



# Cashing Out: Economic Growth through Payment Digitisation

WHITE PAPER





## Executive Summary

“Keep your coins, I want change”—a cashless economy was certainly not what Banksy had in mind with this quip, but the notion is undeniably appropriate.

As governments, particularly in emerging markets, seek economic growth and financial inclusion through reduced cash dependency, the piggy banks of old should no longer see much currency. That is not to say cash is going to disappear completely. On the contrary, social and infrastructural factors keep cash resilient and convenient. Payment digitisation will undoubtedly alleviate many of the downsides of cash. But, despite its liquidity, cash won't be completely heading out with the bathwater just yet.

The World Bank, often in collaboration with governments and the International Monetary Fund, has been funding economic development projects worldwide for over 70 years. Its objectives are noble: greater employment and financial inclusion; balanced gender roles; diversified industry; and improved tax collection and foreign investment through financial transparency. Yet, fundamental challenges persist due to poor infrastructural and industrial bases, limited trust of cash alternatives, and an unrealistic expectation of governments to pursue economic development alone.

Digitisation of the economy, underpinned by a widespread electronic payments network, is crucial to addressing such challenges. But cash still represents 85% to 90% of all consumer transactions globally and often comes with significant direct and indirect costs: lost tax revenues; production, handling and transport costs; and higher levels of crime and corruption.<sup>1</sup> Governments are working to identify the root causes of cash reliance to then develop and implement a comprehensive digitisation programme to reduce—not eliminate—the dependency. Such an initiative would help businesses increase economic activity via better capital and labour use, innovate by increasing competition, and participate in the global economy.

As a global technology company in the payments industry, Mastercard has a long-standing commitment to helping governments and other institutions digitise their economies. In particular, its proprietary Payments Ecosystem Design & Development (PEDD) methodology helps governments systematically and effectively assess and capture the potential of payment digitisation. This paper will discuss the following topics:

- Payment digitisation as a foundation
- The resilience of cash
- Problems associated with cash
- Payment digitisation and inclusive economic growth
- Difficulties in reducing cash
- Mastercard's cash reduction solutions via economic digitisation

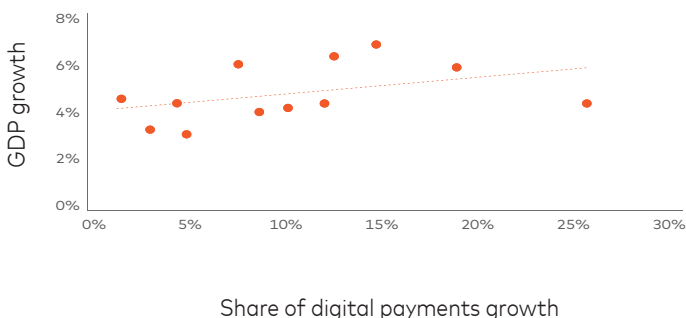
# A Digital Bedrock

## Payment digitisation as a foundation

Digitisation of the economy via digital technologies fosters economic growth through inclusion, efficiency and innovation, according to a World Bank study.<sup>2</sup> For instance, a 10% increase in internet use in an exporting country can increase the number of products traded between two companies by 1.5% as a result of buyers and sellers being able to communicate directly. Early adoption and use of digital technology allows for higher productivity levels through more efficient use of capital and labour, such as the benefits of real-time data in logistics used by ecommerce giants like Alibaba, Amazon and eBay.<sup>3</sup> And the very speed at which digital technologies boost innovation and competitiveness often requires new regulation to avoid unfair competitive advantage for companies like Airbnb, Uber and Lyft.

Payment digitisation exists in a virtuous economic cycle with economic development through its critical role in the economy. This correlates positively with GDP growth (see Figure 1).<sup>4</sup> As the internet grew, developed economies had more resources than developing ones to invest, and then reinvest, in a digital infrastructure. This infrastructure allowed businesses and entrepreneurs to flourish.

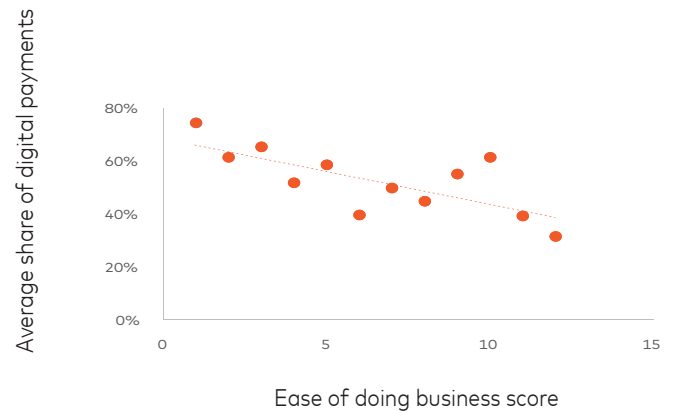
**Fig. 1 GDP Growth vs. Share of Digital Payments Growth (1990–2017)**



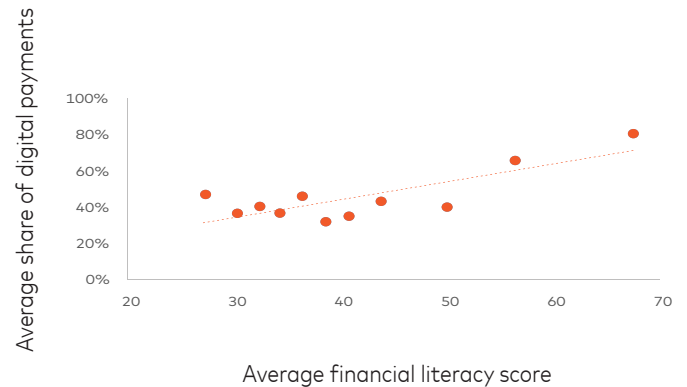
Share of digital payments is one of the five key indicators of economic development alongside ease of doing business, financial literacy, access to education, and lack of corruption. A strong positive correlation naturally exists between a country's standard of living, as measured by

GDP per capita, and all five of these indicators.<sup>7</sup> The five are also not mutually exclusive. By taking digital payments as the point of comparison, a positive correlation with ease of doing business and financial literacy can be clearly identified (see Figures 2 and 3).

**Fig. 2 Ease of Doing Business vs. Share of Digital Payments**



**Fig. 3 Financial Literacy vs. Share of Digital Payments**



The Swedish example of a predominantly cashless society comes from decades of incremental developments. Widespread adoption of payment cards in the 1950s and the digitisation of bank accounts in the 1960s enabled internet banking in the mid-1990s, followed by various payment digitisation initiatives in the 2000s.<sup>5</sup> Sweden then benefitted from reduced fraud, increased online commerce and a smaller grey economy.<sup>6</sup>



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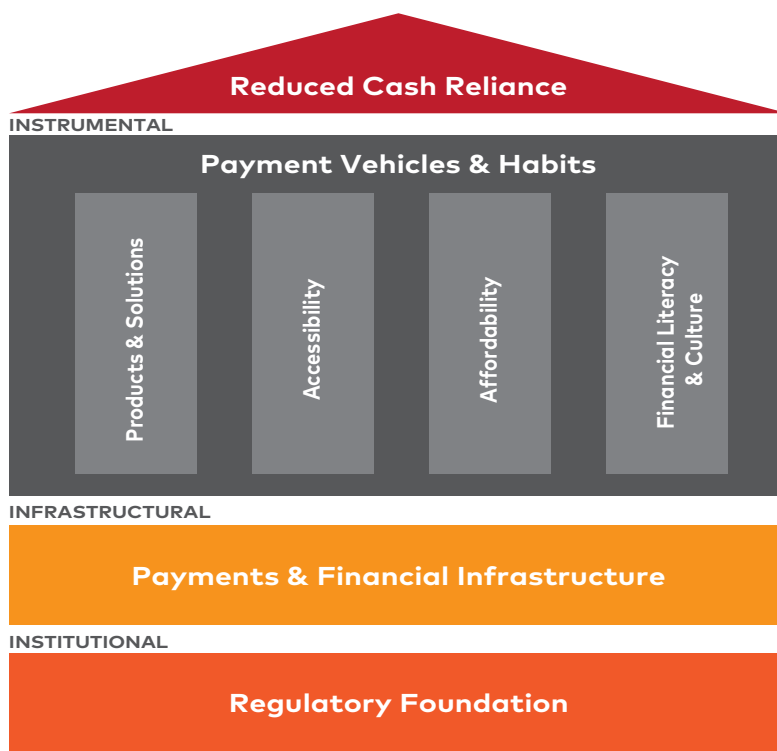
A study conducted by the Fletcher School at Tufts University<sup>8</sup> attributed digitisation to the interplay of four drivers: supply, demand, institutional environment and innovation & change. Unsurprisingly, digital payments play a role in all of them. "Supply" refers to the quality of the physical and digital infrastructure that allows digital payments to become convenient alternatives to cash. "Demand" refers to consumer access and willingness to engage with new technology such as digital payments. "Institutional environment" refers to enabling regulatory conditions and promotional support. "Innovation & change" refers to the way innovations, such as mobile money transfer services like Kenya's M-Pesa<sup>9</sup> or Bangladesh's bKash,<sup>10</sup> contribute to the digital evolution of a country even when the digital infrastructure or financial education is lacking.<sup>11</sup>

## Strapped by Cash—"Cash only, please"

### The resilience of cash

The ubiquity of cash, its universal acceptance and its convenience in handling low-value purchases, justify its continued existence. Although contactless card or e-wallet payments are growing as a result of being able to mimic cash in terms of consumer behaviour, they cannot replace the tangibility of cash. Nonetheless, widespread use of cash does come with costs. Mastercard's Global Cash Reduction Framework breaks down cash's root causes into three components (see Figure 4).

Fig. 4 Mastercard's Global Cash Reduction Framework





### ***Instrumental—payment vehicles & habits***

Lack of easy access to digital alternatives, such as bank accounts and debit or credit cards, and limited financial literacy<sup>12</sup> can allow cash to persist even among people otherwise receptive to alternative options. For example, predominantly cashless Sweden has higher levels of financial literacy than cash-dominant Vietnam where only a quarter of adults are financially literate and the banked population is only slightly higher.<sup>13</sup> Having two-thirds of the population being banked can make a big difference in terms of economic development, but this does not always equate with use. For example, less than 40% of the population use debit cards for transactions in Malaysia despite penetration of almost 75%.<sup>14</sup> Physical money is convenient in low amounts and can provide a sense of security and independence from government oversight. This sense of freedom is especially relevant given how digital records are now analysed more effectively and efficiently than ever before.<sup>15</sup>

### ***Infrastructural—payments & financial infrastructure***

Cash can only be displaced to an appropriate degree if there is an established acceptance infrastructure that is sufficiently trusted and offers compelling electronic payment value propositions for consumers and businesses. OECD (Organisation for Economic Co-operation and Development) countries have successfully included merchants in the banking sector with digital point-of-sale penetration around 50 times higher than other countries where merchants are mostly part of the informal economy and transacting in cash.<sup>16</sup>

### ***Institutional—the regulatory foundation***

Governments and central banks have a critical role to play in digitisation by adopting a mix of policies that increase trust in the banking industry and encourage electronic payments. Ensuring a protected environment for companies while having a balance of incentives and penalties can decrease the shadow economy, provide alternatives to cash, increase tax revenue, and financially include business and citizens.

## Cash Doesn't Come Cheap

### **Problems associated with cash**

Cash prevalence can have a high economic cost purely by virtue of its existence: the US incurs \$200 billion annually to keep cash in circulation;<sup>17</sup> 72 million hours is spent chasing down cash in New Delhi each year; and Mexico's small businesses are nearly twice as likely as large ones to be victims of cash fraud. The burden of excessive cash usage is estimated at between 3.2% to 4.5% of global GDP.<sup>18</sup>

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A number of factors make cash prevalence costly. Their impacts vary across governments, businesses and consumers.

**For governments**

Governments incur direct costs from raw materials and their minting as cash. Human capital adds to this through roles in demand forecasting, currency design, production management, tracking and transportation. Most expensive is missed tax revenue, which can cost 2.2% of annual GDP.<sup>19</sup> A government's inability to collect can result from unreported corporate income as part of the shadow economy, unreported personal income through unregistered employment, sales of goods and services without collection of appropriate value-added tax (VAT) and general tax fraud. Side effects include reduced standards and availability of public goods, distortions in market competition and degradation of economic and social institutions.

Governments incur indirect costs due to crime, corruption and associated law enforcement costs resulting from the shadow economy (see Figure 5).<sup>20</sup> There is a negative relationship between cash use and the shadow economy: quasi-cashless countries, where around 90% of payments are digital, have the smallest shadow economies at 17% of GDP; while cash-predominant countries, where 83% of payments are cash based, have the largest shadow economies at 35% of GDP (see Figure 6).<sup>21</sup> A 1% decrease in the shadow economy decreases corruption by 0.81–1.14%.<sup>22</sup> In Sweden, labour unions representing employees who tended to handle physical cash were unsurprisingly the biggest advocates of a more cashless society.<sup>23</sup>

**Fig. 5 Share of Shadow Economy vs. Degree of Corruption**

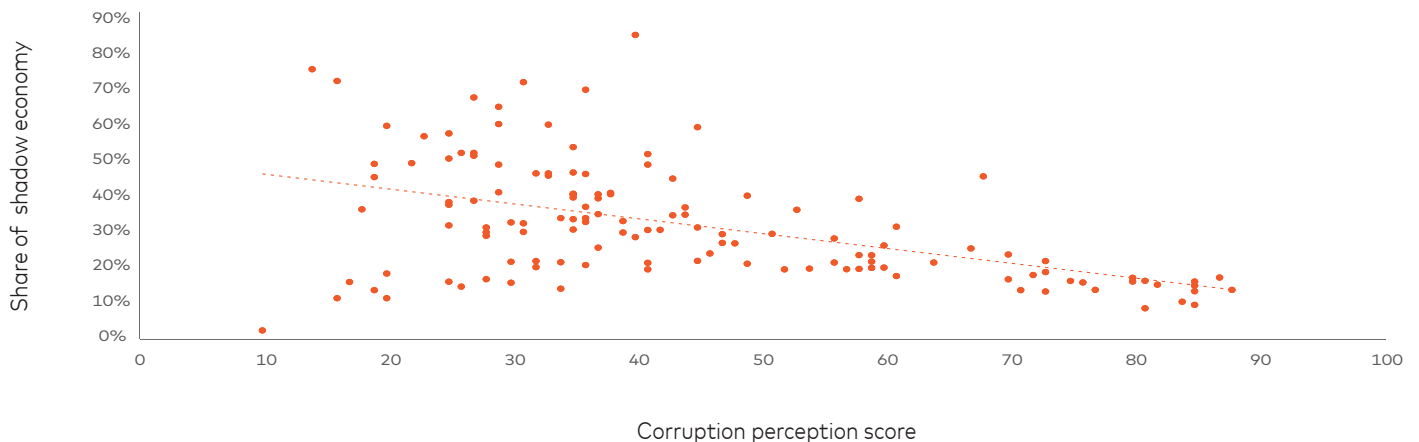
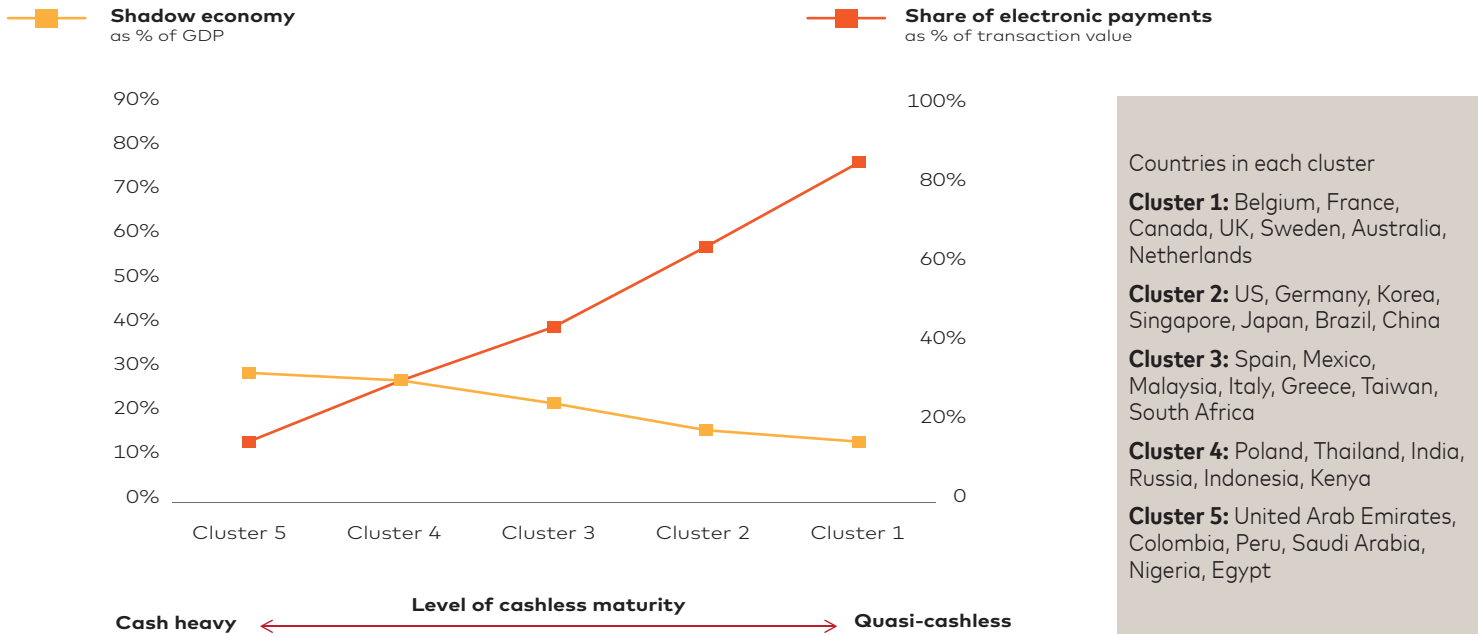


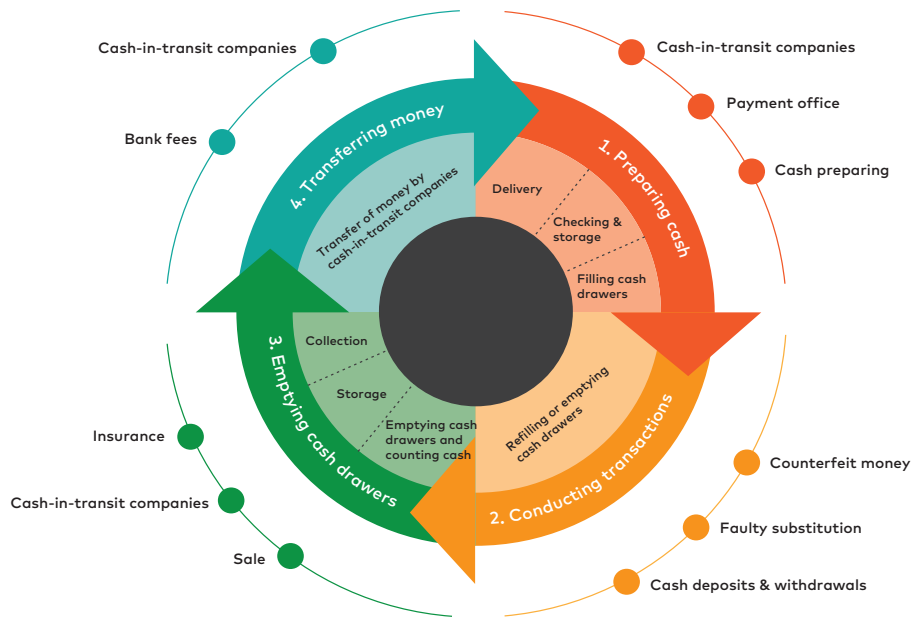
Fig. 6 Share of Electronic Payments vs. Share of Shadow Economy



**For businesses**

Businesses incur direct costs from transporting and handling cash in what is largely manual labour. Banks are particularly affected by cash operations accounting for 5% to 10% of total operating costs.<sup>24</sup> In areas of Sub-Saharan Africa and Latin America, ATM maintenance costs can be particularly high due to security and infrastructural challenges.<sup>25</sup> The retail sector also suffers considerably (see Figure 7). In cash-heavy Germany, the total cost of cash to the retail sector is €6.7 billion per year.<sup>26</sup>

Fig. 7 The Cash Handling Process in the Retail Sector



Source: "Cost of Cash: Status Quo and Development Prospects in Germany", Steinbeis Research Center for Financial Services, 2013

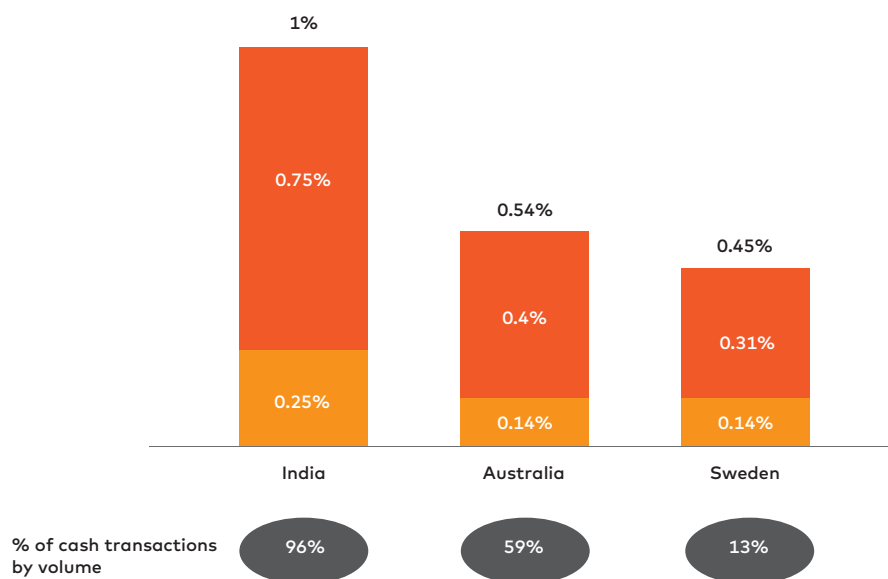
Businesses incur indirect costs due to cash dependency. Cash use can mean forgone interest and lack of access to banking services such as competitive foreign exchange rates, faster bank transfers and short-term loans. The drawbacks of lacking an electronic payment option are not just associated with a loss of incremental revenue. Poorer cash flow results in slower check-outs and no pre-payment opportunities. In addition, the crucial insights into consumers and business operations through payment data are not available. Separately, more cash means more security and insurance costs. US retail businesses lose \$40 billion annually due to cash robberies.<sup>27</sup>

**For consumers**

Total cost of cash to consumers is estimated to vary between 0.5% to 1% of GDP. It also varies considerably across different countries depending on degrees of cash reliance and infrastructure associated with cash (see Figure 8).<sup>28</sup> Even when circumstances make cash the most appropriate payment method for unbanked and under-banked people, the burden of cash can simultaneously be even greater on them than on other groups. And it's not simply due to a lack of access to convenient electronic payments, accounting tools and interest on deposits. Unbanked people can end up paying several times more than their banked counterparts for cash access through payday lending, no-credit-check auto loans, cheque cashing and travel to cash points.<sup>29</sup>

Possession of cash also exposes consumers to security issues. Thefts at cash points are an issue worldwide,<sup>30</sup> and rising incidences of ATM skimming now cost consumers and institutions in the US \$8 billion annually.<sup>31</sup> In some countries, ATM cash withdrawals are free; in others, it can range from a few cents to several dollars.<sup>32</sup> This imbalance is now being redressed as some previously fee-free regions are reintroducing fees to compensate for decreased cash demand.<sup>33</sup>

Fig. 8 Total Cost of Cash to Consumers as % of GDP







**Payment digitisation provides the overarching economic foundations to counteract the direct and indirect problems of cash across governments, businesses and consumers**

## Double-Digital Growth

### Payment digitisation and inclusive economic growth

Payment digitisation provides the overarching economic foundations to counteract the direct and indirect problems of cash across governments, businesses and consumers. Financial inclusion is one of its greatest benefits. Although the objective is not to eliminate cash entirely, the bringing of unbanked and under-banked people into the financial system vastly improve livelihoods and expectedly correlates with the greater ease of doing business and improved financial literacy associated with digital payments.

Payment digitisation also brings its own incremental benefits. Consumers, banked or unbanked, are given a choice in payment methods, easy ways to access and view their funds, and better access to personal credit or to seed capital for the launching of a small business. The positive effect of small businesses on economies are well known. But, even more broadly, the removal of cost and friction from payments through digitisation can have huge economic benefits in increasing consumption.

Higher card use in 70 countries, representing 90% of the world's GDP, contributed an additional US\$296 billion to consumption, according to a study conducted from 2011 to 2015.<sup>34</sup> In global terms, that equates to a 0.1% cumulative increase in global GDP, equivalent to a US\$74 billion annual GDP contribution. Countries with the largest increases in card usage experienced the biggest contributions to growth. The study found that each 1% increase in use of digital payments produced an average annual increase of US\$104 billion in the consumption of goods and services, representing a 0.04% increase in GDP in developed markets and a 0.02% increase in developing ones.

This virtuous economic cycle of increased consumption leading to increased production and jobs can also work the opposite way. In India, where 85% to 90% of debit cards are only used for ATM withdrawals, low debit card spend means issuing banks charge higher fees, rendering them less attractive to merchants.<sup>35</sup>

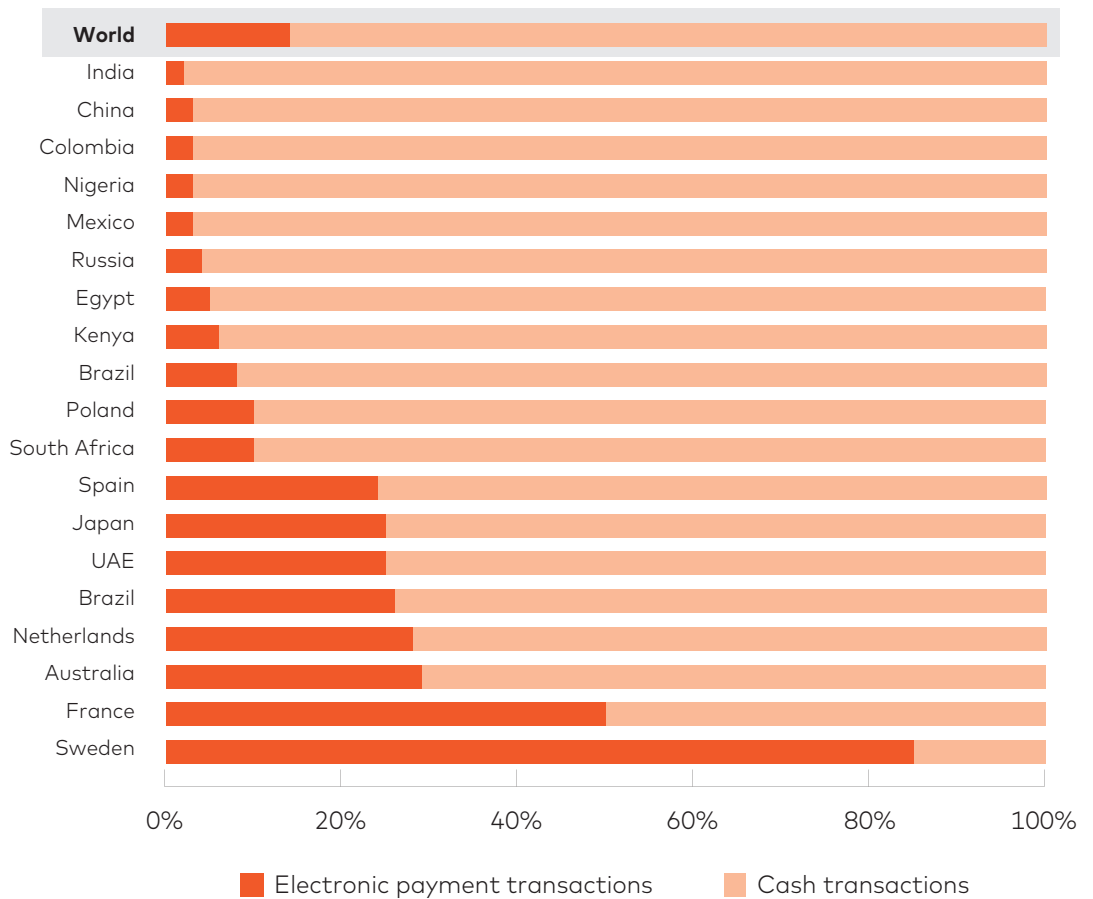
# Surmounting a Mountain of Cash through Public–Private Partnerships

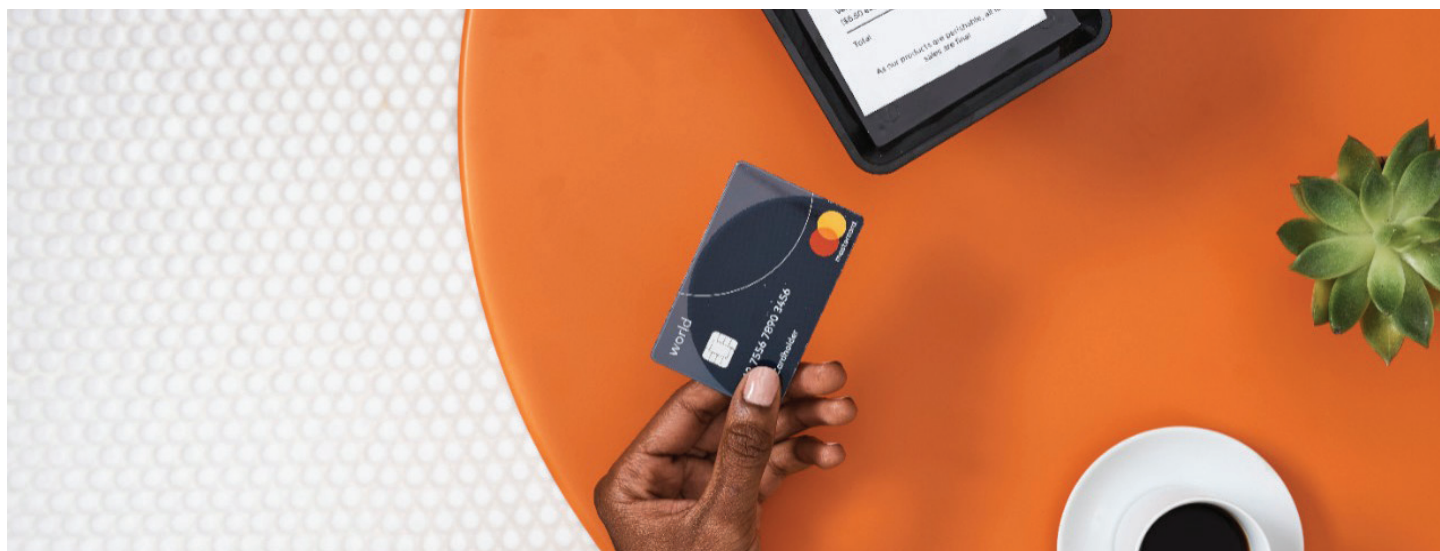
## Difficulties in reducing cash

Globally, 85% to 90% of all consumer transactions are still made in cash, but this varies from 10% in Sweden to 99% in India (see Figure 9).<sup>36</sup>

Countries with lower cash use have a record of successful government or private-sector initiatives encouraging consumers or businesses to go digital.<sup>37</sup> Yet, governments face many unique challenges. The financial appeal of digitisation can lead different departments to adopt different initiatives without a common vision and sometimes without the requisite expertise in payments. The typically high costs of major digitisation programmes mean governments may struggle to win political support and investment without clear statements on economic value. They also have to make a multitude of decisions on which digitisation policies to pursue and in what order of priority.

Fig. 9 **Cash Transaction as a % of Volume of Consumer Payment Transactions**





While purely public-sector initiatives have often struggled, public-private collaborations have been more successful. Banks across Benelux and Scandinavia played a key role in promoting electronic payments, particularly in Sweden and Norway where dispersed populations made it very expensive to maintain branch and ATM networks. In Denmark, banks helped develop mobile payment technologies, such as Denmark's MobilePay app in 90% of Danish smartphones. They also started accepting government benefit payments on debit cards.<sup>38</sup> Swedish merchants worked with the government to install sales-data recorders in cash registers to fight VAT evasion. In emerging economies, Kenya's M-Pesa and Bangladesh's bKash demonstrated how a mobile-phone network could bring financial inclusion without requiring significant additional infrastructure.<sup>39</sup> In Egypt and the UAE, payroll digitisation by central banks and commercial banks financially included millions of citizens and blue-collar workers.

## Cash-Cutting Solutions

### Mastercard's cash reduction solutions via economic digitisation

Mastercard partners with governments worldwide to meet digitisation objectives, and helps implement them through a global network of specialised partners. It offers a range of programmes, products and services across healthcare, education, agriculture, financial inclusion and humanitarian response.

Mastercard plays an active role in government disbursements. For example, the Egyptian government's digital payroll solution has grown into one of the largest such programmes in the world. Several other notable

programmes are carried out by the Mastercard Lab for Financial Inclusion: the Mastercard Farmer Network (MFN) in East Africa and India, Kupaa in Uganda and Kionect in Kenya and Egypt. MFN provides a digital marketplace to link farmers, agents and buyers to enhance sales with digital orders, inventory transparency, order fulfilment and payment processing. Kupaa digitises school ecosystems—including tuition, school purchases and education-related money transfers—for educators, parents, students and governments. Kionect empowers small kiosk owners with an SMS-powered digital payments and orders system that, in turn, generates transaction data through which micro-sellers can qualify for loans on stock inventory.

Mastercard also partners with outside organisations. With Gavi—the Vaccine Alliance—Mastercard is strengthening the efficiency and reach of health services in developing economies with a Wellness Pass containing a digital immunisation record. With the World Food Programme, Mastercard developed a digital voucher programme in Lebanon to deliver food assistance to Syrian refugees.<sup>40</sup>

Through all these partnerships, Mastercard uses a variety of platforms, advisory services and thought leadership to promote the benefits of payment digitisation to the world. Its proprietary PEDD methodology is based on extensive global experience in the payments sector. It helps governments develop a blueprint of their digital economy to mitigate the costs of cash and capitalise on the benefits of a digital economy. The PEDD approach consists of five steps: size the payment flows; determine the drivers of cash; design the strategy; prioritise the initiatives; propose an implementation plan.

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## **PEDD helps governments develop a blueprint of their digital economy to mitigate the costs of cash and capitalise on the benefits of a digital economy**

### ***Size the payment flows***

PEDD establishes the prevalence of cash in an economy by looking at the operational and financial cost of cash management and the losses from missed tax revenue.

By analysing macro-ecosystem indicators—such as salaries, loans, taxes, pensions and purchases—in the payment ecosystem, PEDD determines the nature of payment flows, evaluates their annual size and determines their respective share of cash across the government, businesses and consumers. PEDD then identifies highly transactional micro-ecosystems dominated by cash, such as public transport, public utilities and tourism.

### ***Determine the drivers of cash***

PEDD looks at cash in an economy by engaging central banks, finance ministries, issuing and acquiring banks, and businesses and citizens through Mastercard's Global Cash Reduction framework. The framework divides drivers of cash into three sections: payment vehicles & habits; payments & financial infrastructure; and business foundations.

To assess the relative importance and impact of each driver, PEDD measures their performances against a benchmark. This helps identify room for growth within each section so that the best initiatives can be designed to address them.

### ***Design the strategy***

PEDD designs initiatives to address the issues determined across the framework pillars and across the customer lifecycle issues of access, usage and knowledge/culture.

Those initiatives collectively address all drivers of cash across all payment flows, target all public and private actors in the economy, and create economic opportunities. Each initiative includes supporting business requirements and is benchmarked against the impact of similar initiatives in related economies. These benchmarks permit a high-level understanding of the potential direct and indirect impacts of specific initiatives on the ecosystem to allow for a detailed implementation strategy.

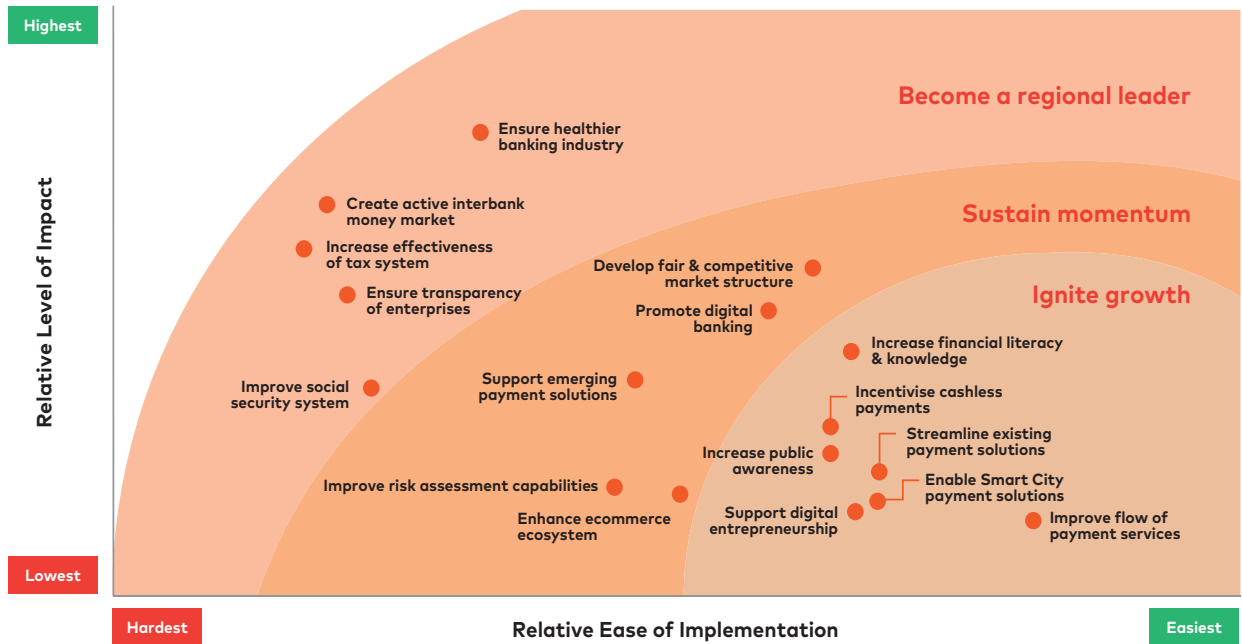
### ***Prioritise the initiatives***

PEDD uses three criteria to prioritise initiatives when establishing an implementation plan: overall impact or the amount of cash converted; ease of implementation; and the level of control from institutional entities.

To prioritise effectively, PEDD groups initiatives into bundles in accordance with how they enable or complement each other. Quantifiable targets are established by benchmarking these initiatives against similar economies where they have been implemented while considering local market contexts and constraints. The combined impacts and benefits of all macro-level and micro-level initiatives can be assessed along the dimensions of relative ease of implementation and impact. For example, the creation of an interbank money market might be classified as high impact but difficult to implement and with low control from the central bank, while the support of digital entrepreneurship might be the inverse (see Figure 10).

Fig. 10

### Prioritising Initiatives: Ease of Implementation vs. Level of Impact



## Azerbaijan Case Study

With 75% of payments being cash based, the Central Bank of Azerbaijan partnered with Mastercard on a PEDD initiative to reduce cash payments in the country to 40% over five years. This equates to a reduction in the volume of cashless payments by US\$10 billion annually. The main outcomes will be reduced cash circulation to a level on par with developed economies, a reduced shadow economy, increased investment opportunities through stronger financial systems, and greater wellbeing through reduced poverty and increased financial inclusion. The government is planning to implement five key initiatives:

- 20,000 University of Economics student cards with a payment functionality to convert US\$27 million to cashless payments in the first year and ultimately expanding to 150,000 university and high school students
- Public transport cards to convert US\$74 million to cashless payments over three years
- Cashback/refund campaigns rewarding the use of cash alternatives with lottery tickets and VAT refunds to convert US\$0.5–1.3 million to cashless payments and promote financial inclusion for consumers and businesses
- Masterpass digital wallet and tokenised contactless/online payments to convert US\$0.5–1 million to cashless payments
- Automated monthly social-security taxation of 10% plus a fixed ~US\$3.50 amount, and an employer contribution of 15% plus a fixed ~US\$26 amount, on gross taxable monthly incomes over ~US\$120



### **Propose an implementation plan**

PEDD hinges on the coordination of all efforts—public and private, local and national—to implement market-specific initiatives.

Successful collaboration also includes government and central bank intervention through mandates and guidelines. Feasibility and effectiveness relies on addressing interdependencies and defining governance and tracking mechanisms. For example, installing QR codes in retail stores requires proper coordination: retailers must be prepared and educated to accept digital payments; financial institutions must be able to process the payments; and governments must be willing to incentivise consumers and educate them about the benefits of such payments. To ensure that launches are properly managed by tactical project teams, PEDD designs a stakeholder map and then layers a project governance framework on top. A monitoring dashboard is then used to track the development, launch and impact of each initiative on the overall ecosystem to enable dynamic adjustments.

It's ironic that cash should often come with a cost. Yet, the inextricable link between digitisation and development has made cost-cutting initiatives quite literally cash-cutting ones. The situation holds true across governments, businesses and consumers. And although governments and the private sector are already collaborating in many parts of the world to digitise economies, cash still represents 85% to 90% of consumer payments. A greater convergence of public and private sector efforts is needed to effect any meaningful change. By establishing the root causes of cash and its costs, Mastercard's PEDD methodology helps governments design blueprints for digital economies and implement them. Benefits range from economic growth and financial inclusion to increased employment and reduced corruption. Moreover, the approach comports with "doing well by doing good"—a notion that Mastercard believes should represent business as usual.



For more information on how Mastercard can help governments achieve economic growth through payment digitisation, contact Elias Aad at [elias.aad@mastercard.com](mailto:elias.aad@mastercard.com).

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