



RELEASING THE FLOW OF DIGITAL MONEY HITTING THE TIPPING POINT OF ADOPTION

The benefits of digital money are clear, yet global adoption rises by only a small amount every year. Can prioritizing high frequency and high reach money flows push consumer behavior toward the crucial tipping point of adoption?

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Foreword

In our interconnected world, it is ever more important for money to travel cleanly and quickly from place to place and from country to country. Few people nowadays can deny the benefits of making money digital, and that's why the discussion around digital money continues to widen and intensify.

Recognizing the importance of this debate, Citi and Imperial College London developed the Digital Money Index in 2014. Covering 90 countries, it offers a comprehensive assessment of where different nations and regions are in the journey toward adoption. In three years of research, the world of digital money has evolved rapidly, often beyond even the boldest predictions.

We feel that this year - the Index's third - is something of a watershed. At the outset of our research we made clear that we are on a journey. Each year, we have dug deeper into the data, to assess the benefits and provide recommendations for the various individuals, businesses and governments with an interest or a stake in digital money.

And each year we felt that there was more to be explored and unearthed. In 2014 we mapped out the journey, looking at the role of political and economic institutions in driving adoption. Last year we highlighted the importance of digital money solutions.

This year we look beyond solutions. Having the right payment method in place is a crucial start, but is not enough on its own - addressing people's propensity to adopt is vital. In this latest version of the Index, we find tangible evidence of culture working as an accelerator to adoption, but also as a barrier.

Looking at five key ways in which money traverses the globe, we explore what must be done to achieve a "tipping point" for consumer adoption of digital money, and how the interplay of location, culture, technology and use case influences our desire to use cash - or not.

In many respects we have reached an important landmark in our digital money journey. As we attempt to address a systematic way to influence consumer behavior, we start to ask ourselves if we can be more prescriptive about what constitutes a "tipping point". We hope to get more answers in the coming years.

And as our research continues and our momentum grows, we hope to provide you with more answers and more insights into digital money's growing impact on all our lives.

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Introduction

Digital Rising, but Cash Still King

Digital money, the migration from cash and checks to credit/debit cards, stored value instruments and other non-paper based mechanisms, is now part of the fabric of the modern world. As a stream of payment solutions and methods make their way into global markets, recognition of digital money - and its attendant hype - has grown rapidly. And there has already been an impact - in 2014, for example, people across the world carried out more than 360 billion non-cash transactions². The benefits of digitizing paper money are well-recognized: saving costs, increasing the speed at which money is transferred, and boosting financial inclusion among the world's two billion unbanked.

But in most countries cash still rules. Despite the emergence of a wealth of new digital payment methods and solutions, significant sections of the world's population still rely on paper money for their day-to-day transactions. About \$13 trillion - almost 18% of global GDP - is withdrawn from ATMs annually³. People's devotion to cash is one of the biggest remaining hurdles to the widespread adoption of digital money. But such dedication is a complex emotion, influenced by socioeconomic,

cultural, financial and political sensitivities.

"The whole idea of my wealth or my income being represented by essentially something I can't feel or see or count physically is a completely unusual phenomenon for many people," says Bhaskar Chakravorti, Senior Associate Dean, The Fletcher School, Tufts University. "There is an attachment to cash which is a combination of emotional, behavioral and rational - all three are in play. The mix of the three really depends on the geography and the context."

Some of our findings reinforce the importance of infrastructure and digital money solutions; equally striking is the role of culture and the undeniable importance of the “tipping point” - the point at which people’s familiarity with and use of digital money solutions pushes adoption toward the mainstream.

How Ready Are We?

To try and understand the forces shaping and steering digital money adoption, Citi with Imperial College, London - has been tracking the readiness for digital money adoption in 90 countries worldwide since 2014. Previous iterations of the Index have looked at how government investment in infrastructure and regulation, and the involvement of industry, can drive adoption. The themes were clear: the widespread use of digital money has real benefits, but adoption will receive a boost from solutions that are tailored to specific markets, and which are often developed in partnership with other key players.

There were some unexpected findings too. Countries we might have expected to be well suited to digital money showed lower adoption. By contrast, countries we might have expected to struggle with digital money had instead embraced it. Clearly a country having a propensity to adopt does not mean that it will. Like the love of cash itself, the reasons for this are complex. Sophisticated cultural dynamics are at play, overlaying the work of governments and companies to establish the foundations. By themselves, digital money solutions are not enough. They need to go hand-in-hand with initiatives - again from governments and businesses - to encourage people to adopt.

This year the findings have been no less unexpected, with readiness shifts in country clusters where we didn’t predict them. The results of the 2016 Index showed that there has been a very small improvement in readiness overall. As before, this underlines that digital money readiness is a journey, and one that is likely to be lengthy. Yet in every cluster of the Index there are success stories of considerable improvements, giving us hope that progress can be accelerated.

As we continue on our own journey of monitoring readiness for digital money around the world, we are digging deeper. Some of the findings reinforce the ongoing importance of infrastructure and the role of government - familiar topics we have covered before - as well as the increasingly crucial role of regulation and the needs of the underbanked. Part 1 of this report provides a brief overview of these findings.

The Value of Connection

Equally striking, however, are the role of culture and the subtleties of human behavior in determining people’s propensity to adopt. As the Index shows, a number of less mature countries start out by making opportunistic progress, developing the necessary infrastructure, but then get stuck: reaching an “adoption plateau” where even the right groundwork can’t shift some weighty cultural barriers. Surmounting these barriers will require affirmative action, perhaps in the form of regulation.

Then there is the undeniable importance of the “tipping point” - the point at which people’s familiarity with and use of digital money solutions pushes adoption toward the mainstream. In Part 2 of the report we explore this idea further, looking at five specific digital money use cases - what we have termed “flows”: in government to person payments, cross-border remittances, retail, e-commerce and small and medium enterprise (SME) collections. In each of these we highlight key approaches to digitizing paper money, from the relatively straightforward to the radical.

By virtue of their frequency and reach, these solutions can become second nature, helping to address the key blockages to the flow of digital money. But the real value is in connecting separate flows - investing in and delivering more than one flow to address structural and cultural barriers and encourage the circulation of digital money. Reaching the tipping point means big benefits: up to \$400 billion in annual savings, as well as powerful social benefits, can be achieved by moving even a quarter of paper-based transactions to digital.

On the Horizon

So what of the future? Part 3 looks at the key considerations in 2016 and beyond: the time lag in investments, the role of interoperability, and

the part played by traditional financial institutions – not least the banks – as we continue on the journey toward a truly cashless society.

Citi's Digital Money Readiness Index segments the 90 countries we survey into four quartiles.

Incipient

Lacks appropriate infrastructure and financial services.

Emerging

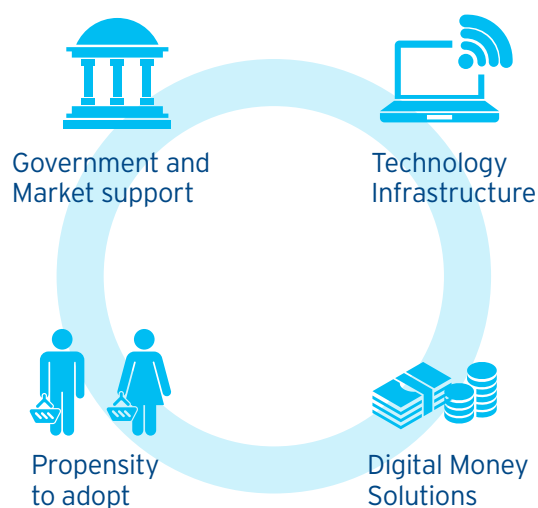
Basic regulation and infrastructure exists in these countries, but they often have a large informal economy underpinned and perpetuated by people's love of cash.

In-Transition

Digital money is starting to make its presence felt in these countries, often in the form of government disbursements. But In-Transition countries still require significant investment in e-commerce initiatives, or the relaxation of regulations to encourage private enterprise.

Materially Ready

People in this group of countries are familiar with digital solutions, and live in a regulatory environment that encourages digital innovation.



These are assessed according to four “pillars” that underpin readiness:

Institutional environment

(the presence of institutional conditions that enable digital money adoption)

Enabling infrastructure

(the availability of critical financial and ICT infrastructure)

Solution provisioning

(Government and private sector solutions that exploit digital money)

Propensity to adopt

(Extent to which consumers and businesses adopt digital innovation)

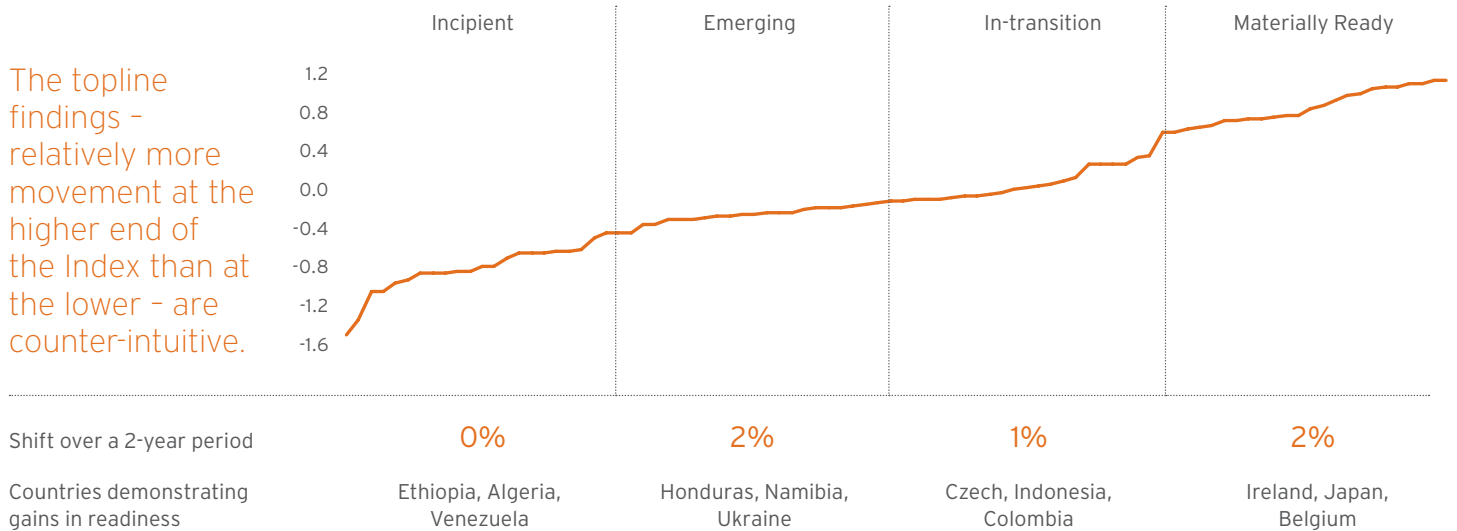
Part 1. The Ends of the Index: An Unexpected Result

The topline findings - relatively more movement at the higher end of the Index than at the lower - are counter-intuitive: we might expect Incipient countries to move more on the Index as they develop their infrastructure and take advantage of solutions (such as mobile money) that often meet their particular needs. Equally, we might expect Materially Ready countries to move less, largely because in terms of development they've less far to go.

Overall there was a very small positive shift in the Index: 1.3%⁴ between 2014 and 2016 (see figure 1).

- Most of the movement on the Index happened in the Materially Ready and Emerging clusters, which shifted by 2.16% and 2.03% respectively. In the list of 20 countries that improved most, 14 were in these two clusters.
- The Incipient cluster remained flat.
- Nine countries in the Emerging quartile improved their score for digital money solutions, indicating the importance of investing in solutions at this stage of maturity.

Figure 1. Digital Money Index reveals counter-intuitive findings

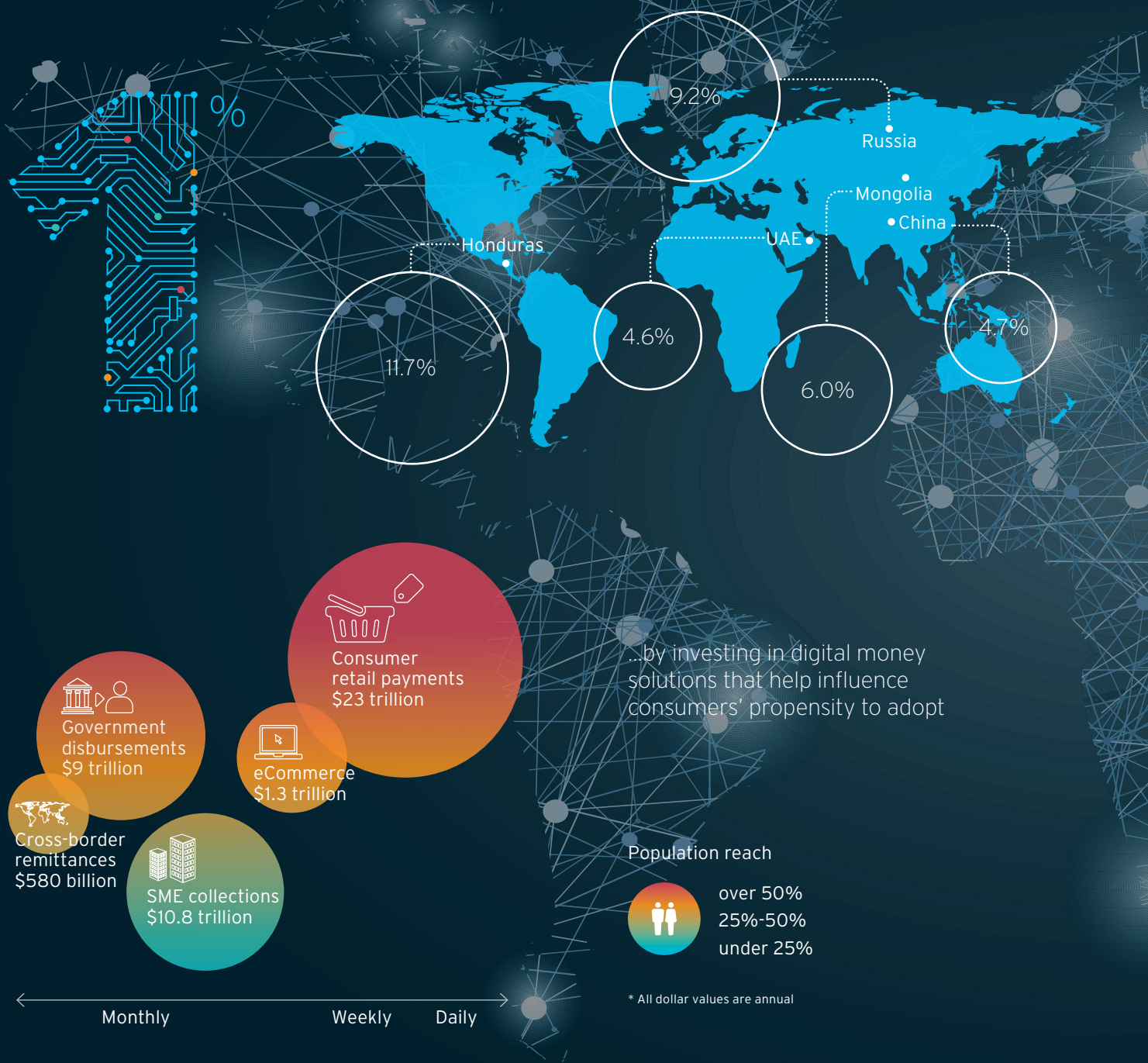


Source: Citi-Imperial College Digital Money Index

Reaching the tipping point of digital money adoption...

Since 2014, digital money readiness has risen slightly across 90 countries...

Yet a selection of countries have made material progress...



Realizing a valuable range of compelling benefits...

Five use cases can unlock \$350-\$400 billion in annual benefits just by moving 25% of paper-based transactions to digital

Retail payments



\$150 billion

In benefits that merchants stand to realize by adopting digital payment solutions

G2P disbursements



\$150 billion

In savings for governments that move to a digital form of disbursement

eCommerce



20% more

Profit per order that eTailers stand to gain by moving to digital payments in emerging markets relying on cash on delivery

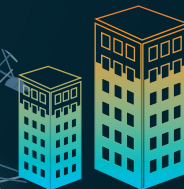
Cross-border remittances



50% less

The potential reduction in cost for sending cross-border remittances

SME collections



\$80 billion

In savings accruals to large businesses that digitize SME collections

Movement Slow at the Lower End

Despite expectations of positive activity in the Incipient quartile, we've seen very little. Implementing the necessary infrastructure for digital money solutions, and the solutions themselves, is hard. As we have highlighted in the past, the keys to success in the early stages are country-specific, relying on government support and investments in national infrastructure. Some countries have succeeded in these areas (notably Ethiopia, Algeria and Nigeria).

Regulation to enable these implementations is vital – either by incentive or coercion (the classic “carrot and stick” approach). Some countries have provided incentives for private sector investments, while others have introduced potential disincentives.

- In Argentina, a tax rebate on card transactions (until December 2013) was designed to promote consumers' use of cards, and to encourage retailers and financial institutions to invest in the payments infrastructure.

The result was a rise in card use in the country, and an increase in point-of-sale terminals⁵.

- The Nigerian government's cashless policy (introduced in 2012) enforced daily limits on the amount that businesses and individuals could deposit or withdraw from their bank accounts. This forced businesses to adopt electronic ways to pay their bills. Some large businesses in Nigeria now pay, on average, 61% of their salaries electronically⁶. Nigeria's government has also introduced a national ID card with which users can withdraw cash – highlighting how success tends to happen when regulation and infrastructure investments go together.

As Ruth Wandhofer, Global Head of Regulatory and Market Strategy, Treasury and Trade Solutions at Citi, points out: “Emerging markets are clearly making the jump to new technologies...this can sometimes be very effectively government-led.”

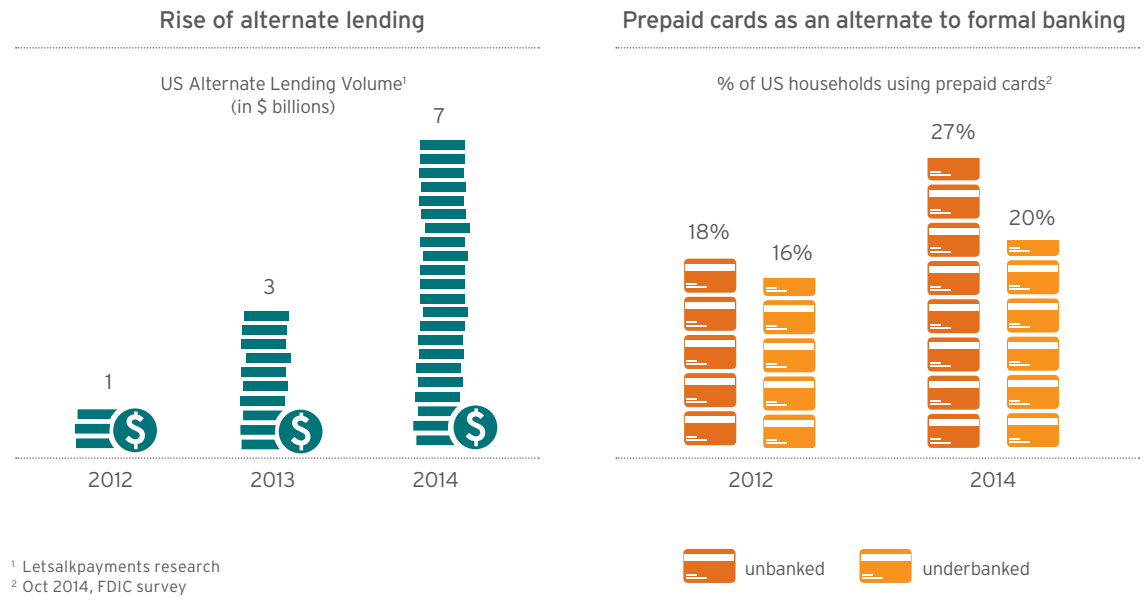


Country Snapshot: Ethiopia

Ethiopia has enjoyed relative economic success in recent years, with GDP growth of 10% in 2014⁷. It has an enlightened approach to technology: its government has focused on using alternative banking mechanisms to boost financial inclusion, and in 2015 it introduced mobile money services for payments and peer-to-peer transfers. The country's central bank has also set up a Financial Inclusion Council to

increase the penetration of banking in the country. It has made use of international expertise (and investment) in setting up these programs. Backing the two main initiatives – helloCash and M-Birr – are Dutch firm BelCash and Irish company Moss ICT, which are providing the infrastructure for local banks and financial institutions to provide banking services via mobile devices.

Figure 2. Rapid growth in financial solutions targeting the unbanked/underbanked



"Emerging markets are clearly making the jump to new technologies...this can sometimes be very effectively government-led."

Ruth Wandhofer
 Global Head of
 Regulatory and Market
 Strategy, Treasury and
 Trade Solutions, Citi.

Continuing to Peak at the Top

According to the Index, Materially Ready countries have moved up the readiness scale; however, this movement is largely because of infrastructure. Countries in this cluster have made progress thanks to investments in next-generation mobile broadband infrastructure, while smartphone penetration has been extensive in the past two to three years. Together with improvements in software and the user experience, and a growing number of possible solutions, these factors have enabled seamless and compelling payment experiences to address certain use cases that are stubbornly wedded to cash.

The success of taxi service Uber, for example, as well as order-ahead payment options in some cafes and restaurants (such as Starbucks) shows just how easily consumers can shift to new payment models, and has encouraged a new breed of entrepreneurs to think about technology in new ways.

Experiences like these are reaching a point where consumers in some markets now expect them in everything they do. The likely result will be a range of digital money solutions that will drive adoption even further. (In our previous digital money report, we referred to these emerging propositions as vital parts of the "Experience Economy".)

Called to account

In these markets there has also been considerable focus on low-income people and the underbanked - individuals who may have bank accounts, but who find it difficult to access credit, and who often resort to sources of funding other than banks (in the US alone, almost 25 million households - about 20% of the total - are underbanked⁸). Most of these people are regular users of cash, and in Materially Ready countries initiatives to address their needs (such as prepaid cards and alternative lending systems) have emerged and been encouraged (see figure 2).

According to Ebru Pakcan, Global Head of Payments, Treasury & Trade Solutions at Citi: "[It] is going to take quite a bit of time in terms of the challenges, since a large proportion of the population in these markets remains unbanked." Phil Bruno, Principal, Global Payments Practice at McKinsey & Company, highlights a related cash issue: "If you digitize all of the cash from affluent people, you actually don't digitize that much cash overall; only 8% of their spending is cash. If you look at people earning \$25,000 or less, there is a significant amount of cash usage."

Regulating for the future

Finally, although it's still not clear at this stage exactly what role regulation will play, some Materially Ready countries are relying on it now to address the remaining usage of cash. Governments are in a position to mandate much of the activity that's vital to successful adoption in places where digital options are already widespread but not compulsory. This can help to surmount the problem of fear and suspicion among users.

Incentives to encourage consumer adoption and private sector investment in terminalization and the payments infrastructure are already paying dividends in places such as the UK (where the Oyster card dominates London's transport system after the option for cash payments was removed in 2014).

Says Elizabeth McQuerry of Glenbrook Partners: "[People-to-government payments] have transformative potential: if you're required to pay for your business license or your tax payment electronically, then more people will adopt some sort of electronic payment and will likely consider using it for other payments over time...More and more governments are interested in studying these sorts of implementations." Ruth Wandhofer, Global Head of Regulatory and Market Strategy at Citi's Treasury and Trade Solutions, agrees: "If a government mandates that all tax payments by everyone are paid through new types of instruments then you have no option but to comply."

"I think it's actually important to work together with the State, the players, the universities - those three parts need to work together. That's when you can make a change."

Johan Lundberg
CEO, NFT Ventures



Country Snapshot: Denmark

The Scandinavian countries are in the vanguard of digital money. In Denmark, the government is keen to wean people off cash, and has proposed allowing certain retail outlets to stop dealing in paper money. The idea is to cut costs and crime - and although there are some sceptical voices, the move is likely to appeal to Danes: according to some reports⁹, almost 40% of the populace use the MobilePay service for peer-to-peer transfers and mobile payments. There are

even discussions about encouraging the wider use of cryptocurrencies.

Says Johan Lundberg, CEO, NFT Ventures: "I think that to be able to be successful you need government cooperation. And you shouldn't be afraid of that. I think it's actually important to work together with the State, the players, the universities - those three parts need to work together. That's when you can make a change."

Part 2. Hitting the Tipping Point: The Five Flows of Digital Money

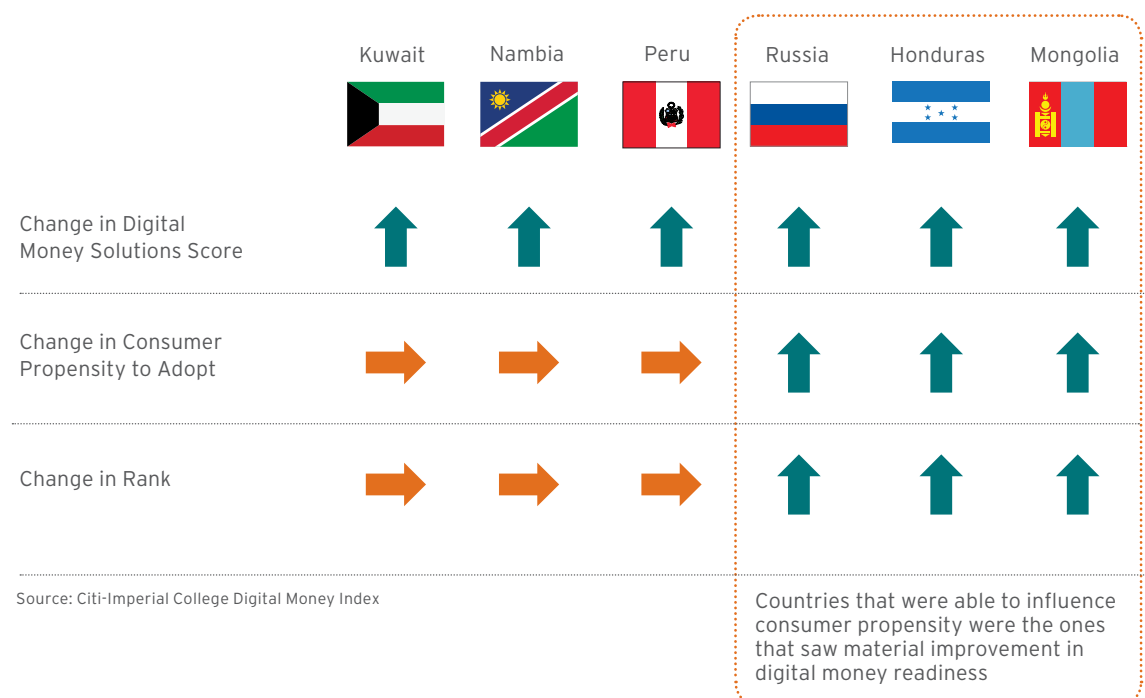
In the Emerging and In-Transition quartiles of the Index there has been much movement – largely because of investments in digital money solutions. Findings from the Index also indicate a strong link between culture and use cases: the pillars “digital money solutions” and “consumer propensity to adopt” go hand-in-hand. So genuine progress in adoption only occurs when consumers’ propensity to adopt reaches a certain “tipping point”, as they become more willing to try non-cash ways to pay. Propensity to adopt itself is a complex issue, shaped and influenced by personal and cultural factors.

It’s About More Than Solutions

The cultural effect is powerful – as shown by one example from the Index. Three of the four countries that improved most in the Emerging cluster – Russia, Honduras and Mongolia – were also in the top 20 countries in terms of improvements to digital money solutions and propensity to adopt. In comparison,

three other countries – Kuwait, Namibia and Peru – had only a moderate overall improvement, despite doing better than Russia, Honduras or Mongolia in terms of digital money solutions. The reason was that Kuwait, Namibia and Peru had no improvement in their propensity to adopt (see figure 3).

Figure 3. Propensity power



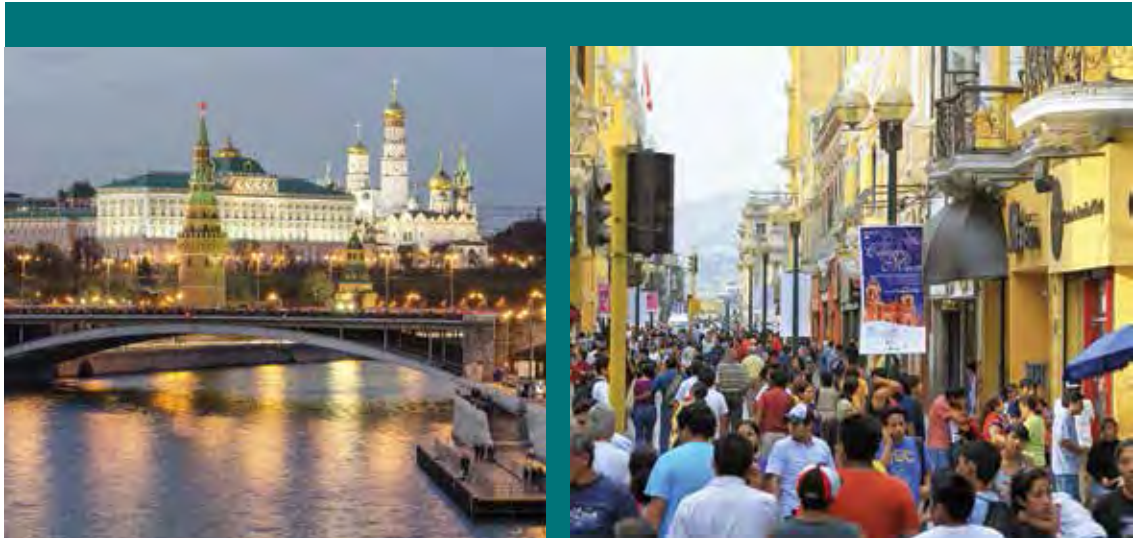


The Culture Effect

Cultural pressures and influences can both inhibit and accelerate adoption, and have many facets: a lack of financial and technical knowledge, a lack of trust in financial systems and concerns about fees and charges. And these influences can be found across geographies.

In India, for example, mobile commerce is growing rapidly, fueled by a flood of startup investment, but also thanks to a huge increase in Indian consumers' awareness and use of m-commerce solutions. Several companies - among them PayTM, Myntra and Snapdeal - have benefitted from this rapid surge in interest. In the U.K., a burgeoning Fintech scene has helped money transfer firms like TransferWise and WorldFirst to steal a march on more traditional providers by luring consumers with lower fees. And since money transfer system Faster Payments was introduced in the UK in 2008, transaction volumes have increased more than ten-fold¹⁰.

But other countries (notably Germany and the US), despite appropriate funding and education, did not increase their ranking on the Index. The reason? Unlike other countries, they didn't improve on consumers' propensity to adopt.



Comparative Country Snapshot: Russia and Peru

Russia: Kiosks to the rescue

Russia is a cash-intensive society, for a number of historical and cultural reasons. Only around a quarter of Russian adults have bank accounts¹¹ (and even they still tend to withdraw cash for their transactions). Although most Russians are aware of non-cash payment methods, there is still a general distrust of digital money.

However, payment kiosks – which let customers use cash to make bill payments, and transfer the funds to merchants digitally – are hugely popular. This is partly due to a 2010 law that required kiosk operators to have a license – which helped to increase their trustworthiness – and to the removal of requirements for ID for relatively low-value transactions. The popularity of kiosks has also helped to boost consumers' adoption of e-wallets, with companies like Qiwi and Yandex reporting healthy adoption levels among Russian adults living in cities.

Peru: Knowledge a problem

Peru's economy is also highly cash-intensive: only 20% of the population has a bank account¹², and access to bank branches is difficult for many, because of the country's topography. The popularity of mobile phones, however, led the government to enable non-banking entities to offer e-money, to help boost financial inclusion. Nevertheless, despite these initiatives, people's general lack of awareness of financial services, and their lack of knowledge about how to bank with their phones, means that change is proving difficult.

Addressing use-cases that have considerable reach and are repetitive in nature creates crucial “muscle memory” in users, helping helping to change their behavior to reach the all-important tipping point.

To explore this further, we look at areas of influence and adoption that are helping to drive digital money toward the crucial tipping point. We have identified five use cases (termed “flows” in this report) that, due to frequency and reach, capture the global movement of money between three entities: governments, businesses and consumers:

- G2P disbursements
- Retail
- E-commerce payments
- Cross-border remittances
- SME payments

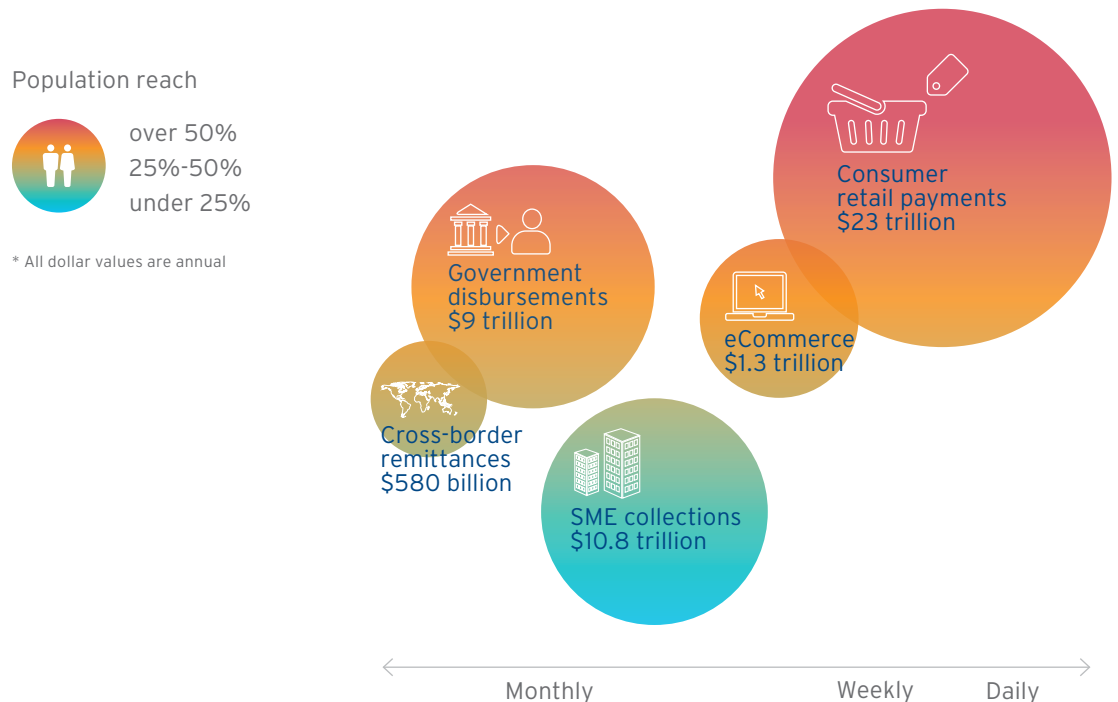
Viewing the world of digital money in the context of the five flows gives a fresh perspective on adoption, and highlights some fascinating global trends. Case studies illustrate important initiatives and developments in several countries.

Together, this data and information provides an intriguing picture of the flow of digital money around the world.

Although each flow has challenges and inefficiencies – usually a heavy reliance on cash and cheques – digital money solutions are helping to drive adoption. These solutions have considerable reach and/or are repetitive in nature¹³ – used weekly, say – affecting consumers’ behavior in the longer term. This creates crucial “muscle memory” in users – essentially becoming second nature to them – helping to change their behavior to reach the all-important tipping point (see figure 4).

Once the tipping point is reached, the benefits (which will vary by use case) will be significant. We believe, for example, that by moving a quarter of paper-based payments to digital across G2P disbursements, retail payments and SME collections together, companies, governments

Figure 4. Five “flows” with frequency and reach



Source: Citi-Imperial College Digital Money Index



By delivering on more than one use case, the flow of digital money can carry on uninterrupted, steering people away from cash by connecting digital payment experiences across flows.

and merchants could unlock between \$350 billion and \$400 billion in annual savings. There could also be considerable social benefits in financial inclusion and gender equality¹⁴.

Keeping It Digital

The five flows are key to driving adoption, because together they can help to shift the stubborn barriers that prevent otherwise mature countries from hitting the all-important tipping point. Nevertheless, we often see examples of markets that opportunistically enjoy the benefits of having digitized a single flow (G2P payments, say), but which then hit a structural barrier. The real secret to digital money flow lies in moving from the opportunistic to the structural. By delivering on more than one use case, the flow of digital money can carry on uninterrupted, steering people away from cash by connecting digital payment experiences across flows.

So G2P payments can be digitized, for example, but recipients are still likely to immediately withdraw their payments as cash – unless value-added services such as utility and retail payments are digitized too. Once that happens, SME collections could be digitized – and so on. And cash-heavy, stubborn use cases can then be addressed by “experience” solutions (in which the payment transaction is seamless and integrated with the customer’s journey – as in the case of Uber, for example).

The Digital Money Solution Map

Government-to-person (G2P) disbursements

Government to consumer flow



What is it?

Government payments to citizens, such as social security payments, pensions and tax rebates

Global market value

\$9 trillion in 2014; \$12 trillion by 2020¹⁵

Paper effect

Cash and checks are used for G2P disbursements in 50% of countries¹⁶

Almost two thirds of developing countries use cash and checks for G2P disbursements¹⁷

Example digital payment methods

Daviplata in Colombia (mobile money)

Electronic benefit cards in Brazil

Biometric authentication to encourage financial inclusion in India

Global benefits

By eliminating the 2.5% cost of cash transactions and preventing leakage, governments and beneficiaries could save about \$150 billion¹⁸

Consumer retail payments

Consumer to business flow



What is it?

Payments for goods and services in-store

Global market value

\$22.5 trillion in 2014; \$31.7 trillion in 2020¹⁹

Paper effect

High costs: administration (2.8% per transaction²⁰) and fraud (1.3% per transaction²¹)

Related problems: poor customer experience because of long waits; a lack of useful customer analytics

Example digital payment methods

Smart in the Philippines; Apple Pay in various countries (mobile payments); China Union Pay; RuPay in India (card schemes)

Global benefits

Merchants could achieve about \$150 billion in benefits by eliminating the 1.7% additional cost of handling cash and the 1.3% in costs related to fraud and theft²²

Electronic commerce

Consumer to business flow



What is it?

Payments for goods and services online (e-commerce)

Global market value

\$1.3 trillion in 2014; \$3.4 trillion by 2020²³

Paper effect

70% of digital commerce in south-east Asia is cash on delivery²⁴. In India, 40% of COD orders result in returns²⁵

Example digital payment methods

Bank transfers in Indonesia
PayTm in India (online shopping platform)
Uber (online taxi firm with a personalized experience)

Global benefits

Marked improvements on a per transaction basis or as a percentage of logistics costs. For example, if profit margins are 10% per order, then a reduction in costs of 2% per COD order will produce a 20% improvement in profitability per order

Cross-border remittances

Consumer to consumer flow



What is it?

The peer-to-peer transfer of funds

Global market value

\$580 billion in 2014; \$700 billion by 2020²⁶

Paper effect

By Q2 2014, the global average cost of sending remittances was 7.68% of the amount sent. In some African countries, the sending fee can be almost as much as 20% of the amount sent²⁷

Example digital payment methods

Orange Money in Africa (mobile money)

Global benefits

The cost of cross-border remittances can be reduced to about 4% from about 8% by adopting non-cash methods like mobile money²⁸

SME collections

Business to business flow



What is it?

A subset of B2B payments exclusive to small and medium-sized companies

Global market value

\$10.8 trillion in 2014; \$13 trillion by 2020²⁹

Paper effect

Cash accounts for 75% of corporate receivables and disbursements in emerging markets, and 25% in developed markets³⁰

Administrative costs, late payments and process problems

In the US alone, up to \$2.4 trillion a year is lost in unpaid invoices³¹

Example digital payment methods

Invoice and payment automation

Basware, Tradeshift (SME-focused payment systems)

Global benefits

Large businesses could save about \$80 billion by avoiding the 5% cost of cash handling associated with SME collections³². Account receivables solutions can reduce past due receivables and bad debt reserves by up to 25%, and daily sales outstanding by up to 20%³³

G2P Disbursements

Paying citizens...

G2P payments are central to the interaction between governments and citizens, and help to boost financial inclusion. Several countries in the Emerging and In-Transition clusters that improved on the Index now have successful G2P payment schemes in place. There are good reasons for doing so: according to one report, the government in Mexico managed to save about \$1 billion dollars by moving to digital payments.³⁴

Daviplata, a mobile money solution in Colombia, enables almost 1m people to receive government payments to their mobile wallets³⁵. Similar initiatives operate in African countries like Kenya and the Philippines, and there are plans to expand these initiatives using card-based

schemes. A frequent stumbling block, however, is the difficulty in reaching the unbanked – those without bank accounts – and dissuading them from simply cashing out their benefits rather than keeping them in some form of account.

Knowing citizens...

Underpinning many electronic G2P payment schemes – and again showcasing improvements in government and market support, infrastructure and financial regulations – are “know your customer” (KYC) schemes: essentially ways for financial institutions and businesses to identify their clients. The Indian government has implemented Aadhar – a unique identification program that has now issued more than 900 million unique ID cards³⁶. By the spring of 2015, people with these cards had been able

Digitizing G2P payments can help to boost financial inclusion; underpinning many electronic G2P payment schemes are digital identity, “know your customer” (KYC) programs.



Country Snapshot: The Philippines

As well as improving its overall Index ranking, the Philippines also improved on its “digital money solutions” score. Mobile phones, and texting, are popular in the country,³⁹ and Filipinos have taken to mobile money solutions with relative ease. The Philippines also has a considerable remittances sector – almost \$30 billion in 2014.⁴⁰ A lack of formal banking experience also helped to catalyse the development of two mobile money solutions – Smart and

GCash – which have been around since the early 2000s, and which are still extremely popular ways for Filipinos to transfer money. Smart also includes a card that can be used in retail outlets.

to open about 150 million new bank accounts³⁷. The government can now pay monies directly to these accounts, creating significant benefits for Indian society.

Remittances

Reaching across borders

According to the World Bank, digital remittance payments will have a profound effect on financial development in emerging countries, familiarizing many with digital money flows and encouraging them to enter more formal banking systems. In 2013, Indonesia’s central bank enabled third parties to provide money transfers for the country’s citizens. The following year, a joint venture involving MasterCard, eServGlobal and BICS announced a deal with telecoms company Indosat to provide remittance services to its customers³⁸.

Retail

The major hurdle

Retail presents a huge challenge, not least because of the range of available solutions. A variety of cards – and now mobiles – can be used to pay for items in many countries in the Emerging and In-Transition quartiles. Terminalization by retailers is a big issue, creating a situation where retailers and consumers are waiting for the other to act first. But there have been some interesting developments in particular countries. India’s central bank has authorized the creation of “payments banks” in which consumers can make card-based point of sale (POS) and digital payments, as well as small deposits.

In August 2015, India’s Reserve Bank approved payments banks licenses for 11 organizations,

Collecting cash is costly, risky (in some markets), and unpredictable, and creates problems for small companies as they strive to maintain their cashflow and the visibility of their payments.

including financial services companies, post offices, IT companies and mobile money operators⁴¹. The Indian government is also proposing tax rebates for retailers that accept card payments – a strategy that has worked in other markets (including Argentina, as highlighted earlier).

The growing penetration of smartphones is also helping with terminalization. With the appropriate app, a smartphone can effectively be converted into a payment acceptance terminal, and the merchant pays per use, rather than incurring a significant up-front charge. In some places this has even created an entire category of “casual” merchants (such as farmers, market stallholders and cab drivers) that can accept digital payments.

E-Commerce

The accelerator

E-commerce sales are expected to grow rapidly, reaching \$3.4 trillion by 2020⁴², as people across global markets gravitate toward the convenience of digital commerce. In most markets, as the rise of e-commerce will naturally result in greater use of digital money, it can serve as an accelerator of adoption.

However, e-commerce does not always mean the end of cash – in South East Asia, for example, 70% of e-commerce orders are still paid cash on delivery⁴³. A variety of methods to address this have appeared in several countries around the world. In Indonesia, more than 80% of online shopping payments are done by bank transfer⁴⁴. Digital players with significant reach also have a role to play in driving growth in digital payments. PayTm in India, for example, has transitioned from being a digital wallet to an e-commerce provider.

SME Collections

Building enthusiasm

At about \$5 trillion, SME collections account for a big chunk of global payments, but cash still plays a significant role, especially in developing markets, where many small merchants even prefer it. But collecting cash is costly, risky (in some markets), and unpredictable, and creates problems for small companies as they strive to maintain their cashflow and the visibility of their payments.

A growing number of companies – including Tradeshift, Basware and PaySimple – now address the issues with integrated payment solutions. And they’re proving popular with companies in more



Country Snapshot: China

Online payment solution Alipay has signed up with 100 banks to facilitate direct digital payments from customers’ bank accounts to merchant accounts, circumventing the card networks. Some players already have payment offerings available to their large

user base (WeChat, for example, has 400m monthly users that already have P2P and/or remote payment offerings⁴⁵). Others, such as Facebook Messenger and WhatsApp (which has 900m monthly users globally⁴⁶) could drive this further in Asia.

developed markets. However, other innovative collection solutions that enable SMEs to use mobile devices have met with mixed success in some markets. In South Korea they have proved popular, but in other countries (such as China and India), companies have been less enthusiastic. This is because their customers conduct most of their transactions in cash, lessening the retailers' appetite to digitize payables.

On the Index, South Korea ranks highly for its propensity to adopt and its cashlessness, whereas both China and India are ranked fairly low. This example illustrates well the connection effect - how improvements in one flow (retail) can have a positive effect on other flows too (in this case SME collections).

But despite some companies' caution, a raft of solutions continue to appear to challenge the inefficiencies in SME collections. Their main drivers are simple: visibility, transparency and predictability, all of which are essential to companies' successful operations, whatever their size.

"Digital processes for payables and receivables don't fix the economy as such, but make it more efficient and more transparent and more visible and more predictable than it is today," says Esa Tihilä, CEO, Basware. "This should be good news, because the more integrated, more visible information we have about what's coming and what's going, the better business for all."



Part 3. Future Flow

Digital money is making its presence felt - not least in the amount of attention it is getting from politicians, entrepreneurs and commentators. But so far this attention is not translating into pervasive adoption: in most markets the tipping point for widespread acceptance has yet to be reached. The digital money journey has begun, but we expect plenty more twists and turns in the coming years before it reaches its conclusion.

Interoperability between payment systems helps keep money flow digital by connecting multiple use-cases.

Interoperability is Critical

Already we are seeing interoperability between payment systems in countries like Mexico - where the central bank acts as a clearing mechanism for a variety of digital payments, including mobile money - and several African countries, which are linked via the South African Development Community's integrated payments system. Interoperability is likely to prove valuable in unlocking specific money flows, particularly in the B2B/SME space. Earthport's partnership with Ripple Labs in 2014 enabled its customers to use Ripple's technology for cross-border payments in line with country-specific regulations, and in currencies as diverse as dollars, yen and bitcoins⁴⁷. In Kenya, Safaricom teamed up with the Commercial Bank of Africa to offer banking and saving service M-Shwari, which now has almost five million active users⁴⁸. And in Nigeria, GT Bank has partnered with mobile network Etisalat Nigeria to develop a phone-based savings account aimed at the under- and unbanked⁴⁹.

Banks to the Rescue?

Previous iterations of the Index identified the significant role that governments and businesses can play in driving adoption. Governments can encourage financial inclusion and mandate the use of new digital money systems, either by developing their own systems or working with other entities. Small start-ups can devise startling new models of digital payments that we didn't know we needed until they came along - encouraging us to give up our cash.

New solutions will continue to appear with bewildering regularity. Most recently, it has been blockchain that has received much of the attention. Its notion of a cryptographically enabled distributed ledger promises offerings that cut across nearly every facet of banking, from faster payments to self-executing smart-contracts to the automation and digitization of highly manual or paper-based processes (e.g. trade-finance syndicated loans).

But talk of cutting-edge technology and rapidly evolving solutions masks another intriguing fact: that help and support for these solutions may come from unexpected quarters. We have already highlighted the importance of partnerships in furthering adoption. And there are plenty of examples of successful ones. In the remittances space, for example, both Western Union and MoneyGram have partnerships with mobile money providers (including M-Pesa in Kenya and Globe and Smart in the Philippines) to save on agent commissions and pass the benefits onto customers in the form of lower prices.

As more traditional financial institutions, notably banks, assess their place in this developing landscape, it will become increasingly clear that their role could be a vital one - partnering with providers of new systems and methods, and using their established monetary and regulatory weight to widen the spread of these solutions, rather than competing head to head with more agile entities. As Nilesh Dusane, VP of Global Sales and Client Relations at Ripple, confirms:

Talk of cutting-edge technology and rapidly evolving solutions masks another intriguing fact: that help and support for these solutions may come from unexpected quarters.

“We’ve been engaged with banks in helping them understand how distributed financial technologies can be used for their cross-border payments. Our firm belief is that banks are an integral component of any payment transaction.” It’s a sentiment echoed by Hank Uberoi, CEO at Earthport: “Are banks destined for failure, where disruptors are going to come in and start to pick at the edges and start taking away the most lucrative business? Not necessarily. They need to start assembling best-of-breed solutions. It’s being done in practically every other industry in the world. If you look at cars, BMW doesn’t manufacture the tires, it doesn’t manufacture the air conditioning system, it doesn’t manufacture the radios, it doesn’t manufacture the seats. But when you buy a BMW you’re buying the brand. You’re buying the economic model. You’re buying the design and the overall experience. Banks

need to partner with best-in-class to assemble the appropriate solutions for their clients without each bank deploying significant capital for no competitive advantage.”

Getting the Timing Right

Finally, timing is critical. There tends to be a natural delay in investments and outcomes. Based on our ongoing research, we believe that it takes three to five years for a country to move up the Index on the back of investments in prior years. In addition, there has been considerable recent effort by several countries to address the flows we have identified. These countries do not range higher in their quartiles just yet, but they are likely to show progression over the coming years. However, the prospect for countries that are less developed in digital money terms to “leapfrog” more developed countries is a distinct possibility.

Conclusion

People are still reluctant to dispense with cash – even if they use digital money flows at some point in their financial processes. Instead of making it easy for people to immediately withdraw cash, what’s required is an ecosystem that allows for digital transactions on an ongoing basis, across more than one connected flow.

“Whether it’s citizen-to-business, government-to-citizen, citizen-to-government, or merchant, it’s all about creating digital liquidity,” says Elizabeth McQuerry of Glenbrook Partners. “Until you give people sufficient motivation and need to keep money in their wallets for continued usage, they’re going to cash it out.”

Whatever the future holds for paperless money, our work with the flows emphasizes the factors that must be in place for adoption to take off worldwide. Successful digital money solutions

should: 1) meet the needs of the market by filling a critical gap (perhaps even one that we didn’t know existed); 2) address muscle memory in users, becoming second nature to them and hitting the all-important tipping point for adoption; and 3) confront structural challenges by addressing multiple flows or connecting multiple use-cases to keep users away from the temptation of paper money. As the journey continues, the more these crucial features are evident, the closer we get to releasing the flow of digital money.

Appendix: 2016 Index Results

Figure 5. Digital Money Index

Rank	Country	Change in rank from 2014	Government and Market Support	Technology and Financial Infrastructure	Digital Money Solutions	Propensity to adopt
1	Finland	0	14	7	1	7
2	Singapore	0	1	3	7	8
3	United States	0	4	12	6	1
4	United Kingdom	3	12	9	2	2
5	Hong Kong	0	3	1	20	12
6	Norway	0	13	8	3	5
7	Sweden	-3	9	4	9	3
8	Switzerland	2	2	2	22	6
9	Japan	0	5	18	8	4
10	Netherlands	-2	6	15	12	9
11	Denmark	0	18	16	4	15
12	Germany	0	7	5	21	18
13	Canada	1	16	11	16	21
14	New Zealand	1	15	22	11	13
15	Austria	-2	19	14	15	20
16	Ireland	3	8	19	17	19
17	Australia	0	22	17	10	17
18	Qatar	-2	11	36	19	10
19	Belgium	3	17	6	25	22
20	United Arab Emirates	-2	20	47	13	11
21	Korea, Republic of	0	25	50	5	14
22	Malaysia	-2	10	20	27	23
23	France	0	21	25	18	24
24	Israel	0	24	26	14	16
25	Czech Republic	5	23	10	43	26
26	Portugal	1	28	31	23	25
27	Chile	-1	29	24	31	28
28	Saudi Arabia	0	32	42	24	27
29	Spain	0	34	23	26	29
30	Panama	-5	31	13	34	32
31	South Africa	0	26	41	50	30
32	Slovenia	2	30	59	32	31
33	Poland	2	33	21	42	43
34	Turkey	-2	39	53	29	36
35	Costa Rica	-2	42	38	38	33
36	Italy	0	37	44	37	38
37	Indonesia	0	41	45	51	34
38	China	1	27	63	41	46
39	Kazakhstan	2	48	57	30	42
40	Thailand	3	43	35	60	37
41	Hungary	3	36	52	45	45
42	Colombia	3	46	34	40	56
43	Croatia	-5	58	40	39	44
44	Romania	2	45	46	47	47
45	Philippines	-3	61	32	62	35

■ Incipient
 ■ Emerging
 ■ In-Transition
 ■ Materially Ready

Rank	Country	Change in rank from 2014	Government and Market Support	Technology and Financial Infrastructure	Digital Money Solutions	Propensity to adopt
46	Mexico	1	49	27	53	55
47	Jamaica	9	52	29	59	49
48	Mongolia	11	60	61	28	50
49	Russian Federation	4	72	58	35	39
50	Brazil	-10	85	51	36	41
51	Trinidad and Tobago	0	56	54	44	52
52	Kuwait	0	70	69	33	40
53	Guatemala	-3	51	49	69	48
54	Sri Lanka	1	38	55	67	58
55	El Salvador	-7	63	39	52	64
56	Morocco	2	47	33	58	67
57	Dominican Republic	-8	62	48	63	57
58	Honduras	7	67	28	75	54
59	Kenya	-2	55	67	54	51
60	Peru	0	64	30	68	62
61	Botswana	2	35	65	56	65
62	Greece	-1	59	71	48	53
63	India	-9	57	37	49	74
64	Namibia	-2	44	66	65	60
65	Ukraine	2	73	64	57	59
66	Viet Nam	0	66	56	66	63
67	Ghana	-3	53	62	70	71
68	Senegal	0	50	74	73	66
69	Egypt	0	71	43	78	72
70	Nigeria	0	82	73	46	70
71	Argentina	3	87	78	55	61
72	Cote d'Ivoire	3	54	77	76	76
73	Tunisia	-1	69	76	71	75
74	Pakistan	-1	78	60	82	77
75	Zambia	-4	40	89	74	69
76	Uganda	0	75	68	77	78
77	Bangladesh	0	84	70	72	80
78	Gabon	1	81	84	61	81
79	Cameroon	-1	74	85	81	73
80	Venezuela, Bolivarian Republic of	1	90	72	64	68
81	Iran, Islamic Republic of	3	86	79	80	79
82	Nepal	0	79	75	89	83
83	Mozambique	2	65	81	88	82
84	Tanzania, United Republic of	-4	76	80	83	84
85	Mali	-2	68	88	79	85
86	Algeria	0	83	82	85	86
87	Burkina Faso	0	77	83	86	89
88	Ethiopia	0	80	86	87	87
89	Angola	0	89	90	84	88
90	Chad	0	88	87	90	90

Footnotes

- ¹ Throughout this report, the term “digital money” refers to the digitization of cash and checks to credit/debit cards, stored value instruments and other non-paper based mechanisms
- ² “Global Payments 2015”, report by Boston Consulting Group, 9 October 2015 [<https://www.bcgperspectives.com/content/interactive/financial-institutions-global-payments-model-interactive-edition/>]
- ³ Retail Banking Research 2014 (cited in “Mobile payments “won’t impact cash demand””, 11 September 2015 [<http://www.ncr.com/company/blogs/financial/mobile-payments-wont-impact-cash-demand>])
- ⁴ In terms of normalized raw scores
- ⁵ “Argentina: Cards, Payments and Consumer Banking” (Lafferty report, January 2015)
- ⁶ Large businesses surveyed for a report on Nigeria’s ‘Cashless’ policy by the Better Than Cash Alliance [<https://www.betterthancash.org/tools-research/case-studies/nigerias-cashless-policy>], 27 August 2015, and cited in the CGAP article “Cashless Nigeria: Facilitating the Transition to Digital Payments”, 12 November 2015 [<http://www.cgap.org/blog/cashless-nigeria-facilitating-transition-digital-payments>]
- ⁷ World Bank data [<http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/countries/ET?display=default>]
- ⁸ 2013 FDIC National Survey of Unbanked and Underbanked Households, 28 October 2014 [<https://www.fdic.gov/householdsurvey/>]
- ⁹ “This could be the first country to go cashless”, CNN Money, 2 June 2015 [<http://money.cnn.com/2015/06/02/technology/cashless-society-denmark/>]
- ¹⁰ “Spotlight on UK Faster Payments: Five years on”, VocaLink, 2014 [https://www.vocalink.com/media/1369/ips_microsite_fpscasestudy.pdf]
- ¹¹ “How QIWI Feeds Russia’s Cash-Hungry Soul”, PYMNTS.com, 13 August 2014 [<http://www.pymnts.com/in-depth/2014/how-qiwi-feeds-russias-cash-hungry-soul/>]
- ¹² “Peru, where the population lives largely without banks”, World Bank, 25 August 2014 [<http://www.worldbank.org/en/news/feature/2014/08/25/peru-donde-la-gente-vive-sin-bancos>]
- ¹³ Note that we don’t quantify frequency and reach here - we intend to explore these factors in more detail in subsequent research.
- ¹⁴ Our estimations for some of the annual benefits achievable in each flow are shown in the subsequent illustrations. Further information on each of the flows is collated in the Appendix.
- ¹⁵ According to the OECD (<https://data.oecd.org/socialexp/social-benefits-to-households.htm#indicator-chart>), within the 37 largest economies (35 OECD countries plus Brazil and India) that together constitute GDP of about \$66 trillion (about 84% of global GDP), the G2P flow of social benefits is about \$8 trillion (12% of GDP). Assuming the same percentage in other countries, the global flow of G2P social benefits is estimated at about \$9.4 trillion. By 2020, global GDP is estimated at about \$98 trillion, and global social benefits at about \$12 trillion.
- ¹⁶ “Payment Systems Worldwide: a Snapshot”, World Bank, 2011 [http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/282044-1323805522895/121534_text_corrections_3-15.pdf]
- ¹⁷ “Payments and Transactions” (report from the Social Protection and Labor Learning Forum, 18 March 2014) [http://www.worldbank.org/content/dam/Worldbank/Event/social-protection/Payments_and_Transactions_Session_Packet.pdf]
- ¹⁸ This estimate is based on the assumption that even if only a quarter of the volumes are digitized, there is the potential to save ~\$150 billion.
- ¹⁹ “Retail Sales Worldwide Will Top \$22 Trillion This Year”, eMarketer, 23 December 2014 [<http://www.emarketer.com/Article/Retail-Sales-Worldwide-Will-Top-22-Trillion-This-Year/1011765>]
- ²⁰ UK figures, in “Mobile Payments to Boost UK Economy”, CEBR, 5 November 2013 [<http://www.cebr.com/reports/mobile-payments-to-boost-uk-economy/>]
- ²¹ US figures, in “U.S. Retail Fraud Survey Reveals Surge In Loss From Cash Theft”, Business Solutions, 7 October 2014 [<http://www.bsminfo.com/doc/u-s-retail-fraud-survey-reveals-surge-in-loss-from-cash-theft-0001>]
- ²² This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ²³ B2C e-commerce sales, in “Worldwide Ecommerce Sales to Increase Nearly 20% in 2014”, eMarketer, 23 July 2014 [<http://www.emarketer.com/Article/Worldwide-Ecommerce-Sales-Increase-Nearly-20-2014/1011039>]
- ²⁴ “Maximize Online Commerce with Digital Cash”, Finextra, 17 April 2015 [<http://www.finextra.com/blogs/fullblog.aspx?blogid=10813>]
- ²⁵ EY research, cited in “Cash-on-delivery: Necessary Evil”, Business Today, 16 February 2014 [<http://www.businesstoday.in/magazine/cover-story/cash-on-delivery-impact-on-e-commerce-companies-customers/story/202680.html>]
- ²⁶ “Remittances growth to slow sharply in 2015, as Europe and Russia stay weak; pick up expected next year”, World Bank, 13 April 2015 [<http://www.worldbank.org/en/news/press-release/2015/04/13/remittances-growth-to-slow-sharply-in-2015-as-europe-and-russia-stay-weak-pick-up-expected-next-year>]
- ²⁷ “The Cost of Sending Remittances: June 2015 Data”, World Bank, June 2015 [<http://www.worldbank.org/en/topic/paymentsystemsremittances/publication/cost-sending-remittances-june-2015-data>]
- ²⁸ This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ²⁹ US market size of \$2.3 trillion extrapolated to the world for each year, based on GDP ratios
- ³⁰ IFC Mobile Money Study (2011 figures), cited in “Corporate Mobile Payments the Opportunity”, Mobile Money Consulting, January 2013 [http://www.mobilemoneyconsulting.com/wp-content/uploads/2012/12/corp_pymt_whitepaper.pdf]
- ³¹ “The cash-crunch crisis”, TradeShift blog, 10 June 2014 [<http://blog.tradeshift.com/the-cash-crunch-crisis/>]
- ³² This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ³³ Paystream Advisors, cited in “17 Things You Should Be Doing Right Now To Reduce Outstanding Accounts Receivable”, Anytime Collect report, June 2014 [http://e2banytime.com/Docs/17_Things_White_Paper.pdf]
- ³⁴ “The Opportunities of Digitizing Payments” (a report by the World Bank Development Research Group, the Better Than Cash Alliance, and the Bill & Melinda Gates Foundation), 28 August 2014 [http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2014/10/27/000456286_20141027124326/Rendered/PDF/903050WPOREPLACEMENTBox385358B00PUBLIC0.pdf]
- ³⁵ “DaviPlata: Taking Mobile G2P Payments to Scale in Colombia”, CGAP blog, 1 July 2015 [<http://www.cgap.org/blog/daviplata-taking-mobile-g2p-payments-scale-colombia>]
- ³⁶ UIDAI data [<https://portal.uidai.gov.in/uidwebportal/dashboard.do>]
- ³⁷ “NPCI links 150 million DBT bank accounts with Aadhaar”, Business Standard, 6 March 2015 [http://www.business-standard.com/article/pti-stories/npci-links-15-crore-dbt-bank-accounts-with-aadhaar-115030600567_1.html]
- ³⁸ “Indonesia’s remittance services improving”, Oxford Business Group [<http://www.oxfordbusinessgroup.com/analysis/indonesias-remittance-services-improving>]
- ³⁹ “Mobile Money in the Philippines - The Market, the Models and Regulation”, GSMA report [<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/Philippines-Case-Study-v-X21-21.pdf>]
- ⁴⁰ “Remittances growth to slow sharply in 2015, as Europe and Russia stay weak; pick up expected next year”, World Bank, 13 April 2015 [<http://www.worldbank.org/en/news/press-release/2015/04/13/remittances-growth-to-slow-sharply-in-2015-as-europe-and-russia-stay-weak-pick-up-expected-next-year>]
- ⁴¹ “11 entities get payments bank licences: What it means for Indian banking sector”, F.Business, 20 August 2015 [<http://www.firstpost.com/business/ril-aditya-birla-et-al-getting-payment-bank-licences-what-it-means-for-the-indias-banking-sector-2399840.html>]
- ⁴² B2C e-commerce sales, in “Worldwide Ecommerce Sales to Increase Nearly 20% in 2014”, eMarketer, 23 July 2014 [<http://www.emarketer.com/Article/Worldwide-Ecommerce-Sales-Increase-Nearly-20-2014/1011039>]
- ⁴³ “Maximize Online Commerce with Digital Cash”, Finextra, 22 December 2015 [<http://www.finextra.com/blogs/fullblog.aspx?blogid=10813>]
- ⁴⁴ “How Asia Pacific is Serving Consumers without Credit Cards”, LinkedIn Pulse, 2 February 2015 [<https://www.linkedin.com/pulse/how-asia-pacific-serving-consumers-without-credit-cards-timothy-lee?TrkSplashRedir=true&forceNoSplash=true>]

- ⁴⁵ "WeChat revenue and statistics", Business of Apps, 3 June 2015 [<http://www.businessofapps.com/wechat-revenue-and-statistics/>]
- ⁴⁶ "Number of monthly active WhatsApp users worldwide from April 2013 to September 2015 (in millions)", Statista [<http://www.statista.com/statistics/260819/number-of-monthly-active-whatsapp-users/>]
- ⁴⁷ "Ripple to plug into Earthport payment network", Finextra, 4 December 2014 [<http://www.finextra.com/news/fullstory.aspx?newsitemid=26779>]
- ⁴⁸ "How M-Shwari Works: The Story So Far", report from the Access to Finance Forum, April 2015 [<http://www.cgap.org/sites/default/files/Forum-How-M-Shwari-Works-Apr-2015.pdf>]
- ⁴⁹ "The battle between Africa's mobile phone companies and banks is a boon for financial inclusion", Quartz Africa, 27 July 2015 [<http://qz.com/462044/the-battle-between-africas-mobile-phone-companies-and-banks-is-a-boon-for-financial-inclusion/>]
- ⁵⁰ According to the OECD (<https://data.oecd.org/socialexp/social-benefits-to-households.htm#indicator-chart>), within the 37 largest economies (35 OECD countries plus Brazil and India) that together constitute GDP of about \$66 trillion (about 84% of global GDP), the G2P flow of social benefits is about \$8 trillion (12% of GDP). Assuming the same percentage in other countries, the global flow of G2P social benefits is estimated at about \$9.4 trillion. By 2020, global GDP is estimated at about \$98 Trillion, and global social benefits at about \$12 trillion.
- ⁵¹ "Payment Systems Worldwide: a Snapshot", World Bank, 2011 [http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/282044-1323805522895/121534_text_corrections_3-15.pdf]
- ⁵² "Payments and Transactions" (report from the Social Protection and Labor Learning Forum, 18 March 2014) [http://www.worldbank.org/content/dam/Worldbank/Event/social-protection/Payments_and_Transactions_Session_Packet.pdf]
- ⁵³ "Traditional versus Innovative G2P Payment Solutions", Payment Systems Development Group, World Bank [http://siteresources.worldbank.org/SAFETYNETSANDTRANSFERS/Resources/281945-1131468287118/1876750-1288815764634/Baijal-Traditional_v_Innovative_G2P_Payments.pdf]
- ⁵⁴ This estimate is based on the assumption that even if only a quarter of the volumes are digitized, there is the potential to save ~\$150 billion.
- ⁵⁵ "Banking the Poor via G2P Payments", CGAP [<http://www.cgap.org/sites/default/files/CGAP-Focus-Note-Banking-the-Poor-via-G2P-Payments-Dec-2009.pdf>]
- ⁵⁶ "Retail Sales Worldwide Will Top \$22 Trillion This Year", eMarketer, 23 December 2014 [<http://www.emarketer.com/Article/Retail-Sales-Worldwide-Will-Top-22-Trillion-This-Year/1011765>]
- ⁵⁷ "The Global Journey From Cash to Cashless", MasterCard report, September 2013 [http://newsroom.mastercard.com/wp-content/uploads/2013/09/Cashless-Journey_WhitePaper_FINAL.pdf]
- ⁵⁸ "Cash Continues to Play a Key Role in Consumer Spending: Evidence from the Diary of Consumer Payment Choice", CPO, April 2014 [http://www.frbsf.org/cash/files/FedNotes_Evidence_from_DCPC.pdf]
- ⁵⁹ UK figures, in "Mobile Payments to Boost UK Economy", CEBR, 5 November 2013 [<http://www.cebr.com/reports/mobile-payments-to-boost-uk-economy/>]
- ⁶⁰ US figures, in "U.S. Retail Fraud Survey Reveals Surge In Loss From Cash Theft", Business Solutions, 7 October 2014 [<http://www.bsinfo.com/doc/u-s-retail-fraud-survey-reveals-surge-in-loss-from-cash-theft-0001>]
- ⁶¹ This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ⁶² B2C e-commerce sales, in "Worldwide Ecommerce Sales to Increase Nearly 20% in 2014", eMarketer, 23 July 2014 [<http://www.emarketer.com/Article/Worldwide-Ecommerce-Sales-Increase-Nearly-20-2014/1011039>]
- ⁶³ "Maximize Online Commerce with Digital Cash", Finextra, 17 April 2015 [<http://www.finextra.com/blogs/fullblog.aspx?blogid=10813>]
- ⁶⁴ UK figures, in "Accepting card payments could reduce small business customer attrition by 24%", Visa press release, January 2015 [<https://www.visa-europe.com/media/pdf/20239.pdf>]
- ⁶⁵ "Remittances growth to slow sharply in 2015, as Europe and Russia stay weak; pick up expected next year", World Bank, 13 April 2015 [<http://www.worldbank.org/en/news/press-release/2015/04/13/remittances-growth-to-slow-sharply-in-2015-as-europe-and-russia-stay-weak-pick-up-expected-next-year>]
- ⁶⁶ "Remittances growth to slow sharply in 2015, as Europe and Russia stay weak; pick up expected next year", World Bank, 13 April 2015 [<http://www.worldbank.org/en/news/press-release/2015/04/13/remittances-growth-to-slow-sharply-in-2015-as-europe-and-russia-stay-weak-pick-up-expected-next-year>]
- ⁶⁷ "Remittance Prices Worldwide", World Bank, June 2015 [https://remittanceprices.worldbank.org/sites/default/files/rpw_report_june_2015.pdf]
- ⁶⁸ This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ⁶⁹ US market size of \$2.3 trillion extrapolated to the world for each year, based on GDP ratios
- ⁷⁰ IFC Mobile Money Study (2011 figures), cited in "Corporate Mobile Payments the Opportunity", Mobile Money Consulting, January 2013 [http://www.mobilemoneyconsulting.com/wp-content/uploads/2012/12/corp_pymt_whitepaper.pdf]
- ⁷¹ "The cash-crunch crisis", TradeShift blog, 10 June 2014 [<http://blog.tradeshift.com/the-cash-crunch-crisis/>]
- ⁷² Data cited in "27 Frightening Accounts Receivable Management Facts You Need to Know", Anytime Collect, 31 October 2014 [<http://blog.anytimecollect.com/27-frightening-accounts-receivable-management-facts-every-cfo-should-know/>]
- ⁷³ "Atradius Payment Practices Barometer", Atradius, September 2015 [http://www.atradiuscollections.com/images/downloads/PaymentPractices/ppb15_ppb_americas.pdf]
- ⁷⁴ Data cited in "27 Frightening Accounts Receivable Management Facts You Need to Know", Anytime Collect, 31 October 2014 [<http://blog.anytimecollect.com/27-frightening-accounts-receivable-management-facts-every-cfo-should-know/>]
- ⁷⁵ This estimate is based on the assumption that 25% of volumes in this flow are digitized.
- ⁷⁶ Paystream Advisors, cited in "17 Things You Should Be Doing Right Now To Reduce Outstanding Accounts Receivable", Anytime Collect report, June 2014 [http://e2banytime.com/Docs/17_Things_White_Paper.pdf]

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