BETTER THAN CASH ALLIANCE | *Empowering People Through Electronic Payments*

betterthancash.org

Measurement Toolkit

The Better Than Cash Alliance has prepared a series of toolkits to help different stakeholders in their shift towards digital payments.

Choose the one which likely best suits you

Ecosystem Diagnostics
How to conduct a diagnostic to review the digital payment ecosystem

Payments Measurement
How to measure the payment flows so as to track the shift to digital

Development Partners

Business

Government

This toolkit is primarily intended for:

Your institution	Central Bank or other regulator	Development partner	Private sector payment participant
Your role within the institution	Staff at payment system department, statistics or research department focused on measurement of payments at the national level	Staff focused on measurement of payments at the national level across 1 or more countries	Staff focused on how and where to grow payments at the national level across 1 or more countries
Your level of prior digital payments knowledge required	Medium to high	Low to medium	Low to medium

First time reader? Get tips on how to navigate this toolkit.

Go directly to the decision tree to help determine your starting point.

Go directly to the index to navigate throughout the toolkit.

Not you above? Maybe another BTCA toolkit may fit your needs better.

Tips on how to use BTCA toolkits to get what you need, fast

BTCA toolkits aim to provide a practical, modular source of advice to readers, so that:

- **first time readers** with limited background on the subject can navigate smoothly through the entire toolkit in stages if they wish; while
- **return readers or those with particular questions or interests** can quickly and easily get to the sections relevant to them.

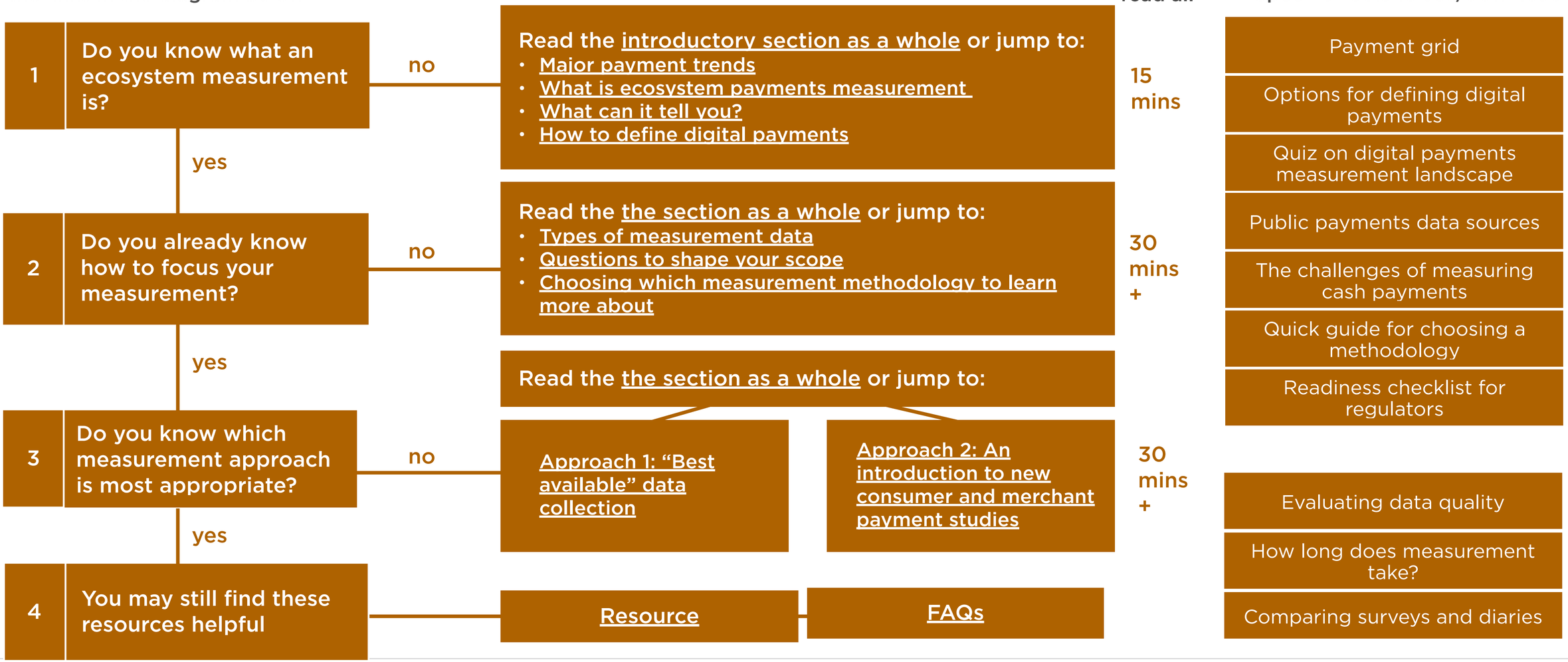
However, there are a variety of particular uses you may have in mind so an initial **decision tree** will enable you to form your own path to relevant material. And you can always get back to the **index** using the button at the bottom of every page.

In addition, there is a bar like the one below at the top of each page to navigate to one of the five main sections, as well as a linked menu on each within each section.

Context and Awareness	Planning Your Diagnostic	Conducting Research	Analysis & Usage	General Resources

Decision Tree: How to use this toolkit

You can download it as one PDF file here or determine your starting point using the links in the diagram below



Index: How to Navigate This Toolkit

Context & Awareness

The objective of measurement is to map and quantify payment flows for the whole, or a portion of, the ecosystem. Mapping tells you who is making the payment, to whom, and how. The quantifying tells you how much of the local currency was transacted.

It may be possible to achieve the objectives above by relying on existing data (i.e., measurement done by others). But where it's not possible to do so, this toolkit explains how you can measure (i.e., map and quantify) payment flows yourself.

Measuring the number, value and type of payments in an economy can be daunting, especially since a large volume of transactions is likely still in cash in most countries worldwide! However, it can be a potentially very valuable exercise for governments, businesses and development partners: it enables them to understand patterns of payment, benchmark the status of the national payments ecosystem, and monitor changes over time. This data can inform policy towards shifting towards digital as well as business strategies regarding the payment types to promote or accept.

This toolkit is a companion to the BTCA ecosystem diagnostic toolkit: having measurement data is an important aspect of those diagnostics, although measurement exercises can also be conducted on their own for defined purposes.

This toolkit steps you through how to design an approach for measuring a national payment ecosystem, starting in this section with the reasons to measure and how measurement can be applied.

Click here to get started.

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- Quiz on digital payments measurement landscape

Major payment trends

Did you know?

Most countries have seen the rapid growth of digital payments in their payments systems over the past few decades. Still, cash usage remains high in most countries. **Consumer payment diaries from seven advanced economies** reveal that this is true even in many developed economies. Such studies have generally not been commissioned by emerging countries due to their high implementation costs. Do these statistics surprise you?

Individual governments, businesses and development partners have executed payments research using different methodologies. Despite methodological differences, the proportion of digital payments in an economy is usually closely related to the overall level of economic development. In low and lower middle income countries, the proportion of digital payments by volume is likely very low —not much more than 2% in most cases. In an upper middle-income country like Colombia, the percentage rises to 10% and more. Some, but by no means all, upper-income countries have recently passed the 50% threshold.

Cash usage usually varies by demographics. Payment studies in seven advanced economies have revealed that cash is generally more often used by the elderly, low-income populations, and those with fewer years of education. If you want to reduce cash usage by consumers, how will this information help you?

In the advanced economies showcased in Figure 2, consumers perform between 1.4 to 2.1 payment transactions a day. The number for developing economies is generally not yet known in the absence of further payment measurement research.

Across a range of developed countries, the number of digital payments per capita has increased while the number of checks declined. Do you have similar statistics for your country?

However, developed countries are not the only ones adopting digital payments. For example, **68% of cell phone owners in Kenya in 2013 reported using their phone regularly to make or receive digital payments**. In South Africa, the number was 29% and in the Philippines, 11%.

Figure 1

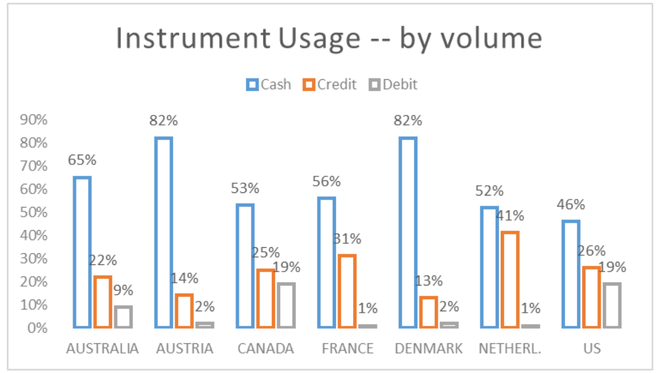
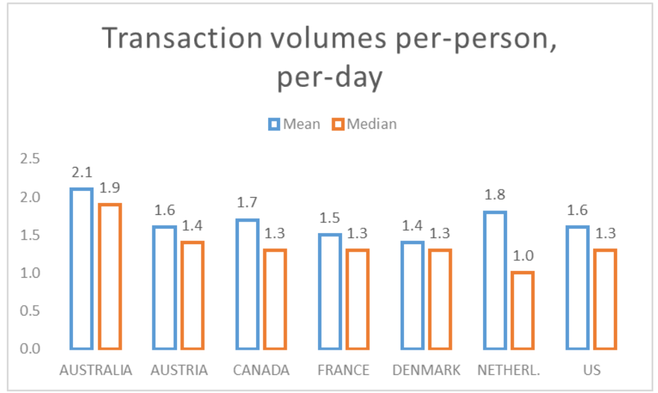


Figure 2



Source: Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data, 2014

What is payments ecosystem measurement?

Defining payments ecosystem measurement

There is an emerging consensus that a transition to digital payments can bring numerous benefits to governments, policymakers, the private sector, and consumers themselves. But there is a dearth of consistent, accurate data on payments in most economies. Payments ecosystem measurement involves dimensioning parts of the payment grid at the national level. Ecosystem measurement differs from self-measurement conducted by an individual payer or a payee since it aggregates across the economy. Businesses that are interested in learning about how to measure their own payments should see the BTCA business toolkit.

Dimensioning the payments grid for an economy as a whole, however, is not easy. It is especially difficult to measure cash payments accurately. As we will discuss later in this toolkit, measuring cash usually requires the use of payment diaries or surveys in which a representative sample of people and businesses record the size and means of payment of every transaction conducted during a defined period—ranging from a few days to a month or longer. The data from surveys such as these can be grossed up to create a picture of payments in the economy as a whole. Payment diaries have to date been executed primarily by central banks in developed countries. However, even when measurement using payment diaries is not possible due to limited budget or timeframe, other entities, such as international donors and private sector players, have commissioned "best-available" data collection using pre-existing sources.

Click here to see how governments and businesses are using this kind of research.

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Payment grid

Options for defining digital payments

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Want to read more on the benefits of digitizing payments?

BTCA together with the World Bank and the Bill and Melinda Gates Foundation brought out a 2014 report called The Opportunities of Digitizing Payments. In this report, the authors argue that digitizing payments will contribute significantly to broader policy objectives. They authors call for governments to digitize their receipts and payments, including social transfers.

What is payments ecosystem measurement?

The payments grid

Payments differ according to who is the payer and the payee in each case, forming the payment grid of combinations below. In each cell, the number and value of payments and the mode of payments will differ. Click here to read about what ecosystem payments measurement is.

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PAYER \ PAYEE	Government	Business	Person (Individual)
Government	**G2G** Budgetary allocations, Funding of programs	**G2B** Grants, Payments for goods and services	**G2P** Welfare programs, salaries, pensions
Business	**B2G** Taxes, Fees for licenses and permits	**B2B** Payments for goods and services in value chains	**B2P** Salaries and benefits
Person (Individual)	**P2G** Taxes, Utilities	**P2B** Purchases	**P2P** Remittances, Gifts
Development community	**D2G** Taxes	**D2B** Payments for goods and services	**D2P** Cash transfers

What can payments measurement tell you?

How governments are using payments measurement

Payments research can help answer various questions like these:

- How are consumers and merchants choosing to pay?
- What share of transactions—by value and volume—are being done with different payment devices?
- Demographics- who uses which payment instrument and why?
- How are payment choices changing over time? How fast are they changing?

If you are a **policymaker,** or you work for your country's **Central Bank or Treasury**...

...you can use payments data to **inform specific policy strategies and interventions.** Payments research can provide you with important **indicators,** such as what business and consumer groups are the most 'cash-heavy,' and what share of transactions—by value and volume—are being done with different payments devices. These snapshot indicators are important to track progress against existing commitments or the success of policies. Consumer preference and usage of payment modes in particular have important implications for monetary policy, which includes decisions on the supply of physical cash.

As a policymaker, payments research can help answer various questions like:

- To what extent is cash substitution occurring and what factors affect demand for cash?
- What are businesses' cash inventory management practices?
- Information to design appropriate regulation for new payment tools

Canada: Canada's Ministry of Finance understood the importance of mapping the landscape of payments to inform the review of the national payments system. In 2011 the Ministry appointed a Task Force whose first task was to establish a baseline of Canadian payments, which were found to be 50% digital. Through building scenarios from this baseline, the Task Force concluded that between 60% and 80% of all payments would be digital by 2020, a finding with important implications on how the payments system should be governed and regulated.

USA: the Boston Federal Reserve's Survey of Consumer Payment Choice (SCPC) the Boston Federal Reserve's Survey of Consumer Payment Choice (SCPC) provides information on the payment volumes and consumer preferences for all types of payment instruments to inform the Federal Reserve's ongoing understanding of the adoption of innovations in the US payment system and the demand for cash.

Nigeria: the Central Bank of Nigeria used data on cash usage versus digital payments to initiate its nationwide "cashless" campaign by demonstrating the high costs of cash.

What can payments measurement tell you?

How businesses are using payments measurement

If you are a **business** ...

- Which payment instruments are you using more? Are you in line with general trends on this?
- Which attributes do your customers prefer in a new payment instrument?
- How does the payment instrument consumers use vary with transaction amounts?

Specifically, for businesses in the payment market, information on payments volumes can provide strategic insight on how and where to grow.

Though most non-financial corporates would not undertake their own national measurement because of the high cost of doing so, participating in measurement efforts can help ensure a seat at the table when important decisions are made, especially for underrepresented interest groups, like small and medium-sized businesses.

For example, the British Retail Consortium (BRC) of large and small UK-based retailers circulated a survey on cash and e-payment usage to stay abreast of payment market trends, interact strategically with key regulatory authorities in the UK and Europe, and push for a significant reduction of fees.

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Payment grid

Options for defining digital payments

Quiz on digital payments measurement landscape

How to define digital payments?

Payments[1] are made using payment instruments[2]. Cash, for example, is a payment instrument. So too are checks. However, digital payments are not one instrument but rather an umbrella term applied to a range of different instruments used in different ways. In this section, we provide some parameters for creating this definition.

Since there is no one standard definition of a digital or e-payment, you should settle on a clear and implementable definition at the start of any measurement exercise. The subject matter is complex, but there are two key dimensions of categorization that are most important:

1. the nature of the payment instrument: through which means—paper or digital—are the instructions carried.
2. the payer-payee interface: whether the payer, payee, or both use an digital medium in a payment transaction.

Click here to see how these two dimensions overlap in commonly used definitions of digital payments.

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[1] The payer's transfer of a monetary claim on a party acceptable to the payee. Typically, claims take the form of banknotes or deposit balances held at a financial institution or at a central bank. (CPMI (formerly CPSS) Red Book series)

[2] Any instrument enabling the holder/user to transfer funds. (CPMI (formerly CPSS) Red Book series)

How to define digital payments — step 1

The nature of the payment instrument | **The payer-payee interface** | **Definition options**

A key first step is understanding which instruments are available in your country, and how they can be grouped.Digital payment instruments can be grouped together with respect to their underlying nature in two ways:

- **Narrow choice- 'Paper' vs 'non-paper':** Instruments which rely on a paper-basis for authorization, such as checks, traveler's checks, and money orders, are regarded as 'non-digital' and all other instruments are regarded as 'digital'.
- **Broad choice - 'Cash' vs 'non-cash':** Every instrument other than cash is regarded as 'non-cash' and therefore digital, since each usually takes a digital form at some stage in the transfer of value.

In reality, there is a spectrum between pure digital and pure physical in how most instruments other than cash are transacted over the whole transaction cycle. The choice of which definitional option to apply will depend on the purpose. For example, if you are measuring to highlight the need to transition away from existing payment instruments due to, for example, cost, then you can make a case for focusing on the broader definition (non-paper instruments). However, if you want to highlight the potential of payment flows to be digitized, you may consider checks as much closer to digital than cash, therefore including them with 'non-cash' in the narrow definition. In an increasing numbers of countries, paper checks are truncated into an digital message on deposit, and since they require the payer to have an account, and are also traceable, they are less like cash in these attributes and more like account-based digital options.

Note, however, that technology is challenging the boundaries of all instrument-based definitions—for example, countries like Canada are considering the introduction of digital cash, where digital legal tender is transferred directly from payer to payee in a payment transaction, and where paper and metallic currency will become obsolete. Hence a 'cash' transaction could be 'digital.'

Click to access a glossary of payment terms. For a more comprehensive list, see the glossary from the international standard setting body for payments, the Committee on Payments and Market Infrastructures (CPMI) at the Bank for International Settlements.

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How to define digital payments — step 2

The nature of the payment instrument | The payer-payee interface | Definition options

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Options for defining digital payments

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The other definitional dimension to clarify is to clarify which party, if any, used digital interfaces. When both the payer and the payee use digital means to initiate and receive payments, the picture is clear—this can be considered 'pure digital'. However, there other payer-payee scenarios which may affect where the boundary line is drawn for digital, as shown below.

Payer-Payee Scenarios

Payer (only) uses an digital channel to initiate payment (but the payee cashes out)	Example: The payer, such as a national government, may issue a pre-paid card to the payee, a recipient. The payee uses an ATM to 'cash out' the funds on the card.
Payee (only) receives digitally a payment which was initiated in paper	Example: An Electronic Funds Transfer (EFT) may start with the payer completing and submitting a paper form across the counter at a bank. The payment is then credited digitally to the payee's account.
Neither party uses digital channels	Example: Money transfers if the terminal points of a remittance are in cash. A sender may hand over cash to an agent who electronically credits another agent's account (by mobile phone, for example). The recipient receives notification that she can cash out at the other agent hence the main transaction is 'cash to cash' but with a digital transaction in the middle.

How to define digital payments?

Choices to be fit for purpose

The nature of the payment instrument | The payer-payee interface | Definition options

Combinations of these two dimensions can create a range of different definitions regarding a digital payment for measurement purposes. The real question is: does your definition fit your measurement objectives?
To illustrate that choice, we show on the next slide two common choices of boundary definitions for digital payments.
To be considered digital, both require that at least one party, whether the payer or the payee in the payment transaction, uses a digital medium to authorize or receive payment. This rules out transactions where only the intermediate parties (such as banks) exchange digital messages.

However, the boundaries differ with respect to the treatment of checks. Under the narrow definition, checks are considered fundamentally a paper instrument which, like cash, carry high costs transactions costs. Therefore, regardless of whether the payee gets credited digitally or not following a deposit, checks are grouped with cash.
In the broad definition, checks are considered to be closer to digital because they (i) are often scanned and converted to digital messages soon after deposit; and (ii) require that the payer has a payment account and is therefore financially included.

So, what's the difference? You might prefer the narrow definition if you are interested in measuring and promoting the efficiency of payments; and all the more so, if checks are still processed manually in your country so that you can separate out their effect from cheaper digital alternatives. However, the broad definition allows you to include checks in a wider universe of formal payment payments, which may be appropriate if your interest relates more to measuring patterns of financial inclusion, for example.

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Click here to see examples of defining digital payments for different measurement exercises.

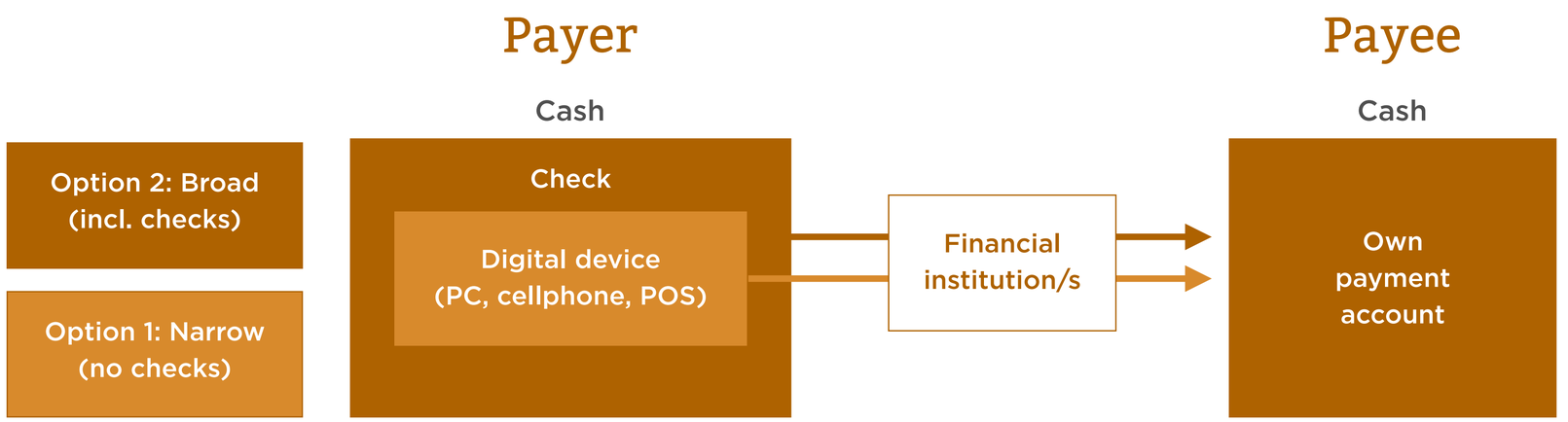
How to define digital payments?

Two options depicted

The nature of the payment instrument

The payer-payee interface

Definition options



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Click here to see examples of defining digital payments for different measurement exercises.

How to define digital payments

How are others engaged in ecosystem measurement defining digital payments?

	BTCA Diagnostics 2013	MasterCard Advisors 2013	Gates Payment Deep Dives 2013	McKinsey Global Payments Map Ongoing
1. Nature of instrument	Paper vs. non-paper	Cash vs. non-cash	Cash, checks, and other instrument data shown separately.	Cash vs. non-cash
2. Payer-payee interface	Payer must initiate the payment digitally	Payer must initiate the payment digitally	Payer must initiate the payment digitally	Payer must initiate the payment digitally

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Note: for more detail on any of the studies referenced above, see here

Quiz on the payments measurement landscape

So, having read this context section, how well do you now understand the payments measurement landscape? You can take this very short quiz to test yourself. Click here to see the answers.

	Please answer each question TRUE, FALSE or UNCERTAIN in the space provided:	
1	There is a standard, global definition of a digital payment.	ANSWER
2	In developed countries, consumers make on average around 50-60 payments per month.	ANSWER
3	If a remitter uses Money Gram or Western Union to send money, this payment is not considered digital.	ANSWER
4	Checks can be considered a form of digital payment.	ANSWER
5	Payments measurement is useful only for monetary authorities and financial regulators.	ANSWER
6	In no developing economy today does a majority of the adult population use digital payments regularly.	ANSWER
7	Since the majority of payments take place in cash in emerging economies, payments research is only useful for developed countries.	ANSWER

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Answers to quiz on digital payments measurement landscape

Note: this self-test feature will be “live” on web-based version

If you got three or fewer questions correct, you may want to re-read **this section**. If you got four or more correct, keep reading to learn how to focus your own ecosystem measurement exercise. Click **here** to go back to the questions.

Q no.	Right answer	Explanation
1	FALSE	Entities differ in how they define digital payments, particularly with respect to the treatment of checks.
2	TRUE	Payment diary research in countries, including the US, Canada, Australia, the UK and Germany have shown numbers in this range.
3	UNCERTAIN	If the terminal points of the payment (payer/payee) are in cash, then the payment is not considered digital. But it is possible that the sender initiated the payment online or using a mobile phone.
4	UNCERTAIN	Checks share properties with both cash and digital payments. While checks are a paper instrument, in many countries, checks are soon converted after deposit to an electronic message, and they are also traceable, unlike cash.
5	FALSE	Regulators are not the only ones who care about payments research. Good payments data can spur change among several stakeholder groups, including international donors and merchants.
6	FALSE	While it is still generally true that a (growing) minority of people use digital means regularly, the widespread adoption of mobile payments in Kenya means that a majority of adults there now make or receive digital payments regularly.
7	FALSE	Emerging economies can use cash research to help shape policy recommendations, or to build support for policy goals. The Central Bank of Nigeria used data on cash usage versus digital payments to initiate and then explain the need for its nationwide “cashless” campaign by demonstrating the high costs of cash.

Focusing your measurement efforts

Now that you know what payment measurement is about, and also how to define a digital payment, this section will help you select an appropriate methodology for your measurement exercise. By the end of this section, you should be able to select the right approach for your analysis.

Your measurement objectives will most influence the choice of appropriate methodology, taking into account:

1. The number of countries covered
2. The frequency of data collection; and
3. The degree of new primary data collection needed.

Other considerations include your budget and time constraints. In general, more time and effort is required to achieve higher levels of accuracy, especially if the primary information available is unreliable.

Effective primary research may get more accurate answers but will usually involve more time and cost than relying on existing sources. If you do not have the time or budget to conduct primary research, there may be sufficient data that already exists. While some central banks have commissioned new demand-side research to better inform policy, others including international donors have pursued “best available” data collection approaches which draw on existing data sources and expert interviews to triangulate an estimation of data points.

Click **here** to begin learning how to focus your ecosystem measurement exercise.

Quick Access

- Public payments data sources
- The challenges of measuring cash payments
- Quick guide for choosing a methodology
- Readiness checklist for regulators

Types of measurement data

There are two main types of payment measurement data:

- **Supply side:** You can obtain key statistics from financial institutions, such as central banks, payment providers, and national switches. However, though some of these supply-side institutions can identify payments by payer and payee in terms of business or consumer – as this can be required in transaction fields -- for others, the data is aggregated, thus requiring secondary estimates for consumer and business categories.
- **Demand side:** If you are interested in more information about payments initiated by **consumers and businesses, especially those which do not pass through or across financial institutions, you will need demand-side tools such as merchant or consumer surveys to collect the data from them directly.**

Financial institution reported data • Data on transaction values and volumes with bank devices	**Retailer/Merchant surveys** • Diaries • Questionnaires—post, phone, in person	**Consumer surveys** • Diaries • Questionnaires—post, phone, in person
Each has pros (+) and cons (-) highlighted below		
Large number of transactions (+) No need to sample (+) Cheap (+) Excludes the unbanked (-) Missing cash transactions (-) Says nothing about payer characteristics	Large number of observations (+) Difficult to be representative (-) Measurement error in absence of all transactions through POS (-) Excludes P2P and other transaction types (-) Expensive (-)	Easier to draw representative sample (+) Includes cash and P2P transactions and unbanked (+) Measurement error (-) Attrition and fatigue bias (-) Expensive (-)

Public Payment Data Sources

The table below lists major recent cross country surveys which provide ranges of payment-related data for varying sets of countries.

Data source	Produced by	Focus	Country coverage
The Global Financial Inclusion (Global Findex) Database	The World Bank Group	The Global Findex is well-known for providing key financial inclusion information and broad consumer trends, such as rates of saving, borrowing, and bank account ownership. The 2014 Global Findex includes a new extended module on payments	148 countries
Government E-Payments Adoption Ranking (GEAR)	VISA; implemented by the Economist Intelligence Unit	GEAR tracks government adoption of e-payments. The study collects 37 qualitative and quantitative indicators for countries on the availability of e-government services. A higher value associates with a more favorable e-payments environment.	62 countries
Global Payment Survey	The World Bank Group	Supply-side global trends on the legal institutional environment for payments. Contains data on electronic payment volumes reported by the countries, but methodology is country-dependent. Recent survey contains useful estimates of the proportions of different types of government payments which are electronic.	130 countries
Gates country payment deep dive reports (2012-2013)	The Gates Foundation; implemented by McKinsey	In-depth picture of the country's payments landscape from an inclusion perspective	6 countries: China, India, Kenya, the Netherlands, Nigeria and the United States
The Cashless Journey (2013)	MasterCard Advisors	Describes how major economies are progressing from cash-based to cashless societies. Focuses on consumer payment values.	33 countries
Digital Money Index (2014)	The Better Than Cash Alliance (BTCA)	Baselines on the volumes, values, and payment modes for government, business, and consumer payments	4 countries: Colombia, Malawi, Nigeria, and the Philippines
Country diagnostics (2014)	The World Bank Group	The Global Findex is well-known for providing key financial inclusion information and broad consumer trends, such as rates of saving, borrowing, and bank account ownership. The 2014 Global Findex includes a new extended module on payments	148 countries

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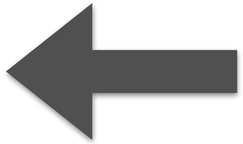
Six questions to shape the scope of your measurement exercise

- What is your budget? How much time do you have? What is your level of expertise?
- Are you measuring in just one country, or across more than one country?
- Do you want a one off picture, or to measure rates of change?
- What part of the payment grid are you most interested in?
- For which payment instruments do you need data?
- Do you care about the volume of transactions? Or just the value? Or both?



Before you start, you need to consider which data you really need. Click on each of the questions to the left to help determine what methodologies are best for you.

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Questions to shape your scope

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An exercise with higher levels of accuracy, such as consumer diaries, can take significantly longer to plan and execute than estimates using existing data. Furthermore, representative payment diaries are difficult to execute properly and usually require the expertise of economists and statisticians. But "best available" data collection efforts may require less expertise.

For example, the BTCA country diagnostic measurement team included one international consultant with measurement experience for 14 working days, supported by an in-country analyst with knowledge of data sources for 25 days to estimate the payment grid in a country using only available data.

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If you are measuring in just one country, the emphasis is usually on the depth of analysis. With the focus on just one country, you are more easily able to investigate in-depth measurement targeted at various parts of the economy without worrying about cross-country comparability.

However, if you are measuring across more than one country, an important goal is consistency to allow comparison. For example, if your main objective is to incentivize reforms to accelerate digital payments across countries, your measurement efforts would likely focus on tracking digital payments across a strategic set of relevant countries and probably over time.

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Questions to shape your scope

What is your budget? How much time do you have? What is your level of expertise?

Are you measuring in just one country, or across more than one country?

Do you want a one off picture, or to measure rates of change?

What part of the payment grid are you most interested in?

For which payment instruments do you need data?

Do you care about the volume of transactions? Or just the value? Or both?

If you know you will want to repeat the exercise, you should privilege methods which can be replicated easily to allow for comparability across time.

For example, if you are interested in rates of change of usage among users, you may consider panel surveys which follow the same sample of respondents over an extended time period.

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Do you care about the volume of transactions? Or just the value? Or both?

Which payer-payee combinations are you trying to understand? For example, government and business payments usually dominate the value of payments, but individuals in aggregate make the most payments by volume in an economy. You may also have an interest in payments to or from specific groups such as payments from development partners to local citizen in the form of social transfers or local salaries. In some countries, donors can play a catalytic role in introducing segments of the population to digital payments.

Note that data availability and quality often varies considerably by payer type. Government payments, at least at the national level, are generally easier to track than those of businesses and individuals, since the key holders of data (such as different agencies and levels of government) are relatively few and easily identifiable. However, few governments yet track and report payments holistically, making the extraction, collation and organization of such data necessary.

Similar to government payments, transactions made by the international development community are less voluminous and manageable to track. But like governments, few donors consistently measure their own payments.

In contrast, data on the private sector and consumers is widely dispersed. Member associations such as national Chambers of Commerce, Bankers' Associations and Retail Associations often do not collect and aggregate information on the payment instrument usage of their members, or even proxy information that may aid measurement efforts, such as the number and type of suppliers.

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- Public payments data sources
- The challenges of measuring cash payments
- Quick guide for choosing a methodology
- Readiness checklist for regulators

Questions to shape your scope

What is your budget? How much time do you have? What is your level of expertise?

Are you measuring in just one country, or across more than one country?

Do you want a one off picture, or to measure rates of change?

What part of the payment grid are you most interested in?

For which payment instruments do you need data?

Do you care about the volume of transactions? Or just the value? Or both?

If you care only about digital payment flows, supply-side data may be sufficient for measurement. There is often a wealth of information from central banks about digital flows across the payment system, though this information may need to be compiled from individual sources. Aggregate supply side data does not depend on sampling technique unlike demand side surveys. However, most supply side data does not contain any information about how cash is used, or data on person-to-person payments.

Measuring the volume and value of cash transactions is more complicated. Regulators manage the supply of cash in circulation, but this tells us very little about the use of cash in an economy given the velocity of money. A single piece of currency facilitates many times its face value in purchases. But dimensioning how many times cash changes hands and in what amounts is difficult and costly. The anonymous nature of bills of coins, along with unreported figures in the black and grey markets, make obtaining reliable estimates even more difficult. So, you need demand-side data.

Click here to read about the challenges of measuring cash.

Quick Access

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Questions to shape your scope

The challenges of measuring cash payments

What is your budget? How much time do you have? What is your level of expertise?

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For which payment instruments do you need data?

Do you care about the volume of transactions? Or just the value? Or both?

The table below summarizes the main methodologies available to measure cash payments. They can be categorized into two broad approaches:

1. Top-down analysis using mainly macro variables; and
2. Bottom-up views using survey data or merchant data.

Top-down methodologies may be less costly because they use available data; however, they usually have a higher margin of error. Furthermore, such methodologies typically yield estimates only of the value of cash exchanged, not the volumes. Bottom-up methodologies require more resources and often involve bespoke measurement surveys, but results are then more accurate. Measurement efforts can use a combination of top-down and bottom-up methodologies for triangulations. If data is of poor quality in a given country, benchmarks can be used from similar countries as heuristics in their place.

Measurement Methodology	Description	Volumes	Values
Top-down			
Circulation residual	Uses currency in circulation and isolates the share of cash being used for payments		√
Consumption residual	Uses the value of household consumption as it appears in the national accounts and subtracts the value of goods and services commonly paid for by means of credit transfers, and the value of POS transactions made by cards and checks to estimate the value of POS cash payments		√
Bottom-up (smaller error bar)			
Consumer or business survey	Estimates both the volumes and values of cash payments from a sample	√	√
Retail survey	Uses data from retail or company surveys on payments received	√	√
Cash withdrawal data	Uses data on cash withdrawals from bank accounts		√
Cash register statistics	Collects data from the cash registers of select large retail chains	√	√
Merchant deposit statistics	Uses deposit statistics to estimate the value of the cash in usage		√

Questions to shape your scope

What is your budget? How much time do you have? What is your level of expertise?

Are you measuring in just one country, or across more than one country?

Do you want a one off picture, or to measure rates of change?

What part of the payment grid are you most interested in?

For which payment instruments do you need data?

Do you care about the volume of transactions? Or just the value? Or both?

Payment regulators typically divide payments between:

- Large value payments and
- Retail payments.

Typically, the value of the first category dwarfs the value of the second since it includes settlements for financial market transactions. However, retail payments dominate volumes since they include most person-to-business and person-to-person transactions.

As an example, BTCA country diagnostics measured both values and volumes, but focused on volume since this highlighted financial inclusion considerations— most payment volumes are comprised of consumer payments which get dwarfed in value by business or government. Because of this focus linked to its mission, BTCA excluded large value payments between financial intermediaries since these are usually made to settle underlying transactions or else related to investment only.

Note that information about payment values are often more readily available than volume information. For example, while the BTCA diagnostic teams were often able to obtain detailed expenditure values from government bureaus and budget offices, government payment volumes in some cases required extrapolation based on a dipstick analysis of select government units.

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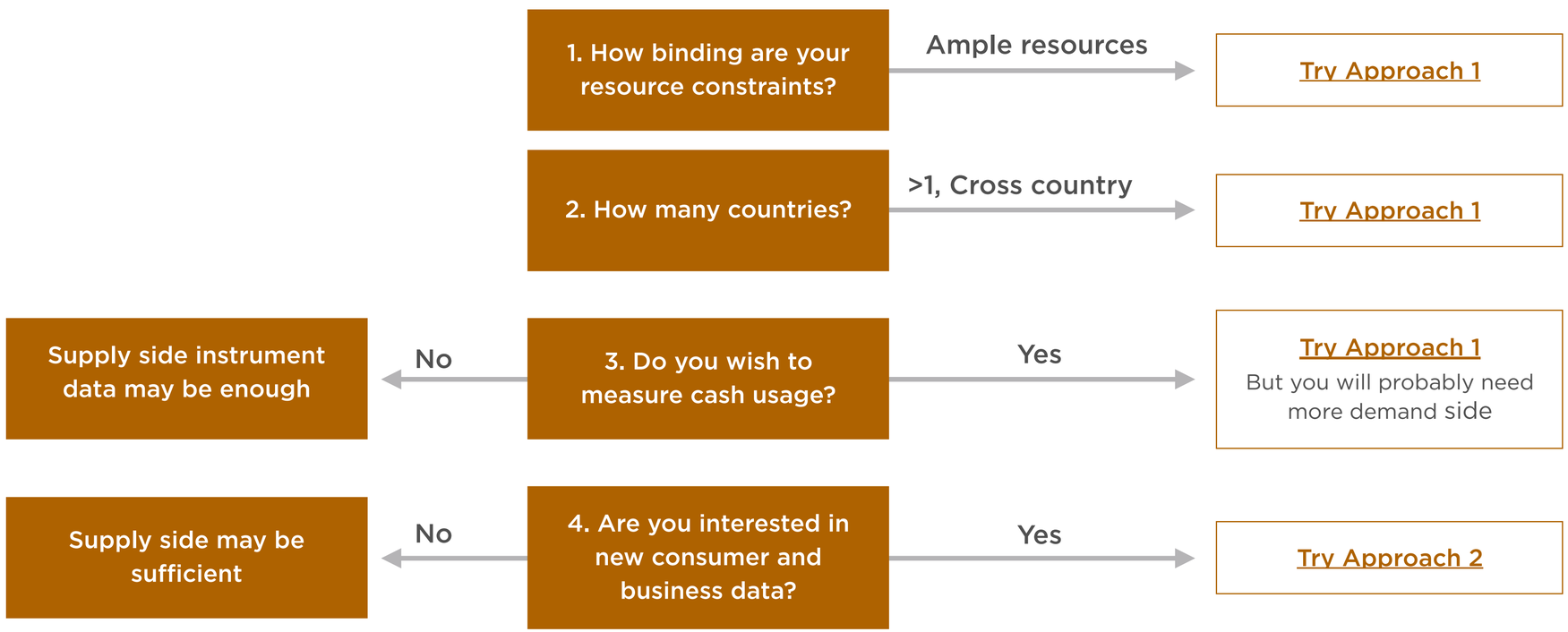
Choosing which measurement methodology to learn more about

So, which methodology is right for you? Answer the four questions below to get an idea of which of two basic approaches may make sense for you.



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- Public payments data sources
- The challenges of measuring cash payments
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- Readiness checklist for regulators

If you are a Central Banker or a regulator, check if you are ready to conduct an ecosystem measurement exercise before proceeding to the next section.

Choosing which measurement methodology to learn more about

How ready are you?

If you are a regulator or central banker, you are more likely to be ready to start to measure your national payments ecosystem if following characteristics below apply (tick each one which does):

		Tick here
1	You already have buy-in and support from functional departments collecting data, such as the Central Bank, Ministry of Finance, Government Statistical Bureau or equivalents.	
3	Providers of data trust that you can ensure the confidentiality of the information you collect.	
4	You have in-house capacity for data collection and analysis.	
5	You are undergoing a broader strategy, diagnostic, or planning exercise which has clear measurement requirements.	
6	You have received a clear mandate from your senior leadership for this exercise.	

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Measurement methodologies

This section describes two basic approaches to payments ecosystem measurement:

1. Using “best available” data

   - This approach relies primarily on collating and triangulating using already available data. The nature and extent of data used can vary widely. This section overviews approaches taken in three recent major measurement exercises:
   - MasterCard Advisors: The Cashless Journey
   - Bill & Melinda Gates Foundation: Payment Deep Dives
   - BTCA Country Diagnostics

2. Collecting new primary data: an introduction to new consumer and merchant payment studies

   - This approach relies on designing new primary data collection approaches to fill gaps.

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Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

Approach 1: "Best available" data collection

Example 1: MasterCard Advisors-- The Cashless Journey (2013)

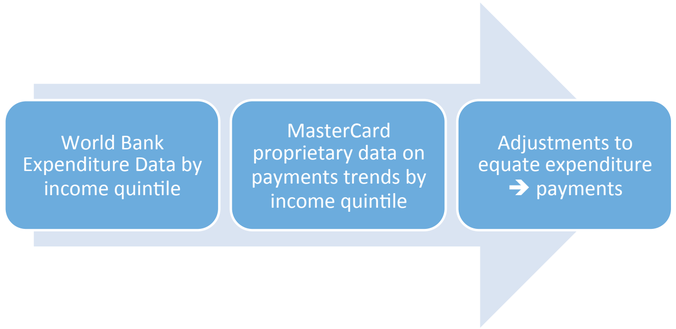
Using the approach depicted at bottom left, MasterCard Advisors estimated the share of consumer cash payments drawing on data from a range of sources: the World Bank, secondary research and category level adjustments. Note that other payer types, like the government and businesses, are excluded from this analysis. Top-down macroeconomic measurement options were dismissed due to large error bars, and instead the following were used: (1) World Bank household expenditure data, and (2) primary, bottom-up data from pre-existing proprietary surveys for converting expenditure data to payments. Results were, however, triangulated using macro-level data.

Using these data points from 33 countries, MasterCard Advisors was able to provide country by country estimates of the **proportion of cash used by consumers**, as shown in the figure at bottom right, as well as analyze where changes were happening fastest.

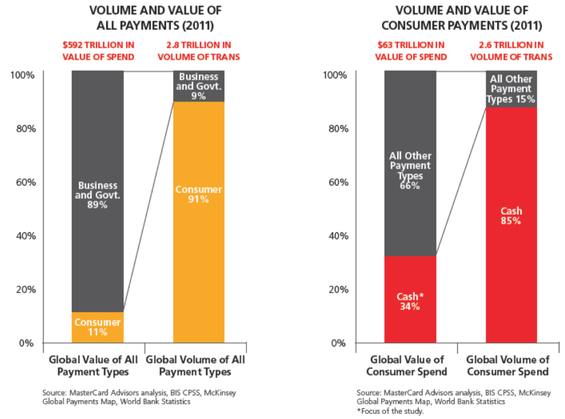
Quick Access

- Evaluating data quality
- How long does measurement take?
- Comparing surveys and diaries

A summary of The Cashless Journey's methodology



MasterCard Advisors' –
Global consumer payment volumes and values



“Best available” data collection

Example 2: Bill & Melinda Gates Foundation: Payment Deep Dives 2012/3

The Payment ‘deep dives’ commissioned by the Gates Foundation estimated cash and non-cash payments by instrument type without bespoke information from consumers or merchants. As part of its research into digital financial service models, the Gates Foundation commissioned these studies in 2012-3 to provide in-depth pictures of the payments landscape from an inclusion perspective in six countries: China, India, Kenya, the Netherlands, Nigeria and the United States.

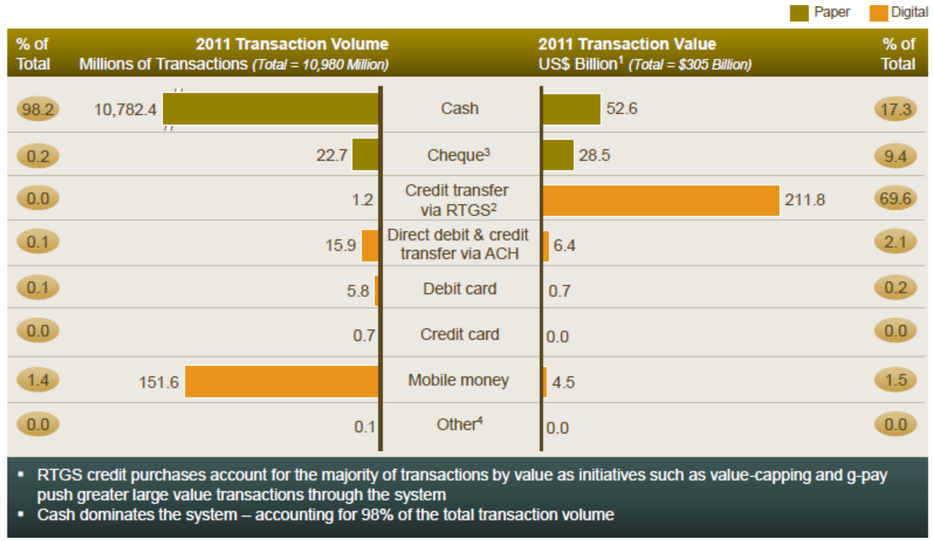
Consulting firm McKinsey Inc. led the research, collecting data from existing sources, including:

- Central banks
- Payments providers
- Banking associations
- Expert interviews.

They also drew on McKinsey’s Global Payments Map which carries proprietary payment data for 43 countries worldwide.

Using these sources, and without commissioning any further primary research or surveys, the Kenya deep dive, for example, concluded that cash accounts for 98.2% of all Kenyan transactions by volume in Kenya, but only 17.3% by value and gave a profile of instrument types shown in the Figure alongside.

Kenya cash, check and other payments



1 90 Kenyan shillings = 1 US$, 2011 average; 2 Includes all payments through RTGS system, excludes net settlement resulting from clearing house operations; 3 Includes all cheques converted to ACH; 4 Includes prepaid cards

SOURCE: Kenyan Central Bank; Safaricom; Kenyan Bankers Association; Expert interviews

Source: Gates Foundation (2013)

“Best available” data collection

Example 3: BTCA Country Diagnostics 2013

BTCA wanted to measure the starting point of selected countries in their shift to digital payments, and learn more about payment research methodologies. The diagnostics sought to test the limits of what data could be collected from existing sources to inform the overall payments picture within a particular timeframe. The diagnostics were implemented in close collaboration with government counterparts who will use the information gathered to inform policy. For more information on how to conduct a full diagnostic, see the BTCA diagnostics toolkit.

Over the course of six months, the country diagnostics compiled baselines on the volumes, values, and payment modes for payments in four economies: Colombia, Malawi, Nigeria, and the Philippines. Some of the diagnostics have since been published at the request of the country counterparts.

To tackle the daunting task of measuring a country’s payments, the measurement teams pursued a bottom-up, component-based analysis using existing data sources, and expert interviews, when necessary, to identify the percentage of digital payments.

There were 6 steps to the process shown below. Steps 1-2 are necessary starting points, but steps 3-6 can be very iterative. For example, researchers may end up collecting only partial or unreliable data for specific data points, and thus may take a step back and restart analysis for that specific data point. You can click on each one, in or out of sequence to find out more what BTCA did.

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

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Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

“Best available” data collection

BTCA Country Diagnostics Step 1

BTCA commissioned payment measurement exercises linked to ecosystem diagnostics in four countries in 2013, conducted by consulting firm BFA. The approach followed six distinct steps shown below:

1. Agree on objectives, resources and other parameters
2. Agree on definitional scope for exercise
3. Identify data gaps
4. Gather existing data
5. Collate
6. Triangulate: quality cross check & score

The main choice parameters specified at the outset of the BTCA country measurement exercise are captured below. In your own exercise, it might be useful to have a similar clear statement at the outset.

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Evaluating data quality

How long does measurement take?

Comparing surveys and diaries

	Parameter	BTCA country measurement example
1	Objective/s	(i)To measure the overall volume and value of payments in the national economy to highlight cash pools that can be shifted to digital; (ii)To test and develop measurement methodology which can be replicated
2	Resource parameters	1 international consultant with measurement experience for 14 working days, supported by an in-country analyst with knowledge of data sources for 25 days
3	Timeframe	To be completed within three months of start
4	Usage of data	For use in a country diagnostic report which may be published and which could be used by country counterparts to better understand their own payment ecosystem
5	Data sources	Secondary available data, whether published or not (can be obtained under confidentiality, if needed)
6	Accuracy requirement	As good as possible given parameters above; data availability will determine ultimate accuracy.

“Best available” data collection

BTCA Country Diagnostics: Step 2

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

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Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

Next, BTCA settled various definitional choices regarding the payments to be measured shown below. The Table below sets out the key definitional parameters, with the components used in the BTCA country diagnostic.

	Parameter	BTCA country measurement example
1	**Definition of digital**	Digital includes payment instruments other than paper (cash and check) where at least the payer initiates digitally
2	**Specific inclusions**	Payments from international donors based in the country to social welfare recipients and local employees
	Specific exclusions	Inter-account transfers where payer and payee are same; ATM cash withdrawals and deposits
3	**Unit of measurement**	Both volume and value
4	**Timeframe for data**	Latest year, converted to monthly
5	**Granularity required**	Payer-payee: headline stakeholder groups: Government, Business, Individuals, Development partners Instrument types: other than as in #1 above, not required

“Best available” data collection

BTCA Country Diagnostics: Step 3

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

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Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

Before beginning the actual data collection process, BTCA identified data (primary and secondary) on payment trends that was already available for the case-countries. There is likely other ad-hoc research on your country of interest (see this list of initial go-to resources). For each data point required, such as public pension payments’ information, we noted the information availability, source, and level of priority. The table below shows the Nigeria data gap analysis for government payments only.

NIGERIA DATA GAP ANALYSIS

CATEGORY/DATA	STATUS	IN-COUNTRY SOURCE	LEVEL OF PRIORITY
GOVERNMENT			
A1. SALARIES		1. Office of the Head of Civil Service of the Federation (OHCSF) 2. Integrated Payroll and Personal Information System (IPPS) in the Office of the Accountant General of the Federation (OAGF)	Medium
A2. PENSIONS		1. Office of the Head of Civil Service of the Federation (OHCSF) 2. Integrated Payroll and Personal Information System (IPPS) in the Office of the Accountant General of the Federation (OAGF)	Medium
A3. SOCIAL WELFARE BENEFITS/CASH TRANSFERS		1. National Poverty Eradication Program (NAPEPC) 2. National Planning Commission (NPC)	High
A4. ACTIVE SUPPLIERS PER GOVERNMENT ENTITY		1. Bureau of Public Procurement (BPP) 2. Office of the Accountant General of the Federation (OAGF)	High
A5. INTER-GOVERNMENT PAYMENTS		1. Federal Accounts Allocations Committee (FAAC) in MoF 2. Office of the Accountant General of the Federation (OAGF)	Medium

Available, needs verification

Partially available, partially estimated

Not available

"Best available" data collection

BTCA Country Diagnostics: Step 4

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	**4. Gather existing data**	5. Collate	6. Triangulate: quality cross check & score

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Using the payment grid as the guiding structure for data collection, the BTCA measurement team set about gathering data on the number, value, and percentage digital of payments made by government, businesses, and individuals using the 3-step data gathering process shown in the figure below.

Click here to read how BTCA drew from multiple data sources to estimate certain indicators. Click here to read how BTCA used assumptions drawn from international experience to fill data gaps.

“Best available” data collection

BTCA Country Diagnostics: Step 4—field visit

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

An in-country visit involving meetings with government, industry, and experts was instrumental in locating additional sources of information. Data from the central banks, national statistics departments, and tax revenue authorities provided the backbone for analysis, and represented the most clear and credible information included in our calculations.

Payment service providers, including national switches and major credit card companies provided additional helpful data. For government payments, most of the statistics for volume, value, and percentage of payments that are digital are calculated regularly and are publicly available. In contrast, data on payments made by businesses and individuals are not widely available, and in some cases the metrics we required have not been calculated before. Consequently, for some statistics we had to combine data from multiple sources, documenting assumptions.

As expected, **cash payments** were particularly difficult to measure. Though consumer and business surveys and diaries are the only methodology that can provide information on cash values and volumes, including for person-to-person (P2P) payments, we pursued other methodologies due to cost and time constraints.

Estimates of the payments in the informal sector, in particular, often required multiple assumptions. For example, in order to estimate informal business-to-person transactions, the BTCA Philippines diagnostic team first obtained an estimate for the number of informal sector operators from the National Statistics Office. The team then used salary information on earners with elementary education levels as a proxy for informal wages. In Colombia, the diagnostic team made use of a national household survey that interviewed workers employed in both formal and informal sectors to arrive at an estimate. However, while proxies may exist for measuring the informal/gray market, few such data points exist for the illegal/black market. Note that there are estimates for the size of informal economies for a number of countries. See in particular Schneider and Enste’s 2000 study on shadow economies for helpful starting points.

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BTCA Country Diagnostics—Step 4 Using heuristics

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

Using International benchmarks to fill gaps

International benchmarks can help to fill gaps in data. Existing measurement studies, such as those by MasterCard Advisors and the Gates Foundation, provide publicly available measurement data points. If data is not available for your specific country of interest, you may able to draw on benchmark figures for countries with similar characteristics. The BTCA country diagnostics have also created data points for an upper middle income country (Colombia), two lower middle income countries (Nigeria and the Philippines) and one lower income country (Malawi) on the volume and value of government, private sector, and consumer payments, as well as extrapolated figures on the number of individual payments per adult per month. However, given that many of these estimates were made using other international heuristics and proprietary data, it is too early to say whether the four diagnostics have created new, reliable data points.

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Evaluating data quality

How long does measurement take?

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BTCA Country Diagnostics—Step 5

1. Agree on objectives, resources and other parameters
2. Agree on definitional scope for exercise
3. Identify data gaps
4. Gather existing data
5. Collate
6. Triangulate: quality cross check & score

We combined the final data points in a tailored spreadsheet that included the parameters and scope we were particularly interested in. The figure on the right shows a sample spreadsheet from the BTCA Colombia diagnostic which aimed to capture all parties involved in a national payments landscape, as well the volumes and values of digital payments.

BTCA Colombia Measurement Grid						Monthly payments		Exchange rate	0.00056
GOVERNMENT									
	# of payments	% volume electronic	# of payments Electronic	Avg. Value per payment COP	Ave. Value per payment USD	Total Value COP Monthly	Total Value USD	Total Value E (USD)	% value elec.
G2P									
Government: Employees Federal	2,114,000	96%	2,029,440	$1,331,341.39	$739.63	2,814,455,693,858	$1,563,586,496.59	$1,501,043,036.72	96%
Government: Employees departments	404107	80%	323,286	$1,331,341.00	$739.63	269,002,166,750	$149,445,648.19	$119,556,518.56	80%
Government: Employees municipalitie	618,674	60%	371,205	$1,331,341.00	$739.63	411,833,242,663	$228,796,245.92	$137,277,747.55	60%
Government: Pensioners	1,679,000	100%	1,679,000	$1,682,549.14	$934.75	2,825,000,000,000	$1,569,444,444.44	$1,569,444,444.44	100%
Government: CCTs	992,097	86%	849,405	$95,726.82	$53.18	94,970,288,465	$52,761,271.37	$45,172,670.47	86%
Family compensation fund	5,606,110	60%	3363666	211064.7133	$117.26	1,183,252,000,000	$657,362,222	$394,417,333	60%
G2P total	11,413,988	75%	8,616,001			7,598,513,391,737	$3,564,034,107	$3,372,494,417.75	95%
G2B									
Government: National suppliers	125,405	100%	1,504,855	6,105,100	$3,391.72	9,187,290,541,799	$5,104,050,301	$5,104,050,301.00	100%
Government: Local suppliers- departm	17,007	40%	6,803	6,105,100	$3,391.72	51,915,414,250	$28,841,897	$27,688,220.93	96%
Government: Local suppliers- municipa	28,682	40%	11,473	6,105,100	$3,391.72	87,552,910,975	$48,640,506	$46,694,885.85	96%
Utilities	113,675	100%	113,675	390,565	$216.98	44,397,526,737	$24,665,293	$24,665,292.63	100%
G2B total	284,769	575%	1,636,806			9,371,156,393,762	$5,206,197,997	$5,203,098,700.42	100%
G2G									
Government: interagency transfers	170	100%	170	11,204,411,765	$6,224,673.20	1,904,750,000,000	$1,058,194,444	$1,058,194,444.44	100%
Government: Transfers to LGUs	1,134	100%	1,134	4,890,309,025	$2,716,838.35	5,545,610,433,813	$3,080,894,685	$3,080,894,685.45	100%
Government: royalties to LGUs	1,133	100%	1,133	437,010,901	$242,783.83	495,133,350,888	$275,074,084	$275,074,083.83	100%
Government: Inter-Local transfers									
G2G total	2,437	100%	2,437			7,945,493,784,701	$4,414,163,214	$4,414,163,213.72	100%
	# of payments	% Electroni	# electronic				Total Value USD		
Government Total	11,701,194	88%	10,255,244			24,915,163,570,200	$13,184,395,317	$12,989,756,332	94%
BUSINESS									
	# of payments	% volume electronic	# of payments Electronic	Avg. Value per payment COP	Ave. Value per payment	Total Value COP	Total Value USD	Total Value E (USD)	% value electro
B2G									
IVA	129,915	37%	48576	6,898,939.92	$ 3,832.74	896,276,302,722	$497,931,279	$57,481,030.88	12%
Patrimony tax	8,374	9%	788	43,692,855.01	$ 24,273.81	365,891,250,000	$203,272,917	$20,110,925.93	10%
Witholding tax	384,304	41%	156140	5,750,632.88	$ 3,194.80	2,209,993,055,802	$1,227,773,920	$158,853,258.21	13%
Financial transaction tax	5,146	68%	3524	88,318,125.87	$ 49,065.63	454,440,916,667	$252,467,176	$16,219,907.41	6%
Business: Department taxes		100%	0	N/A	N/A	407,099,093,333	$226,166,163	$226,166,162.96	100%
Business: Municipal taxes		100%	0	N/A	N/A	853,999,045,243	$474,443,914	$474,443,914.02	100%
B2G total	527,739	40%	209027			5,187,699,663,767	$2,882,055,369	$953,275,199.41	28%

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- Evaluating data quality
- How long does measurement take?
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"Best available" data collection

BTCA Country Diagnostics—Step 6

1. Agree on objectives, resources and other parameters
2. Agree on definitional scope for exercise
3. Identify data gaps
4. Gather existing data
5. Collate
6. Triangulate: quality cross check & score

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Evaluating data quality
How long does measurement take?
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All measurement activities will confront the issue of how to assess data availability and quality. The best available data gathering process involves finding and analyzing a wide range of different data sources of different time intervals and quality. In some cases, extrapolation or interpolation is necessary to make up for gaps in data availability. The BTCA diagnostics included an assessment of data quality in each key sector, which helped enable a sense of the reliability of estimates. A Data Quality Index (DQI) was constructed to rate the quality (completeness and reliability) and the availability of a country's payments data to determine key data gaps. The DQI rates on a scale of 1 to a maximum of 5 for high quality, widely available data as shown below:

Rating	Quality Assessment	Availability Assessment
5	Complete, recent, and from credible sources	Available from one or few up-to-date websites or online publications
4	Recent and from credible sources. 1-2 components of estimate based on expert opinion or assumptions.	Available from disparate web sites or from a combination of scholarly and popular publications
3	Incomplete, recent, and based on expert opinion or available data. Few assumptions required.	Available in-person through simple records requests or interviews with public-facing officials
2	Incomplete and/or outdated, and informed by local sources, ad hoc research, and international heuristics. Some assumptions required.	Available from proprietary sources through non-disclosure agreements
1	Incomplete and/or outdated, and informed by local sources, ad hoc research, and international heuristics. Multiple assumptions required.	Additional measurement activities required to capture meaningful data

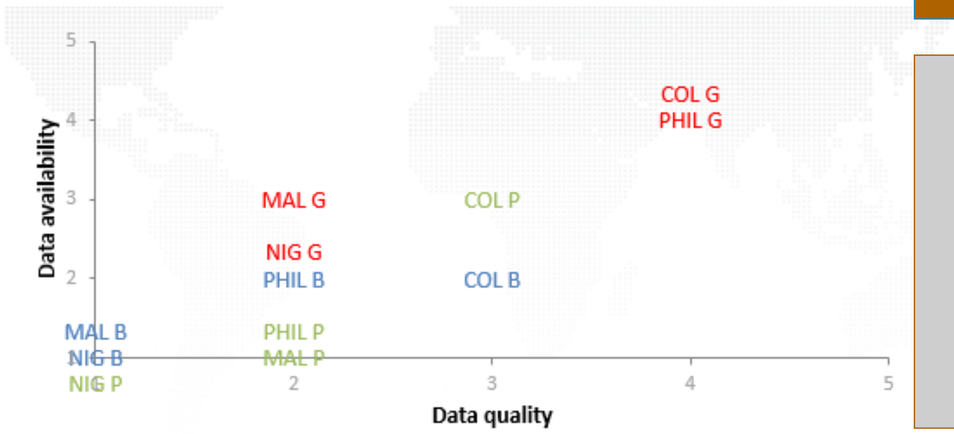
The DQI score based on underlying components not only gives a basis for assessing the likely accuracy of a measurement but also for prioritizing further data collection and publication initiatives. Further data collection can be prioritized based on what activities would most improve the DQI. Click here to see an example of these ratings in practice. Click here to see the time that it took to conduct the BTCA measurement exercise.

“Best available” data collection

BTCA Country Diagnostics: Data Quality Comparison

1. Agree on objectives, resources and other parameters	2. Agree on definitional scope for exercise	3. Identify data gaps	4. Gather existing data	5. Collate	6. Triangulate: quality cross check & score

In practice, data quality varied considerably correlated to level of development. It also varied depending on the sector, with (national) government payments generally being the most complete. In Colombia and the Philippines, data from national government sources had a DQI of 4 for quality and 4 for availability, reflecting greater availability of recent and credible data. However, some government data in both countries was non-public and required clearances from authorities. To receive a score of 5, aggregated payments data would have to be available from public sources, such as websites or online publications. Furthermore, payment data was not always complete. For example, estimates for local government payments in the Philippines were extrapolated from a dipstick analysis of select local government units. Business and consumer payments generally received lower scores as estimates had to be assembled from various data sources and assumptions were required, especially for B2B and P2B payments.



Key: Countries:
COL—Colombia
PHIL—Philippines
NIG—Nigeria
MAL—Malawi
Sectors:
G—government
B—business
P—individual

Quick Access

Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

“Best available” data collection

BTCA Country Diagnostics—scope

How long did this measurement research take?

The BTCA diagnostics, which included both a measurement component and a diagnostic component that assesses the readiness of the country ecosystem to support a shift to digital, took over four months from inception to draft report. However, an exercise which seeks greater levels of accuracy, such as payment diaries, can take significantly longer.

Month 1: Set up phase:

- Country team mobilized by Country Director and timing parameters for mission agreed
- Available payments data collated by measurement analyst
- In-country meeting list compiled and meetings requested
- A pre-visit draft of background and measurement component prepared by Country Director and measurement analyst

Month 2 or 3: Country visit (1 week to 10 days):

- Meet users and owners of key data, as well as possible survey firms or research houses which may be contracted to fill emerging data gaps

Month 3:

- Follow-up requests for information
- Measurement chapter drafted

Month 4-5:

- Engagement with country champion to review recommendations regarding additional measurement

Quick Access

Evaluating data quality

How long does measurement take?

Comparing surveys and diaries

Approach 2: An introduction to new consumer and merchant payment studies

Approach 2 relies on designing and commissioning new primary data.

This section provides only a short overview of common consumer and merchant payment studies.

By the end of this section, you should know the difference between a payment survey and a payment diary, and other considerations to keep in mind when designing surveys.

Click here for a comparison of the two types of studies.

Quick Access

Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

An introduction to new consumer and merchant payment studies

Survey | Diaries | Comparison

Central Banks in a number of advanced economies (see here) have spent considerable resources tracking demand for cash and payment preferences using comprehensive consumer surveys and diaries. These are the only tools that can provide reliable and accurate data on volumes and values across all person and business payer-payee combinations. Most surveys in developed countries are conducted either on-line or by phone. In emerging countries, technological and other barriers would necessitate that such surveys take place face-to-face. As a result, these studies often become too costly for emerging countries to commission.

What can payment surveys tell you? Some examples:

Netherlands: consumers made about 5 billion cash payments in 2010. Payments to businesses made in cash stood at 65%. Cash use is on the decline (decreased by 17% over the years) mainly due to the increasing popularity of the debit card.

The US: in 2010, the number of consumer payments increased nearly 9% from 2009 as the economy began to recover from the financial crisis. The share of consumer cash payments in 2010 declined. In 2009, the cash share had increased by 8.4% due to the financial crisis. The number of cash payments by consumers grew 3 percent in 2010 from the preceding year as consumers favored cash relative to other payment instruments in the aftermath to the financial crisis.

Do you know similar information for your country?
How would you go about finding it?

Quick Access
- Evaluating data quality
- How long does measurement take?
- Comparing surveys and diaries

An introduction to new consumer and merchant payment studies

Survey | **Diaries** | Comparison

Quick Access

- Evaluating data quality
- How long does measurement take?
- Comparing surveys and diaries

In 2014, representative financial diary exercises have been completed in many developed countries, but also among sectors within a growing sample of emerging countries: among poor (and mainly rural) households in India, Kenya and are underway in Mexico, yielding insights on the financial behaviour and instrument choices among these households.

The Table below shows the size, scope and one high level outcome from diaries initiatives in a range of developed countries. See the resources for links to these data.

Survey details	Australia (2011)	Canada (2011)	Denmark (2011)	Germany (2010)	Netherlands (2010)	Norway (2008)	U.K. (2011)	U.S. (2010)
Sample size	1,241	6,800	1,294	2,272	7,499	2,608	2,000	2,102
No. of point-of-sale transactions per day	2.2	1.7	1	1.6	1.6	0.8	2.1	2.4
Survey time period	1 week	3 days	1 week	1 week	1 day	-	4 weeks	3 days

An introduction to new consumer and merchant payment studies

Survey | Diaries | **Comparison**

With both types of studies, particular care must be given to:

- **Sampling:** sampling at the consumer level is more accurate in terms of weighting and is closer to actual behavior than sampling at the household level, and it is less expensive.

- **Survey vs. Diary:** With a payment diary in particular, consumers keep a paper or digital record of all purchase amounts and instrument types over a given period of time (often one day to one week). As the figure to the right shows, there are pros and cons to both methods.

With good design, the differences in trends revealed by diaries and surveys is relatively small. Some studies have used both surveys and diaries to triangulate data. A comparison of survey and diary data by the Boston Federal Reserve found no marked difference in consumer recall of payment instruments used and transaction types.

Survey:
+ Cheaper
+ Faster for respondent
+ Can consider larger sample
- Recall bias (can be minimized)

Diary:
+ Less recall bias
+ Greater transaction detail
- Respondent fatigue
- Respondent attrition

Here are the key methodological choices you should pay attention to when conducting consumer and merchant surveys:

Checklist for design surveys

- [ ] Diary versus survey?
- [ ] If a diary, for how many days should consumers log payments?
- [ ] Balance need for detailed information with customer's time to complete
- [ ] Is the sample representative of the country or stratified on populations of interest?
- [ ] Mail or telephone surveys, or in-person surveyors sitting with retailers/consumers

Quick Access

Evaluating data quality
How long does measurement take?
Comparing surveys and diaries

General Resources

Helpful resource list

Do you know another useful source on this topic? Please let us know

Bagnall et al. (2014). Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data.

Bill & Melinda Gates Foundation. (September 2013). Fighting Poverty Profitably: Transforming the economics of payments to build sustainable, inclusive financial systems.

BTCA Country diagnostics (2013), available via [TBD]

British Retail Consortium (2012). Cost of payment collection survey.

Canadian Task Force for the Payments System Review. (2010). Scenarios for the Future of the Canadian Payments System.

Demirguc-Kunt, A., & Klapper, L. (2012). Measuring financial inclusion: The Global Findex Database.

ECB (23 August 2013). Payment statistics.

Economist Intelligence Unit. (2011). 2011 Government E-Payments Adoption Ranking.

Federal Reserve System. (2013). Federal Reserve Payments Study.

Jonker, N. et al. (2012). Cash usage in the Netherlands: how much, where, when, who, and whenever one wants?

MasterCard Advisors. (2013). Cashless Journey.

Reserve Bank of Australia. (2011, April 17). Strategic Review of Innovation in the Payments System: Results of the Reserve Bank of Australia's 2010 Consumer Payments Use Study.

Schuh, S., & Stavins, J. (2011). How Consumers Pay: Adoption and Use of Payments.

World Bank. (2012). Developing a comprehensive national retail payments strategy.

Frequently Asked Questions – 1

Your question not answered?
Please let us know

QUESTIONS	ANSWERS
What is the purpose of this toolkit? How will it benefit me?	This toolkit helps payment regulators, domestic policymakers, international donors, and retail players understand payments measurement research and how to begin payments measurement. It overviews: • General payments research trends • What you can learn from payments research • What currently available measurement resources you can draw on • The key choices around defining an digital payment • determining the scope of your measurement exercise; and • the fundamentals of pursing payment diaries and payments research based on ”best available”sources
What existing resources can I rely on for my initial desk review?	Some data on payment trends in your country may already exist. See this list of resources.
How to measure cash usage?	Measuring cash usage accurately is very difficult. However, demand-side surveys, like consumer and merchant surveys, can provide estimates. These surveys are high cost and methodological complicated, however. There are other, less-intensive top-down and bottom-up alternatives.

Frequently Asked Questions – 2

Your question not answered?
Please let us know

QUESTIONS	ANSWERS
How to define digital payments?	This depends ultimately on your objectives. As described here, the two key parameters are 1) the classification of payment instruments; and 2) the method of payment for the payer/payee.
What choices do I have of methodology?	There are two main methodologies outlined here. One relies on "best available" data approach, using existing sources of information and expert interviews. The other relies on collecting primary information from the demand-side, supply-side, and financial institutions.
How can a country improve quality and access to data?	There are no consistent and uniform standards for determining payments research reliability and credibility. However, the BTCA DRFRP diagnostics created a preliminary Data Quality Index (DQI) to help assess the reliability of payments data gathered. This can be used to benchmark where a country is today.
How long does payments measurement take?	This varies considerably depending on the methodological rigor employed, and the research objective. An initial desk review of existing sources of data, however, can be completed in a few days.

Digital payments glossary

The world of digital or e-payments has terms which may be unfamiliar to a new reader. This section provides a way of understanding different types of digital payments.

Payments are made using payment instruments. Cash, for example, is a payment instrument. So too are checks. However, when it comes to digital payments, it can be confusing because of the range of different terms used for similar services, sometimes even within the same country!

In this section, we provide definitions based on the functionality of the main categories of payment instrument, together with the common terms used. A key first step is understanding which instruments are even available, and on what basis, in your country.

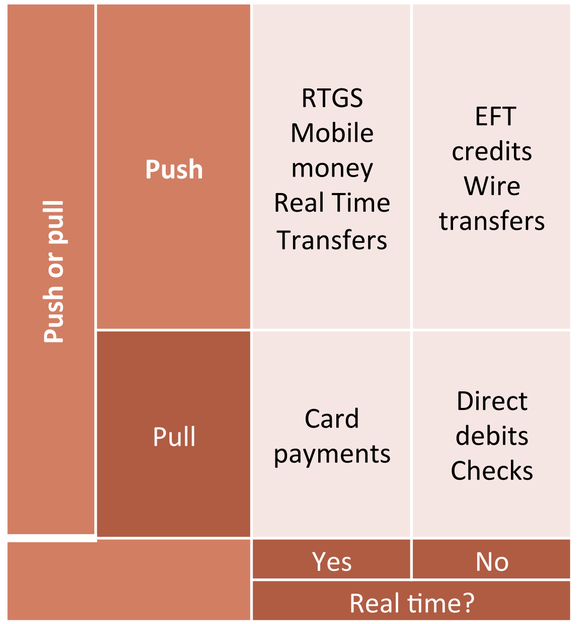
To help understand the main differences in categories which affect the functioning of payment instruments, here are two important distinctions:

- Whether they are real time or not i.e. whether the recipient receives confirmation that he has received funds after transmission within seconds of when the sender makes the payment, or whether it may take hours or even days for this to happen—this matters since the timing affects the ability to confirm and may affect cost; and
- Who initiates the payment transaction: whether the payer 'pushes' the money by entering the details of the recipient and authorizing the payment; or the opposite process, where a recipient, such as a merchant, initiates the process to 'pull' the funds from the account of the payer, based on some defined process, such as swiping the payer's card at a point of sale terminal for a card transaction. This matters since it affects the risks of the transaction to both parties—for example, how it can be reversed or disputed by a payer or payee.

These two distinctions form the axes of the Figure alongside, creating spaces in which the current common payment instruments are shown.

A term missing?
Please let us know

Examples



FURTHER READING ON E-PAYMENTS:

If you want more technical definitions, then download the complete glossary of payment terms developed by the international standard setting body for payments among central banks, the Committee on Payment and Settlement Systems at the Bank for International Settlements.

Digital payments glossary contd.

Common digital payment instruments

A term missing?
Please let us know

Credit transfers: (which may also be called internet or wire transfers, or EFT credits, or ACH credits or stop orders, SMS banking, mobile banking): "a payment order … made for the purpose of placing funds at the disposal of the beneficiary. Both the payment instructions and the funds described therein move from the bank of the payer/originator to the bank of the beneficiary…" (CPSS)

Within this category, one can distinguish between:

- Batch payments: when the payment instruction is delivered (whether singly or in bulk) in a file which is processed with a lag so that the credit to the receiver only happens after an interval, typically overnight although it may be longer in some cases such as international wire transfers.
- Real time payments: this feature is often offered for payments between parties with accounts at the same financial institution; and central banks often operate a special payment system for high value transactions mainly between banks although it can sometimes be used for larger value transactions of their clients too; although it is rarer for real time retail transfers to be offered widely across financial institutions.

Direct debits: pre-authorized debit on the payer's bank account initiated by the payee. (CPSS). Direct debits allow the payer to authorize in advance the payment order, which is then presented (digitally) by the payee to her bank at the right time for payment. If the payer's bank is different, then the payee's bank will have to present the order to the payer's bank in order for them to make the transfer. There is usually a lag between presenting the order and receiving the funds. Debits are therefore a pull instrument.

Card payments: card payments are payments involving plastic cards which are often (although not always) branded with the names of the international card associations such as MasterCard or Visa, as well as the issuing financial institution. These payments usually involve the payer presenting his card at a device, such as a point of sale machine or an ATM, and entering a PIN number to authorize a payment transaction via that device. There are various different types of cards, which are subject to different rule sets as to how they work and how the parties are charged:

- Credit: in which the funds from which the payment is made from a credit account which must be repaid afterwards;
- Debit: in which the funds belong to the payer and are contained in a linked account at a financial institution which may take a variety of forms;
- Pre-paid: similar to debit in that the account is already funded by the account holder, but often with a more limited functionality.

These cards are also typically available to businesses as well as individuals through issuing banks.

FURTHER READING ON E-PAYMENTS:
See World Bank, A practical Guide for Retail Payment Stocktaking

Digital payments glossary contd.

This table provides common definitions of terms you will find in the toolkit

A term missing?
Please let us know

Term	Definition
Authentication process	The methods used to verify the origin of a message or to verify the identity of a participant connected to a system and to confirm that a message has not been modified or replaced in transit. (CPSS)
Interoperability	A situation in which payment instruments belonging to a given scheme may be used in other countries and in systems installed by other schemes. Interoperability requires technical compatibility between systems, but can only take effect where commercial agreements have been concluded between the schemes concerned. (CPSS)
Digital payment	A transfer of value using a payment instrument which is at least initiated in digital format. See further discussion in this toolkit here
E-payment	See digital payment
Payment grid	The table of different payment types formed by different payer-payee combinations—see more here
Payment instrument	Any instrument enabling the holder/user to transfer funds. (CPSS). For examples, of main categories, see here
Payment (transaction) device	A device that uses the payment instrument and information from the recipient to complete a transaction. Examples include: Â ATM, Point of sale device, PC, mobile phone

FURTHER READING ON E-PAYMENTS:
If you want more definitions, then download the complete glossary of payment terms developed by the international standard setting body for payments among central banks, the Committee on Pavment and Settlement Svstems at the Bank for International Settlements. from which some of the above definitions are excerpted.

Types of measurement data

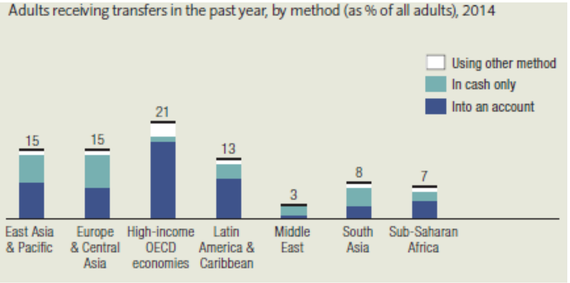
Global FINDEX data on payments

The 2014 Global Findex includes a new extended module on payments. It provides information on (1) payments from businesses or government to people (wages, government transfers, and payments for agricultural products; (2) payments from people to businesses or government (bills, school fees); and (3) person-to-person payments (domestic remittances).

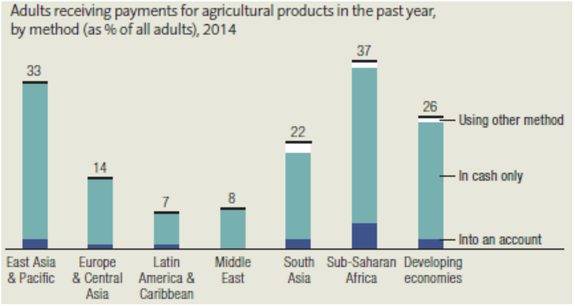
The 2014 Findex reveals a number of opportunities to shift to digital:

- Among the unbanked, 80 million people in the poorest 40% of households receive wages and transfers from the government in cash.
- While 83% of respondents who receive government transfers in high-income OECD economies get them through bank accounts, only about half of those in developing economies report receiving such transfers into an account. 130 million adults without a bank account (unbanked) receive G2P payments in cash only.
- In developing countries, most families (roughly 220 million adults) receive payments for the sale of agricultural products in cash. However, in Sub Saharan Africa, 13% of such families report obtaining payments into an account (usually a mobile money account).
- Among the unbanked in developing economies, 270 million people send or receive domestic remittances in cash only. In Sub-Saharan Africa, 80 million people (22% of unbanked adults) send or receive P2P payments in cash.
- There is tremendous opportunity to shift even those with bank accounts to digital. More than 1.3 billion adults in developing economies who have accounts still pay their utility bills or school fees with cash. 22% of adults with an account pay both utility bills and school fees in cash.

1. Government transfer recipients and how they receive payments



2. Agricultural payment recipients and how they receive payments



Source: Global Findex Database, 2014