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PAYMENT SYSTEMS POLICY AND RESEARCH

# RETAIL PAYMENTS **A PRACTICAL GUIDE FOR MEASURING RETAIL PAYMENT COSTS**

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## FOREWORD AND ACKNOWLEDGEMENTS

Retail payment systems play an important role in the smooth functioning of an economy, and inefficiencies in the retail payments market can have cascading effects that provoke sub-optimal performance throughout the economy. Such inefficiencies persist, especially in many middle-income and low-income countries, with cash still being the most widely used payment instrument.

A number of issues are responsible for this situation, and the lack of a coherent, comprehensive strategy for the development of retail payment systems is among the most significant factors. However, in order to develop such a strategy, it is important to have a good understanding of the costs associated with different retail payment instruments. The definition of objectives for the national payments system in general and for the retail payment system in particular, in terms of the optimal mix of payment instruments and overall retail payment system efficiency, relies on the availability of high-quality payment-related data. Data on the costs of payment instruments can prove valuable in developing an implementation plan to achieve the desired outcomes. Such cost data, however, is rarely available, and the data that is available typically fails to capture the full costs of payment instruments. As a step toward addressing this gap in information, this document provides a comprehensive methodology to measure the costs of retail payments for users and suppliers of payment instruments, as well as the economy as a whole.

The novelty of this retail payments cost methodology is that it provides an overall perspective, laid out in this practical guide. In the future, this guide may serve as a reference point for interested stakeholders and countries who aim to perform a retail payment cost analysis. It also ensures a high level of standardization and comparability of results across countries when using the same methodology to estimate retail payment costs.

This report has been developed by the World Bank Group's Finance & Markets Global Practice and, in particular, the Payment Systems Development Group (PSDG). The lead authors of this document are Thomas Lammer, Holti Banka and Gergana Kostova. Substantial input has been provided by Harish Natarajan, Jose Antonio Garcia Luna, Lois Estelle Quinn, Gynedi Srinivas, Balakrishnan Mahadevan, Maria Teresa Chimienti, Pablo Pereira and Melina Cholmondeley. We would like to thank all the internal and external reviewers who commented on the consultative draft (published in November 2015) for their thorough review and insightful comments – and we would especially like to recognize Anneke Kosse and Heiko Schmiedel for their detailed feedback and drafting suggestions. Massimo Cirasino provided the overall guidance for this project.

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>ABC</b>	Activity-based costing
<b>ATM</b>	Automated teller machine
<b>B2B</b>	Business-to-business
<b>B2G</b>	Business-to-government
<b>B2P</b>	Business-to-person
<b>CIT</b>	Cash-in-transit company
<b>DFID</b>	Department for International Development
<b>E-Commerce</b>	Electronic commerce
<b>E-Money</b>	Electronic money
<b>ECB</b>	European Central Bank
<b>EFT</b>	Electronic funds transfer
<b>G2B</b>	Government-to-business
<b>G2G</b>	Government-to-government
<b>G2P</b>	Government-to-person
<b>GDP</b>	Gross domestic product
<b>HiFi</b>	Harnessing Innovation for Financial Inclusion
<b>IC</b>	Integrated circuit
<b>ICT</b>	Information and communication technology
<b>IT</b>	Information technology
<b>M-Money</b>	Mobile money
<b>MOTO</b>	Mail order/telephone order
<b>MTO</b>	Money transfer operator
<b>P2B</b>	Person-to-business
<b>P2G</b>	Person-to-government
<b>P2P</b>	Person-to-person
<b>PC</b>	Personal computer
<b>PIP</b>	Payment infrastructure provider(s)
<b>POS</b>	Point-of-sale
<b>PSDG</b>	Payment System Development Group
<b>PSP</b>	Payment service provider(s)
<b>PSU</b>	Payment service user(s)
<b>RC</b>	Resource costs
<b>SEPA</b>	Single Euro Payments Area
<b>SME</b>	Small or medium enterprise
<b>TC</b>	Transfer costs
<b>WBG</b>	World Bank Group

## EXECUTIVE SUMMARY

### Objective

Retail payment systems play an important role in the smooth functioning of an economy and inefficiencies in the retail payments market can have cascading effects throughout the economy. While there are a number of issues that are responsible for the persistence of inefficiencies in retail payment markets, the lack of a coherent, holistic strategy for the development of retail payment systems is among the most common<sup>1</sup>. In order to develop such a strategy, it is important to economically substantiate the migration from less cost-efficient retail payment instruments (typically cash and paper-based instruments) to more cost-efficient ones (typically electronic payments). A good understanding of the costs associated with different retail payment instruments is therefore needed.

Overall, establishing a sound economic baseline for national retail payment systems in terms of costs of different payment instruments can better guide system development and enable high-impact changes. Efficiency gains due to the migration to lower-cost retail payment instruments, and more efficient use of those instruments, could have significant benefits for economic development and growth as the transaction costs of exchanging goods and services are reduced. Lower costs of retail payments can also fundamentally boost the reach of electronic payment services to lower income households and further improve the efficiency of the national payment system as access to modern payment instruments is broadened.

This document is designed to serve as a practical guide for central banks and other public or private-sector stakeholders interested in conducting a study on the costs of day-to-day retail payments in their economies. In order to achieve this objective, this guide provides a comprehensive methodology that can be used in its entirety or adopted in module form. The framework also offers the flexibility to adapt certain elements to the specific conditions of a national retail payments market.

The results of a cost study based on this methodology can help decision makers to agree on the targeted gains in efficiency in their retail payments system, define an implementation plan for achieving a desired future mix of payment instruments, and provide information for all stakeholders involved in the retail payments market.

By applying the methodology for measuring the costs of retail payments provided in this document, cross-country comparability and benchmarking is possible and the experience of other countries can be taken into consideration when developing or adjusting the national retail payments strategy based on the results of the cost study.

### Methodological assumptions

The methodology presented in this guide is premised on a set of “stylized facts” resulting from the experiences of the Payment Systems Development Group (PSDG), and others, in developing practical guidance of applicability to diverse circumstances that yields useful and comparable results. These “stylized facts” include:

- Public or private parties engaging in a study on the cost of different retail payment instruments are likely to have a sound understanding of the current state of their national retail payments market (e.g. as

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<sup>1</sup> For detailed guidance on developing a retail payment system strategy and a description of the evolution of retail payment instruments and services, factors influencing their adoption, their clearing and settlement process and the different roles within retail payment systems refer to chapter 2 of “Developing a comprehensive national retail payments strategy” (Oct. 2012). Retail Package: <http://go.worldbank.org/JFEVAXK310>

regards the payment instruments used for specific use cases or the volume and value of payments made with non-cash payment instruments)<sup>2</sup>.

- The application of a common international framework ensures a systematic approach when surveying and calculating the costs of retail payments within a national payments market and allows for cross country comparability and benchmarking of the results.
- The use of common and internationally recognized definitions of the retail payment instruments analyzed for a cost study limits the misperceptions and facilitates international comparability.
- The methodological framework needs to identify the levers that drive the outcome and achieve a balance between the detail of the theoretical formulation and the feasibility of the framework's practical implementation. In this framework the payment characteristics of both the payment instrument and the context are the "levers" that drive the costs of a specific retail payment, and the outcome is the costs of retail payments.
- The methodology focuses on domestic "day-to-day" retail payments. Extraordinary payments of high value, for example, the purchase of a car by a consumer or cross-border payments<sup>3</sup> are not considered. The combination of different stakeholders (users and service providers) who incur different costs, their role (payer or payee) in different use cases, the service channel, and the payment instruments used, are all relevant characteristics which were analyzed.
- The design of the methodology allows for flexibility without losing its comparative basis. If applied fully, the methodology comprises of surveys of payment service users (consumers, businesses, and government agencies), payment service providers and payment infrastructure providers, while at the same time capturing any regional differences. Moreover, the surveys ensure validity (capturing all relevant information and being able to generalize to the entire target population) and reliability (consistency of cost element measurement). In order to provide implementation flexibility, the survey execution and data analysis can be conducted by in-house experts or with the help of professional market research firms.
- While this methodology tries to identify the costs of retail payments it does not aim to explain the preference of payment service users for choosing certain payment instruments and/or the service offering on the supply side, nor does the methodology aim to quantify factors.

### Scope of the methodology

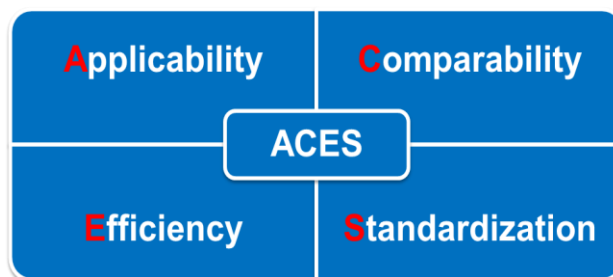
This methodology addresses the following dimensions: (i) the demand side: costs borne by payment service users (PSU), i.e. consumers, businesses and government agencies, in their roles as payers and payees; (ii) the supply side: payment service providers (PSP) and payment infrastructure providers (PIP); and (iii) the overall economy. It builds on and forms an integral part of the [World Bank Group's Retail Payments Package](#). The methodology aims to meet the following criteria: (i) applicability, (ii) comparability; (iii) efficiency, and (iv) standardization.

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<sup>2</sup> The World Bank (2012): A practical guide for retail payments stocktaking (2012), jointly drafted by the Payment Systems Development Group (PSDG) of the World Bank, the Banco Central do Brazil, and the European Central Bank, identifies a methodology for undertaking a detailed stocktaking of a country's retail payments landscape to get such an understanding.

<sup>3</sup> The World Bank Group has been monitoring data on the cost of sending and receiving relatively small amounts of money from one country to another since 2008 and publishes the results on the Remittance Prices Worldwide website (<https://remittanceprices.worldbank.org/en>). The site covers 365 "country corridors" worldwide, from 48 remittance sending countries to 105 receiving countries.

**Figure 1: Criteria the methodology aims to meet**



The methodology hopes to capture the retail payment costs by identifying ten payment instruments: cash, cheque, voucher, debit card, credit card, prepaid card, direct debit transfer, direct credit transfer, mobile money, and online money. Countries implementing the methodology will choose from the payment instruments relevant in their retail payment system. These ten payment instruments are the complete set of potential payment instruments available for day-to-day transactions. Any payment mechanism within a country, based on its main characteristics, is assigned to one of these payment instruments in order to ensure comparability and common terminology.

The methodology examines the payment instruments in the overall context of their use by including important factors that are likely to affect retail payment costs. Specifically, the following parameters are taken into account when deriving and measuring retail payment costs per payment instrument borne by the different stakeholders on the demand and supply side:

- **Payment type:** indicates the direction in the flow of funds among the three PSUs categories (e.g. government-to-person) and their role as payer and/or payee.
- **Payment purpose (use case):** brings to surface the reason that triggers the transaction (e.g. salary payments).
- **Payment transmission method:** describes how a payment is initiated and/or received (in-person or remotely) and via which service channel (e.g. branch, ATM, agent).

### Structure of the Practical Guide

This document is organized in five parts, which are further divided into sections and sub-sections. Part I introduces the methodology by putting the cost analysis in context and analyzing the different building blocks such as, key definitions of relevance for retail payments, classification of stakeholders by type, description of payment transmission method and payment purposes (use cases), and classification of costs. Part II analyzes the costs incurred by the demand side. More specifically, each payment service user category (i.e. consumers, businesses, and government agencies) is analyzed in a separate section, including process steps for identifying the specific cost elements, while also providing guidance on the content to be covered in the surveys and the calculation of costs. Part III examines the costs incurred by the supply side, namely the payment service and payment infrastructure providers, following a similar structure to the demand side. Part IV brings the demand and supply side costs together by calculating the overall costs to the economy, after adjusting for transfer costs<sup>4</sup>. Moreover, it further examines the savings that can be achieved under substitution scenarios from paper-based to electronic payments. Finally, Part V challenges the implementation of the framework by suggesting a step-by-step approach that can be used to execute the

<sup>4</sup> Transfer costs are fees paid to other stakeholders in the retail payment process for services rendered.

framework. Depending on a country's needs, the demand and supply side of the framework can be implemented independently. However, regardless if only the demand or only the supply side is implemented, Part I and Part V of the document are relevant for the understanding of the overall methodology. Finally, if the demand and supply side costs have both been identified, it becomes possible to implement Part III on the costs for the overall economy.

### Key outcomes

The implementation of this framework will produce important findings on the costs for the demand side, the supply side, and the entire economy.

#### *For the demand side:*

- **Ratio** of paper-based to electronic payments (based on volume) during a calendar/fiscal year for each payment purpose (use case).
- **Total costs** of using each of the retail payment instruments covered in the retail payment cost study.
- **Total costs** for each payment purpose (use case).
- **Total costs** borne by each payment service user category: the sum of the resource costs and transfer costs.
- **Average costs** per payment, use case and payment instrument combination, given a specific service channel (e.g. the cost of receiving public sector salary in cash from the premises of a government office).

#### *For the supply side:*

- **Total annual costs** associated with each type of payment instrument.
- **Average costs** per payment processed, per type of payment instrument.
- **Average costs** per combination of payment processed and service channel used.
- **Total annual costs** for payment service providers.
- **Total annual costs** for payment infrastructure providers.

#### *For the entire economy:*

- **Total resource costs**
- **Total transfer costs**
- **Total annual costs** to the economy associated with each payment instrument, in absolute terms and expressed as percentage of the country's GDP.
- **Savings** that could occur from different substitution hypotheses (e.g. hypothesis under which all public sector salaries distributed in cash at the premise of a government office are substituted by direct credit transfers).

## I. OVERVIEW OF FRAMEWORK

1. Recent interest in retail payment instruments and retail payment systems has now shifted the decades-long focus of central banks and other authorities from large-value payment systems<sup>5</sup>. In the meantime, it has been widely acknowledged that retail payments are essential for economic activities. Improving retail payments' efficiency is beneficial to the day-to-day transactions between consumers and businesses and the payments made by and to government agencies, alike.

2. A retail payment instrument is a means of exchange that facilitates the transfer of funds between non-financial institutions (i.e. "payment service users", such as consumers, businesses, or government agencies). While almost every method of retail payment<sup>6</sup> involves payment service providers (often financial institutions) at some point in the transaction processing and fund settlement process, a key characteristic of a retail payment is that one or both of the parties to the transaction, i.e. the payer and/or the payee, is not a financial institution. Further characteristics of retail payments are that the transferred funds are of relatively low value and their settlement is typically not time-critical. Retail payments can be completed entirely with physical instruments (typically cash), initiated on paper then converted into electronic format during processing (e.g. paper cheques, which are truncated), or initiated, authorized, authenticated, cleared and settled electronically (e.g. card payments). Based on their main characteristics retail payment instruments can be classified into the following categories:

3. **Physical instruments:** These include cash (banknotes and coins), paper cheques, money orders, paper vouchers, and traveler's cheques. Cash is typically used for in-person transactions of low value directly between payer and payee. Other paper-based instruments normally require the involvement of one or more intermediaries (banks or non-bank payment service providers) to affect the transfer of value from the payer to the payee. Non-cash paper-based instruments are used during face-to-face and remote payments and their transaction value is, on average, higher than those of cash payments. Non-cash paper-based instruments are often converted into electronic format during the processing, clearing and settlement process.

4. **Electronic funds transfer (EFT)-based instruments:** These are direct credit transfers and direct debit transfers, and they are typically used for remote payments. If the payer and the payee have accounts with different institutions, the transaction processing and funds settlement of EFT payment instruments is generally conducted in between payment service providers (PSP)<sup>7</sup> under well-codified rules and procedures ("payment schemes"). These schemes are usually domestic, although there are also schemes that have an international coverage (e.g. the jurisdictional scope of the SEPA credit transfer and the SEPA direct debit schemes, currently being used in 34 European countries<sup>8</sup>). The scheme management is often centralized in a company that is not operationally active (also referred to as "governance authority" or "scheme owner"). Typically, this governance authority is also responsible for adapting the scheme to new

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<sup>5</sup> Large-value payment systems typically process a relatively small number of high-value and time-critical payments, typically between financial institutions. These systems are essential to the proper functioning of the financial system; a failure could trigger disruptions or transmit shocks, both at local and international levels. Large-value payments are often also referred to as systemically important payments and include: interbank money market operations, the cash leg of securities trades, and the cash leg of foreign exchange trades. While for a lot of large value payments only financial institutions are the ultimate payer/payee, some customer transactions may also be processed in large-value payment systems.

<sup>6</sup> Cash payments and innovative peer-to-peer transactions (e.g. virtual currency transactions) are the two exceptions.

<sup>7</sup> Payment service providers (PSP) offer payment services to payment service users (PSU), while payment infrastructure providers (PIP) offer payment-related services to PSP. PSP include deposit-taking institutions, credit institutions and other authorized service providers like postal offices, money transfer organizations or e-money institutions. PIPs include providers of Automated Clearing Houses, Automated Cheque Processing, Payment Switches, and Settlement Systems, and cash-in-transit companies. For a detailed description, see sub-section I.1.1.

<sup>8</sup> 28 EU Member States plus Iceland, Norway, Liechtenstein, Switzerland, Monaco and San Marino.

legal, technological, or user requirements. From an end-to-end perspective between payer and payee, EFT instruments are often not fully electronic: direct credit transfers are often initiated in paper-form and direct debit transfer mandates are also often issued and signed on paper. However, typically the first PSP within the payments process converts paper forms into electronic format and increasingly PSPs aim to migrate to end-to-end electronic processing (e.g. by leveraging internet banking applications).

5. **Payment card-based instruments:** These include credit card payments, charge card payments and debit card payments, and typically involve usage of a physical plastic card by a payer to discharge the payment obligation to the payee. The physical card has the associated account information encoded in a magnetic stripe and/or in an embedded integrated circuit (IC) chip, and in addition the relevant information is usually printed or embossed on the plastic card. The information on the magnetic stripe or IC chip, when read by an appropriate device of the payee or by an ATM, can be used to trigger a funds transfer from the payer's account in favor of the payee. Payment cards can be used for in-person purchases, as well as for remote payments. Increasingly, card-based payments are accepted in all standard service channels like ATMs, internet, telephone/mobile phone, and at payment centers. In addition card payments are very popular for payments in e-commerce, either by simply providing the e-commerce retailer or the PSP with the card details shown on the payment card (card number, expiry date, and card security code) or via more sophisticated solutions, which include a proper authorization by the card issuing PSP.

6. **Prepaid instruments:** This category includes payment products that are emerging in both developed and developing countries and can take the form of prepaid cards, vouchers, mobile money or online money. These products usually require the payer maintaining a prepaid payment account with a (often specialized) PSP, not necessarily a financial institution. Often these instruments are proprietary solutions, which are not interoperable with deposit transaction accounts or e-money transaction accounts from other issuers for individual transactions, but the funding can typically be effected via cash, EFT, or payment cards. Payment instructions can be initiated through agents of the PSP, the internet, mobile phones, or typically as in the case of prepaid cards, at the POS-terminal or ATM. In a lot of jurisdictions these prepaid instruments are qualified as "e-money products". By definition, e-money is a record of funds or value available to a consumer and stored on a payment device such as chip, prepaid cards, mobile phones or on computer systems as a non-traditional account with a banking or non-banking entity. E-Money products are further differentiated into mobile money, prepaid cards and online money (electronic wallets).

## I.1. RETAIL PAYMENTS: CONTEXT AND DEFINITIONS

7. A retail payment is defined as a transaction that meets the following criteria: (i) the payment is not directly related to a financial market transaction; (ii) the settlement of funds is not time-critical; (iii) the payer, the payee, or both are consumers, businesses and/or government agencies, but not financial institutions; (iv) the payer, the payee, or both are not direct participants in the payments system that is processing the payment; and (v) it is effected in the course of regular conduct of life/business (e.g. not associated to a life event or extraordinary procurement). In addition, it is recommended to include a maximum threshold in terms of value. High value payments, even if they meet all the criteria for retail payments, are likely to be processed differently than the bulk of low value retail payments and therefore cannot be considered to be representative in terms of costs. A maximum threshold in absolute terms is not recommended though, but rather to define the threshold as a multiple of the gross domestic product per capita (e.g. twice the GDP per capita).

### I.1.1. Stakeholders in retail payments

8. The objective of this methodological framework is to help public and private parties to identify the representative costs borne by the demand and supply side for retail payments for a certain period of time. Furthermore, the methodology should help in extrapolating the identified costs for an entire year based on the annual volume of retail payment transactions within an economy. The application of a consistent terminology and methodology as proposed in this report is the common denominator to facilitate a cross-country comparison of results, notwithstanding the acknowledgement that during implementation country specific and language specific adaptations in the terminology might be required.

9. **Payment service users (PSU)** constitute the demand side of retail payment actors. PSU can be broadly categorized into consumers (the term “households”, “individuals”, or “persons” could also be used), businesses (registered enterprises, including retailers, sole proprietorships and self-employed providers of goods and services), and government agencies (federal, regional and local ones). All of them typically have a dual role, being the payer for certain retail payment transactions and the payee for others. The following table presents the possible combinations of payer and payee, also referred to as payment types, taking into account the involvement of the three categories of PSU, and their role as a payer and payee. These payment types are further explained in the respective sections for consumers, businesses, and government agencies, in Part II.

**Table 1: Types of retail payments for the demand side**

Payer \ Payee	Consumer	Business	Government Agency
Consumer	P2P	P2B	P2G
Business	B2P	B2B	B2G
Government Agency	G2P	G2B	G2G <sup>9</sup>
P=Person, B=Business, G=Government			

10. **Payment service providers (PSP) and payment infrastructure providers (PIP)** are the actors which constitute the supply side of the retail payments chain. The PSP which offer their services directly to PSU include banks and non-bank payment service providers, like money transfer operators or e-money institutions. The PIP which enables the PSP's service provision to the PSU without typically directly servicing the PSU, include (for cash payments) cash-in-transit (CIT) companies and central banks, and (for non-cash payments) operators of retail payment systems (e.g. clearing-houses), large value payment systems (e.g. real-time gross settlement systems) and payment switches. While it is obvious that retail payment systems and payment switches need to be considered for the cost of retail payment systems, large-value payment systems are taken into consideration to the extent that they are processing retail payments (be it on a per-transaction basis or for their net settlement).

### I.1.2. Retail payment instruments

11. **The choice of retail payment instruments included in the cost study is decisive for the explanatory power of the results.** While from a theoretical point of view the consideration of all retail payments used in a country would be preferable, the exclusion of niche retail payment instruments makes sense from a practical point of view, since the level of effort to achieve representative results for niche products might not be meaningful and/or not justify the effort. The decision of which instruments to

<sup>9</sup> G2G payments will be considered only in the context of secondary activities such as cash receipts and cheques, supply of change, and transfer of funds between own accounts.



include in a specific country study should be based on statistical data for the use of retail payments. Those retail payment instruments which have a reasonable share of the overall retail payments volume should be included into the cost study. Typically payment instruments which constitute five percent or more of the total volume should be included into the study. In addition emerging payment instruments which, based on their trajectory, are likely to play an important role in medium term, might be considered, even if their existing share of the total volume is below the threshold<sup>10</sup>. A description of the most common retail payment instruments is provided in the following:<sup>11</sup>

12. **Cash:** Banknotes and coins issued by a central bank or government, which are recognized as legal tender in the respective country, or accepted next to local currency for retail payments. The definition is not confined to the national currency of that country. While the methodology does not include cross-border payments in countries where foreign currencies are used for domestic retail payments alongside the local currency, the former also needs to be considered.

13. **Cheque**<sup>12</sup>: Written order from one party (the drawer) to another (the drawee, normally a bank) requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. Cheques may be used for settling debts and withdrawing cash from banks. While cheques are typically categorized as a paper-based retail payment instrument, they are increasingly becoming a “hybrid payment instrument” due to cheque truncation. Cheque truncation is the process of replacing the exchange of paper cheques as part of the clearing process with exchange of their images or digital substitutes.

14. **Voucher:** Certificate or document that can be exchanged for cash or can be used for the conditional purchase of goods and services. Vouchers can be issued by government agencies for the payment of salaries, pensions, subsidies and social transfer and by businesses (as part of their salary payments or for customer refunds). While vouchers have traditionally been issued in paper form, electronic vouchers are becoming more and more important. The main differentiating criteria between electronic vouchers and e-money payment instruments is that the latter are general purpose payment instruments while vouchers can typically be used for dedicated purposes only (e.g. the purchase of agricultural inputs, groceries, or school supplies).

15. **Debit card:** Payment card where the funds are debited in full for every transaction from the underlying transaction account. It enables the holder to make purchases and/or withdraw cash. Some issuers of debit cards provide an overdraft feature allowing the payer to use the card even without sufficient balance in the underlying account.

16. **Credit card:** A type of payment card, indicating that the bearer has been granted a line of credit. It enables the bearer to make purchases and/or withdraw cash up to a prearranged ceiling. The credit granted can be settled in full by the end of a specified period or can be settled in part, with the balance taken as extended credit. Interest is charged on the amount of any extended credit and the holder can be charged an annual fee. A special type of credit card is a charge card. It enables the bearer to make purchases but does not offer extended credit. Moreover, the full amount of the debt incurred must be settled at the end of a specified period. The bearer is usually charged an annual fee.

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<sup>10</sup> Depending on the relevance of this emerging payment instrument, this might be done as part of the overall cost study, or if no representative data can be obtained, in form of a case study.

<sup>11</sup> This description is based on the glossary of terms (Annex 8) of the World Bank publication “Developing a comprehensive national retail payments strategy”. The terms used there have been largely taken from CPSS Glossary (CPSS, 2003). In some cases, the definition provided in “Developing a comprehensive national retail payments strategy” was adapted.

<sup>12</sup> Also referred to as “check”.

17. **Prepaid card:** E-money product for general purpose use where the record of funds is stored on the payment card (on magnetic stripe or the embedded integrated circuit chip) or a central computer system, and which can be drawn down through specific payment instructions to be issued from the bearer's payment card.

18. **Direct debit transfer:** A payment order or a sequence of payment orders made for the purpose of collecting funds from the payer and placing at the disposal of the payee. The payment instructions typically move from the PSP of the payee to the PSP of the payer, possibly via several other PSP as intermediaries and/or more than one direct debit transfer system. If both, the payer and the payee are customers of the same PSP, the direct debit transfer can be processed without the involvement of other PSP and/or direct debit transfer systems. Direct debit transfers are typically categorized as electronic-fund transfer payment instruments, the authorization (or mandate) forming the contractual basis for the (series of) direct debit transfer(s) is however often still paper-based.

19. **Direct credit transfer:** A payment order or possibly a sequence of payment orders ("standing order") made for the purpose of placing funds at the disposal of the payee. Both the payment instructions and the funds described therein typically move from the PSP of the payer/originator to the PSP of the payee, possibly via several other PSP as intermediaries and/or more than one direct credit transfer system. If both the payer and the payee are customers of the same PSP, the direct credit transfer can be processed without the involvement of other PSP and/or PIPs. While direct credit transfers are typically categorized as electronic-fund transfer payment instruments, they can be a "hybrid payment instrument", if they are initiated on paper forms. As part of the clearing process, these paper forms are replaced with copies of their images, or more commonly digital substitutes.

20. **Mobile money:** E-money product where the record of funds is stored on the mobile phone or a central computer system, and can be drawn down through specific payment instructions issued from a mobile phone, typically the one of the payer. However, the payer can also make use of the mobile phone of an agent. It is also known as m-money.

21. **Online money:** E-money product where the record of funds, stored on a central computer system, can be drawn down through accessing this central computer system via an internet connection on a variety of devices (e.g. desktop PC, laptop, tablet, smart-phone).

### I.1.3. Payment transmission methods and service channels

22. Retail payments can be initiated and received in different contexts and through different methods. One main category of payment transmission methods is that of in-person payments which require the physical presence of the payer and the payee (or a representative, including machines). In-person payments can be initiated in the course of the underlying (economic) interaction (e.g. matching payment with delivery) or there might be a time-gap in-between (i.e. a certain period is allowed for the payment and payer and payee to meet again to discharge the payment obligation). The other main transmission method is remote payments, i.e. the payer and the payee (or a representative, including machines) do not meet at the same location. Remote payments are initiated from a distance (e.g. via mail, phone or internet). Similar to in-person payments they can be initiated in the course of the underlying (economic) interaction (e.g. MOTO or online shopping) or with a time-lag. It is worth noting that both transmission methods, in-person and remote payments, do not necessarily require an economic interaction as a basis, but can also be effected based on a courtesy or personal obligation.

Table 2: Typical use of retail payment instruments for PSU

Payer \ Payee	Consumer	Business	Government agency
Consumer	Cash Cheque Direct credit transfer Mobile money Online money	Cash Cheque Voucher Debit card Credit card Prepaid card Direct credit transfer Direct debit transfer Mobile money Online money	Cash Cheque Voucher Debit card Credit card Prepaid card Direct credit transfer Direct debit transfer Mobile money Online money
Business	Cash Cheque Voucher Prepaid card Direct credit transfer Mobile money Online money	Cash Cheque Debit Card Credit Card Direct Credit Transfer Direct Debit Transfer	Cash Cheque Debit card Credit card Direct credit transfer Direct debit transfer
Government agency	Cash Cheque Voucher Prepaid card Direct credit transfer Mobile money Online money	Cash Cheque Debit card Credit card Prepaid card Direct credit transfer	Cash Cheque Direct credit transfer Direct debit transfer
P=Person, B=Business, G=Government			

23. It is important to emphasize that the payment transmission method and service channel for the same payment instrument can differ: cheques and payment cards can, for example, be used for in-person payments (e.g. a payment the grocery store) or remotely (e.g. mailing a cheque or using the payment card over the internet).

24. **In-person payments** involve the physical presence of the payer at the point of economic interaction and/or a service channel provided by the payee (payee's payment center) or a PSP (branches of the PSP, ATMs, PSP payment centers or agents). If the payer travels to a certain location to initiate the payment this will result in payment specific time and travel costs.

- a. **Point of (economic) interaction:** Constitutes the main service channel of in-person payments and can be described as the convergence of the locations of the payer and the payee. Examples include the location of the payer (e.g. home-delivery), the location of the payee (e.g. at a grocery store or a restaurant) or any other place where the payer and the payee meet (e.g. in a taxi). This is the only sub-category of in-person payments in which neither the payer nor the payee incurs any payment specific travel costs.
- b. **Payment center:** Physical outlets allowing one or more payees (e.g. in case of utility companies) to collect or payers to disburse (e.g. in case of government agencies disbursing via their own counters) funds. These activities might be conducted at the teller or in the self-service area of the payment center. The main identifying criteria of payment centers and what differentiates them from branches or agents is that payment centers are set up by (or for) a PSU for the main purpose of initiating and/or receiving funds.

- c. **Branch:** Physical outlet of a PSP that permits a PSU, to withdraw cash from their accounts and/or access other services such as balance inquiries, transfer of funds, or acceptance of deposits. These activities might be conducted via the teller or in the self-service area of a branch.
  - d. **Automated teller machine (ATM):** An electromechanical device that permits authorized PSUs, typically using machine-readable payment cards, to withdraw cash from their accounts and/or access other services such as balance inquiries, transfer of funds, or acceptance of deposits. ATMs may be operated either online with real-time access to an authorization database, or offline. ATMs might be located at branches or at other locations.
  - e. **Agent:** An agent provides payment services on behalf of a PSP. The type of service provided by the agent could vary from direct processing of transactions like disbursing cash or accepting deposits, to ancillary non-transaction-related services like collection of documents, opening of transaction accounts, or addressing customer service queries, among others. An agent can provide these services in a physical outlet (e.g. own shop or stand) or can be a mobile agent.
25. **Remote payments** imply that the physical locations of the payer, the payee, and/or the PSP do not coincide. Remote payments can be initiated via mail, the internet, or the (mobile) phone.
- a. **Mail:** The use of regular mail for sending cheques, vouchers, initiating credit or debit card transactions<sup>13</sup>, or even cash.
  - b. **Internet:** Data communication network that allows a PSU to access services such as balance inquiries or transfer of funds, via a variety of internet-enabled devices (e.g. desktop PC, laptop, tablet, smart phone). Instead of the internet, designated lines can also be established for data communication.
  - c. **Telephone/mobile phone network:** Voice or text communication network that allows a PSU to access services such as balance inquiries or transfer of funds, via landline or mobile phones.

#### I.1.4. Purpose of retail payments and use cases

26. The purpose of a retail payment can be: i) the compensation for an economic transaction (e.g. purchase/sale of goods and services), ii) a transfer due to an entitlement or obligation (e.g. salaries, social transfers, tax payments), iii) a personal transfer (e.g. courtesy transfer to support relatives or donation)<sup>14</sup>, or iv) the reorganization of the payer's own funds (e.g. cash withdrawals or deposits).
27. Table 3 lists the most common PSU use cases for each of these payment purposes and some of the main payment services and infrastructures provided by the PSP and PIP. Table 4 accommodates these various use cases to the types of retail payments identified in Table 1.
28. The use cases are examples of retail payments that have a regular character either for the payer or the payee, i.e. these payments should be effected at least once a year on a regular basis (e.g. annual payment of taxes). While for a consumer life time events or bigger investments (e.g. the purchase of a house or a car) would not be considered as retail payment, the monthly leasing would be. On the other hand, a car dealer would consider the payment from the buyer and the payment to the wholesaler as retail payments.

<sup>13</sup> The payer can provide their card information to pay a bill or order a good via regular mail.

<sup>14</sup> See: "Payments and Social Ties," by Viviana Zelizer (1996).

### I.1.5 Value and Volumes of Retail Payments

29. Special emphasis should be placed on the collection of data for both values and volumes of retail payments. Even if there is statistical data available in a country on value and volume for certain retail payment instruments, the retail payment cost study can provide additional insights as regards value and volume of transactions by stakeholder group, payment transmission method/service channel, and purpose of retail payments.

30. Volume figures in terms of the number of transactions allow for computing for example unit costs, while data on the values of retail payment transactions may give indications of the thresholds/break-even points when a particular payment instrument is used or preferred compared to others.

31. Finally, if a maximum value threshold has been defined, the value figures will identify those retail payments within the scope of the cost survey.

**Table 3: Purpose of retail payments and use cases**

Purpose	Common use cases for PSU
<b>Compensation for an economic transaction (payment for goods, utilities or services)</b>	<ul style="list-style-type: none"> <li>• Payments by consumers for retail goods (e.g. groceries, food, newspapers, pharmaceuticals, tobacco)</li> <li>• Payments of regular transport expenses (e.g. public transport tickets, gasoline, taxi, airfare)</li> <li>• Payments for financial services (including insurance)</li> <li>• Payments by consumers for services (e.g. doctor visits, hairdresser, craftsmen)</li> <li>• Payments by businesses and government agencies for procurement of supply chain products and professional services (e.g. office maintenance, auditing and accounting, IT)</li> <li>• Payments for utilities and other periodic bills (e.g. rent, mortgage, utilities, insurance, Internet, phone, tuition fees, membership fees)</li> <li>• Payments for consumer durables (e.g. electronic appliances, furniture, apparel, etc.)</li> <li>• Payments by businesses and government agencies for procurement of consumable goods (e.g. stationary) and capital goods (e.g. machinery, equipment)</li> <li>• Payments by businesses for raw material, semi-finished goods, and wholesale products</li> </ul>
<b>Payment for an entitlement or obligation</b>	<ul style="list-style-type: none"> <li>• Payments of taxes, fines, fees, and other obligations to regional and central government authorities</li> <li>• Payment of tax refunds (e.g. income and corporate tax refunds)</li> <li>• Payment of social security contributions (employer's share, employee's share)</li> <li>• Payments of salaries, pensions, social benefits (e.g. private sector payroll, public sector payroll, conditional/unconditional social transfers)</li> </ul>
<b>Personal transfer</b>	<ul style="list-style-type: none"> <li>• Payments made to relatives and/or friends without an underlying economic transaction (e.g. personal remittances)</li> <li>• Payments in the social context (e.g. repayment of advance money or charitable contribution)</li> </ul>
<b>Reorganization of the payer's own funds</b>	<ul style="list-style-type: none"> <li>• Cash withdrawals and deposits, supply of change</li> <li>• Transfers of funds between own accounts</li> </ul>
Function	Main services by PSP and infrastructures of PIP
<b>Services</b>	<ul style="list-style-type: none"> <li>• Issuance of payment instruments</li> <li>• Provision of transaction accounts</li> <li>• Customer service (including exception handling)</li> <li>• Branding and marketing</li> </ul>
<b>Infrastructures</b>	<ul style="list-style-type: none"> <li>• Facilitation of retail payment transactions: payments switching, clearing, netting and settlement, exception handling and fraud monitoring</li> <li>• Scheme management</li> <li>• Branding and marketing</li> </ul>

**Table 4: Typical use cases for different types of PSU**

Payer \ Payee	Consumer	Business	Government Agency
Consumer	<ul style="list-style-type: none"> <li>• Payments made to relatives and/or friends without an underlying economic transaction</li> <li>• Payments in the social context</li> <li>• Withdrawals, deposits</li> <li>• Transfer of funds between accounts of one and the same account holder</li> </ul>	<ul style="list-style-type: none"> <li>• Payments for retail goods</li> <li>• Payments for services</li> <li>• Payment for financial services</li> <li>• Payments of regular transport expenses</li> <li>• Payments for utilities and other periodic bills</li> <li>• Payments for consumer durables</li> </ul>	<ul style="list-style-type: none"> <li>• Payments of taxes, fines, fees, and other obligations to regional and central government authorities</li> <li>• Payments for employee's share of social security contributions</li> </ul>
Business	<ul style="list-style-type: none"> <li>• Payments of salaries</li> </ul>	<ul style="list-style-type: none"> <li>• Payments for procurement of consumable and capital goods</li> <li>• Payments for procurement of supply chain products and professional services</li> <li>• Payments of regular transport expenses</li> <li>• Payments for utilities</li> <li>• Payments for financial services</li> <li>• Deposits of cash and cheques, supply of change, and transfer of funds between accounts of one and the same account holder</li> </ul>	<ul style="list-style-type: none"> <li>• Payments of taxes, fines, fees, and other obligations to regional and central government authorities</li> <li>• Payments for employer's share of social security contributions</li> </ul>
Government Agency	<ul style="list-style-type: none"> <li>• Payments of salaries</li> <li>• Payments of pensions</li> <li>• Payments of social benefits</li> <li>• Payments of tax refunds</li> </ul>	<ul style="list-style-type: none"> <li>• Payments of corporate tax refunds<sup>15</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Deposits of cash receipts and cheques, supply of change, and transfer of funds between own accounts<sup>16</sup></li> </ul>
P=Person, B=Business, G=Government			

## I.2. COSTS OF RETAIL PAYMENTS

32. This section discusses the costs of retail payments from the demand and supply side perspective, by defining and classifying costs into different types. Moreover, it briefly introduces the Activity-Based Costing methodology which is particularly relevant for capturing the cost data on the supply side.

### I.2.1. Type of costs

33. **Using and providing payment services generates costs for the actors involved, i.e. for PSUs, PSPs, and PIPs.** In the last two decades a number of studies have tried to quantify those costs, the majority of which have focused mainly on the supply side and – if the demand side was captured – typically on businesses only (see Table 5). The cost terminology used in the studies varies. However, an increasing number of studies have chosen concepts such as “social costs” and “private costs”. Since this document is supposed to serve as a guide for policy makers, the emphasis has been put on the practical application

<sup>15</sup> For those payments where government agencies “act like a business”, they are considered under the B2B type of payments. In fact all use cases listed there, with the exception of “Payments for procurement of supply chain products and services”, also apply to government agencies.

<sup>16</sup> The suggested framework does not consider other G2G payments such as intra-governmental (across agencies within the same country) and inter-governmental (across government entities of different countries) since they typically include large-value payments.

of the terms used. As a result, the following differentiation has been made: **i) resource costs vs. transfer costs** and **ii) total costs per stakeholder group vs. costs for the entire economy**<sup>17</sup>. The distinction between resource costs and transfer costs is necessary for a correct calculation of the total costs per stakeholder group and the costs for the entire economy. In order to allow policymakers to make the right decisions, the types of costs also should be distinguished along two additional dimensions: **i) direct vs. indirect costs** and **ii) variable vs. fixed costs**. The distinction between direct costs and indirect costs mainly facilitates the accurate collection of comprehensive data, and is essential for estimating the potential savings when substituting one payment instrument with another (overall, for a particular payment transmission method/service channel, or in a particular use case). It is worth stressing that the following three categories **i) type (resource vs. transfer), ii) attribution (direct vs. indirect), and iii) variability (fixed vs. variable)**, are distinct within the category, but not mutually exclusive between categories, and that there is no dedicated relationship between them. That is, a cost element that is classified as resource (or transfer) can be either direct or indirect, as well as fixed or variable.

34. **Resource costs:** The sum of all internal costs incurred by a stakeholder in order to initiate and/or receive payments (in the case of PSU), or in order to make payment instruments and/or services available (in the case of PSP and PIP). Typically, resource costs for the PSU include time-based costs (e.g. time to get to an ATM to withdraw cash or initiate a payment), labor-based costs (e.g. end-of day cash processing at a store or reconciliation), travel costs (e.g. mileage to get to the branch) and capital/technology-based costs (e.g. hardware and software costs or terminal maintenance for merchants). If payment-related internal processes are outsourced to a PSP/PIP (e.g. a cash logistic company) they should be treated as transfer costs in order to allow for a correct calculation of the total costs for the economy.<sup>18</sup> If payment-related internal processes are outsourced to a provider not captured as PSP/PIP in this methodology, conceptually they still have to be considered as resource costs in all calculations. Holding costs (i.e. the private cost in terms of foregone interest of holding cash) should also be treated as resource costs. The resource costs of PSP/PIP, include the production, issuing, reissuing, destruction, and logistics costs of payment instruments that have physical representation, costs for initiating and processing payments, payments-related infrastructure and its maintenance costs, security costs, as well as costs for supporting activities associated with payments (e.g. customer service, creating and maintaining transaction accounts, marketing and advertising, etc.). If internal processes are outsourced by PSP/PIP to another entity that is not a PSP or PIP or not captured by the cost study, conceptually they still have to be considered as resource costs (e.g. since agents are not considered to be PSP for the purposes of this study, agent commission fees are considered to be resource costs).

35. **Transfer costs:** Are the fees paid to other stakeholders of the same or a different stakeholder category in the retail payment process for services rendered (e.g. transaction fees, outsourcing fees for payment-related services), including fees paid by the payer for using a specific payment instrument (e.g. surcharges) or discounts granted by the payee to incentivize the use of specific payment instruments.

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<sup>17</sup> The total costs for the economy consist of resource costs, transfer costs, and economic externalities. In the context of costs, negative externalities are of main importance, although positive externalities also exist. One of the most important negative economic externalities results from the use of cash to facilitate the underground ("black" or "gray") economy, among others. The calculation of externalities is beyond the scope of this methodology, but it is acknowledged that the total costs for the economy are likely to be underestimated as a result of this omission.

<sup>18</sup> When calculating the costs of the demand side only, outsourcing fees should always be treated as resource costs. Otherwise the true payment-related production costs of those stakeholders who outsource some of their internal processes will be underestimated, since outsourcing fees will be omitted. On the other hand, when calculating the total costs for the economy, outsourcing fees of the PSU paid to the PSP/PIP should be treated as transfer costs, since the true production costs will be accounted for by the resource costs reported by the outsourcees.

**Table 5: Focus of selected retail payment cost studies**

Specifications			Stakeholders examined in cost calculations			
Authors (Year): Organization	Country	Type of cost	Demand side			Supply side
			Consumers	Businesses	Government	PSP/PIP
Humphrey & Burger (1989)	USA	Average		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Wells (1996)	USA	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Stavins (1997)	USA	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Raa & Shestalova (2002)	Netherlands	Average		<input checked="" type="checkbox"/>		
Humphrey et al. (2003)	12 European Countries	Average		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Brits & Winder (2005)	Netherlands	Average & Marginal		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Simes, Lancy & Harper (2006)	Australia	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
National Bank of Belgium (2006)	Belgium	Average & Marginal		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Garcia-Swartz, Hahn & Layne-Farrar (2006)	USA	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Banco de Portugal (2007)	Portugal	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Bergman, Guidborg & Segendorf (2007): Sveriges Riksbank	Sweden	Average	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Banco Central do Brazil (2007)	Brazil	Total				<input checked="" type="checkbox"/>
Shampine (2007)	USA	Marginal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Takala & Viren (2008): Bank of Finland	Finland	Average		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Arango & Taylor (2008): Bank of Canada	Canada	Unit Variable		<input checked="" type="checkbox"/>		
Gresvik & Haare (2009): Norges Bank	Norway	Average	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Schwartz et al. (2009): Reserve Bank of Australia	Australia	Average & Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Ehrbeck et al. (2010)	India	Total			<input checked="" type="checkbox"/>	
Turjan et al. (2011): Magyar Nemzeti Bank	Hungary	Average & Total & Unit Variable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Schmiedel, Kostova & Ruttenberg (2012): ECB	EU Countries	Average & Total		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Danmarks Nationalbank (2012)	Denmark	Average & Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Segendorf & Jansson (2012)	Sweden	Average & Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Pleijster & Ruis (2012)	Netherlands	Average & Marginal & Total		<input checked="" type="checkbox"/>		
Kleine, Krautbauer & Weller (2013)	Germany	Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Chakravorti & Mazzotta (2013)	USA	Total & Per Capita	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mazzotta et al. (2014)	India	Total	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mazzotta et al. (2014)	Mexico	Average & Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Stewart et al. (2014): Reserve Bank of Australia	Australia	Average	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

36. **Revenues:** Transfer costs for one stakeholder covered by the methodology can be considered as revenue for another stakeholder: e.g. the payer (in case of discounts), the payee (in case of surcharges), the PSP (for fees paid by the PSU), and the PIP (for fees paid by the PSP). The main source of information for transfer costs will be the stakeholder who is paying the fee and revenue information can be indirectly obtained that way. However, it is recommended to include questions on surcharges and discounts into the business survey and on revenues from payment related services into the supply side surveys. This information will not only allow for quality checks of the transfer cost information received, but also



interpret individual stakeholders' behavior and choices, which are likely to be affected by the total net costs they are facing (i.e. the total costs minus their revenues), and needs to be taken into consideration when discussing substitution scenarios. Payment instruments that are relatively inefficient from the overall economy's point of view, might be an important source of income for certain stakeholders. In which case stakeholders are unlikely to embrace the substitution of those payment instruments. In this context seigniorage income could be considered as a source of revenue for the central bank and/or the mint acting as issuer of currency, and – if it can be obtained – reported alongside other supply side revenues.

37. **Total costs for a type of stakeholder versus costs for the economy:** By adding up all resource and transfer costs for a single type of stakeholder, the total costs for that specific stakeholder group can be derived. In contrast, in order to avoid double-counting when calculating the total costs for the economy, only the resource costs of the stakeholders involved and economic externalities should be included.

38. The following table provides an overview of the relationship between resource costs, transfer costs and total costs for each stakeholder, but also the economy as a whole:

**Table 6: Relationship among resource costs, transfer costs and total costs**

Stakeholder \ Type of costs		Resource costs (RC)	Transfer costs (TC)	Total costs per stakeholder
PSU	Consumers	$RC^P$	$TC^P$	$\Sigma (RC^P, TC^P)$
	Businesses	$RC^B$	$TC^B$	$\Sigma (RC^B, TC^B)$
	Government agencies	$RC^G$	$TC^G$	$\Sigma (RC^G, TC^G)$
PSP & PIP	Payment service providers (PSP)	$RC^{PSP}$	$TC^{PSP}$	$\Sigma (RC^{PSP}, TC^{PSP})$
	Payment infrastructure providers (PIP)	$RC^{PIP}$	$TC^{PIP*}$	$\Sigma (RC^{PIP}, TC^{PIP})$
Total costs for the economy		$\Sigma (RC^P, RC^B, RC^G, RC^{PSP}, RC^{PIP})$		
* PIP typically act as service providers for PSP. As a result, they typically do not incur transfer costs by other type of stakeholders in the retail payment chain. In that case their transfer cost would be 0. If they incur transfer costs to other PIP, this should be taken into consideration in this regard.				

39. **Direct versus indirect costs:** A relevant distinction between direct and indirect costs can also be made if the costs are explicitly linked to a specific retail payment instrument and/or transaction.

40. **Direct costs are those that arise from a direct and exclusive use of resources to issue a retail payment instrument or make a retail payment.** In other words, direct costs are the costs “directly related” to the activities carried out for producing, issuing and destroying each retail payment instrument and/or conducting each retail payment transaction, and which can be imputed in a straightforward way (e.g. production costs and/or costs associated with fees and commissions and with staff directly involved in each activity and with each payment instrument)<sup>19</sup>. If a specific payment instrument can be used for more than one payment transaction (e.g. cash or payment cards as opposed to cheques), its production and destruction costs should be depreciated over its average lifetime (e.g. time a banknote is on average in circulation or a payment card is valid) and the annual depreciation costs be allocated to the number of

<sup>19</sup> See: “The Social and Private Costs of Retail Payment Instruments – A European Perspective,” by Schmiedel et al., European Central Bank (2012).

transactions conducted with this payment instrument. By doing so, direct costs of production, issuing, and destruction become indirect costs of usage.

41. **Indirect costs are those that arise from a non-exclusive use of resources to make a retail payment.** Indirect costs are the costs associated with local overhead<sup>20</sup> and support functions<sup>21</sup> that are necessary to carry out the activities associated with retail payments. These costs should be imputed to each transaction using specific allocation keys (e.g. costs relating to rentals, maintenance and depreciation, and other corporate support services).<sup>22</sup>

42. **Bundled products/services:** It is often the case that PSUs are recipients of bundled financial services (i.e. pay only one single fee but receive services that are associated with multiple payment instruments and/or additional services not directly linked to payments like free insurance or reward points). Indeed, for the purpose of real cost findings, it is important to rigorously allocate the single (indirect) fee to the different products and services offered in the case of bundles on the demand side of the payment chain. This methodology suggests that in the case of bundled services provided to a PSU, the price of a comparable basic payment service is used as a proxy and costs not related to payment transactions (e.g. free insurance) are considered out of the scope of the methodology. For the PSP, however, this represents a resource cost associated with the provision of payment services, which needs to be captured.

43. **Fixed versus variable costs:** Depending on the variability of the costs, they can be qualified as variable or fixed costs. Fixed costs remain unchanged for a specific payment instrument, irrespective of the amount or purpose of the retail payment it is used for. Variable cost can vary per payment instrument dependent on the amount and/or the service channel used for the retail payment. This goes beyond the definition of variable cost typically used in cost accounting, which focuses mainly on variability due to volume. However, within payment instruments the variability dependent on the amount requires consideration too, since certain pricing practices (e.g. ad valorem fees) result in different (transfer) costs to be borne by PSU. Variable costs do not necessarily change linearly: they might be stepwise variable.<sup>23</sup> Especially for the calculation of potential cost savings, it is necessary to get a sound understanding of what share of the costs is fixed and what share is variable with the number and value of transactions made in the economy. The identification of the variability of the costs should ideally be done by the respondents themselves, by asking for each cost item, whether they are fixed, variable with the number of transactions or variable with the value of transactions.

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<sup>20</sup> Costs that are direct at the level of the organizational entity that is responsible for executing the concerned activities/delivering the concerned service or product, but which cannot directly be allocated to them in an economically feasible way (e.g. division head and the secretariat function or other support functions (e.g. conceptual work) within the respective organizational entity). Source: Schmiedel et al. (2012).

<sup>21</sup> Support functions are all functions that refer to financial accounting and reporting, information and communication technology (ICT) which cannot be directly assigned to payment services, secretariat services to decision-making bodies, communication, event and meeting services, language services and lawyer-linguist services, planning and controlling, and organization, internal auditing, internal institutional, legal, tax and administrative issues, human resources management and social affairs, and internal services. Source: Schmiedel et al. (2012).

<sup>22</sup> See: Schmiedel et al. (2012).

<sup>23</sup> It should be acknowledged upfront how they are treated (linearly or not), and any assumptions made in the process.

## II. OVERVIEW OF COST ELEMENTS FOR THE DEMAND SIDE (PAYMENT SERVICE USERS)

44. Resource and transfer costs comprise of different cost categories and consist of a variety of individual cost elements (see Table 7 and definitions). This methodology tries to find an appropriate balance between the necessary level of detail and a realistic and practical level of effort when surveying and/or analyzing this data.

**Table 7: Categorization and classification of different cost elements for PSU**

Type of costs	Cost category	Cost element	Attribution of cost element		Variability of cost element		Relevant for demand-side category <sup>24</sup>
			Direct	Indirect	Fixed	Variable	
Resource costs	Time costs	Travel time	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	P, B, G
		Waiting time	<input checked="" type="checkbox"/> <sup>25</sup>	<input checked="" type="checkbox"/> <sup>26</sup>		<input checked="" type="checkbox"/>	P, B, G
		Transaction time	<input checked="" type="checkbox"/> <sup>25</sup>	<input checked="" type="checkbox"/> <sup>26</sup>		<input checked="" type="checkbox"/>	P, B, G
		Reconciliation time		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	P, B, G
		Operations time		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>27</sup>	<input checked="" type="checkbox"/> <sup>28</sup>	B, G
	Logistic costs	Travel costs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>29</sup>		<input checked="" type="checkbox"/>	P, B, G
		Communication costs <sup>30</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	P, B, G
	Infrastructure costs	Maintenance costs		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		B, G
		Depreciation costs		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		B, G
	Damage costs	Error costs <sup>31</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	B, G
		Theft costs <sup>31</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	P, B, G
		Fraud costs <sup>31</sup>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	P, B, G
		Insurance costs		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		P, B, G
	Production costs	Production costs of banknotes and coins		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	P, B, G
		Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	B, G
		Production costs of cheques/vouchers	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	P, B, G
		Production costs of cards	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	P, B, G
	Cost of funds	Holding costs		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	P, B, G

<sup>24</sup> P stands for consumers, B for businesses, G for government agencies.

<sup>25</sup> Except in the context of businesses and government agencies in their role as payees when picking up petty cash or depositing cash, cheques, or vouchers or when a PSU queues to initiate several payments at once (e.g. initiating several credit transfers at once at the teller or ATM).

<sup>26</sup> In the context of businesses and government agencies in their role as payees when picking up petty cash or depositing cash, cheques, or vouchers or when a PSU queues to initiate several payments at once (e.g. initiating several credit transfers at once at the teller or ATM).

<sup>27</sup> Operations time costs are fixed when they refer to time spent to install and keep physical acceptance devices for electronic payments (e.g. POS terminals) operational.

<sup>28</sup> Operations time costs are variable when they refer to preparing the cash register before opening hours and closing the cash register at the end of the business day.

<sup>29</sup> Travel costs are indirect only when they are incurred to get to the branch, ATM, agent outlet or payment center for depositing the day's sales if more than one payment instrument is involved.

<sup>30</sup> Depending on the telecommunication contract of the PSU, telecommunication costs incur directly in connection with a payment (for example in case of a flat fee telecommunication contracts) or have to be assigned proportionally to a specific payment. They can be fixed (for example if a flat fee telecommunications/internet service is paid) or variable with the volume of payments (for example, if payment is made by mail, the cost of stamps will be considered a telecommunication cost and it will vary with the number of payments made).

<sup>31</sup> Depending on the type of loss, costs can be either attributed directly to a specific payment (e.g. errors in filling a cheque or direct credit transfer form and associated reconciliation errors) or indirectly (e.g. loss of cash and payment card fraud in case of loss or theft of the entire wallet).

Type of costs	Cost category	Cost element	Attribution of cost element		Variability of cost element		Relevant for demand-side category <sup>24</sup>
			Direct	Indirect	Fixed	Variable	
Transfer costs	Service costs	Periodic fees		☑	☑	☑	P, B, G
		Per transaction fees	☑	☑ <sup>32</sup>	☑ <sup>33</sup>	☑ <sup>34</sup>	P, B, G
		Fees for services outsourced <sup>35</sup>		☑	☑		B, G
	Cost of funds	Float costs	☑			☑	P, B, G

45. **Time costs** are associated with time spent by a PSU to access and/or obtain a payment instrument, initiate a payment transaction, receive a payment transaction and/or reconcile that payment. Time costs are typically variable in nature. While a PSU should be asked about the perceived time spent, it is recommended to complement this information by conducting field studies and measuring the time spent on those cost elements which are observable (e.g. waiting time or – for in-person payments – transaction time). Previous cost studies have observed considerable differences between the perceived time spent and the effective time measured.

46. While one cannot assume that any stakeholders would incur earnings spontaneously at any time, this methodology suggests quantifying the costs of time-based opportunity costs, since disregarding this component would adversely affect the real costs of retail payments. The national minimum wage<sup>36</sup> could be used as a proxy to quantify the opportunity cost of the time spent by consumers. For transparency reasons it is recommended to report the opportunity costs for consumers explicitly in time units per use case/payment instrument/service channel combination and to calculate the costs of retail payments with and without time-based opportunity costs for consumers. For PSUs which are businesses or government agencies, time costs can be measured in labor costs. In that case the real or average wages of the persons involved in the payment transaction could form the basis of the calculation. However, for practical reasons and in order to avoid inflating the time costs, it is recommended that the minimum wage approach is also applied to businesses and government agencies. Time costs can be further broken down in the following cost elements:

- a. **Travel time** refers to the time required for the PSU to get from the place of residence or office to a designated physical point in order to effect (i.e. initiate or receive) a payment transaction.<sup>37</sup> By definition travel time does not incur if the payment is conducted as part of the underlying economic or personal transaction and/or payments are initiated remotely via the internet or phone. However, travel time is incurred if a remote payment initiated by mail requires travelling to the post office or a mailbox to post the payment.
- b. **Waiting time** refers to the time interval from the moment the PSU arrives at the designated physical point of payment (e.g. at payment center, branches, agents) until the interaction with the teller (or a device like the ATM) begins. The time a consumer waits at the checkout of a

<sup>32</sup> In case of cash and cheque depositing.

<sup>33</sup> In case of fixed transaction fees.

<sup>34</sup> In case of ad valorem fees.

<sup>35</sup> Fees for services outsourced are treated as resource costs when functions or activities are outsourced to third parties that are not PSP/PIP.

<sup>36</sup> The suggestion for using this conservative proxy avoids inflating the cost, which could potentially occur if other proxies are used, such as the average wage. While countries might not have a national minimum wage defined by law, statistical data about income distribution is usually available. In that case, the lower level of income distribution should be used. If no reliable data on the minimum wage is available, alternatively, per capita gross domestic product figures could be considered.

<sup>37</sup> In theory, when the trip to a designated service point for payment purposes is combined with other activities, only the equivalent fraction of the time-based opportunity cost should be allocated to the payment activity. For practical purposes, though, this framework assumes that the trip is entirely attributed to the payment activity, and as such, the entire travel time from the PSU's home or work place is allocated to the payment activity and the payment instrument used in the process.

physical store to pay for purchases made is not considered part of the waiting time for retail payments, rather it is considered as part of the underlying economic transaction.

- c. **Transaction time** refers to the time of effective direct interaction between the payer and the payee (from each side, respectively) or the payer and a device made available by the payee for the purpose of effecting a payment (e.g. POS-terminal). While the lengths of the transaction time for the payer and the payee are coinciding as in the case of in-person payments (unless a self-service checkout is used), the cost of that time to the payer and payee is likely to differ unless the national minimum wage is applied as a proxy in both cases. For payments without direct interaction between payer and payee, transaction time encompasses the time spent by the PSU with a representative of the PSP (e.g. the teller) or a device (ATM, computer, phone, etc.). For remote payments conducted via internet or phone, the transaction time is defined as the period from the moment the payer accesses the relevant application (e.g. enters the online banking website to arrange the transaction) until the transaction has been successfully initiated.
  - d. **Reconciliation time** refers to the time spent by consumers in checking their personal transaction account/card statements and for business and government agencies, as both payers and payees, in reconciling payments received/sent with the amounts due based on the accounting information.
  - e. **Operations time** is mainly relevant to businesses and government agencies when handling physical payment instruments like cash, cheques, or vouchers as well as the time spent installing and keeping physical acceptance devices for electronic payments (e.g. POS terminals) operational. In the case of businesses and government agencies, it includes aspects such as preparing cash registers before the opening hours, closing cash registers, and preparing cash and cheques at the end of the business day for bank deposit. Operations time also includes exceptions' handling (e.g. the handling of counterfeited banknotes or chargebacks).
47. **Logistic costs** comprise monetary costs spent by the PSU that occur in the process of accessing and/or obtaining a payment instrument and initiating or receiving a payment transaction. Specific cost elements under this category are:
- a. **Travel costs** refer to the distance travelled by the payer/payee to get from the place of residence or office to a designated physical point in order to effect (i.e. initiate or receive) an in-person payment transaction.<sup>38</sup> By definition travel costs are not incurred by the payer if the in-person payment transaction is conducted as part of an underlying economic transaction and/or payments are initiated remotely via mail, internet or phone. On the other hand PSUs are likely to incur travel costs for a transaction that involves physical payment instruments (i.e. cash deposits or cash-outs, cheques, and vouchers), assuming this activity has not been outsourced. While the PSU might choose different means of transportation (e.g. walking, cycling, public transportation, personal motor vehicles or other paid forms of transportation such as taxis), irrespective of the explicit monetary travel costs (e.g. fuel costs, the bus ticket and/or the taxi/minivan for the trip), it is recommended that for comparability reasons the distance is chosen as the relevant cost

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<sup>38</sup> In theory, when the trip to a service point for payment purposes is combined with other activities/chores, only the equivalent fraction of the travel costs should be allocated to the payment activity. For practical purposes, though, this framework assumes that the trip is entirely attributed to the payment activity, and as such, the entire travel time is allocated to the payment activity and the payment instrument used in the process.

parameter. Official mileage allowances or equivalent data could be used for the calculation of the travel costs.

- b. **Communication costs** are associated with the supporting activities that affect a payment transaction. The most typical communication costs include data transmission costs (e.g. for internet connectivity or the use of fixed lines) on the payer and the payee side, phone communication costs (voice communication, messaging) and postal charges for regular mail. It is recommended to use country averages for the internet, voice, messaging, and postal fees.

48. **Infrastructure costs** are mainly relevant for businesses and government agencies and cover costs borne in the process of maintaining the existing infrastructure for effecting payments. They include the following specific cost elements:

- a. **Maintenance costs** typically include the infrastructural costs for keeping payment terminals, physical outlets, vaults, and other relevant payment infrastructure (e.g. IT-infrastructure) functioning during the day-to-day operations.
- b. **Depreciation costs** refer to the assets' value that has been reduced. More specifically, they refer to the used value of payment terminals, physical outlets, vaults, and other relevant payment infrastructure (e.g. IT-infrastructure).

49. **Damage costs** are associated with the use of a range of payment instruments and appear in various forms, resulting in losses for the different PSU actors. They are synonymous to risk costs and consist of:

- a. **Error costs** refer to losses typically incurred by businesses and government agencies due to imbalances between cash registers and actual receipts and/or costs associated with losing cheques or vouchers.
- b. **Theft costs** refer to any losses due to extraction of funds from a PSU without consent, and apply to multiple payment instruments.
- c. **Fraud costs** constitute losses of various forms (e.g. counterfeiting, identify theft) and could be associated with banknotes, coins and non-cash payment instruments, to the extent that they are not covered by insurance.
- d. **Insurance costs** include insurance premiums paid against losses associated with different payment instruments.

50. **Production costs** are associated with the primary material used and the procedure followed to produce payment instruments. Production costs refer to the costs associated with printing physical paper forms (e.g. for direct debit transfer mandates, direct credit transfer forms, cheques, and vouchers) and can be incurred by the payee and/or the PSP. The billing process itself is not considered as part of the costs of retail payments, therefore costs for printing invoices are excluded from the production costs.

- a. **Production costs of cash** refers to the costs of obtaining banknotes and coins.
- b. **Production costs of cheques** refer to the costs of obtaining cheques or cheque books.
- c. **Production costs of cards** refer to the costs of obtaining a new payment card or a payment card replacement (in case of loss, theft, or fraud).

51. **Service costs** are fees and charges paid by a PSU to another stakeholder in the retail payment process, in most of the cases to a PSP. They include the following cost elements:

- a. **Periodic fees** refer to fees typically paid by the PSU to the PSP for services and infrastructure components (e.g. POS terminals) provided. They could be variable or fixed, depending on the service, and are paid periodically.
- b. **Per transaction fees** occur when a payment is performed. They can either be fixed fees per transaction, ad valorem fees or a combination of both. Unlike periodic fees, per transaction fees could also be paid from one PSU to another (e.g. surcharges paid by a payer to a payee or discounts for the use of certain payment instruments given by a payee to a payer).
- c. **Fees for services outsourced** refer to fees paid to external actors for services that are not generated in-house (e.g. to cash logistic companies).

52. **Cost of funds** are the losses associated with not holding funds in an interest-bearing account. More specifically, they include:

- a. **Holding costs** refer to losses of interest foregone by not holding funds in an interest-bearing account.
- b. **Float costs** refer to funds that are often not at the disposal of the PSUs (neither the payee nor the payer) for a certain period of time between initiation and receipt of the payment transaction. As such, in this case there is still interest foregone from the payee's perspective, since he does not have immediate access to the funds and as such cannot deposit them in an interest-bearing account.

## II.1. RETAIL PAYMENT COSTS BORNE BY CONSUMERS

53. This section applies the cost methodology to consumers in their role as PSUs (acting as payers for some transactions and payees for others).

### II.1.1. Classification of consumer retail payments by type

54. Payment types (see Table 8) highlight the interaction between consumers and other PSUs while identifying the role of consumers as payer and/or payee. While the use cases per payment type might differ from country to country, the payment types as such should be universally applicable and it can be assumed that at least one use case per payment type exists in every country. Payment types can be grouped according to the role of consumers in the retail payment process, i.e. whether they are acting as payers, payees or both. In the following paragraph, the types of retail payments involving consumers are listed and some typical use cases are mentioned. For a detailed list of use cases the reader is referred to sub-section I.1.4.

**Table 8: Types of retail payments for the demand side**  
(those relevant for consumers highlighted)

Payer \ Payee	Consumer	Business	Government Agency
Consumer	<b>P2P</b>	<b>P2B</b>	<b>P2G</b>
Business	<b>B2P</b>	B2B	B2G
Government Agency	<b>G2P</b>	G2B	G2G
<b>P=Person, B=Business, G=Government</b>			

55. **If both, the payer and the payee are consumers,** the payments are referred to as person-to-person payments.

- a. **Person-to-person (P2P)** payments include transfers of money, without an underlying economic transaction, to support or to make a present to family members/friends (e.g. domestic or international remittances). Payments to other individuals in the social context (e.g., to repay for a shared restaurant bill) also fall into this category. Moreover, P2P payments include the disposition of a persons' own funds (e.g. deposits, withdrawals, and transfers between accounts of one and the same account holder), given that these transactions can be viewed as transactions with oneself. P2P costs should be captured separately for the payer and the payee side of P2P payments.

56. **If only the payer is a consumer,** the relevant use cases can be grouped into P2B and P2G type of retail payments.

- a. **Person-to-business (P2B)** payments include retail payments associated with the purchase of retail goods and services from businesses irrespective of the size of the business and whether the business is formally registered or not. P2B payments include payments for financial services other than payment services (for example insurance), regular transport expenses, utilities and other periodic bills, and consumer durables and consumables. It is important to emphasize that this category also covers individual service providers (e.g. one-person companies and individuals receiving compensation for services rendered) and/or purchases from suppliers not necessarily falling into the category of retailers (e.g. fresh farm product sales). Within an economy a large share of the total volume of retail payments falls into the category of P2B payments. The value per transaction however can vary widely depending on the type of good/service the payment is made for.
- b. **Person-to-government (P2G)** payments include obligations that citizens pay to central, regional and/or local government authorities. Typical use cases include income tax payments and the employee's share of social security contributions (if they are not paid by the employer on behalf of the employee, in which case it would be qualified as a B2G payment) as well as other taxes (e.g. property tax). Fines (e.g. traffic fines), duties, and other types of government collections (e.g. fees for government issued documents like passports or driving licenses) vary significantly across countries and thus should be identified on a country-by-country basis.

57. **If only the payee is a consumer,** the relevant use cases can be grouped into B2P and G2P type of retail payments.

- a. **Business-to-person (B2P)** payments are typically payroll payments to individuals that are employed by the payer, provided the payer is not considered to be a government agency.



Government agency employees are considered part of G2P payments. When it comes to entirely state-owned companies, it will depend on how the payment is made. If the state-owned company pays its employees directly, this would be considered as a B2P payment. If the payroll payments are effected via a ministry or other government agency, they should be treated like payroll payments for government employees (i.e. as G2P payment).

- b. **Government-to-person (G2P)** payments are associated with four main use cases. The two most prominent cases (in terms of volume) are pensions paid to retirees and payroll payments to individuals employed by government agencies (or state-owned enterprises for which the payment is effected via the government agency). Other relevant use cases are the payment of social benefits (often also referred to as cash transfers, even if the underlying payment instrument is electronic) and tax refunds to individuals (applicable in particular for income taxes).

## II.1.2. Identification of the relevant payment instruments and service channels per use case

58. The use cases identified herein represent the typical range of payments initiated and received by consumers, irrespective of the state of economic development of a country and/or its national payment system. However, when conducting the cost study, the use cases should be critically assessed and adapted to country-specific circumstances, as appropriate.

**Table 9: Identification of the payment instruments and service channels relevant to consumers per use case**

Payment type	Consumer's role	Use case	Payment instrument <sup>39</sup>	Service channel <sup>40</sup>
<b>Person-to-person (P2P)</b>	Payer/ Payee	<input type="checkbox"/> Payments made to relatives and/or friends without an underlying economic transaction	<input type="checkbox"/> Cash	<input type="checkbox"/> Point of interaction
		<input type="checkbox"/> Payments in the social context	<input type="checkbox"/> Cheque	<input type="checkbox"/> Payment center
		<input type="checkbox"/> Withdrawals, deposits <input type="checkbox"/> Transfer of funds between own accounts	<input type="checkbox"/> Voucher	<input type="checkbox"/> Agent
<b>Person-to-business (P2B)</b>	Payer	<input type="checkbox"/> Payments for retail goods	<input type="checkbox"/> Debit card	<input type="checkbox"/> Branch
		<input type="checkbox"/> Payments for services	<input type="checkbox"/> Credit card	<input type="checkbox"/> ATM
		<input type="checkbox"/> Payment for financial services	<input type="checkbox"/> Prepaid card	<input type="checkbox"/> Mail
<b>Person-to-government (P2G)</b>	Payer	<input type="checkbox"/> Payments for regular transport expenses	<input type="checkbox"/> Direct credit transfer	<input type="checkbox"/> Internet/ designated lines
		<input type="checkbox"/> Payments for utilities other periodic bills	<input type="checkbox"/> Direct debit transfer	<input type="checkbox"/> Telephone/ mobile network
		<input type="checkbox"/> Payments for consumer durables	<input type="checkbox"/> Mobile money	
<b>Business-to-person (B2P)</b>	Payee	<input type="checkbox"/> Payments of taxes, fines, and fees to government authorities <input type="checkbox"/> Payments for employee's share of social security contributions	<input type="checkbox"/> Online money	
<b>Government-to-person (G2P)</b>	Payee	<input type="checkbox"/> Payments of salaries (by other than government agencies) <input type="checkbox"/> Payments of salaries (by government agencies) <input type="checkbox"/> Payments of pensions <input type="checkbox"/> Payments of social benefits <input type="checkbox"/> Payments of tax refunds		

<sup>39</sup> For every use case the choice of all payment instruments should be given. The same applies for businesses and government agencies.

<sup>40</sup> For every use case the choice of all service channels should be given. The same applies for businesses and government agencies.

59. Once the relevant use cases are identified, the payment instruments that can be used by consumers for the specific use cases should be identified. It is assumed that the entity conducting the cost study knows which payment instruments can, in principal, be used for the identified use cases. If this is not the case, this information should be obtained via desk research, focus group interviews, and/or surveys on the payments behavior of consumers prior to conducting surveys in the context of the cost study.

### II.1.3. Identification of cost elements per payment instrument-service channel combination

60. For every payment instrument identified as relevant for at least one use case, the service channel(s) for the use of that payment instrument and the cost elements associated with the payment instrument-service channel combinations need to be identified. These cost elements can be assigned to each specific payment instrument-service channel combination (see Table 10). Given that in the case of consumers the different cost elements for these combinations are typically the same<sup>41</sup>, irrespective of whether or not the consumer is in the role of the payer or payee, cost elements will not be separately listed in the following.

**Table 10: Matching payment instruments with service channels and cost elements for consumers**

Payment instrument	Payment service channel	Cost element
Cash	<input type="checkbox"/> All service channels <sup>42</sup>	Transaction time
		Error costs
		Theft costs
		Fraud costs
		Holding costs
		Production costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
		Per transaction fees
Cheque	<input type="checkbox"/> All service channels <sup>43</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Production costs
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
		Per transaction fees
	<input type="checkbox"/> Mail	Travel time
		Waiting time
		Travel costs
		Communication costs

<sup>41</sup> While the cost elements are likely the same in nature, their size might differ depending on the role of the consumer as payer or payee.

<sup>42</sup> These include point of interaction, payment center, agent outlet, branch, and ATM.

<sup>43</sup> These include point of interaction, payment center, agent outlet, branch, ATM, and mail.

Payment instrument	Payment service channel	Cost element
<b>Voucher</b>	<input type="checkbox"/> All service channels <sup>44</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Per transaction fees
		Holding costs
		Production costs
	<input type="checkbox"/> Payment center	Travel time
		Waiting time
		Travel costs
<b>Debit card</b> <b>Credit card</b> <b>Prepaid card</b>	<input type="checkbox"/> All service channels <sup>45</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Production costs
		Periodic fees
		Per transaction fees
		Holding costs (in case of prepaid cards)
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
	<input type="checkbox"/> Internet/designated lines <input type="checkbox"/> Telephone/mobile phone network	Communication costs
<b>Direct debit transfer</b> <b>Direct credit transfer</b>	<input type="checkbox"/> All service channels <sup>46</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Production costs
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM <input type="checkbox"/> Internet/designated lines <input type="checkbox"/> Telephone/mobile phone	Float costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
	<input type="checkbox"/> Internet/designated lines	Communication costs

<sup>44</sup> These include point of interaction and payment center.

<sup>45</sup> These include point of interaction, payment center, agent outlet, branch, ATM, Internet/designated lines, and telephone/mobile phone network.

<sup>46</sup> While direct credit transfers and direct debit transfers are mainly remote payment instruments, they are used in a number of payment markets at the point of interaction too. Probably the most prominent example is ELV in Germany, which initiates a direct debit transfer by using the card at the point of interaction.

Payment instrument	Payment service channel	Cost element
	<input type="checkbox"/> Telephone/mobile phone network	
Mobile money	<input type="checkbox"/> All service channels <sup>47</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Periodic fees
		Per transaction fees
	Holding costs	
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Telephone/mobile phone network	Communication costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent	Travel time
Waiting time		
Travel cost		
Online money	<input type="checkbox"/> All service channels <sup>48</sup>	Transaction time
		Reconciliation time
		Communication costs
		Error costs
		Theft costs
		Fraud costs
		Periodic fees
		Per transaction fees
		Holding costs

#### II.1.4. Sample selection and survey design for consumers

61. Once the relevant cost elements per payment instrument have been identified, primary data on the overall frequency of the different use cases, the relevance of the different payment instruments per use case (in terms of volume and value) and the value of cost elements associated with a payment instrument needs to be identified via a consumer survey. Consumers are asked to report their payments for a “typical month”. This implies that the consumer disregards seasonality effects which could influence payment behavior during certain times, e.g. holiday season spending or even unusual spending within a week.

62. The involvement of a professional market research firm or institute at this stage is recommended in order to ensure accurate results and reliable and representative data to the largest possible extent.

63. **Mode:** Personal interviews<sup>49</sup> at the residence of the respondent, are ideal, as they increase the accuracy of information collected, reduce non-response rates, and make it easier for interviewers to probe, whenever necessary. The duration of the interview can range between 30 and 75 minutes, depending on the respondent and the number of payment instruments covered. Alternatively, in the case of budget limitations and difficulties to reach certain areas physically, telephone interviews should be considered. Incentive schemes (e.g. cash, gift cards, mobile phone credits, vouchers) can increase

<sup>47</sup> These include point of interaction, payment center, agent outlet, and telephone/mobile phone network.

<sup>48</sup> These include Internet/designated lines and telephone/mobile phone network.

<sup>49</sup> Also referred to as “in-person interviews” in the literature.

response rates among consumers, regardless of the mode used, but at the same time add to the cost of the survey and might therefore not always be feasible.

64. **Structure:** The survey collects individual payment information and as such, the respondent provides information for payments he/she initiates or receives, rather than payment information for the entire household. The questions in the consumer survey should be designed to best capture cost elements per single transaction depending on the payment instrument used. By doing so the other important parameters that affect costs such as payment type, payment purpose, and payment transmission method/service channel, are taken into consideration. In order to capture all the relevant cost data identified in the framework, the consumer questionnaire can be structured into three main sections. The first section covers questions on the volume and value of retail payments (received and initiated), based on use cases, payment instruments and transmission methods/service channels. The breakdown of payments by use case should make it easier for consumers to recall the number of payments they receive and initiate. The second section focuses exclusively on the cost elements. Specifically, once the volume of payments (as well as the breakdown by use case, instrument and transmission method) has been captured, the next step is to capture the individual cost elements associated with using specific payment instruments and transmission methods. For this section, respondents are requested to provide their perception, since it is impossible for them to have an accurate estimate, especially for time-based costs. The third section covers socio-demographic data (e.g. age, gender, education, employment status, card ownership, access to transaction accounts, etc.). The intent is to use the socio-demographics for regression analysis, tabulations, as well as for extrapolation purposes to the entire population of the implementing country. See a list of sample questions in Box 2 (please note that the terminology has been slightly adapted in order to simplify the questionnaire compared to the methodology, depending on the country specifics further adaptations in terminology are likely to be needed).

65. Apart from the generally accepted factors in social science determining the survey design, there are some factors that are specific to the cost study. Selecting the sampling technique is one of the most important steps in designing the survey. The sampling technique will play a significant role in determining the appropriate size of the sample necessary to obtain accurate results.

66. **Sampling:** Stratification is the recommended technique and the most cost efficient way of choosing the sample, conducting the survey, and achieving national representativeness. Regardless of the country implementing the survey, certain factors (e.g. margin of errors) can be determined in advance, while other factors, such as expected non-response rate, will vary by country. These are all factors that affect the derivation of a precise sample size, and as such, a sample size for the survey cannot be pre-determined but rather has to be specified on a country by country basis. However, the sampling technique plays a major role in determining the quality of the survey, rather than the sample size itself. Thus, if countries use the same sampling technique, results can still be compared regardless of the exact sample size used. For reference, global surveys such as the Findex normally use sample sizes that range between 500 and 1,000 respondents, for most countries, while for large countries such as China and India, the sample reaches 2,000 respondents.<sup>50</sup>

67. **Sampling Frame:** The target population, the population from which the actual sample is selected, is usually the entire civilian, non-institutionalized population, aged 15 years and older. If a country desires to exclude certain regions from the sampling frame because they are difficult to access in terms of security

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<sup>50</sup> For more on the methodology used in Global Findex, see: <http://www.worldbank.org/en/programs/globalfindex/methodology>

or geographic reasons, this should be considered when making assumptions on the national representativeness.

### Box 1: Selected sample questions for the consumer survey

#### Section 1: Volume and Value of Payments

1. In a typical month, do you RECEIVE at least one transfer of funds from relatives and/or friends without exchanging goods/services?

☐ Yes ☐ No

*If "yes", proceed with the following questions, otherwise continue with the next use case.*

2. What is the average transaction value of this type of payment? \_\_\_\_\_ local currency

3. How often do you receive these payments in a typical month? \_\_\_\_\_ times

4. What is the payment instrument(s) via which you receive transfer?

☐ Cash ☐ Credit transfer ☐ Mobile money

5. How many of those payments do you receive via the following service channels?

Branch \_\_\_\_\_ Agent \_\_\_\_\_ Internet \_\_\_\_\_ Phone \_\_\_\_\_

Answers in: ☐ Number ☐ Percentage

#### Section 2: Cost Elements of Payments

1. When you visit the following service points, how long does it typically take you to get there? Please answer in minutes.

Branch \_\_\_\_\_ ATM \_\_\_\_\_ Agent \_\_\_\_\_ Payment center \_\_\_\_\_

2. When you visit the following service points, how far do you typically need to get travel? Please answer in kilometers.

Branch \_\_\_\_\_ ATM \_\_\_\_\_ Agent \_\_\_\_\_ Payment center \_\_\_\_\_

3. How much do you typically pay in fees when you cash-out from the following service points? Please answer in local currency.

Branch \_\_\_\_\_ ATM \_\_\_\_\_ Agent \_\_\_\_\_

4. How long (in minutes) does it take, on average, to initiate a payment via one of the following payment instruments - from the moment you start inserting in the data until the payment has been completed?

Debit card \_\_\_\_\_ Credit card \_\_\_\_\_ Direct credit transfer \_\_\_\_\_ Mobile money \_\_\_\_\_

#### Section 3: Socio-demographic Data

1. Do you have access to an account via which you can make and receive payments? ☐ Yes ☐ No

2. Do you personally use internet banking? ☐ Yes ☐ No

3. What is your age? \_\_\_\_\_

4. What is your level of education?

☐ None ☐ Primary school ☐ Secondary school ☐ Vocational school

☐ University (Bachelor's degree) ☐ Post University (Master's, Doctoral, Post-Doctoral degree) ☐ Other ☐ No response

68. **Stratification:** It is recommended that the initial phase of stratification results in the creation of two main strata: urban and rural. As a second step, the urban and rural strata can be further stratified separately by district/region, and finally, the districts can be sub-divided into census enumeration areas.

69. **Selection of Units:** There are two different ways a researcher could draw enumeration areas (and thus households) from the different districts. The first one is the so-called probability proportional to sample size whereby the number of households to be surveyed from each district is derived as follows: the percentage of the population represented in each district will also be used as the percentage of sampled households (from entire sample) for the respective district. The second way uses a disproportionate sample in terms of probability. Specifically, the population distribution does not matter, but rather, enumeration areas are chosen in a random order (e.g. every fifth enumeration area). Then, households are chosen from the selected enumeration areas (typically an equal number of households for each enumeration area), and eventually, individual respondents from the households. In order to maximize the quality of information obtained, the person with the highest frequency of payments could be selected for the interview, or to further enhance statistical accuracy, the respondent can be chosen randomly.

**Table 11: Cost data to be captured during the consumer survey**

Cost category	Cost element	Cost item
<b>Time costs</b>	Travel time	Time in minutes (for one direction)
	Waiting time	Time in minutes (per visit)
	Transaction time	Time in minutes (per visit)
	Reconciliation time	Time in minutes (per week)
<b>Logistic costs</b>	Travel costs	Distance in linear dimension unit (for one direction)
	Communication costs	Costs in currency unit (per transaction)
<b>Damage costs</b>	Error costs	Costs in currency unit (for the last month)
	Theft costs	Costs in currency unit (for the last month)
	Fraud costs	Costs in currency unit (for the last month)
<b>Production costs</b>	Issuing costs of cheques	Costs in currency unit (per cheque)
	Issuing costs of cards	Costs in currency unit (per card)
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period)
	Per transaction fees	Costs in currency unit <b>or</b> as percentage of the value (per transaction)
<b>Cost of funds</b>	Holding costs	Amount of average cash, voucher and e-money holding
	Float costs	Time between debiting payment initiation by payer and the credit date of the amount to the payee (only if consumer is payee)

## II.1.5. Calculation and reporting of retail payment costs for consumers

70. Before the data analysis, it is important to examine the data for missing and ineligible entries. For the latter part, having a designated program for data entry can help to filter out any ineligible entries or data beyond the specified range. It is often the case that the top and bottom one percent of data are removed from the final data set in order to capture outliers. In terms of missing data, that can either be treated as such during the analysis phase (since most data analysis software recognize missing data) or be imputed using data imputation techniques (e.g., substituting the missing values with the average of the existing values).

71. Most of the data pertaining to costs borne by consumers are direct and variable costs and can be allocated upfront to single transactions (e.g. travel time, waiting time, and transaction time) for

consumers in their role as payer and/or payee. However, data for some cost elements will be obtained per period (e.g. on a weekly, monthly, or annual basis) rather than on a per transaction basis. These are mainly indirect and fixed costs such as fees associated with the underlying transaction account and/or payment instruments (e.g. annual fees for opening and maintaining a transaction account, reconciliation time per month). Upon data analysis, though, these cost elements will be allocated to single payment transactions using transaction volume as the main allocation key, in order to create a common basis. Since transaction volume data will be available from the consumer survey, indirect and fixed costs can then be divided by the volume of payment transactions (per period) across payment instruments, use cases, and service channels.<sup>51</sup>

72. The average monetary value per cost element will be calculated from the data obtained via the consumer survey. If these cost elements are direct costs per transaction, they should be added up for every use case and multiplied by the number of payments initiated/received by the average consumer per annum per use case. For indirect costs, appropriate multipliers need to be identified and used, rather than simply applying the number of transactions (e.g. a time factor). The relevant cost data obtained via the consumer survey should be complemented and/or quality checked against supply side data available via secondary sources (e.g. price databases, price sheets from the PSP, etc.).

73. Once all cost elements are expressed per payment, they can all be summed up, as a first step, in order to report the cost associated with a single use case payment, the instrument and the service channel through which it has been received or initiated (e.g. a single payment in cash performed at the point of interaction for the purchase of goods). As a second step, the per payment cost figures can be multiplied by the annual volume figures in order to generate estimated annual cost figures associated with the different payment instruments and payment purposes, for the payer and the payee, separately. If a cost is a resource or a transfer cost does not matter as such to the consumer, since it is still borne by them. The differentiation is important for calculating the total costs to the economy.

74. As such, this approach allows the understanding and reporting of cost results on two bases: firstly, on a structural per payment basis, for a single payment purpose, the instrument and the service channel associated with it; and secondly, on an annual basis, for all annual transactions for a specific payment purpose, using a specific payment instrument and transmission method.

75. Particular emphasis should be placed on quality control procedures. Internal control procedures should occur in order to detect potential mismatches and inconsistencies in the data captured in the surveys. Moreover, given the unique nature of cost data and potential measurement errors, external sources should also be used in order to compare and validate the survey data. For instance, annual financial reports, central bank data, prior cost surveys (if any), private sector reports, to mention a few, are examples of external sources that could be used for quality control. In addition, sensitivity analysis is of equal importance in order to see how sensitive the results are to certain assumptions. Quality control procedures and sensitivity analysis should be performed for the data gathered for each stakeholder, on the demand and supply side.

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<sup>51</sup> For this methodology, it is assumed that the cost function associated with the different payment instruments is linear (on volume), and therefore, dividing by the volume will lead to equal cost allocation across payments.



**Table 12: Calculation of the monetary value per single cost element for consumers**

Cost category	Cost element	Calculation of the monetary value cost per cost element, consumer and year
<b>Time costs</b>	Travel time	Wage per minute * Time in minutes * 2 (directions) * number of transactions per annum
	Waiting time	Wage per minute * Time in minutes * number of transactions per annum
	Transaction time	Wage per minute * Time in minutes * number of transactions per annum
	Reconciliation time	Wage per minute * Time in minutes * 52 (weeks)
<b>Logistic Costs</b>	Travel costs	(Costs in currency unit or distance in linear dimension unit * mileage allowance) * 2 (directions) * number of transactions per annum
	Communication costs	Costs in currency unit (per transaction) * number of transactions per annum
<b>Damage costs</b>	Error costs	Costs in currency unit * 12 (months)
	Theft costs	Costs in currency unit * 12 (months)
	Fraud costs	Costs in currency unit * 12 (months)
<b>Production costs</b>	Issuing costs of cheques	Costs in currency unit (per cheque) * number of transactions per annum
	Issuing costs of cards	Costs in currency unit (per card) / validity of the card in years
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period) * number of periods per annum
	Per transaction fees	Costs in currency unit * number of transactions per annum or Percentage * average value (per transaction) * number of transactions per annum
<b>Cost of funds</b>	Holding costs	Amount in currency unit of average cash, voucher or e-money holding * average interest rate
	Float costs	Number of days (between initiation by payer and crediting of funds on payee's transaction account) * average interest rate per day * transaction amount in currency unit

## II.2. RETAIL PAYMENT COSTS BORNE BY BUSINESSES

76. This section applies the cost methodology to businesses as one category of the PSU, in their role as payers and/or payees. Specifically, it does so by guiding the reader through the steps of identifying the relevant payment types and use cases for businesses and linking them to the respective service channels and payment instruments.

### II.2.1. Classification of business retail payments by type

77. Payment types highlight the interaction between businesses and other PSUs, while identifying the role of businesses as payer and/or payee. While the use cases per payment type might differ from country to country, the payment types as such should be universally applicable and it can be assumed that at least one use case per payment type exists in every country. Payment types can be grouped according to the role of businesses in the retail payment process, i.e. whether they are acting as payers, payees or both. In the following paragraph, the different types of retail payments involving businesses are listed and some typical use cases are mentioned. For a detailed list of use cases the reader is referred to sub-section II.2.2.

**Table 13: Types of retail payments for the demand side**  
(those relevant for businesses highlighted)

Payer \ Payee	Consumer	Business	Government Agency
Consumer	P2P	<b>P2B</b>	P2G
Business	<b>B2P</b>	<b>B2B</b>	<b>B2G</b>
Government Agency	G2P	<b>G2B</b>	G2G
P=Person, B=Business, G=Government			

78. **If one business is in the role of the payee and another one in the role of the payer**, these payments are referred to as Business-to-Business (B2B) payments.

- a. **Business-to-business (B2B) payments** are generally characterized by a large number of transactions on a daily-basis, ranging from large-value payments associated with large inter-industry transactions (which are not in focus of this methodology), to low-value payments between small, medium and large-sized enterprises. Typically, payments for procurement of consumable goods, supply chain products and professional services are included under retail payments as defined by this methodology. In addition, the B2B category includes payments for regular transport expenses, payments for utilities and other periodic bills, and payments for financial services (including insurance). The reorganization of a business' own funds, e.g. deposits of cash and cheques, the supply of change, and transfers of funds between businesses' own accounts, can be considered as B2B payments too.

79. **If only the payer is a business**, the relevant use cases can be grouped into B2P and B2G type of retail payments:

- a. **Business-to-person (B2P) payments** are normally characterized by a large number of transactions of relatively small value. They typically involve periodic transactions in compensation for the work rendered by employees, i.e. payrolls (wages, salaries, and incentives).<sup>52</sup>
- b. **Business-to-government (B2G) payments** are typically periodic payments, usually characterized by a large number of transactions of varying value. B2G payments typically include corporate tax payments (e.g. income taxes, sales taxes and value-added taxes), fees for government services (e.g. company registration; permits, etc.), penalties paid by businesses (e.g. fines, etc.) and employer's share of social security contributions. In a lot of countries it is also the responsibility of the employer to pay the employee's income tax and social security contribution directly to the government agency. These transactions would be considered as B2G payments too.

80. **If only the payee is a business**, the relevant use cases can be grouped into P2B and G2B type of retail payments:

- a. **Person-to-business (P2B) payments** are characterized by large volumes and varying values (depending on the type of good/service the payment is made for). They typically involve payments for retail goods and services, payments for regular transport expenses, payments for utilities and other periodic bills (e.g. utility bills, rent, etc.), financial services (including insurance) and payments for consumer durables (e.g. electronics, furniture, etc.). It is important to emphasize that this category also covers payments to individuals acting as entrepreneurs (e.g. one-person

<sup>52</sup> Large, state-owned enterprises (e.g. electricity or water distribution companies), unless they are now separate entity but rather part of a Ministry, are also treated as businesses for the purpose of this framework.

companies and individuals receiving compensation for services rendered) and/or purchases from suppliers not necessarily falling into the category of retailers (e.g. fresh farm product sales) and to public sector enterprises which are not considered as government agencies.

- b. **Government-to-business (G2B) payments** are characterized by a large number of transactions with average value varying widely, ranging from large-value procurement contracts (which are not considered within this methodology) to low-value payments falling into the retail payments category. Specifically, they include payments made by the government (procurement) to the private sector for consumable goods (e.g. stationery) and capital goods (e.g. equipment, computers, etc.), services (e.g. cleaning, maintenance, professional services, etc.), transport expenses (e.g. travel expenses, gasoline, etc.), and periodic bills (e.g. utility bills, rent, etc.). G2B payments can also be the result of corporate tax refunds and – although not in scope of this analysis – the disbursement of loans, subsidies or business assistance provided to the private sector. For cases in which government agencies, or quasi-government organizations, are “acting like a business” (including all procurement related payments of government agencies), they should be included into the “business” category. This is especially true when the government agency’s accounts and payment mechanisms are entirely separate from those of the government accounting.

## II.2.2. Identification of the relevant payment instruments and service channels per use case

81. The use cases identified aim to represent typical payments initiated and received by businesses, irrespective of the state of economic development of a country and/or its national payment system. However, when conducting an actual cost study, the use cases should be critically assessed and adapted, as appropriate, to the country-specific situation.

**Table 14: Identification of the payment instruments relevant to businesses per use case**

Payment type	Role	Use case	Payment instrument <sup>53</sup>	Service channel <sup>54</sup>
<b>Business-to-business (B2B)</b>	Payer/ Payee	<input type="checkbox"/> Payments for procurement of consumable goods <input type="checkbox"/> Payments for procurement of supply chain products and professional services <input type="checkbox"/> Payments for regular transport expenses <input type="checkbox"/> Payments for utilities and other periodic bills <input type="checkbox"/> Payments for financial services (including insurance) <input type="checkbox"/> Deposits of cash receipts and cheques, supply of change, and transfer of funds between own accounts	<input type="checkbox"/> Cash <input type="checkbox"/> Cheque <input type="checkbox"/> Voucher <input type="checkbox"/> Debit card <input type="checkbox"/> Credit card	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM
<b>Person-to-business (P2B)</b>	Payee	<input type="checkbox"/> Payments for retail goods <input type="checkbox"/> Payments for services <input type="checkbox"/> Payment for financial services (including insurance) <input type="checkbox"/> Payments for regular transport expenses <input type="checkbox"/> Payments for utilities and other periodic bills <input type="checkbox"/> Payments for consumer durables	<input type="checkbox"/> Prepaid Card <input type="checkbox"/> Direct credit transfer	<input type="checkbox"/> Mail <input type="checkbox"/> Internet/ designated lines <input type="checkbox"/> Telephone/ mobile network
<b>Government-to-business (G2B)</b>	Payee	<input type="checkbox"/> Payments of corporate tax refunds		
<b>Business-to-person (B2P)</b>	Payer	<input type="checkbox"/> Payments of salaries (by other than government agencies)		

<sup>53</sup> For every use case the choice of all payment instruments should be provided. The same applies for businesses and government agencies.

<sup>54</sup> For every use case the choice of all service channels should be provided. The same applies for businesses and government agencies.

Payment type	Role	Use case	Payment instrument <sup>53</sup>	Service channel <sup>54</sup>
<b>Business-to-government (B2G)</b>	Payer	<input type="checkbox"/> Payments of taxes, fines, fees, and other obligations to regional and central government authorities <input type="checkbox"/> Payments for employer's share of social security contributions	<input type="checkbox"/> Direct debit transfer <input type="checkbox"/> Mobile money <input type="checkbox"/> Online money	

82. Once the relevant use cases have been identified, those payment instruments which can be used by businesses for the specific use cases should be identified. It is assumed that the entities implementing the methodology know which payment instruments can be used for the identified use cases. If this is not the case, this information should be obtained via information gathering efforts prior (e.g. focus group discussions or consultation of business associations) to the launch of the cost of retail payments business survey.

### II.2.3. Identification of cost elements per payment instrument- service channel combination

83. For every payment instrument identified as relevant for at least one use case, the service channel(s) available for the use of that payment instrument, and the cost elements associated with those payment instrument-service channel combinations need to be identified. Depending on the service channel, the payer and the payee may face different cost elements. These cost elements can be assigned to each specific payment instrument-service channel combination (see Table 15). For businesses, the cost elements typically are different depending on whether or not the business is in the role of the payer or payee. Therefore, unlike for consumers, separate analysis of the two roles is provided.

**Table 15: Matching payment instruments with service channels and cost elements for businesses in their role as payers**

Payment Instrument	Payment service channel	Cost element
<b>Cash</b>	<input type="checkbox"/> All service channels <sup>39</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Holding costs
	<input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
<b>Cheque</b>	<input type="checkbox"/> All service channels <sup>43</sup>	Per transaction fees
		Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Production costs of cheques
		Periodic fees
		Per transaction fees

Payment Instrument	Payment service channel	Cost element
	<input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM <input type="checkbox"/> Mail	Travel time
		Waiting time
		Travel cost
		Communication costs
	<input type="checkbox"/> Mail	
<b>Debit card</b>  <b>Credit card</b>  <b>Prepaid card</b>	<input type="checkbox"/> All service channels <sup>45</sup>	Transaction time
		Reconciliation time
		Production costs of cards
		Error costs
		Theft costs
		Fraud costs
		Periodic fees
		Per transaction fees
		Holding costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
		Communication costs
	<input type="checkbox"/> Internet/designated lines	
<b>Direct debit transfer</b>  <b>Direct credit transfer</b>	<input type="checkbox"/> All service channels <sup>45</sup>	Transaction time
		Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Travel time
		Waiting time
		Travel costs
	<input type="checkbox"/> Internet/designated lines	Communication costs
<b>Online money</b>	<input type="checkbox"/> All service channels <sup>48</sup>	Transaction time
		Reconciliation time
		Communication costs
		Error costs
		Theft costs
		Fraud costs
		Periodic fees
		Per transaction fees
		Holding costs

**Table 16: Matching payment instruments with service channels and cost elements for businesses in their role as payees**

Payment instrument	Payment service channel	Cost element
Cash	<input type="checkbox"/> All service channels <sup>55</sup>	Reconciliation time
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Branch <input type="checkbox"/> Agent	Travel time
		Waiting time
		Transaction time
		Operations time
		Travel costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Maintenance costs
		Depreciation costs
		Periodic fees
		Per transaction fees
		Holding costs
Cheque Voucher	<input type="checkbox"/> All service channels <sup>43</sup>	Reconciliation time
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> Mail	Travel time
		Waiting time
		Transaction time (depositing)
		Travel costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Maintenance costs
		Depreciation costs
		Periodic fees
		Per transaction fees (discounts)
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	Transaction time
		Float costs
Debit card Credit card Prepaid card	<input type="checkbox"/> All service channels <sup>45</sup>	Reconciliation time
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Branch <input type="checkbox"/> Agent	Float costs
		Transaction time
		Operations time
		Communication costs
		Maintenance costs
		Depreciation costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs

<sup>55</sup> These include point of interaction, payment center, agent outlet, and branch.

Payment instrument	Payment service channel	Cost element
		Periodic fees
		Per transaction fees
<b>Direct debit transfer</b>  <b>Direct credit transfer</b>	<input type="checkbox"/> All service channels <sup>45</sup>	Reconciliation time
		Fees for services outsourced
		Float costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Branch <input type="checkbox"/> Agent <input type="checkbox"/> Internet/designated lines <input type="checkbox"/> Telephone/mobile phone network	Transaction time
		Operations time
		Maintenance costs
		Depreciation costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Point of interaction	Production costs of direct credit transfer
	<input type="checkbox"/> Internet/designated lines	Maintenance costs
<b>Mobile money</b>	<input type="checkbox"/> All service channels <sup>47</sup>	Reconciliation time
		Periodic fees
		Per transaction fees
		Fees for services outsourced
		Float costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Branch <input type="checkbox"/> Agent <input type="checkbox"/> Telephone/mobile phone network	Transaction time
		Operations time
		Communication costs
		Maintenance costs
		Depreciation costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
	<input type="checkbox"/> Point of interaction	Transaction time
<b>Online money</b>	<input type="checkbox"/> All service channels <sup>48</sup>	Transaction time
		Reconciliation time
		Operations time
		Communication costs
		Maintenance costs
		Depreciation costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Periodic fees
		Per transaction fees
		Fees for services outsourced
		Float costs

#### II.2.4. Sample selection and survey design for businesses

84. Once the cost elements per payment instrument have been identified, primary data on the relevance of the different use case/payment instrument combinations (in terms of volume) and the monetary value of those cost elements can be obtained via a business survey. Depending on the country context, business data may be sensitive and businesses may be reluctant to provide the necessary level of detail to government authorities or certain external parties, in which case a neutral third party (e.g. a market research firm or institute) might be perceived as ensuring a higher degree of confidentiality. In countries with a high degree of formality and/or in the case of large enterprises/headquarters, it might on the contrary be helpful if an authority (e.g. the central bank) is directly involved in approaching the business and/or even conducting the interview.

85. **Mode:** Business surveys on the cost of payment instruments are ideally conducted through personal interviews with business representatives responsible for finance and payments of the specific business. In addition to personal interviews, additional options and/or a combination thereof should be offered to business (telephone, paper-based, and online interviews). Depending on the business size, information might not be readily available for which reason follow ups contacts are likely to be needed. Upon data analysis, branches that are part of an establishment or chain should be treated as individual stores for sampling purposes, and the data for those stores are extrapolated in the same way as for single store businesses. However, in addition to the branches, head-offices should be interviewed too, in order to complement information which is not known to branch level staff (e.g. functions that are handled centrally). Headquarter level information will also be an important quality control, when extrapolating the individual branch level results. The length of the interview should not exceed one hour. In order to reduce the response burden for businesses, they can be invited to share relevant raw data (e.g. cash register data), based on which the researchers are helping them to complete the survey. Incentives for businesses to participate could be personalized letters, e.g. signed by a high-ranking central bank representative, the possibility to attend webinars or dissemination events for the presentation of the results, (in case of independent business owners) the possibility to win a prize, and/or the possibility have their business listed in the acknowledgement of the report.

86. **Structure:** The questionnaire for businesses can be structured in three sections. The first section asks for aggregate data on the distribution of payment transactions initiated and received (based on volume and value) by instrument, use case, and service channel. The second section focuses on cost elements associated with the different payment instruments, separated based on the flow of payments (cost elements that are unique to payment transactions initiated, cost elements that are unique to payment transactions received, and cost elements that are common to both). The third section captures other business-specific information (not related to payments) such as turnover, number of branches, etc., which are useful for extrapolation and analytical purposes. See a list of sample questions in Box 2.

87. **Sampling:** It is recommended that countries use the stratification technique in the process of drawing the sample of businesses to be surveyed. Stratification ensures proper representation of important sub-groups, which if left to randomness, might be left out of the sample. Moreover, stratification results in a cost efficient way of drawing the sample, as compared to using a randomly drawn sample. The most important rule in the process of stratification is that strata should be divided in a way that heterogeneity is observed among them while there is homogeneity within them. The main stratification criteria for businesses include: industry, size (number of employees or annual turnover), and geographic location. In the following paragraphs, the three main steps in this process are described.



88. **Sampling Frame:** Authorities typically have access to a database or an official business register, which contains data for all registered businesses, based on industry, location, number of employees, and other information. Most business surveys use the business register as the main sampling frame to draw the sample from, and it is recommended that implementers do the same for the purpose of this survey. In the absence of a business register or access to it, the implementing entity will need to obtain the relevant data from alternative sources, e.g. from business associations. The main drawbacks of business registers are that they might not be up to date and that the register would not capture the self-employed and sole proprietors that are not registered. The former drawback is offset by the fact that they constitute the most inclusive readily available sampling frame. The latter, the potential absence of the self-employed, merits special attention, particularly in cases where the self-employed play a significant role in the economy. It should therefore be thoroughly considered how to capture data for the sampling of self-employed appropriately, e.g., via their special interest groups. Moreover, to further validate the register, random checks could be made by calling businesses in order to verify in advance if they are still active. It is hard to specify in advance the sample size, given that it will depend on country specific factors. However, for reference, the Enterprise Surveys conducted by the World Bank around the world in order to capture private business data uses a sample size which starts from a minimum of 120 businesses and reaches almost 2,000 businesses.<sup>56</sup>

89. **Stratification:** For business surveys, it is recommended that stratification is performed at three levels, starting at the industry level. Once the relevant industries assigned to capture and collect data from<sup>57</sup> have been identified, the sampling frame can be divided into the applicable industry strata. Secondly, each industry stratum can be further divided into businesses based on size, using the number of employees as the basis for grouping them into single-member, small size, medium size, and large size enterprises. The thresholds for the classification into small, medium, and large size will depend on country specific circumstances. Another alternative could be to use the level of annual turnover to classify businesses. Thirdly, each industry stratum could also be stratified based on geographic location within the country. This last stratification criterion is particularly useful for capturing a geographically diverse set of SMEs, given that large industries are typically concentrated in certain areas of a country.

90. **Selection of units:** The units of interest in this case are the businesses that will be surveyed. An important step in the process, in addition to the stratification, is the allocation of units among the different strata. In general, it is recommended that the probability proportional to sample size for the allocation of units among the strata is used. That is, the percentage of the businesses represented in each stratum will reflect the percentage that businesses with those specific characteristics correspond to in the “true population” of businesses. Other alternatives could be used for countries with unique business ecosystems.

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<sup>56</sup> For more on the methodology used in the Enterprise Surveys of the World Bank, see: <http://www.enterprisesurveys.org/methodology>

<sup>57</sup> To facilitate the pre-identification of key businesses/ industries and characterize the inter-industry trade at the country level, the National Income and Products Accounts (NIPAs) may be considered. NIPAs broadly involve: i) input-output accounts, which capture the intermediate inputs (energy; raw materials; semi-finished goods and services) consumed by industries in producing its gross output; ii) the GDP by industry accounts, which provide an industry-by-industry breakout of GDP and therefore its contribution to the economy. Thus, these widely used accounts provide statistics on industries, their interaction with each other and the roles they play in the economy.

## Box 2: Sample questions that can be asked during the business survey

### Section 1: Volumes, Values, and Distribution of Payment Transactions Initiated and Received

1. How many transactions have you RECEIVED with each payment instrument over the past fiscal year for [insert use case]? What was the average value per transaction by payment instrument?

Payment instrument	Number of transactions	Minimum transaction value	Maximum transaction value
Cash			
Cheque			
Voucher			
Debit card			
Credit card			
Prepaid card			
Direct debit transfer			
Direct credit transfer			
Mobile money			
Online money			
Total			

### Section 2: Cost Elements of Payments

1. How long does it take to accept a payment at the point of interaction: from the time you announce the amount until the transaction has been completed? Please estimate in minutes/seconds per transaction.

Cash      Cheque      Voucher      Debit card      Credit card      Prepaid card      Mobile money

\_\_\_\_\_

2. How much does your business pay in charges/fees to banks for depositing cash per month?

\_\_\_\_\_ (in local currency)

3. On average, how much do you pay monthly for communication charges associated with the acceptance of the following payment instruments at the point of interaction?

Debit cards      Credit cards      Mobile money

\_\_\_\_\_

### Section 3: Business Information

1. Company name (optional): \_\_\_\_\_

2. Contact person (optional): \_\_\_\_\_

3. Number of full time employees: \_\_\_\_\_ part time employees: \_\_\_\_\_

4. Average hourly salary paid over the past fiscal year per employee \_\_\_\_\_ (in local currency).

5. Average hourly salary paid over the past fiscal year per employee involved in accepting/initiating payments \_\_\_\_\_ (in local currency).

**Table 17: Data to be covered during the business survey**

Cost category	Cost element	Data to be obtained in the course of the business survey
<b>Time costs</b>	Travel time	Time in minutes (for one direction)
	Waiting time	Time in minutes (per visit)
	Transaction time	Time in minutes (per visit)
		Time in seconds (per payee)
	Reconciliation time	Time in minutes (per business day)
	Operations time	Time in minutes (per business day)
<b>Logistic costs</b>	Travel costs	Distance in linear dimension unit (for one direction)
	Communication costs	Costs in currency unit (per transaction)
<b>Infrastructure costs</b>	Depreciation costs	Costs in currency unit (per period)
	Maintenance costs	Costs in currency unit (per period)
<b>Damage costs</b>	Error costs	Costs in currency unit (for the last month)
	Theft costs	Costs in currency unit (for the last month)
	Fraud costs	Costs in currency unit (per period)
	Insurance costs	Costs in currency unit (per period)
<b>Production/issuing costs</b>	Issuing costs of cheques	Costs in currency unit (per cheque)
	Issuing costs of cards	Costs in currency unit (per card)
	Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit (per paper-based payment instrument)
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period)
	Per transaction fees	Costs in currency unit or as percentage of the value (per transaction)
	Fees for services outsourced	Costs in currency unit (per period)
<b>Cost of funds</b>	Holding costs	Amount of average cash and e-money holding
	Float costs	Time between debiting payment initiation by payer and the credit date of the amount (only if business is payee)

#### II.2.5. Calculation and reporting of retail payment costs for businesses

91. While most of the cost elements in the consumer sample questions are captured per single payment transaction, the nature of costs for businesses is such that the majority of cost elements will be reported per period. Indeed, service costs, reconciliation time, and fraud, only to mention some, constitute major costs borne by businesses which are typically recorded on a daily, weekly, monthly or annual basis.

92. Similarly as in the case of consumers, a two-step analysis process needs to be followed here. Upon data analysis, the cost elements reported per period will still need to be disaggregated to the per transaction level. By doing so, cost elements will be allocated to single payment transactions using transaction volume as the main allocation key, in order to create a common basis. Since transaction volume data will be available from the business survey, indirect and fixed costs can then be divided by the

volume of payment transactions (per period) across payment instruments, use cases, and service channels.<sup>58</sup>

93. The average monetary value per cost element will be calculated from the data obtained via the business survey. If these cost elements are direct costs per transaction, they should be totaled for every use case and multiplied by the number of payments initiated/received by a business per annum per use case. For indirect costs, appropriate multipliers need to be identified and used, rather than simply applying the number of transactions (e.g. a time factor). The relevant cost data obtained via the business survey should be complemented and/or quality checked against supply side data available via secondary sources (e.g. price databases, price sheets from the PSP, etc.).

94. Once all cost elements are expressed per payment, they can all be summed up, as a first step, in order to report the cost associated with a single use case payment, the instrument and the service channel through which it has been received or initiated (e.g. a single payment in cash received at the point of interaction for the sale of goods).

95. Eventually, though, once the per-transaction allocation has been achieved for each cost element, the volume of payments will be used for the reverse process, that of the aggregation of costs to annual<sup>59</sup> levels, by multiplying cost per transaction with the annual volumes<sup>60</sup>. Whether a cost is a resource or a transfer cost, that does not matter as such to the business as it is still a cost borne by them. The differentiation is important for calculating the total costs to the economy and to policymaking, business decisions (in terms of fees paid to outsource services), and efforts to enhance the efficiency of payment services.

96. As such, this approach allows the understanding and reporting of cost results on two bases: firstly, on a structural per payment basis, for a single use case, the payment instrument and the service channel associated with it; and secondly, on an annual basis, for all annual transactions for a specific use case, using a specific payment instrument and transmission method.

97. The total costs for all the businesses of an economy can be calculated by multiplying the average costs per business of a certain category of businesses (small, medium, large-sized) and industry by the total number of businesses within this category of businesses in that economy. Calculations and separate analyses can also be performed for a sub-set of businesses surveyed, in order to explore more in-depth the patterns of certain industries or business sizes that might be of particular interest.

98. Particular emphasis should be placed on quality control procedures. Internal control procedures should occur in order to detect potential mismatches and inconsistencies of the data captured in the surveys. Moreover, given the unique nature of cost data and potential measurement errors, external sources should also be used in order to compare and validate the survey data. For instance, annual financial reports, central bank data, prior cost surveys (if any), private sector reports, to mention a few, are examples of external sources that could be used for quality control. In addition, sensitivity analysis is of equal importance in order to see how sensitive the results are to certain assumptions. Quality control

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<sup>58</sup> For this methodology, it is assumed that the cost function associated with the different payment instruments is linear (on volume), and therefore, dividing by the volume will lead to equal cost allocation across payments.

<sup>59</sup> Businesses usually keep records based on fiscal rather than calendar year. It could also be the case that the dates for the fiscal year for different businesses vary. Even though such deviations are not expected to affect the results in a drastic way, the specification of the calendar and fiscal year dates should accompany the analysis.

<sup>60</sup> It should be noted that the sample questions do not capture volumes on annual basis, since it is hard for the respondent to recall annual volumes. Volume questions are typically asked on a weekly and monthly basis, and then extrapolated to an annual basis.

procedures and sensitivity analysis should be performed for the data gathered for each stakeholder on the demand and supply side.

**Table 18: Calculation of the monetary value per single cost element for businesses**

Cost category	Cost element	Calculation of the monetary value cost per cost element , consumer and year
<b>Time costs</b>	Travel time	Wage per minute in currency unit * Time in minutes * 2 (directions) * number of transactions per annum
	Waiting time	Wage per minute in currency unit * Time in minutes * number of transactions per annum
	Transaction time	Wage per minute in currency unit * Time in minutes * number of transactions per annum
	Reconciliation time	Wage per minute in currency unit * Time in minutes * number of business days
	Operations time	Wage per minute in currency unit * Time in minutes * number of business days
<b>Logistic costs</b>	Travel costs	(Distance in linear dimension unit * mileage allowance) * 2 (directions) * number of transactions per annum
	Communication costs	Costs in currency unit (per transaction) * number of transactions per annum
<b>Infrastructure costs</b>	Depreciation costs	Costs in currency unit (per period)* number of periods per annum
	Maintenance costs	Costs in currency unit (per period)* number of periods per annum
<b>Damage costs</b>	Error costs	Costs in currency unit (for the last month) * 12 (months)
	Theft costs	Costs in currency unit (for the last month) * 12 (months)
	Fraud costs	Costs in currency unit (per period) * number of periods per annum
	Insurance costs	Costs in currency unit (per period) * number of periods per annum
<b>Production costs</b>	Issuing costs of cheques	Costs in currency unit (per cheque) * number of transactions per annum
	Issuing costs of cards	Costs in currency unit (per card) / validity in years
	Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit * annual number of direct debit mandates and/or credit transfer forms
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period) * number of periods per annum
	Per transaction fees	Costs in currency unit * number of transactions per annum <b>or</b> Percentage * average value (per transaction) * number of transactions per annum
	Fees for services outsourced to another party	Costs in currency unit (per period) * number of periods per annum
<b>Cost of funds</b>	Holding costs	Amount of average cash and e-money holding * average interest rate for sight deposits per annum
	Float costs	Time between debiting payment initiation by payer and the credit date of the amount (only if business is payee) * average interest rate for sight deposits per annum

## II.3. RETAIL PAYMENT COSTS BORNE BY GOVERNMENT AGENCIES

99. This section applies the cost methodology to government agencies as the PSU in their role as payers and payees.

### II.3.1. Classification of government agency retail payments by type

100. Government payment types highlight the interaction of government agencies with other PSUs while identifying the role of government agencies as payer and/or payee. While the use cases per payment type might differ from country to country, the payment types as such should be universally applicable and it can be assumed that at least one use case per payment type exists in every country. Payment types can be grouped according to the role of government agencies in the retail payment process, i.e. whether they are acting as payers, payees or both. In the following the different types of retail payments involving government agencies are listed and some typical use cases are mentioned. For a detailed list of use cases the reader is referred to sub-section II.3.2.

**Table 19: Data to types of retail payments for the demand side**  
(those relevant for government agencies highlighted)

Payer \ Payee	Consumer	Business	Government Agency
Consumer	P2P	P2B	<b>P2G</b>
Business	B2P	B2B	<b>B2G</b>
Government Agency	<b>G2P</b>	<b>G2B</b>	<b>G2G<sup>61</sup></b>
<b>P=Person, B=Business, G=Government</b>			

101. Government related retail payments represent typically a significant proportion of a nation's overall retail payment volume and value, in both developed as well as in developing economies. The scale of governments' use of the retail payment services is an important consideration for policy makers. Improvements in the way government payments are disbursed, collected and processed can have a significant positive impact on the economy and catalytic effects on the payment system as a whole. The government's share of the volume and value of retail payments can be measured directly in countries where overall retail payment volumes and values are tracked and the government maintains accurate records on their payment activity. If this information is not available, an approximation can be determined from the size and influence of the government in domestic economic activity. Specifically, the share of government expenditures plus government revenue in GDP<sup>62</sup> will provide a rough proxy measure of the activity of the government in retail payments relative to overall retail payment activity.

102. **If one government agency is in the role of the payee and another one in the role of the payer,** these payments are referred to as government-to-government (G2G) payments.

- a. **Government-to-government (G2G) payments** are typically intra-governmental transfers from one government agency to another for budget allocation or extra-budgetary purposes, or transfers from one level of government to another. Compared to other types of government payments, an average G2G payment is typically large in terms of value, while the number of

<sup>61</sup> G2G payments will be considered only in the context of secondary activities such as cash receipts and cheques, supply of change, and transfer of funds between own accounts.

<sup>62</sup> The relative importance of government payments is naturally correlated to the size and influence of the government in the overall economy, which is usually measured in terms of government expenditures as a share of the GDP, and/or tax collections as a share of the GDP. In the majority of cases such ratios range between 15 percent to about 45 percent of the GDP. Source: The World Bank: General Guidelines for the Development of Government Payment Programs, July 2012.

transactions made is relatively small. Government agencies, just like consumers and businesses, also conduct payments across their own accounts. These transactions include, for example, deposits of daily cash receipts and cheques and transfers of funds between accounts. Given the important role these transactions play in government payments, they are included in the G2G payments under consideration here. In that regard, it is worth underscoring that one category of G2G payments, i.e., intra-governmental transfers, are not included in this cost methodology given the fact that such transfers are typically of large value that do not qualify as day-to-day retail payments. However, G2G transactions on government agencies' own accounts are included here.

103. **If only the payer is a government agency**, the relevant use cases can be grouped into G2P and G2B type of retail payments.

- a. **Government-to-person (G2P) payments** are typically associated with social benefit transfers (e.g. conditional cash transfers, child support payments, or student allowances), government employee salaries, pension payments, and tax refunds, among others. G2P payments are normally characterized by a very large number of transactions of relatively small value per transaction.
- b. **Government-to-business (G2B) payments** are characterized by a large number of transactions with values varying widely, ranging from large-value procurement contracts (which are not considered in this framework) to retail payments. While in section I.5 G2B payments have been discussed from the perspective of the business as the payee, the focus here is on the government agencies in their role as payer. One major category of G2B payments, includes those made by the government for the procurement of consumable goods (e.g. stationery) and capital goods (e.g. equipment, computers), services (e.g. cleaning, maintenance, professional services), transport expenses (e.g. travel expenses, gasoline), periodic bills (e.g. utility bills, rent). For these payments government agencies might "act like a business". On the other hand, given the government's significant presence in the payment industry, the government may face different payment costs than businesses. Thus, it is recommended to address such G2B payments separately from similar B2B payments. A second major category of G2B payments include corporate tax refunds, and a third, although not in scope of this analysis, the disbursement of loans, subsidies or business assistance provided by the public sector.

104. **If only the payee is a government agency**, the relevant use cases can be grouped into P2G and B2G type of retail payments.

- a. **Person-to-government (P2G) payments** include payments made by citizens to the central and regional government agencies in the form of tax payments (e.g. personal income taxes if paid directly by employees/persons and not by their employer), the employee's share of social security contributions, payments for obtaining services from government agencies (e.g. licenses, permits), penalties (e.g. fines), and other obligations to regional and central government authorities. P2G payments tend to be of small-value and large volume, given the typical scope of applicability across the population.
- b. **Business-to-government (B2G) payments** include payments made by businesses to government agencies in the form of tax payments (e.g. corporate income taxes, corporate sales taxes, value-added taxes, and personal income taxes paid on behalf of employees where applicable), the employer's share of social security contributions, payments for obtaining services (e.g. permits) and penalties (e.g. fines). The discussion of B2G payments in section I.5 focused on the perspective of the business as the payer, the focus here is on the government agencies in their

role as payee. B2G are a mirror of G2B payments with regard to average size and transactional volumes (i.e. varying size and large number of payments).

### II.3.2. Identification of the relevant payment instruments and service channels per use case

105. The use cases identified aim to represent typical payments initiated and received by government agencies, irrespective of the state of economic development of a country and/or its national payment system. However, when conducting an actual cost study, the use cases should be assessed and adapted, as appropriate, to accurately reflect the range of transactions conducted by the government.

**Table 20: Identification of the payment instruments and service channels relevant to government agencies per use case**

Payment type	Role	Use case	Payment instrument <sup>63</sup>	Payment service channel <sup>64</sup>
<b>Government-to-government (G2G)</b>	Payer/ Payee	<input type="checkbox"/> Deposits of cash receipts and cheques, supply of change, and transfer of funds between own accounts <sup>65</sup>	<input type="checkbox"/> Cash <input type="checkbox"/> Cheque	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center
<b>Person-to-government (P2G)</b>	Payee	<input type="checkbox"/> Payments of taxes, fines, fees, and other obligations to regional and central government authorities. <input type="checkbox"/> Payments for employee's share of social security contributions.	<input type="checkbox"/> Voucher <input type="checkbox"/> Debit card <input type="checkbox"/> Credit card <input type="checkbox"/> Prepaid card	<input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM
<b>Business-to-government (B2G)</b>	Payee	<input type="checkbox"/> Payments of taxes, fines, fees, and other obligations to regional and central government authorities <input type="checkbox"/> Payments for employer's share of social security contributions	<input type="checkbox"/> Direct credit transfer <input type="checkbox"/> Direct debit transfer	<input type="checkbox"/> Mail <input type="checkbox"/> Internet/ designated lines
<b>Government-to-person (G2P)</b>	Payer	<input type="checkbox"/> Payments of salaries <input type="checkbox"/> Payments of pensions <input type="checkbox"/> Payments of social benefits <input type="checkbox"/> Payments of tax refunds	<input type="checkbox"/> Mobile money <input type="checkbox"/> Online money	<input type="checkbox"/> Telephone/ mobile network
<b>Government-to-business (G2B)</b>	Payer	<input type="checkbox"/> Payments of corporate tax refunds <sup>66</sup>		

106. Once the relevant use cases have been determined, those payment instruments, which can be used by government agencies for the specific use cases, should be identified. It is assumed that the entities implementing this methodology know which payment instruments can be used for the identified use cases. If this is not the case, this information should be obtained from the relevant government agencies, prior to the launch of the government survey.

### II.3.3. Identification of cost elements per payment instrument - service channel combination

107. For every payment instrument identified as relevant for at least one use case, the service channels available for the use of that payment instrument, and the cost elements associated with those payment instrument-service channel combinations, need to be identified. Depending on the service channel, the

<sup>63</sup> For every use case the choice of all payment instruments should be provided. The same applies for businesses and government agencies.

<sup>64</sup> For every use case the choice of all payment transmission methods should be provided. The same applies for businesses and government agencies.

<sup>65</sup> The suggested framework does not consider other G2G payments such as intra-governmental (across agencies within the same country) and inter-governmental (across government entities of different countries) since they typically include large-value payments.

<sup>66</sup> For those payments where government agencies "act like a business", they are considered under the B2B type of payments. In fact all use cases listed there, with the exception of "Payments for procurement of supply chain products and services" also apply to government agencies.



payer and the payee may face different cost elements. These cost elements can be assigned to each specific payment instrument-service channel combination (see Table 21). Given that in the case of government agencies the cost elements may differ depending whether or not the government agency is in the role of the payer or payee, like for businesses, a separate analysis of the two roles is provided.

**Table 21: Matching payment instruments with service channels and cost elements for government agencies in their role as payers**

Payment instrument	Payment service channel	Cost element
Cash	<input type="checkbox"/> All service channels <sup>67</sup>	Travel time
		Waiting time
		Transaction time
		Reconciliation time
		Travel costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Fees for services outsourced
		Periodic fees
		Per transaction fees
		Holding costs
Cheque	<input type="checkbox"/> All service channels <sup>68</sup>	Travel time
		Waiting time
		Transaction time
		Reconciliation time
		Travel costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Issuing costs of cheques
		Fees for services outsourced
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Mail	Communication costs
Prepaid card	<input type="checkbox"/> All service channels <sup>67</sup>	Travel time
		Waiting time
		Transaction time
		Reconciliation time
		Travel costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Issuing costs of cards
		Fees for services outsourced

<sup>67</sup> These include payment center, agent outlet, branch, and ATM.

<sup>68</sup> These include payment center, agent outlet, branch, ATM, and mail.

Payment instrument	Payment service channel	Cost element
		Periodic fees
		Per transaction fees
		Holding costs
<b>Direct debit transfer</b>  <b>Direct credit transfer</b>	<input type="checkbox"/> All service channels <sup>69</sup>	Transaction time
		Reconciliation time
		Communication costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Fees for services outsourced
		Periodic fees
		Per transaction fees
		Float costs
<b>Mobile money</b>	<input type="checkbox"/> All service channels <sup>70</sup>	Transaction time
		Reconciliation time
		Communication costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Fees for services outsourced
		Periodic fees
		Per transaction fees
		Holding costs
<b>Online money</b>	<input type="checkbox"/> All service channels <sup>48</sup>	Transaction time
		Reconciliation time
		Communication costs
		Error costs
		Theft costs
		Fraud costs
		Insurance costs against losses
		Fees for services outsourced
		Periodic fees
		Per transaction fees
		Holding costs

<sup>69</sup> These include payment center, agent outlet, branch, ATM, and internet/designated lines.

<sup>70</sup> These include payment center, agent outlet, and telephone/mobile network.

**Table 22: Matching payment instruments with service channels and cost elements  
for government agencies in their role as payees**

Payment Instrument	Payment service channel	Cost element
<b>Cash</b>	<input type="checkbox"/> All service channels <sup>42</sup>	Reconciliation time
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	Travel time (picking up petty cash and depositing the day's sales)
		Waiting time (petty cash, depositing)
		Transaction time (petty cash, depositing)
		Transaction time
		Operations time
		Travel costs (petty cash, depositing)
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Maintenance costs
		Depreciation costs
		Periodic fees
		Per transaction fees
		Holding costs
	<input type="checkbox"/> Agent	Float costs
<b>Cheque</b>  <b>Voucher</b>	<input type="checkbox"/> All service channels <sup>43</sup>	Reconciliation time
		Float costs
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Mail	Travel time (depositing the day's sales)
		Waiting time (depositing)
		Transaction time (depositing)
		Travel costs (depositing)
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Maintenance costs
		Depreciation costs
		Periodic fees
		Per transaction fees (discounts)
	<input type="checkbox"/> Point of interaction	Transaction time
<b>Debit card</b>  <b>Credit card</b>  <b>Prepaid card</b>	<input type="checkbox"/> All service channels <sup>71</sup>	Reconciliation time
		Float costs
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	Transaction time
		Operations time
		Communication costs
		Maintenance costs
		Depreciation costs
		Error costs

<sup>71</sup> These include point of interaction, payment center, agent outlet, branch, Internet/designated lines, and telephone/mobile phone network.

Payment Instrument	Payment service channel	Cost element
		Theft costs
		Fraud costs
		Insurance costs
		Periodic fees
		Per transaction fees
		Fees for services outsourced
		Float costs
<b>Direct debit transfer</b>  <b>Direct credit transfer</b>	<input type="checkbox"/> All service channels <sup>45</sup>	Reconciliation time
		Float costs
		Fees for services outsourced
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Agent <input type="checkbox"/> Branch <input type="checkbox"/> ATM	Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Periodic fees
		Per transaction fees
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	Transaction time
		Operations time
		Maintenance costs
		Depreciation costs
<b>Mobile money</b>	<input type="checkbox"/> All service channels <sup>47</sup>	Reconciliation time
		Error costs
		Theft costs
		Fraud costs
		Insurance costs
		Periodic fees
		Per transaction fees
		Fees for services outsourced
		Float costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Telephone/ mobile phone network	Transaction time
		Operations time
		Communication costs
		Maintenance costs
		Depreciation costs
<b>Online money</b>	<input type="checkbox"/> All service channels <sup>48</sup>	Reconciliation time
		Float costs
		Fees for services outsourced

#### II.3.4. Sample selection and survey design for government agencies

108. Once the cost elements per payment instrument have been identified, quantitative information on the monetary value of those costs can be obtained via a survey of the financial management units of the relevant government agencies, including the Ministry of Finance. If central banks or other authorities are the entities implementing this methodology, they might consider conducting the government

agencies' surveys on their own, bearing in mind that they are relatively small in number and the information obtained may be sensitive.

109. **Mode:** Personal interviews with the financial management units of government agencies are recommended. Multiple visits might be required, no longer than one hour each. In certain cases, the questionnaires can be sent electronically to agencies to fill out, along with detailed instructions, for a more cost efficient procedure.

110. **Structure:** The structure of the government agency questionnaire is similar to the equivalent for businesses. The difference being that some customization might be needed for the different government agencies that will participate in the survey, depending on their function. Despite any potential customization, the questionnaire can be structured in three standardized sections. The first section asks for aggregate data on the distribution of payments initiated and received (based on volume and value) by instrument, use case, and service channel, relevant to the agency. Payments that do not meet the definition of retail payments (even if not large in terms of value) as defined in this methodology, should not be captured. The second section focuses on individual cost elements associated with the different payment instruments. The third section captures other agency-unique information (not related to payments) such as, number of offices, number of employees, etc., which are useful for extrapolation and analytical purposes. See Box 3 for sample questions.

111. **Sampling:** Unlike the consumer and business surveys where representative surveys are suggested, if possible, all central government agencies and units with authority to directly initiate or collect payments to/from consumers and businesses and/or directly manage their own accounts should be surveyed. Depending on the country, for regional and municipal government agencies, a representative sample might be surveyed (based on stratification criteria such as region and size of community they represent). Government payments are quite unique in that the processes followed and the instruments used are specific to country circumstances. Moreover, given that government agencies differ in their role and their daily operations, it is challenging to specify upfront a designated way to collect data on the costs associated with the payment instruments used by the government, and to propose a specific sampling technique. The level of centralization of government payments is a key determinant of the scope of the survey, in terms of number of participants to be surveyed. If a centralized treasury single account model prevails, the Treasury initiates most government payments on behalf of government agencies, and collects most payments for the government. In such circumstances, it is the financial management unit in the Treasury that determines which payment instruments are used and responsible for the adoption of new payment technologies. In contrast, if the government's payment system is decentralized, each government agency initiates payments via their own accounts (either at the central bank or at PSP) and collects fees directly from the public. In between, there are multiple variations.

**Box 3: Sample questions that can be asked during the government survey**

**Section 1: Volumes, Values, and Distribution of Payments Initiated and Received**

1. What is the percentage distribution of payments INITIATED with each payment instrument via each service during the past fiscal year?

Payment instrument Transmission method	Cash	Cheque	Voucher	Debit card	Credit card	Prepaid card	Direct debit transfers	Direct credit transfers	Mobile money	Online money
Point of interaction										
Branch										
ATM										
Agent outlet										
Payment center										
Mail										
Internet/designated lines										
Telephone/mobile network										
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Section 2: Cost Elements of Payments**

1. How much per month do you pay to payment service providers (e.g. agent outlet, bank branch, etc.) for collecting payments on your behalf? \_\_\_\_\_ (in local currency)
2. Please report the time spent by you or your employees in an average week to examine bank account statements. \_\_\_\_\_ hours \_\_\_\_\_ minutes

**Section 3: Government Agency Information**

1. Agency name (optional): \_\_\_\_\_
2. Contact person (optional): \_\_\_\_\_
3. Number of outlets: \_\_\_\_\_
4. Number of payment centers: \_\_\_\_\_
5. Number of bank accounts: \_\_\_\_\_

**Table 23: Data to be covered during the government agency survey**

Cost category	Cost element	Data to be obtained in the course of the government agency survey
<b>Time costs</b>	Travel time	Time in minutes (for one direction)
	Waiting time	Time in minutes (per visit)
	Transaction time	Time in minutes (per visit)
	Transaction time	Time in seconds (per payee)
	Reconciliation time	Time in minutes (per business day)
	Operations time	Time in minutes (per business day)
<b>Logistic costs</b>	Travel costs	Distance in linear dimension unit (for one direction)
	Communication costs	Costs in currency unit (per transaction)
<b>Infrastructure costs</b>	Depreciation costs	Costs in currency unit (per period)
	Maintenance costs	Costs in currency unit (per period)
<b>Damage costs</b>	Error costs	Costs in currency unit (for the last month)
	Theft costs	Costs in currency unit (for the last month)
	Fraud costs	Costs in currency unit (for the last month)
	Insurance costs	Costs in currency unit (per period)
<b>Production costs</b>	Production costs of cheques	Costs in currency unit (per cheque)
	Production costs of cards	Costs in currency unit (per card)
	Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit (per paper-based payment instrument)
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period)
	Per transaction fees	Costs in currency unit or as percentage of the value (per transaction)
	Fees for services outsourced	Costs in currency unit (per period)
<b>Cost of funds</b>	Holding costs	Amount of average cash and e-money holding
	Float costs	Time between debiting payment initiation by payer and the credit date of the amount (only if government agency is payee)

### II.3.5. Calculation and reporting of retail payment costs for government agencies

112. In order to draw conclusions on the cost of different payment instruments for government agencies, the direct costs for these payment instruments have to be totaled and an appropriate distribution of indirect costs determined. Similarly to the consumer and business analyses, a two-step analysis process needs to be followed. Upon data analysis, the cost elements reported per period will still need to be disaggregated to the per transaction level for every payment instrument, using the volume of payments per payment instrument as the main allocation criterion.

113. For government agencies and businesses, many of the cost elements associated with particular payment use cases are captured and reported periodically. Indeed, service costs, infrastructure costs, damage costs and reconciliation time, to name a few, constitute major costs borne by government agencies, and are usually recorded daily, weekly, monthly, or annually.

114. If indirect costs apply to several payment instruments, the value of the indirect costs per annum should be assigned to the different payment instruments according to their share of transaction volume<sup>72</sup>.

115. The average monetary value per cost element will be calculated from the data obtained via the government survey. If these cost elements are direct costs per transaction, they should be totaled for every use case and multiplied by the number of payments initiated/received by a government agency per annum per use case. For indirect costs, appropriate multipliers need to be identified and used, rather than simply applying the number of transactions (e.g. a time factor).

116. Once all cost elements are expressed per payment, they can all be summed up, as a first step, in order to report the cost associated with a single use case payment, the instrument and the service channel through which it has been received or initiated (e.g. a single payment in cash made via a payment center to the beneficiary of a social transfer).

117. Eventually, though, once the per-transaction allocation has been achieved for each cost element, the volume of payments will be used for the reverse process, that of the aggregation of costs to annual<sup>73</sup> levels, by multiplying cost per transaction with the annual volumes.

118. As such, this approach allows the understanding and reporting of cost results on two bases: firstly, on a structural per payment basis, for a single use case, the payment instrument and the service channel associated with it; and secondly, on an annual basis, for all annual transactions for a specific use case, using a specific payment instrument and transmission method.

119. The total costs for all government agencies can be calculated by adding the costs of all individual surveyed government agencies and extrapolating the results for any that were not surveyed. A more in-depth analysis can be performed for certain regional or local government units, if the payment costs for those government units incur is of particular interest.

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<sup>72</sup> For this methodology, it is assumed that the cost function associated with the different payment instruments is linear (on volume), and therefore, dividing by the volume will lead to equal cost allocation across payments.

<sup>73</sup> Government agencies usually keep records based on fiscal rather than calendar year. It could also be the case that the dates for the fiscal year for different businesses vary. Even though such deviations are not expected to affect the results in a drastic way, the specification of the calendar and fiscal year dates should accompany the analysis.



**Table 24: Calculation of the monetary value per single cost element for government agencies**

Cost category	Cost element	Calculation of the monetary value cost per cost element , consumer and year
<b>Time costs</b>	Travel time	Wage per minute in currency unit * Time in minutes * 2 (directions) * number of transactions per annum
	Waiting time	Wage per minute in currency unit * Time in minutes * number of transactions per annum
	Transaction time	Wage per minute in currency unit * Time in minutes * number of transactions per annum
	Transaction time	Wage per second in currency unit * Time in seconds * number of transactions per annum
	Reconciliation time	Wage per minute in currency unit * Time in minutes * number of business days
	Operations time	Wage per minute in currency unit * Time in minutes * number of business days
<b>Logistic costs</b>	Travel costs	(Costs in currency unit or distance in linear dimension unit * mileage allowance) * 2 (directions) * number of transactions per annum
	Communication costs	Costs in currency unit (per transaction) * number of transactions per annum
<b>Infrastructure costs</b>	Depreciation costs	Costs in currency unit (per period) * number of periods per annum
	Maintenance costs	Costs in currency unit (per period) * number of periods per annum
<b>Damage costs</b>	Error costs	Costs in currency unit (for the last month) * 12 (months)
	Theft costs	Costs in currency unit (for the last month) * 12 (months)
	Fraud costs	Costs in currency unit (for the last month) * 12 (months)
	Insurance costs	Costs in currency unit (per period) * number of periods per annum
<b>Production costs</b>	Issuing costs of cheques	Costs in currency unit (per cheque) * number of transactions per annum
	Issuing costs of cards	Costs in currency unit (per card) * number of cards issued per annum
	Production costs of direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit (per paper-based payment instrument produced) * monthly number (direct debit mandates + credit transfer forms) * 12 (months)
<b>Service costs</b>	Periodic fees	Costs in currency unit (per period) * number of periods per annum
	Per transaction fees	Costs in currency unit * number of transactions per annum or Percentage * average value (per transaction) * number of transactions per annum
	Fees for services outsourced	Costs in currency unit (per period) * number of periods per annum
<b>Cost of funds</b>	Holding costs	Amount of average cash/e-money holding * average interest rate for sight deposits per annum
	Float costs	Time between debiting payment initiation by payer and the credit date of the amount (only if government agency is payee) * average interest rate for sight deposits per annum

### III. OVERVIEW OF COST ELEMENTS FOR THE SUPPLY SIDE (PAYMENT SERVICE AND PAYMENT INFRASTRUCTURE PROVIDERS)

120. The methodology for assessing the costs of retail payments addresses the demand side and the supply side separately, by identifying and measuring the costs borne by all actors in the payments process chain. This part of the framework focuses on the supply side, which comprises actors providing services and infrastructure to demand side actors (i.e. payment service users: consumers, businesses, and government agencies) and/or other supply-side actors.

121. Both, the supply side as well as the demand side of the methodology can be implemented independently if a country is interested in examining only the costs borne by suppliers or those borne by users. However, only if both – the retail payments’ costs for the supply and the demand side - have been assessed, the overall costs of retail payments for a country’s economy can be calculated (after adjusting for transfer costs).

122. For identifying the costs borne by the supply side, two categories of supply side actors have been identified in this guide, and detailed in the following section: payment service providers (PSP) and payment infrastructure providers (PIP). The supply side methodology, where necessary, deviates from the demand side methodology, given that supply and demand side costs are different in nature. However, the core components of the methodology are the same.

123. **Payment service providers (PSP)** issue payment instruments (e.g. cash, payment cards, e-money) to PSU and/or offer services, which allow PSU to initiate retail payments with a given payment instrument, including supporting services (e.g. opening and maintaining transaction accounts). A central bank is typically the issuer of banknotes and coins, while commercial banks, micro-finance institutions, e-money institutions, and other non-bank PSP (e.g. payment institutions) are issuers of non-cash (including electronic) payment instruments. In addition to PSPs that issue payment instruments and (in the case of non-cash payments) typically maintain transaction accounts, there are institutions which offer over-the-counter cash-in/cash-out transaction services (e.g. money transfer operators) or additional functions (e.g. currency exchange bureaus if foreign currency plays a considerable role in a country’s retail payment system).

124. **Payment infrastructure providers (PIP)** provide payment infrastructure services typically to the PSP and not directly to the PSU. Typical services provided by the PIP include cash logistic services or (for non-cash payments) authorization, switching, clearing, and netting and/or settlement services.

125. It is important to emphasize that the present methodology follows a functional approach rather than an institutional approach when identifying and measuring the costs associated with the PSP/PIP. Depending on the market conditions, one institution can fall into the PSP as well as the PIP category. A typical example of this would be central banks, which in many countries do not only issue currency (a PSP function), but also offer payment settlement and sometimes even payment switching, clearing and netting services (PIP functions).

126. Payment related supply side costs associated with supporting activities outside the PSP/PIP sphere (e.g. card manufacturing, banknote printing, coin minting, provision of telecommunication services, and production of POS-terminals) are considered as transfer costs of the PSP/PIP when outsourced to other PSP/PIP and as resource costs when outsourced to non-PIP/non-PSP. This distinction is important for accurately calculating the total costs for the economy as described in part IV.

127. Whenever relevant, the measurement of the supply side costs should also take into consideration the service channels, via which payment services are offered. This will mainly be relevant for PSP and their service offering to PSU.

128. All payment instruments taken into consideration on the demand side also have to be analyzed from the supply side perspective. Table 25 below summarizes and classifies cost elements borne by PSP and PIP based on their type (resource vs. transfer) and functional cost category, followed by the definitions of each cost element. Most cost elements are classified as resource costs. However, it is important to distinguish the instances where the activities associated with particular cost elements are outsourced to other surveyed PSP/PIP. In order to avoid double-counting costs in these cases, it is important to make a distinction between the cases where an activity is outsourced to (i) another surveyed PSP/PIP and where an activity is outsourced to (ii) a third party (which is neither a PSP nor PIP) or to a type of PSP/PIP not surveyed for the study. In the first case, the outsourcing fee paid is considered a transfer cost, while in the second, it is considered a resource cost since the cost of performing the outsourced activity is not accounted for elsewhere.

129. **Production/procurement costs** are associated with the production of payment instruments (both paper-based and electronic), which have some type of physical representation.<sup>74</sup> They are fees and charges paid to stakeholders in the retail payment process not necessarily covered by this methodology (e.g. specialized banknote printing companies, mints, card manufacturers, cheque printing companies). This cost includes the following cost elements:

- a. **Production/procurement costs of banknotes** are paid (in case of sourcing from an external banknote printing company) or calculated (banknote printing is done in-house by the currency issuer) cost per unit (banknote, bundle or brick) and denomination of banknote. This includes all costs associated with the production of banknotes (e.g. raw materials, staff costs, facilities maintenance, etc.).
- b. **Production/procurement costs of coins** are paid (in case of sourcing from an external minting company) or calculated (minting is done in-house by the currency issuer) cost per unit and denomination of coins. This includes all costs associated with the production of coins (e.g. raw materials, staff costs, facilities maintenance, etc.).
- c. **Production/procurement costs of cheques/direct credit transfer paper forms/direct debit transfer mandate paper forms** are paid (in case of sourcing from an external printing company) or calculated (printing is done in-house) cost per unit. This includes all costs associated with the production (e.g. raw materials, staff costs, facilities maintenance, etc.).
- d. **Production/procurement costs of payment cards** are paid (in case of sourcing from an external card manufacturing company) or calculated (certain activities) cost per unit. This includes all costs associated with the production (e.g. raw materials, staff costs, facilities maintenance, etc.) of the payment card.

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<sup>74</sup> These costs do not include handling, quality control and personalization costs.

**Table 25: Categorization and classification of the different cost elements for PSP and PIP**

Type of costs	Cost category	Cost element	Attribution of cost element		Variability of cost element		Relevant for supplier category
			Direct	Indirect	Fixed	Variable	
Resource costs	Production/procurement costs	Production/Procurement costs of banknotes	☑			☑	PSP
		Production/Procurement costs of coins	☑			☑	PSP
		Production/Procurement costs of cheques/card/direct credit transfer paper forms/direct debit transfer mandate paper forms	☑			☑	PSP
		Production/Procurement costs of payment cards	☑			☑	PSP
	Issuing, reissuing and destruction costs	Banknote (re-)issuing costs	☑			☑	PSP
		Coin (re-)issuing costs	☑			☑	PSP
		Banknote destruction costs	☑			☑	PSP
		Coin destruction costs	☑			☑	PSP
		Cheque/payment card issuing costs	☑			☑	PSP
	Logistic costs	Cash logistic costs	☑			☑	PSP, PIP
		Cheque/payment card logistic costs	☑			☑	PSP, PIP
	Time costs	Transaction time	☑			☑	PSP
	Payment handling costs	Truncation (cheques, direct credit transfer paper forms, direct debit transfer mandate paper forms) costs	☑			☑	PSP, PIP
		Authorization costs	☑			☑	PSP, PIP
		Payment processing costs	☑			☑	PSP, PIP
		Return costs due to insufficient balance	☑			☑	PSP
		Cancellation costs	☑			☑	PSP, PIP
	Payments-specific infrastructure and maintenance costs	Vault maintenance costs	☑		☑	☑	PSP, PIP
		Cash handling costs	☑			☑	PSP, PIP
		Payments-specific IT costs	☑	☑		☑	PSP, PIP
		ATM maintenance costs	☑ <sup>75</sup>	☑ <sup>76</sup>	☑	☑	PSP, PIP
		POS management costs		☑		☑	PSP, PIP
		Loyalty program costs	☑			☑	PSP
		Switching costs	☑			☑	PSP, PIP
		Clearing costs	☑			☑	PSP, PIP
		Settlement costs	☑			☑	PSP, PIP
	Security costs	Insurance costs	☑	☑	☑	☑	PSP, PIP
		Costs of loss, robbery, fraud and theft	☑			☑	PSP, PIP
		Fraud prevention costs	☑		☑	☑	PSP, PIP
	Costs for supporting activities	Transaction account costs	☑	☑ <sup>77</sup>		☑	PSP
		Marketing and advertising	☑	☑	☑	☑	PSP
		Acquiring and training costs	☑	☑		☑	PSP
		Customer support costs	☑			☑	PSP
		Archiving costs	☑ <sup>78</sup>	☑ <sup>79</sup>		☑	PSP, PIP
		Overhead costs		☑		☑	PSP, PIP
Transfer costs	Service costs	License fees	☑		☑	☑	PSP
		Interchange fees	☑		☑ <sup>80</sup>	☑	PSP
		Agent commission fees	☑			☑	PSP

<sup>75</sup> In the case of cash.

<sup>76</sup> In the case of cheques.

<sup>77</sup> In the case of debit cards, credit cards, prepaid cards, and mobile money.

<sup>78</sup> In the case of cheques

<sup>79</sup> Except for cheques.

<sup>80</sup> In the case of cash, cheques, debit cards, credit cards, and prepaid cards.

130. **Issuing, reissuing and destruction costs** are associated with payment instruments which have physical representation. These are costs incurred for processes related to the proper handling, quality control, and personalization (where relevant) of payment instruments after they are produced, but before they are distributed or redistributed to PSU. They include the following cost elements:

- a. **Banknote (re-)issuing costs** refer to costs of checking, sorting, counting, and packaging of banknotes, but without the effective transport of banknotes.
- b. **Coin (re-)issuing costs** refer to costs of checking, sorting, counting, and packaging of coins, but without the effective transport of coins.
- c. **Banknote destruction costs** refer to cost of destroying unfit banknotes, whereas any revenues from selling destroyed banknote materials are to be deducted.
- d. **Coin destruction costs** refer to cost of destroying unfit coins, whereas any revenues from selling destroyed coin materials are to be deducted.
- e. **Cheque/payment card issuing costs** refer to costs of personalizing cheques/payment cards, but without the effective transport of cheques and cards.

131. **Logistic costs** are the costs of transporting payment instruments with physical representation to their designated PSU or between different PSP or PIP locations (typically in the case of cash)<sup>81</sup>. They include the following cost elements:

- a. **Cash logistic costs** are associated with the movement of banknotes and coins between the central bank's main vault, cash centers and/or other PSP in the process of issuing and/or collecting banknotes and coins (including staff costs, transport costs, and depreciation costs).
- b. **Cheque/payment card logistic costs** are the costs of providing new or existing customers with cheques/payment cards.

132. **Time costs** are associated with time spent by PSP assisting customers in effecting deposits, withdrawals, or payment transactions over the counter or remotely:

- a. **Transaction time** includes time spent by employees in accepting customer cash deposits and withdrawals, cheque deposits or cash-outs, initiating direct credit transfers, establishment of standing orders and direct debit transfers, etc. Includes payments initiated over the counter or remotely with the PSP. As mentioned for the time cost elements of the PSU, it is recommended to complement the information received via the survey by measuring the effective time in the field (e.g. within bank branches).

133. **Payment handling costs** are costs accrued when a PSU initiates a payment to until that payment is settled, including costs associated with returned and disputed payments. They include the following cost elements:

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<sup>81</sup> Security costs and any possible losses that may be incurred during transportation are not included here.

- a. **Truncation costs** include costs of scanning, archiving and managing paper cheques and/or card payments/direct credit transfers initiated on paper forms, direct debit transfer paper mandates, etc.
- b. **Authorization costs** include costs of processing the payment authorization request for certain payment instruments (e.g. payment cards, direct debit transfers, online money or mobile money) by verifying whether a specific transaction can be executed (e.g. right credentials, sufficient account balance), including costs related to maintaining databases with authorization-related data.
- c. **Payment processing costs** includes the costs of processing a cheque, payment card, direct debit transfer, or direct credit transfer transaction, from the point when the transaction is authorized to until the customer's account is debited and the retailer's account is credited. This includes clearing, netting, and settlement of the payment.
- d. **Return costs due to insufficient balance** are the costs of returning a payment after authorization that could not be settled due to insufficient funds (e.g. if the authorization process does not involve blocking of the respective amount).
- e. **Cancellation costs** includes the costs involved in canceling a cheque, payment card, direct debit transfer or direct credit transfer order before a transaction is settled, as well as chargeback processing costs associated with disputed transactions that have been settled.

134. **Payments-specific infrastructure and maintenance costs** are costs for the depreciation and maintenance of equipment and for performing of processes, whose sole purpose is to make payment instruments or payment-related services available. They include the following cost elements:

- a. **Vault maintenance costs** are the costs associated with the maintenance of currency vaults, including facility costs (rent, depreciation, utilities, surveillance, facility insurance, etc.), if not already covered under one or the other operative cost elements.
- b. **Cash handling costs** are costs for handling cash, including cash inventory costs, rearrangement costs, costs associated with night safe deposits, etc., not covered under 'vault maintenance costs' or other cost elements.
- c. **Payments-specific IT costs** include costs for payments-related software developments, interfaces for internet banking, interfaces with ATM/POS networks and other centralized infrastructures, etc. This cost element excludes ATM maintenance costs and POS terminal management costs.
- d. **ATM maintenance costs** include the costs associated with machine maintenance and depreciation of ATMs.
- e. **POS management costs** include costs of managing and maintaining POS terminals (e.g. costs associated with machine maintenance and depreciation, staff, IT and communications, rent, etc.).
- f. **Loyalty program costs** refer to costs related to loyalty programs, like bonus miles, insurance, cash back transactions and other benefits, to the extent not covered by other cost elements.
- g. **Switching costs** are associated with routing authorization and authentication-related messages and the payment transactions as such between participating PSPs in a payment scheme.

- h. **Clearing costs** are associated with the process of transmitting, reconciling, confirming payment orders prior to settlement, including the netting of instructions and the establishment of final positions for settlement.
- i. **Settlement costs** are associated with the process of discharging obligations in respect of funds transfers between two or more parties.

135. **Security costs** include losses and the costs of preventing potential losses of value from holding payment instruments or providing services related to payment instruments due to unforeseen circumstances or illegal activity. They include the following cost elements:

- a. **Insurance costs** with respect to cash, include insurance premiums paid against losses induced by activities related to the production, issuing, collecting, storing and destroying of banknotes and coins. With respect to non-cash payment instruments, insurance premiums paid against losses induced by activities related to the production of payment instruments (where relevant) and processing of payment transactions.
- b. **Costs of loss, robbery, fraud and theft** are costs induced by the occurrence of loss, fraud and/or theft of banknotes and coins and non-cash payment instruments, to the extent that they are not covered by insurance.
- c. **Fraud prevention costs** are the costs of managing the risk of fraud, excluding the costs for insurance against fraud. These include costs associated with procedures in the event of cheque/card loss or theft (including customer service, reissuing and delivering of cheques/cards, etc.) to the extent that they are not covered under any other cost element and/or are not paid by the PSU; maintaining and monitoring “black lists” and other attempts for fraudulent card use; investigating fraud attempts; etc.

136. **Costs for supporting activities** include all costs for activities that are related to payment instruments and payment-related services and are of foundational and/or supporting nature. They include the following cost elements:

- a. **Transaction account costs** are associated with opening, maintaining and closing transaction accounts, as well as costs for producing and delivering periodic account statements to customers, to the extent not covered by other cost elements. These costs can be one-off and/or ongoing, suggesting that some of them will recur and some will vary from period to period.
- b. **Marketing and advertising costs** refer to costs for marketing and information dissemination aimed at acquiring new customers and/or campaigns targeting existing customers. It is important to note that this cost element contains two types of costs: i) the costs associated with new customer campaigns are one-off costs that may not recur periodically, and ii) the costs associated with educating and offering new services to existing customers are mainly ongoing, that is, they are recurring costs. Campaigns specifically aiming to educate existing and/or potential customers should also be included under this cost element.
- c. **Acquiring and training costs** include the costs associated with acquiring and training employees, agents and/or merchants accepting certain payment instruments (e.g. costs associated with staff, marketing and advertising, etc.).

- d. **Customer support costs** refer to costs for responding to customer complaints or providing further clarifications related to a particular payment instrument/transaction account activity/loyalty programs (including staff costs, consumables, etc.), to the extent not included in other cost elements.
- e. **Archiving costs** are associated with moving paper or electronic data that is no longer actively used to a separated database for retention and costs associated with maintaining existing archives as required by law or by the needs of the PSP/PIP.
- f. **Overhead costs** are associated with staff, rent for branch office buildings, utilities, depreciation of resources, general IT and communications, back office processing, archiving, as well as any other costs for supporting activities related to payment instruments/services, to the extent not included in other cost elements.

137. **Service fees** are fees and charges paid to another stakeholder in the retail payment process, in most cases to the PSP or PIP. They include the following cost elements:

- a. **License fees** refer to costs paid by the PSP to governance authorities of payment schemes, under the agreement established with these companies for the issuing and/or acquiring of payment instruments.
- b. **Interchange fees** are transaction fees payable in the context of a payment scheme by one participating PSP to another, for example by an acquirer to a card issuer.
- c. **Agent commission fees** include fees paid to agents for registering new customers and/or carrying out transactions.

### III.1 ACTIVITY-BASED COSTING APPROACH

138. Activity-Based Costing<sup>82</sup> (ABC) has been the approach for disaggregating the costs borne by suppliers of retail payment services in previous cost studies. However, it seems that the ABC-approach is often considered too complex and time-consuming for supply side respondents, which might, in the worst cases, adversely affect the willingness to respond. Therefore, this document suggests a simplified version of ABC to identify the costs for the supply side, by still following the cause and effect approach, which suggests that there is an immediate relationship between the costs incurred for performing a particular organizational activity and the retail payment instruments/services offered as a result of performing this activity. As such, this methodology allows for accurately allocating costs to a particular retail payment instrument.

139. Each cost element identified in Table 25 corresponds to an organizational activity performed in order to make a particular retail payment service and related infrastructure (e.g. issuing payment instruments, providing transaction accounts, and facilitating retail payment transactions) available. Each activity is a cluster of related tasks and procedures comprising a specific stage in the process of making a retail payment service available. All the work done in an organization can be classified as being part of a

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<sup>82</sup> The conceptual basis for the design and use of activity-based systems were put forward by Cooper and Kaplan in 1992. They observed that traditional cost systems used volume-driven allocation bases to assign organizational expenses to individual products. However, many of the resource demands are not proportional to the volume of units produced or sold. Thus, they put forward a method that links activities and used resources to costs. See: "Activity-Based Systems: Measuring the Costs of Resource Usage", by Robin Cooper and Robert S. Kaplan (1992).



specific activity, which can take place in one or more functional areas. Also, an activity must have a measureable effect, regardless of whether or not it is performed by humans.

140. The methodology requires that costs are classified as direct and indirect. Direct costs are those that arise from a direct and exclusive use of resources to provide retail payment services. That is, direct costs are the costs “directly related” to the activities carried out for the provision of certain retail payment instruments/executing transactions, and which can be imputed in a straightforward way (e.g. costs associated with fees and commissions and with staff directly involved in each activity and with each payment instrument)<sup>83</sup>. Indirect costs are those that arise from a non-exclusive use of resources to provide retail payment services. Indirect costs are the costs associated with the local overhead<sup>84</sup> and support functions<sup>85</sup> that are necessary to carry out the activities involved with the provision of services for different retail payment instruments and cannot be directly assigned to a certain payment instrument and/or payment transaction (e.g. POS-terminals that can be used for debit, credit and prepaid card payments). These costs should be imputed to the provision of each retail payment instrument/the execution of each retail payment transaction using specific allocation keys (e.g. costs associated with rentals, maintenance and depreciation, and other corporate support services)<sup>86</sup>.

141. Three steps are performed in order to create the list of the payment related cost elements.

142. **First step:** The activities performed by the PSP and PIP are identified to ensure that all relevant resources are considered in the analysis. This is necessary to accurately identify all activities for which indirect costs are incurred<sup>87</sup>. Then, the identified activities are classified as:

- a. Activities related to retail payment services<sup>88</sup>;
- b. Supporting activities<sup>89</sup>;
- c. Activities not related to retail payment services<sup>90</sup>.

The shaded areas in Figure 2 show the relevant groups of activities translating into payment related costs. The costs incurred by an organization for performing “activities related to retail payment services” are direct costs, which need to be considered in calculating the total costs incurred for making payment instruments and services available. The costs for “supporting activities” are incurred for activities that are related and activities that are not related to payments. The first sub-category is indirect costs, which together with the direct costs form the total payment related costs. The second sub-category is other costs unrelated to payment systems, which are irrelevant for this study and not examined further. Finally,

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<sup>83</sup> See: Schmiedel et al. (2012)

<sup>84</sup> Costs that are direct at the level of the organizational entity that is responsible for executing the concerned activities/delivering the concerned service/product, but which cannot directly be allocated to them in an economically feasible way (e.g. division head and the secretariat function or other support functions within the respective organizational entity). Source: Schmiedel et al. (2012).

<sup>85</sup> Support functions are all functions that refer to financial accounting and reporting, information and communication technology (ICT) which cannot be directly assigned to payment services, secretariat services to decision-making bodies, communication, event and meeting services, language services and lawyer-linguist services, planning and controlling, and organization, internal auditing, internal institutional, legal, tax and administrative issues, human resources management and social affairs, and internal services. Source: Schmiedel et al. (2012).

<sup>86</sup> See: Schmiedel et al. (2012)

<sup>87</sup> The cost study conducted by the European Central Bank (Schmiedel et al., 2012) shows that indirect costs are a substantial proportion of the total costs of making payment instruments available.

<sup>88</sup> The costs in this category are *direct costs* if they arise from a direct and exclusive use of resources to make a particular retail payment/service available through a particular payment channel, or *indirect costs* otherwise.

<sup>89</sup> The proportion of payments-related costs in this category is classified as *indirect costs*, and the non-payments-related proportion is irrelevant.

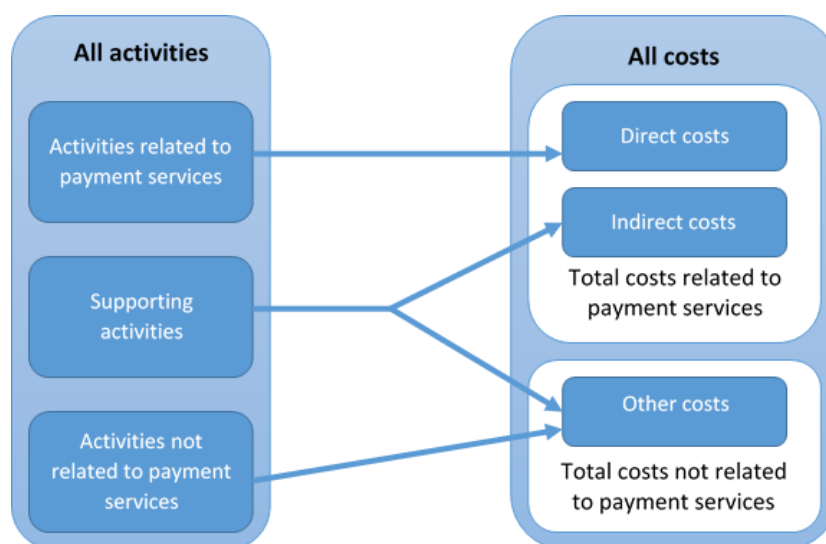
<sup>90</sup> The costs incurred for performing the activities in this category are irrelevant to payments, therefore, they are ignored further.

the costs incurred for performing “activities not related to retail payment services” are also irrelevant for the purpose of this study.

143. **Second step:** The costs for each cost activity are imputed. Costs for activities directly related to payment instruments/services can be easily assigned. In order to allocate the accurate proportion of costs related to payment instruments/services for supporting activities between payment-related and non-payment-related services, the relative size of these services needs to be assessed. A quick measure of size can be the number of employees working directly to provide each type of service (payment vs. non-payment related), the number of machine hours, or the revenues earned by providing each type of service.

144. **Third step:** The costs for each activity are allocated across payment services or payment instrument/service channel combinations (where applicable) on the basis of their use during the production process. Among the multiple sophisticated allocation methods that exist<sup>91</sup>, the transaction cost driver is preferred due to its simplicity and data availability. That is, payments volume is used for cost allocation.

**Figure 2: Relationship between activities and costs**



145. It is worth stressing that this approach needs to be used even if a PSP or PIP provides services related to a single payment instrument-service channel combination (where applicable) only. By doing so cost elements can be classified based on traceability (direct vs. indirect), variability (fixed vs. variable) and nature (resources vs. transfer), which is important from a data analytics point of view.

<sup>91</sup> The ABC methodology suggests three types of allocation keys: 1) *Transaction cost driver*: Corresponds to the number of times an activity is carried out and assumes that the same amount of resources is needed each time the activity is performed; 2) *Duration cost driver*: Reflects the time needed to carry out an activity. It is used when there is a significant variation in the way the activity contributes to making a product or service available; and 3) *Intensity cost driver*: Involves accounting for the resources actually used for each operation. In practice, this allocation mechanism is applied if the resources are expensive and have significant variations. Those three types of allocation keys allow for more accurate allocation of costs; however, more general allocation keys can be used for simplicity.

### III.2. COSTS BORNE BY PAYMENT SERVICE AND PAYMENT INFRASTRUCTURE PROVIDERS

146. The cost differentiation among the various actors on the supply side is based on the payment services and payments infrastructure they provide. As such, it would not matter for the purpose of cost identification and measurement what type of institution an actor on the supply side represents, but rather, what function it serves. This is the reason why no specific institutional actors are examined on the supply side, but rather two major groups are distinguished: Payment Service Providers (PSP) and Payment Infrastructure Providers (PIP).

147. Depending on country circumstances and payments market structure, there might be actors who offer a wide range of activities, some of which belong to the PSP group, and others to the PIP group. Hence, the selection of the specific actors from which cost data will be gathered on the supply side is to be determined on a country-by-country basis.

148. Typically, though, PSPs are: the central bank, commercial banks, e-money institutions (online money providers, mobile money providers), microfinance institutions, currency exchange centers (if foreign currencies are of relevance for a national payment system), and money transfer operators other than mobile money providers (if domestic money orders are of relevance for a national payment system).

149. PIPs typically are: the central bank, cash-in-transit companies, payment switches, automated clearing houses, cheque clearing houses, and other providers of switching, clearing, and/or settlement services. One and the same entity can combine different PIP-services: for example automated clearing houses for electronic fund transfers can also clear cheques.

#### III.2.1. Identification of cost elements per payment instrument-service channel combination

150. The remainder of this section provides a step-by-step guide for identifying and measuring the costs associated with the above-mentioned set of actors. The table below summarizes all payment instrument and service channel combinations (only relevant for PSP). While mobile money and/or online money transaction can only be initiated via one service channel, all other payment instruments can be initiated over multiple service channels, including point of interaction, payment center, branch, ATM, agent, internet/designated lines, and/or telephone/mobile phone network.

**Table 26: Identification of the payment instruments and service channels relevant to PSP**

Payment Instrument	Payment Service Channel						
	Point of interaction	Payment center	Branch	ATM	Agent	Internet/designated lines	Telephone/mobile phone network
Cash	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Cheque	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Debit card, credit card, and prepaid card	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Direct debit transfer <sup>92</sup> and direct credit transfer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>92</sup> A direct debit transfer typically includes a mandate, by which the debtor (payer) confirms that his/her account is debited. The mandate itself is not considered a payment instrument on its own, but an agreement between payer and payee and/or payer and PSP, authorizing one or a series of direct debit transfers. The transmission methods indicated for direct debit transfers are only relevant if both, authorization of mandate and initiation of direct debit transfer are coinciding. For direct credit transfers the transmission methods indicated are only relevant for one-off transactions rather than standing orders.

Payment Instrument	Payment Service Channel						
	Point of interaction	Payment center	Branch	ATM	Agent	Internet/ designated lines	Telephone/ mobile phone network
Mobile money							<input checked="" type="checkbox"/>
Online money						<input checked="" type="checkbox"/>	

151. Table 27 summarizes the cost elements of the PSP per payment instrument and service channel, and Table 28 summarizes the cost elements of the PIP for each payment instrument. While PIP's costs vary based on the payment instrument, payment service channels are mostly irrelevant, since PIP do typically not directly interact with PSU. For example, PIP's costs are the same, regardless if a PSU initiates a card payment at the point of interaction, payment center, agent, or over internet/designated lines. However, the costs of the PSP can vary substantially based on the payment instrument, but also based on the PSU's choice of service channel. For example, PSPs incur additional acquiring and training costs for providing payment services at agents. They also pay an agent fee for payments initiated at an agent.

**Table 27: Matching payment instruments with service channels and cost elements for PSP**

Payment Instrument	Payment service channel	PSP cost element
Cash	<input type="checkbox"/> All service channels <sup>93</sup>	Production/Procurement costs of banknotes
		Production/Procurement costs of coins
		Banknote (re-)issuing costs
		Coin (re-)issuing costs
		Banknote destruction costs
		Coin destruction costs
		Cash logistic costs
		Transaction time
		Vault maintenance costs
		Cash handling costs
		Payments-specific IT costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Customer support costs
		Overhead costs
	<input type="checkbox"/> ATM	ATM maintenance costs
	<input type="checkbox"/> Agent	Interchange fees
		Acquiring and training costs
Cheque	<input type="checkbox"/> All service channels <sup>93</sup>	Agent commission fees
		Production/Procurement costs of cheques
		Cheque issuing costs
		Cheque logistic costs
		Transaction time
		Truncation costs

<sup>93</sup> As identified in Table 26 above.

Payment Instrument	Payment service channel	PSP cost element
		Payment processing costs
		Return costs due to insufficient balance
		Cancellation costs
		Clearing costs
		Payments-specific IT costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Marketing and advertising
		Customer support costs
		Overhead costs
		Archiving costs
		Interchange fees
<b>Debit card</b>  <b>Credit card</b>  <b>Prepaid card</b>	<input type="checkbox"/> ATM	ATM maintenance costs
	<input type="checkbox"/> Agent	Acquiring and training costs
		Agent commission fees
	<input type="checkbox"/> All service channels <sup>93</sup>	Production/Procurement costs of payment cards
		Payment card issuing costs
		Payment card logistic costs
		Transaction time
		Authorization costs
		Payment processing costs
		Return costs due to insufficient balance
		Cancellation costs
		Payments-specific IT costs
		Loyalty program costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Marketing and advertising
		Customer support costs
		Overhead costs
		License fees
		Interchange fees
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Branch <input type="checkbox"/> Agent	Production/Procurement costs of card paper forms Truncation costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	POS management costs
	<input type="checkbox"/> Agent	Acquiring and training costs
		Agent commission fees
<b>Direct debit transfer</b>	<input type="checkbox"/> All service channels <sup>93</sup>	Transaction time
<b>Direct credit transfer</b>		Authorization costs
		Return costs due to insufficient balance

Payment Instrument	Payment service channel	PSP cost element
		Cancellation costs
		Payments-specific IT costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Marketing and advertising
		Customer support costs
		Overhead costs
		Interchange fees
	<input type="checkbox"/> Branch	Production/Procurement costs of direct credit transfer paper forms/direct debit transfer mandate paper forms
		Payment processing costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center	POS management costs
	<input type="checkbox"/> Point of interaction <input type="checkbox"/> Payment center <input type="checkbox"/> Internet/designated lines	Payment processing costs
<b>Mobile money</b>	<input type="checkbox"/> All service channels <sup>93</sup>	<input type="checkbox"/> Agent
		Acquisition and training costs
		Agent commission fees
		Transaction time
		Payments-specific IT costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Marketing and advertising
		Customer support costs
		Overhead costs
		Interchange fees
	<input type="checkbox"/> Agent	Acquisition and training costs
		Agent commission fees
<b>Online money</b>	<input type="checkbox"/> Internet/designated lines	Payments-specific IT costs
		Insurance costs
		Costs of loss, robbery, fraud and theft
		Fraud prevention costs
		Transaction account costs
		Marketing and advertising
		Customer support costs
		Overhead costs
		Interchange fees

**Table 28: Matching payment instruments with cost elements for PIP**

Payment Instrument	PIP Cost Element	Payment Instrument	PIP Cost Element
<b>Cash</b>	Cash logistic costs	<b>Direct debit transfer</b> <b>Direct credit transfer</b>	Payment processing costs
	Vault maintenance costs		Switching costs
	Cash handling costs		Clearing costs
	Overhead costs		Settlement costs
<b>Cheque</b>	Cheque logistic costs		Archiving costs
	Payment-specific IT costs		Overhead costs
	Payment processing costs	<b>Mobile money</b>	Payment processing costs
	Switching costs		Payment-specific IT costs
	Clearing costs		Switching costs
	Settlement costs		Clearing costs
	Archiving costs		Settlement costs
	Overhead costs		Archiving costs
<b>Debit card</b> <b>Credit card</b> <b>Prepaid card</b>	Payment card logistic costs		Overhead costs
	Payment-specific IT costs	<b>Online money</b>	Payment processing costs
	Payment processing costs		Payment-specific IT costs
	Switching costs		Switching costs
	Clearing costs		Clearing costs
	Settlement costs		Settlement costs
	Archiving costs		Archiving costs
	Overhead costs		Overhead costs

### III.2.2. Sample selection and survey design for payment service and payment infrastructure providers

152. Once the cost elements per payment instrument have been identified, primary data on the relevance of the different retail payment instruments, transmission methods, and the monetary value of those cost elements can be estimated via a corresponding PSP/PIP survey. The PSP/PIP data may be highly sensitive and the PSP/PIP may be reluctant to provide the necessary level of detail to a professional research firm or to any other external party. Therefore, where necessary, relevant authorities are encouraged to conduct the surveys on their own in order to ensure reliable information and accurate results. Survey participants may even request a non-disclosure agreement to be signed or for the data to be stored on encrypted devices. To ensure the involvement of the relevant PSP/PIP, implementing entities should closely involve them and/or their association throughout the process (from the design of the questionnaire, to the data collection and validation phase). This could be done through a working group and/or task force involving the relevant supply side actors.

153. **Mode:** PSP/PIP surveys on the cost of payment instruments are ideally conducted through personal interviews or through online supplementary questionnaires. In both cases, follow-ups that allow PSP/PIP to obtain data and ensure the accuracy of the data will likely be needed. However, each visit, at the head office, should not last much more than an hour.

154. **Structure:** As in the case of the demand side actors, a three-section questionnaire can capture the relevant data for the supply side actors, the PSP and PIP. The first part should cover volume data. It is important to collect data on the volume of transactions carried out using each payment instrument through each transmission method (where applicable) and on the number of payment instruments issued,

delivered, recycled, destroyed, truncated, etc. (e.g. number of banknotes, coins, paper cheques, paper forms for direct credit transfers and direct debit transfer mandates, payment cards, etc.) within a certain period of time. The second section deals with the cost elements. For the PSP questionnaire, a distinction needs to be made between resource costs and transfer costs, in particular. It is important to point out that, although many cost elements are classified as resource costs, this is only the case when the activities associated with these cost elements are performed in-house or they are outsourced to organizations that are not qualified as the PIP or PSP. When activities are outsourced to other surveyed PIP/PSP, the outsourcing fees are considered to be transfer costs by definition. Therefore, the design of the PSP questionnaire should make it possible to distinguish between activities performed internally, fees paid for services outsourced to other PSP/PIP surveyed or non-PSP/non-PIP. This approach aims to avoid double counting of costs. The third and final section captures general information such as number of employees, number of branches, number of transaction accounts, operations costs, and other information of this nature. See sample questions in Box 4 (PSP) and Box 5 (PIP).

155. **Sampling:** All relevant payment suppliers should be surveyed, assuming that they do not constitute large numbers (i.e. less than 100 units, in total). If this is not possible, the aim should be to survey at least those providers holding a total of 50 percent of all transaction accounts in a country. For a PSP with a large branch network, such as commercial banks, savings or cooperative banks, next to the headquarter (or head institution) a representative sample of branches can be selected and interviewed, using urban/rural and (if applicable) connected online to the headquarter/offline as the main stratification criteria. The number of PIP is typically even more limited. Implementing entities might decide not to survey all PIP if they have a good understanding of the profit margin of those PIP (or the PIP works on a cost-recovery rather than a for-profit bases). In that case the transfer costs reported by PSP (corrected by the profit margin if needed) can be used as a proxy for the resource costs of the PIP.

156. If the implementing entity is the central bank, it might have strong moral suasion power to convince the PSP/PIP to participate, but it will typically lack the legal power to compel them doing so. If the implementing party is no central bank, getting the PSP/PIP on board might be even more challenging. To get these stakeholders on board, various countries have used the argument that the results will allow individual participants to benchmark themselves to their entire sector and provide insight in potential areas of cost reductions. In addition, personalized letters signed by the central bank's governor may be used. It is also crucial to ensure the confidentiality and anonymity of the collected data. Countries may want to clearly underline that the respondent-specific information collected from individual entities will not be published or distributed to any other party and only be used for central bank research and policy. Also, in case of concentrated markets, the responses of various stakeholder groups (e.g. banks and CIT companies) may need to be merged and published as one aggregated total to ensure their confidentiality.

157. Although the costs associated with most cost elements accrue reasonably uniformly over years, months or even more frequent time intervals, those of production/procurement, issuing, reissuing, and destruction of cash can vary substantially from one year to the next. For example, banknotes of a particular denomination may only be printed once in a few years and stored until they are issued. At the same time, it is possible to have years when no banknotes are printed or coins minted. In order to arrive at reasonable production/procurement costs of cash which do not over- or under-estimate the true costs of cash due to the specific year chosen to conduct a cost study, it is recommended that: i) a 5-year<sup>94</sup> average number of banknotes/coins per denomination is calculated, and ii) the current year's cost<sup>95</sup> of

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<sup>94</sup> Different denominations of banknotes and coins have different life times, often longer than 5 years, which suggests that a longer time period may need to be considered for improved accuracy. However, it is possible that detailed data longer than 5 years may not be readily available.

<sup>95</sup> The current year's cost per coin/banknote of each denomination is chosen in order to reflect the current level of prices in the economy. This is particularly important when the costs of cash are presented as a proportion to the country's GDP.



printing/minting a unit of each denomination is used for the purpose of the study. If a certain denomination which is still in use was not printed/minted over the past 5 years, the number of banknotes printed/coins minted last and the predicted life of the current stock of that denomination should be used to estimate the average number of banknotes/coins of the denomination issued in an average year. For example, if 1 million banknotes of denomination 50 (local currency) were last printed 7 years ago and the current stock is expected to last for 3 more years, it is recommended to assume that, on average, a supply of 100,000 units<sup>96</sup> of that banknote is needed every year. When printing of banknotes and minting of coins is outsourced, it is recommended to average the inflation-adjusted<sup>97</sup> outsourcing fees paid annually for the past 5 years.

158. Similarly, issuing, reissuing, and destruction of banknotes and coins may vary substantially from year to year. Therefore, the following recommendation applies to estimating the annual costs accrued for each of these activities/cost elements: a 5-year average of inflation-adjusted costs or outsourcing fees should be used instead of the actual current year's costs.<sup>98</sup>

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<sup>96</sup> This figure equals 1 million units of the banknote divided by 10 years, the expected number of years the stock will suffice for.

<sup>97</sup> Inflation in some countries can be high (or negative); therefore, not adjusting prices paid in past years to reflect current price levels may substantially bias the results of the study.

<sup>98</sup> Current year's costs may be used in case the volume of banknotes and coins issued, reissued, and destroyed is reasonably uniform each year.

#### Box 4: Sample questions that can be asked during the PSP survey

##### Section 1: Volumes, Values, and Distribution of Payments Processed

1. For debit cards issued by your institution, how many transactions were initiated through each service channel over the past year, and what was the average value per transaction?

Transmission method	Number of transactions	Average transaction amount (in local currency)
<i>Point of interaction</i>		
<i>Payment center</i>		
<i>Branch</i>		
<i>ATM</i>		
<i>Agent outlet</i>		
<i>Mail</i>		
<i>Internet/designated lines</i>		
<i>Telephone/mobile phone network</i>		
<i>Other / Unknown</i>		

##### Section 2: Cost Elements of Payments

1. What are the typical production costs you incur per debit card issued?

OR

	Cost per debit card (in local currency)	Average number of debit cards issued per year
<i>Manufacturing</i>		
<i>Personalization</i>		
<i>Distribution to customer</i>		

Personalization was done: ☐ In-house ☐ By a PSP/PIP ☐ By a third party

2. What are the annual costs (in local currency) borne by your institution for promoting the following payment instruments? Please provide a combined figure if you cannot break it down by payment instrument.

Cash	Cheque	Debit card	Credit card	Direct debit transfer	Direct credit transfer	Online money	Mobile money
_____	_____	_____	_____	_____	_____	_____	_____

##### Section 3: PSP Information

- Company name (optional): \_\_\_\_\_
- Contact person (optional): \_\_\_\_\_
- Number of branches: \_\_\_\_\_
- Number of full time employees: \_\_\_\_\_ part time employees: \_\_\_\_\_
- Average hourly salary paid over the past fiscal year per employee \_\_\_\_\_ (in local currency)

### Box 5: Sample questions that can be asked during the PIP survey

#### Section 1: Volumes, Values, and Distribution of Payments Processed

1. What is the total number of transactions processed over the past year for each payment instrument listed below? Please indicate the average amount per transaction.

Payment instrument	Number of transactions	Average transaction amount (in local currency)
<i>Cheque</i>		
<i>Debit card</i>		
<i>Credit card</i>		
<i>Prepaid card</i>		
<i>Direct debit transfer</i>		
<i>Direct credit transfer</i>		
<i>Online money</i>		
<i>Mobile money</i>		

#### Section 2: Cost Elements of Payments

1. What is the annual cost (in local currency) that your company/institution incurs from the collection and transportation of cash?
2. What are the annual costs (in local currency) that your company incurs in for providing archiving, switching, clearing, and settlement services?

	Payment Instrument						
Service	Cheque	Debit card	Credit card	Direct debit transfer	Direct credit transfer	Online money	Mobile money
<i>Archiving</i>							
<i>Switching</i>							
<i>Clearing</i>							
<i>Settlement</i>							

#### Section 3: PIP Information

1. Company name (optional): \_\_\_\_\_
2. Contact person (optional): \_\_\_\_\_
3. Number of branches: \_\_\_\_\_
4. Number of full time employees: \_\_\_\_\_ part time employees: \_\_\_\_\_
5. Average hourly salary paid over the past fiscal year per employee \_\_\_\_\_ (in local currency)

**Table 29: Data to be captured during the PSP survey**

Cost category	Cost element	Data to be obtained in the course of the PSP/PIP survey
<b>Production/ procurement costs</b>	Production/Procurement costs of banknotes	Costs in currency unit per denomination <b>and</b> Five-year average number of units per denomination (per annum)
	Production/Procurement costs of coins	Costs in currency unit per denomination <b>and</b> Five-year average number of units per denomination (per annum)
	Production/Procurement costs of cheques/cards/direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit per item <b>and</b> Average number of units per item (per annum)
	Production/Procurement costs of payment cards	Costs in currency unit per item <b>and</b> Average number of units per item (per annum)
<b>Issuing, reissuing and destruction costs</b>	Banknote (re-)issuing costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Coin (re-)issuing costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Banknote destruction costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Coin destruction costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Cheque/payment card issuing costs	Costs per cheque/card <b>or</b> Outsourcing fees paid (per annum)
<b>Logistic costs</b>	Cash logistic costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	Cheque/payment card logistic costs	(Costs per cheque/card <b>or</b> Outsourcing fees paid (per annum))
<b>Time costs</b>	Transaction time	Time in minutes (per transaction) <b>and</b> Number of transactions (per week)
<b>Payment processing and cancelation costs</b>	Truncation costs	Costs in currency unit (per annum <b>or</b> per truncated payment instrument)
	Authorization costs	Costs in currency unit (per annum <b>or</b> per transaction)
	Payment processing costs	Costs in currency unit (per annum <b>or</b> per transaction)
	Return costs due to insufficient balances	Costs in currency unit (per annum <b>or</b> per transaction)
	Cancellation costs	Costs in currency unit (per annum <b>or</b> per transaction)
<b>Payments-specific infrastructure and maintenance costs</b>	Vault maintenance costs	Costs in currency unit (per annum)
	Cash handling costs	Time in minutes (per transaction)
	Payments-specific IT costs	Costs in currency unit (per annum)
	ATM maintenance costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	POS management costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	Loyalty program costs	Costs in currency unit (per annum)
<b>Security costs</b>	Insurance costs	Costs in currency unit (per annum)
	Costs of loss, robbery, fraud and theft	Costs in currency unit (per annum)
	Fraud prevention costs	Costs in currency unit (per annum)

Cost category	Cost element	Data to be obtained in the course of the PSP/PIP survey
<b>Costs for supporting activities</b>	Transaction account costs	Time in minutes (per week) <b>and</b> additional costs in currency unit (per annum <b>or</b> per account)
	Marketing and advertising	Costs in currency unit (per annum)
	Acquiring and training costs	Time in minutes (per week) <b>and</b> additional costs in currency unit (per annum <b>or</b> per agent) <b>and</b> Number of agents / staff trained
	Customer support costs	Costs in currency unit (per annum) <b>or</b> time in hours (per time period)
	Archiving costs	Costs in currency unit (per annum)
	Overhead costs	Costs in currency unit (per annum)
<b>Service costs</b>	License fees	Costs in currency unit (per annum)
	Interchange fees	Costs in currency unit (per payment transaction and per payment instrument)
	Agent commission fees	Costs in currency unit (per transaction) <b>and</b> costs in currency unit (per registration)

**Table 30: Data to be captured during the PIP survey**

Cost category	Cost element	Data to be obtained in the course of the PSP/PIP survey
<b>Logistic costs</b>	Cash logistic costs	Costs in currency unit <b>or</b> outsourcing fees paid (per annum)
	Cheque/payment card logistic costs	(Costs per cheque/card <b>or</b> outsourcing fees paid (per annum))
<b>Payment processing and cancelation costs</b>	Payment processing costs	Costs in currency unit (per annum <b>or</b> per transaction)
<b>Payments-specific infrastructure and maintenance costs</b>	Switching costs	Costs in currency unit (per transaction <b>or</b> per annum)
	Clearing costs	Costs in currency unit (per transaction <b>or</b> per annum)
	Settlement costs	Costs in currency unit (per transaction <b>or</b> per annum)
<b>Costs for supporting activities</b>	Archiving costs	Costs in currency unit (per annum)
	Overhead costs	Costs in currency unit (per annum)
<b>Payments-specific infrastructure and maintenance costs</b>	Payments-specific IT costs	Costs in currency unit (per annum)

### III.2.3. Calculation and reporting of retail payment costs for payment service and payment infrastructure providers

159. The following steps need to be followed to ensure the necessary level of detail for cost calculation and cost reporting on the supply side.

160. **First step:** The comprehensive lists of cost elements (activities) per PSP/PIP, payment instrument and transmission method provided in the above tables should be used as guidance.

161. **Second step:** The costs for supporting activities (mainly overhead cost) needs to be allocated so that only the payments-related proportion can be used further in the calculations. A simple way to allocate those costs between payment services and other services performed by the PSP/PIP is to assess the relative size of payment vs. non-payment-related services either based on the number of employees providing these types of services or based on the share of revenues earned by offering payment vs. non-payment-related services.

162. **Third step:** The costs for each cost element must be allocated across payment instruments and transmission methods (where applicable) on the basis of their use during the production process. The costs directly related to a payment instrument can easily be assigned to a particular cost element. Allocation keys should be carefully designed to assign the accurate proportion of indirect costs to each payment instrument/transmission method. Payments volume is an appropriate and readily available allocation key. Alternatively, roughly estimated shares of costs can be used, along with the number of months/years of circulation and the use of certain payment instruments such as cash and cards. The latter information is particularly useful for the cost distribution in the case of the PIP. It is important to keep in mind that all relevant supporting activities' costs need to be allocated as accurately as possible. The indirect nature of some of the cost elements comes from the fact that many payments-related products and services are offered as bundles, cutting across multiple payment instruments and transmission methods. As previously suggested, the indirect costs associated with each payment instrument and/or transmission method can be disaggregated using volume as the main allocation key.

163. **Fourth step:** Since each payment service and payment instrument/service channel combination has a specific set of cost elements attached, total costs related to a specific combination are obtained from the sum of the costs imputed to the activities needed to make the instrument available through the particular channel (where applicable). Given that data for many of the costs of payment suppliers is collected on an annual basis, it is recommended to first annualize all costs per payment instrument-transmission method combination and then estimate the costs per transaction. The unit costs for each PSP/PIP and payment instrument are calculated from the total direct and indirect costs and the volume of transactions. With the sum of direct and indirect costs, the total cost per PSP/PIP, per payment instrument, and per transmission method (wherever applicable) is then obtained.

164. As such, this approach allows for understanding and reporting cost results on three bases: first, on PSP/PIP basis, for all relevant payment instruments and, if applicable, service channels; second, on a structural per processed payment basis, identifying the instrument and the transmission method associated with it; and third, on an annual basis, for all payments processed annually through a specific payment instrument and transmission method.

**Table 31: Calculation of the monetary value per single cost element for PSP**

Cost category	Cost element	Calculation of the monetary value cost per cost element
<b>Production/ procurement costs</b>	Production/Procurement costs of banknotes	Costs in currency unit per denomination * Five-year average number of units per denomination (per annum)
	Production/Procurement costs of coins	Costs in currency unit per denomination * Five-year average number of units per denomination (per annum)
	Production/Procurement costs of cheques/cards/direct credit transfer paper forms/direct debit transfer mandate paper forms	Costs in currency unit per item * Average number of units per item (per annum)
	Production/Procurement costs of payment cards	Costs in currency unit per item * Average number of units per item (per annum)
<b>Issuing, reissuing and destruction costs</b>	Banknote (re-)issuing costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Coin (re-)issuing costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Banknote destruction costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Coin destruction costs	Five-year average costs in currency unit <b>or</b> Five-year average outsourcing fees paid (per annum)
	Cheque/payment card issuing costs	Costs per cheque/card * Number of cheques/cards issued (per annum) <b>or</b> Outsourcing fees paid (per annum)
<b>Logistic costs</b>	Cash logistic costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	Cheque/payment card logistic costs	Costs per cheque/card * Number of cheques/cards delivered (per annum) <b>or</b> Outsourcing fees paid (per annum)
<b>Time costs</b>	Transaction time	Time in minutes (per transaction) * Number of transactions (per week) * 52 weeks
<b>Payment processing and cancelation costs</b>	Truncation costs	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per truncated payment instrument) * Number of truncated payment instruments (per annum)
	Authorization costs	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per transaction) * Number of transactions (per annum)
	Payment processing costs	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per transaction) * Number of transactions (per annum)
	Return costs due to insufficient balances	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per transaction) * Number of transactions (per annum)
	Cancelation costs	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per transaction) * Number of cancelled payments (per annum)
<b>Payments-specific infrastructure and maintenance costs</b>	Vault maintenance costs	Costs in currency unit (per annum)
	Cash handling costs	Time in minutes (per transaction) * Number of transactions (per week) * 52 weeks

Cost category	Cost element	Calculation of the monetary value cost per cost element
	Payments-specific IT costs	Costs in currency unit (per annum)
	ATM maintenance costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	POS management costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	Loyalty program costs	Costs in currency unit (per annum)
<b>Security costs</b>	Insurance costs	Costs in currency unit (per annum)
	Costs of loss, robbery, fraud and theft	Costs in currency unit (per annum)
	Fraud prevention costs	Costs in currency unit (per annum)
<b>Costs for supporting activities</b>	Transaction account costs	Time in minutes (per week) * 52 weeks + Additional costs in currency unit (per annum <b>or</b> (per account * Number of accounts))
	Marketing and advertising	Costs in currency unit (per annum)
	Acquiring and training costs	Time in minutes (per week) * 52 weeks + Additional costs in currency unit (per annum <b>or</b> (per account * Number of agents))
	Customer support costs	Costs in currency unit (per annum)
	Archiving costs	Costs in currency unit (per annum)
	Overhead costs	Costs in currency unit (per annum)
<b>Service costs</b>	License fees	Costs in currency unit (per annum)
	Interchange fees	Costs in currency unit (per annum)
	Agent commission fees	Costs in currency unit (per transaction) * Number of transactions  Costs in currency unit (per registration/account issued) * Number of registrations/accounts issued



**Table 32: Calculation of the monetary value per single cost element for PIP**

Cost category	Cost element	Calculation of the monetary value cost per cost element
<b>Logistic costs</b>	Cash logistic costs	Costs in currency unit <b>or</b> Outsourcing fees paid (per annum)
	Cheque/payment card logistic costs	Costs per cheque/card * Number of cheques/cards delivered (per annum) <b>or</b> Outsourcing fees paid (per annum)
<b>Payment processing and cancelation costs</b>	Payment processing costs	Costs in currency unit (per annum) <b>or</b> Costs in currency unit (per transaction) * Number of transactions (per annum)
<b>Payments-specific infrastructure and maintenance costs</b>	Payments-specific IT costs	Costs in currency unit (per annum)
	Switching costs	Costs in currency unit per transaction * Number of transactions (per annum) <b>or</b> Costs in currency unit(per annum)
	Clearing costs	Costs in currency unit per transaction * Number of transactions (per annum) <b>or</b> Costs in currency unit (per annum)
	Settlement costs	Costs in currency unit per transaction * Number of transactions (per annum) <b>or</b> Costs in currency unit (per annum)
<b>Costs for supporting activities</b>	Archiving costs	Costs in currency unit (per annum)
	Overhead costs	Costs in currency unit (per annum)

## IV. OVERVIEW OF COST ELEMENTS FOR THE ENTIRE ECONOMY

165. The costs for the whole economy are calculated based on the demand side and the supply side data as collected and analyzed in parts II and III. Three main goals are of interest here: i) calculating the total resource costs, total transfer costs of retail payments and consequently the total economic costs; ii) calculating the total annual costs to the economy associated with each payment instrument (expressed as percentage of the country's GDP); iii) exploring different approaches of creating savings for the national payment system.

### IV.1. CALCULATING THE TOTAL COSTS FOR THE ECONOMY

166. The retail payment costs for the whole economy are the sum of all resource (internal) costs associated with making or accepting payments (from demand side perspective) and those associated with making payment instruments/services available (from supply side perspective). In order to calculate the total retail payment costs for the economy, the demand side (PSU) and the supply side (PSP and PIP) resource costs need to be aggregated (see Table 33, same as Table 6, repeated below for convenience).

**Table 33: Relationship among resource costs, transfer costs and total costs (same as Table 6)**

Stakeholder \ Type of costs		Resource costs (RC)	Transfer costs (TC)	Total costs per stakeholder
PSU	Consumers	$RC^P$	$TC^P$	$\Sigma (RC^P, TC^P)$
	Businesses	$RC^B$	$TC^B$	$\Sigma (RC^B, TC^B)$
	Government agencies	$RC^G$	$TC^G$	$\Sigma (RC^G, TC^G)$
PSP & PIP	Payment service providers (PSP)	$RC^{PSP}$	$TC^{PSP}$	$\Sigma (RC^{PSP}, TC^{PSP})$
	Payment infrastructure providers (PIP)	$RC^{PIP}$	$TC^{PIP*}$	$\Sigma (RC^{PIP}, TC^{PIP})$
Total costs for the economy		$\Sigma (RC^P, RC^B, RC^G, RC^{PSP}, RC^{PIP})$		
* A PIP typically acts as service providers for a PSP. As a result, they typically do not incur transfer costs by other stakeholders in the retail payment chain. In that case their transfer cost would be 0.				

167. It is instrumental to sum up all resource costs and all transfer costs and look at the ratio of resource costs (or transfer costs) to the total costs for the economy. The ratio of resource costs to total costs shows how much of the costs associated with payment services are true production costs. However, it is important to stress that aggregating the demand side and the supply side costs to arrive at the total costs for the economy is not as simple as adding up all measured costs. In order to avoid double-counting, transfer costs need to be excluded from the total costs calculation. That is, fees paid to those PSP and PIP within the scope of the survey for services performed or services outsourced must be excluded from the total economy cost calculation. The rationales behind this are the following:

- When calculating the total costs for the economy, only resource costs are relevant since those are the internal (production) cost for the performed activities. Businesses or governments on the demand side or the PSP/PIP on the supply side may choose to outsource some of their internal payment-related processes, which can consist of one or more activities as defined in section III.1, to (other) PSP/PIP. The costs of these activities are counted twice: once as transfer costs for the

stakeholder outsourcing the process, and once as resource costs for the stakeholder performing the process. When activities are performed in-house, only the internal (production) costs of performing those activities are reflected in the reported resource costs. On the other hand, when activities are outsourced, outsourcing fees include a profit margin in addition to the actual cost incurred for performing the activities. If outsourced activities are performed by the PSP/PIP within the scope of the cost study, outsourcing fees paid are treated as transfer costs, while the costs incurred by the PSP/PIP are treated as resource costs. However, if outsourced activities are performed by non-PSP/non-PIP, outsourcing fees paid are treated as resource costs since the actual production costs are unknown. In this case, the reported resource costs exceed the true production costs by the profit margin charged by the outsourcee<sup>99</sup>.

- b. When the PSU and PSP pay service fees to (other) PSPs or PIPs comprised in the scope of the survey, the costs for performing the particular services are also counted twice: once as transfer costs for the stakeholder requiring the services, and once as resource costs for the stakeholder performing the services. Again, when calculating the total costs for the economy, only the resource costs are relevant, since those are the internal (production) costs for the performed services and do not include the profit margin charged.

168. When the PSU/PSP/PIP pays payment-related service fees or outsources payment-related functions to third parties whose resource costs are not accounted for in one of the retail payment costs surveys, those service or outsourcing fees are conceptually considered as resource costs. Since the parties receiving the fees do not report their resource costs, those costs are not counted twice. For example, since agents are not surveyed for the purpose of this study, the cost element agent commission is considered a resource cost and it must be included in the total costs for the economy. If agents were surveyed, their internal costs would be considered as resource costs and the commissions that they are paid would be considered as transfer costs. At the same time, outsourcing fees or payment-related service fees include a profit margin on top of the true production costs required for performing the service. Therefore, when service fees are treated as resource costs, resource costs are overestimated, while transfer costs are underestimated. It is important to recognize this shortcoming, even if it cannot be addressed.

169. Table 34 summarizes the resource cost and the transfer cost elements for the demand side (PSU) and the supply side (PSP & PIP) actors, respectively. It is assumed that all activities associated with the cost elements listed under resource costs are performed in-house, unless explicitly stated otherwise.

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<sup>99</sup> It is difficult to estimate the profit margins charged and there is no consensus in the literature on how to do that. This guide does not provide specific guidelines on calculating profit margins and suggests omitting them, although this leads to overestimation of resource costs and underestimation of transfer costs.

**Box 6: The difference between resource costs and transfer costs when activities are performed in-house vs. outsourced to PIP/PSP vs. outsourced to third parties**

**Example 1:**

A retail business owner (that is a PSU) needs to deposit cash/cheques and get change from the bank on a regular basis. The business owner has the options to i) do this in-house (perform those tasks on his/her own or have an employee responsible for performing them), or to ii) pay a cash logistic company (cash-in-transit / CIT company) to do that (that is, outsource to a PIP). When those tasks are performed in-house, their cost is considered to be a resource cost. However, if the tasks are outsourced to a CIT company those costs are accounted for twice: first, they are reported by the business in the business survey and, second, they are reported by the CIT company in the PIP survey. In this case, the costs reported by the CIT company are the true production costs incurred for performing the outsourced task and they need to be categorized as resource costs. The outsourcing fees paid by the business to the CIT company are categorized as transfer costs and they cover the CIT's production costs and a profit margin charged by the CIT.

**Example 2:**

A mobile money provider (that is a PSP) has the following ways of reaching its customers: i) to open offices/branches where it can service its clients (that is perform the task at hand in-house), or ii) to outsource the task to agents (who are neither PSP, nor PIP). Again, when performed in-house, the costs incurred by the mobile money provider are categorized as resource costs. Since agents are beyond the scope of this study (they are neither PSP, nor PIP) and they are not surveyed, the calculation of the true costs of agents for offering services to mobile money provider customers comprised in the study. Therefore, the costs for performing this task are reported only once by the mobile money providers themselves. In this case, those costs are categorized as resource costs, even though they exceed the true production costs (by the profit margin agents might be able to achieve). If the profit margin of agents is known, it could be subtracted from the agent fees paid reported by the mobile money provider.

**Table 34: Typical categorization of resource vs. transfer costs for the calculation of the total costs for the economy**

Cost category	Cost element	Demand side costs	Supply side costs - PSP	Supply side costs - PIP
<b>Time costs</b>	Travel time	RC	-	-
	Waiting time	RC	-	-
	Transaction time	RC	RC	-
	Reconciliation time	RC	RC	RC
	Operations time	RC	RC	RC
<b>Logistic costs</b>	Travel costs	RC	-	-
	Communication costs	RC	RC	RC
	Cash logistic costs	TC (if outsourced) RC (if done in-house)	TC (if outsourced) RC (if done in-house)	RC
	Cheque/payment card logistic costs	TC (if outsourced) RC (if done in-house)	TC (if outsourced) RC (if done in-house)	-
<b>Infrastructure costs</b>	Maintenance costs	RC	RC	RC
	Depreciation costs	RC	RC	RC
<b>Damage costs</b>	Error costs	RC	RC	RC
	Theft costs	RC	RC	RC

Cost category	Cost element	Demand side costs	Supply side costs - PSP	Supply side costs - PIP
	Fraud costs	RC	RC	RC
	Insurance costs	RC	RC	RC
<b>Production/ procurement costs</b>	Production/Procurement costs of banknotes	-	RC	-
	Production/Procurement costs of coins	-	RC	-
	Production/Procurement costs of cheques/direct credit transfer paper forms/direct debit transfer mandate paper forms	RC	RC	-
	Production/Procurement costs of payment cards	-	RC	-
<b>Issuing, reissuing and destruction costs</b>	Banknote (re-)issuing costs	-	TC (if outsourced) RC (if done in-house)	RC
	Coin (re-)issuing costs	-	TC (if outsourced) RC (if done in-house)	RC
	Banknote destruction costs	-	TC (if outsourced) RC (if done in-house)	RC
	Coin destruction costs	-	TC (if outsourced) RC (if done in-house)	RC
	Cheque/payment card issuing costs	TC	TC (if outsourced) RC (if done in-house)	RC
<b>Payment processing and cancellation costs</b>	Truncation costs	-	TC (if outsourced) RC (if done in-house)	RC
	Authorization costs	-	TC (if outsourced) RC (if done in-house)	RC
	Payment processing costs	-	TC (if outsourced) RC (if done in-house)	RC
	Return costs due to insufficient balance	-	TC (if outsourced) RC (if done in-house)	RC
	Cancellation costs	-	TC (if outsourced) RC (if done in-house)	RC
<b>Payments- specific infrastructure and maintenance costs</b>	Vault maintenance costs	RC	RC	RC
	Cash handling costs	TC (if outsourced) RC (if done in-house)	TC (if outsourced) RC (if done in-house)	RC
	ATM maintenance costs	-	TC (if outsourced) RC (if done in-house)	RC
	POS management costs	TC	TC (if outsourced) RC (if done in-house)	RC
	Loyalty program costs	-	RC	-
	Switching costs	-	TC (if outsourced) RC (if done in-house)	RC
	Clearing costs	-	TC (if outsourced) RC (if done in-house)	RC
	Settlement costs	-	TC (if outsourced) RC (if done in-house)	RC
<b>Security costs</b>	Insurance costs	RC	RC	RC
	Costs of loss, robbery, fraud and theft	RC	RC	RC
	Fraud prevention costs	RC	RC	RC
	Transaction account costs	-	RC	-

Cost category	Cost element	Demand side costs	Supply side costs - PSP	Supply side costs - PIP
<b>Costs for supporting activities</b>	Marketing and advertising	-	RC	-
	Acquiring and training costs	-	TC (if outsourced) RC (if done in-house)	RC
	Customer support costs	-	TC (if outsourced) RC (if done in-house)	RC
	Archiving costs	-	RC	RC
	Overhead costs	-	RC	RC
<b>Service costs</b>	Fees for services outsourced to third parties	RC	RC	RC
	Payment service fees paid to third parties	RC	RC	RC
	Agent commission fees	-	RC	-
<b>Cost of funds</b>	Holding costs	RC	-	-
<b>Service costs</b>	Periodic fees paid to PSP	TC	-	-
	Per transaction fees paid to PSP	TC	-	-
	License fees	-	TC	-
	Interchange fees	-	TC	-
	Fees for services outsourced to PIP or PSP	TC	TC	-
<b>Cost of funds</b>	Float costs	TC	TC	-

TC = Transfer costs (assumes that the entity performing the service/receiving the fees is also within the scope of the cost study).  
RC = Resource costs

170. The total costs for the economy per payment instrument and the total costs for the economy of all retail payments are of interest. First, the procedure described above can be repeated for each payment instrument separately. Second, the total costs for all payment instruments can be added in order to arrive at the total costs for the economy.

171. In order to assess the economic value of the calculated cost for the economy as a whole and per payment instrument, the costs can be expressed as proportion to the surveyed country's GDP for the survey year. The costs per GDP for the whole economy (per payment instrument and for all retail payments) are useful in assessing the efficiency of a country's payments system against other countries. It can also be effectively used as a benchmark for future reference. Since time based costs opportunity costs of PSUs are likely to have a substantial impact on the overall resource costs, it is recommended to calculate the total costs for the economy with and without time based costs for PSUs.

172. The average cost per payment transaction made with a particular payment instrument can also be calculated by dividing the total costs for the economy for that payment instrument by the annual volume of payments made with the particular instrument. The average total costs of payment instruments can be compared in order to assess efficiency. However, it is important to keep in mind that some payment instruments are more efficient for some use cases than others. Therefore, simply comparing average total costs per payment instrument may lead to wrong conclusions.

173. In order to make more accurate comparisons of the relative efficiency of payment instruments across all stakeholders, more detailed analysis may be performed by exploring the average economic costs of payment instruments for a specific use case and a specific service channel. The resource costs of the

PSU per use case and transmission method are available from the demand side data analysis. On the supply side, the average resource costs of the PSP per payment instrument-transmission method combination, as well as the resource costs of the PIP per payment instrument (the transmission method does not affect the cost in this case), can be calculated. As such, the resource costs borne by the three aforementioned stakeholders can be added for a specific payment instrument-transmission method-use case combination, so that the total economy costs associated with such combinations can be calculated (transfer costs are not considered by the equation when calculating the costs for the total economy).

## IV.2 SAVINGS SCENARIOS

174. One of the objectives of this methodological framework is to provide insights on the potential savings that may arise when migrating from paper-based to electronic payments. Different substitution scenarios can be considered, depending on a country's goals. This section outlines some simple approaches that can be used to estimate savings due to migrating from paper-based to electronic payments, without suggesting a specific strategy to be followed by a country. It also outlines the steps that need to be followed to predict the potential cost savings resulting from the implementation of the specific strategies chosen by each country.

175. One way to show savings is to use the overall annual figures calculated in the previous section (annual costs borne by all stakeholders per payment instrument) and consider certain reduction projections resulting from the migration of one payment instrument (e.g. cheques) to another (e.g. direct credit transfers). For example, a scenario would be converting 10 percent of a country's cheque payments to direct credit transfers. More complex scenarios would include paper-based payments migrating to multiple electronic payment instrument equivalents, rather than to a single one. For example, converting 10 percent of cash payments into credit transfers, and 50 percent of cheque payments into debit transfers would constitute another scenario.

176. A second approach is to derive savings by also incorporating the service channels. More specifically, this approach uses cost per payment transaction, given a specific combination of payment instrument and service channel. This would allow for comparison of the costs of the different combinations and derive savings per single transaction migrating from one pair of payment instrument-service channel to another. This can be done separately for the payments received and initiated on the demand side, and for payments processed on the supply side. In the case of utility bill payments, for example, payers may benefit from migrating from cash to card payments, either in-person or different remote service channels. From a supply side perspective, migrating from cheque payments to direct credit transfer payments can be most beneficial for this particular use case. Again, the specific scenarios explored are country-specific and depend on the current state of the payment system and payment patterns, as well as policy objectives. It may be useful to explore the use cases with the highest volume or value of payments, those where authorities or large billers can steer migration (e.g. government payments or utility payments), and/or those supposed to be most inefficient and with the highest potential savings. It is important to mention here that electronic payments have greater potential to realize economies of scale (resulting from increased use) due to the higher level of fixed costs incurred for making them available and processing electronic payment instrument transactions, for which reason a linear extrapolation of costs might overestimate the real costs incurred by a substantial increase of the volume of electronic payments.

177. Once viable savings scenarios are selected, it is suggested that the potential savings that can be realized by replacing one or a set of payment instruments with another be estimated. When the volume

of transactions initiated with a particular payment instrument increases, in most cases economies of scale are achieved and the costs per transaction decrease and vice versa. In order to correctly estimate the costs of initiating payments under a hypothetical scenario (that is, after implementing one or more of the chosen strategies), it is important to calculate the new cost of a single transaction with each payment instrument involved. This can be done as follows:

- a. First, the new transaction volumes and (average and/or aggregate) values per payment instrument need to be calculated.
- b. Second, the fixed costs for each relevant payment instrument need to be distributed based on the new transactions volume.<sup>100</sup> If a payment instrument is replaced, then its transaction volume under the hypothetical scenario will decrease, therefore the fixed costs per transaction will increase. If a payment instrument replaces another one, then its transaction volume will increase and its fixed costs per transaction will decrease.
- c. Third, variable costs have to be split up according to their variability with transaction volume or transaction value and their elasticity with volume and/or value needs to be estimated. For example, error costs will vary in direct proportion with the number of transactions: when, for example, cheque transactions decrease by 10 percent, error costs associated with cheques will decrease by 10 percent as well. However, if cash transactions decrease by 10 percent, cash logistic costs may only decrease by 7 percent, for example. In a similar way, the variability of costs with transaction value needs to be assessed. Although it may not be possible to estimate exact elasticities, it is important to examine each variable cost element carefully and make an informed prediction about its variability with transaction volume and/or value.
- d. Fourth, the new variable costs per transaction with each relevant payment instrument need to be estimated using the new transaction volumes and values and the elasticities of each cost element.
- e. Fifth, the new estimated fixed and variable costs per transaction should be added and the total costs per payment instrument should be estimated by multiplying the total cost per transaction by the transaction volume.
- f. Finally, for each scenario the total costs of making payments before and after implementing a chosen strategy can be compared in order to verify that the strategy will lead to significant savings.

178. Following these six working steps (as shown in Box 7) can be instrumental in finding the value of implementing specific savings strategies. However, this methodology is cost-driven and ignores the

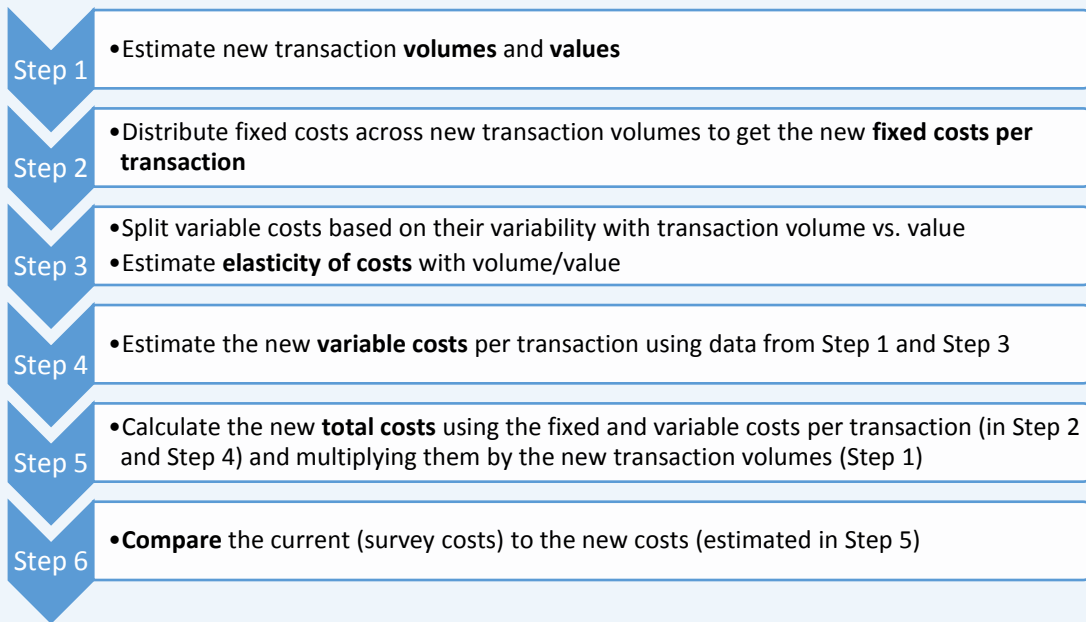
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<sup>100</sup> Fixed cost per payment instrument may increase or decrease because of the need for infrastructural changes due to drastic variations in demand. For the sake of simplicity, it can be assumed that significant infrastructural changes will be unnecessary unless the use of a particular payment instrument is completely or nearly eliminated.



benefits of certain payment instruments over others. Those benefits should be considered when choosing strategies and creating new policies.

#### Box 7: Working steps to derive savings



### Box 8: Substitutions scenarios based on a cost study conducted by the Hungarian central bank

In 2011, Magyar Nemzeti Bank (MNB) published a report named “Nothing is free: A survey of the social cost of the main payment instruments in Hungary” (see Turján et al. (2011) for further details), based on the results of a cost of payments study initiated by the European Central Bank. The number, value, and costs per transaction/100 Hungarian forints (HUF) of payment value from the study based on data from 2009 are summarized in the table below (based on Table 66 of the original report).

Payment instruments	Share % based on		Resource (social) costs (in HUF)	
	number	value	per transaction	per HUF 100 of payment value
<b>Cash transactions</b>	77.49%	12.22%	73.66	0.41
<i>Debit card transactions</i>	4.11%	0.25%	201.33	2.88
<i>Credit card transactions</i>	0.67%	0.05%	796.18	9.76
<i>(Direct ) credit transfers, of which</i>	7.58%	86.14%	270.84	0.02
paper-based	1.29%	14.64%	742.88	0.06
electronic	6.29%	71.49%	174.15	0.01
<i>B2B direct debits (direct debit transfers)</i>	0.02%	0.12%	918.75	0.16
<i>Direct debits (direct debit transfers)</i>	2.10%	0.15%	100.39	1.21
<i>Postal inpayment money orders*</i>	7.42%	0.71%	143.52	1.20
<i>Postal outpayment money orders for pensions*</i>	0.60%	0.37%	302.39	0.43
<b>Overall</b>	<b>100.00%</b>	<b>100.00%</b>	<b>106.01</b>	<b>0.09</b>

\* This is a paper-based payment instrument particular to Hungary. Payments are initiated and processed by the Hungarian Post (Magyar Posta). Postal outpayment money orders are mainly used by the government for pension payments and postal inpayment money orders are mainly used by PSUs for bill payments and domestic remittances.

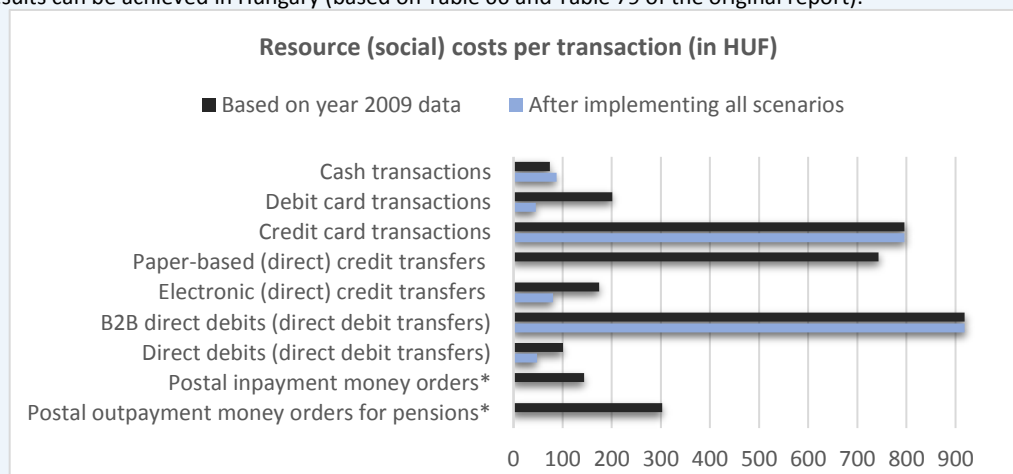
It is evident that most transactions are conducted in cash and, at the same time, cash payments have the lowest resource (social) cost per transaction. However, this does not mean that they are the most cost efficient. Paper-based payments (including cash and postal inpayment/outpayment money orders) have lower proportion of fixed costs and higher proportion of variable costs compared to electronic payments, which suggests that electronic payments can be more efficient if used at a scale. Recognizing this and other disadvantages of cash (and other paper-based payments), the MNB developed three scenarios under which they aimed to reduce the resource (social) costs of making and accepting payments from 1.49% to 1.09% of Hungary's GDP. Various unquantified positive externalities are also likely to take place. The following proposed scenarios are independent and can be applied at the same time or separately.

**Scenario 1:** High volume substitution of cash transactions with debit card transactions in the retail sector.

**Scenario 2:** Shifting of paper-based remote payment instruments (direct credit transfers and postal inpayment money orders) to electronic channels (direct debit/credit transfers) in the private sector.

**Scenario 3:** Shifting of pension outpayments to bank accounts (using direct credit transfers).

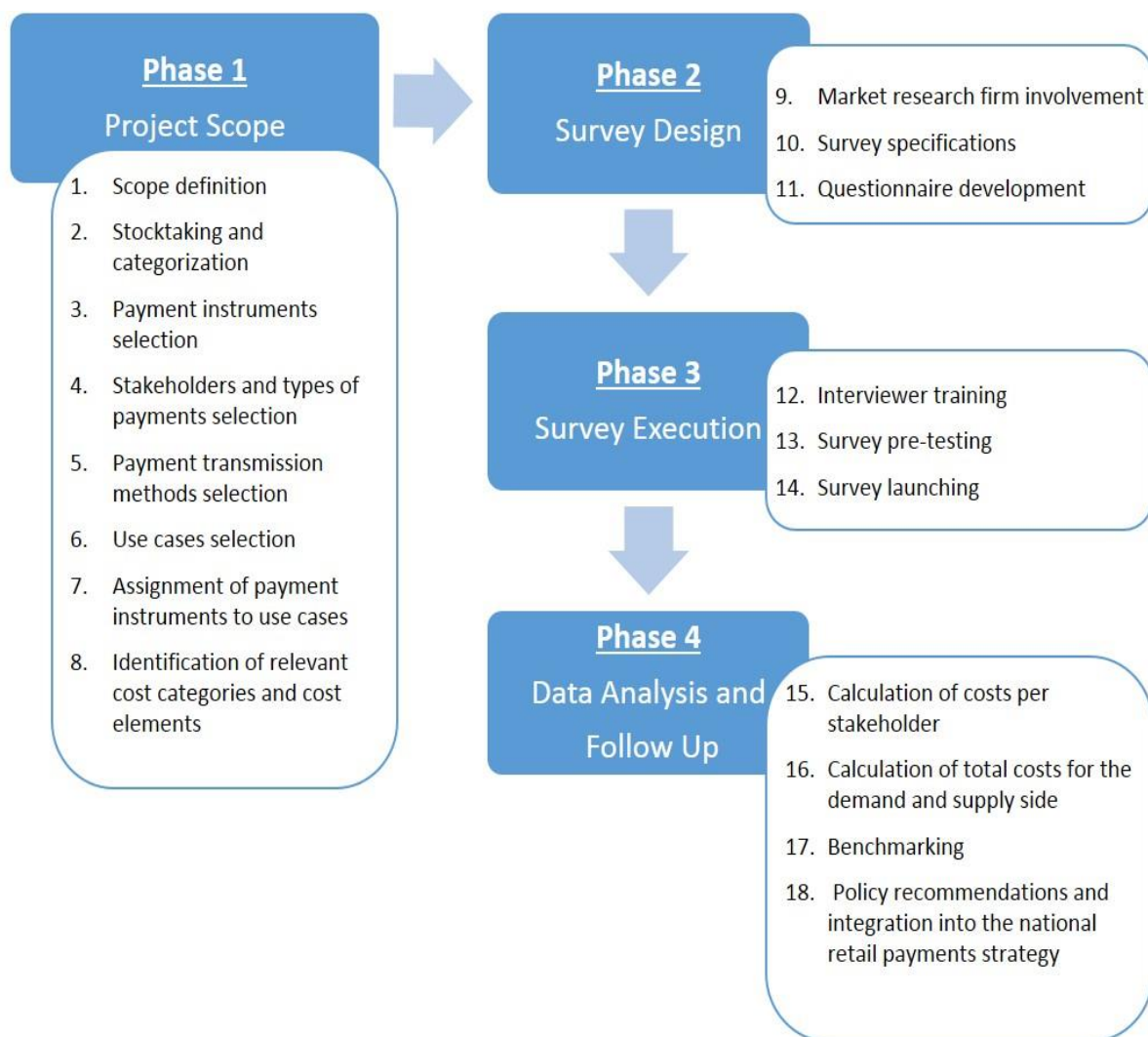
Incorporating the above three scenarios and assuming that fixed costs for each payment instrument remain the same, the following results can be achieved in Hungary (based on Table 66 and Table 79 of the original report):



## V. IMPLEMENTATION

179. The steps outlined in this guide can be grouped into four phases: project scope, survey design, survey execution, and finally, data analysis and follow up. Each phase involves a series of steps, as summarized Figure 3 and further described below. For each step, reference to the relevant information in the guide is made to help the implementation of that step. Overall, a comprehensive retail payments cost study is a major effort, and will realistically take one year at minimum.

**Figure 3: Summary of project implementation steps**



## V.1 PHASE 1: PROJECT SCOPE

180. **Scope definition:** Prior to launching the study, the scope of the project must be determined. The most significant factors in defining the scope or focus of the study are the project's objectives and resource constraints. Part I.3 of this document is relevant to the demand side, while Part II is relevant to the supply side. If both the demand and supply side of the methodology have been implemented, the total costs for the economy can be calculated, as described in Part III. The demand side and the supply side methodologies can be implemented independently of each other, and in any order or simultaneously.

181. **Stocktaking and categorization:** A key step in the definition phase of the project is to identify the key characteristics of the currently available retail payment instruments and group the instruments accordingly. This step is necessary to appropriately identify the cost elements associated with each, and streamline the survey by addressing similar instruments as a group. By creating a "dictionary" and assigning domestically used terms and product names to common and internationally recognized definitions, as described in Part I, international comparability can be facilitated. Despite variations in the details of retail payment service offerings, with ten different retail payment instruments most of the retail payment instruments offered worldwide can be categorized. As outlined in this guide, these payment instruments are cash, cheque, voucher, debit card, credit card, prepaid card, direct credit transfer, direct debit transfer, mobile money, and online money. In defining a national retail payment instrument universe, all payment instruments relevant to the particular economy need to be considered. The World Bank (2012) publication "A practical guide for retail payments stocktaking" provides valuable guidelines on who to take stock of the payment instruments within a country's context. For convenience, Box 10 shortly describes those guidelines.

182. **Payment instruments selection:** Given the fact that cost savings are likely to be among the goals of the cost study, focusing on retail payment instruments that currently serve a significant proportion of market and/or those that have the potential to serve a growing proportion of demand seems to be most efficient. Niche payment instruments, like cheques for example, in most of the European countries (with the notable exceptions of France and the UK), may not need to be included in the study. In this regard, a threshold of a percentage of the total retail payment volumes may be chosen (e.g. 5 percent) can be considered – i.e. only payment instruments above the volume-threshold are taken into consideration for the cost study. In addition payment instruments below the threshold but with a clear potential and/or upward trend can be relevant too. For countries that currently lack information on volume and value of retail payments by instrument, guidance on the collection, organization, validation and analysis of such data is provided in Guideline 4 of the World Bank (2012).

### **Box 9: Guidelines for retail payments stocktaking**

The below text is a direct excerpt from the World Bank, the European Central Bank, and Banco Central do Brasil's 2012 publication "A practical guide for retail payments stocktaking".

**Guideline 1: The overall scope and structure of the stocktaking exercise shall be driven by the high-level public policy goals set forth in the area of retail payments.** The public policy goals would vary from country to country, but in general are associated with the safety and efficiency of retail payment systems in the country. Some other relevant public policy areas may include increased access and affordability, the availability of a socially optimal mix of payment instruments, and the availability of the required industry infrastructure to process such payment instruments. The retail payments stocktaking exercise should be designed so as to enable a clear understanding of the issues and areas of improvements required for achieving the stated public policy goals. The scope should be broad-based and should be developed in close co-ordination with all stakeholders.

**Guideline 2: Adequate attention needs to be devoted to the planning and organization of the stocktaking exercise.** Retail payments stocktaking is a complex undertaking requiring meticulous planning and active involvement of numerous stakeholders. A wide-range of information sources should be used, including the information available in the broader payment systems community and also other sources. This information helps in benchmarking the status in the particular country. Where obtaining direct data might be difficult, information from other sources will help in assessing the intended aspects or variables in an indirect manner.

**Guideline 3: Industry players should be involved from the very early stages.** The retail payments industry will require adequate background information and sufficient time to ensure availability of good quality information when the stocktaking exercise is rolled out. In addition, the central bank should actively seek dialogue with industry participants as the latter can provide valuable inputs in structuring the exercise, including agreeing on certain common terminologies and helping to determine the appropriateness of the data being required as well as the feasibility of obtaining such data reliably.

**Guideline 4: Obtaining sufficient, high-quality data and other types of information is at the heart of the stocktaking exercise.** The collection, organization, validation and analysis of data is a critical part of the stocktaking exercise, and is probably the most resource-intensive one. Appropriate human and technological resources should therefore be devoted to this element of the exercise, including a strong emphasis on validating the data received from the industry. A retail payments stocktaking exercise is also not a one-off exercise; hence, an approach to enable comparison across iterations to measure evolution should also be considered.

**Guideline 5: Devote sufficient time to report preparation and to designing the strategy for the wide dissemination of results.** Being able to properly document and communicate the results of the stocktaking exercise as well as the alternatives available to address the underlying shortfalls is of outmost importance. A carefully designed strategy for the communication and dissemination of the diagnosis report should be developed

183. **Stakeholders and types of payments selection:** Part I of this document explains the categories of PSU and the types of retail payments on the basis of the payer/payee role of the PSU. A clear categorization of PSU into consumers, businesses and government agencies should be made. It is recommended to use a functional rather than an institutional approach. In other words, government agencies acting as businesses (e.g. when providing utilities) should be covered under the business category for this part of their retail payments share, unless they are departments of a Ministry or other government agency rather than a separate entity. On the other hand, individuals who are selling goods and/or providing services should be covered under businesses, even if they are not a legal entity. Based on this categorization, different types of retail payments can be identified, depending on the role of the PSU as payer or payee. To this extent, the collaboration of the participating stakeholders in the initial consultation phases are crucial for the successful implementation of the survey, in a way that full participation is ensured. This can be achieved by holding pre-survey workshops and working groups so that the ground is prepared for the actual survey implementation and all parties are fully aware of the content and objectives of the survey. Particularly for the business surveys, the involvement of business associations can be helpful in the process. It is worth emphasizing that for businesses and payment service providers (i.e. commercial banks), data might be needed at both, the branch level, and the head office level.

184. **Service channel selection:** Part I also elaborates on the range of service channels (part of payment transmission methods) via which retail payments can be effected. All relevant service channels for each category of payment instruments should be identified and the set of use cases as developed in this report should be assessed.

185. **Use cases selection:** Retail payments serve three main purposes: i) the compensation for an economic transaction, ii) a transfer due to an entitlement or obligation, iii) a personal transfer, or iv) the reorganization of the payer's own funds. For each of these purposes, typical use cases can be identified. Only the use cases of relevance in the particular retail payment landscape should be considered. Adaptations to the use cases identified in this guide can be made as appropriate and/or additional use cases can be introduced as necessary. Such modifications should not significantly compromise the cross-country comparability of cost study results.

186. **Assignment of payment instruments to use cases:** The next step is to identify the payment instruments that can be used for each use case by consumers, businesses, and government agencies. Entities conducting a retail payment cost study typically can draw on prior knowledge to complete the instrument/use case matching. If this is not the case, this information should be obtained prior to the completing the survey design. Focus discussions with industry stakeholders are recommended to yield this information.

187. **Identification of relevant cost categories and cost elements:** For every payment instrument identified as relevant for at least one use case and the associated transmission method, cost elements for both the payer and the payee need to be identified. More often than not, these cost elements differ for the payer and the payee. The scope of the cost study, as defined earlier, will determine which cost elements are relevant.

## V.2. PHASE 2: SURVEY DESIGN

188. **Market research firm/institute involvement:** One of the key steps in the survey design phase is to determine whether or not to engage a professional market research firm/institute. Professional market researchers can offer significant advantages in terms of the quality and representativeness of the data derived from the survey, enhance the timeliness of the collection and analysis of the data, and allow the interested public and private parties, as well as policy makers, to focus on substantive aspects of the study and its policy and regulatory implications. Bearing in mind the specifics of payment services, market research firms/institutes with a proven track record in the area of payment services are to be preferred. Several factors should be taken into consideration in determining whether to engage a market research firms/institutes: (i) whether the organization implementing the cost study methodology has a research unit that can conduct the study in-house, (ii) the scope of the retail payment cost study, (iii) the number of respondents to be surveyed, (iv) the degree of representativeness and (v) the time and funds available for the cost study. This decision may need to be reevaluated once some of the initial steps of the survey design phase are implemented.

189. **Survey specifications:** A retail payment cost study should aim to capture appropriate representation for every PSU category (i.e. consumers, businesses, government agencies), and for the range of use cases the instruments and transmission methods identified as relevant for the economy. If a representative sample is not feasible due to time and/or budgetary constraints, it might be decided to conduct a retail payment cost study that is representative at least for certain geographic areas (e.g. urban areas), PSU categories (e.g. businesses of a certain size) or for certain use cases (e.g. payment for retail goods purchased at the point of interaction). In some cases, e.g. for certain payment instruments, even anecdotal evidence for the cost of retail payments may be collected. It is important that the decision on the representativeness is taken consciously and that any resulting limitations of findings are recognized. It is also recommended that the degree of representativeness is made transparent if findings of the retail payment cost study are published. Ideally, broad confidence intervals associated with cost estimates need to be disclosed and a sensitivity analysis should be performed, as cost estimates have proven to be highly sensitive to underlying assumptions and inputs.

190. **Questionnaire development:** There are two aspects to questionnaire design: (i) question development and (ii) questionnaire format and structure design. On question development, the parties implementing the study need to be deeply involved, even if a market research firm has been engaged, to ensure the survey yields the information needed on the cost elements and volume-related aspects of the retail payment uses. A comprehensive set of sample questions covering the relevant questions on volume/value-related aspects of retail payment use cases and questions on the cost elements, for both the demand and supply side, has been developed in the context of the present report, tested in several markets and can be shared with implementing countries upon request. On the question of the format and structure of the questionnaire, further consultations in the national context may be needed.

## V.3. PHASE 3: SURVEY EXECUTION

191. **Interviewer training:** Providing sufficient training to the interviewers is imperative in order to ensure high quality data collection. The entity implementing the cost study can choose the same group of interviewers to conduct the surveys on both the demand and supply side (if the different stakeholders are interviewed at different points in time), or different groups of interviewers for each stakeholder survey (if the different stakeholders are interviewed simultaneously). Either way, training has to be provided separately for each survey pertaining to a different stakeholder (on the demand and supply side). Given

that in many countries payment cost data have not been gathered before through surveys, the interviewers have to fully understand the overall context and content of the surveys. This is why time and resources have to be invested in interviewer training, so that the quality of the data gathered is not compromised. At the same time, a detailed question-by-question training has to be offered so that clarity is obtained in terms of the question wording, the question objective, and the units in which the answers are reported. Being equipped with this knowledge, the interviewer can then probe whenever necessary during the personal interviews. The training can also be complemented by an instruction handbook for the interviewers for each stakeholder survey.

192. **Survey pre-testing:** The step of pre-testing is crucial in order to make further adjustments to the questionnaire based on the in-field experience, before launching the survey. A small sample (ranging from 10-50 units, depending on the stakeholder and the final sample size) can be selected in order to test the questionnaire for each stakeholder. In addition to recording the answers to the actual questions, the interviewers should also keep notes of challenges they or the interviewees face during the process with wording, sensitive information or other issues. Typically, the pre-testing sample is not considered part of the final sample. However, in cases where no major issues are identified during pretesting and hence, no major changes are made to the questionnaire, the pre-testing sample could be incorporated into the final sample. During the pre-testing step, the interviewers can also test the use of supportive material such as visual images of payment instruments and transmission methods so that it becomes easier for the interviewee to distinguish among them in a tangible way. This approach ensures the minimization of confusion and misreporting by the interviewees. Ideally, in-field pre-testing should be conducted even if the final surveys are planned to be conducted electronically. In parallel, the implementing entity can also organize focus groups or information workshops in order to test the questionnaire. This pre-testing method can be particularly useful for stakeholders such as government agencies and payment service providers which might be harder to reach for in-field pretest. Such workshops can also function as a dissemination platform to announce to industry and government agency representatives the launching of the payment cost survey and the usefulness of the results for the different stakeholders. Indeed, this approach could potentially increase the participation in the survey since experience has shown that stakeholders such as government agencies and payment service providers are more hesitant to participate in payment cost studies. Moreover, this step will allow implementing authorities to anticipate potential challenges that could be encountered during the actual survey.

193. **Survey launch:** After the successful completion of interviewer training, pretesting, and questionnaire adjustments, the final step in the execution phase is the survey launch. Surveys can be conducted either through personal interviews, telephone interviews, or online questionnaire fill-out by the respondent, depending on the stakeholder being interviewed. The duration of the survey has to be determined in advance so that the implementing market research firm or organization can allocate the interviewers accordingly in the different parts of the country. Data entry and quality checks can take place either during data collection or after the survey is completed. For instance, the implementing entity can agree in advance with the interviewers to send in completed questionnaires regularly, so that data entry can occur in parallel to data collection. This approach can result in time efficiency, given that data entry can be a time consuming task in itself, especially if it requires the conversion from a paper to an electronic format. Alternatively, data entry can start when the data collection process has been completed and all completed questionnaires have been submitted or computer assisted personal interviews can be leveraged, during which the interviewer processes the data electronically during the interview instead of filling in the paper questionnaire. It is worth emphasizing that the implementing entity should consider providing an official letter to the interviewer to carry and show to the interviewee, stating the purpose of the survey, the anonymity ensured in the data collection process confirming that the respondent-specific



information will not be shared with other institutions and that individual responses will be merged and only published as an aggregate total, and the name of the authorities that support the cost study, in order to provide transparency and credibility in the process.

194. Finally, particular attention needs to be paid to the time and day in which the personal interviews are conducted, particularly for consumers at their place of residence. It is likely that individuals who are employed will be out of their residence during weekdays and working hours. In order to avoid capturing a skewed range of socio-economic backgrounds (e.g. pensioners or unemployed), after work hours or weekends might need to be considered.

#### V.4. PHASE 4: DATA ANALYSIS AND FOLLOW UP

195. **Robustness and quality checks:** When collecting and before analyzing the data, several robustness checks and quality controls should be performed to ensure the consistency and accuracy of the data used in the report. Given the level of detail and sensitivity, the responses are likely to be prone to measurement errors. Outliers or extreme observations should be removed from the data set as these have the potential to impair the results, in particular in smaller sample sizes. One option is to use the interquartile range rule (IQR). As such, any data numbers more than 1.5 interquartile ranges below the first quartile or above the third quartile were removed. The interquartile range (IQR) measures the difference between the third quartile (Q3) and the first quartile (Q1):  $Q3 - Q1$ . The first quartile equals the number of data points at the 25th percentile of the total data. The third quartile equals the number of data points at the 75th percentile of the total data.

196. External sources, should be used to compare and validate the data. Also, a careful comparison across responses may signal inconsistencies or abnormalities. Finally, since many assumptions need to be made along the way (e.g. with respect to the breakdown between fixed versus variable costs, the allocation of indirect costs across payment methods and what interest rates to use for foregone interest and float), implementing entities should conduct some sensitivity analyses in order to see how sensitive the results are to certain assumptions.

197. **Calculation of costs per stakeholder:** The different stakeholders on the demand and supply side have to be examined separately, bearing in mind the specifics for each of them when initiating, receiving and processing retail payments. When calculating the costs based on the survey results, the consistent application of the different cost categories is necessary to allow for the calculation of the overall costs of retail payments of an economy. Special attention has to be paid to the differentiation between resource and transfer costs. In addition, the costs per payment instrument and the differentiation between fixed and variable costs is required to develop a retail payment policy strategy based on the results of the cost study.

198. **Calculation of total costs for the demand and the supply side:** When calculating the total costs for the demand and supply side, in general all resource costs per stakeholder group can be totaled. More attention has to be paid to the transfer costs. Those transfer costs paid to PSP (and if applicable to PIP), should be included in the calculation of the total costs for the demand side, but excluded in the overall economy costs.

199. **Benchmarking:** Ideally, the cost survey should be repeated in periodicity of several years in order to assess changes in costs as a result of policy and/or regulatory measures and other changes in the payments landscape. In particular, as the payment industry is largely a network industry and driven by substantial network externalities technological developments are most likely to substantially drive and

reshape the future payment landscape. The initial retail payment cost study can serve as a benchmark for future studies, as well as its immediate goal to inform policy and regulatory decision-making. The results of retail payment cost studies implemented based on the approach suggested in this report, can be compared against those of other economies and international benchmarks to further inform policy makers. Often times, the timeframe for the completion of all steps for the project might take more than a calendar year and also, might not coincide with the year that other countries conduct their own studies. Nevertheless, comparisons can still be made since projections and a standardized base year can be used in order to achieve this objective. Respective implementing countries can rely on the assistance of the Payment Systems Development Group in this respect.

200. **Policy recommendations and integration into the national retail payments strategy:** Overall, establishing a sound economic baseline for national retail systems in terms of costs of different payment instruments can better guide system development and enable high-impact changes. The resulting efficiency gains could yield significant benefits for economic development and growth as the cost of exchanging goods and services are reduced. Lower retail payments costs can also significantly enhance the reach of payment services to lower income and economically isolated households, and further improve the efficiency of the retail payments system as access to modern payment instruments is broadened.

**Table 35: Summary of the implementation steps for a retail payments cost study**

Phase	Implementation step		Options/actions
Project scope	1	Scope definition	a) Demand side retail payment costs b) Supply side retail payment costs c) Retail payment costs for total economy
	2	Stocktaking and categorization	a) Paper-based b) Electronic Funds Transfer-based c) Card-based d) Prepaid
	3	Payment instruments selection	a) Cash b) Cheque c) Voucher d) Debit Card e) Credit Card f) Prepaid Card g) Direct Credit Transfer h) Direct Debit Transfer i) Mobile Money j) Online Money
	4	Stakeholders and types of payments selection	a) Consumers (P2P, P2B, P2G, B2P, G2P) b) Businesses (B2P, B2B, B2G, P2B, G2B) c) Government Agencies (G2P, G2B, G2G, P2G, B2G). d) Payment Service Providers (PSP) e) Payment Infrastructure Providers (PIP)
	5	Service channel (payment transmission method) selection	a) In-person payments (point of economic interaction, payment center, branch, ATM, agent) b) Remote payments (mail, internet/designated lines, telephone/mobile phone network)
	6	Use case selection	a) Payment for goods, utilities or services b) Payment due to an entitlement or obligation c) Personal transfer d) Reorganization of the payer's own funds

Phase	Implementation step		Options/actions
	7	<b>Assignment of payment instruments to use cases</b>	a) Combine steps 3 and 6 for each PSU
	8	<b>Identification of relevant cost categories and cost elements</b>	a) Combine steps 3, 4, and 5 to derive cost elements for PSUs, PSPs, and PIPs separately
Survey design	9	<b>Market research firm involvement</b>	a) In-house b) Market research firm
	10	<b>Survey specifications</b>	a) Coverage and representativeness b) Sampling
	11	<b>Questionnaire development</b>	a) Question formulation (sample questions available upon request) for each stakeholder b) Questionnaire structure and format for each stakeholder
Survey execution	12	<b>Interview training</b>	a) Training sessions for each stakeholder questionnaire b) Interviewer handbook
	13	<b>Survey pre-testing</b>	a) In-field pre-testing of a small sample (10-50 units, depending on the stakeholder) b) Focus groups/workshops
	14	<b>Survey launching</b>	a) Survey mode (personal, telephone, online) b) Survey duration c) Interview days/times d) Data entry
Data analysis And follow up	15	<b>Calculation of costs per stakeholder</b>	a) Combine resource and transfer costs to derive total costs per stakeholder
	16	<b>Calculation of total costs for the demand and supply side</b>	a) Exclude transfer costs when calculating total economy costs
	17	<b>Benchmarking</b>	a) Longitudinal analysis b) Cross-country analysis
	18	<b>Policy recommendations and integration into the national retail payments strategy</b>	a) Results can be used in order to assess the status quo of the payments ecosystem across stakeholders b) Results can be used to promote financial inclusion policies c) Results can be used to design overarching reforms in the context of a national retail payments strategy

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