Accessed July 2018.

²⁰ Kopf, Dan. India's use of cash is back to the levels before demonetization. QUARTZ India. 2018. <https://qz.com/1284590/indias-use-of-cash-is-back-to-the-levels-before-demonetization/>. Accessed July 2018.

²¹ Anand, Nupur. India's ATM crisis proves that demonetisation failed and cash remains king. QUARTZ India. 2018. <https://qz.com/1254249/indias-atms-are-running-dry-because-cash-is-back-with-a-vengeance-after-demonetisation/>. Accessed July 2018.

²² Singh, Shelley. Cash is king: Year after note ban India still remains a cash economy. The Economic Times. 2017. <https://economictimes.indiatimes.com/news/economy/policy/cash-is-king-year-after-note-ban-india-still-remains-a-cash-economy/articleshow/61512446.cms>. Accessed July 2018.

²³ Goel, V. and Raj, S. India clings to cash, even as tech firms push digital money. The New York Times. 2018. <https://www.nytimes.com/2018/01/07/technology/india-digital-money.html>. Accessed July 2018.

²⁴ Anand, Nupur. Mastercard says India will become a less-cash economy—but only in 10 years. QUARTZ India. 2018. <https://qz.com/1262849/mastercard-says-india-will-become-a-less-cash-economy-but-only-in-10-years/>. Accessed July 2018.

CASH AND THE STATE OF ATMS IN INDIA

A closer examination of India's ATM network provides additional insights into how the nation engages with and accesses cash. As in previous cash reports, PYMNTS reviewed the growth of India's ATM terminals, bank branches and POS terminals compared to other nations in the region to better understand how it views cash.

India's ATM network has a shorter reach than other countries in the region. It has 17.1 ATMs per 100,000 people, as outlined in Table 2, which is much lower than the rates observed in South Korea (234.8 per 100,000) and Australia (134.8 per 100,000). What's more, many are located in large cities, meaning access can be more challenging for rural-area residents.

Its POS accessibility is considerably lower than that of neighboring nations, too. India has just 194.6 POS terminals per 100,000 people, far below the rate of countries like Australia (3,912.8 per 100,000) and Singapore (3,321.9 per 100,000). Its ATM accessibility might be lower than its neighbors, and may skew more favorably toward urban residents, but a lack of POS terminals makes it challenging for digital payment tools to effectively compete with cash.

Lack of POS terminal availability also explains India's low value of card payments per capita. Only \$500 USD per capita in card payments was reported in India, a very low figure compared to the \$17,100, \$13,300 and \$10,100 per capita reported in Australia, South Korea and Singapore, respectively.

TABLE 2. COMPARISON OF FEATURES AMONG ASIA PACIFIC COUNTRIES (2016)

DESCRIPTION	AUSTRALIA	CHINA	INDIA	JAPAN	KOREA	SINGAPORE
Bank branches per 100,000 people	22.0	--	11.4	--	14.3	8.2
ATM terminals per 100,000 people	134.8	66.8	17.1	107.8	234.8	48.9
POS terminals per 100,000 people	3912.8	1774.4	194.6	--	--	3321.9
ATM withdrawals per capita thousand (USD)	4.1	2.6	0.4	0.9	1.1	7.7
OTC withdrawals per capita (thousand USD)	1.7	0.4	0.8	0.2	0.1	0.7
Card payments per capita (thousand USD)	17.1	5.6	0.5	4.0	13.3	10.1
ATM withdrawals per ATM terminal (USD)	3.1	3.8	2.12	0.8	0.5	15.8
OTC withdrawals per bank branch (USD)	7.8	--	6.9	--	0.7	8.0

India is in better shape in terms of bank branch access, however — though still behind some of its Asia Pacific neighbors. India has 11.4 bank branches per 100,000 people, roughly half the rate of Australia's footprint (22 per 100,000), lower than South Korea's (14.3 per 100,000) but higher than Singapore's (8.2 per 100,000).

Indian ATMs' limited availability also means a lower rate of related cash withdrawals. The nation's ATM withdrawal rate is \$400 per capita, far below the rates of Singapore (\$7,700), Australia (\$4,100) and China (\$2,600).

In terms of OTC withdrawals, India sees \$800 per capita, largely beating out all but one of its neighbors. Its withdrawal rate is higher than that of Singapore, South Korea, Japan and China, meaning only Australia, at \$1,700 per capita, is ahead of it.

ASSESSING THE YOUTH FACTOR

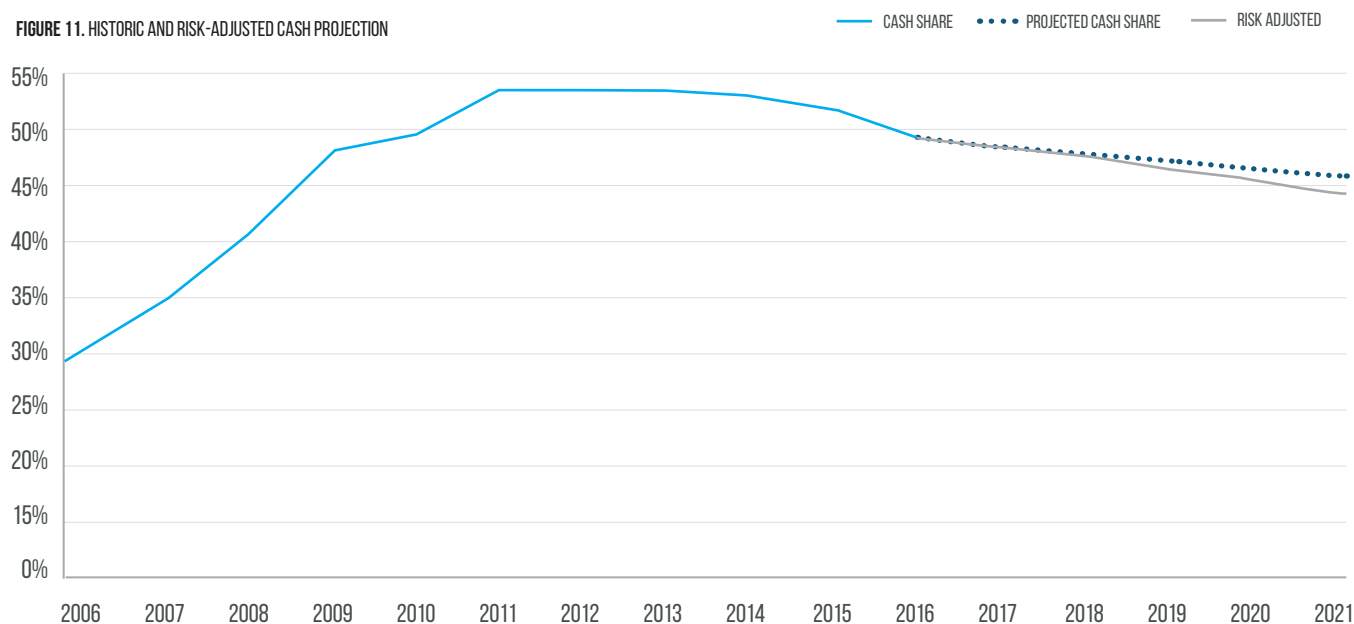
The role that young people could have on a nation's economy is another element to consider in India's relationship with cash.

Younger consumers can more easily adopt new payment technologies, so they often prefer using alternate payment methods alongside cash. As they grow older, these

consumers might become more cash-averse, which could pose a challenge to the payment method's future grip on the Indian economy.

Even this does not appear to have much impact on the nation's expected cash share, though. Taking youth into account, cash will likely decrease to 44.6 percent of the GDP.

FIGURE 11. HISTORIC AND RISK-ADJUSTED CASH PROJECTION



TOTAL CASH USAGE

India's cash share has been declining slightly over the past few years, but cash use for everyday transactions has been growing — and expects further growth in the future.

The country's strong GDP is fueling cash use and, as Table 3 outlines, its economy has grown at a CAGR of 11.7 percent from 2011 to 2016. It is showing no signs of slowing, either, with a projected CAGR at 11.9 percent from 2016 to 2021.

This increase offsets the roughly 0.5 percent annual decline in cash share for both periods. The result is an increase in cash usage, first by 10.2 percent from 2011 to 2016 period and then by 10.5 percent from 2016 to 2021.

As its economy grows and produces more goods and services, India needs additional cash to facilitate purchases. This can be achieved by increasing usage of both cash and other payment methods.



TABLE 3. INDIA'S CASH SHARE, GDP AND TOTAL CASH USAGE

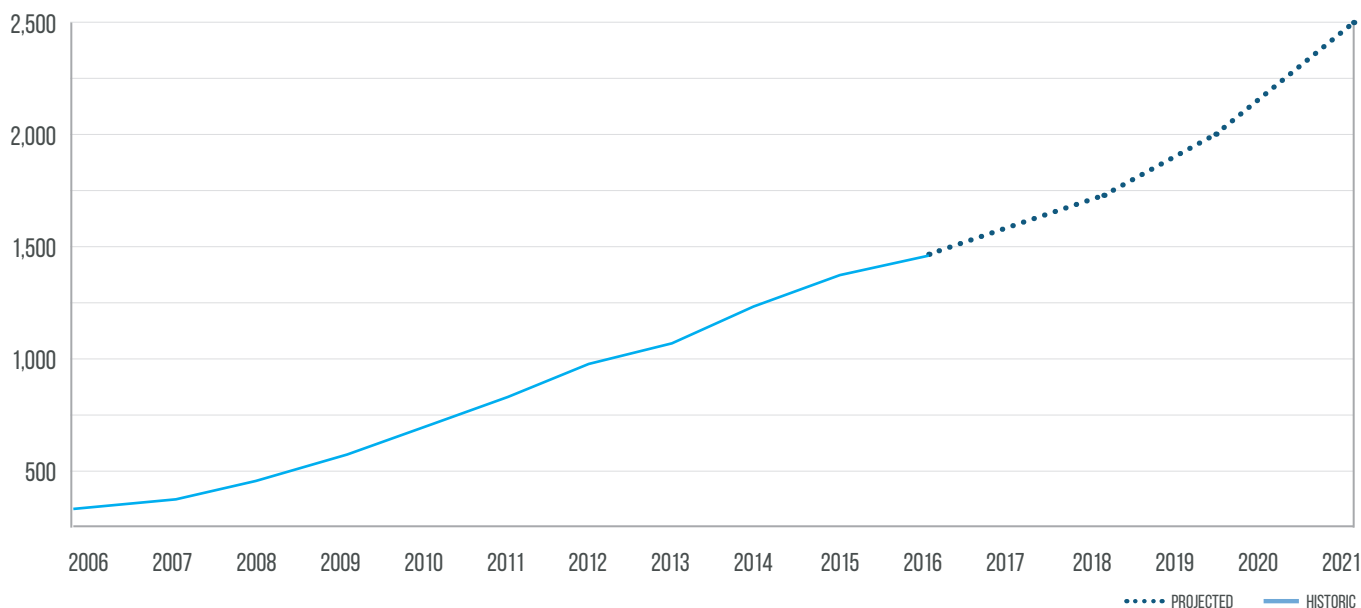
	CASH USAGE AND PROJECTIONS					COMPOUND ANNUAL GROWTH RATE	
	2001	2006	2011	2016	2021	2011 – 2016	2016 – 2021
CASH SHARE	-	29.3%	52.8%	49.3%	46.2%	-0.51%	-0.50%
GDP	470	857	1,743	3,030	5,319	11.69%	11.91%
TOTAL CASH USAGE	-	251	921	1,494	2,458	10.17%	10.47%

India's cash share is still projected to lessen over time, however. A look at trends from 2001 to 2016 indicates the share of cash-based transactions may have peaked at 52.8 percent in 2011. That figure declined to 49.3 percent by 2016, though, and is expected to further dip to 46.2 percent by 2021.

The current decrease in cash share indicates it will take years before India sees the levels it saw in 2006. Although its share is declining, cash is likely to continue to play a strong role in India's economy for years to come.

Meanwhile, cash usage is headed for growth, as outlined in Figure 12. India has already seen its usage increase at a CAGR of 10.17 percent between 2011 and 2016, and that rate is projected to see 10.47 percent from 2016 to 2021.

FIGURE 12. HISTORIC AND PROJECTED TOTAL CASH USAGE (IN BILLION DOLLARS)



THE STATE OF CASH IN INDIA

The two-year anniversary of India's demonetization experiment is coming up in November, making now a good time to take stock of the policy's effectiveness.

Cash is being challenged on multiple fronts in India, including a government-backed agenda to phase it out, a growing market for digital payment methods and a younger population that could play a larger role in alternate payment adoption, among others.

That said, India's path toward cashless appears to be a long one. Despite these challenges, cash appears positioned to thrive in the country for many years to come. A large rural population with limited internet access, distrust of the nation's financial systems and deep cultural ties to payment practices means cash will likely remain a cornerstone of the Indian economy for a long time.

All told, the demonetization experiment appears to have fallen short of its goals, even backfiring in some respects. India's reliance on cash has already returned to its former levels, and the policy has shaken consumers' confidence in India's banking systems. This has prompted citizens to become *more* reliant on cash, not less.

One of the biggest mistakes was failing to lay the groundwork for successful policy implementation. Years of cultural attachment to cash cannot be undone overnight, nor will rural citizens turn to digital alternatives when the digital banking infrastructure is largely outside their reach.

Demonetization did help spur the digital payments market's growth in India, though. The country's younger population and vast smartphone adoption are both creating an opening by which cash's reign could be challenged.

For now, cash remains the payment method of choice in India, and is likely to remain so for years to come — despite the government's efforts to change that.



FEATURE STORY

CASH REMAINS CENTRAL TO INDIA'S ECONOMY, **BUT COMPETITION IS GROWING**



Despite its governments' efforts to shift from physical bank notes to digital payment systems, cash continues to thrive in India.

The country's demonetization policy was launched to help boost tax revenues, spur the modernization of its payment system, crack down on corruption and deter its underworld economy. Residents' decades of cash use and a sizable rural population that falls outside the traditional banking infrastructure makes demonetization a highly challenging goal, however.

The cashless experiment has not yet rendered cash obsolete in the country, either. It has opened new opportunities for alternative payment options like mobile wallets to gain ground, though — an important move in a country with a sizable, mobile-savvy, young population.

PYMNTS recently caught up with Ritesh Pai, chief digital officer of India's [YES BANK](#), about the country's high affinity for cash, the shift in consumers' payment preferences and the long digital payments road ahead.

Electronic payments gain appeal

Prior to the demonetization implementation, Pai noted that India was heavily cash dependent. Approximately 95 percent of all transactions were made using cash as recently as

2016, and 90 percent of merchants did not have an electronic POS system to accept card-based payments.²⁵

The Indian population has not abandoned cash en masse since demonetization, though. In fact, the RBI recently reported that cash in circulation as a share of GDP will likely return its pre-demonetization levels.²⁶

While the policy might not have resulted in a rapid overnight shift to digital payment systems, Pai explained that it did have another impact: Specifically, it prompted many Indian citizens to explore and discover alternative payments.

"Demonetization got the ball rolling," Pai explained. "[Fearing] the absence of cash, people had no choice but to go to electronic payments."

The policy has ultimately helped fuel India's digital banking system. Without it, adoption of more modern, electronic payment methods may have proceeded at a considerably slower pace.

"What it ended up doing is it gave [us] a jump of about three to four years," Pai said. "Otherwise, to do it in a more organic way would have taken much more time."

²⁵ Shepard, Wade. A cashless future is the real goal of India's demonetization move. Forbes. 2016. <https://www.forbes.com/sites/wadeshepard/2016/12/14/inside-indias-cashless-revolution/#702168e44d12>. Accessed July 2018.

²⁶ Kopf, Dan. India's use of cash is back to the levels before demonetization. QUARTZ India. 2018. <https://qz.com/1284590/indias-use-of-cash-is-back-to-the-levels-before-demonetization/>. Accessed July 2018.

Helping inform consumer choice

Demonetization may have breathed life into the digital payment market, but not all consumers are ready to give up cash in favor of a debit card, credit card or mobile wallet options like the UPI or PayPal. Some prefer using cash, others an alternate payment form, meaning there's no "one-size-fits-all" approach, Pai said. Consumers have varying payment needs, too, and banks and retailers must account for that.

"As a bank, I often take the view that we have to behave like a restaurant, where you have a buffet spread," he added. "You have all the cuisine that is available, and it is the choice of the customers what they want to pick and choose."

YES BANK works to pitch new consumers on the potential benefits of digital banking, but it also take steps not to alienate cash-focused customers in the process.

"If you try to force [alternative] solutions down [the] throats of people who are still interested in cash, then sometimes you will have pushback," Pai said.

There are many Indian small- to medium-sized businesses (SMBs) interested in transitioning from cash to an electronic payment option. They might have relationships with suppliers and customers who primarily rely on cash, however, therefore slowing or preventing the switch.

The long road away from cash

India is also home to a sizable rural population, a group that often falls into the "underbanked" category, according to Pai. Digital banking infrastructure often doesn't extend to its geographic area, meaning this population's very scope could keep cash in play for a long time to come.

"It's a real herculean task [for banks] to cater to these locations," he said.

The country's rural residents are also less trusting of the electronic payment system, and news of hacks and data breaches can further erode their already-low confidence in digital banking. This keeps the group returning to cash.

"In the eagerness to move to electronic payments, you cannot compromise the safety and security aspect," Pai said. "[That's] because you will have a lot of vulnerable people in the ecosystem who will get cheated. Once they lose faith in this payment system, it's very difficult to get back."

Residents in these areas are often slower to adopt newer payment methods like mobile wallets, unlike those in more populated metro regions. Biometric solutions could go a long way toward assuring rural citizens that their data is secure, though, and Indian banks are currently raising awareness about how iris scans or fingerprints can authenticate electronic payments using the Aadhaar system.

In fact, the Indian government's demonetization has created an opportunity for FIs like YES BANK to educate rural and urban residents alike about the growing field of payment options, Pai said. It has ultimately failed to reduce the influence of cash, though,

meaning it is likely to remain active in the economy for years — even as new payment methods gain popularity.

"For cash to be eliminated completely will be a challenge," he added.

All told, the policy has begun a conversation about India's current payments and what we can expect to see down the road. New methods are gaining ground and showing promise, but cash still has a reliable seat at the payments table for the foreseeable future.

"If you try to force [alternative] solutions down [the] throats of people who are still interested in cash, then sometimes you will have pushback."

METHODOLOGY AND DATA

The PYMNTS.com Global Cash Index, powered by Cardtronics, analyzes overall cash usage and projected trends over the next five years for the 40 worldwide countries that have provided sufficient data to make estimates on cash usage. These countries are divided into four regions – Western Europe, Eastern Europe, the Americas and Asia and Other – and we will publish reports reviewing cash share and usage on one region each quarter.

WESTERN EUROPE	EASTERN EUROPE	THE AMERICAS	ASIA AND OTHER
 AUSTRIA	 BULGARIA	 UNITED STATES	 AUSTRALIA
 BELGIUM	 CROATIA	 MEXICO	 CHINA
 FINLAND	 CZECH REPUBLIC	 BRAZIL	 INDIA
 FRANCE	 ESTONIA		 JAPAN
 GERMANY	 GREECE		 SOUTH KOREA
 IRELAND	 HUNGARY		 SINGAPORE
 ITALY	 LATVIA		 SAUDI ARABIA
 LUXEMBOURG	 LITHUANIA		 SOUTH AFRICA
 MALTA	 POLAND		
 NETHERLANDS	 ROMANIA		
 PORTUGAL	 RUSSIA		
 SPAIN	 SLOVAKIA		
 SWEDEN	 SLOVENIA		
 SWITZERLAND	 TURKEY		
 UNITED KINGDOM			

- The first factor is cash share, or the total amount of purchases made with cash. We measure cash share as the total amount of cash used by a country divided by the country's annual GDP. The total cash used by citizens of the country is assumed to be equal to the total amount of cash withdrawn at ATM machines plus the total amount of cash withdrawn OTC at bank branches in the country.
- The second factor is how the overall economy is growing. The total cash usage is estimated as the total cash share multiplied by the country's GDP. As a country's economy develops and grows, more overall spending occurs, which means more cash spending is occurring.

We have found that total cash share is decreasing in most countries. Because both population and GDP are growing, however, total cash usage is also still growing (albeit at rates lower than the GDP).

To calculate the results in this report, we performed the following for each country:

- Gathered historic and projected data.
- Estimated OTC cash withdrawals for countries that do not report this data.
- Calculated historic cash share.
- Estimated cash share for 2015 and beyond.
- Estimated total cash usage for 2015 forward and beyond.

Gathered historic and projected data.

We collected historic data for each country from 2000 to 2014, including information regarding total population, GDP, cash withdrawals from ATM and OTC, total card spending and payments infrastructure, such as the number of ATM machines and bank branches.²⁷ We also gathered data to project cash usage, including projected GDP and projected population by age group.²⁸

We gathered data from 2000 through 2014 and used as much as was available. We have data on population and GDP for all years, and data on cash withdrawals and payments infrastructure for many but not all years.

For each country, we collected projections for the GDP and for population by age group. This data comes from the International Monetary Fund (IMF) and World Bank, respectively, and is from the same source as the historic data. Population projections are available every five years, and we used a linear interpolation for the years that are not reported. GDP projections are by year, and if we needed time periods beyond the last projected data point, we assumed that final GDP growth rate will be consistent over time.

Estimated OTC cash withdrawals for countries that do not report this data.

As described, cash share is defined as the total cash withdrawals from ATM machines plus total OTC cash withdrawals. We have selected the 40 countries in our analysis based on the availability of sufficient cash withdrawal data. The 40 included countries produced at least some data on the level of ATM withdrawals each year. If ATM withdrawals are not available, the country is excluded from our analysis.

While all 40 countries provided ATM data, only 12 provided data on OTC cash withdrawals. This means that for the other 28 countries, we had to estimate the level of OTC withdrawals. We did this by looking at each of our 28 target countries (the ones for which we need to estimate OTC withdrawals) and selecting a comparable country from the 12 countries that did provide data (we refer to these as our potential comparable countries).

The estimation procedure is done in the following four steps:

- **ONE:** Calculate the OTC-to-ATM ratio for each of the 12 potential countries that do provide OTC data. These are all potentially comparable countries. This is a simple calculation of dividing the level of OTC withdrawals by the level of ATM withdrawals for each year where data is available.

²⁷ Data on Population is from the World Bank [<http://data.worldbank.org/indicator/SP.POPTOTL>], Data on GDP is from the IMF [<http://www.imf.org/external/ns/cs.aspx?id=28>], and data on cash with draws, card spending and the payments infrastructure is from the Bank of International Settlements [<http://www.bis.org/cpmi/publ/d142.pdf>] or from the European Central Bank [https://www.ecb.europa.eu/pub/pdf/other/art2_mb201104en_pp79-90en.pdf]

²⁸ Data on projected population is from the World Bank, and projected GDP is from the IMF. If these are the same, combine these footnotes into a single footnote.

- **TWO:** Estimate the logarithmic trend of the OTC to ATM ratio from 2000 through 2014 for each of the potentially

$$\left(\frac{OTC}{ATM}\right)_{Year} = \alpha + \beta \times LN(Year) + \epsilon$$

comparable countries.²⁹

We do this to remove any data jumps or movements that are due to factors specific to the country. This trend gives us a complete trend of the OTC to ATM ratio for each year from 2000 through 2014.

- **THREE:** Select the potential comparable country. For each country that does not have OTC data (target

country), we select the most comparable country from the list of countries that do provide OTC data. This country is selected by comparing the trends and levels in five different variables:

- ATM withdrawals as a percentage of GDP
- Card spending as a percentage of GDP
- Bank branches per 1,000 people
- ATM terminals per 1,000 people
- POS terminals per 1,000 people

For each potential comparable country, we calculate a difference in levels and a difference in changes over an eight-year period from 2006 to 2014. These are calculated as follows:

$$\text{Difference in levels} = \sqrt{\sum_{i=2006}^{2014} (Variable_{Comparable/i} - Variable_{Target/i})^2}$$

$$\text{Difference in changes} = \sqrt{\sum_{i=2006}^{2014} \left(\frac{Variable_{Comparable/i}}{Variable_{Comparable/i-1}} - \frac{Variable_{Target/i}}{Variable_{Target/i-1}} \right)^2}$$

In the formula above, i is the year and "Variable" refers to each of the five variables listed above. We perform this calculation for each of the 28 target countries against each of the 12 potential comparable countries. This provides a difference in levels and a difference in changes for each of the five variables for each combination of a target country and comparable comparison country. We then assign a weight of two-thirds to the difference in levels and one-third difference in changes, and for each target and comparable country, we calculate a weighted average difference:

$$\begin{aligned} \text{Weighted Average Difference}_{ij} \\ = 0.667 * \text{Avg difference in levels} + 0.333 * \text{Avg difference in changes} \end{aligned}$$

In this equation, i is the target country and j is the comparable country.

For each target country, we then have a weighted average difference for each of the 12 potential comparable countries. The comparable country for each target is selected as the potential comparable country with the smallest difference for each target

²⁹ For three countries, the reduction in OTC-to-ATM ratio was so strong that we used a polynomial trend. These three countries were Latvia, Romania and Slovakia.

country. The following table shows the comparable country selected for each of the 28 target countries.

NUMBER	TARGET	COMPARABLE
1	AUSTRALIA	UNITED KINGDOM
2	AUSTRIA	ITALY
3	BELGIUM	NETHERLANDS
4	BRAZIL	MALTA
5	BULGARIA	HUNGARY
6	CHINA	SLOVAKIA
7	CROATIA	MALTA
8	ESTONIA	NETHERLANDS
9	FINLAND	NETHERLANDS
10	FRANCE	ITALY
11	GREECE	HUNGARY
12	INDIA	SLOVAKIA
13	IRELAND	LATVIA
14	JAPAN	GERMANY
15	KOREA	UNITED KINGDOM
16	LUXEMBOURG	ITALY
17	MEXICO	CZECH REPUBLIC
18	POLAND	HUNGARY
19	PORTUGAL	UNITED KINGDOM
20	RUSSIA	ROMANIA
21	SAUDI ARABIA	SLOVAKIA
22	SINGAPORE	NETHERLANDS
23	SLOVENIA	HUNGARY
24	SOUTH AFRICA	SLOVAKIA
25	SWEDEN	NETHERLANDS
26	SWITZERLAND	NETHERLANDS
27	TURKEY	MALTA
28	UNITED STATES	UNITED KINGDOM

- **FOUR:** Calculate the estimated level of OTC withdrawals for the target country. We have 28 target countries for which we are estimating the level of OTC withdrawals. For nine of these countries, we do have data on the OTC-to-ATM ratio for a single year but have no other data that can allow us to understand how it's trending.

For these countries, we adjust the value of $\left(\frac{OTC}{ATM}\right)_{Year}$

such that it matches the known OTC-to-ATM ratio. This has the result of shifting the OTC-to-ATM ratio for every year up or down such that our estimated trend line passes through the known point. For the other 19 countries, we assume that this adjustment is equal to zero or that the OTC-to-ATM ratio for the selected comparable country is the same as the OTC-to-ATM ratio for the target country.

For each target country, we then take this adjusted value of $\left(\frac{OTC}{ATM}\right)_{Year}$ for the selected comparable country and use it to calculate the level of OTC withdrawals for each from 2000 through 2014.

$$OTC\ Withdrawals_{Year} = \left(\frac{OTC}{ATM}\right)_{Year} \times ATM\ Withdrawals_{Year}$$

The following table identifies the 12 countries for which OTC data is reported, the nine countries for which we have to estimate the trend based on a comparable country but for which we do have a single known data point to set the level of OTC withdrawals, and the 19 countries for which the trend and OTC-to-ATM ratio are derived from the comparable country.

ASIA AND OTHER

NO	COUNTRY	SOURCE OF OTC DATA		
		OTC DATA AVAILABLE	KNOWN DATA POINT	VALUE IS DERIVED
1	AUSTRALIA		✓	
2	CHINA			✓
3	INDIA			✓
4	JAPAN			✓
5	SOUTH KOREA			✓
6	SINGAPORE			✓
7	SAUDI ARABIA			✓
8	SOUTH AFRICA			✓

WESTERN EUROPE

NO	COUNTRY	SOURCE OF OTC DATA		
		OTC DATA AVAILABLE	KNOWN DATA POINT	VALUE IS DERIVED
1	AUSTRIA			✓
2	BELGIUM			✓
3	FINLAND		✓	
4	FRANCE		✓	
5	GERMANY	✓		
6	IRELAND		✓	
7	ITALY	✓		
8	LUXEMBOURG			✓
9	MALTA	✓		
10	NETHERLANDS	✓		
11	PORTUGAL		✓	
12	SPAIN	✓		
13	SWEDEN		✓	
14	SWITZERLAND			✓
15	UNITED KINGDOM	✓		

EASTERN EUROPE

NO	COUNTRY	SOURCE OF OTC DATA		
		OTC DATA AVAILABLE	KNOWN DATA POINT	VALUE IS DERIVED
1	BULGARIA			✓
2	CROATIA		✓	
3	CZECH REPUBLIC	✓		
4	ESTONIA			✓
5	GREECE			✓
6	HUNGARY	✓		
7	LATVIA	✓		
8	LITHUANIA	✓		
9	POLAND			✓
10	ROMANIA	✓		
11	RUSSIA			✓
12	SLOVAKIA	✓		
13	SLOVENIA		✓	
14	TURKEY			✓

AMERICAS

NO	COUNTRY	SOURCE OF OTC DATA		
		OTC DATA AVAILABLE	KNOWN DATA POINT	VALUE IS DERIVED
1	UNITED STATES		✓	
2	MEXICO			✓
3	BRAZIL			✓

Calculated historic cash share.

The cash share is defined as the total cash spending divided by the GDP. In this sense, cash usage is relative to the overall size of the economy. Total cash spending is defined as ATM withdrawals plus OTC withdrawals. Total cash share is calculated as follows:

$$\text{Cash Share}_{\text{Year}} = \frac{\text{ATM Withdrawals}_{\text{Year}} + \text{OTC Withdrawals}_{\text{Year}}}{\text{GDP}_{\text{Year}}}$$

Estimated cash share for 2015 forward.

The cash share is estimated as a logarithmic trend of the historic data. We then estimate the log trend and adjust the line such that it lines up with the historic data for 2014. This creates a naïve historic cash share trend starting at the historic cash share for 2014, rolling forward for five or 10 years.

We then adjust this naïve cash share based on the demographic trends in the country and the likelihood that younger demographics will be more prone to shift away from cash to new payment methods such as mobile wallets or other new technologies that are becoming available. This adjustment analyzes the proportion of the population that is younger and accounts for the relative amount of spending (because younger people generally earn and spend less than older people). This analysis suggests that the actual cash share is likely to be lower than the naïve cash share estimated above once we take these factors into account.

This analysis results in a projected cash share that is less than the cash share projected using the naïve analysis described above.

Estimated total cash usage for 2015 forward.

The total cash usage is calculated by multiplying the adjusted cash share by the projected GDP for each year, 2015 through 2020.

ATM AND BANK BRANCH AVAILABILITY INDEXES

We have created two indexes based on the availability of ATMs and bank branches per 100,000 people in the following countries. To do this, we used economy data and population data from 40 nations, delineated below:

 AUSTRALIA	 INDIA	 SAUDI ARABIA
 AUSTRIA	 IRELAND	 SINGAPORE
 BELGIUM	 ITALY	 SLOVAKIA
 BRAZIL	 JAPAN	 SLOVENIA
 BULGARIA	 LATVIA	 SOUTH AFRICA
 CHINA	 LITHUANIA	 SOUTH KOREA
 CROATIA	 LUXEMBOURG	 SPAIN
 CZECH REPUBLIC	 MALTA	 SWEDEN
 ESTONIA	 MEXICO	 SWITZERLAND
 FINLAND	 NETHERLANDS	 TURKEY
 FRANCE	 POLAND	 UNITED KINGDOM
 GERMANY	 PORTUGAL	 UNITED STATES
 GREECE	 ROMANIA	
 HUNGARY	 RUSSIA	

The indexes consider the availability of ATM and bank branches per 100,000 inhabitants in each country. The maximum value an index can achieve is 100 points and zero is the minimum. Each country has been assigned its own score.

We show how we calculated both indexes for each country in the following table. We first obtained the number of ATM and bank branches present per 100,000 people, then took the lowest and the highest number for each index and labeled them 0 and 100, respectively. The rest of the numbers were calculated according to the following equation:

$$Index_i = \frac{x_i - x_{Min}}{x_{Max} - x_{Min}}$$

In this formula, x represents the number of ATM and bank branches per 100,000 people and i represents each country that was neither a minimum nor a maximum score.

COUNTRY	ATM PER 100,000	BANK BRANCHES PER 100,000	INDEX	
			ATM	BANK BRANCHES
AUSTRALIA	132.3	22.89	51.9	27.3
AUSTRIA	156.1	47.49	62.6	67.8
BELGIUM	139.7	31.33	55.2	41.2
BRAZIL	81.4	—	29.1	—
BULGARIA	79.2	51.61	28.1	74.6
CHINA	63.1	—	20.9	—
CROATIA	—	27.84	—	35.4
CZECH REPUBLIC	43.6	19.68	12.2	22.0
ESTONIA	61.0	8.15	20.0	3.0
FINLAND	37.3	19.21	9.3	21.2
FRANCE	96.1	58.45	35.7	85.9
GERMANY	104.5	41.43	39.5	57.8
GREECE	62.8	23.42	20.8	28.2
HUNGARY	48.9	29.38	14.5	38.0
INDIA	16.4	11.15	0.0	7.9
IRELAND	56.9	22.20	18.1	26.1
ITALY	81.6	50.13	29.2	72.2
JAPAN	107.7	—	40.9	—
LATVIA	53.3	13.90	16.5	12.5
LITHUANIA	41.9	19.21	11.4	21.2
LUXEMBOURG	92.0	39.61	33.9	54.8
MALTA	49.9	25.53	15.0	31.6
MEXICO	37.9	10.61	9.6	7.0
NETHERLANDS	41.4	10.42	11.2	6.7
POLAND	56.3	37.64	17.9	51.6
PORTUGAL	149.5	53.81	59.6	78.2
ROMANIA	57.9	24.91	18.6	30.6
RUSSIA	89.5	26.24	32.7	32.8
SAUDI ARABIA	54.9	6.34	17.2	0.0
SINGAPORE	50.8	8.51	15.4	3.6
SLOVAKIA	50.4	23.80	15.2	28.8
SLOVENIA	81.9	28.55	29.3	36.6
SOUTH AFRICA	52.7	7.37	16.2	1.7
SOUTH KOREA	239.7	14.84	100.0	14.0
SPAIN	107.5	67.01	40.8	100.0
SWEDEN	31.9	—	6.9	—
SWITZERLAND	84.6	29.76	30.5	38.6
TURKEY	62.1	15.79	20.5	15.6
UNITED KINGDOM	108.2	30.00	41.1	39.0
UNITED STATES	—	34.83	—	47.0

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