PAYMENT SYSTEMS WORLDWIDE

A SNAPSHOT

SUMMARY OUTCOMES OF THE FOURTH GLOBAL PAYMENT SYSTEMS SURVEY

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ABBREVIATIONS

ACH	Automated Clearinghouse
AFI	Alliance for Financial Inclusion
AML/CFT	anti-money laundering / combating the financing of terrorism
ATM	Automated Teller Machine
BCEAO	*Banque Centrale des Etats de L'Afrique de l'Ouest* (Central Bank of Western Africa States)
BCP	Business Continuity Plan
BIS	Bank for International Settlements
CCP	Central Counterparty
CPMI	Committee on Payments and Market Infrastructures (formerly CPSS)
CSD	Central Securities Depository
DVP	Delivery versus Payment
EAP	East Asia and Pacific
ECA	Europe and Central Asia
ECCB	Eastern Caribbean Central Bank
ECCU	Eastern Caribbean Currency Union
EU	European Union
FIFO	First in, First out
FX	Foreign Exchange
GCC	Gulf Cooperation Council
GPSS	Global Payment Systems Survey
LAC	Latin America and Caribbean
IOSCO	International Organization of Securities Commissions
MFI	Microfinance Institution
MNA	Middle East and North Africa
MOU	Memorandum of Understanding
MIC	Middle-income countries
MNO	Mobile Network Operator
MTO	Money Transfer Operator
NBFI	Non-Bank Financial Institution
NBFC	Non-Bank Finance Company
NGO	Non-governmental Organization
NPC	National Payments Council
NPS	National Payment System
ODE	Other Developed Economy
ONFI	Other Non-Bank Financial Institutions
OTC	Over-the-Counter
POS	Point of Sale
PSDG	Payment Systems Development Group (World Bank)

PSO	Payment System Operator
PVP	Payment versus Payment
PSP	Payment Service Provider
RSP	Remittance Service Provider
RTGS	Real Time Gross Settlement
RTO	Recovery Time Objective
SA	South Asia
SSA	Sub-Saharan Africa
SSS	Securities Settlement System
SWIFT	Society for Worldwide Interbank Financial Telecommunication
T2S	TARGET2-Securities
TR	Trade Repository

INTRODUCTION

Payment systems and remittances represent the foundations of financial sector stability and financial inclusion. Payment systems support financial stability by reducing systemic and settlement risks, acting as firewall to prevent contagion of losses, facilitating proper liquidity management, and through the effective transmission of monetary policy. Also, payment systems are a critical enabler of financial inclusion. Transactions accounts allow people – including the "unbanked" – to make and receive payments in a cost-efficient way. Payment systems also promote economic and financial development: improvements in the national payments system lead to savings for the overall economy, while financial markets benefit from efficient post-trade processing and the safe custody of securities.

In this context, for the last twenty years the World Bank has been supporting national authorities in improving national payment systems, in cooperation with private sector stakeholders, through a broad range of financing, technical, and knowledge instruments. Global data is instrumental to benchmarking and monitoring & evaluation, and helps identify common paths and solutions. In this connection, the World Bank launched the Global Payment Systems Survey (GPSS) for the first time in 2007, to collect information on the status of payment systems worldwide. Since then, the GPSS has allowed authorities and policy makers to make meaningful cross-country comparison and assess progress in payment systems development, and has facilitated dissemination of best practices.

In 2015, the fourth GPSS was expanded to collect information to help assess the readiness of the country's payments system to underpin the World Bank Group Universal Financial Access goal and strategy. Its focus was broadened to include transaction accounts, and analysis is deepened to cover payment product and business model innovation to enable access. The quantitative module (referred to as "Accounts & Access" module) collects data for 2010-2015, facilitating trend analyses, and was published in October 2016.

This note provides results of the analysis of the qualitative data collected by the fourth GPSS (data as of end of 2015) on the various aspects of national payment systems. The purpose of this analysis is to identify trends in the underlying legal, regulatory and oversight frameworks and the infrastructure foundations that underpin the safe and efficient provision of payment and settlement services.

The GPSS questionnaire

To identify the qualitative features of national payment systems, the GPSS "main" questionnaire spans the following areas: (i) legal and regulatory framework, (ii) large-value payment systems, retail payment systems and services, (iii) foreign exchange settlement systems, (iv) cross-border payment systems and international remittances, (v) securities and derivatives clearing and settlement systems, and (vi) payment system oversight and cooperation. The questionnaire also aims at obtaining information on on-going reforms, and opinions on what are the main factors that hinder or facilitate reforms of the national payments system.[1] Although not the primary focus of this note, the analysis of the qualitative aspects of large-value and retail payment systems is complemented by data on number and value of payments collected through the main GPSS questionnaire.

Given the increasing attention paid to expanding access to transaction accounts by national authorities worldwide, an annex on agent-based models was added to the fourth GPSS. In this connection, a section of this note also considers selected features of agent-based models. The analysis of the "Account & Access" module of the fourth GPSS covering transaction accounts and access points was presented in October 2016, and referenced in this note as appropriate.

Answers

In most of the questions, respondents were requested to answer yes or no, or to mark with an "X" all possibilities that may apply. Even though in some cases specific answers provided by various authorities did not fully coincide with the information collected in the previous iteration of this survey or in the context of assessments, answers were taken as "given" by respondents to the extent possible. Solely for comparative analysis, some answers were adjusted based on direct knowledge of the systems' features, and in consultation with the authorities.

The survey was carried out through electronic means rather than through in-person interviews; as such, it is not possible to ensure a consistent interpretation of all survey questions. In many cases, respondents were asked to indicate the answer that best reflected their situation; in other cases, they were asked to provide an opinion or make a judgment on a given issue.

Data analysis

Apart from providing information on global trends, this note also aims at identifying trends based on certain variables to determine whether such variables appear to be related to national payment system features and its overall development. Three such broad economy-level characteristics have been consistently used across GPSS iterations for this purpose, all of which are considered exogenous to national payments system development include: i) level of *per capita* income; ii) geographical location; and, iii) population size.[2] Accordingly, for sections I

[1] The complete GPSS questionnaire can be obtained from the World Bank's Payment System Development Group, by sending an email to paymentsystems@worldbank.org.

[2] These and other factors were identified in the CPSS General Guidance for National Payment System Development. More specifically, this report identifies four general factors influencing national payment system development: i) environmental factors, ii) economic factors; iii) financial factors; and iv) public policy factors. Following the CPSS classification, two of the categories selected for analysis in this paper (geographical location and population size)

through VIII of this paper, and including the analysis of the annex module on agent-based model, economies were classified into each of these categories:

- By level of *per capita* income: economies were classified following the World Bank's income classifications: i) high income; ii) upper-middle income; iii) lower-middle income; and, iv) low income.[3]
- By geographical region: developing economies were classified according to the World Bank's regional country classifications: i) East Asia and Pacific (EAP); ii) Europe and Central Asia (ECA); iii) Latin America and the Caribbean (LAC); iv) Middle East and North Africa (MNA); v) South Asia (SA); and, vi) Sub-Saharan Africa (SSA). Eastern European economies that are also members of the European Union (EU) represent an exception. EU members were further distinguished in two sub-categories: euro area economies and other EU members (that have not adopted the euro). All other high-income economies, to avoid an excessive number of categories with very few observations, were classified into a single separate sub-category denominated here as "other developed economies" (ODE). Annex I shows the list of economies that fall under of each of these sub-categories related to geographical region.
- By population size i) large – population over 30 million; ii) mid-size – population between 5 million and 30 million; iii) small – population less than 5 million. World Bank's World Development Indicators data on 2015 population were used for this purpose.

Numbers and percentages presented throughout this note, as well as the comparative tables[4] are based on the simple addition of the number of economies in each of the previously mentioned categories and worldwide totals. Moreover, percentages assigned to 'developing economies' were derived through a simple averaging of percentages assigned to low-, lower-middle and upper-middle income economies. Similarly, percentages for middle-income economies were derived through a simple average of percentages assigned to lower-middle and upper-middle income economies. Different weights to each economy based on country-specific characteristics such as economic size, territory or other variables are *not* applied.

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would fall under the "environmental factors" group, while the "level of income" category would fall under the "economic factors" group.

[3] Two cases deserve special treatment: 1) that of the countries belonging to the Western Africa Monetary Union (BCEAO) comprised of Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo; 2) countries belonging to Easter Caribbean Currency Union (ECCU) consisting of Anguilla, Antigua, and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. The questionnaire was sent to, and received from the BCEAO and ECCU. Whenever the issue under discussion related to the number of countries, answer from the BCEAO and the ECCU were counted as one.

[4] Comparative tables, for this and the previous iterations of the GPSS, are available for download at the following link: http://www.worldbank.org/en/topic/paymentsystemsremittances/brief/gpss

Finally, caution should be used when comparing the latest results with those of previous iterations of the survey: the number of economies/systems have changed and income and population classifications are expected to continue to change over time. Additionally, perennial changes in the geographical classification (e.g., European Union member countries), as well as institutional and infrastructure developments in this area may complicate or even invalidate comparison of the current results to those collected during the past rounds of survey. Respondents also vary with each iteration of the survey.

I. LEGAL AND REGULATORY FRAMEWORK

The GPSS starts off with the legal basis for payment and securities settlement systems. After covering the main relevant laws, the key legal concepts and how they apply to the various payment systems in a country, the analysis turns to selected legal aspects in the provision of payment services. This section closes with an analysis of licensing and oversight arrangements.

Pieces of legislation that have direct/explicit references to payment and securities settlement systems. Globally, central bank law is clearly the basic legal reference for payment and settlement issues, as indicated by 98 percent of all economies participating in the survey. This marks a notable increase from 2008, when 88 percent of surveyed countries indicated central bank law as the most relevant legal support for payment systems. Although a comparable trend can be observed across regions, the latest data show central bank law as highly relevant in EAP, ECA, SSA and EU regions, and less relevant in MNA and LAC regions. **Table I.1** provides insights into pieces of legislation with explicit reference to payment systems.

Central bank law is universally recognized as the most relevant legal support for payment systems, equally among high-income and developing economies. Similarly, close to two-thirds of high-income and developing economies report banking law as being highly relevant. Securities market laws explicitly refer to payment system issues in 79 percent of high-income countries, compared to 61 percent of developing economies. In contrast, developing economies tend to rely more heavily on central bank regulations with power of law (85 percent) as opposed to high-income economies (65 percent).

The number of economies with securities markets laws that now include references to payment and settlement aspects has continued to grow since 2012: 77 percent of all countries in 2015 compared to 70 percent in the 2012 survey. The progress is more noticeable from a regional perspective: compared to the 2012 results, 30 percent more economies in ECA, LAC, and MNA regions consider securities markets laws as relevant for payment systems. Consistent with the results of previous surveys, the relevance of securities markets laws for payment systems is higher in larger economies, possibly explained by the presence of deeper securities markets in such countries.

Payment systems laws are a relatively newer phenomenon. Nevertheless, a total of 69 economies (62 percent) indicated that they have one. Payment systems laws are present in 58 percent of high-income and 66 percent of developing economies. Experience has shown that, in economies with weaker legal infrastructure for financial transactions, enacting a payment systems law can provide a more straightforward alternative to amending existing laws. This appears to be the case in both upper-middle and low-income countries, with over 70 percent of the surveyed economies in these categories responding positively for the existence of a payment system law.[5] Payment systems laws are more common in ECA, SSA and Euro area regions, and the least relevant in LAC, MNA and SA regions.

The latest data also show that e-money laws, another relatively recent legislative phenomenon, have been enacted in almost a half of the surveyed countries. This type of law is more relevant among high-income economies (56 percent), compared to developing economies (34 percent). None of the MNA economies and only a third of the economies in LAC and SA regions reported having e-money laws (with explicit reference to payment systems).

Among the various legislations mentioned in this question, the civil code and/or the commercial code (37 percent), in addition to consumer protection law (38 percent) and the competition law (31 percent), are not as relevant laws for payment systems as the other aforementioned pieces of legislation. Nevertheless, civil/commercial code as well as consumer protection laws in developing economies are twice as likely to contain explicit reference to payment systems as similar laws in high-income economies. From a regional perspective, these pieces of legislation are mostly likely to contain specific references to payment systems for countries comprising ECA (64 percent, civil/commercial code) and MNA regions (civil/commercial code, and consumer protection code), and the least likely for countries belonging to the EU (in terms of civil/commercial code), LAC (as it pertains to consumer protection law) and SA (17 percent, commercial law) regions.

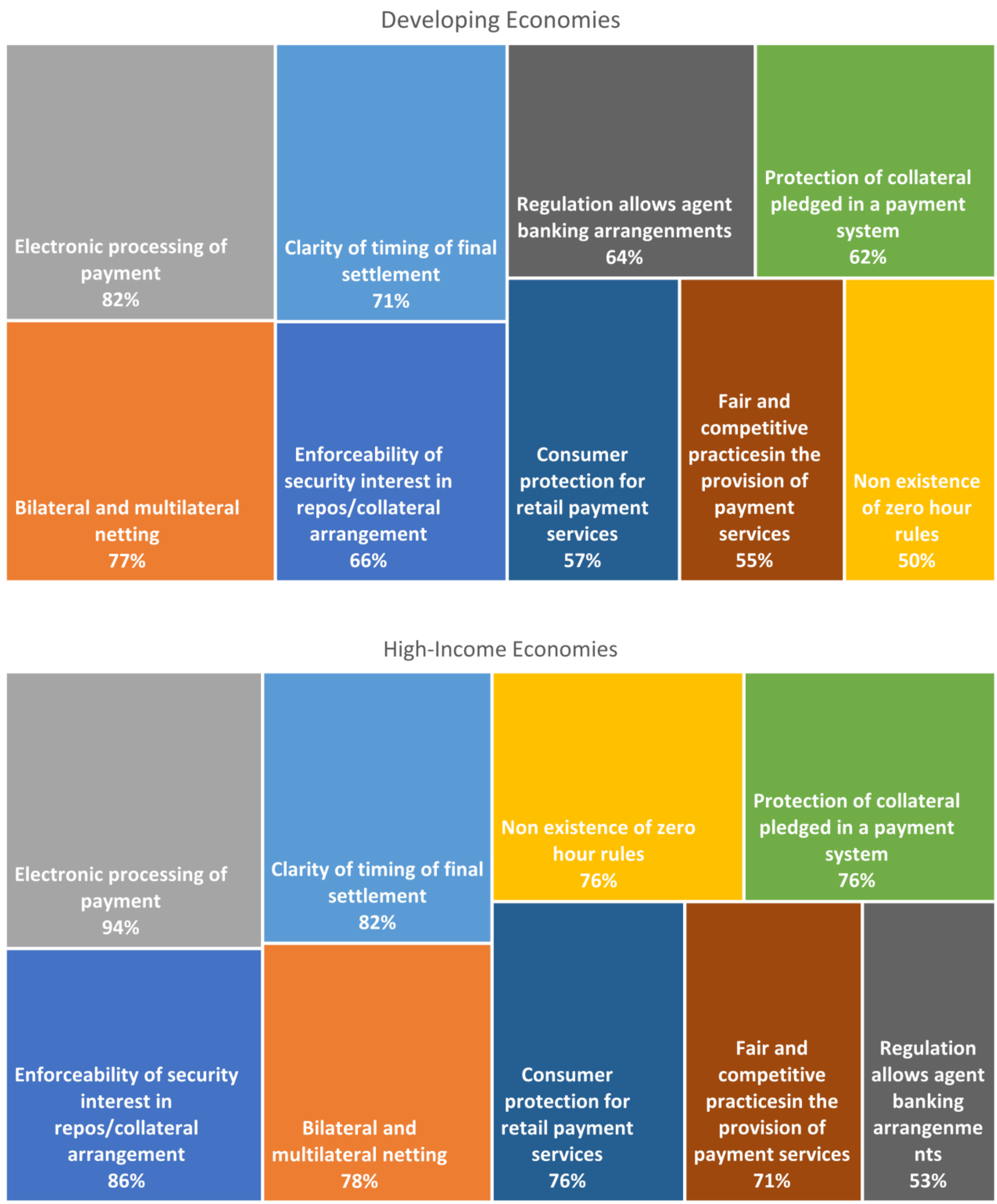
Key payment concepts covered in the legal framework. As shown in **Table I.2**, at the global level, most countries indicate that their legal framework provides proper coverage of settlement finality (79 percent), netting (86 percent), and the electronic processing of payments (88 percent). These percentages are slightly higher compared to the results from 2012. Figures are somewhat higher for other concepts such as the non-existence of zero-hour rule (66 percent), the enforceability of security interests in collateral or repo agreements (77 percent), and the legal protection of collateral pledged in a payment system (75 percent).

High-income and upper-middle income countries tend to cover a larger number of key payment concepts in the legal framework. From a regional perspective, legal aspects related to payment systems are covered extensively in EU member countries, and slightly less also in ODEs and the ECA regions. The MNA and LAC regions are those that cover the smallest number of key payment concepts in the legal frameworks per the latest survey data, although in those cases progress is

[5] It should be noted, however, that some countries have recently adopted a payment systems law for other reasons. Commonly, a payment system law can be designed as an overarching law that ensures the consistency of the various elements of the legal and regulatory framework already contained in other legal pieces (e.g. Central Bank Law, the Banking Law, etc.).

evident since the 2012 survey. **Figure 1** presents the differences between high-income and developing economies in payment system concepts covered in the legal framework.

Figure 1: Payment system concepts covered in the legal framework



Applicability of key payment system concepts. Table I.3 shows the types of systems to which the key payment system concepts discussed earlier apply. A clear trend shown in the survey is that, through legal enhancements, 57 percent of all economies now indicate that key legal concepts are applicable to all payment systems, regardless of who the operator of such systems is or the nature of the system. This figure is highest for EU economies (83 percent) and lowest for LAC (33 percent) economies, reiterating the findings of the 2012 survey.

Key securities settlement concepts covered in the legal framework. ECA and EU countries also have legal frameworks with highest coverage of issues related to securities settlement systems. Table I.4 shows that in most of the surveyed economies, the legal underpinning for the dematerialization (82 percent) and immobilization (70 percent) of securities, for transferring securities ownership by means of book entries (88 percent) and for ensuring the finality of such transfers (82 percent) exists. Percentages are higher for high and upper-middle income countries and lower for lower-middle and low-income countries. Overall, these results follow the trend identified in the previous iterations of this survey.

Linked to the above, 74 percent of all economies pointed out that their legal framework provides adequate legal protection of securities custody arrangements in the event the custodian goes bankrupt. While the survey results show that high income economies are the most diligent in providing adequate legal protection, there is significant improvement among developing economies (65 percent as compared to 49 percent in 2008). Notwithstanding these positive developments, faster progress in this area is desirable.

Selected legal aspects related to the provision of payment services. Additional concepts such as electronic money, individuals' access to accounts, or regulation to allow non-bank provision of payment services were included in the 2015 survey (see **Table I.2**). Coverage of electronic money concept and non-banks provision of payment services is the highest among high income economies, especially those in the ECA and EU regions. On the other hand, individuals' access to accounts is more commonly covered in the legal framework of developing economies than those of high-income economies.

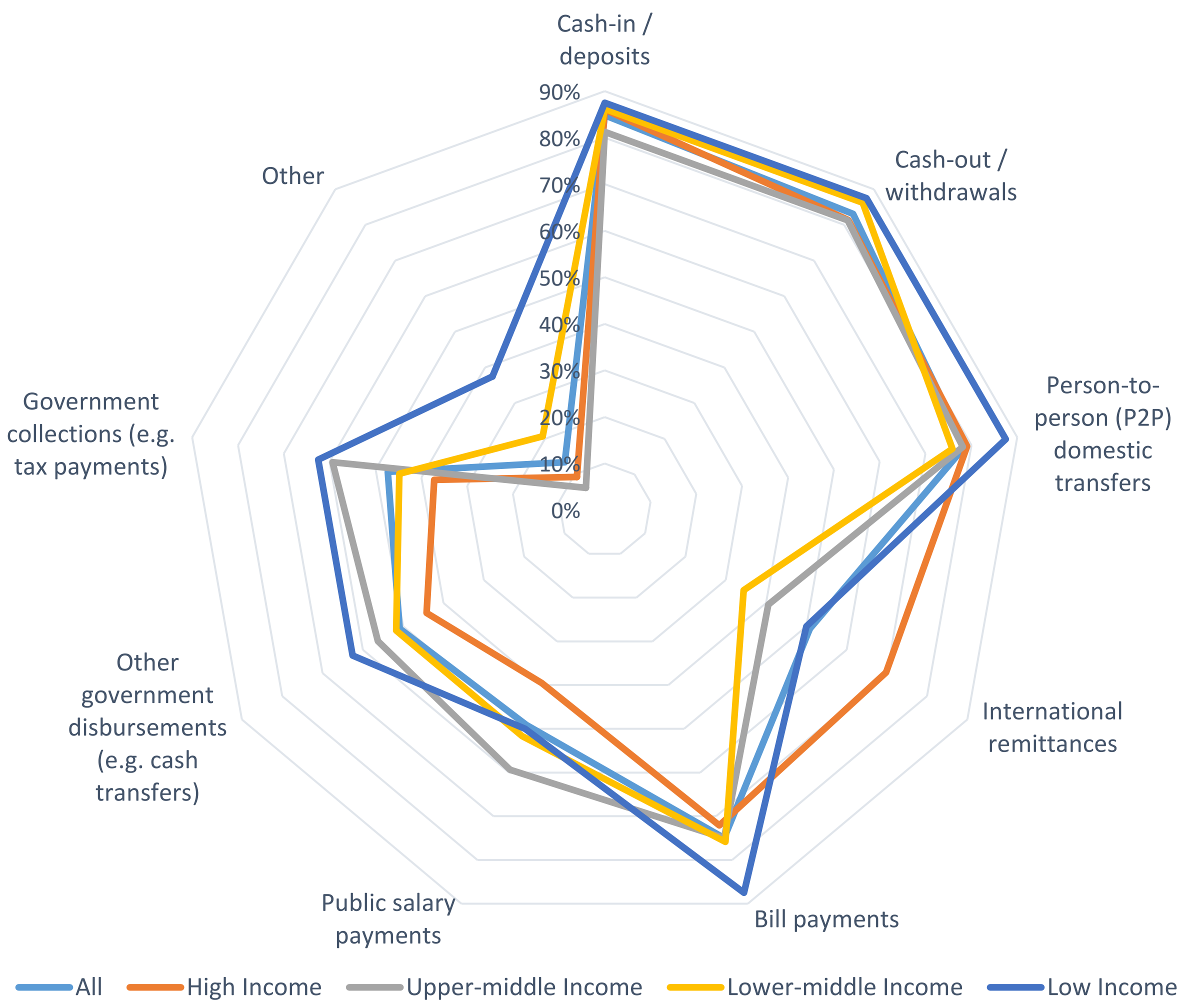
Consumer protection requirements are detailed in **Table I.5**. The latest data shows that terms, conditions, fees, and customer rights must be disclosed prior to the customer entering into a contract or performing a transaction in 97 of the surveyed economies (87 percent). In close to three quarters of the reporting economies, customers are protected against unauthorized transactions in the form of (limited) customer liability. Slightly few more economies have clearly articulated recourse and dispute resolution mechanisms. On these basic aspects, data shows almost no distinction between high-income and developing economies. However, while 79 percent of the high-income economies reported clearly articulating admissible disclosure of transactional and/or personal data, the same requirements are articulated by 67 percent of developing economies. Similarly, while 68 percent of developing economies indicated that customers are protected against third-party claims on customers' funds, 74 percent of high-income economies did so. From a regional perspective, such requirements are most commonly articulated among ECA and EU member economies, in line with generally more comprehensive legal frameworks for payment systems and services (see above). Also, countries bigger in size tend to uphold these requirements more often than their smaller counterparts.

Regarding basic payment accounts, **Table I.6(a)** shows that across two-thirds of the surveyed countries, this service is regulated in some fashion. Such outcome is more common among developing economies, perhaps reflecting a higher priority attached to financial inclusion. From a regional perspective, 89 percent of the MNA countries and 72 percent of LAC and SSA countries, respectively, report that they regulate basic payment accounts in some fashion. However, regulation of basic accounts is likely to vary significantly among countries. Data show that in 31 percent and 34 percent of the economies regulation prescribes parameters for minimum balance, and for cash withdrawal fees and conditions, respectively. It is worth noting that none of the ECA or Other EU Member economies report the existence of such regulatory parameters. In general, across all aspects of regulation of basic accounts as covered in the GPSS, developing economies are more likely to have these requirements in place than high-income economies. On the other hand, while 58 percent of developing economies report that basic payment accounts are protected by deposit insurance or similar mechanism, 70 percent of high-income countries indicate the same. Furthermore, **Table I.6(b)** shows that a tiered approach established by regulation to know-your-customer/ customer due diligence (KYC/CDD) is supported across 81 percent of the sample.

Finally, **Table I.7** provides details on transactions that can be performed using e-money products. Deposit and withdrawals (cash-in/cash-out) are allowed across over 80 percent of the surveyed economies.[6] From this analysis, it emerges that public salary payments, other government disbursements (such as cash transfers) and government collections (such as tax payments) can be affected via e-money accounts across half of the surveyed economies. Only 42 percent of the developing economies allow e-money to be used for channeling international remittances, compared to 70 percent of high-income economies. This could likely be explained by a more cautious approach to e-money regulation given the (actual or perceived) heightened risk (e.g., AML/CFT) linked to international transfers. **Figure 2** below depicts the transactions that can be performed using e-money, and how countries belonging to different income groups diverge away from the global averages, as a percentage of surveyed economies.

[6] This figure is closely comparable with the results found in **Table I.2**, with nearly four fifths of the surveyed economies indicated that they now regulate e-money.

Figure 2: Transaction that can be performed using e-money



Legal foundations of payment system oversight. Although the payment systems oversight function is discussed in detail in *Section VIII* below, issues related to the formal empowerment of the central bank to perform this function are included in this section as part of the analysis of the legal and regulatory framework.

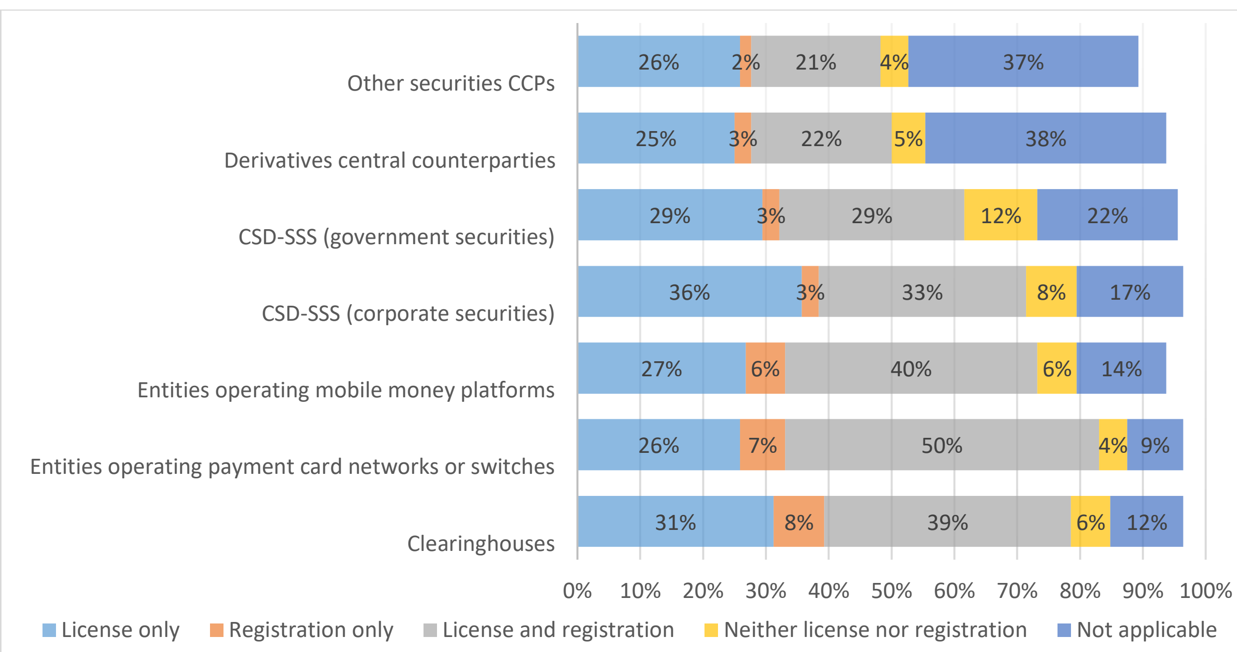
Table I.8(b) shows six variables that relate to the legal basis of the payment systems oversight function. These can be grouped in three broad categories: i) the law or laws where oversight powers are conveyed to the central bank; ii) whether such powers are implicit or explicit; and, iii) whether central banks are empowered to oversee other settlement systems such as securities settlement systems and/or central counterparties.

Only three central banks – two in the LAC region and the other in the SSA region – indicated that they have no formal legal powers to perform payment systems oversight. These figures are notably lower than in the 2012 survey where 10 countries indicated such a situation. Payment systems oversight powers are to be found mainly in central bank laws (83 percent), followed by payment systems laws and other laws (56 percent and 32 percent, respectively). The latest results are almost identical to the results of the 2012 reiteration of this survey.

The issue of whether the payment systems oversight function is stated explicitly or only implicitly in the legal framework is subject to a wide range of interpretations. On a global level, 68 percent of the countries indicate that the payment systems oversight powers are explicitly stated in the law, while 29 percent indicate that such powers are only implicit. This confirms the trend observed in 2012, where 53 percent of the surveyed countries indicated that empowerment was explicit, and 39 percent implicit.

Licensing of payment system operators. Table I.9 provides details on the licensing requirements of various payment systems operators (PSOs) including specialized service providers such as clearinghouses, central counterparties (CCPs), entities operating mobile money platforms or payment card networks, and central securities depositories (CSDs). On average across the surveyed countries, PSOs are required to obtain both license and registration in 34 percent of the cases, and in almost another third of the economies only a license is required. Registration only, or neither license nor registration is indicated by 4 percent and 7 percent of the economies, respectively. The latter is most often the case in EAP and ECA regions. Licensing is generally more frequent in high-income and larger economies, possibly also reflecting greater supervision capacity. **Figure 3** below shows that PSOs are most commonly required to obtain either a license or more commonly license and registration to commence their operations.

Figure 3: Licensing of payment system operators



Licensing of payment service providers. Table I.10 provides information on the licensing powers over non-bank payment services providers, such as money transfer operators (MTOs), mobile network operators (MNOs), supervised and unsupervised non-bank financial institutions (NBFIs) and other non-financial institutions (ONFIs). Supervised NBFIs, MTOs, and MNOs are more often required to obtain both license and registration (in 48 percent, 50 percent, and 45 percent of the cases, respectively) than either one or the other, or none. It is worth noting that in ODEs more than in other regional groups a registration will suffice. Unsupervised NBFIs and ONFIs, on the other hand, are less likely to provide payment services or are explicitly prohibited from doing so; when they do provide payment services, license plus registration is a requirement in only 10 percent of the countries.

Table I.11 describes admissible activities by type of non-bank payment service provider. From various types of non-bank PSPs, the latest data show that surveyed countries allow supervised NBFIs to engage in a wider set of payment-related activities, ranging from issuing payment cards (54 percent), to transferring international remittances (51 percent) and others. The same holds true for e-money issuing, with 46 percent of economies allowing entities licensed as (supervised) NBFIs to issue e-money, as compared to 21 percent and 29 percent of economies allowing MTOs and MNOs to do so, respectively. Other non-financial institutions are allowed to issue e-money across 15 percent of the surveyed economies. It is also worth noting that MNOs can transfer international remittances in 24 percent of the surveyed economies.

Table I.12 provides a detailed perspective on a number of licensing requirements by type of non-bank PSPs and shows that on a worldwide level, (supervised) NBFIs, MTOs and MNOs are the most intensively regulated non-bank PSP types, likely reflecting the diversity in number and nature of the above-described activities. In this connection, more than two thirds of the surveyed economies require supervised NBFIs to maintain minimal capital requirements. Furthermore, 56 percent and 49 percent of economies require that supervised NBFIs and MTOs maintain minimum authentication requirements. Interoperability requirements are upheld for MTOs, MNOs and supervised NBFIs in slightly more a fifth of the surveyed economies. Finally, compliance with AML/CFT requirements imposed on MTOs and NBFIs by 71 percent of the economies, and on MNOs by 46 percent.

Regulation and supervision of PSOs and PSPs. Table I.13 shows authorities legally empowered to supervise payment system operators and non-bank PSPs. The latest survey results show that central banks are the lead regulator and supervisor for payment systems operators (clearinghouses, payment cards networks / switches, mobile money platforms) in most the economies surveyed. In up to 15 percent of the economies, central banks share this responsibility with banking supervisory authorities. The latter are reported to be legally empowered to regulate and supervise payment system operators in 20 percent (in the case of clearinghouses, payment cards networks / switches) to 23 percent (for mobile money platforms) of the economies. Regulation and supervision of securities and derivatives clearing and settlement systems is more often the prerogative of the securities regulator, except for government-securities CSD-SSS where the central bank is designated in 59 percent of the surveyed economies. Regarding non-bank PSPs, responses may be interpreted as reflecting both the more limited range of payment services (if any) they can offer, and less clear/explicit regulatory and supervisory frameworks. Central banks are more often empowered to regulated and supervise non-bank PSPs, followed by the banking supervisory authorities. Overall, it is worth noting that developing economies rely more heavily on central bank empowerment than high-income economies, where responsibilities appear to be more distributed. In contrast, anti-trust authorities are more often empowered in high-income countries.

II. LARGE-VALUE PAYMENT SYSTEMS

Having the capacity to generate and transmit disturbances of a systemic nature to the financial sector, large-value payment systems have long been the focus of central banks' involvement, including through the direct operation of these systems. The importance of real time gross settlement (RTGS) of high-value payments for limiting settlement and systemic risks was extensively discussed in previous GPSS reports, and is reflected in their broad adoption worldwide. More recently, automated transfer systems (ATS) have allowed combining a gross-settlement functionality for large-value payments with a net clearing facility for low-value payments. This section begins with a landscape of large-value payment systems. It then turns to analyzing the specific features of RTGS systems, including risk management practices. Finally, it covers arrangements for large-value cheques and large-value systems other than-RTGS.

Systems used in the country for large-value funds transfers. This round's survey questionnaire invited the participating central banks to provide information on three types of system(s) generally used to channel large-value payments: RTGS systems, cheque clearinghouses, and "other" systems.[7]

Information on the type of system used to process large-value payments is shown in **Table II.1.**[8] Ninety-one percent of the total respondents (103 economies) indicated they are using at least one RTGS system. The actual number of economies that have developed an RTGS system is estimated to be higher. It is worth noting that higher-income countries are more likely to have an RTGS system in place, although this is a fairly generalized trend across income levels. In fact, when looking from a regional perspective, close to 90 percent of countries representing each of the regions indicated having a RTGS system in place, except for EAP region with 79 percent of the countries comprising this group. Also, as noted in previous iteration of the survey, RTGS systems are more commonly adopted in countries that have large populations (100 percent) as compared with their smaller counterparts (82 percent).

On the other hand, a quarter of the surveyed countries still use cheque systems for large-value payments. These results are largely comparable to those collected in 2012 and seem to indicate some legacy issues associated to cheque systems. Also, a total of 18 countries (16 percent) indicated that they use a system other than the RTGS system or the cheques clearinghouse for large-value payments.

[7] While in general the average value of each individual payment processed by these systems is high when compared to other systems (e.g. automated clearinghouses or payment cards switches), many so-called large-value systems covered in this section also process payments of relatively low value.
[8] Answers do not necessarily add up to 100 percent since several countries indicated more than one system through which large-value payments are executed.

Table II.1(b) provides detailed information on the relative use of systems based on volume breakdown data. The latest data shows that 82 percent of the surveyed countries use RTGS systems to process, at the minimum, 50 percent of their large-value fund transfer volume. Additional 9 percent of countries use cheque systems to process 50 percent or more of their large-value transfers, as compared to 13 percent in 2012. This seems to indicate that although high-value cheques linger – thus cheques systems continue to be accounted towards high-value transfer systems – their relative importance (in terms of volumes processed) tends to decrease. When compared to the previous round's results, the latest data show that countries belonging to LAC, MNA, SA and SSA regions are less likely now to use a cheques system as their main large-value system than they were in 2012. Among middle-income countries (MICs), lower-middle income countries appear to rely more extensively on cheques systems than upper-middle income countries: in the first group, 21 percent report channeling over 50 percent of total high-value volumes through cheques systems, as opposed to only 6 percent of countries in the second group. Finally, of 38 countries that have launched a RTGS system in the last decade, five still process from a minimum of 25 percent to a maximum of 90 percent of large-value payment volumes through cheques systems instead.

Real Time Gross Settlement Systems. The bulk of systems captured in the GPSS are 10 year-old or older (55), whereas 35 have been implemented between 2006 and 2011, and 8 systems have been launched in 2012 or later.

Table II.2 shows that the central bank is the owner, operator and settlement agent for the RTGS system in 95 percent, 90 percent, and 93 percent of the countries using an RTGS, respectively.

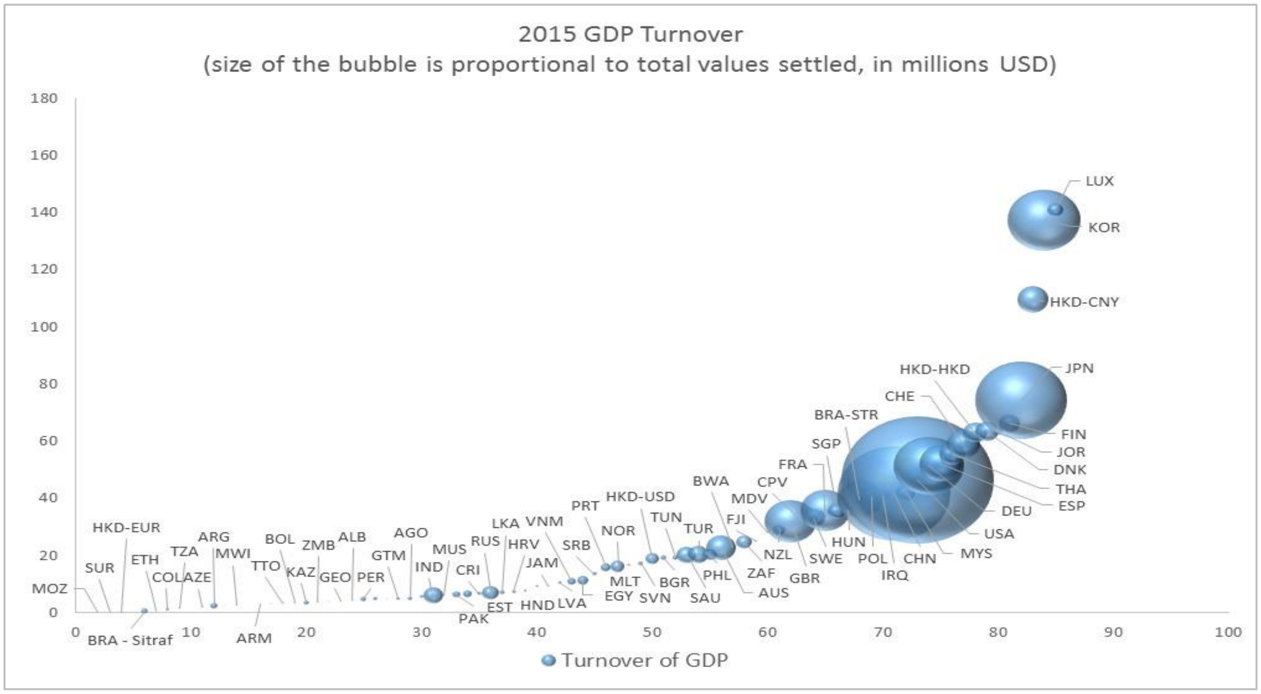
Fourteen countries indicated that their RTGS system handles transactions both in local currency and in at least one foreign currency.[9] In addition, there are designated foreign currency systems in China and Hong Kong (China). Bulgaria, Latvia, Lithuania, Poland and Romania have a TARGET2 component for the settlement of transactions in euro, in addition to their domestic RTGS systems.

Table II.3 shows basic statistics for RTGS systems worldwide for year 2015, with important differences among countries. In general, GDP turnover of RTGS systems is on average three and a half times higher for high-income countries (where it is assumed that RTGS systems support the settlement of a significant number of securities market transactions). Nevertheless, many developing economies also show large numbers, which, when viewed in conjunction with growth trends, stress the increasingly systemic importance of RTGS systems around the world. The sum

[9] Argentina (USD), Bolivia (USD), Costa Rica (USD), Dominican Republic (USD), Honduras (USD), Iraq (USD), Jamaica (USD), Jordan (USD), Rep. of Korea (USD), Malaysia (CNY), West Bank and Gaza (USD, JOD, ILS), Peru (USD), Tanzania (USD), Uruguay (USD).

of 2015 RTGS values is equivalent to 36.3 times the global GDP, as compared to 32.8 times in 2012.

Figure 4: GDP turnover of RTGS systems (2015)



Detailed features of RTGS systems worldwide. The discussion below shifts the basis of the analysis from countries to systems. Once the various exceptions are accounted for, the survey presents information on 90 RTGS systems worldwide.[10]

Regarding the primary means through which direct RTGS participants send their payment orders (see **Table II.4**), SWIFT closed-user groups on the one hand and proprietary telecommunications networks on the other are by far the most common alternatives, each serving approximately half of all RTGS systems surveyed. SWIFT closed-user groups are more common throughout the EU and ODEs, and in EAP and SSA regions. One could speculate that limitations in local infrastructure have prompted central banks in some developing regions to make use of the infrastructure provided by SWIFT. Yet, when analyzed from an income perspective, data show that proprietary telecommunications networks are preferred means of communication among developing economies. No significant difference between countries were observed when the information is analyzed from a country's population size angle. Close to a quarter of the surveyed countries' systems indicated using SWIFT international network, particularly in ECA, LAC, MNA and SSA regions.

[10] In this number, TARGET2 is considered and Euro area countries are counted as one. The eight BCEAO countries are served by one RTGS system.

The GPSS also collects information on RTGS pricing policies. The 2015 survey data (see **Table II.5**) shows that RTGS operators apply no charges in 10 out of 90 RTGS systems (11 percent of the worldwide total). This marks a miniscule change from 2012, when nine systems indicated applying no charges. A grand majority of these systems belong to MICs. From a regional perspective, close to a quarter of countries comprising LAC and a third of the SA group indicated this option. On the other end of the spectrum, only four systems reported having a pricing policy aiming at recovering all costs in full, in addition to profits and/or opportunity cost.

In the middle, over a fifth of systems indicated having a pricing policy that aims at *full* recovery of the *operational costs* of the system. Additional fifth noted having a pricing policy to achieve *partial* recovery of the *operational cost* of the system, while a comparable number of systems indicated that they aim to recover *all costs (operational plus investment) in full*. Developing countries more often indicate partial recovery objectives, although a third of ODEs also fall in this category. On the other hand, high-income countries report that they pursue full recovery of the operational costs more often than developing economies do. From a regional perspective, almost a half of systems in EAP region, and more than a third of those in MNA, SSA and ODE regions fall in this category.

RTGS systems in MICs are relatively more likely to charge prices that have no particular relation to cost recovery. From a regional perspective, a quarter of RTGS operators in ECA and SSA fall in this category.

Population size does not seem to be related to the pricing policy adopted. One could argue that full cost recovery is more difficult to achieve in countries with a smaller number of participants / transactions. In fact, operators of RTGS systems in countries with small populations are more than four times as likely to make no charges. However, at the same time, they are just as likely to adopt a pricing policy which aims at the full recovery of operational cost.

On average, the recovery period for investment cost is 6.6 years. Population does not seem to play a significant role in lowering the investment cost recovery period. In fact, systems in countries with smaller populations (5 million and below), on average, recover their investment cost within 6.3 years, as compared to 6.85 years in case of countries with mid-size population and 6.6 for systems in countries with populations of 30 million and above.[11] Similarly, there is very little difference in the average period required to recuperate the investment cost, when looking at the data from an income perspective. Indeed, while investment cost recovery period is 6.2 years in case of high-income countries, operators of RTGS systems in developing economies recover their investment cost within 6.25 years.

[11] The average investment cost recovery period for small countries increases to 6.54 (closely comparable to the worldwide average) once New Zealand, with an average recovery period of 4 years, is excluded.

Liquidity and credit risk management frameworks. The GPSS gathers information on the main sources of liquidity in a system, as indicated by the central bank/system operator. As shown in *Table II.6*, all systems surveyed with one exception reported that opening balances and funds received by other participants during the day are one of the main sources of liquidity. Reserve requirements are regarded as one of the main sources of liquidity in 68 out of 90 systems, with the majority of these systems allowing participants to make use of all reserve requirements. The use of lines of credit between banks as a source of liquidity in the RTGS system is more relevant among developing economies (64 percent compared to 54 percent among high-income country systems). From a regional perspective, except for Other EU member countries, at a minimum 50 percent of all other regional groups' systems reported this as being one of the main sources of liquidity.

At a global level, most RTGS systems rely on the central bank providing some form intraday credit, either in the form of loan or repo (74 percent) or participants' account overdrafts, either in a collateralized (28 percent) or uncollateralized (3 percent) form. As such, intraday credit is to a great extent provided on a collateralized basis, with only 1 operator granting uncollateralized credit. Fifteen RTGS systems do not provide any form of credit at all. These are mainly located in developing economies (28 percent), as opposed to high income countries (15 percent), and comprise nearly a quarter of the systems in countries belonging to ECA and nearly a fifth of countries in SSA regions.

With exception of two systems (one each in LAC and SA regions), participants have access to real-time information on their settlement balances and available credit/overdrafts during the day.

Regarding credit risk management, in 85 percent the surveyed systems where participants have access to credit facilities, the operator demands high quality collateral to minimize its own credit exposures (see **Table II.7(a)**). In seven surveyed systems, should a participant be unable to repay the intraday credit (or overdraft) by the end of the system's operating day, the operator proceeds to seize the collateral immediately thereafter. In most cases (64 systems), however, intraday credit can be transformed into overnight credit. To penalize a defaulting participant, the system operator typically applies penalty rates (in close to two thirds of all systems granting credit). In 17 systems, the participant is charged the market rate for overnight credit. These results are summarized in **Table II.7(b)**, and are closely comparable to those reported in 2012.[12] Eleven RTGS systems that extend credit selected 'other' option.[13]

[12] In some countries, more than one option or a combination of options is applied: the approach varies depending on the frequency of such failure, or of the participant's preference. For example, depending on the case, both market and penalty rates can apply, and in one system the participant can choose between immediate seizing of collateral and borrowing funds overnight at penalty rate.

[13] Among systems that reported "other" options (11), five central banks indicated that the intraday credit is transformed into overnight in the form of central bank standing facilities and the respective standing facilities

Seventy-four percent of systems surveyed count with queuing facilities. In most cases, payments placed in the queue can be settled through liquidity optimization algorithms (see below). One central bank, which applies limits on intraday credit, reported that overdrafts against net debit caps are monitored ex-post, allowing the payment to go through. In limited circumstances, a participant's intraday position may be monitored in real-time and any payment order that would result in a breach of that cap would be rejected. On the other hand, in 17 percent of the cases (as compared to 23 percent in 2012), the system would immediately reject a payment order if the participant does not have enough balance (see Table II.7(c)).

Table II.8(a) describes how queuing resolution mechanisms work in 68 RTGS systems around the world that have indicated having a centralized queuing facility.[14] In more than four fifths of the sample, participants can set and change priorities to their payment orders. While all surveyed systems in high-income countries enable this option, above two-thirds of systems in developing economies allow setting priorities to payment orders, and close to a three-quarters allow changing priorities of payment orders in a queue waiting to be settled. From a regional perspective, at the minimum 80 percent of the systems allow participants to set and change priorities to their payment orders. Moreover, the basic FIFO (first-in, first-out) resolution algorithm is used in 88 percent of the systems. In over half of surveyed systems offsetting of payment orders waiting in a queue takes place on both a bilateral and multilateral basis, followed by another third of systems that use only multilateral offsetting. In 47 percent of surveyed systems, the operator can trigger the offsetting mechanism manually at any time. Automatic offsetting is mostly triggered by time-related parameters, as opposed to other factors such as accumulated volumes pending settlement.

The use of the pricing policy by RTGS operators to promote a smooth flow of payment throughout the day (i.e. using differentiated charges according to the time of the day in which payment orders are sent to the system for processing, with lower charges applying to those payments sent during RTGS off-peak hours) is not as common on a worldwide level, with only a third of RTGS operators relying on this tool for liquidity optimization. These results are identical to those of the 2012 round of survey (see **Table II.8(b)**).

overnight rates, or other interest rates set by the central bank in implementing its monetary policy, are applied. If a participant does not have access to the central bank lending facility and is unable to reimburse the intraday credit at the end of the day, participant may be subject to penalties. The penalty rate may be increased if the same participants default more than once within a specific period of time. In one system, the debt amount is charged by confiscating all accounts of the participant held at the central bank. If this amount is not enough to cover the debt, the participant is allowed to pay the remaining debt and the penalty amount on the next business day. After 11:30 am, collaterals of the participant in sufficient amount is liquidated thereafter immediately.

[14] It should be noted that many RTGS system operators use a combination of the alternatives presented, thus it is not possible to draw conclusions on what specific combination(s) are more commonly used.

Resilience and business continuity. Ever-increasing attention is being paid to the topic of enhancing resilience and ensuring proper business continuity of systems that are of critical importance for the financial system. In terms of setting out the RTGS operational risk management framework, as shown in **Table II.9**, in over 80 percent of the surveyed systems the roles and responsibilities for addressing operational risk are explicitly defined, with the framework being endorsed by the board. A comparable number of systems have their frameworks periodically reviewed and tested. All but two surveyed systems indicated having basic routine procedures in place for periodical data back-ups. Tapes and other storage media are kept in sites other than the main processing site in 92 percent of the participating countries' systems. Furthermore, in order to ensure continuity of their systems' operations even in extreme circumstance, more than three quarters of the surveyed systems have deployed back-up servers at the main processing site, whereas 79 operators (88 percent) reported having implemented a fully-equipped alternate processing site. The latest data shows insignificant difference between systems in countries with large and small populations in this regard. However, from an income perspective, high-income countries' systems are more likely to have the alternate processing site than developing economies' systems, 96 percent compared to 75 percent. More than a fifth of the surveyed systems now have a third backup site. Recovery time after a failure is indicated at two hours or less in 67 countries or 74 percent. Finally, more than 80 percent of the surveyed RTGS system operators informed having developed a formal business continuity plan (BCP). In 88 percent of the cases where such a BCP exists (79 out of 90), it is tested on a regular basis. These practices are more common throughout the EU, ODEs, and the EAP and ECA. On the other hand, the SA region lags in this particular area.

In general, the outcomes are quite positive, showing high levels of awareness of operational risks and international standards in these field. Important improvements are evident in the LAC, MNA and SSA regions, while SA region's lag is notable. However, this conclusion should not be interpreted as attesting standards' observance in the surveyed countries.

When asked about dependencies from other systems or service providers (**Table II.10**), 73 systems (or 81 percent of the worldwide total), have identified a dependency on a central securities depository / securities settlement system (CSD-SSS). In one third of these cases, the CSD-SSS is operated by a third party, whereas in additional 31 percent of the cases, the CSD-SSS is integrated in the same platform as the RTGS. In another 17 percent of the responses, the CSD-SSS and RTGS are not integrated into the same platform, but the CSD-SSS is operated by RTGS operator. Thirty-seven systems (41 percent of the worldwide total) have identified dependencies on a third-party service provider.

The questionnaire also compiled information on the existence of so-called RTGS Users' Groups.[15] **Table II.11** shows that a total of 71 countries (6 more than in the previous survey) indicated that such a group has been created for the RTGS operator to better address participants' needs. RTGS Users' Groups are quite common in systems originating from all country income groups, averaging close to 80 percent across all income groups and being comprised of systems belonging to Euro area and SA regions.

Finally, information was collected on access criteria to, and participant types in, RTGS systems (**Tables II.12 and II.13**). Per the latest data, commercial banks are they only participant type to have direct access to the RTGS systems in all systems worldwide. Fifty systems (or 56 percent of the worldwide total) can be accessed directly by banks other than commercial banks, while direct access to RTGS systems by supervised NBFIs is allowed by 28 systems (31 percent of the worldwide total). However, NBFIs (supervised and unsupervised) are more likely to have no access at all (39 percent and 49 percent, respectively), with indirect access through another participant not being very common. Where applicable, ACH operators, payment card network operators, SSSs, and CCPs are more often granted direct access with no credit to the RTGS system; however, cases of payment system operators not allowed to access the RTGS range from 17 percent (for ACH) to 32 percent (for payment card network operators). Moreover, access to central bank credit is granted to commercial banks by 79 percent of the systems, to banks other than commercial banks by 37 percent of the systems, and to supervised NBFIs by 13 percent.

About 93 percent of all RTGS system operators indicate there is an explicit policy that deals with granting access to, and excluding participants from, the system upon the fulfillment of a certain set of criteria. The same figure in the 2012 survey was 94 percent, which was judged unexpectedly high, leading to warning against different interpretations central banks may give to the concept of "explicit". In 90 percent of all surveyed systems, direct access to the RTGS system depends on the institutional standing of participants, i.e. whether participants are banks or other types of financial or even non-financial institutions. At the same time, a total of 73 RTGS system operators (81 percent of the worldwide total) indicated direct access is also related to the fulfillment of a set of objective criteria (e.g. minimum capital or technological requirements). This seems to indicate that in most countries participation requirements reflect a combination of institutional and functional criteria. The orderly and timely exit of a participant that no longer meets the established criteria is explicitly addressed by 82 operators or 91 percent of the worldwide total, similarly to 2012 results.

[15] The typical core objective of a RTGS Users' Group is to promote a more active involvement and empowerment of participants in the decision-making framework of the system in order to better address the needs of the financial market on an on-going basis.

Non-RTGS large-value payment systems. In 2015, it was found that 18 countries worldwide channel large-value payments through "other" systems, either partially or exclusively. The regional distribution of the 18 central banks which provided information on non-RTGS large-value systems varies widely, as do the corresponding country income levels and country population size. The only regional groups not represented in this group of 18 central banks are other EU members. **Tables II.14 to II.17** summarize the features of 15 of these systems for which detailed information was provided.

In over a half of the "other" large-value systems, settlement of payments is executed on a gross basis but not in real time. In less than a third of these systems, there are multiple clearing sessions during the day, while in the remaining two systems payments are processed on a net basis at the end of the day. No specific regional or income-related trends were observed.

Most of these systems (60 percent) settle through accounts kept with the central bank (a majority of developing economies fall in this category), additional third does this through a RTGS systems, whereas the remaining two settle in commercial bank money (one each in LAC and ODEs).

Credit facilities of such systems were also investigated, with the result that the operator extends immediate credit in only one high income country. In case a participant does not have enough balance to process new payments, 47 percent of the surveyed countries with a non-RTGS systems indicated that the payment order is delayed until funds are made available, while in more than half (53 percent) the payment is rejected immediately.

Finally, regarding dependencies applicable to non-RTGS large-value payment systems, four fifths of the surveyed systems are dependent on other systems for final settlement. No system indicated dependency on a CDS-SSS (possibly as a result of no credit facilities with one exception) or other third-party system provider.

Special procedures for large-value cheques. A special procedure for large-value cheques has been implemented across 31 percent of cheque clearing systems, with almost no variation among countries when looking from an income or population-size perspective. However, from a regional point of view, this type of procedure is most common among EAP (42 percent) and LAC (33 percent) countries, while no country belonging to Other EU members group indicated having this feature. Large-value cheques can be settled on a gross basis and with same-day value across 17 percent and 16 percent of all cheque clearing systems, respectively, or half of the systems reporting some procedure for large-value cheques in place.

III. RETAIL PAYMENT INSTRUMENTS AND SYSTEMS

The existence of a wide range of payment instruments is essential to support customers' needs in a market economy. While a less than optimal use of payment instruments may ultimately have a negative impact on economic development and growth, the safe and efficient use of money as a medium of exchange in retail transactions ultimately underpins the stability of the monetary system.

It has been argued in the previous GPSS iterations that the largest differences between high-income countries and developing economies continue to exist with regard to retail payment systems. It was noted that the use of retail payment instruments differs among countries due to a variety of cultural, historical, economic, and legal factors. However, GPSS results can be interpreted to suggest that the levels of financial inclusion, and the existence of certain infrastructure, supported by an enabling legal and regulatory environment have a strong explanatory power of the supply and use of different retail payment instruments.

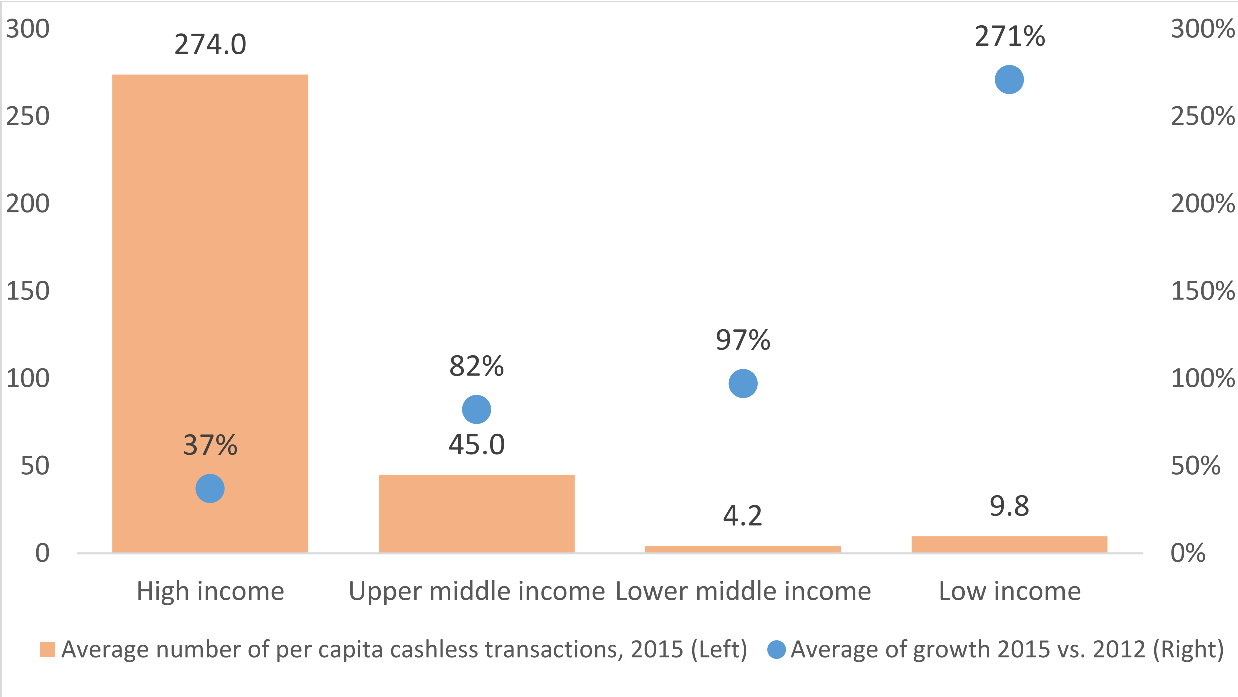
Increasingly country authorities are recognizing the relevance of efficient retail payment systems and services for financial inclusion. At the same time, there are clear efficiency gains that enhanced financial inclusion can bring to the retail payment system, and to the national payments system as a whole. For example, providers of "traditional" payment services may achieve savings by improving national financial infrastructures, or by adopting new service delivery models. However, in order to do so, they will need to address difficulties in translating modern technology and other innovations into increased access to and usage of transaction accounts.

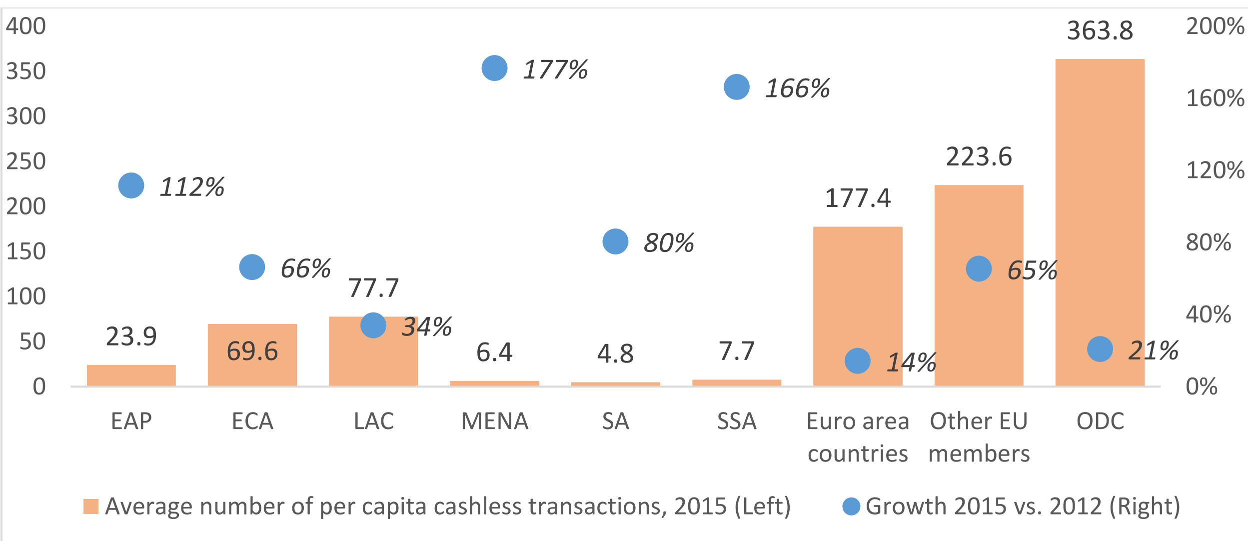
While an analysis of transaction accounts and access points can be consulted in the GPSS note on 'Accounts & Access",[16] this section provides additional insights in the use and evolution of electronic payment instruments and access channels, and focuses on the clearing and settlement arrangements underlying these transactions. On average across all surveyed countries, the number of cashless transactions[17] per capita grew by 73 percent in the three-year period between 2012 and 2015. Many low and lower-middle income economies have seen very high growth rates in cashless transactions per capita, though to a certain extent such high growth rates reflect a lower starting point or comparison base (see chart below). While on average high-income economies have 274 cashless transactions per capita in a year, developing economies range from 4.2 (lower income countries) to 68.3 (upper-middle income).

[16] http://pubdocs.worldbank.org/en/504871475847684346/GPSS-UFA-Note-October2016.pdf

[17] The number represents the sum of payment transactions made with cheques, credit transfers, direct debits, payments with debit cards and credit cards, and e-money.

Figure 5: Cashless transactions per capita (by income levels and regions)





Cheques and cheque clearinghouses. On a global survey total, 72 countries reported having a cheque clearinghouse. Countries without a cheque clearinghouse totaled 28, and are mainly concentrated in Central and Eastern Europe (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Czech Republic, Kosovo, and Slovenia), the Baltic, and the CIS region. Other countries without a cheque clearinghouse are Finland,[18] Ireland, Luxembourg, Mongolia, Netherlands and Switzerland.

Some of the most relevant settlement features associated with cheque clearinghouses are discussed in **Table III.4(a)** and **Table III.4(b)**. **Table III.3** shows that in 48 percent of all cases, central bank acts as the operator of a cheque clearinghouse. While central banks act as cheque clearinghouse operators across almost half of the MICs sample, and all surveyed low-income countries, only 33 percent of central banks belonging to the high-income group do the same. From a regional perspective, significant involvement of the central bank as the operator of a cheque clearing system were reported by countries in MNA region (78 percent).

In terms of efficiency, cheques are standardized across 92 percent of the surveyed countries, with a few countries across MNA (2), SA (1), EAP (2), and LAC (1) regions still lacking standardization. Similarly, automated cheque processing is increasingly common (91 percent). Compared to the 2012 survey, there is an increase in the percentage of countries where cheque truncation is used (47 percent compared to 36 percent in 2012). The largest increase in the number of clearinghouses with cheque truncation features is in lower-middle income countries (35 percent compared to 20 percent in the 2012 survey). Despite these results, physical exchange is still practiced across all regions, and in 44 percent of the worldwide total, with significant presence among developing economies (56 percent), compared to a less than a third of high-income countries. PSDG experience in this area points to legal and regulatory issues as a relevant barrier to further adoption of cheque truncation. From a population size perspective, 32 percent of small countries have adopted this technology compared to 50 percent or more for larger countries.

Table III.4(b) shows that in the majority of cheque clearinghouses (68 percent), net balances are calculated and settled once a day, while two or more clearing sessions per day occur in 23 systems or 30 percent of all cheque clearinghouses worldwide – up from 22 percent in 2012. These results mirror those compiled by the 2012 survey. More frequent calculation of net balances was reported by at least a quarter of countries belonging to EAP, LAC, SA, SSA, Euro area and Other EU regions. In addition, 33 percent and 29 percent of clearinghouses in middle-sized and larger countries, respectively, now settle more than once a day. For 14 percent of systems that do not calculate multilateral balances, it is believed that bilateral netting is used instead, either due to legal restrictions or as a risk management tool.

[18] Cheques are bilaterally cleared in Finland, in a system called POPS and settled in the BOF-RTGS system. https://www.ecb.europa.eu/pub/pdf/other/ecbbluebook2001en.pdf?e58d96b25d1c820c4e47fda8419e3126

The final settlement of participants' positions in the cheque clearinghouse is made in a RTGS system in 81 percent of the systems, a modest increase when compared to 73 percent observed in the previous iteration of this survey. Although not through a RTGS system, settlement is done in central bank money in 16 percent of the systems. In fact, settlement of cheque clearinghouses in commercial bank money is extremely rare, with only three countries not choosing either option.

A notable improvement has been noted regarding the timing of customer accounts' crediting: in over 90 percent of the cases, customer accounts were credited by T+2 at the time of the last survey, as compared to 70 percent in 2012.

Table III.5 presents details on risk control mechanisms used in cheque clearing and settlement systems around the world. No such mechanisms are in place in 19 percent of cheque clearing systems around the world, down from 23 percent in 2012. In 39 percent of all cases, if one or more participants are unable to settle, unwinding takes place and net positions are recalculated after removing some or all payments involving failed participants. This procedure is quite common in cheque systems in the EAP, ODE, and LAC regions, and used in both systems reported in the ECA region. In 45 percent of surveyed systems, the central bank (or other operator) would ultimately provide liquidity should the system be unable to completed settlement. These results are closely comparable to those compiled during the 2012 round of this survey. Other risk management mechanisms such as limits and guarantee funds are still relatively rare in cheque systems, although increasingly common. In 60 percent of cheque clearinghouses worldwide, participants have access to information during the day on their preliminary position. From a regional perspective, this feature is most common among countries belonging to Other EU members and LAC regions, while no country in SA region reported having this feature in place. Overall, across nearly a half of all surveyed clearinghouses risk management mechanisms are reported to ensure completion of daily settlements in case of the inability to settle by the participant with the largest single settlement obligation. No country in SA region reported having this feature in place, while more than two-thirds of countries in EAP and Other EU members' regions did.

As noted above, risk management practices in cheque systems around the world are still relatively weak. While some operators may argue that tighter risk control mechanisms are not necessary for a system that is no longer systemically important, the latest survey results point to cheque systems still having some degree of systemic importance in 28 countries (see Table II.1). In very few cases (four reported in 2015), the cheque clearinghouse is the only central clearing system available in the country.

Credits transfers, direct debits and automated clearinghouses (ACH). Survey results show that a total of 90 ACH systems serve 97 countries for the processing of retail electronic credit transfers and direct debits.[19] Detailed country responses can be found in **Table III.6**. It should be noted, however, that in some countries where an ACH does not exist, electronic funds transfers of low-value are nevertheless common, and credit transfers might be processed through the RTGS system (e.g., Mexico, Turkey).

ACH infrastructures worldwide are undergoing significant change (see also Section VIII on reforms). In some countries comprising the EU, local ACHs have been discontinued and moved to the pan-European platform. In other countries, ACH systems have been implemented as components to modern automated transfer systems (ATS) that can handle both large-value and retail payments. Examples of recent ACH systems implemented since the last GPSS include the Eastern Caribbean Automated Clearing House (ECACH) and the Tanzania Automated Clearing House (TACH).

Table III.7 analyzes operational and settlement features of ACH systems. At the worldwide level, the central bank is the operator of the ACH in 40 percent of the cases – an identical number as reported in the 2012 round of survey, and significantly lower than cheque clearinghouse. In fact, central banks have traditionally refrained from assuming a direct role in the operations of low-value systems. However, it is worth noting that 4 out of 5 systems reported for low-income countries are central-bank operated. From a regional perspective, the majority of systems are operated by central banks in countries belonging to ECA, MNA and SSA regions (88 percent, 57 percent and 53 percent, respectively), while those in LAC, ODE and Other EU regions are the least likely to be operated by central banks (25 percent, 14 percent, and 11 percent, respectively).

In a similar fashion to the results of the 2012 round of survey, approximately 3 out of 4 ACH systems worldwide can process both electronic credit transfers and direct debits. This is most commonly the case for SA (100 percent) and ODE (86 percent) countries, as opposed to MNA (57 percent) and EAP (56 percent) countries, and for countries with larger populations, consistently with greater importance of direct debits (see above).

More ACHs than cheques clearinghouses have multiple clearing cycles, and 84 percent settle final positions in a RTGS system (the same figure for cheque systems was 81 percent). The latter feature has remained virtually unchanged over time; yet, in LAC for instance it grew to cover all surveyed ACH systems by 2015. On the other hand, settlement of ACH obligations in commercial bank money is rare: only 15 out of 89 cases (17 percent of the global survey total), according to the latest data.

Table III.8 shows survey outcomes on the types of mechanisms used in ACH systems to control or limit credit and liquidity risks. This survey iteration confirms that, to a great extent, operators

[19] This total includes the ACH system of the BCEAO which serves 8 different countries.

do not consider ACH credit and liquidity risk management as warranting the types of risk controls outlined in the survey. First, the percentage of ACHs without any form of risk management is 22 percent, up from 14 percent in 2012. On the other hand, no ACH system in ECA, ODE regions, and Other EU members lack a risk management mechanism. Second, the percentage of ACH systems with access to central bank liquidity increased only slightly since 2012 – from 31 percent to 38 percent. Yet, 24 percent of the surveyed ACHs have arrangements in place that ensure completion of settlement in case of inability of the participant with the largest net debit position to settle. There are few differences across regions and practically none when viewed from the income level perspective, with exception of SA countries where such arrangements do not exist.

Finally, **Table III.9** provides detailed country responses to questions related to ACH access policies around the world, which have become increasingly important also to establish and maintain the level-playing field among payment service providers. In addition to commercial banks, the latest survey data show that direct access is also provided to banks other than commercial banks in over a half of the sample. On the other hand, more than a half of the surveyed ACHs do not allow access to exchange bureaus (57 percent of the global survey total), unsupervised NBFIs (56 percent), international MTOs (55 percent), local MTOs (54 percent), and MNOs (53 percent). Although 38 percent of ACH systems does not envisage access by supervised NBFIs, direct (24 percent) and indirect (21 percent) access combined lead to a majority of these systems to provide some form of access to supervised NBFIs. A similar observation can be made for the National Treasury, which can access the ACH either directly or indirectly in 39 percent of the cases, as compared to another 38 percent in which it has no access altogether. Access by other non-financial institution is for the most part not allowed (38 percent) or not applicable (34 percent). Looking from an income perspective, ACH in high-income and upper-middle income country groups appear to have the least number of restrictions around direct access of non-banks. Given the role of these players in in expanding access to financial services in developing economies (see below), these results may indicate a significant operational constraint.

Payment cards and related systems. This section presents the analysis of the survey questions covering payment cards, payment card switches[20] and other related aspects. It has been suggested that factors other than country income have an important influence in the

[20] For the purposes of this report, a payment card switch is defined as a mechanism that connects various institutions allowing interchange of payment cards transactions of participating institution cardholders at other participating institution merchants, ATMs and other card acceptance devices. A payment card switch is typically used for routing authorization and authentication-related messages between participating institutions, and can also generate and distribute clearing and settlement files. In some settings, the individual institutions could themselves have payment card switches to connect their own ATMs and POS terminals to their own internal card processing systems, and these payment card switches are then connected to a central inter-institution payment card switch. This is also referred to as a payment card network. Payment card switches are also beginning to be used for processing of card transactions initiated through other channels like internet and mobile phones.

development and expansion of payment card circuits.[21] This may include the levels of competition in the provision of payment services, government programs that leverage payment cards, the pace of innovation, and the broader use of electronic payment instruments. According to PSDG experience, limited access to transaction accounts, and inadequate consumers' awareness contribute on the demand side to explain slower uptake and development of payment card instruments / systems in certain countries.

Table III.10 shows information on the local card market. International brands like Visa, MasterCard and others dominate domestic card market in 78 of the responding countries (74 percent of the global survey total), while domestic networks are dominant in 28 percent of the cases. Similar to previous survey rounds' results, international brands dominate MIC markets, whereas there seem to be a relatively stronger case for local brands in the surveyed low-income countries. Local and international brands are present in the EAP region in equal measure, while international brands are prevalent in all other regions. Interestingly, while international brands are generally expected to be more prevalent across countries with smaller populations because of the large investment costs associated with setting up a processing network, survey data show weak evidence in this regard.

Interoperability in the context of payment cards makes it possible for cardholders to use their (locally-issued) payment/cash cards seamlessly (though probably at a cost) at any acceptance device. In the specific case of **Table III.11** central banks were asked to assess the interoperability of ATMs and POS terminals in four categories.[22] Overall, slightly less than two-thirds of central banks participating in the survey indicated that both ATMs and POS terminals are fully interoperable. The number of central banks indicating full interoperability for ATMs (62 percent) is higher than POS terminals (59 percent). These figures are similar to the results of the previous survey round. Full interoperability of both ATM and POS terminals is significantly higher in high income economies. From a regional perspective, full interoperability is the highest in countries belonging to the Euro area, Other EU members and ODE regions. On the other hand, EAP, SSA, and SA country groups are the most likely to experience partial or low interoperability of ATMs and POS terminals. From the country population size perspective, full interoperability of ATMs and POS terminals is more common in larger countries, whereas partial interoperability is observed more frequently in smaller countries.

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[21] Zandi, M., Singh, V., and Irving, J. (2013). The Impact of Electronic Payments on Economic Growth. Moody's Analytics.
https://usa.visa.com/dam/VCOM/download/corporate/media/moodys-economy-white-paper-feb-2013.pdf

[22] "Full interoperability of ATMs" is described as all payment and cash withdrawal cards being used seamlessly (though probably at a cost) in all ATMs in the country. Similarly, "full interoperability of POS terminals" means all payment cards can be used seamlessly in any POS terminal.

In addition, participating central banks provided their assessment of the use of payment cards. As such, 62 countries (59 percent of the global survey total) indicated that payment cards are used extensively as a payment instrument, e.g., for payments at the point of sale. Discrepancy among countries based on income is clear – while 93 percent of all high-income economies indicate that payment cards are extensively used to make purchases, only 32 percent of developing economies do the same, and only a fifth of the countries in MNA and SA regions. Similarly, although only a third of the global survey total indicated using payment cards as a payment instrument on occasional basis ('sometimes'), this is more often the case of developing economies (51 percent) than it is for high-income economies (8 percent).

Table III.12 shows the types of services offered by ATMs. In over 80 percent of the countries, ATMs offer at least one non-cash payment service, which contributes to the efficiency of the payments system. Compared to the 2012 iteration of this survey, more countries have expanded the range of ATM (non-cash) services from bill payments (74 percent), to same-bank credit transfers (81 percent), whereas interbank credit transfers are enabled in fewer surveyed countries (45 percent). In this regard, income-based differences are not as significant as suggested in previous survey iterations, nor is country population a factor except for interbank transfers which result from broader interoperability issues. From a regional perspective, ATMs in countries belonging to LAC and Other EU members offer considerably less non-cash services.

Table III.13 shows information on the interconnectedness of ATM and POS terminals. On a worldwide level, nearly a half of the surveyed central banks in case of ATMs, and above a third in case of POS terminals, indicated that all local networks are interconnected, enabling inter-network customer transactions which result in inter-network clearing. Slightly over one fourth of the surveyed central banks indicated that, in case of both ATM and POS terminals, most local networks are interconnected.

When asked to provide an opinion on whether the interchange fees prevailing in their jurisdictions are "high", 50 percent of the surveyed central banks answered positively (see **Table III.14**). Several of the central banks reported that they coordinate with the relevant players (e.g. domestic payment networks) for setting interchange fees. Also, 60 percent of the central banks indicated that authorities have taken actions or are considering taking action to address the issue of "high" interchange fees. In this connection, nine countries have reported having gone through instances of litigation on interchange fees brought by the government. These were mostly high-income countries from Euro area, Other EU members and ODEs. In addition, in 12 countries (11 percent of the sample) there have been instances of litigation on interchange fees brought by merchants.

In order to prevent fraud in payment card systems, surveyed central banks indicated introducing a host of solutions to ensure system's efficiency and transparency. In this connection, at the minimum three-quarters of the surveyed central banks have indicated at least one of the following measures being in place: (i) industry-led standards (83 percent of the global survey total), (ii) common efforts undertaken by the banking industry and merchants' associations (76 percent), or (iii) legal requirements applicable to payment service providers/users (79 percent). In all three cases, developing economies are lagging high-income economies, potentially reflecting lower levels of market cooperation, and/or the absence of specific regulation. Similar disparity in terms of fraud prevention between high-income and developing economies has already been discussed in section I, which, among other topics, analyzed consumer protection requirements.

Payment card switches, by interconnecting ATMs and POS terminals of different issuing and acquiring banks, increase the positive network externalities to the benefit of customers and the effective size to the access channel network. **Table III.15(a)** provides details on payment switches and the transactions they support. In 2015, 92 central banks reported a total of 153 local payment card switches. While switches originate from the processing of ATM and POS transactions, over the years, their scope was expanded to include other payment instruments and channels. In this connection, as shown in **Table III.15(a)**, 47 percent of the surveyed switches support funds transfers transactions, while 75 percent and 58 percent were reported supporting transactions initiated via the internet and other remote channels such as mobile phones, respectively. Over 80 percent of surveyed switches support EMV transactions.[23]

The ownership structure of the payment card switches is described in **Table III.15(b)**. Most switches are private sector entities (32 percent),[24] followed closely by a consortium of a large number of banks (30 percent). Only 10 percent of the payment card switches are operated by central banks; this is more often the case of MNA countries (42 percent) than other country groups. Close to a third of the surveyed countries indicated that their payment card switches are owned by a large number of banks. This is relatively more common in higher income countries, especially among Euro area countries (39 percent). Ownership by a small number of large banks prevails in LAC region (74 percent).

Table III.15(c) elaborates on the settlement features of payment card switches. A majority of systems (58 percent) settle through the RTGS system, while 15 percent use central bank money, although settlement does not take place through a RTGS system. An additional quarter of

[23] EMV is a technical standard for smart payment cards and for payment terminals and automated teller machines that can accept them. EMV cards are smart cards (also called chip cards or IC cards) that store their data on integrated circuits in addition to magnetic stripes (for backward compatibility). EMV stands for Europay, MasterCard, and Visa, the three companies that originally created the standard.

[24] These include a variety of institutions, ranging from 'a dedicated company licensed as a national card scheme' (Albania), telecommunication company (Cabo Verde), investment fund (Denmark), Ecuador (cooperatives), credit union league (Jamaica), private equity fund (Jordan), or a private company (Latvia, New Zealand), among others.

payment switches settle in commercial bank money inside the country, while 12 payment switches settle abroad.

Regarding the pricing models of payment switches, most of the surveyed switches (54 percent) indicate that they pursue full cost recovery in addition to building a surplus. Full cost recovery is the objective of the pricing policy of another 21 percent of the sample. Finally, only 6 percent and 7 percent of the surveyed switches indicated making no charges or having a partial cost recovery model, respectively (see **Table III.15(d)**).

Furthermore, payment switches can perform other services, ranging from operating ATM and POS terminals, to hosted platform for e-money. **Table III.15(e)** provides detailed analysis of country responses on these services. For instance, 73 percent of the surveyed payment switches can serve as a gateway for foreign transactions on domestic cards and foreign cards used in the country. In addition, 44 percent and 52 percent operated ATM and POS terminals, respectively, whereas 47 percent manage payment card brands. Hosted platform services for debit and credit cards and/or e-money instruments are provided by 43 percent of the switches. Further, 35 percent manage merchants' relationships, 34 percent provide settlement guarantee to merchants, and 20 percent supports ATM cash management functions.

Table III.15(f) summarizes access conditions to payment switches. In addition to commercial banks, 40 percent of the surveyed switches allows access by banks other than commercial banks, while nearly a quarter admits supervised NBFIs. However, in most cases, responses indicate either lack of access or non-applicability, which together represent the vast majority of responses across types of non-banks.

The role of central banks regarding switches varies (see **Table III.16**). On a global survey total, 59 percent of the surveyed central banks responded that they have no role in the local payment switches, while a third of the sample shows central banks acting as an observer. Furthermore, central banks play a role of stakeholder in a quarter of the global survey sample, in addition to performing other functions, such as member of the board of directors (16 percent), provider of settlement services (48 percent), and other roles (12 percent). In addition to these functions, the central bank or government may mandate the utilization of a designated national payment card switch for the clearing and settlement of domestic transactions. Such mandatory use is provided by regulation in almost a quarter of surveyed central banks, while 10 percent use moral suasion. Results regarding the central bank or government mandating the utilization of a designated national payment card switch for the clearing and settlement of domestic transactions are shown in **Table III.17**.

The role of non-banks and innovative payment services. Table III.18 shows that on a worldwide level, non-cash payment instruments are issued by non-bank financial institutions including microfinance institutions, financial cooperatives and other NBFIs as well as non-financial institutions such as postal networks and mobile network operators.[25] As previously discussed in the section on legal and regulatory framework, supervised entities licensed as NBFIs are among those the most commonly allowed to undertake payment services and issue e-money. Among types of financial institutions that issues non-cash instruments, the relevance of MFIs is generally greater in developing country groups, although across income groups at most 50 percent of the countries report non-banks to actively engage in these activities. From a regional perspective, 50 percent and 69 percent of Euro area countries report that financial cooperatives / credit unions and other financial institutions issue non-cash instruments, while the postal network is more often engaged in these activities across the Euro area and MNA countries. Also, MNOs are relevant in 60 percent of ODEs.

Innovative retail payment products (whether card-based, computer-based or mobile-based) have emerged in most of the countries covered in the GPSS, in combination with legal and regulatory frameworks that accommodate such developments (see section I of this note). Indeed, 63 of the surveyed central banks (60 percent of the global survey total) indicated that card-based innovative products have been introduced, such as chip cards with an electronic purse or cards (either chip or magnetic stripe cards) used to access a non-traditional account maintained at a central infrastructure/payment processor. The same number of central banks pointed to computer/server-based payment products being introduced such as software or network based e-purses, or prefunded network accounts, in addition to an internet service used to access a non-traditional account maintained in a central infrastructure/payment processor. Furthermore, a significant number of economies has leveraged mobile phone technology: over a half of the surveyed central banks indicate that mobile phones are being used to store pre-paid amounts for making payments and money transfers, while three quarters report that that mobile phone provides a means of access to an account maintained at a central infrastructure. In half of the surveyed countries, mobile phones are also being used to store account information required to initiate a transaction, thus enabling payment initiation.

When asked about innovative *access channels*, over 90 percent of central banks indicated mobile and internet banking as the two most important ones providing access to a “traditional” bank account for payment purposes. In addition to these, close to three quarters of the surveyed central banks pointed at functionalities of ATMs for remote access to operate a bank account (in addition to cash withdrawals and balance inquires) as well as POS terminals that are magnetic stripe, biometric and chip-enabled as innovative features of access channels. Finally, close to a half of the surveyed central banks also identified other non-bank remote access payment mechanisms, such as self-service kiosks, telephone or TV-based mechanisms, payment initiation

[25] Microfinance institutions (18 percent), out of which 17 percent are supervised, finance cooperatives and credit unions (29 percent), out of which 22 percent are supervised, and other financial institutions (38 percent).

services, and interactive voice responses (IVRs). Data show that developing economies are still catching up with high-income economies in terms of mobile and internet banking services. In fact, while on average 80 percent of developing economies use mobile and internet banking as an access channel to a back account, all surveyed high-income economies use these platforms for their banking needs. Given the gaps in ICT infrastructure, countries comprising SSA (71 percent) and SA (80 percent) regions have reported the lowest percentages in terms of mobile and internet banking use. In contrast, all surveyed Euro area and other EU member countries reported using these mediums to access bank accounts.

Government payments. Given their relative size, and their critical role in supporting financial inclusion objectives, and in fostering new payment product development, government payments[26] are addressed in the GPSS within the context of retail payment systems and instruments. The objective is to determine the extent to which government payments leverage electronic payment instruments in the surveyed countries. Given that only 53 countries have provided answers to these survey questions, careful interpretation of the results of the analysis is warranted. Moreover, GPSS is not a primary source of these data, and country-level mapping exercises provide a better platform for a more comprehensive analysis of government payments.

The GPSS gathers information on the “most widely used” payment instruments (electronic, paper-based, cash) for government payments (both in terms of disbursements and collections). The latest data show that in case of government-to-person (G2P) payments (public sector salaries, pension and transfer payments, and cash transfer and social benefits), electronic instruments are by far the most widely used instruments. Eighty-one percent of the responding central banks indicated that electronic instruments are used the most for public sector salaries, as compared to 70 percent for pensions and transfer benefits, and 55 percent for cash transfers and social benefits. However, unlike in the case of public sector salaries, developing economies have reported a significantly stronger preference for cash as a means of disbursing pensions and transfer payments, and cash transfers and social benefits, as compared to high-income economies. In fact, while no high-income countries indicated using cash for cash transfer and social benefits payments, more than a fifth (21 percent) of developing economies did so.

In terms of person-to-government (P2G) payments, use of electronic instruments also appear to dominate. However, unlike in the case of G2P payments, paper-based instruments and cash take a much closer second position. For example, in case of tax payments, 36 percent of the

[26] Broadly defined, government payments include four key categories of payments: (i) cash transfers, salaries and social benefits payments made by a government entity to a person or G2P payments; (ii) payments collected by a government entity from persons or businesses including taxes and payments for government services such as utilities, etc., also known as P2G and B2G payments; (iii) payments made by a government entity to businesses for operational or procurement purposes or G2B payments; and, (iv) intra-governmental payments involving payments from one government agency to another for budgetary or operational purposes or G2G payments.

responding central banks reported that electronic instruments dominate, while 26 percent and 11 percent of the sample indicated that paper-based instruments and cash are used the most, respectively. In terms of utility payments, the sample is almost equally split between cash (25 percent) and electronic payments (28 percent). A very similar observation can be made for payment of government services. While 32 percent of the responding central banks indicated that electronic instruments are used the most, 25 percent reported a preference for cash. Interestingly, across all three types of person-to-government payments, cash and paper-based instruments ten to be significantly more used in developing economies, than high-income economies. For example, while in 41 percent of developing economies individuals mostly use cash to pay government taxes, no high-income country has reported this to be a case.

For government-to-business (G2B) payments, 62 percent of the responding central banks reported that electronic instruments dominate for the purposes of procuring goods and services, with an additional fifth of the sample using paper-based instruments the most. No country indicated that cash dominates for this type of G2B payment purposes. An almost identical distribution holds for tax refunds, where 55 percent of the responding central banks indicated that electronic instruments are used the most, followed by 23 percent of the sample which reported that paper-based instrument are used the most.

In terms of instruments used for business-to-government (B2G) payments, electronic and paper-based instruments are used the most in 40 percent and 30 percent of the surveyed countries, respectively, to pay taxes, in 36 percent and 17 percent of the countries, respectively, to make utility payments, and in 43 percent and 17 percent of the countries, respectively, to make payment for government services. Cash as the most used payment instrument for B2G.

Plans to migrate public sector salaries to electronic payments within the next year were envisaged by 30 percent of the responding countries. A similar dynamic holds for the migration to electronic payments of pensions and other transfer payments (30 percent), as well as cash transfers and social benefits to electronic payments (34 percent). Across these payment types, deposit accounts are often preferred to pre-paid cards a delivery mechanism. It is not surprising that the bulk of countries that have described migration plans of government payments to electronic means are developing economies. This process is reported as being driven mostly by financial inclusion objectives. In fact, for 22 percent of the responding countries, financial inclusion is the main objective underlying the migration of government-to-person payments to electronic payments. Additional 28 percent of the responding countries indicated that the main objective underlying the migration of G2P payments to electronic payments is to increase the efficiency of the national treasury and/or reduce operational costs. In addition, 19 percent of participating countries indicated that G2B payments will be migrated within a year to direct deposit to the account of the beneficiary. A comparable number of economies (22 percent) indicated that payments to the government will be required to be done mostly or solely through banks (and/or other deposit institutions).

Countries were also asked to provide details on the process underlying the disbursement of government payments. As such, in nearly half of the responding countries, ministries of finance (through national treasuries or equivalent institutions) deposits funds to the accounts of the various government agencies, which in turn make the payment to the intended beneficiary. While no significant distinction between countries based on income and population size was observed, in terms of regional perspective, this arrangement is used the most by SA countries (80 percent) and ODEs (70 percent). In contrast, only 44 percent of Euro area countries indicated using this type of process. Alternatively, 34 countries (or 32 percent of the global survey total) indicated having ministries of finance (through national treasuries or equivalent institutions) making all payments directly to the beneficiary upon request by the executing agency. No significant differentiation was observed among countries based on income and population size, although in terms of regional classification, discrepancies are evident. For example, while no country in SA region or only 13 percent of other EU members indicated using this arrangement, nearly 60 percent of ECA countries indicated so.

Finally, 74 percent of the surveyed countries reported that regarding collections of the central government (taxes, duties, rights, etc.), funds are transferred directly to, and concentrated/ consolidated at the account of the national treasury (or equivalent).

IV. SETTLEMENT OF FOREIGN EXCHANGE TRANSACTIONS

The foreign exchange (FX) market serves as the primary mechanism for making payments across borders, transferring funds, and determining exchange rates between different national currencies. Over the last decade with globalization the FX market has grown significantly in terms of volume and diversity of participants and products. The value of transactions that are settled globally each day has risen exponentially—from USD 1 billion in 1974 to USD 5.1 trillion in 2016.[27] This makes the FX market the largest sector of the global financial system.[28] The US dollar remained the dominant vehicle currency, being on one side of 88 percent of all trades in April 2016. According to the BIS, in April 2016, sales desks in five countries – the United Kingdom, the United States, Singapore, Hong Kong (China), and Japan – intermediated 77 percent of foreign exchange trading, up from 71 percent in April 2010.

All members of the FX community potentially bear the risk of loss of principal due to settlement risk (also referred to as principal or Herstatt). Settlement failure is widely recognized as the most significant source of systemic risk to participants in the FX market, making its mitigation a high priority for the whole community.

The survey collected information regarding the organization of FX markets, central bank services provided for the settlement of FX transactions, settlement arrangements used to reduce FX settlement risk, and average duration of FX exposures.

General features of foreign exchange markets. Given the pervasiveness of a few world currencies that dominate global FX markets, it is not surprising to see that in close to a half of surveyed countries, one foreign currency accounts for 90 percent or more of total FX transactions, as shown in **Table IV.1**. This type of FX concentration is the most acute in LAC region, where 94 percent of surveyed countries reported one foreign currency accounting for 90 percent or more of total FX activity. This represents a 25 percent increase since 2010. In addition to LAC, exposure to one single currency in the SA region as a whole has increased by 25 percent. In contrast, fewer EAP and MNA countries report one foreign currency dominating 90 percent or more of total FX transactions, as compared to the 2010 results. The lowest concentration is found in the countries of the EU.

More than one half of the central banks responding to this survey, offer current account services in at least one major foreign currency. Likely reflecting more supporting legal system, and adequate infrastructure and capacity, the collected data show that high- and upper-middle income countries are nearly twice as likely to offer current accounts services in at least one major foreign currency, compared to low- and lower middle-income economies. Regionally, the

[27] See BIS Triennial Central Bank Survey of foreign exchange and OTC derivatives markets in 2016, December 2016.
[28] https://www.newyorkfed.org/medialibrary/microsites/fxc/files/2016/fxc011916.pdf

availability of this service varies with less than 30 percent of the surveyed SA and Euro area countries offering this service, as compared to 78 percent of EAP and MNA countries.

Similarly, the latest data show that the lower the income level of a country, the more likely it is to have some type of restrictions on FX dealing and that FX market may not be very active. In fact, out of 21 countries, or a fifth of the entire sample, that reported restrictions on FX dealing in 2015, 95 percent are developing economies.

Settlement features in organized FX markets. In some countries, the central bank is directly involved in the settlement of the foreign leg of FX transactions. This is the case in nearly 30 percent of the countries where FX transactions are traded in a "centralized market"[29] (see **Table IV.3**). In 2015, 24 countries – of which the vast majority are MICs – reported centralized foreign currency markets, mostly in ECA, LAC, SA and SSA regions. Also, centralized foreign currency markets are almost twice as likely to be found in countries with a large population, compared to smaller countries.

Of the 24 countries that reported having organized FX markets, in 88 percent one foreign currency accounts for more than 90 percent or more of their total FX market activity. In addition, 83 percent reported the existence of an exchange platform that supports settlement arrangements for foreign currency deals. In the majority of these markets (17 out of 24, or 70 percent), settlement is made on a payment-versus-payment (PvP) basis. The modalities vary, though. As mentioned, in nearly 30 percent of the countries with centralized markets for FX transactions, settlement of FX deals occurs on a PVP basis solely through settlement accounts at the central bank.[30] For an additional 40 percent, PvP is achieved through a combination of central bank (for the settlement of the domestic leg) and foreign correspondent banks. In three cases, settlement relies on the local commercial banks and their foreign correspondent banks, and takes place on a PvP basis.

Settlement features in over-the-counter (OTC) markets. In terms of settlement risk management in OTC FX markets, 47 out of 89 surveyed countries reported the existence of a mechanism or procedure for FX trades to be settled on a PvP basis, as shown in Table IV.4. The results vary depending on the region, with 80 percent of countries belonging to the SSA region reporting settling FX deals on a PvP basis, mostly through a common correspondent bank, as compared to only 22 percent in the ECA region. In terms of country size, larger countries are three times as likely to rely on a common foreign correspondent bank to support PvP, compared to their smaller countries. Furthermore, in twelve of the surveyed countries, mostly found in the

[29] For the purpose of this survey, a centralized market is defined as a structured arrangement for trading at a central location, e.g. an Exchange.

[30]In this case, the central bank offers current accounts in one or more foreign currencies and facilitates the PVP settlement against the domestic currency. As it is shown in **Table IV.2**, 52 central banks offer such services.

LAC region, central banks play a pivotal role in facilitating PvP through the local RTGS or other system.

Finally, of the surveyed 89 countries, 15 indicated having no PVP procedures in place for OTC FX markets. Close to a three-quarters of these countries experience a time lag between the confirmation of settlement of the foreign currency leg and the domestic currency leg exceeding two but no greater than 24 hours. Although the number of economies with no PVP procedure in place is notable, the combined share of these countries' GDP is 3.37 percent of the world's total. However, it is worth noting that these cases of lack of PvP for OTC FX transactions are concentrated in the MNA region.

V. INTERNATIONAL REMITTANCES AND OTHER CROSS-BORDER PAYMENTS

International remittances to developing economies reached an estimated USD 431.6 billion in 2015 and more than USD 450 billion in 2017, nearly four times greater than official development assistance.[31] Given that for certain countries international remittances are equivalent to 20 percent or more of their GDP, significant global attention continues to be paid to facilitating the cross-border and domestic payments. In terms of cost, from 2009 the global average cost of sending international remittances fell by 2.3 percentage points as of the end of 2015, and by more than 2.7 percentage points as of Q3 2018.[32] These cost reductions reflect, in part, greater price transparency and competitive pressure on pricing, and enhancements to payment system infrastructure and payment services.[33]

International Remittances. Recognizing the importance of remittances for economic development, this survey approaches remittance services from a payment perspective, as cross-border, person-to-person transfers of a low-value. It aims to obtain information on the types of remittance service providers (RSPs) operate in various countries, how RSPs are regulated, and the main payment instruments used to channel international remittances. This survey does not report statistics on the remittance flows by each country, or on the cost of sending remittances from one country to another.[34] At the outset, it should be noted that a central bank's perception of its local markets is not aligned with trends observed for international remittances at the global level. This misalignment is more pronounced when it comes to reporting on operating models of RSPs, as opposed to legal and regulatory aspects. The survey findings are discussed below keeping this issue in mind.

First, the survey determines whether respondents belong to the remittance-receiving, remittance-sending, or both remittance-receiving and -sending categories. At the global level, respondent countries split almost equally across all three categories, with 30 percent designated as remittance-sending countries, 32 percent as remittance-receiving countries, and another 25 percent deemed to be both, remittance-receiving and remittance-sending country.

Expectedly, high- and middle-income economies comprise more than 95 percent of remittance-sending countries. On the other hand, low- and middle-income economies comprise more than 60 percent of remittance-receiving countries. In terms of countries that have designated themselves as both remittance-receiving and sending, close to 70 percent fall within lower-

[31] http://pubdocs.worldbank.org/en/661301460400427908/MigrationandDevelopmentBrief26.pdf

[32] https://remittanceprices.worldbank.org/sites/default/files/rpw_report_june_2015.pdf

[33] As of September 2018 (publication date), the global average cost of sending remittances, according to the World Bank's Remittance Prices Worldwide, was 6.94 percent, according to *Remittance Prices Worldwide* database by the World Bank.

[34] The costs of sending remittances are available for 365 corridors from the World Bank's Remittance Prices Worldwide database at http://remittanceprices.worldbank.org.

middle or upper-middle income category. From a regional perspective, the data points to Euro area and ODE regions as the main sources of outbound remittances. ECA and LAC regions are the most common recipients of remittances. EAP region has the biggest number of both remittance-receiving and sending countries. These results are aligned with the outcomes of the previous iteration of this survey.

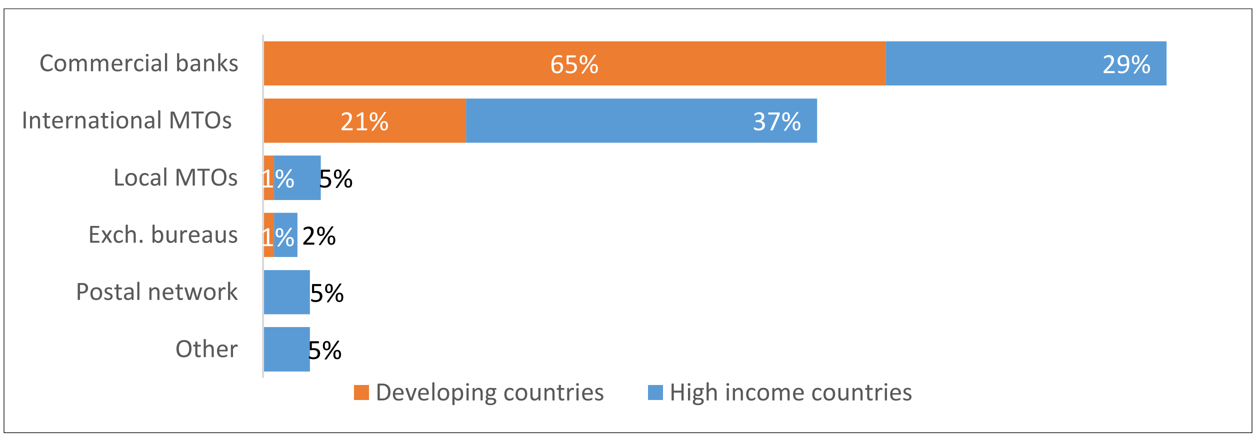
The survey analyzes possible barriers to entry in the remittance market. It finds that RSPs are occasionally required to be incorporated as banks. The latest GPSS data suggests that such requirements exist in 19 percent of the responding countries. This marks an increase from 2012, when 7 percent of the responding countries reported the existence of such requirement. From an income and regional perspective, such barriers are more common in developing economies (26 percent), as compared to high-income economies (12 percent), and are geographically located mostly in ECA (27 percent), MNA (22 percent), and SSA (37 percent). They also are more likely to be found in countries with smaller populations. In addition, 56 percent of the surveyed countries indicated that their local RSPs must meet stipulated minimal capital requirements. This type of requirement seems to be the most prevalent in high- to middle-income countries. From a regional perspective, capital requirements prevail in ECA, MNA and Euro area regions. Compared to the previous results, more countries reported the existence of this requirement in 2015. While 28 percent of lower-middle income economies required RSPs to meet stipulated minimum capital requirements in 2012, 52 percent of them reported having this requirement in place in 2015. Furthermore, confirming the findings of the 2012 survey, the latest survey's data indicates that RSPs are allowed to disburse funds in foreign currency in 44 percent of all responding countries, and three times as likely in high- (66 percent) to middle-income (42 percent) countries, as compared to low- (13 percent) and lower-middle-income (24 percent) economies. From a regional perspective, no responding country in SA region allows their RSPs to disburse funds in foreign currency. On the other hand, 90 percent of the responding ODEs allow this service.

The survey considers nine different categories of financial and non-financial institutions that may be allowed to perform the role of agents of RSPs, and inquires on the legal permission to use agents and subagents. Results laid out in **Table V.6** indicate that across 67 percent of the responding countries, commercial banks are permitted to serve as agents of RSPs, followed by local MTOs (59 percent), postal networks (50 percent) and exchange bureaus (48 percent). Across 35 percent of the responding countries on average, all other institutions (financial cooperatives and credit unions, microfinance institutions, mobile phone operators, retail outlets, and others) can act as agents of RSPs. These results are generally in line with the previous survey's findings. The latest data also shows that there are 56 countries that allow more than three agent types, and 36 countries that allow six or more agent types. The highest number of RPS agent types is recorded in the Euro area, followed by countries comprising the other EU members group, in addition to ODEs.

It is expected that in the vast majority of the countries, commercial banks and local MTOs offer remittance services on the basis of a contractual relationship with an international MTO. The fact that, according to the survey, only in 67 percent and 59 percent of countries worldwide banks and local MTOs, respectively, are allowed to do so might be explained as a misclassification of the operating model. A similar consideration can be made about the use of sub-agents, i.e., agents of RSPs, which appear to be permitted only in 23 percent of the responding countries.

The survey also asks participating central banks to indicate the most important types of RSPs, and payment instruments to send and receive remittances. Across 52 percent of the worldwide total, commercial banks continue to be regarded as the most important RSP type, followed by international MTOs (26 percent). As already pointed out in previous GPSS reports, international MTOs often enter joint ventures / partnerships with commercial banks and post offices, which might explain these results. Bank dominance is much more pronounced from an income group perspective, as shown in **Figure 6** below. While commercial banks are perceived as the most important RSP type across, at the minimum, 65 percent of developing economies, only 29 percent of high-income countries reported the same.

Figure 6: RSP types ranked "most important" by central banks



When asked to rank payment instruments for sending and receiving remittances, central banks indicated that cash and account-to-account fund transfers are the most frequently used instruments for sending and/or receiving remittances. As **Figure 7** shows, most central banks in developing economies indicated a more pronounced reliance on cash (63 percent), compared to slightly more than one-third (37 percent) of central banks in high income countries.[35]

[35] The use of cash is more predominant among all responding countries than it was reported. Sixty-six responding countries marked "Other" option while simultaneously indicating they were using cash as a medium of payment,

Furthermore, while 78 percent of central banks from countries in MNA region deemed cash as the most preferred instrument for sending / receiving remittances, only 29 percent of Euro area countries did so. Comparable results were captured by the 2010 and 2012 data. The majority (60 percent) of remittance-receiving countries indicated that cash is the most used payment mechanism, as compared to 72 percent of remittance-sending countries and 54 percent of countries that are both remittance-sending and remittance-receiving countries.

Figure 7: Payment instruments ranked as most important by central banks

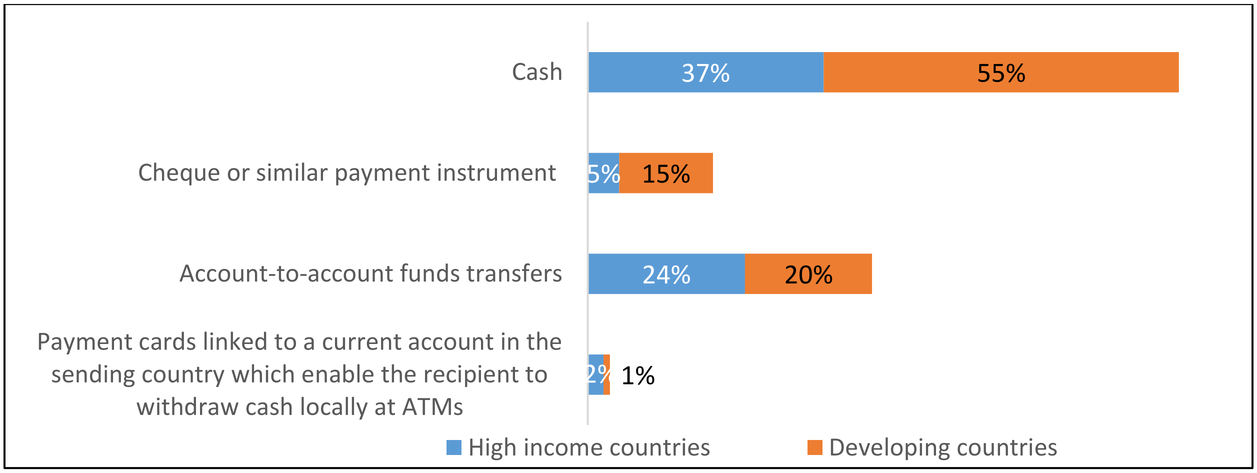


Table V.9 provides information on various measures of transparency and disclosure requirements. Similar to the results of the previous iterations of this survey, Euro area countries show the highest levels of transparency in regard to remittance services. ODEs and countries from the EAP region follow in a distant second place as the most transparent markets for remittance services. On the other end, LAC and SA regions show the lowest percentages in these categories. The survey also finds that a standard format of receipt is used in 30 percent of surveyed countries and that databases on remittance prices are available in 16 percent of the worldwide total. Compared to 2010 and 2012 data, notable progress has been achieved.

Table V.10 provides detailed information on market structure and competition in remittance service, which contribute to driving the cost of sending remittances. The survey question covers fair market practices, whether a level playing field exists, and the flexibility with which RSPs or their agents can service the market. Exclusivity agreements[36] are present in 18 percent of the surveyed countries worldwide, down from 23 percent in 2010. They are more likely to be present among developing economies (22 percent), than in high income countries (12 percent). From a

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such as "cash, via MTOs, banks or other regulated service providers; as well as via unregulated service providers or family members / friends".

[36] An exclusivity condition is where an RSP allows its agents (or other RSPs) to offer its remittance service subject to the condition that such agents do not offer any other remittance service. For more information, please see CPSS and The World Bank, 2007.

regional perspective, exclusivity agreements are more likely to be present in Other EU member countries (25 percent), LAC (24 percent), MNA (22 percent), and EAP and SSA regions (both 21 percent). The 2015 data closely follows the suit of 2012 results. Although a fifth of the responding developing economies indicated that exclusivity agreements are present in their national remittance markets, a comparable number of economies also reported the existence of legislation that specifically bans exclusivity agreements.[37] This legislation is more common among low-income economies as well as those in SA and SSA regions. Both, exclusivity agreements and legislation banning them, are rarely in existence in economies with small populations. Finally, 45 percent of the responding economies confirmed the existence of a legislation addresses other types of anti-competitive or monopolistic behavior. This type of legislation is present among 63 percent of the surveyed low-income countries – a nearly 20 percent increase since the 2012.

Cross-border payments. As cross-border financial activities continue to intensify as a result of trade and finance liberalization, authorities and private sector stakeholders in various countries have pursued projects of harmonization/integration of financial infrastructures. Such initiatives have recognized benefits, such as (i) reduction of end-to-end transaction costs; (ii) lower costs for end-users; (iii) improve accessibility and reach to all market participants to cross-border transactions and other services, including an expansion of investment assets; (iv) resource and skill/capabilities sharing; and, (v) systemic risk reduction. This section explores the current initiatives of regional integration for payments, bilateral links between national payment system infrastructure being the simplest form, to more advanced forms that imply a unified scheme and a common technical-operational facility, either centralized or decentralized. Regional and cross-border linkages between national ACHs, for instance, range from horizontal structures to centralized infrastructures, generally constructed through (horizontal) bilateral structures.

In 2015, a total of 54 countries have established links for cross-border settlement, a number closely comparable to the total of 59 countries reported in 2010 GPSS report. In addition, 23 countries expect to have such links established within the next two years, while a comparable number of economies (21) expects to establish these links in more than two years.

In terms of the international SWIFT network, which is largely used in connection with cross-border funds transfers, the latest survey results show that in 83 percent of all responding countries, 90 percent or more of commercial banks are connected to SWIFT (no change from the previous survey results). The level of connection is the lowest among low-income countries, where 63 percent of the surveyed countries' commercial banks are able to connect to SWIFT. From a regional perspective, commercial banks in EAP (64 percent) and SA (67 percent) regions are the least connected to SWIFT, while those in ECA (91 percent) and MNA (100 percent) regions the most. Data also suggest that commercial banks in small and medium-sized countries are more

[37] These two questions are mutually exclusive to avoid contradictory double-counting of countries.

connected to SWIFT than their counterparts in countries with larger populations. This can be explained by the fact that many financial institutions may find the small size of a country as an unattractive characteristic in terms of a market potential. In those circumstances, financial communities in those countries are likely to find establishing of a reliable cross-border connection, such as through SWIFT, as a viable alternative.

In past few decades, with many developing economies having much more limited access to international financial markets, it was common practice for banks and other users to connect to SWIFT via their central bank's own connection to this network. The 2015 GPSS data shows that none of the surveyed countries continue this practice, following a declining trend acknowledged by the 2010 iteration of the survey, where only 8 percent of surveyed countries preferred this medium of access. Alternative approaches were provided through SWIFT Service Bureaus, which were designed as alternative access points for smaller banks and other types of financial institutions to access the SWIFT network. The 2015 survey results show that this alternative is used in 3 percent of the worldwide total. This marks a dramatic decrease compared to the 30 percent figure in the previous iteration of the survey. The practice is continued mostly among the few countries in SSA and SA regions.

VI. SECURITIES SETTLEMENT SYSTEMS

Securities and derivatives clearing and settlement systems are covered here in consideration of their systemic importance, and the high degree of interdependency with payment systems. In particular, market liquidity is to a large extent dependent on the safe and efficient functioning of these systems. Government securities are used extensively to carry out monetary policy through open market operations; in this context, inefficiencies in the custody, clearing and settlement infrastructures for government securities could hamper the ability of the central bank to implement monetary policy. Finally, development of financial markets benefits from efficient post-trade processing and safe custody of securities.

This section begins with a brief analysis of the general features of securities markets, and the securities custody, clearing and settlement arrangements, covering central securities depositories (CSDs), securities settlement systems (SSSs), and central counterparties (CCPs). Then, it describes the main operational and risk management features of CSDs, SSSs, and CCPs, and briefly expands on trade repositories (TRs). Regulatory and oversight issues relating to securities clearing and settlement have been addressed in sections I and VIII, respectively.

General features of securities clearing and settlement systems worldwide. As shown in **Table VI.1**, in 27 of 102 countries that provided information, securities markets are at a nascent stage. These countries are mostly concentrated in the lower-middle income and low-income groups, and in SSA, EAP regions. The majority of these countries have populations of less than 5 million. One or more stock exchanges operate in 94 countries.

Securities dematerialization (or immobilizing of physical securities) has been widely adopted in 87 percent of the sample – up from 71 percent in 2010. Once again, there is room for improvement in the lower-middle income and low-income groups, and in EAP, SSA regions, as well as in smaller countries.

Some questions in the survey aim to understand the market structure before a discussion of systems' operations and risk management. In slightly over half of responding countries (52 percent), there is a single CSD handling all types of securities, whereas in 32 percent two or more CSDs handle each only certain types of securities ("specialized CSDs"). On the other hand, situations where two or more CSDs handle each all types of securities are the exception (6 percent). The single CSD model appears to be slightly more common in high-income countries, and in the Euro area and ECA region. Where two or more CSDs exist – i.e., in all regions and income groups, the fact that they most often handle only "certain types" of securities reflects traditionally separate arrangements for government securities on the one hand, and corporate securities on the other hand. The majority of SA countries (80 percent) have elected this option.

The number of economies with a CCP (40 percent) and a trade repository (20 percent) in place have increased by 5 percentage points as compared to 2010. High-income and more populated countries continue to lead the group of countries that have put in place these FMI types; on the other hand, from a regional perspective, in SSA and MNA regions, these FMIs are hardly present. Settlement in central bank money continues to be prevalent; the percentage of countries in which at least one SSS does not settle in central bank money (28 percent) has not changed significantly, but is more likely in some regions (i.e., SA) than in others.

CSD main features and risk management practices. Detailed information on CSD system features and risk management frameworks was collected (see **Tables VI.2 to VI.5**). As in previous rounds of the survey, this information is presented on a system-by-system basis (for a total of 132 CSDs). Also in line with previous surveys, the majority of CSD systems for which information was provided deal with government and corporate securities (54 percent), followed by government securities-only CSDs (28 percent) and corporate securities-only CSDs (18 percent). Thirty-three percent of surveyed CSDs are operated by the central bank – of these, only 16 percent handle both government and corporate securities. Central bank-operated CSDs represent the majority of CSDs surveyed in SSA countries, and in low-income countries.

Procedures and controls to safeguard the integrity of securities records – e.g., dematerialization (or immobilization), reconciliation, prohibition of overdrafts, segregation of assets and participants' securities – are observed to a great extent (i.e., close or above 90 percent), according to central banks. The data also points to a majority of CSDs serving as the official securities registrar. In 57 percent of all CSDs, beneficial owners are identified at the individual level. Half of all CSDs have links with other CSDs. Linked CSDs are heavily concentrated in high-income countries (86 percent), and in Euro area countries, other EU members, and ODEs. In the latter country groups, CSD links are more likely to be of a cross-border nature. One-third of CSDs in LAC have links with other foreign CSDs, whereas 43 percent are linked to another domestic CSD.

SSS main features and risk management practices. Although SSSs have been surveyed separately, in practice 82 percent of the SSSs covered in the survey (a total of 135 systems) are operated by the same entity as the CSD operator, as shown in **Table VI.6**. As a result, the breakdown in terms of types of securities handled is very similar to CSDs, with the majority of SSSs (56 percent) handling both government and corporate securities. The vast majority (93 percent, up from 89 percent in 2010) of SSSs is used to transfer ownership following a secondary market trade, while 70 percent are not limited to clearing/settling exchange-traded securities and handle OTC transactions as well. These outcomes are identical to 2012.

With the majority (55 percent) of SSSs adopting a rolling settlement cycle of T+2 or shorter for all securities trades, most countries appear to have met (or exceeded) the relevant standard.[38] This marks a progress since 2012, when slightly more than 30 percent of SSSs had adopted T+2 for all trades. Central bank money continues to be most used settlement asset (78 percent) worldwide, with peaks in other EU members (100 percent) and ODEs (93 percent). On the other hand, with 44 percent of SSSs located in SA region settling in central bank money, these data confirm that FMIs in this region do not rely on this central bank service as other regions do. The data also confirm that securities lending is not commonly used: in fact, it has been implemented in only 37 percent of the systems.

As in the previous survey iterations, credit risk is managed to a great extent (93 percent of the systems) through delivery-versus-payment (DvP, see **Table VI.7**). The few systems (9 in total) that do not use DvP are spread across MNA (3), SSA (2), EAP (2), ECA (1), and LAC (1) regions. The DvP model used varies based on the type of securities cleared/settled: for government and private debt securities, DvP1 is used in the majority of the cases (58 percent and 39 percent, respectively), whereas for equities, DvP 2 (34 percent) followed by DvP 1 (27 percent) apply.

CSD-SSS resilience and business continuity. In line with previous surveys' findings, the latest data indicate that operational risk is generally well-managed. In fact, as shown in Table VI.9, 92 percent of CSD-SSS systems have a documented business continuity plan; in parallel, 88 percent of systems have a fully-equipped alternate processing site. In a similar number of systems, business continuity arrangements are regularly tested. In this regard, SSA region countries appear to have made limited progress to meet the current bar of operational risk management.

CSD-SSS governance. Similarly, on governance aspects (see **Table VI.10**), the majority of systems appear to have incorporated best practices. Yet, regional disparities are evident, especially in SA region and to a less extent in SSA region. Among other aspects, overall risk management has been endorsed at the board level in 86 percent of the systems, and the risk management and audit functions enjoy independence form the organization's business units in 85 percent of the cases. However, as noted above, these results should not be intended as certifying standards' observance and cannot be compared to formal country assessments. Finally, the adoption of the CPMI-IOSCO disclosure has increased to 60 percent - up from 40 percent in 2012.

The FMI types under this section also include CCPs and TRs (see **Tables VI.11 to VI.17, and VI.18**, respectively).

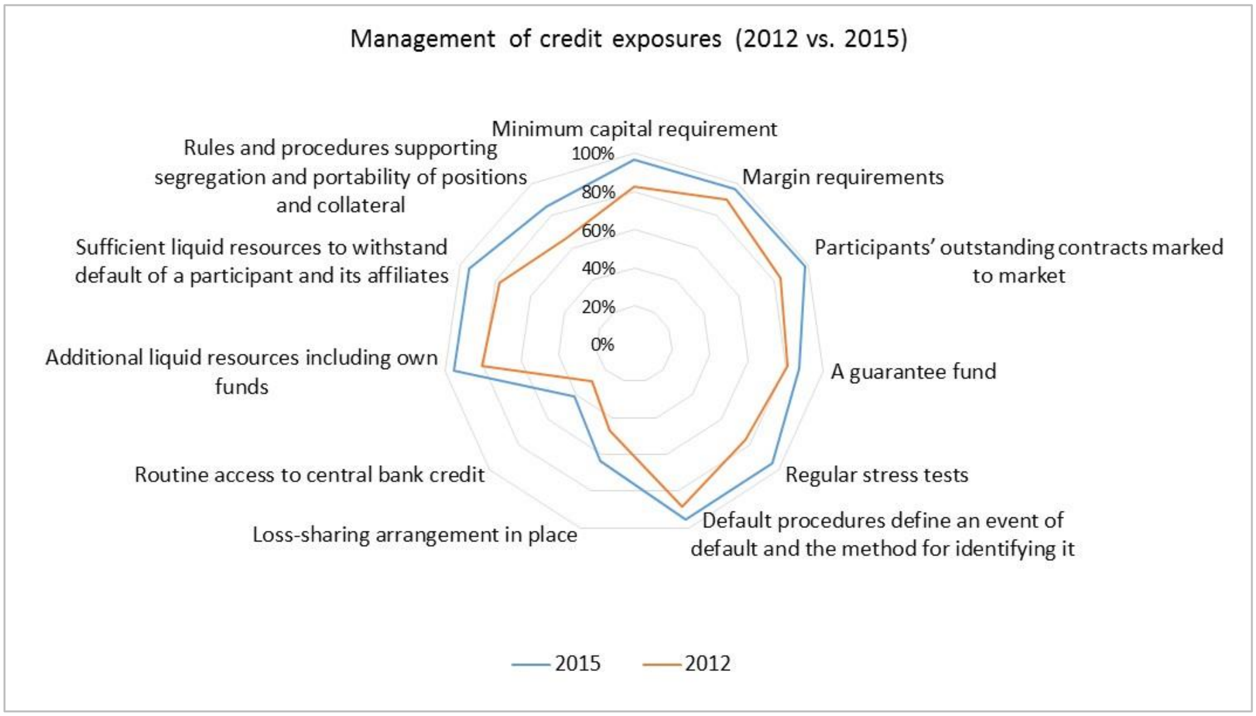
CCP main features and risk management practices. CPs are a relatively recent phenomenon. The survey covered a total of 63 CCP systems, the majority of which is used to clear exchange-traded

[38] Recommendation 3 of the CPSS-IOSCO Recommendations for Securities Settlement Systems envisages that "final settlement should occur no later than T+3".

derivatives (73 percent), followed by corporate equities (56 percent). Over 60 percent of CCPs covered in the survey were concentrated in high-income and more populated countries. The most important area of growth seems to be OTC-traded derivatives CCPs, which stood at 27 in 2015 as compared to 20 in 2012. Chart below shows the progress made in improving management of credit exposures.

From a regional perspective, the legal underpinnings of most CCPs are found in the legal concept of novation to a great extent (83 percent), whereas open offer is more common in ECA countries. 29 percent of CCPs operate in multiple jurisdictions – when looking at the euro area this is the case for the majority of CCPs surveyed.

Figure 8: CCP management of financial risks



The sound and efficient management of credit risk exposures is critical for CCPs which, according to the latest data, have enhanced their risk management practices as compared to the situation in 2012. 97 percent of CCPs have set minimum capital requirements for participants. Similarly, 97 percent apply margin requirements to limit credit exposures, and 98 percent mark to market participants' outstanding contracts at least once a day. It is worth noting that in 2012 almost one in four CCPs did not conduct regular stress tests; by 2015, 95 percent undertook regular stress tests. Also, cover 1 is observed by 95 percent of CCPs, compared to 78 percent in 2012. Relatively lower percentages of CCPs adopting certain practices were recorded around the formalization of loss-sharing arrangements (63 percent), CCP rules' and procedures' support of segregation and portability of participants' positions and collateral (86 percent), and the creation of a fund consisting of participants' contributions (87 percent). As noted above, by no means this information should be used to infer that risk management practices reported by central banks as adopted by CCPs are adequate in practice.

Slightly more than half of CCPs (57 percent) conduct money settlements in central bank money, up from 44 percent in 2012. All CCPs in the LAC region settle in central bank money; this arrangement is also very common in the euro area and other EU member countries. Access to routine central bank credit is limited to 41 percent of CCPs worldwide; yet, this is a significant increase from 29 percent as recorded in 2012. CCPs in high-income countries and the euro area are more likely to have access to this central bank service. Finally, only 21 percent of CCPs hold (own / participants' collateral) funds at the central bank: once again, this is more often the case in high-income countries, although overall the use of commercial banks is far more common. Less than 20 percent of CCPs worldwide have links; in the majority, these links are of a cross-border nature and are more common in the euro area.

The analysis of governance and operational risk management aspects yields very similar results to CSDs-SSSs, although both types of frameworks appear to be even more comprehensive and sound for CCPs than they are for to CSDs-SSSs, perhaps also reflecting an emphasis on regulation and oversight/supervision of this FMI type in certain countries in the recent past. The two charts below visually present general features of CCPs and SSS as well as general features of securities settlement from a regional perspective.

TRs – general information. Lastly, a total of 22 TRs were reported, concentrated in high-income and upper-middle income countries. Of these, 59 percent provide aggregate data to the public that is available on the internet (it is worth noting that the forms of disclosures were not independently validated), whereas 91 percent provide authorities with routine access to participant-level data.

VII. PAYMENT SYSTEM OVERSIGHT AND COOPERATION

As payment system evolve, e.g. as a result of technology and business model innovation, the objectives and scope of oversight are also expected to change over time. The oversight function relies on some form of legal empowerment. Also, overseers must ensure that they have an adequate internal organizational structure, and the capacity to keep abreast of developments in the national payments system, while proactively expanding the range of instruments at their disposal. Increasingly, payment system oversight relies on the cooperation with a number of authorities and stakeholders. Recently, greater emphasis was put on the effective coordination among the authorities responsible for the regulation, supervision and oversight of payment systems and financial market infrastructures. Equally important is the transparent communication of payment system oversight objectives to all market participants.

This section explores general aspects of payment system oversight, including the formalization of this function, the clarity and transparency in communicating oversight policies, the scope of oversight, the instruments, etc. The chapter also looks at cooperation arrangements involving financial sector authorities as well as market players.

Payment system oversight – general issues. The latest GPSS results (see **Table VII.1**) show that over 90 percent of surveyed central banks –10 percent more than in 2010 – have already established a payment system oversight function, and perform this function on an ongoing basis. Payment system oversight reforms appear to have been accelerated in SSA and MNA regions, where the results indicate more than 20 percent increase in the number of economies having established payment system oversight. The latest results show no significant variation among countries belonging to different country groups by population size.

Organizational separation between the central bank's oversight and operational functions helps ensure the consistent application of policies and standards. The latest data show that more than 85 percent of surveyed countries have their payment system oversight function segregated from operational tasks. This marks a healthy improvement, compared to 69 percent of countries in 2010, or 70 percent in 2012. Segregation is more likely to be achieved in high income countries, especially countries belonging to the EU, non-EU and ODEs groups, although developing economies have improved significantly. Regionally, nearly 50 percent more countries in EAP, 40 percent in SA and 20 percent in SSA have achieved this separation as compared to the 2010 results. In terms of country's population size, small countries inevitably continue to lag behind those with larger populations.

Regarding the objectives of payment system oversight (see **Table VII.2**), 91 central banks (or 83 percent of worldwide total) indicated that these have been specified either in a central bank regulation or in a policy document. Whereas about half of surveyed countries prioritize the safety and efficiency of relevant payment systems, 37 countries reported their objectives to also pertain to competition, consumer protection, and others issues. In the various survey iterations, the percentage of central banks that have broadened their objectives beyond the core ones hardly exceeded 40 percent. Developing countries tend to have broader oversight objectives than high-income economies. This trend is the most pronounced in MNA and SSA regions, where nearly 20 percent more countries have a wide scope of central bank objectives, as compared to 2010 and 2012. This may reflect public sector strategies and/or formal commitments to promote financial inclusion.[39].

Scope of payment system oversight. Two aspects relating to the scope of payment system oversight were surveyed: depth dimension, which looks at who operates a payment system (whether central bank, commercial banks, or any other entity), and the breadth dimension, which aims to capture the central bank's engagement beyond systemically important funds transfer systems. With regard to the first dimension, there is a stronger push by central banks towards a wider scope, overseeing all relevant payment systems in a country, regardless of the operator of the system. Survey results in 2010, 2012 and 2015 show continuous improvements in the coverage of oversight, leading to 92 percent of respondent countries in 2015 opting for overseeing all operators/providers including non-banks. Nonetheless, lower-middle and low-income countries are more likely to prioritize central-bank operated systems, which appears to contradict their stated objectives. From a regional perspective, this reflects in SA and EAP country groups adopting a narrower approach more often than other regions.

A "broad" scope of payment system oversight is defined to include systems other than systemically important funds transfer systems, such as retail payment systems, services and instruments. The latest data confirm the importance of remittance flows to certain regions, with the majority of countries belonging to EAP (64 percent) and SSA (59 percent) regions including remittance services within their oversight purviews. Close to 90 percent of the worldwide total reported extending the scope of payment system oversight to retail payment systems. In addition, 60 percent of central bank surveyed are the primary overseers for CSDs for government securities, whereas primary responsibility for the oversight of CSDs for corporate securities is less common (36 percent of the total). Even less so is central bank's primary responsibility for the oversight of CCPS and TRs (see **Table VII.4**).

In terms of transparency in disclosure of the criteria used to identify payment systems that are subject to central bank oversight, 72 percent of surveyed countries indicated they publicly disclose such benchmarks. From the regional perspective, only 40 percent of countries belonging

[39] For example, as of June 2016, Alliance for Financial Inclusion (AFI) member institutions had made 58 Maya Declaration Commitments. http://www.afi-global.org/publications/2359/The-2016-Maya-Declaration-Report

to the SA region publicly disclosed the criteria, lagging behind those in MNA (56 percent), LAC (61 percent), EAP (64 percent) or Euro area (94 percent).

Instruments of payment system oversight. Central banks were asked to rank from 1 to 3 the instruments commonly used to undertake payment system oversight, with "1" being the most relevant and "3" being the least relevant. Six common oversight instruments were included in the question in the 2015 survey, ordered from "soft" instruments to tougher/more formal ones, including monitoring, dialogue and moral suasion, publication of statistics and other payment systems reports, issuance of regulations, application of sanctions, and on-site inspections.

Similar to the results from the 2010 and 2012 survey rounds, in 2015 central banks continued to prefer "soft" oversight instruments, as seen in **Tables VII.5(a) and VII.5(b)**. The percentages of the central banks assigning the highest ranking to "soft" instruments, such as monitoring, dialogue and moral suasion, and assessments using the CPSS-IOSCO international standards have all increased to 85 percent, 65 percent and 72 percent, respectively. The comparable figures in 2012 were 72 percent, 51 percent and 64 percent respectively.

Among the "formal" oversight instruments, issuing of regulation is the tool rated the highest by the most respondent countries (60 percent). In fact, only 12 percent of the surveyed countries indicated this instrument as being 'less relevant'. These results are consistent with the increased number of central banks now having formal powers to perform payment system oversight functions. Application of sanctions and on-site inspections are more rarely used as oversight instruments, with 21 percent and 35 percent of surveyed countries regarding these instruments as 'highly relevant', respectively. While the number of economies that see application of sanctions as a 'highly relevant' oversight instrument grew in absolute terms from 19 in 2012 to 23 in 2015, the number of economies ranking on-site inspections at the top of the oversight instruments list is unchanged. From a regional perspective, the relevance of the latter instruments appears to have increased significantly among upper-middle income countries.

From a regional perspective, issuing regulation is considered a primary oversight instrument across MNA, SA and SSA, with on average 60 percent of central banks answering positively to this specific issue. In contrast, this percentage is significantly lower than the preference for 'soft' instruments through the EU, ECA and EAP regions. The latest results for other "formal" oversight instruments vary significantly between regions. For example, while 44 percent of the surveyed countries in MNA region regard application of sanctions as "highly relevant" oversight instrument, no country in SA indicated such preference. Similarly, while 77 percent of SSA countries consider on-site inspections as "highly relevant", only 11 percent of the countries belonging to LAC region share this opinion.

Cooperation with other relevant authorities. Cooperation arrangements between the overseer and other authorities and stakeholders are described in **Tables VII.6 and VII.7**. At a worldwide level, the 2015 survey shows a small decrease in the number of economies that report having no significant cooperation with other relevant authorities, as compared to the 2012 data. Cooperation among authorities is weaker in EAP, ECA and SA regions, and in small and middle-size countries. Nonetheless, the 2015 survey shows some improvement in formalizing cooperation with other relevant authorities. Increasingly, cooperation is ensured through a formal mechanism (54 percent as compared to 49 percent in 2010), as opposed to taking place on an ad-hoc basis (26 percent as compared to 45 percent in 2010). The latest results also show progress in the intensity of such cooperation: the 2015 data shows a 10 percent increase in the number of economies holding regular information exchanges, prior notice of regulatory actions, joint inspections etc. These improvements cut across all income levels. From a regional perspective, the most significant progress in formalizing the cooperation initiative can be found among SSA countries, where only 33 percent had an established formal cooperation mechanism with other relevant authorities in 2010, compared to 76 percent five years later. At the other end of spectrum are SA countries without a single country reporting the existence of a formal coordination mechanism in 2015.

More than half (57 percent) of respondents confirmed that cooperation with relevant authorities takes place both at domestic and international level. From a regional perspective, countries belonging to the EU and ODE groups expectedly provided an overwhelming affirmative response to this question. However, the survey also shows a high level of cooperation on both the domestic and international level for 94 percent of surveyed SSA countries. National payments councils (NPC) have been created in 44 countries in order to promote a structured cooperation among relevant stakeholders. Similar to the 2010 and 2012 survey results, the SSA region and EU countries show the highest numbers of NPCs in place. Although nearly 15 percent more of developing economies have indicated that cooperation with other authorities takes place both at domestic and international level in 2015, as compared to results from 2012, the latest data show that level of cooperation on both domestic and international levels is significantly higher for high-income (79 percent) than for developing economies (58 percent).

Cooperation with other stakeholders. While the percentage of countries with a national payments council is the same as in 2010, the latest survey results show a dramatic decrease in the percentage of countries relying on ad-hoc meetings with stakeholders (on a worldwide level, 76 percent in 2010 and 12 percent in 2012, compared to 5 percent in 2015). A similar dramatic decrease was noted in the percentage of countries consulting their stakeholders sporadically or bilaterally (31 percent in 2010 compared to 7 percent in 2012 and 2015). The percentage of countries where a central bank consults almost exclusively with the banker's association has also more than halved, from 25 percent in 2010 to 11 percent in 2015.

Finally, central banks rated their involvement in the pricing of large-value payment services, retail payment services, and remittance services. Four options were included: “Limited to collection of information”, “Limited to voicing opinions”, “Actively regulate”, and “Others”. Central banks that chose the “Actively regulate” option were also asked to list the types of fees that apply. Table VII.8 summarizes responses to this question. Similar to the 2010 results, 48 percent of central banks indicate that they actively regulate prices of large-value payment systems. This can be explained by the fact that most central banks operate large-value payment systems and as such, play a significant role in pricing the corresponding payment services. When it comes to the pricing of interbank transfers and retail payment services, more than 30 percent of respondent countries indicated some type of involvement, mostly among MNA and Euro area countries. The biggest percentage of central banks being involved in pricing of payment cards also comes from the MNA region (67 percent), followed by SA countries (60 percent). Also, consistently with the increased relevance of regulation as a “formal” oversight tool, MICs tend to be more actively involved in regulating pricing aspects.

VIII. REFORMING THE NATIONAL PAYMENTS SYSTEM

Reforming national payment systems, regardless of a country's income level of development, requires a sharp focus on main elements, ranging from payment instruments and infrastructure, financial and non-financial institutions, and market arrangements (such as conventions, regulations and contracts) that define the playing field. Reform efforts proved to be more effective with a holistic, rather than piecemeal, approach.

This section looks closely at the trends in reforming national payment systems across these elements. It starts with a landscape of reforms efforts by area, and by stage of the reform's implementation. It continues with the analysis of factors that triggered these reforms. Finally, it focuses on the approaches followed in the latest reform effort.

Ongoing reforms in national payment systems (NPS) around the world. The survey results show that 105 economies (close to 90 percent of all respondents) are reforming one or more components of their national payments system. As shown in **Table VIII.1**, payment system reforms are present in all regions regardless of income levels or population size. These results are similar to those of the previous iterations of this survey, thus indicating a continued focus on payment system reform.

Areas of the NPS being reformed. Going further, **Table VIII.2** provides information about the areas of the national payments system where reforms are being undertaken. In 2015, 67 percent of the responding economies have engaged in reforming the legal and regulatory framework of their national payment systems. The other most common areas of reform were large-value fund transfer systems and retail payment systems with 51 percent of the responding countries undergoing the reform of these particular payment system areas. The emphasis in SA region is more on large-value, whereas the Euro area is the least focused on large-value, placing more emphasis on retail payments. The momentum of retail payments reform is strongest in MNA and EAP groups. Cross-border payments and remittances are in focus in only 27 percent of the surveyed countries (SSA countries lead this group), while 10 percent has indicated undertaking reform efforts for FX settlement systems (predominantly in EAP region).

Reforms across all areas continue to be generally more prevalent among developing economies. Compared to the previous rounds of the survey, high income countries show slower momentum of reform. In fact, half of the surveyed high-income countries did not indicate any area currently being reformed.

For instance, payment system oversight is an area where developing economies are mostly active: close to 60 percent of low-income and 70 percent of lower-middle income countries reported reforming payment system oversight functions; in comparison, less than 30 percent of high-income and 43 percent of upper-middle income countries indicated the same. It is worth noting that in in the 2012 survey's round, payment system oversight was significantly more subscribed across income levels. Indeed, in 2012, more than four-fifths of low- and lower-middle income countries reported reforming payment system oversight, as compared to nearly or over three-fifths of upper-middle or high-income countries, respectively.

Looking across all area of payment systems currently under reform, and from a regional perspective, countries in EAP and MNA regions have taken a comprehensive approach to reforming their national payment systems, in terms of number of areas being reformed, followed by countries comprising SSA and SA regions. On the other hand, EU countries and those belonging to ODE group have engaged in narrower, more-targeted reform initiatives.

In general, while certain issues, such as securities settlement, or types of systems such as cheques clearing systems appear to be less in focus now than they were in the previous survey round, more countries have reported reform efforts around mobile payments systems in 2015 (46 percent).

Stage of NPS reforms. Table VIII.3 identifies the stage in which those reforms were at the time of central banks submission of their questionnaires. On average, across all areas of payment systems under reform at the time, 12 percent of reforms are in the implementation stage. These results show a slower momentum of reform, as compared to results from the 2012 iteration of this survey, when 27 percent of reforms were in implementation stage. Furthermore, within the reform areas that are the most subscribed by the respondents (e.g., legal & regulatory, large-value payment systems, and retail payment systems), mobile payment systems and payment card systems are more often in the most advanced stage of development (i.e., implementation/testing). In addition, a fourth of surveyed countries – comprised equally of high income (53 percent) and middle-income (47 percent) countries – are in the early phases (conceptual/discussion and definition of requirements) of ACH reform. This could possibly indicate innovative developments as ACHs are moving away from single, end-of-day batch processing towards more frequent settlement cycles. In addition, as the technology becomes cheaper and more accessible, transaction-by-transaction settlement in central bank money is becoming more realistic for a larger number of retail payments. Finally, mobile device innovation has provided ubiquitous access to m-commerce services, and has created a higher demand for faster, round-the-clock funds transfer for retail payments.

Factors that triggered reforms. Six typical "triggers" were given in the survey questionnaire, ranging from the need to reduce risks and/or improve efficiency to demands from the various sectors for improved payment services to accommodating technological innovations. Based on the World Bank's experience in payment system development, the factors underlying a reform effort are likely to be multiple rather than unique. Survey results are consistent with these findings, as most countries selected two or more of the available options.

The latest data (shown in **Table VIII.4**) find the need to increase the overall efficiency of the payment system as the most important factor driving reforms across income levels. Close to 90 percent of the responding economies found this to be the most important reform trigger. Other important drivers of reforms include responding to, and reaping the benefits of, technological innovations (75 percent), addressing the increased demand from market participants for better payment and settlement service (67 percent) and financial inclusion priorities (67 percent).

While the different income groups generally agree on the relative importance of the various drivers, developing economies, unlike high-income economies, found financial inclusion objectives to be the second most important factor behind the reform momentum. In fact, 73 percent to 89 percent of countries in developing country groups indicated that the expansion of access to financial products and services triggers payment system reform. In contrast, 44 percent of high-income countries did the dame.

Approach followed in undertaking reform efforts. Table VIII.5 offers insight into the approach and methodology followed in the process of reforming the payments system. Three main elements underlying a reform effort were captured: (i) scope, (ii) pace of change, and (iii) broadness of objectives. Central banks were asked to indicate one of the two extreme approaches for each of these elements (i.e. holistic vs. system-specific for the scope, "big bang" vs. gradualist for the pace of change, and strategic vs. based on operational needs for broadness of objectives).

The latest survey data shows that, unlike previous results, more countries prefer a holistic approach to the system-specific approach when it comes to setting out the scope of the reform. The latest data also show specific preference for this approach among high-income and upper-middle income countries. In contrast, over half of the surveyed lower-middle income countries surveyed expressed a preference for a system-specific approach.

In terms of the pace of reforms, there is a strong preference overall for a gradualist approach (64 percent) as opposed to a 'big-bang' approach (17 percent). Although results show little variation among different income groups, some differences are evident from a regional perspective that have some bearing on income-level analysis as well. For example, while no country belonging to SA region expressed preference for a 'big-bang' reform pace, 40 percent of those included in the ODE group reported their preference for this type of reform pace.

Finally, in terms of reform objectives, close to two-thirds of the surveyed countries indicated their preference for a strategic (goal-based) approach, as compared to 18 percent of those who expressed preference for starting from the operational particularities in the country. The operational-based approach was subscribed by a higher proportion of lower-middle and low-income countries. It should be noted that a strategic approach requires a high level of cooperation among stakeholders under the central bank's leadership; when the results of section VII on oversight and cooperation arrangements are considered, it is possible to conclude that the effectiveness of arrangements in this area (or the lack thereof) may have a role in determining the approach to NPS reform.

IX. AGENT-BASED MODELS

In recent years, agent-based models have been adopted and implemented with varying degrees of success by a number of developing economies. Brazil is often recognized as a global pioneer in this area since it was an early adopter of the model, and over the years has developed a mature network of agents covering more than 99 percent of the country's municipalities.[40] Other countries around the world have also utilized the agent-based model to expand financial services, including 66 countries that responded to the GPSS annexed module on agent-based models.

Agent-based models allow PSPs to expand services into areas where they do not have sufficient incentive or capacity to establish a branch. This is particularly true in rural and remote areas, where, as a result of high fixed costs to establish a physical presence through branches, a high percentage of people might be excluded or under-served. Coupled with the technological innovations and mobile connectivity, the last few years have seen agent-based models help expand access to payments and financial services to the previously "un-reachable" segments of the population.[41]

Within this broader context, the focus on this section is on the factors that enable or challenge the sustainable and scalable expansions of agent networks, including legal and regulatory issues. Other aspects relating to the design and operations of agent-based models are not discussed here. The section starts by looking at the type of entities (commercial banks, other deposit-taking institutions, or non-bank PSPs) that are allowed to engage in agent-based models. Then, it analyzes regulatory and supervisory requirements to operate as agents. The analysis covers agent network management issues, such as multi-tier agent arrangements and agent exclusivity. Finally, this section assesses which type of services agents of aforementioned financial and non-financial institutions are allowed to provide.

The definition of agent-based model used for this survey was intentionally kept broad. It refers to bank/PSP partnerships with non-banks, typically retail commercial outlets, in order for the latter to provide a range of banking and other financial services on behalf of the bank/PSP.

PSPs engaging in the agent-based model. More than two-thirds of the surveyed countries allow commercial banks and other non-bank PSPs to use agents, as shown in **Table IX.1**. Slightly less than a half of the 66 responding countries allow other deposit-taking institutions to use agents. Middle-income countries are more likely to allow commercial banks to use agents, compared to

[40] At least six countries have more than 100,000 agents, and Brazil tops the list with its Central Bank reporting 377,000 agents as of January 2015. http://www.cgap.org/topics/agent-networks

[41] Mobile money system has jump-started a wave of second-generation innovative businesses and uses on MNOs infrastructure, helping to address other development priorities. In Kenya, M-Kopa or Mobisol in Tanzania have created micro-leasing for off-grid, community-based solar power. Similar advances are being made with respect to water services to low-income households and communities.

high-income countries. As for other deposit-taking institutions, only 28 percent of lower-middle income countries allow them to use agents, compared to more than 50 percent of other income groups. Use of agents by other non-bank PSPs is more prevalent in high income countries (95 percent), compared to middle-income countries (from 67 percent to 71 percent).

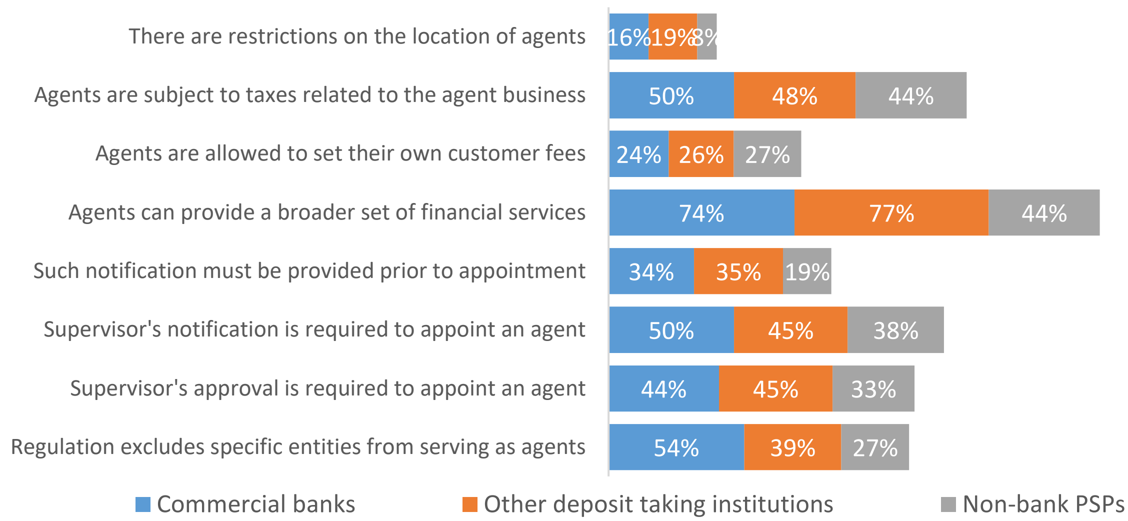
From a regional perspective, the use of commercial bank agents is prevalent in all regions, although with some regional differences. For example, commercial banks are allowed to use agents throughout LAC (100 percent) and in most of SSA (89 percent), but to a lesser extent in ECA and SA (67 percent each). When considering the use of agents by other deposit-taking institutions, there are none of the ECA countries allow other deposit-taking institutions to use agents. In contrast, in nearly two-thirds of countries in LAC and SSA regions, use of agent is permitted by these institutions. Non-bank PSPs are permitted to use agents throughout the represented world's regions, and in almost all surveyed countries in EAP, EU and ODE regions, as compared to slightly more than half in LAC and SSA regions.

It appears that countries with bigger populations tend to allow a more diverse set of institutions to use agents, including banks and other deposit-taking financial institutions. Use of agent by other non-bank PSPs is universally high among all countries, regardless of their population size.

Regulatory and supervisory requirements to operate as an agent. From a regulatory point of view (see **Table IX.2**), 40 percent of the responding countries indicated the existence of regulation that excludes specific entities from serving as agents across the three principal types. There appear to be significant differences across regions. While such regulatory requirements do not exist in any of the surveyed Euro area countries, two thirds or more of countries in EAP, ECA, MNA regions and other EU countries have such requirements in place with regard to agents of commercial banks. On the other hand, it appears that non-bank PSP agents are more likely to be impacted by such limitations in LAC and MNA regions (67 percent and 50 percent, respectively). In India, for instance, a wide range of eligible agents is permitted, such as post offices, for-profit companies, including MNOs, certain nonprofits, and retired teachers.[42] Explicitly excluded, however, are the largest microfinance institutions (MFIs) registered as nonbank finance companies (NBFCs). Kenya takes a different approach, requiring agents to be for-profit actors and disallowing nonprofit entities (like nongovernment organizations [NGOs], educational institutions, and faith-based organizations).[43] In another example, Brazil permits any legal entity to act as an agent, but prevents individuals from doing so.[44]

[42] RBI/2005-06/288, DBOD.No.BL.BC. 58/22.01.001/2005-2006 (25 January 2006)
[43] Guideline on Agent Banking—CBK/PG/15, Section 4.2
[44] Resolution CMN 3110/03, Article 1 (July 2003), as amended by Resolution CMN 3156/03 (December 2003)

Figure 9: Regulatory and supervisory requirements to operate as agents



The latest data, as well as the chart above, show that when appointing an agent, regulators are slightly more likely to require notification rather than approval. For example, commercial banks are required to seek approval by a responsible supervisory in 44 percent of the responding countries, while in 50 percent they only provide notification. In the latter case, such notification must be provided prior to the appointment in 34 percent of the responding countries (or in over two thirds of the countries requiring notification). Results vary significantly throughout the regions. While no country belonging to the SA region requires supervisor's approval, ODEs and other EU members appear to rely more extensively on approval for agents of commercial banks, in addition to EAP and LAC regions for agents of other deposit-taking institutions. Finally, there are more countries in EAP, ECA and LAC that require approval than they require notification from agents of non-banks. The latest data also show that countries with larger populations are less likely to require supervisor's approval to appoint an agent, compared to less populated countries. Notification requirements, on the other hand, are more prevalent in SA region and the Euro area countries.

Setting own customer fees is not common across agent types, with up to 27 percent of countries surveyed indicating that agents are allowed to do so. These mainly include high-income countries belonging to the Euro area, other EU and ODE groups. In terms of population, a quarter of the survey countries with populations smaller than 30 million (small and mid-size countries) indicated allowing commercial banks agents to set up their own customer fees, compared to 8 percent of countries with large populations. A similar pattern is observed for agents of other deposit-taking institutions and non-bank PSPs.

Taxes related to the agent business are levied across 44 percent to 50 percent of the countries, depending on the type of agent. This type of tax policy is the most prevalent in the SA region and

ODEs for agents of banks and other deposit-taking institutions, and to a lesser extent in the SSA region and Euro area for agents of non-banks. From an income and country-size perspective, there is no significant variation in country responses.

Restrictions on agent locations are also uncommon: only 16 percent of the surveyed countries indicated the existence of such restrictions affecting commercial bank agents, as compared to 19 percent for other deposit-taking institutions and 8 percent for agents of non-banks. Countries belonging to ECA, MNA, SA and other EU country groups impose no such locational restrictions across agent types. In contrast, slightly more than a third of countries in the EAP region present these types of restrictions for commercial bank and other deposit-taking institutions' agents.

Agent network management. While there is no single recipe to build a viable network of agents, some recurrent challenges can be identified, ranging from the business case for agents, to agent network management, and training, among others.[45] In this context, the latest GPSS data (see **Table IX.3**) show that multi-tier agent arrangements are allowed or not explicitly prohibited in the majority of the responding countries across agent types. From an income perspective, multi-tier arrangements and agent network managers are slightly less supported in upper-middle income countries.

From a regional perspective, regulatory frameworks supportive of multi-tier agent arrangements for agents of banks and other deposit-taking institutions are the most prevalent among countries belonging to SA and ODE groups, and in SSA and ODE groups for agents of non-banks. In terms of the size of population, larger countries are slightly more likely to allow multi-tier arrangements, compared to smaller ones, regardless of the type of institution using the agent-based model.

In a small number of countries that responded to the agent banking section (29 percent to 35 percent across types of agents), agent managers of commercial banks do not require separate authorization to engage with each individual agent. From a regional perspective, such authorization is required less often across countries belonging to SA, Euro area and ODE country groups, regardless of the institutions engaging in the agent-based model. It is worth noting that, for agents of non-bank PSPs, high income countries are significantly more likely not to require agent managers to obtain a separate authorization to engage with an individual agent than middle-income countries.

Regulations may also prohibit banks from contracting agents on an exclusive basis in order to promote competition and expand reach. In addition, the viability of an agent business depends

[45] See "Agent Management Toolkit", Consultative Group to Assist the Poor, 2011, available at http://www.cgap.org/sites/default/files/CGAP-Technical-Guide-Agent-Management-Toolkit-Building-a-Viable-Network-of-Branchless-Banking-Agents-Feb-2011.pdf

on sufficient transaction volumes, and agents in low-traffic areas may need to process transactions on behalf of multiple banks/PSPs to generate sufficient revenues. It is international guidance and World Bank advice that exclusivity conditions in the use of access points (e.g., agents) by PSPs should be discouraged when they harm competition, and interoperability fostered. Survey results show that agent exclusivity is allowed or not explicitly prohibited in half of the responding countries across agent types. Comparable to results of exclusivity agreements related to international remittance flows (**Table V.10**), across more than a third of the surveyed countries, exclusivity of agents is an accepted market practice. The latest data also points towards more high-income countries allowing agent exclusivity arrangements than MICs, regardless of the institutions engaging in an agent-based model. Exclusivity of agents of commercial bank and other deposit-taking intuitions is an equally common market practice among developing and high-income countries alike. However, although the latest results showed that pieces of legislation that specifically bans exclusivity agreements in the international remittance markets are most common among low-income countries, the latest data also show that developing economies (44 percent) are more likely to engage in practice of exclusivity agreements for non-bank PSPs than high-income countries (30 percent).

Services provided by agents. Agent functionality varies significantly across countries based on permitted activities by regulations and on the basis of business models. GPSS data (see **Table IX.4**) shows that in 48 percent to 65 percent of the countries that responded to the agent banking section, depending on the type of agent, new customer account opening is a permissible activity by agents. This is the case mostly in MNA region and ODEs for agents of commercial banks, SA region and ODEs for agents of other deposit-taking institutions, and SA region and Euro area for agents of non-bank PSPs. In another 23 percent to 26 percent of the respondents (depending on the type of agent), agents can play a role in facilitating account opening (for example, by collecting the necessary documents). Agents have no role in customer sign up in 15 percent to 18 percent of the total respondents. Regarding commercial bank agents, the least active role is more prevalent in the LAC region followed by ECA, whereas LAC comes second after SSA for agents of non-bank PSPs.

Lastly, the data provide detailed information on the payment services agents are allowed to offer, as shown in **Table IX.5**. In general, cash-in/cash-out, domestic P2P, and bill payments appear to be among the services most frequently permitted across countries and types of agents, although with some variations. Regarding agents of commercial banks, bill payments are permitted by two-thirds of the countries, initiating international remittances is allowed in less than a half of the responding countries (43 percent). In approximately one-fourth of the responding jurisdictions, domestic P2P transfers, international remittances and bill payment services may be provided to non-customers by agents of commercial banks, although it is unclear whether these refer to entirely cash-based services or "over-the-counter" services using the agents' account. The same trend can be observed for agents of non-bank PSPs.

From a regional perspective, it is worth noting that sending international remittances is the least likely to be permitted to commercial bank agents in LAC and ODE group (20 percent), whereas commercial bank agents are generally allowed in other EU members (75 percent) and ECA countries (71 percent) to do so. A similar pattern is evident for agents of non-banks, except for ODEs, where these types of agents are to a great extent allowed to initiate and disburse international remittances.

Furthermore, government disbursements and collections are less often contemplated as bank agents' services across the countries responded, with agents other than commercial banks' being very seldom leveraged for this purpose. In slightly less than a half of the responding countries, commercial bank agents are allowed to collect government payments (46 percent) and disburse public sector salaries and other government transfers (41 percent and 44 percent, respectively). Regional differences are significant, with two-thirds or more of MNA and SSA countries using commercial bank agents to disburse salary payments and other government transfers, as opposed to collections, which are more commonly allowed to commercial bank agents in EAP countries, followed by LAC and MNA countries. Public salary payments and other government disbursements by commercial bank agents are twice as common among countries with larger populations, compared to smaller ones. Among ODEs and SA, and ECA countries, agents of non-bank PSPs are slightly more likely to play a role in government disbursements and collections, respectively.

Finally, regarding agents of other non-bank deposit taking institutions, response rates are generally lower, possibly reflecting a more limited range of payment services allowed to the principals, or less codified/established business models.

ANNEX I: LIST OF COUNTRY RESPONSES TO THE GLOBAL PAYMENT SYSTEMS SURVEY

Main Module

Afghanistan
Albania
Angola
Argentina
Armenia
Austria
Australia
Azerbaijan
Bangladesh
Bolivia
Botswana
Bulgaria
Brazil
Cabo Verde
Cambodia
Cayman Islands
Chile
China, People's Republic of
Colombia
Costa Rica
Croatia
Cyprus
Denmark
Dominican Republic
Eastern Caribbean
Ecuador
Egypt, Arab Republic of
Estonia
Ethiopia
Fiji
Finland
France
Georgia
Germany
Greece
Guatemala
Honduras
Hong Kong SAR, China
Hungary
India
Iraq
Ireland
Israel
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Korea, Republic of
Kosovo
Latvia
Lebanon
Liberia
Lithuania
Luxembourg
Malawi
Malaysia
Maldives
Malta
Mauritius
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Netherlands
New Zealand
Nigeria
Norway
Pakistan
Palestine
Peru
Philippines
Papua New Guinea
Poland
Portugal
Romania
Russian Federation
Samoa
San Marino
Saudi Arabia
Serbia
Seychelles
Singapore
Slovak Republic
Slovenia
Solomon Islands
South Africa
South Sudan
Spain
Sri Lanka
Suriname
Swaziland
Sweden
Switzerland
Tanzania
Thailand
Timor-Leste
Trinidad and Tobago
Tunisia
Turkey
UAE
United Kingdom
United States
Uruguay
Vietnam
Yemen, Republic of
Zambia
Zimbabwe

Annex on Agent-based Models

Afghanistan
Albania
Angola
Armenia
Australia
Azerbaijan
Bangladesh
Bolivia
Bulgaria
Brazil
Cabo Verde
Cambodia
Chile
China, People's Republic of
Colombia
Costa Rica
Croatia
Dominican Republic
Eastern Caribbean
Ecuador
Egypt, Arab Republic of
Ethiopia
Fiji
Finland
France
Georgia
Germany
Guatemala
Honduras
Hungary
Iraq
Israel
Jamaica
Japan
Jordan
Kazakhstan
Korea, Republic of
Kosovo
Liberia
Lithuania
Luxembourg
Malaysia
Malta
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Nigeria
Norway
Pakistan
Paraguay
Peru
Philippines
Poland
Portugal
Russian Federation
Rwanda
Samoa
San Marino
Saudi Arabia
Serbia
Slovak Republic
Slovenia
South Africa
Spain
Sweden
Thailand
Tunisia
Turkey
UAE
United States
Vietnam
Yemen, Republic of
Zimbabwe

Annex on Accounts and Access

Albania
Angola
Argentina
Armenia
Australia
Azerbaijan
Bangladesh
BCEAO
Bolivia
Bulgaria
Brazil
Cabo Verde
Cambodia
Cayman Islands
Chile
China, People's Republic of
Colombia
Costa Rica
Croatia
Dominican Republic
Eastern Caribbean
Ecuador
Egypt, Arab Republic of
Ethiopia
Fiji
Finland
France
Georgia
Germany
Greece
Guatemala
Honduras
Hungary
India
Iraq
Ireland
Israel
Jamaica
Japan
Jordan
Kazakhstan
Korea, Republic of
Kosovo
Liberia
Lithuania
Luxembourg
Malaysia
Malta
Mexico
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Netherlands
Nigeria
Norway
Pakistan
Peru
Philippines
Poland
Portugal
Russian Federation
Rwanda
San Marino
Saudi Arabia
Singapore
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Tanzania
Thailand
Trinidad and Tobago
Tunisia
Turkey
UAE
United States
Uruguay
Vietnam
Yemen, Republic of
Zimbabwe