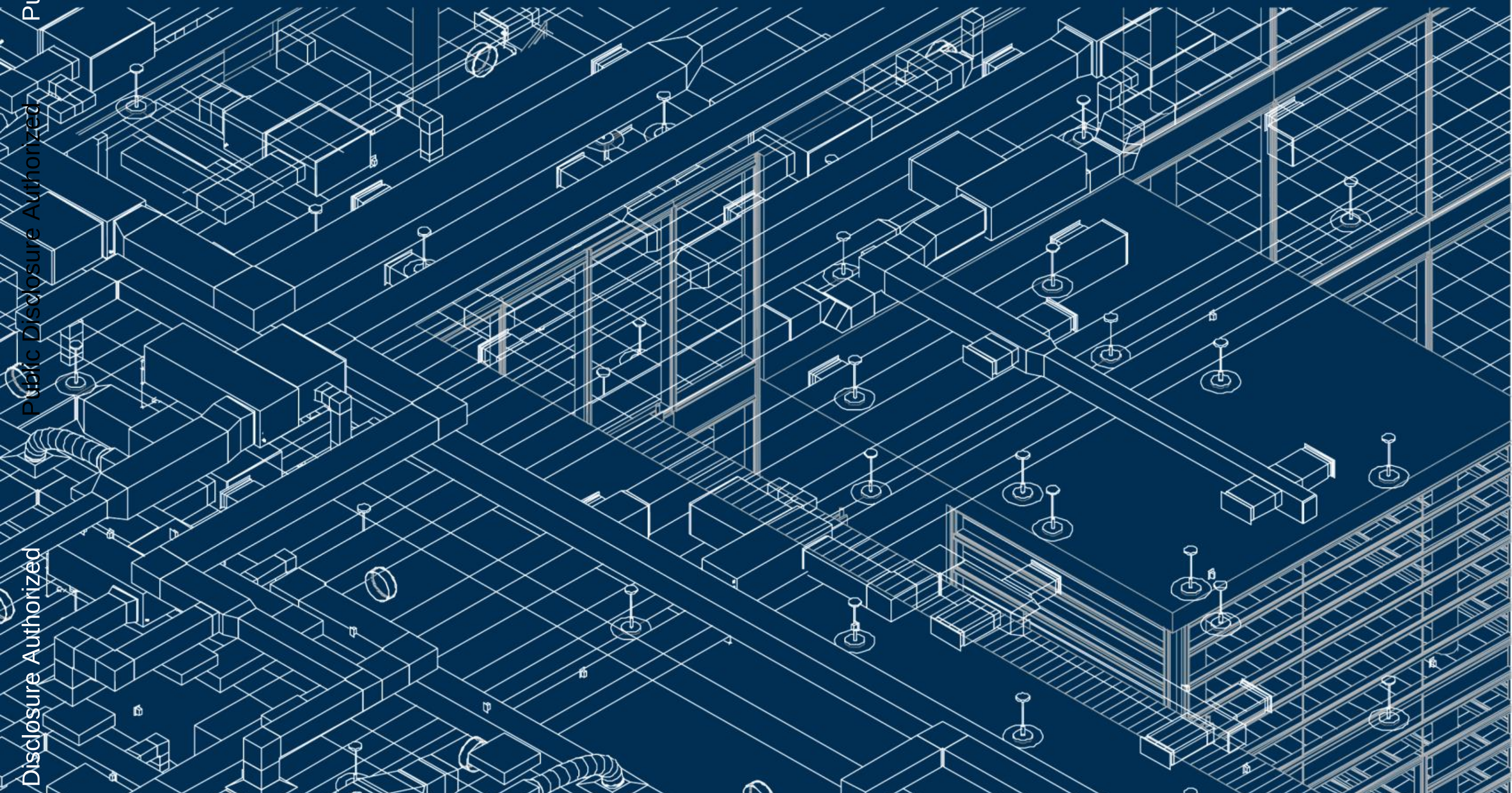
A SNAPSHOT

PAYMENT SYSTEMS WORLDWIDE

SUMMARY OUTCOMES OF THE SIXTH GLOBAL PAYMENT SYSTEMS SURVEY



October 2023

THE WORLD BANK
IBRD • IDA

1818 H Street NW

Washington DC 20433

Telephone: + 1 202 473 1000

Fax: + 1 202 522 2422

Internet: www.worldbank.org

E-mail: pubrights@worldbank.org

ACKNOWLEDGMENTS

This study “Payment Systems Worldwide: A Snapshot” presenting the outcomes of the sixth iteration of the World Bank Global Payment Systems Survey (GPSS) is the result of collective efforts of the Payment Systems Development Group (PSDG) of the World Bank’s Financial Inclusion, Infrastructure and Access Team of Finance, Competitiveness, and Innovation (FCI) Global Practice.

The implementation of the GPSS and drafting of this report and preparation of the tables that show the detailed survey outcomes was done under the general guidance of Harish Natarajan, by a core team led by Oya Ardic and comprised Edlira Dashi, Jose Antonio Garcia Luna, Holti Banka, Biagio Bossone, Dorothee Delort, Peter Jensen, Guillermo Galicia Rabadan, Balakrishnan Mahadevan, Nilima Ramteke and Gynedi Srinivas. Other PSDG members that contributed included Nenad Bosiljcic, Maria Teresa Chimienti, Francesco Di Salvo, Isaku Endo, Ahmed Faragallah, Karol Karpinski, Maria Chiara Malaguti, Marco Nicoli, and Alice Zanza. Numerous other World Bank colleagues in the FCI Global Practice Regional Teams supported the drafting team in reaching out to the central banks in their respective regions. The team would like to thank the peer reviewers Will Cook (CGAP), Thomas Lammer (CPMI), Safari Kasiyanto and Arif Ismail (IMF), and Ahmed Rostom (World Bank).

Finally, the PSDG also wants to thank each and every central bank that participated in this effort.

CONTENTS

ABBREVIATIONS

ACH	Automated clearinghouse
AMF	Arab Monetary Fund
AML/CFT	Anti-money laundering / Combating the financing of terrorism
API	Application programming interface
ATM	Automated teller machine
ATS	Automated transfer system
B2G	Business-to-government
BCEAO	*Banque Centrale des Etats de L'Afrique de l'Ouest* (Central Bank of West African States)
BCP	Business continuity plan
BIS	Bank for International Settlements
CBDC	Central bank digital currency
CCP	Central counterparty
CDD	Customer due diligence
CPMI	Committee on Payments and Market Infrastructures
CSD	Central securities depository
DVP	Delivery versus payment
EAP	East Asia and Pacific
ECA	Europe and Central Asia
CC	European Central Bank
ECCB	Eastern Caribbean Central Bank
ECCU	Eastern Caribbean Currency Union
EFT	Electronic funds transfer
EU	European Union
FAFO	First-available, first-out
FI	Financial institution
FIFO	First-in, first-out
FMI	Financial market infrastructure
FPS	Fast payment system
FX	Foreign exchange
G2B	Government-to-business
G2P	Government-to-person
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GPSS	Global Payment Systems Survey
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions

KYC	Know-your-customer
LAC	Latin America and the Caribbean
LMICs	Low- and middle-income countries/economies
LVPS	Large-value payment system
MDR	Merchant discount rate
MNA	Middle East and North Africa
MNO	Mobile network operator
MTO	Money transfer operator
NBFI	Non-bank financial institution
NPC	National payments council
NPS	National payments system
OECD	Organization for Economic Cooperation and Development
OTC	Over-the-counter
P2G	Person-to-government
P2P	Person-to-person
PCI DSS	Payment card industry data security standard
PFMI	Principles for financial market infrastructures
POS	Point of sale
PSDG	Payment Systems Development Group (World Bank)
PSO	Payment system operator
PSP	Payment service provider
PVP	Payment versus payment
PSP	Payment service provider
QR	Quick response (code)
RPW	Remittance Prices Worldwide
RSP	Remittance service provider
RTGS	Real time gross settlement
RTO	Recovery time objective
SA	South Asia
SIPS	Systemically important payment system
SSA	Sub-Saharan Africa
SSS	Securities settlement system
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TSA	Treasury single account
USD	United States dollar
WAEMU	West African Economic and Monetary Union

EXECUTIVE SUMMARY

Launched for the first time 2007, the Global Payment Systems Survey (GPSS) has assisted authorities and policy makers worldwide in making meaningful cross-economy comparisons and assessing progress in national payments system development and has facilitated dissemination of best practices. Each iteration of the GPSS is accompanied by a snapshot report which summarizes the data, but without any interpretations or recommendations.

The sixth iteration, GPSS 2021, shows generalized progress in most areas. More payments are made with instruments other than cash reflecting a safer, more efficient and more inclusive provision of payment and settlement services. More specifically, the number of cashless transactions per capita per year rose to 135 in 2020, which represents a 48 percent increase over 91 transactions reported in 2017.

Legal and regulatory frameworks

The legal and regulatory framework for payments continues to strengthen. A significant element underpinning progress area has been the enactment of payment system laws, which are now found in 81 percent of the economies that participated in the survey. This is a significant increase compared to the first GPPS survey in 2007, when only 46 percent of the responding economies had enacted such laws. The legal and regulatory framework for securities clearing and settlement continues to improve in each iteration.

More economies have included in their legal and regulatory framework concepts associated with enhancing financial access and inclusion. The existence of legislation on electronic money has steadily increased from 58 to 70 percent between the two most recent surveys. Moreover, 86 percent of respondents indicated they have in place adequate legal support for agents and agent-based models for the provision of payment services, compared to 79 percent in the last survey.

Large-value payment systems

Globally 97 percent of economies indicated that they are using at least one real time gross settlement (RTGS) system. Furthermore, RTGS systems now process a larger share of large-value payments than they did in 2018 in a larger number of economies: 97 versus 87 percent. In addition, international standards and best practices for RTGS systems are increasingly being adopted in all relevant areas including resilience and business continuity, identification and detection of and protection from cyber threats.

The 2021 iteration included new questions on whether the RTGS operator, central bank or other, intends to expand the operating hours. Around a quarter of the respondents indicated that they already have or intend to have their RTGS system operating 24/7 within the next 2 years.

Retail payment systems

In the area of retail payment systems, several important findings emerge:

- There is steady progress in the implementation of robust practices (e.g., for risk management) in traditional systems like cheque clearinghouses, automated clearinghouses (ACHs) for electronic funds transfer (EFT)-based instruments and payment card switches.

- For ACHs, globally, 46 percent of economies reported usage of ISO 20022 as the messaging standard. The adoption of ISO 20022 messaging standards is highest in high-income economies at 56 percent. Further, 30 other economies (29 percent of respondents) indicated that there is a plan to migrate to ISO 20022 standards within the next 2 years.
- Fifty-seven respondents out of 93 (61 percent, compared to only 43 percent previously) indicated that an FPS or an equivalent service is already operational in their economies, while 27 other respondents indicated planning for implementation in the next 3 years.
- ACH systems process fast payments in 40 percent of the economies globally, especially in High-income OECD economies (77 percent). Globally, ISO 20022 is the preferred standard for 68 percent of the FPS system implementations, followed by ISO 8583 (9 percent).
- Interoperability between and across the various retail payment systems has improved as assessed by respondents in all regions and regardless of income levels. In this iteration, "low and "no interoperability" were, together, mentioned by only 15 percent of LMICs.

Foreign exchange settlement systems

Trading in over the counter (OTC) foreign exchange (FX) markets continues to increase reaching USD 7.5 trillion per day in April 2022, up from USD 6.6 trillion per day in April 2019. Only 22 percent of respondents (almost all LMICs) indicated that there is a centralized FX market in their economy. In 11 out of the 12 FX trades that are organized through an exchange and where settlement arrangements are also organized by the exchange, payment versus payment (PVP) is achieved. However, slightly less than half of the respondents indicated that OTC FX markets have PVP arrangements in place. This finding is similar to the 2018 and 2015 iterations.

Remittances and other cross-border payments

Several important findings emerge from the analysis on remittances and cross border payments:

- Commercial banks were reported as having the highest market share and being the most important remittance service provider (RSP) in 36 percent of the economies worldwide, down from 43 percent in the previous iteration.
- Cash continues to be the most used payment instrument for remittances, especially in South Asia (SA) and Sub-Saharan Africa (SSA). Bank accounts were indicated as the most used one by 20 percent of economies, compared to 28 percent three years ago. In contrast, mobile money was indicated as the most used instrument only by 4 percent of economies.
- Transparency and disclosure requirements for RSPs continue to improve, though marginally, as there have already been improvements in this area in the 2018 iteration.
- Regarding cross-border integration of payment systems, the number of economies that reported having established at least one type of link for cross-border payments and settlement is 65, higher than in previous iterations (56 in 2018 and 54 in 2015). Another 45 economies indicated ongoing or future plans in this area.

Securities and derivatives clearing and settlement systems

Most economies are making progress in adopting international standards and best practices for securities and derivatives clearing and settlement. For example, all but one reported securities settlement systems (SSSs) have delivery versus payment (DVP) mechanisms in place, 94 percent of the reported central counterparties (CCPs) apply margin requirements and 88 percent perform mark-to-market valuation at least daily. Furthermore, 92 percent of CCPs report maintaining sufficient liquid resources to withstand the default of the participant and its affiliates that would generate the largest aggregate payment obligation (compared to 82 percent in 2018).

Operational risk management, including cybersecurity and cyber-resilience measures, is robust in the various FMIs that handle securities and derivatives. Similarly, in the area of governance, practically all FMIs reported having governance arrangements, and also reported having independent risk management and audit functions.

Oversight Arrangements

National payments system (NPS) oversight function has been established and is performed regularly and on an ongoing basis in the 95 percent of the responding jurisdictions (compared to 91 percent in 2018), and 93 percent mentioned that they have a specific unit or department responsible for oversight. Safety and efficiency remain as the key objectives of oversight while some economies, mainly LMICs, usually adopt additional objectives like the promotion of competition and of financial inclusion.

Ninety-eight percent of the responding central banks indicated that oversight covers all systemically important payment systems (SIPS), regardless of who the operator is (compared to 93 percent in 2018). Also, a growing number of central banks extend their oversight to retail payment systems (93 percent in 2021 compared to 78 percent in 2018) and to banks in their role as payment service providers (PSPs). On the other hand, the coverage of critical service providers under oversight remains relatively limited at the global level (47 percent); and it is more prevalent in high-income economies (57 percent). Payment services are overseen by 74 percent of the responding central banks globally, similar to the 2018 figure. Yet, there is a marked difference between high-income economies (60 percent) and LMICs (83 percent).

Cybersecurity and cyber-resilience

The GPSS 2021 included a dedicated section on cybersecurity and cyber-resilience (apart from the more specific questions on these topics in other sections of the survey). Cybersecurity laws are now in place in more than half of the economies surveyed (59 percent). High-income economies have the highest adoption rate with 67 percent, while LMICs follow with 53 percent. Globally, 80 percent of respondents stated that their economies have a national strategy to address cybersecurity and/or cyber-resiliency, with 71 percent having a strategy at the financial sector-level and 85 percent at the central bank-level.

Innovative payment services

In the area of innovative payment services, most respondents indicated the availability of the following services: mobile money services enabling the account holder to perform several types of payments including transfers to bank accounts, P2P domestic transfers, and bill payments; quick response (QR) code payment acceptance; bill payment aggregation services; and merchant aggregators. However, white-label automated teller machine (ATM) and point-of-sale (POS) networks are not commonly observed. Mobile money is more prevalent in LMICs, especially in SSA, while the other innovative services surveyed are more common in high-income economies.

Interoperability of these services is still limited. For example, 43 percent of economies indicate no interoperability between mobile money service providers, although there is progress from the previous iteration in which almost two-thirds of respondents indicated this shortfall. Likewise, while the number of merchants accepting QR code appears to be reaching significant numbers, interoperability among providers of QR code services for payments is still low.

National payment systems reforms

Most of the surveyed economies continue to implement one or more reforms of their NPS. Increasing the overall efficiency of the NPS and responding to technological innovation (both 96 percent) were the top motivations for engaging in reforms. However, for LMICs another important reason is the need to expand financial access. Increasing financial inclusion is still a top priority for 82 percent of respondents, except for most high-income OECD economies.

Globally, most common reforms areas involve the legal and regulatory framework, retail payments (especially related to the introduction or enhancement of FPSs), large-value payment systems and payments oversight. Notably, payments oversight-related reforms have taken a more prominent role when compared to the 2018 GPSS iteration: 63 percent of the economies are actively reforming their payments oversight, four times more than the previous iteration.

Special topic: effects of the COVID-19 pandemic on payment systems

Regulators and governments implemented measures to enhance digital payments in response to the COVID-19 induced lockdowns. Many economies focused on accelerating the digitalization of government-to-person (G2P) and person-to-government (P2G) payments, improving payment infrastructures, implementing electronic Know Your Customer (e-KYC) processes, and enhancing the interoperability of payment instruments and services. Financial authorities prioritized crisis preparedness, operational resilience, and cyber security. While 58 percent of economies reported improved security in the financial sector, some experienced an increase in cyber risks and fraud in digital transactions. Overall, the pandemic also had a major impact on remittance markets, with 75 percent of economies reporting significant shifts in remittance volumes, and 61 percent reporting an increase in digital payments for remittances.

Special topic: central bank digital currencies

Thirty-three percent of responding economies indicated that they plan to issue a retail central bank digital currency (CBDC). This is slightly more common across LMICs. Improving domestic and cross-border payments efficiency stand out as the key motivators for implementing it. Around one fifth of responding economies are planning to introduce a wholesale CBDC and another one fifth are planning to introduce cross-border CBDC, respectively. Both are almost twice more prevalent in LMICs. The main motivators for wholesale CBDC were financial integrity and cross-border payments efficiency, while for cross-border CBDC, they were cross-border payments efficiency and domestic payments efficiency. Within this set of responses, 31 percent indicated that a retail CBDC was likely or very likely to be implemented within 3 years, and another 42 percent between 3 and 6 years.

METHODOLOGY

For almost thirty years the World Bank has been supporting national authorities in improving their national payments system (NPS), in cooperation with private sector stakeholders, through a broad range of financing, technical assistance, and knowledge instruments. Global data is instrumental to benchmarking and monitoring & evaluation and helps identify common paths and solutions.

The World Bank therefore launched the Global Payment Systems Survey (GPSS) for the first time in 2007, to collect information on the status of payment systems and services worldwide. Since then, the GPSS has assisted authorities and policy makers in making meaningful cross-economy comparison and assess progress in NPS development and has facilitated dissemination of best practices.

The current survey is the sixth GPSS and it was conducted during 2021-2022. Hereinafter, it is referred to as the "GPSS 2021".

THE GPSS QUESTIONNAIRE

The questionnaire aims at obtaining mainly qualitative information, complemented by some quantitative data to identify trends and comparisons across country categories. Quantitative data was collected as of end-2020.

The GPSS 2021 was expanded to collect information on cybersecurity and cyber-resilience as well as some additional aspects of fintech issues and payment services. On this basis, the questionnaire for GPSS 2021 spanned the following areas: (i) legal and regulatory framework, (ii) large-value payment systems, (iii) retail payment systems and services, (iv) foreign exchange settlement systems, (v) cross-border payment systems and international remittances, (vi) securities and derivatives clearing and settlement systems, (vii) NPS oversight and cooperation, (viii) cybersecurity and cyber-resilience, (ix) payment services, and (x) on-going and planned reforms to the NPS.

New questions were also included in several of these sections to capture innovations in the relevant areas. Furthermore, the GPSS 2021 also included two supplements to explore specific topics that emerged and/or that have become increasingly significant since the previous iteration. Hence, Supplement A provides an overview of the impact of the COVID-19 pandemic on payments, and the subsequent measures taken by regulators regarding digital payments, cybersecurity, and remittances. Supplement B analyzes the perspectives and initiatives that regulators have been undertaking on Central Bank Digital Currencies (CBDCs).

SURVEY ADMINISTRATION

The survey was conducted through electronic means rather than through in-person interviews. The survey was completed by central banks and other monetary authorities.

In most questions, respondents were requested to answer "yes" or "no," or to identify all possibilities that may apply. In some 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. In this context, for the latter type of questions it was sometimes difficult to ensure a consistent interpretation of all survey responses. Responses were taken as given.

DATA ANALYSIS

Apart from providing information on global trends, this note also aims at identifying whether and to what extent certain general factors influence the NPS features and its overall development. Two such broad economy-level characteristics, which are considered exogenous to NPS development, have been consistently used across the various GPSS iterations and include the level of *per capita* income and geographical location.[1] In the 2021 iteration, the first two classifications are maintained through sections I through X of this report and in the supplements to the extent feasible as follows:

- 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. Categories (ii) to (iv) are merged under one group of "low- and middle-income countries" (LMICs).
- By geographical region: developing economies were classified according to the World Bank's regional economy 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). The analysis also included the group "high-income OECD" economies. The latter category covers economies that are both OECD member economies of that organization and high-income, and therefore excludes emerging member economies like Mexico or Türkiye.[2]

A total of 107 national and regional central banks/financial supervisory authorities representing 128 economies responded to the survey, although with differences in completion rates by section, question, and sub-question. Moreover, two cases deserved special treatment: 1) that of the countries belonging to the West African Economic and Monetary Union (WAEMU) comprised of Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo; 2) countries belonging to Eastern 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 respective central banks, the Central Bank of West African States (BCEAO) and the Eastern Caribbean Central Bank (ECCB). Whenever the issue under discussion related to the number of economies, answers from the BCEAO and the ECCB were counted as one economy each.

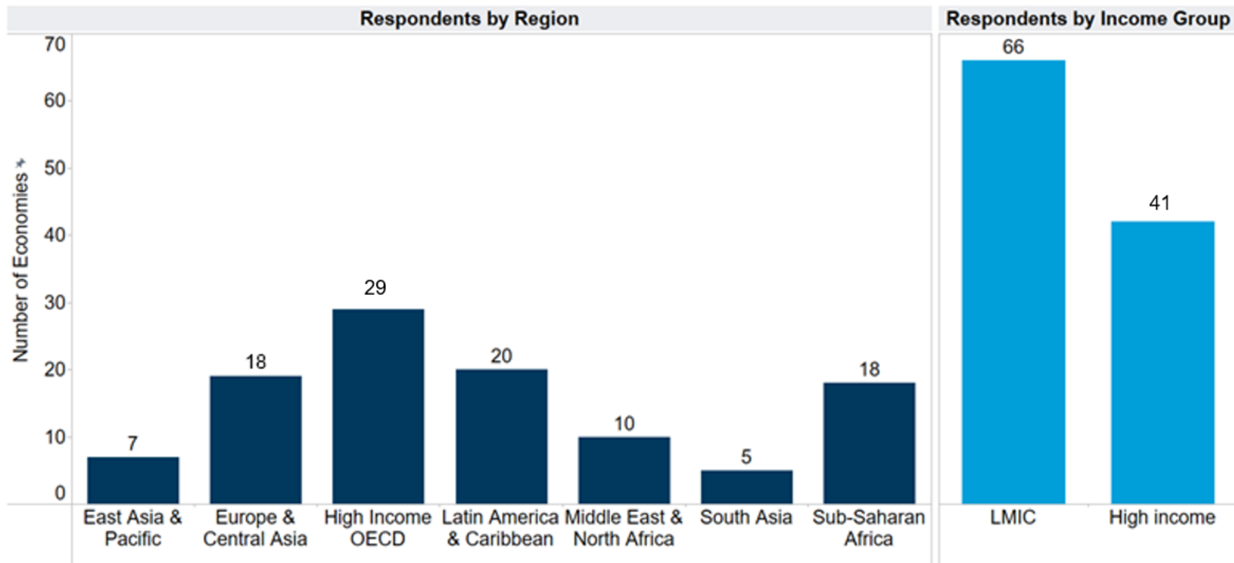
---

[1] These and other factors were identified in the CPMI General Guidance for National Payment System Development. More specifically, the CPMI 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 CPMI classification, the "geographical location" category selected for analysis in this paper would fall under the "environmental factors" group, while the "level of income" category would fall under the "economic factors" group.

[2] Please see https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups for World Bank's classification of countries by income and region.

The breakdown of respondents by region and income group are presented in the charts below, and the list of respondents is presented in Annex C.

Chart M.1 Number of Respondents by Region and Income Group



Numbers and percentages presented throughout this note are based on the simple addition of the number of economies in each of the categories and worldwide totals. In other words, different weights to each economy based on economy-specific characteristics such as economic size or other variables are not applied.

The detailed information of survey results is presented in charts and tables. The charts are inserted in the text of this Snapshot report and are usually a limited version of the information contained in the tables. The tables contain the full summary information collected on the survey and can be downloaded separately.[3] To the extent possible, table numbers and names are similar across the survey iterations for the recurring sections to enable comparisons. The text makes references to both charts and tables.

In addition, not all respondents answered each question and each sub-question. Therefore, the total of respondents may vary for each line item in the charts and tables presented. The percentages presented are based on the number of respondents for each sub-question.

Finally, caution should be used when comparing the latest results with those of previous iterations of the survey: the number of economies and systems have changed, and the responding economies have varied with each iteration of the survey as well as with each question in this iteration. Moreover, income classifications continue to change over time and changes also exist in the geographical classification (e.g., previous iterations had an additional category for European Union member economies). The GPSS nevertheless continues to represent a valid and critical tool to monitor the status of NPS developments across the world.

---

[3] The tables for GPSS 2021 and the previous iterations are available for download at the following link: https://www.worldbank.org/en/topic/financialinclusion/brief/gpss

SECTION I: LEGAL AND REGULATORY FRAMEWORK

This section focuses on the legal basis for payments and market infrastructures, covering the main relevant laws, the key legal concepts and how they apply to the various payment and settlement systems in a country. It also analyses selected legal aspects in the provision of payment services, and licensing of payment service providers.

LEGISLATION WITH DIRECT OR EXPLICIT REFERENCES TO PAYMENTS AND MARKET INFRASTRUCTURES

Having a dedicated central bank law has become customary in most economies worldwide, and 97 percent of reporting economies included in the survey have enacted such a law. In terms of the powers granted to central banks, 79 percent of the central banks surveyed can issue regulations or other types of secondary legislation which have the power of law (**Chart I.1** and **Table I.1**).

Chart I.1: Legislation regulating payment and settlement systems and related aspects

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Central Bank Law	97% (92/95)	100% (7/7)	94% (17/18)	100% (27/27)	94% (15/16)	88% (7/8)	100% (3/3)	100% (16/16)	97% (57/59)	97% (35/36)
Banking Law	85% (81/95)	86% (6/7)	89% (16/18)	89% (24/27)	69% (11/16)	89% (8/9)	100% (3/3)	87% (13/15)	84% (49/58)	86% (32/37)
Payment Systems Law (or equivalent)	81% (78/96)	71% (5/7)	76% (13/17)	78% (21/27)	75% (12/16)	89% (8/9)	100% (4/4)	94% (15/16)	86% (51/59)	73% (27/37)
Electronic money (e-money) Law (or equivalent)	70% (63/90)	43% (3/7)	76% (13/17)	76% (19/25)	69% (11/16)	38% (3/8)	67% (2/3)	86% (12/14)	67% (37/55)	74% (26/35)
Securities Markets Law	83% (77/93)	100% (7/7)	88% (15/17)	89% (24/27)	63% (10/16)	71% (5/7)	100% (3/3)	81% (13/16)	81% (46/57)	86% (31/36)
Civil Code and/or Commerce Code	52% (45/86)	29% (2/7)	69% (11/16)	48% (13/27)	44% (7/16)	71% (5/7)	50% (1/2)	55% (6/11)	54% (27/50)	50% (18/36)
Central Bank Regulations having the power of Law	79% (71/90)	71% (5/7)	82% (14/17)	69% (18/26)	75% (12/16)	100% (9/9)	75% (3/4)	91% (10/11)	83% (45/54)	72% (26/36)
Other	78% (47/60)	67% (4/6)	92% (12/13)	89% (16/18)	50% (7/14)	50% (1/2)	100% (2/2)	100% (5/5)	78% (29/37)	78% (18/23)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

National banking laws also address payments and payment-related matters in 85 percent of the economies surveyed which is an increase from 79 percent compared to the previous survey.

The trend towards the adoption of specific payment systems laws was identified in the previous GPSS iterations and has continued, with now 81 percent of the economies surveyed having a payment systems law in place, which is an increase from the 72 percent observed in the 2018 iteration. The existence of payment system laws across low- and middle-income economies (hereafter “LMICs”) remains higher compared to high-income economies with adoption rates of 86 percent, compared to 73 percent for high-income economies.[4]

Presence of legislation regarding electronic money (e-money) has steadily increased overall from 58 percent to 70 percent between the two most recent surveys, with regions such as LAC recording an increase from 35 percent to 69 percent. The adoption of e-money legislation is slightly lower in LMICs (67 percent) compared to high-income economies (74 percent).

In 52 percent of economies surveyed the civil code or commercial code contain provisions regulating payments, PSPs and payment systems. This is up from 47 percent in the previous survey. The use of civil codes or commercial codes for regulating payments is slightly higher in LMICs with a 54 percent adoption rate.

LEGAL PROVISIONS WHICH COVER SPECIFIC ISSUES ON PAYMENT SYSTEMS

As shown in **Chart I.2** and **Table I.2a**, the legal basis for when finality of settlement occurs are supported by legal provisions in 96 percent of the economies surveyed. This is an increase from 88 percent in the last survey. Three out of the four economies which reported no legal provisions in place regarding settlement finality are high-income economies. In addition, 95 percent of economies report having legislation in place that recognizes bilateral or multilateral netting, which is a slight increase from 91 percent in the last survey. Three out of five of the economies where there are no legal provisions in support of netting are high-income economies. It should be noted that 20 percent of respondents appear to have some kind of zero-hour rule in place.[5] Nevertheless, this is a slight reduction from 22 percent from the previous survey.

Box 1: Settlement Finality and Zero-hour Rule.

The zero-hour rule is a legal principle that retro-dates the effects of insolvency of a (financial) entity. According to this principle, effects of insolvency occur at midnight of the day before insolvency is actually declared. The consequence is that any transaction settled over the day when insolvency is declared, is null and void. This affects both netting and real-time settlement. In order to reduce the consequences of such rule, in the absence of its abrogation, some exemption must protect transactions within clearing and settlement systems (for instance, by inserting such exemption in legislation for resolution and winding down of payment systems).

Source: Authors’ elaboration.

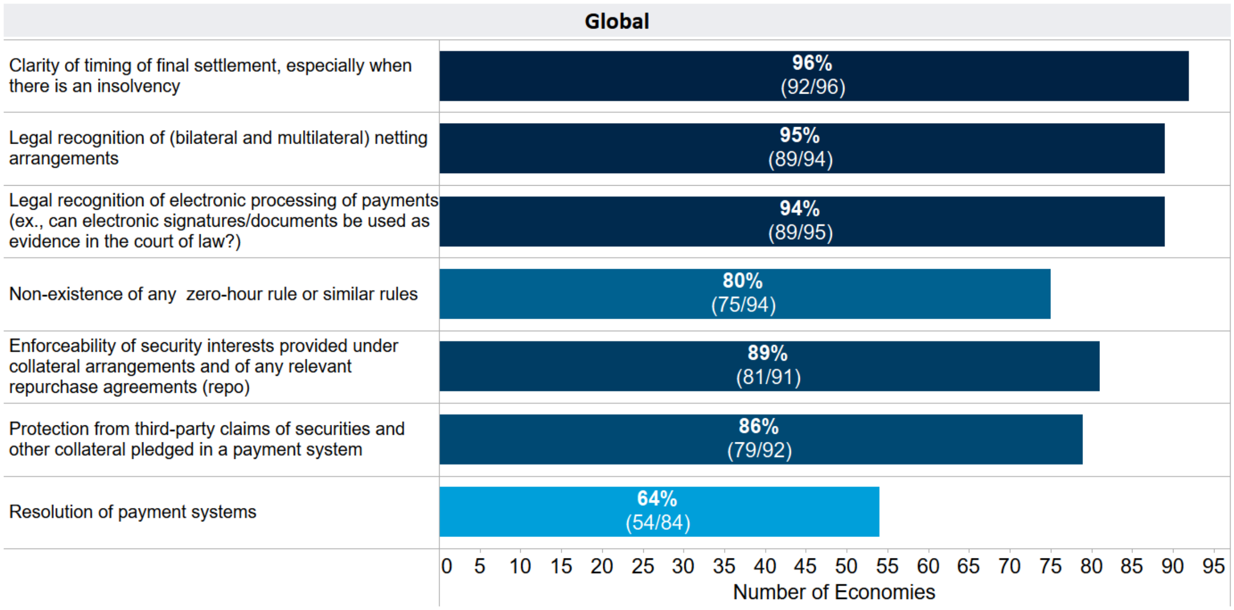
The enforceability of security interests under collateral agreements is ensured by law in 89 percent of the economies surveyed and protection is granted against third party claims regarding the collateral pledged in payment systems in 86 percent of the economies. This is a slight increase from 84 percent and 82 percent, respectively, compared with the results of the last survey.

---

[4] The reason for such difference might depend on factors like the level of modernization of existing legislation at the time when the NPS is modernized. Furthermore, economies with a more modern banking legislation also tend to have more mature financial markets, since developments in financial legislation/regulation are often the consequence of development of the financial markets themselves. In some LMICs, the creation of a strategy and then a specific legislation on the NPS can act as a driving force for the modernization of the market and the development of new services.

[5] Eighty percent report that no such zero-hour rules are in existence.

Chat I.2 Payment system concepts covered by the legal framework



Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents varies.*

A new question legal provisions for the resolution and winding down of a payment system was included for GPSS 2021 and 64 percent of the respondents indicated that such provisions are in place, as stated by 69 percent of LMICs and 58 percent of high-income economies.

Box 2: Resolution and Winding Down of payment and settlement systems

Legal provisions for the resolution and winding down of payment systems are an important aspect of financial regulation, helping to safeguard financial stability and protect the interests of stakeholders.

In the event of a payment system's failure, resolution measures may include restructuring, sale, or liquidation of the system's assets and liabilities. Some countries have established special resolution frameworks for payment systems, such as the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States, or the European Union's Bank Recovery and Resolution Directive.

Examples of recent implementations of payment system resolution frameworks include the implementation of the Payment Systems Act in Singapore in 2019, which establishes a framework for the resolution of designated payment systems, and the implementation of the Financial Market Infrastructure Act in Switzerland in 2020, which sets out a framework for the resolution of systemically important payment systems.

Source: Authors' elaboration.

In 71 percent of the economies, the various legal provisions discussed earlier apply to all the payment systems operating in each of those economies, whereas in other 22 percent of the economies those legal provisions are reported as being solely applicable to systemically important payment systems. In the remaining 7 percent of economies, the legal provisions are only applicable to the payment systems operated by the Central Bank. The latter being observed in the ECA, LAC and MNA regions.

In no instance has any of the legal provisions covered been deemed null and void by a national court in any of the economies surveyed.

LEGAL PROVISIONS WHICH COVER SPECIFIC ISSUES ON PAYMENT SERVICES

The use of electronic documents and electronic signatures are granted legal validity in support of electronic payment processing in 94 percent of the economies surveyed, compared to 90 percent in the previous iteration.

Ensuring consumer protection for users of payment services is important both for building and retaining consumer and user confidence (**Chart I.3** and **Table I.2b**). Ninety-one percent of respondents, including all LMICs, report having in place specific consumer protection measures regarding retail payment services. Legal and regulatory provisions regarding fair and competitive practices for the provision of payments services are reported in 86 percent of economies.

Chart I.3 Legal and/or regulatory provisions covering specific issues related to payment services and instruments

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Electronic money (e-money)	93% (89/96)	100% (7/7)	94% (15/16)	93% (26/28)	88% (14/16)	89% (8/9)	100% (4/4)	94% (15/16)	93% (54/58)	92% (35/38)
Consumer protection measures for users of retail payment services	91% (86/95)	100% (7/7)	94% (15/16)	96% (26/27)	69% (11/16)	89% (8/9)	100% (4/4)	94% (15/16)	90% (52/58)	92% (34/37)
Fair and competitive practices in the provision of payment services	86% (81/94)	86% (6/7)	88% (14/16)	93% (25/27)	60% (9/15)	89% (8/9)	100% (4/4)	94% (15/16)	89% (51/57)	81% (30/37)
Existence of basic payment accounts or basic transaction accounts	83% (79/95)	86% (6/7)	63% (10/16)	93% (25/27)	75% (12/16)	100% (9/9)	100% (4/4)	81% (13/16)	83% (48/58)	84% (31/37)
Non-bank payment service providers (PSPs) being able to directly provide account-based payment services, including for e-money	81% (77/95)	100% (7/7)	75% (12/16)	85% (23/27)	69% (11/16)	78% (7/9)	100% (4/4)	81% (13/16)	81% (47/58)	81% (30/37)
Use of agents and agent-based business models	86% (80/93)	86% (6/7)	94% (15/16)	84% (21/25)	81% (13/16)	78% (7/9)	100% (4/4)	88% (14/16)	90% (52/58)	80% (28/35)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Basic payment accounts or transaction accounts have become an important tool for financial inclusion and for providing different payment services for the underserved. In this iteration, 83 percent of the economies reported having legal and or regulatory provisions in place in support of such accounts – up from 76 percent in the previous iteration, with no meaningful differences between LMICs and high-income economies.

In line with the objective of establishing a level playing between different types of payment service providers, 81 percent of economies have provisions in place which enable non-banks to hold payment accounts, including e-money accounts, and provide payment services from such accounts. The comparable figure for the previous iteration was 69 percent.

Being able to act through different types of agents is important for banks and other PSPs for establishing a wider distribution network and for facilitating the provision of payment services in more remote areas. Eighty-six percent of the economies worldwide report having legal provision in place in support of agents and agent-based business models regarding the provision of payment services, compared to 79 percent in the last survey.

While, as mentioned earlier, 70 percent of economies have adopted dedicated e-money laws, **Chart I.3** shows that 93 percent of economies report having a legal and/or regulatory framework that regulates specific aspects related to e-money.

OTHER LAWS AND REGULATIONS OF RELEVANCE TO PAYMENTS AND PAYMENT SYSTEMS

In addition to the legal and regulatory framework which is directly applicable to banks and payment service providers or applicable to payment services, a wide range of other laws and regulations are of relevance to the provision and use of payment services.

Legislation regarding anti-money laundering and anti-terrorist financing is becoming near universal at 98 percent, which is at par with the previous survey (**Table I.4**). Ensuring the legal validity of electronic signatures is important for enabling digital payments and facilitating customer on-boarding and such laws and regulations: these have been enacted in 84 percent of the economies surveyed. Laws or regulations regarding digital IDs have been introduced in 52 percent of economies. In further support of electronic transactions, laws, or regulations in support of the use of electronic contracts are in place in 47 percent of economies, and also 47 percent have legislation in place regarding e-invoicing. General consumer protection statutory legislation is in place in 91 percent of economies, whereas 65 percent report also having enacted dedicated financial consumer protection laws. Of broader relevance to payments and payment services, competition laws are in place in 87 percent of the economies and 87 percent have enacted data privacy or data protection legislation.

Laws on information security are in existence in 66 percent of economies, and cybersecurity laws are in place in 59 percent of the economies surveyed. In this last regard, 67 percent of high-income economies reported having such laws, while for LMICs this figure is 53 percent. This is further developed in section VIII.

In general, the levels of adoption regarding the different aspects discussed in this subsection are higher amongst high-income economies.

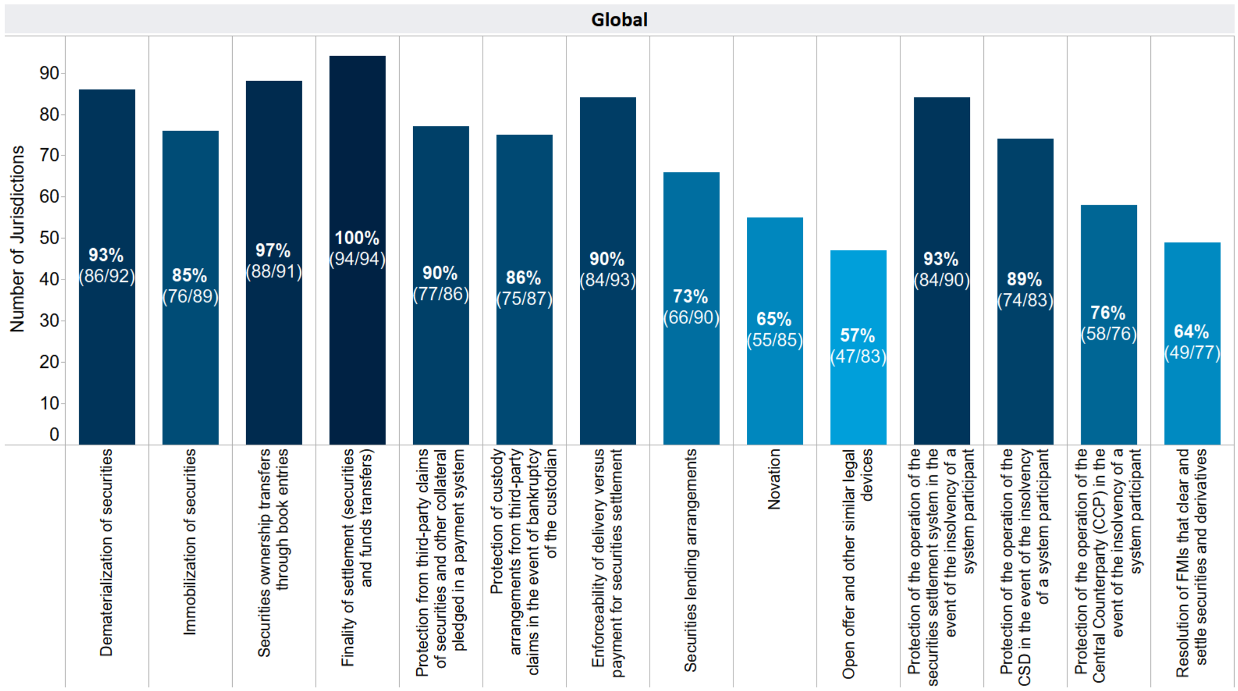
KEY SECURITIES SETTLEMENT CONCEPTS COVERED IN THE LEGAL FRAMEWORK

The GPSS 2021 has been expanded regarding legal provisions for the operations of securities and derivatives clearing and settlement systems compared to the previous GPSS surveys. The results are summarized in **Chart I.4** and **Table I.3**.

The dematerialization of securities to facilitate and support their electronic handling is recognized in 93 percent of economies. The transfer of ownership of securities through book entries is recognized in 97 percent of economies (compared to 88 percent in GPSS 2018).

Legal provisions in support of settlement finality both in relation to securities and funds transfers are universal, with 100 percent of the economies surveyed reporting having such provisions in place. Delivery vs. payment (DVP) regarding securities settlement is legally enforceable in 90 percent of economies, a slight increase from 87 percent in the previous GPSS iteration. Legislation regarding the DVP is somewhat lagging in economies in the ECA, LAC, MNA and SSA regions.

Chart I.4 Securities settlement concepts covered in the legal framework



Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

In 93 percent of economies, there are legal protections in place to ensure the continued operation of a securities settlement system (SSS) in case of insolvency of the operator. Similarly, legal protections are provided for the operations of a central security depository (CSD) in case of participant insolvency in 89 percent of economies. In 76 percent of economies, such protections are also in place for the operations of a central counterparty.

The resolution and winding down of FMIs, which clear and settle securities and/or derivatives, is provided for in the legal framework in 64 percent of the economies, with greater prevalence in high-income economies at 80 percent.

Similar to the provisions regarding payment systems, all economies report that the legal provisions covered by the GPSS survey regarding securities and derivatives clearing and settlement has not been deemed null and void by a national court in any instance.

FORMAL POWERS OF CENTRAL BANK TO PERFORM OVERSIGHT

All economies report that the national central bank is equipped with formal powers to perform payment system oversight. In the previous survey the corresponding figure was 98 percent. In 76 percent of cases the powers of the central bank are explicit, whereas 24 percent indicate that the oversight powers are implicit and are interpreted as being part of the broader mandate of the central bank, for example to ensure the adequate and safe functioning or protection of payment systems. The results are summarized in **Table I.8a**.

The specific powers of the central banks on oversight are established in different types of laws depending on the economy. Oversight powers are included in a central bank law in 89 percent of the economies, in a payment systems law in 69 percent of cases or in other types of laws in 40 percent of cases. These would imply that in several countries the central bank oversight powers are contained in multiple laws. In 66 percent of cases the oversight powers granted to the central bank also include explicit powers to oversee other types of settlement systems (**Table 1.8b**).

LICENSING OF PAYMENT AND SETTLEMENT OPERATORS

The licensing requirements for payment and settlement operators which are not a central bank vary across economies globally. Non-central bank operators of RTGS systems must obtain a license and/or register in 43 percent of cases, whereas 22 percent of economies do not require a license or registration. The corresponding figure regarding ACHs licensing and/or registration is 63 percent whereas 20 percent have no formal licensing or registration requirements.

A new indicator has been included in this iteration regarding licensing of stand-alone fast payment systems (FPS) which are not part of other payment systems. Such FPSs must either obtain a license or register with the appropriate authorities, or both, to operate in 47 percent of the economies surveyed, whereas no license or registration is required in 19 percent of cases. License, registration or both license and registration is required to operate a mobile money interoperability platform in 47 percent of the economies surveyed. A national payment card network or switch is subject to license and/or registration, or both, in 57 percent of economies, whereas foreign payment card networks or switches are only subject to similar requirements in 38 percent of cases. The results are summarized in **Table I.9.**

LICENSING OF NON-BANK PSPS

Both domestic Money Transfer Operators (MTO) and international MTOs are subject to licensing requirements in most economies, which in some cases is a combination of both licensing and registration requirements (**Table I.10**). The differences between domestic and international MTOs in relation to licensing appear to be negligible, with domestic MTOs having to meet such requirements in 86 percent of cases while for international MTOs the percentage is 80 percent.[6] Domestic MTOs can operate without any licensing requirements in only 10 percent of cases and international MTOs in 11 percent of cases.

There appears to be some divergences globally between the licensing requirements applicable to Mobile Network Operators (MNOs) which provide e-money services in comparison with other e-money issuers. MNOs providing e-money services are subject to licensing or registration requirements, or both, in 71 percent of economies whereas other E-money issuers are subject to similar requirements in 82 percent of cases. In 10 percent of economies, an MNO is not allowed to provide payment services to the public.

[6] This figure comprises three categories: License only, Registration only and License AND registration.

Merchant aggregators and payment gateways can operate in 28 percent and 44 percent of economies respectively, without having to obtain a license, or to register with the regulator.

REGULATION OF BASIC PAYMENT ACCOUNTS

Chart I.5 and **Table I.6** provide the summary data on basic account regulations.

In 78 percent of economies, the provision of basic payment accounts by banks or other PSPs is regulated and provision of such accounts to any customer that requires this service is mandated by law in 81 percent of economies, which is an increase from 69 percent in the last survey. The mandate to offer basic payment accounts ranges from 67 percent in SA to 100 percent in MNA.

A majority of economies (59 percent) further mandate that the basic payment account must be opened free-of-charge to the users, which is an increase from 32 percent in the last survey. The mandate to offer basic payment accounts free of charge exists in 72 percent of the low- and middle-income economies and only in 42 percent of high-income economies.

Box 3: Basic payment accounts

A basic payment account is designed to provide basic banking services to individuals who may have difficulty accessing traditional banking services. This includes individuals who have a low income, a poor credit history, are new to the country, or that live in rural or remote areas. Basic payment accounts are subject to regulations in many countries.

The features of a basic payment account may vary across economies and the financial institution offering the account, but they generally include:

- No fees or low fees to make them more affordable for individuals with low incomes.
-Provide basic services such as depositing and withdrawing money, paying bills, and receiving government benefits.
- Typically, they do not offer overdraft or credit facilities.
- Typically, easy to open and manage, with simple documentation requirements.

Basic payment accounts are typically offered by banks and other financial institutions, increasingly in the form of e-money accounts/products.

Source: Authors' elaboration.

Non-bank PSPs can offer the basic payment account in the form of e-money in 35 economies.

The users of basic payment accounts are protected by deposit insurance or a similar mechanism in 90 percent of economies, which is a significant increase from the 58 percent observed in the previous iteration. Similar protections (e.g., pass-through deposit insurance) apply to the funds held in basic payment accounts issued by non-banks in 48 percent of economies.

To facilitate and enable access to basic payment accounts, the KYC/CDD procedures applicable to the opening of such accounts are specifically tailored to those purposes in 79 percent of economies. In addition, in 72 percent of cases the KYC/CDD procedures applicable to the opening of basic payment accounts can be performed by agents on behalf of a bank or PSP.

Customers can maintain a basic payment account with a zero balance without being charged a fee in 77 percent of economies and 43 percent of economies have imposed a cap on the amount which can be held in a basic payment account. In addition, 47 percent of economies limit the number, or value, of cash withdrawals from basic payment accounts and 46 percent have imposed restrictions on the types of payment transactions which can be conducted with a basic payment account.

Chart I.5 – Regulation of Basic Payment Accounts

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The provision of Basic payment accounts by banks and/or other PSPs is regulated through a law or regulation	78% (72/92)	67% (4/6)	56% (9/16)	93% (26/28)	67% (10/15)	100% (8/8)	75% (3/4)	80% (12/15)	74% (40/54)	84% (32/38)
Banks and/or other PSPs are required by law to provide basic payment accounts to any customer that requests such an account	81% (59/73)	75% (3/4)	89% (8/9)	73% (19/26)	80% (8/10)	100% (8/8)	67% (2/3)	85% (11/13)	85% (35/41)	75% (24/32)
Basic payment accounts be opened free of charge, at least for a basic package of services	59% (42/71)	50% (2/4)	67% (6/9)	36% (9/25)	70% (7/10)	100% (8/8)	100% (3/3)	58% (7/12)	73% (29/40)	42% (13/31)
Basic payment accounts can be provided by non-bank PSPs in the form of e-money	54% (35/65)	100% (3/3)	22% (2/9)	23% (5/22)	70% (7/10)	86% (6/7)	67% (2/3)	91% (10/11)	73% (27/37)	29% (8/28)
Basic payment accounts are protected by deposit insurance (e.g. for banks) or similar mechanism	90% (60/67)	100% (2/2)	100% (9/9)	92% (22/24)	80% (8/10)	86% (6/7)	67% (2/3)	92% (11/12)	92% (35/38)	86% (25/29)
Basic payment accounts issued by non-bank PSPs (e.g. e-money accounts) are protected by pass-through deposit insurance or a similar mechanism	48% (27/56)	67% (2/3)	11% (1/9)	38% (6/16)	67% (6/9)	67% (4/6)	33% (1/3)	70% (7/10)	57% (20/35)	33% (7/21)
KYC/CDD requirements are tailored to facilitate the opening of basic payment accounts	79% (53/67)	67% (2/3)	78% (7/9)	57% (13/23)	90% (9/10)	100% (7/7)	100% (3/3)	100% (12/12)	90% (35/39)	64% (18/28)
KYC/CDD can be performed by agents of financial institutions or e-money issuers	72% (46/64)	50% (2/4)	67% (6/9)	60% (12/20)	70% (7/10)	67% (4/6)	100% (3/3)	100% (12/12)	85% (33/39)	52% (13/25)
A zero balance in the account is allowed without the customer being charged for this	77% (51/66)	25% (1/4)	88% (7/8)	83% (19/23)	89% (8/9)	57% (4/7)	100% (3/3)	75% (9/12)	76% (29/38)	79% (22/28)
There is a cap on the account balance that a customer can maintain	43% (29/68)	75% (3/4)	13% (1/8)	22% (5/23)	70% (7/10)	57% (4/7)	67% (2/3)	54% (7/13)	60% (24/40)	18% (5/28)
There are limits on the volume or value of cash withdrawals from the basic account (daily, monthly, etc.)	47% (31/66)	67% (2/3)	25% (2/8)	32% (7/22)	70% (7/10)	57% (4/7)	67% (2/3)	54% (7/13)	56% (22/39)	33% (9/27)
There are restrictions on the types of payment transactions that can be performed	46% (32/69)	50% (2/4)	33% (3/9)	43% (10/23)	60% (6/10)	50% (4/8)	33% (1/3)	50% (6/12)	50% (20/40)	41% (12/29)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

TAXATION OF PAYMENT SERVICES

Two different types of taxes applied in relation to payment services are covered by GPSS (**Table I.14**). Firstly, the taxes, such as value-added tax (VAT), which are applicable to the fees charged to users by banks and other PSPs, and, secondly, the taxes which are directly applicable to specific transaction types, typically applied and calculated based on the amount of the transaction.

In terms of taxes applied to fees charged by PSPs, the fees applied to the opening of a bank account are taxed in 17 percent of the economies surveyed and the corresponding figure for opening an e-money account is 16 percent. There are no significant distinctions on these issues based on the economies' income levels.

Taxes are applied to any fees charged for transfers from bank accounts in 28 percent of the economies and the similar figure for the transfers from e-money accounts is 25 percent. Fees applied to the sending of international remittances are taxed in 33 percent of cases while the figure regarding tax on fees for receiving remittances is 27 percent.

Overall, the application of taxes on fees appears to have been reduced considerably since the last survey. According to GPSS data, instances of economies taxing the fees for funds transfers from bank accounts have been reduced to 28 percent from 73 percent and instances of taxes applied to fees regarding funds transfers from e-money accounts have been reduced from 50 percent to 25 percent. The figures regarding such taxes in the last survey for sending or receiving international remittances were 85 percent (now 33 percent) and 45 percent (now 27 percent) respectively.

Box 4 – Taxation of Mobile Money services[7]

Taxation of mobile money services is considered by some governments as an opportunity to expand the tax revenue base as mobile money is widely used by customers and businesses who usually transact in the informal economy. Taxation of mobile money services may also be easier to implement when compared to other taxes, considering the limited number of mobile money providers and the digital nature of transactions, which create records to collect taxes more efficiently and accurately.

There are nevertheless various potential downsides to this type of taxes, such as:
-Mobile money transaction tax can be avoided if users move their operations back to cash.
-Evidence suggests that a mobile money transaction in practice targets the poor, as the rich can find alternatives to using mobile money.
-Mobile money transaction tax is not proportional to the incomes of taxpayers as it taxes the total transaction amount and not the profits. Low-margin businesses where profit per transaction is low would bear a higher burden than high-margin businesses.

In this context, some policy considerations include:

1. Tax design is key to avoid harmful impact on rural and poor users. The key consideration is that tax paid on low value transactions should be much lower that the tax paid on high value transactions, while at the same time the tax on high value transactions should not discourage use of the regulated financial sector. This could be addressed by treating the transaction tax as a withholding tax that can be adjusted against income tax or even refunded if the taxpayer does not have taxable income.
2. Well-designed tax policies may help drive behavioral shift and increase mobile money use cases beyond P2P. For example, an appropriate level of tax on cash-in and cash-out could incentivize a shift towards usage of mobile money for merchant payments, assuming other frictions impacting usage of mobile money for this purpose are addressed.
3. Industry consultation is important as well as an analysis of alternative approaches.
4. A different tax treatment of mobile and bank account-based services may be harmful for competition and discourage the development of key components of the ecosystem.

[7] Sources: Doris Akol and Adrienne Lees (2021), “There and back again: the making of Uganda’s mobile money tax”, Working Paper 123, ICTD, July 2021. Imran Khan and Karrar Hussain Jaffar (2021), “Searching for the Binding Constraint to Digital Financial Inclusion in Pakistan: A Decision Tree Approach”, CGD Policy Paper 218. Washington, DC: Center for Global Development. Njuguna Ndung’u (2019), “Taxing mobile phone transactions in Africa Lessons from Kenya”, Africa Growth Initiative at Brookings, Policy Brief.

In terms of taxes applied to specific payment transaction types, such as a tax on the principal amount transferred, these are applied to transfers from bank accounts in 15 percent of the economies surveyed. The figure regarding transfers from e-money accounts is somewhat lower, at 8 percent. The figures regarding taxes applied to the sending and receiving of international remittances are similar at 11 percent.

In comparison with the last survey, these specific types of taxes also appear to have been reduced considerably. In the last survey, the sending or receiving of international remittances was taxed in 31 percent and 21 percent of cases respectively and domestic funds transfers were subject to tax in 25 percent of cases.

PROTECTION OF CUSTOMER FUNDS RECEIVED IN EXCHANGE OF E-MONEY AND DEPOSIT INSURANCE

Several new questions were introduced in GPSS 2021 in relation to the legal and regulatory requirements for the protection of funds received from customers in exchange for e-money. Additional questions were also included regarding deposit insurance measures (**Table I.16**).

Legal and regulatory mandates regarding the separation of the funds received in exchange of e-money from other funds held by the e-money issuer exist in 81 percent of the economies which responded to the GPSS 2021 survey. In addition, such funds must be kept in an account at one or more regulated financial institutions - which may include the central bank - in 77 percent of the economies. In 4 percent of the economies, only a fraction of the funds received need to be safeguarded, while 14 percent of the economies surveyed report that no safeguarding mandates exist for e-money. The accounts which must be used for safeguarding these funds differ and are predominantly trust accounts (56 percent) and/or regular bank accounts (54 percent).

In 64 percent of economies, non-bank e-money issuers are prohibited by law to use funds received in exchange of e-money for other purposes than conducting funds transfers on behalf of their customers or for redeeming e-money. Twelve percent of economies reported that no such limitations regarding the use of customer funds for other purposes are in existence.

Additional legal protections are provided in 68 percent of economies by ensuring the protection of the holders of e-money in case of bankruptcy of the e-money issuer. Legal protections are also provided in 53 percent of cases against the bankruptcy of the financial institution where the funds are held as part of the safeguarding measures.

Deposit insurance schemes and systems exist in 87 percent of economies whereas 13 percent report having no deposit guarantee system. Eighty-four percent of economies have a dedicated deposit insurance fund for the protection of deposits which are primarily managed by the public sector in 53 percent of cases or managed jointly by the private and public sector in 26 percent of the economies surveyed.

As noted earlier, users of basic payment accounts are protected by deposit insurance or a similar mechanism in 90 percent of economies, and similar protections (e.g., pass-through deposit insurance) apply to the funds held in basic payment accounts issued by non-banks in 48 percent of economies (see **Chart I.5**).

SECTION II: LARGE-VALUE PAYMENT SYSTEMS

Well-designed large-value payment systems (LVPS) play a critical role in a safe, reliable, and efficient financial sector and for the efficient and effective execution of monetary policy, and as such support financial stability. At the same time, deficiencies in risk management framework of LVPS's can generate and transmit systemic risk.[8] As such, they have long been the focus of central banks' involvement in a country's NPS, including through the direct ownership and operation of these systems. The importance of real time gross settlement (RTGS) of high-value and time-critical payments for limiting settlement and systemic risks has been extensively discussed in previous GPSS reports and is reflected in the broad adoption of RTGS systems worldwide.

This section begins with a landscape of LVPS. It then turns to analyzing the specific features of RTGS systems. Finally, it covers other arrangements for processing large-value payments.

SYSTEMS USED IN EACH ECONOMY FOR LARGE-VALUE FUNDS TRANSFERS

The options for processing large-value payments include RTGS systems, cheque clearinghouses, and "other" systems.[9] Of the 94 economies that answered this section of GPSS 2021, 97 percent of them indicated they are using at least one RTGS system. Some RTGS systems are used by two or more economies (e.g., TARGET2 in the Euro area), while some economies use more than one RTGS system (e.g., the case of Hong Kong). The total number of RTGS *systems* whose features were reported in detail was 92. At the same time, 17 percent of the survey economies still use cheque systems for large-value payments, which is a reduction from the 24 percent in the previous survey iteration. This prevails in 50 percent of reporting low-income economies (compared to 55 percent in 2018). A total of 15 economies indicated that they use a system other than an RTGS system or a cheque clearinghouse for large-value payments, compared to 17 in GPSS 2018. Such systems usually operate in parallel or in addition to the RTGS system. About half of these "other" types of systems for large-value payments are used in high-income economies.

Regarding the relative importance of each type of system for processing large-value payments, the trend continues to be in favor of RTGS systems instead of using cheques or "other" systems. In the current iteration, 97 percent of economies reported that they use their RTGS system(s) to process more than half of the total value of large-value payments (versus 87 percent in GPSS 2018 and 82 percent in GPSS 2015). In this iteration, only one economy indicated that it is channeling over 50 percent of the settlement throughput through the cheque clearinghouse, while three still channel over 50 percent through their "other" settlement system.

RTGS SYSTEMS

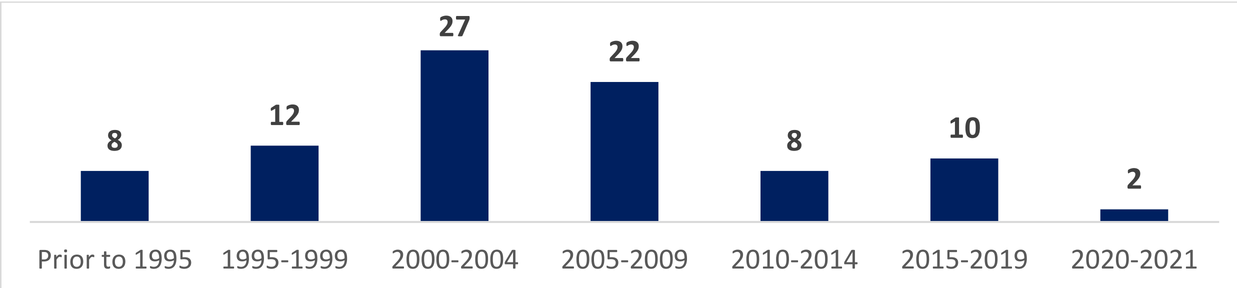
Chart II.1 below is the same as in the 2018 iteration, showing that most RTGS system implementation occurred in the decade of 2000s, peaking in 2001-2008. Since 2016, only a

[8] While the average value of each individual payment processed by these systems is high when compared to other systems (e.g., ACHs or payment cards switches), many of the "large-value" systems covered also process payments of relatively low value. In fact, the distinction between LVPS and retail payment systems is blurring in many countries. The distinction is kept in the GPSS for comparative purposes across previous iterations, as well as for the systemically important nature of many of these systems.

[9] Answers do not necessarily add up to 100 percent since several countries indicated more than one system through which large-value payments are executed.

handful of “new systems” (in countries where there was no RTGS system before) have been implemented. However, as per World Bank information - not discernible from the survey - RTGS systems have been renovated in several other countries.

Chart II.1: Number of RTGS systems worldwide by year of implementation



As some RTGS systems are used by multiple economies[10] and some economies have more than one RTGS system, *the discussion on RTGS systems for the remainder of this section of the report takes as basis the number of the reported RTGS systems and not the number of economies.*

Of the reported RTGS systems, the central bank is the owner in 93 percent of cases, the operator in 88 percent and the settlement agent in 89 percent of the reporting economies. The corresponding figures for the 2018 iteration were 98, 89 and 93 percent.

Three RTGS systems are reportedly operating on a 24/7 basis out of a total of 90 systems for which the operating hours were reported. GPSS 2021 included new questions on whether the central bank or other operator intends to expand the operating hours of the RTGS system, and even make it available 24/7 over the next two years (**Chart II.2**). There are plans in place for expanding the operating hours (but not to 24/7) for 12 RTGS systems. Nine of these systems are located in LMICs and there is at least one RTGS system in every region, with 3 located in SSA. Furthermore, there are plans for another 13 systems to become available 24/7 within two years. Twelve systems are located in LMICs and one in a high-income economy.

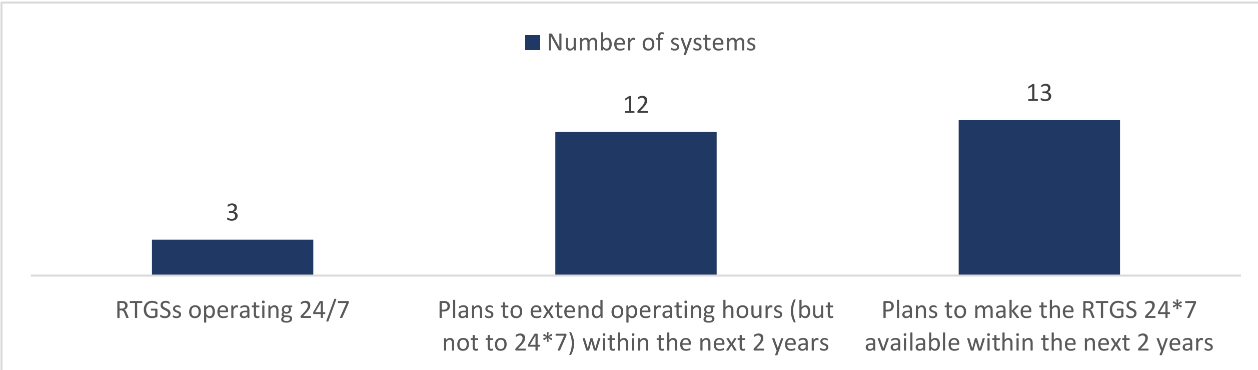
Table II.3 shows basic statistics for RTGS systems worldwide for years 2017 and 2020.[11] In about one-fourth of all responding economies total settlement through put measured in USD decreased during this period of time. In the case of volume of transactions processed, it decreased in about 20 percent of the responding economies, compared to about one-tenth of economies in the previous iteration.

Global growth in terms of volume during this period was 37 percent, which seems robust considering that FPSs have been capturing many of the real-time retail payments that until recently were being processed by RTGS systems.

[10] Apart from the RTGS systems operated by BCEAO, ECB and ECCB, which are used by multiple economies, there are other cases. One is BUNA that is operated by the Arab Monetary Fund (MAF) and provides services to AMF-member economies. As BUNA is not operated by a central bank, it has not been captured by GPSS.

[11] Chart II.3 only includes countries for which the data on the value and volume settled was deemed consistent based on validations made with data reported by CPMI, CEMLA, other regional groupings, and/or with data published on the website of the corresponding central bank.

Chart II.2: Plans to extend operating hours of the RTGS system



As in previous iterations, total settlement throughput expressed in terms of GDP turnover is, on average, three to four times higher for high-income economies (where RTGS systems often support the settlement of a significant number of securities market transactions). The sum of the total settlement throughput for all reported RTGS systems was equivalent to approximately 40 times the global GDP in 2021,[12] significantly more than the 30 times recorded in 2018 and closer to the 36.3 times recorded in 2015. This increase is also reflected in **Table II.3**, as the *average GDP turnover per country* increased to 24.8 times compared to 17.9 times observed in 2017.

Detailed features of RTGS systems worldwide[13]

Primary means to send payment orders

Regarding the primary means through which direct participants send their payment orders to the RTGS systems (see **Table II.4**), SWIFT closed user groups and proprietary telecommunications networks are the most common alternatives, each serving 41 and 49 percent, respectively, of all RTGS systems surveyed. The figure for proprietary telecommunications networks is slightly higher than in the previous iteration (40 percent). SWIFT closed user groups are especially prevalent in High-income economies, as well as in the EAP and SSA regions. On the other hand, proprietary telecommunications networks continue to be the preferred means of communication among LMICs, like those in EAP, ECA and LAC, and in this iteration also in the MNA region, with nearly two-thirds of the systems in these regions using this connection type (50 percent was reported in this iteration for LAC though). Twenty-eight percent of the surveyed systems indicated using the SWIFT international network, compared to 11 percent in the 2018 iteration – while the 2015 iteration showed 21 percent. This option is more common in the MNA and SSA regions.

This iteration also included new questions on the adoption of ISO 20022. Out of 64 systems that responded, 27 percent indicated that they are already using ISO 20022 as their primary messaging format, especially in MNA (50 percent) and SA (67 percent), while lowest adoption is observed in High-income OECD economies at 11 percent (**Chart II.3 and Table II.4**). All the

[12] Note that the global GDP includes all economies in the world, including those that did not participate in the GPSS 2021.

[13] In some questions of RTGS system features more than one answer is possible. Percentages may not add up to 100 percent.

remaining systems indicated that they have plans to migrate to ISO 20022 within the next two years.

Chart II.3 Primary means through which payment orders are sent to the RTGS system

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	High Income OECD	LMIC	High income
Does the RTGS system use ISO20022 messaging format as the primary communications means or the channel through which direct participants send payment orders for processing?	27% (17/64)	27% (3/11)	27% (3/11)	20% (2/10)	50% (4/8)	67% (2/3)	17% (2/12)	11% (1/9)	30% (14/46)	17% (3/18)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems.*

Pricing policies[14]

The current survey data (see **Table II.5** and **Chart II.4**) shows that out of 91 RTGS systems for which the questions on pricing were answered, only 8 of them (9 percent) apply no charges, most of them being in LAC, SA and SSA (2 systems each). This percentage is almost identical from that of the 2018 iteration (8 percent).

Chart II.4 RTGS system pricing and charges

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	High Income OECD	LMIC	High income
Charges are applied with no particular relation to cost recovery	7% (6/91)	14% (1/7)	6% (1/18)		22% (2/9)	25% (1/4)	7% (1/15)		9% (5/55)	3% (1/36)
The pricing policy aims at full recovery of the operational cost of the system	19% (17/91)	43% (3/7)	28% (5/18)	8% (1/12)	22% (2/9)		27% (4/15)	8% (2/26)	24% (13/55)	11% (4/36)
The pricing policy aims at full recovery of the operational cost of the system plus partial recovery of the investment costs	9% (8/91)			8% (1/12)			13% (2/15)	19% (5/26)	4% (2/55)	17% (6/36)
The pricing policy aims at partial recovery of the operational cost of the system	20% (18/91)	14% (1/7)	17% (3/18)	25% (3/12)	33% (3/9)	25% (1/4)	27% (4/15)	12% (3/26)	24% (13/55)	14% (5/36)
The pricing policy aims at recovering all costs (operational plus investment) in full	34% (31/91)	29% (2/7)	39% (7/18)	33% (4/12)	11% (1/9)		13% (2/15)	58% (15/26)	24% (13/55)	50% (18/36)
The pricing policy aims at recovering all costs in full plus profits/opportunity cost	3% (3/91)		6% (1/18)	8% (1/12)				4% (1/26)	4% (2/55)	3% (1/36)
The RTGS operator makes no charges for the processing/settlement of payment orders	9% (8/91)		6% (1/18)	17% (2/12)	11% (1/9)	50% (2/4)	13% (2/15)		13% (7/55)	3% (1/36)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

[14] The survey also asked if the pricing policy is used to promote a smooth flow of payment throughout the day. This specific question is discussed as part of liquidity risk management later in this section.

The pricing policy option that was more prevalent was full recovery of all costs (operational plus investment), with 31 responses or 34 percent of the total, up from 19 responses or 22 percent in 2018. This pricing policy option is especially prevalent in High-income OECD economies. Full or partial recovery of operational costs followed, with close to 20 percent of responses each. Six systems apply charges with no particular relationship to cost recovery, and in only 3 systems the pricing policy aims at obtaining a profit.

<u>Liquidity risk management</u>

As shown in **Chart II.5,** all but four systems surveyed reported that the opening balances in the settlement accounts and funds received from other participants during the day are the main sources of liquidity – compared to three systems in the 2018 iteration. Sixty-one percent of respondents indicated that participants could use the full amount of their reserve requirement during the operational day to make payments. This is similar to the percentage from the 2018 iteration. Full usage of reserve requirements continues to be less common in low-income economies, and from a regional perspective this is the case especially in SSA but also in EAP.

Chart II.5 Sources of liquidity in the RTGS system

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. Opening balances and funds received from other participants during the day	95% (81/85)	82% (9/11)	100% (17/17)	93% (14/15)	93% (13/14)	100% (9/9)	100% (4/4)	100% (15/15)	29% (17/59)	12% (3/26)
b. Participants can use all their reserve requirements balance during the day	61% (52/85)	45% (5/11)	65% (11/17)	73% (11/15)	79% (11/14)	56% (5/9)	100% (4/4)	33% (5/15)	95% (56/59)	96% (25/26)
• If No, Participants can use a part of their reserve requirements during the day	24% (20/85)	18% (2/11)	24% (4/17)	7% (1/15)	14% (2/14)	22% (2/9)		60% (9/15)	63% (37/59)	58% (15/26)
c. Lines of credit between banks	66% (56/85)	91% (10/11)	76% (13/17)	40% (6/15)	50% (7/14)	67% (6/9)	50% (2/4)	80% (12/15)	68% (40/59)	62% (16/26)
d. The RTGS operator/manager provides liquidity to participants on an uncollateralized basis"	5% (4/85)	9% (1/11)		7% (1/15)	7% (1/14)	11% (1/9)			5% (3/59)	4% (1/26)
e. Other sources of liquidity during the day.	29% (25/85)	27% (3/11)	18% (3/17)	20% (3/15)	36% (5/14)	56% (5/9)	25% (1/4)	33% (5/15)	34% (20/59)	19% (5/26)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

The use of lines of credit between banks as a source of liquidity is also quite common with 66 percent of responses indicating this option (61 percent in the 2018 iteration). It is more relevant especially in the EAP, ECA and SSA regions.

Regarding provision of intraday liquidity by the central bank, most RTGS systems do rely on it. Ninety-five percent provide it on a collateralized form, either in the form of loan or repo (78 percent) or participants' account overdrafts (6 percent). Another 15 percent of systems within the collateralized intraday liquidity category indicate they provide both options. Sixteen systems did not answer any of the options about central bank provision of intraday liquidity, which could mean that they do not provide this facility in any form – compared to 23 systems in the 2018 iteration. Provision of collateralized intraday credit by the central bank is common across the various categories from both the income and regional perspectives.

Suitable collateral is required in 86 percent of all cases (compared to 84 percent in 2018), with a higher percentage observed in high-income economies (94 percent) and lower for LMICs (80 percent), especially those in SSA and MNA (**Table II.8**).

Should a participant be unable to repay the intraday credit (or overdraft) by the end of the system's operating day, in most cases the operator transforms the intraday credit into an overnight credit at a penalty rate (in 61 percent of the RTGS systems that answered this question) or at the market rate (39 percent). In this iteration, 21 percent of RTGS systems also indicated that they proceed to seize the collateral immediately after the daily closing time of the system. In the 2018 iteration only 7 percent of systems indicated this latter option, which could be a sign of inconsistency in the responses for this specific question.[15] Results are summarized in **Chart II.6** and **Table II.9**.

Chart II.6 Non-repayment of intraday liquidity at the end of the operational day

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. The RTGS operator liquidates the collateral immediately thereafter	21% (13/61)	20% (2/10)			63% (5/8)	50% (4/8)	33% (1/3)	9% (1/11)	25% (10/40)	14% (3/22)
b. The RTGS operator transforms the intraday credit into overnight at market rates	39% (24/61)	60% (6/10)	40% (4/10)	33% (4/12)	13% (1/8)	38% (3/8)	67% (2/3)	36% (4/11)	33% (13/40)	50% (11/22)
c. The RTGS operator transforms the intraday credit into overnight at penalty rates	61% (37/61)	40% (4/10)	70% (7/10)	67% (8/12)	63% (5/8)	50% (4/8)	100% (3/3)	64% (7/11)	70% (28/40)	45% (10/22)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

A central queuing facility is another crucial liquidity management tool in RTGS systems (**Table II.11a**). Sixty-seven percent of the systems have in place queuing facilities, down from the 81 and 74 percent observed in the 2018 and 2015 iterations, respectively. Only in 12 systems (15 percent of the total) transactions are rejected if no funds or credit are available in the account of the initiator (**Table II.10**). These figures are similar throughout the various regions, with only the ECA region showing a noticeably smaller percentage (53 percent) for the first variable.

Queuing resolution mechanisms are illustrated in **Tables II.11a** and **II.11b.** A large majority of systems (82 percent) use a first-in, first-out (FIFO) resolution algorithm – compared to 74 percent in the 2018 iteration. This is used more extensively in the ECA (94 percent) and LAC (93 percent) regions. In addition, first-available, first-out (FAFO) algorithm is reported in 16 percent of the RTGS systems globally and is most common in the MNA region (33 percent) and High-income

[15] Nevertheless, it should be noted that some systems do apply more than one option; the approach varies depending on the frequency of such failure, or even the participant's preference.

OECD economies (33 percent). In 84 percent of the systems, participants can set priorities to their payment orders (68 percent in GPSS 2018), and in 72 percent they can change the priority of payment orders in the queue before these orders are settled (54 percent in GPSS 2018). For these two, the percentages are somewhat smaller in LMIC economies. Changing the priority of queued payment orders is less common in LAC (43 percent) and highest in EAP (91 percent).

Regarding more advanced tools for saving liquidity in the RTGS systems, such as offsetting, 18 systems use multilateral offsetting (compared to 30 systems in the previous iteration), 8 use bilateral offsetting (13 in the previous iteration), while 35 use both (down from 43).[16] The offsetting mechanism can be triggered manually in almost half of the cases, especially in economies in MNA. Automatic triggering every certain period of time occurs also in almost half of the cases (compared to almost two-thirds in 2018), while automatic triggering based on other parameters (e.g., accumulated volumes pending settlement) is observed in about one-fifth of the cases. The latter feature was reported by only one RTGS system in the EAP and SA regions.

The two final questions on liquidity risk management asked whether the pricing policy is used by the RTGS operators to promote a smooth flow of payment throughout the day[17] and whether RTGS systems participants have access to real-time information on their settlement account balances and available credit/overdrafts during the day (**Table II.12** and **Table II.13**, respectively). Price incentives - with lower charges applying to those payments sent and settled earlier in the operating day - are used by 30 percent of RTGS operators (about the same as in the previous iterations). These are more common in LMICs and less in high-income economies (only 7 percent). Participants' access to real-time information on account balances and credit is available in all but six reported RTGS systems.

<u>Resilience and business continuity</u>

Enhancing resilience and ensuring the robustness of business continuity arrangements for payment and other settlement systems that are of critical importance for the financial system continues to be a focus of overseers, regulators and operators. This sub-section addresses operational risk management in RTGS systems (**Table II.14**).

On the governance of the underlying risks, in 92 percent of the systems the operational risk management framework has been endorsed by the Board of Directors of the entity operating the RTGS system (up from 83 percent in the 2018 iteration), and in all but three of such cases the framework is periodically reviewed and tested, including the business continuity arrangements. The lowest percentages of Board endorsement of the risk management framework are observed in the SA region.

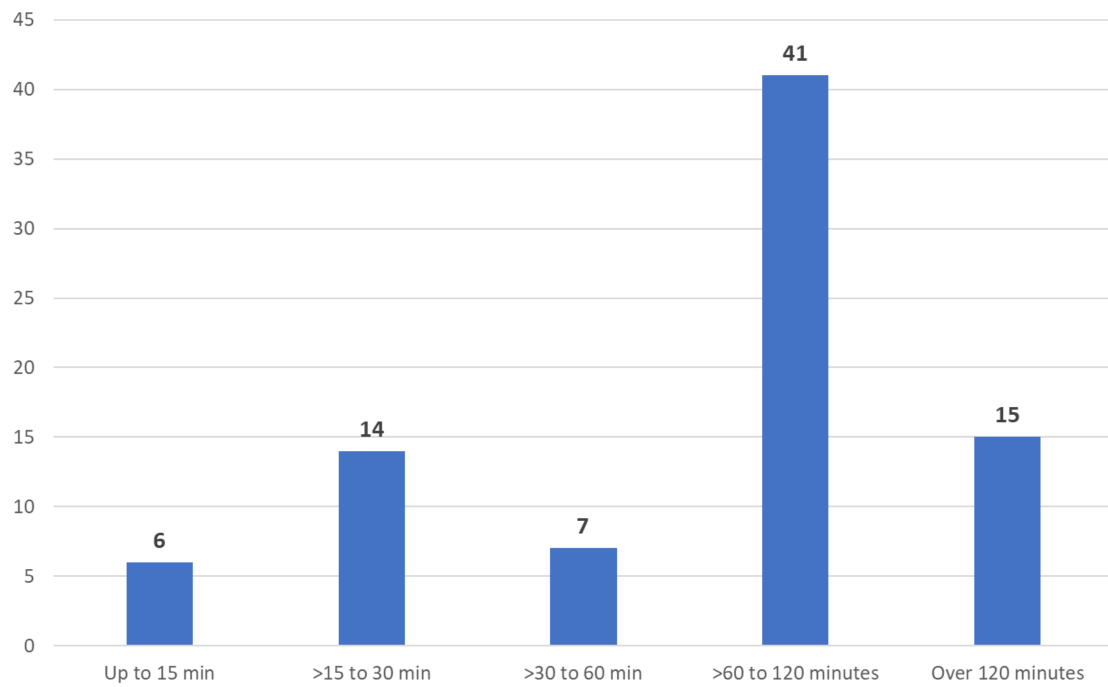
When it comes to cybersecurity and resilience, however, in 75 percent of the cases the operational risk management framework includes a specific cyber resilience framework. Notably, this figure was only 3 percent three years ago. Moreover, in 87 percent of the cases the operator already has a specialized unit that is responsible for identifying, detecting and protecting from

[16] Not all the 83 systems that indicated they use offsetting responded also about the offsetting modalities that they use.
[17] For example, by 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.

cyber threats (up from 58 percent in 2018). Also, in 56 percent of systems there is a cybersecurity committee in place involving the relevant stakeholders. The 2018 iteration showed that both the specialized unit and the stakeholder committee were more prevalent in high-income economies than in LMICs, but this changed dramatically in the current iteration with 85 percent of LMIC economies having a specialized unit compared to 92 percent for high-income economies, while the prevalence of the committee is similar between the two country categories. This is further developed in section VIII.

Ninety-four percent of the 85 operators that responded to this section of the survey reported having a formal business continuity plan (BCP) in place, compared to 86 percent in 2018. BCPs are reviewed and tested regularly by all but 7 of the 85 systems. Such practices are observed in all high-income countries and in all EAP and MNA countries. In contrast, the SA region lags in this specific area. Finally, 62 of the 85 operators perform these tests in coordination with interdependent FMIs. The latter indicator is significantly higher than in 2018.

Chart II.7 RTGS System Recovery Time Objective – Number of Systems



Regarding specific business continuity measures, 94 percent of the surveyed RTGS system operators reported having implemented a fully equipped alternate processing site, which is slightly higher than in the 2018 iteration. Moreover, 39 percent of the operators also report having a third backup site, which is also higher than the 33 percent reported in 2018 (and about 20 percent in 2015). The third alternate site is more prevalent in LMIC economies (42 percent compared to 31 percent in high-income economies). From a regional perspective, MNA and SSA have the highest shares of operators that report having a third site.

The last question in this area was on the recovery time objective (RTO). **Chart II.7** shows that the vast majority of RTGS systems operators target an RTO of no more than 2 hours or 120 minutes as recommended by the CPMI-IOSCO Principles for Financial Market Infrastructures (PFMIs).

Interdependencies

Survey results confirm the trend of high interdependencies between RTGS systems and other systems (other FMIs and retail payment systems) or service providers. **Chart II.8** and **Table II.17** show that 65 percent of the systems that answered this question have identified a dependency with a CSD-SSS (down from 83 percent in 2018 and the 81 percent in the 2015 iteration). In 23 percent of the cases the CSD-SSS is integrated in the same platform as the RTGS. In addition, in 18 percent of the systems the same entity operates the RTGS and the CSD-SSS, with a higher prevalence also in LMICs. Furthermore, 52 percent of the RTGS systems identified dependencies on a third-party service provider (e.g., a message carrier), similar to what observed in 2018.

Chart II.8: Dependencies applicable to the RTGS system

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The RTGS system is dependent on another system for final settlement (such as the Central Bank's General Ledger or other system that holds the current accounts of RTGS participants)	29% (27/92)	36% (4/11)	32% (6/19)	13% (2/15)	25% (4/16)	33% (3/9)	60% (3/5)	29% (5/17)	34% (22/65)	19% (5/27)
The system is dependent on a CSD-SSS (e.g. for collateralized intraday credit)	65% (60/92)	82% (9/11)	58% (11/19)	93% (14/15)	44% (7/16)	89% (8/9)	20% (1/5)	59% (10/17)	58% (38/65)	81% (22/27)
The system is dependent on one or more third-party service providers, such as technology provider or message carriers.	52% (48/92)	82% (9/11)	37% (7/19)	67% (10/15)	44% (7/16)	22% (2/9)	20% (1/5)	71% (12/17)	48% (31/65)	63% (17/27)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems.*

RTGS Users' Groups

To better address participants' needs, RTGS operators in many countries create forms of RTGS Users' Groups.[18] Out of a total of 92 responses, 71 percent indicated that such a group has been created for the RTGS system, this percentage being almost identical to the previous iteration (**Table II.16**). The EAP region and High-income OECD countries show higher results at 100 and 93 percent, respectively, while the lowest one is observed in the ECA region with only 42 percent.

Access and exit policies

The last set of questions for RTGS systems covers the issue of access and exit policies to these systems, including the types of entities that can become participants, the key conditions for their participation and conditions for terminating access. Commercial banks are the only type of entity that has direct access to the RTGS systems in all systems worldwide. In 18 percent of the cases, however, this access does not include access to central bank credit. Other types of banks and supervised NBFIs have direct access in 68 and 34 percent of the cases, respectively, though access to central bank credit is much less common. Direct access of supervised NBFIs including access

[18] The typical core objective of an 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.

to central bank credit is more common in high-income economies, while access to a settlement account only is more common in LMICs. In contrast, unsupervised NBFIs typically do not have direct access to RTGS systems. In only four cases direct access was reported – all of them without access to central bank credit, the same as in the 2018 iteration.

Where applicable, direct access to the RTGS system is granted to other system operators (e.g., CCPs, SSSs, ACHs, payment card network operator, FPS operators) with ACHs and SSSs being the most common participants, followed by CCPs, and all of them with less than 40 percent prevalence. Direct access of SSSs and CCPs is more common in high-income economies. Access to central bank credit is highly restricted to all these operators.

The current survey also included e-money issuers, the postal network (when not licensed as a bank), national treasuries, MNOs and MTOs as other potential participants in RTGS systems and asked the same questions as for the more traditional participants (**Table II.18**). Slightly less than half of National Treasuries have direct access to the RTGS system. In contrast, access of non-bank PSPs is slowly rising but in general terms is still low. Postal networks show the highest percentage, at 14 percent, while all others do not exceed 10 percent for direct access. Except for postal networks, these percentages are in general similar to those of the 2018 iteration.

Chart II.9 RTGS access policies

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. There is an explicit access/exclusion policy for the RTGS system	89% (82/92)	100% (11/11)	84% (16/19)	100% (15/15)	88% (14/16)	100% (9/9)	60% (3/5)	82% (14/17)	86% (56/65)	96% (26/27)
b. Access to the RTGS is granted on the basis of institutional standing (i.e. whether the applicant is a bank, or some other specific type of financial institution)	84% (77/92)	100% (11/11)	79% (15/19)	87% (13/15)	75% (12/16)	100% (9/9)	80% (4/5)	76% (13/17)	82% (53/65)	89% (24/27)
c. Access to the RTGS is granted on the basis of the fulfillment of a set of objective criteria to ensure a safe and sound operation of the system (e.g. capital requirements, technological capacity, internal risk controls, appropriate management, etc.)	76% (70/92)	64% (7/11)	84% (16/19)	87% (13/15)	63% (10/16)	100% (9/9)	40% (2/5)	76% (13/17)	79% (51/65)	70% (19/27)
d. Formal rules or arrangements are in place to allow the RTGS operator to exclude a system participant in a timely fashion	84% (77/92)	91% (10/11)	84% (16/19)	93% (14/15)	75% (12/16)	100% (9/9)	80% (4/5)	71% (12/17)	82% (53/65)	89% (24/27)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. The numbers in the chart refer to the number of RTGS systems.*

Chart II.9 and **Table II.19** show that 89 percent of all RTGS system operators indicate that they have an explicit policy that states the criteria for granting access to, and conditions for excluding participants from, the system (93 percent in the 2018 iteration). This high percentage is observed for all income levels and regions, except in the SA region with only 60 percent. In 84 percent of the cases, 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 non-financial institutions. At the same time, 76 percent of RTGS system operators 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 economies access criteria 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 84 percent of the operators that answered this question. No significant change is observed in these indicators compared to the 2012, 2015 and 2018 survey iterations.

OTHER SETTLEMENT SYSTEMS FOR LARGE-VALUE PAYMENTS

The last part of the large-value section of GPSS covers other settlement systems used for processing and settling large-value payments. Two sets of questions were asked: the type of settlement model used and where final settlement takes place.

In the current iteration, 15 economies worldwide indicated that they channel large-value payments through "other" systems, either partially or exclusively. This number is slightly lower than that of the 2018 and 2015 iterations (17 and 19, respectively).

Settlement model[19]

The settlement model used by these "other" systems are captured in **Table II.20a**. Not all 15 economies answered all questions though. The most common models are net settlement with multiple clearing cycles during the operating day (38 percent of the 8 responses received), followed by non-real-time gross settlement (38 percent) and end-of-day net settlement (25 percent). These percentages are similar to previous iterations. Out of the 3 reported systems with multiple cycles of net settlement, 1 are in high-income OECD economies and 2 in the LAC region.

Final settlement

Questions on where and how final settlement of these "other" systems occurs were answered by 9 economies (**Table II.20b**). Final settlement takes place through an RTGS system in 89 percent of the cases, meaning that in these economies the "other" system for large-value payments operates in parallel to the RTGS system. Out of these 8 systems, LAC and high-income OECD have 3 each. In the remaining cases, final settlement takes place in central bank money though not through an RTGS system.

Credit facilities and interdependencies

Credit facilities of such systems were also investigated (**Table II.22**). In 8 economies, if a participant does not have enough balance to process a new payment, the payment order is delayed until funds are available. In 2 cases, the payment order is rejected immediately. The operator extends collateralized intraday credit in two systems: one in the LAC region and another one in the SSA region. In two cases, there is a guarantee fund that allows some payments to go through even if the relevant participant does not have sufficient balance in its settlement account.

On interdependencies of these "other" systems for large-value payments, 3 systems that responded to this sub-section indicated dependency on another payment system for final

---

[19] As per the instructions in the questionnaire, only those economies that answered these questions are supposed to be using "other systems" for large-value payments.

settlement, while 5 systems indicated they are dependent on a CSD-SSS (e.g., for collateralized intraday credit), all of the latter being in the ECA, LAC and SSA regions **(Table II.23).** Finally, three system operators indicated dependence on a third-party service provider.

Special procedures for large-value cheques

Finally, the survey included questions on the existence of any special procedures for the settlement of large-value cheques (**Chart II.10** and **Table III.5a** and Table **III.5b**). A total of 21 economies reported that their cheque clearinghouse also handles large-value payments. Almost half of these economies are high-income.

Among the special procedures used, 59 percent of the subset of economies where a special procedure for large-value cheques exists indicated that cheques are settled with same-day value, this being the case in all the responding economies in the ECA and SSA regions. In 11 economies the procedure involves processing large-value cheques on a gross basis, and another 5 economies cheques are processed on a deferred net basis, but settlement occurs more than once a day. For deferred net processing, in 5 cases there is a settlement guarantee fund.

Chart II.10: Special clearing and settlement procedures for large-value cheques

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. As part of this procedure, large-value cheques can be settled with same-day value	59% (13/22)	50% (1/2)	100% (2/2)	25% (1/4)	57% (4/7)	50% (1/2)	50% (1/2)	100% (3/3)	67% (8/12)	50% (5/10)
b. As part of this procedure, large-value cheques are processed on a gross basis	58% (11/19)		50% (1/2)	50% (2/4)	83% (5/6)	50% (1/2)		100% (2/2)	50% (5/10)	67% (6/9)
c. As part of this procedure, net balances are calculated and settled more than once a day	28% (5/18)		50% (1/2)		33% (2/6)	50% (1/2)		50% (1/2)	30% (3/10)	25% (2/8)
d. There is a settlement guarantee fund for large-value cheques processed on a net basis	26% (5/19)		50% (1/2)		50% (3/6)	50% (1/2)			30% (3/10)	22% (2/9)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

SECTION III: RETAIL PAYMENT SYSTEMS AND INSTRUMENTS

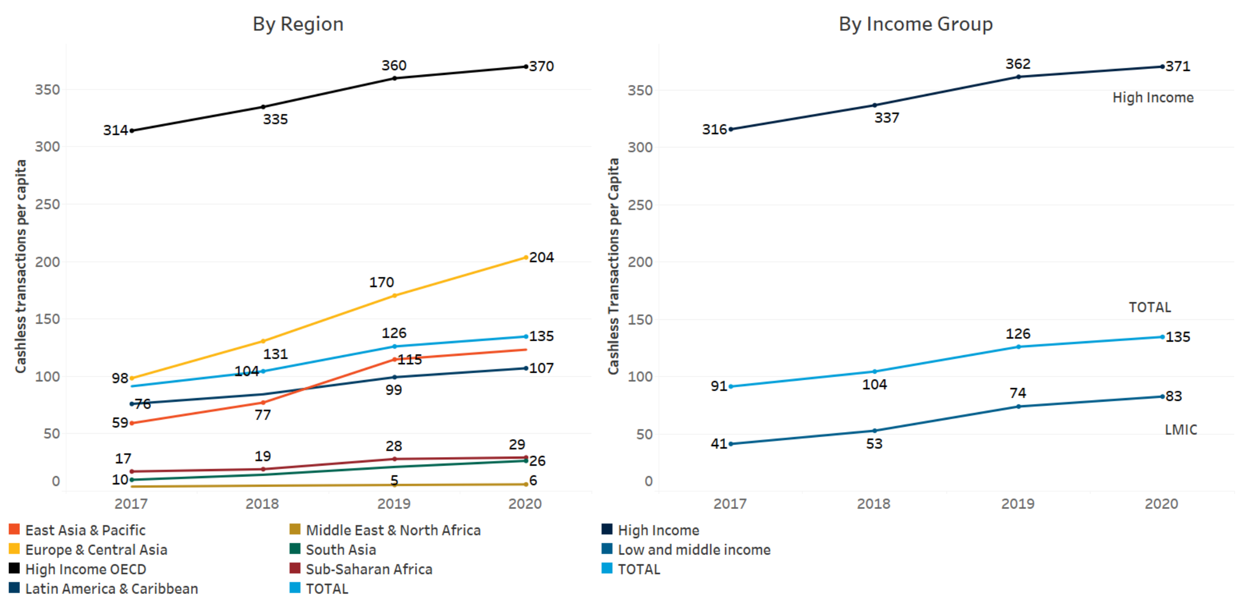
The existence of a wide range of payment instruments is essential to support customers' needs in a market economy. While a less than optimal use of payment instruments may ultimately have a negative impact on economic development and growth, the safe and efficient use of money as a medium of exchange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

This section provides insights on the use and evolution of non-cash payment instruments and access channels and focuses on the underlying clearing and settlement arrangements.

CASHLESS TRANSACTIONS PER CAPITA

Cashless transactions per capita grew by 48 percent (or 10 percent annually) between 2017 to 2020 to reach 135 transactions in 2020 (**Figure III.1**, **Table C.A**). The growth is more pronounced in the EAP and ECA regions, where cashless transactions doubled during the reporting period. While other regions have experienced double digit growth, a significant gap persists in SSA, SA and MNA, where cashless transactions per capita are over 80 percent lower than the global average. Cashless transactions per capita have doubled in LMICs, while the growth in high-income economies is more subdued estimated at 17 percent.

Figure III.1: Cashless transactions per capita by region and income groupings



CHEQUE CLEARING SYSTEMS

Of the 88 economies that provided responses to this section of the GPSS, 62 (70 percent) reported having a cheque clearinghouse. These systems exist in 77 percent of low- and middle-income economies and only in 61 percent of high-income economies. From a regional perspective, all reporting economies in the EAP, MNA and SA regions have a cheque clearing system (**Table III.4**).

Box 5: Abolition of cheques in South Africa and Namibia

In 2020, the South African Reserve Bank announced that the use of cheques as a payment instrument in the country would be completely phased-out by the end of 2021 due to declining usage and the availability of more efficient payment methods. The decision was made after consulting with various stakeholders and assessing the impact on the financial system. A similar decision was made in Namibia, where the central bank announced that cheques would be phased out by the end of 2021 due to declining usage and the adoption of electronic payment systems.

These plans were completed as planned. Both central banks worked with financial institutions to ensure that alternative payment methods were available to customers, and that the transition away from cheques was as smooth as possible.

The impact of phasing out cheques has been minimal, as the use of cheques had been declining significantly in these countries for several years.

Source: Authors' elaboration.

Cheque clearinghouse main features and efficiency of cheque processing

In 51 percent of the economies where such systems exist, the central bank acts as the operator (**Table III.4a**). From a country-income perspective, the central bank plays this role in 57 percent of LMICs and in 39 percent of high-income economies. From a regional perspective, significant involvement of the central bank as the operator was reported in the MNA region (75 percent) followed by SSA region (73 percent), while High-Income OECD economies had, as a group, the lowest percentage (31 percent) followed closely by ECA economies (33 percent).

Cheques are standardized across 96 percent of the 68 economies that answered this question (**Table III.4b**). This percentage is lower however in the ECA and EAP regions (83 and 71 percent, respectively). Cheque standardization is observed in all high-income economies and 93 percent of LMICs.

Regarding automation of cheque processing, as it was the case with the previous GPSS iteration, all economies that answered this question reported having this feature (**Table III.4c**). Eighty percent of the responding economies indicated they are using cheque truncation and image-based processing, while the remaining ones still exchange physical cheques even if their processing for payment is automated. Economies in EAP (40 percent) and LAC (27 percent) regions, and to a lesser extent also economies in ECA (25 percent) and High-Income OECD economies (20 percent), lag in adopting image-based cheque processing. PSDG experience in this area points to legal and regulatory issues as a barrier to further adoption of cheque truncation.

Clearing and settlement models

Most cheque clearinghouses (91 percent) use multilateral net settlement (**Table III.4d**). Net positions are calculated and settled only once a day in 74 percent of economies globally. This practice is more prevalent in high-income economies (81 percent) (**Table III.4e).** More than one settlement cycles each day is mostly observed in economies in the SA region (50 percent).

All economies indicated that the settlement of net positions happens in central bank money, and in 92 percent of the cases this occurs through the RTGS system (**Table III.4f**).

The actual crediting of customer accounts takes place not later than T+2 in 82 percent of the reporting economies. Economies in the ECA region have the highest percentage (67 percent) of cases in which crediting of customer accounts takes more time (**Table III.4g**).

Risk management

Only 59 percent of the reporting economies stated their cheque clearinghouse has a settlement risk management framework in place (**Table III.6a**). The percentage is highest in LMICs (65 percent) compared to high-income ones (50 percent), possibly reflecting the fact that cheque clearing systems in the latter are considered to have less systemic risk potential. From a regional perspective, in ECA only 3 of 12 reporting economies (25 percent) stated that their cheque clearinghouse has established this framework, in contrast to 80 percent of economies EAP.

Chart III.1: Credit and liquidity risk controls in the cheque clearinghouse

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. In the event a participant is unable to settle its debit position, an unwinding procedure would be initiated	73% (27/37)	100% (3/3)	50% (1/2)	78% (7/9)	78% (7/9)	50% (2/4)		78% (7/9)	72% (18/25)	75% (9/12)
b. Participants have access to information during the day on their preliminary position in the clearinghouse	87% (34/39)	100% (4/4)	50% (1/2)	78% (7/9)	100% (9/9)	50% (2/4)	100% (1/1)	100% (10/10)	93% (25/27)	75% (9/12)
c. There are limits in place to protect netting systems from significant exposures	49% (18/37)	67% (2/3)		50% (4/8)	44% (4/9)	25% (1/4)		70% (7/10)	54% (14/26)	36% (4/11)
d. There is a specific guarantee fund in place for the system	39% (15/38)	25% (1/4)	50% (1/2)	38% (3/8)	56% (5/9)	50% (2/4)		30% (3/10)	44% (12/27)	27% (3/11)
e. Risk management mechanisms in place ensure completion of daily settlements in case of the inability to settle by the participant with the largest single settlement obligation	71% (27/38)	75% (3/4)	50% (1/2)	75% (6/8)	67% (6/9)	50% (2/4)		90% (9/10)	74% (20/27)	64% (7/11)
f. The Central Bank or the operator ultimately provides liquidity to the system	65% (24/37)	67% (2/3)		50% (4/8)	67% (6/9)	25% (1/4)	100% (1/1)	100% (10/10)	73% (19/26)	45% (5/11)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

More detailed risk management mechanisms for credit and liquidity risks were analyzed in further detail. The results are shown in **Chart III.1** and **Table III.6b.**

Eighty-seven percent of the economies that responded indicated that cheque clearinghouse participants have access to information during the day about their preliminary settlement positions so that they can make arrangement for funds for settlement accordingly. Only in 71 percent of the responding economies there are mechanisms in place to ensure completion of daily settlements in case of the inability to settle by the participant with the largest single settlement obligation. Further, in 65 percent of the cases the central bank or the operator of the cheque clearing system provides liquidity. This feature is highly prevalent in SA and SSA economies (100 percent each), followed by LAC and EAP economies (67 percent each).

In 39 percent of the cases, a settlement guarantee fund is available. Guarantee funds are available in 44 percent of LMICs, 56 percent of the economies in LAC, and half the economies in ECA and MNA. Further, only 49 percent of respondents set limits to net debit positions.

Lastly, in 73 percent of the economies that answered this specific question item, 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 feature is also present in at least half of economies in each region, except for MNA (0 percent).

AUTOMATED CLEARINGHOUSES OR ACHS

This part of GPSS 2021 refers to automated clearinghouses (ACH) that process electronic funds transfer (EFT) type transactions, such as credit transfers and direct debits, and potentially other instruments.[20] These systems have been undergoing significant evolution.[21] For example, in many EU economies domestic ACHs have been discontinued and EFT-type transactions have been migrated to the pan-European platform. In other economies, ACH-type transactions are processed through so-called Automated Transfer Systems (ATS) that are a component of modern RTGS platforms that handle both real-time critical payments as well as non-time critical payments. Furthermore, in about 40 percent of cases, the ACH system also supports fast payments processing (**Chart III.2** and **Table III.7**).

Survey results show that a total of 105 ACH systems serve 82 economies (**Table III.6**), which is similar to the 108 ACHs for 87 economies reported in GPSS 2018. Eighty-four percent of the economies had one ACH system, while 11 percent had two ACHs and 5 percent had 3 systems of this kind. Also, there are some ACHs that serve more than one economy, e.g., the case of the ACH system operated by the BCEAO for the economies of the Western African Monetary Union.

Key features of ACH systems

Globally, about 36 percent of ACHs are operated by central banks (**Table III.7b**), again similar to what observed in 2018. In terms of regional comparison, central bank-operated ACHs are more prevalent in economies in the MNA, SSA and SA regions (75, 56 and 50 percent, respectively). Much smaller differences are observed in terms of income groupings (**Chart III.2** and **Table III.7b**).

Twenty-one percent of the systems process only credit transfers, while 66 percent of them process credit transfers and direct debits. The share of ACH systems that support direct debits varies widely across economy income levels and regions.

Forty-two percent of the ACH systems process truncated cheques. Moreover, ACH systems process fast payments in 40 percent of the economies globally, especially in High-income OECD

[20] This definition of an ACH has been used for the purposes of the GPSS. In practice, a separate system like a payment cards switch is also an automated clearinghouse, and some countries that have automated cheque processing also consider that cheque clearinghouse as an ACH. Moreover, FPSs that settle on a net basis can also be considered an ACH.

[21] See also Section VIII on Reforms.

economies (77 percent), compared to 37 percent observed in the previous GPSS iteration. From an income perspective, ACHs support the processing of fast payments in 62 percent of high-income economies, compared to only 27 percent of LMICs.

Chart III.2: Key features of ACH

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. The ACH is operated by the Central Bank	36% (38/105)	25% (2/8)	33% (6/18)	23% (7/30)	26% (5/19)	75% (6/8)	50% (2/4)	56% (10/18)	44% (29/66)	23% (9/39)
b. The ACH allows the processing of credit transfers only	21% (22/105)	38% (3/8)	28% (5/18)	13% (4/30)	16% (3/19)	25% (2/8)	25% (1/4)	22% (4/18)	26% (17/66)	13% (5/39)
c. The ACH allows the processing of credit transfers AND direct debits	66% (69/105)	50% (4/8)	50% (9/18)	73% (22/30)	68% (13/19)	75% (6/8)	75% (3/4)	67% (12/18)	61% (40/66)	74% (29/39)
d. The ACH also allows the processing of truncated cheques	42% (44/105)	25% (2/8)	6% (1/18)	50% (15/30)	42% (8/19)	38% (3/8)	75% (3/4)	67% (12/18)	39% (26/66)	46% (18/39)
e. The ACH also allows the processing of fast payments	40% (42/105)	38% (3/8)	11% (2/18)	77% (23/30)	32% (6/19)	13% (1/8)	25% (1/4)	33% (6/18)	27% (18/66)	62% (24/39)
f. Net balances are calculated and settled once a day or in longer time intervals	36% (38/105)	50% (4/8)	56% (10/18)	23% (7/30)	26% (5/19)	50% (4/8)		44% (8/18)	41% (27/66)	28% (11/39)
g. Net balances are calculated and settled in multiple times during the same day	63% (66/105)	50% (4/8)	61% (11/18)	67% (20/30)	68% (13/19)	63% (5/8)	100% (4/4)	50% (9/18)	62% (41/66)	64% (25/39)
h. Final settlement of net positions takes place through an RTGS system	89% (93/105)	100% (8/8)	89% (16/18)	80% (24/30)	89% (17/19)	88% (7/8)	75% (3/4)	100% (18/18)	92% (61/66)	82% (32/39)
i. Final settlement takes place in Central Bank money, but not through an RTGS	9% (9/105)			10% (3/30)	21% (4/19)	13% (1/8)	25% (1/4)		6% (4/66)	13% (5/39)
j. Final settlement takes place in commercial bank money	15% (16/105)	25% (2/8)	11% (2/18)	7% (2/30)	11% (2/19)	13% (1/8)	25% (1/4)	33% (6/18)	18% (12/66)	10% (4/39)
k. The ACH is using ISO20022 message format	46% (48/105)	50% (4/8)	44% (8/18)	60% (18/30)	16% (3/19)	50% (4/8)	75% (3/4)	44% (8/18)	39% (26/66)	56% (22/39)
l. If ACH is not using ISO20022, is there a plan to mitigate to that message format in the next 2 years?	29% (30/105)		28% (5/18)	17% (5/30)	42% (8/19)	38% (3/8)	25% (1/4)	44% (8/18)	35% (23/66)	18% (7/39)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

In terms of settlement of ACH transactions, most ACH systems (89 percent) reported that the final settlement of the net positions takes place in the RTGS system of the respective economy.

Globally, in 63 percent of the ACH systems net balances are calculated and settled multiple times a day, while in the rest they are calculated and settled only once a day or at longer time intervals. Multiple daily settlements are common across all economy income levels. From a regional perspective, the highest percentage for multiple daily settlements is observed in the SA (100 percent), followed by LAC (68 percent), and the lowest in EAP and SSA (50 percent in each).

Messaging standards

Globally, 48 of 105 economies (46 percent) reported usage of ISO 20022 as the messaging standard for their ACH system. Further, 30 of 105 (29 percent) economies reported that there is a plan to migrate to ISO 20022 standards within the next 2 years (**Chart III.2** and **Table III.7b**).

The adoption of ISO 20022 messaging standards is highest in high-income economies at 56 percent. In terms of regional comparison, usage of ISO 20022 standards is highest in the economies of the SA region (75 percent), followed by High-income OECD economies (60 percent), and the EAP and MNA regions (50 percent each). In other regions, adoption ranges from 16 percent (LAC region) to 44 percent (SSA and ECA regions).

Risk management

This part of the questionnaire focused on settlement risk (**Chart III.3** and **Table III.8a**). Ninety-two percent of the economies that responded to this question item indicated that they have a settlement risk management framework for the ACH operating in their economies.

Among the key settlement risk management features, 84 percent of ACHs provide their participants with access to information during the day on their preliminary settlement positions (**Chart III.3** and **Table III.8b**).

Chart III.3: Settlement risk management tools in ACHs

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. In the event a participant is unable to settle its debit position, an unwinding procedure would be initiated	65% (58/89)	86% (6/7)	62% (8/13)	63% (17/27)	76% (13/17)	50% (3/6)	50% (1/2)	59% (10/17)	68% (39/57)	59% (19/32)
b. Participants have access to information during the day on their preliminary positions in the clearinghouse	84% (75/89)	86% (6/7)	100% (13/13)	78% (21/27)	65% (11/17)	100% (6/6)	100% (2/2)	94% (16/17)	88% (50/57)	78% (25/32)
c. There are limits in place to protect netting systems from excessive exposures	38% (34/89)		54% (7/13)	22% (6/27)	41% (7/17)	67% (4/6)	50% (1/2)	53% (9/17)	46% (26/57)	25% (8/32)
d. There is a specific guarantee fund in place for the system	29% (26/89)	43% (3/7)	15% (2/13)	30% (8/27)	35% (6/17)	17% (1/6)	50% (1/2)	29% (5/17)	32% (18/57)	25% (8/32)
e. The guarantee fund ensures completion of the daily settlement in case of inability to settle by the participant with the largest single settlement obligation	28% (25/89)	43% (3/7)	15% (2/13)	26% (7/27)	35% (6/17)	17% (1/6)	50% (1/2)	29% (5/17)	32% (18/57)	22% (7/32)
f. The Central Bank or the operator provides ultimately liquidity to the system	44% (39/89)	86% (6/7)	8% (1/13)	30% (8/27)	41% (7/17)	33% (2/6)	50% (1/2)	82% (14/17)	49% (28/57)	34% (11/32)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Setting limits to net debit positions is used as a tool to protect netting system from excessive exposures in 38 percent of the ACH systems. None of the economies in the EAP region reported having such a feature. In contrast, most of the economies in MNA (67 percent), ECA (54 percent), SSA (53 percent) and SA (50 percent) regions reported having this control in place.

Globally, there is a specific settlement guarantee fund in place for ACH transactions in 29 percent of the reported ACHs (33 percent was reported in the previous iteration). In practically all cases where this fund exists, the purpose is to ensure completion of the daily settlement in case of inability to settle by the participant with the largest single settlement obligation.

The central bank ultimately provides liquidity to ACHs in 44 percent of the reported systems, with this being more prominent in LMICs (49 percent) than in high-income economies (34 percent).

Further, in about two-thirds of the systems (65 percent) there are provisions in place to initiate an unwinding procedure in the event a participant is unable to settle its net debit position (71 percent in GPSS 2018). This tool is common in the majority of economies, except in the MNA and SA regions where only 50 percent of the economies reported this feature. This procedure is slightly more common in LMICs (68 percent), compared to high-income economies (59 percent).

Access to the ACH

Most respondents (97 percent) indicated that commercials banks have direct access to the ACH systems (**Table III.9a to Table III.9k**). Other types of institutions have, in general, much lower direct access rates. These include the National Treasury (30 percent), supervised NBFIs (23 percent), postal networks (15 percent) and other non-bank PSPs (11 percent).

Indirect access with an ability to send payment orders to the ACH system (as opposed only to receiving incoming payments) is not common, with the highest percentage observed for local MTOs at only 9 percent. Indirect access to ACH without the ability to send transactions to the ACH system (i.e., only receive transactions) is observed for supervised NBFIs at 17 percent followed by other non-bank PSPs (13 percent) and local MTOs (11 percent).

FAST PAYMENTS

Given the growing importance of fast payments and FPSs, the GPSS 2021 included several additional questions to better understand the *status quo* in this area, with a focus on system implementation and key operational features.

Box 6: The World Bank Fast Payments Toolkit

The World Bank has been monitoring developments in fast payments and has been leading a dedicated workstream on analyzing fast payment implementations across the world. The work aims to provide policy guidance on the aspects that authorities need to consider when developing or enhancing an FPS and incorporating the same in their NPS reform agenda.

The work, which is featured in a policy toolkit,* consists of different components and is based on the analysis of multiple FPS implementations across the world. These components are:

1. Global tracker of FPS implementations with high level information.
2. A framework, organized in a flagship report, which guides counties across the different stages of an FPS lifecycle: conceptualize – design/implement – go live/scale up.
3. Country case studies on the FPS implementation journey, spanning from technical design features to risks to governance, among other.
4. Focus notes on specific technical topics deemed highly relevant for fast payments (e.g., QR codes, aliases, scheme rules).

* https://fastpayments.worldbank.org/

Current implementation of FPSs and plans to operationalize an FPS

Fifty-seven respondents out of 93 (61 percent, compared to only 43 percent in the previous iteration) indicated that an FPS or service is already operational in their economies (**Chart III.4** and **Table III.10**). High-income economies (82 percent) currently lead in the implementation of this type of system/service, compared to 47 percent in LMICs. From the regional angle, High-income OECD economies (93 percent) lead in this aspect closely followed by EAP (71 percent), LAC (64 percent), MNA (50 percent) and SA (50 percent) regions. The ECA (31 percent) and SSA (38 percent) regions lag in the implementation of FPSs. Twenty-seven economies respondents also indicated that an FPS is being planned for implementation within the next 3 years.

Chart III.4 FPSs already in place and plans for implementation in the near future

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Has a "fast payments" system for retail payments been developed in the country and is it already operational?	61% (57/93)	71% (5/7)	31% (5/16)	93% (26/28)	64% (9/14)	50% (4/8)	50% (2/4)	38% (6/16)	47% (26/55)	82% (31/38)

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Is there a plan to implement a system in the near future (next one to three years)?	75% (27/36)	50% (1/2)	90% (9/10)	60% (3/5)	60% (3/5)	75% (3/4)	100% (2/2)	75% (6/8)	77% (20/26)	70% (7/10)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Implementation method

Leveraging an existing ACH system was the most common choice of implementation, observed in 59 percent of FPSs currently in operation (**Table III.26**). Predominance of this was observed in high-income economies (86 percent) compared to LMICs (37 percent). From a regional perspective, most reported their FPS implementations were on the existing ACH systems. About 50 percent of the economies in the MNA, EAP and LAC regions reported having leveraged ACH systems, but none of the economies in the SA region reported such usage.

Settlement model[22]

Real-time gross settlement was a preferred choice for settlement for 55 percent of FPSs, while 43 percent opted for deferred net settlement (**Table III.12c**). The corresponding figures for the 2018 survey were 52 and 46 percent. Only one high-income economy reported deferred gross settlement. While High-income economies (75 percent) indicated preference for the gross settlement method, LMICs as a group preferred deferred net settlement (64 percent).

[22] Based on the World Bank's experience, the choice of the settlement model is often a function of how fast payments were implemented. If it was a brand-new system implementation, it is more likely to follow the instant gross settlement model, whereas if it is an adaptation/upgrade of an existing system (e.g., ATM switch or ACH), then it is more likely to be using the deferred net settlement model.

In the regional context, deferred net settlement was mostly preferred in the SA (100 percent), MENA (80 percent) and EAP (67 percent) economies. Other regions show preference for real-time gross settlement.

Messaging standards[23]

Globally, ISO 20022 is the standard adopted by 68 percent of FPSs, followed by ISO 8583 (9 percent) (**Table III.12h**). High-income economies (85 percent) had a higher share of ISO 20022 adoption. In terms of regional comparisons, while ISO 20022 message standards were observed mostly in EAP (100 percent) and High-income OECD (82 percent) economies, they are also common among ECA (57 percent) and MNA (75 percent) economies. On the other hand, ISO 8583 was mostly observed in SA (50 percent) and SSA (50 percent) economies.

Chart III.5: Payment instruments supported by fast payments

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
1.Cards (debit, credit)	21% (9/42)		40% (2/5)	13% (2/16)	17% (1/6)	50% (2/4)	50% (1/2)	25% (1/4)	23% (5/22)	20% (4/20)
2. Credit Transfer	98% (57/58)	100% (6/6)	100% (7/7)	100% (25/25)	100% (9/9)	100% (4/4)	100% (2/2)	80% (4/5)	96% (27/28)	100% (30/30)
3. Direct Debit	39% (17/44)	50% (3/6)	60% (3/5)	24% (4/17)	33% (2/6)	50% (2/4)	100% (2/2)	25% (1/4)	43% (10/23)	33% (7/21)
4. e-money	39% (16/41)	60% (3/5)	25% (1/4)	7% (1/15)	40% (2/5)	75% (3/4)	50% (1/2)	83% (5/6)	55% (12/22)	21% (4/19)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Payment instruments supported by FPSs

In terms of payment instruments, all but one economy (98 percent) that have an FPS in place answered this question indicating that the system supports account-based credit transfers (**Chart III.5** and **Table III.12d**). Card-based funds transfers are supported in 9 economies (21 percent) and in 39 percent of the cases the FPS also support direct debits. Further, in 16 economies (39 percent) e-money is also supported by the FPS. The SSA (83 percent) and MNA (75 percent) economies had the highest support for e-money instruments.

Channels from which fast payments may be accessed

Regarding the channels from which fast payments may be accessed, at the global level agent/branch (100 percent), Internet banking (100 percent) and mobile (96 percent) were

[23] The questionnaire had asked for specifying the message formats used, so these were grouped as ISO 20022, ISO 8583 and "others" for the purposes of the analysis. Based on the World Bank's experience, the choice of messaging standards is also often a function of how the FPS was implemented. If it was a brand-new system implementation, it is more likely to follow ISO 20022; if it is an upgrade of the existing cards switch, it is more likely to follow ISO 8583; and if it is an upgrade of ACH, it is more likely to be the message format used in the original ACH system.

reported as channels that can be used to initiate a transaction of this kind, followed by POS/QR codes (69 percent) and ATMs (53 percent) channels (**Chart III.6** and **Table III.12e**).

Chart III.6: Channels from which fast payments may be accessed

		By Region							By Income Level	
Global		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
1.Internet	100% (57/57)	100% (6/6)	100% (7/7)	100% (23/23)	100% (9/9)	100% (5/5)	100% (2/2)	100% (5/5)	100% (29/29)	100% (28/28)
2.Mobile	96% (55/57)	100% (6/6)	100% (7/7)	91% (21/23)	100% (8/8)	100% (5/5)	100% (2/2)	100% (6/6)	100% (29/29)	93% (26/28)
3.ATM	53% (23/43)	60% (3/5)	100% (4/4)	37% (7/19)	60% (3/5)	75% (3/4)	100% (2/2)	25% (1/4)	70% (14/20)	39% (9/23)
4.POS/QR Code	69% (29/42)	60% (3/5)	100% (6/6)	50% (8/16)	60% (3/5)	75% (3/4)	100% (2/2)	100% (4/4)	81% (17/21)	57% (12/21)
5.Agent/branch	100% (27/27)	100% (2/2)	100% (5/5)	100% (7/7)	100% (3/3)	100% (5/5)	100% (2/2)	100% (3/3)	100% (18/18)	100% (9/9)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

When it comes to ATMs, economies in the SA (100 percent) and ECA (100 percent) regions lead in that aspect. POS/QR code channel is also very popular in the SSA (100 percent), SA (100 percent), ECA (100 and MNA (75 percent) regions. In other regions also most of the economies reported the availability of POS/QR code as a channel for FPS.

Limits on fast payment transactions

Per transaction and/or daily limits for users of fast payment services are a common risk management measure set by the operator and/or the participating PSPs (**Table III.12f**). Seventy-seven percent of the 56 respondents indicated that they have set per transaction limits. These are more common in MNA (100 percent), SA (100 percent), SSA (83 percent), and ECA (83 percent), followed closely by high-income OECD (74 percent), EAP and LAC regions (67 percent each).

Regarding daily amount limits per user, only 27 percent of respondents indicated they are using this type of limit. It is observed mostly in SA (100 percent) and MNA (75 percent) economies.

Support for alias names

Globally, 35 of the reported FPSs (60 percent) support the use of alias names of some kind (e.g., phone number, email ID, national ID, or others) and this is more common LMICs (69 percent) (**Table III.12i** and **Chart III.7**). Looked from the regional angle, this feature is more common and above global average in EAP (100 percent), ECA (86 percent) and MNA (75 percent) economies.

Chart III.7 Fast Payment Systems Operations and Rules

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
f. Is there a limit to the amount that can be paid via this service for each transaction?	77% (43/56)	67% (4/6)	83% (5/6)	74% (17/23)	67% (6/9)	100% (4/4)	100% (2/2)	83% (5/6)	82% (23/28)	71% (20/28)
g. Is there a limit to the daily amount that can be paid via this system for each user?	27% (15/56)	17% (1/6)		22% (5/23)	25% (2/8)	75% (3/4)	100% (2/2)	33% (2/6)	25% (7/28)	29% (8/28)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

<u>Support for Application Programing Interfaces (APIs) in Fast payment transactions</u>

Globally, 28 of the reported FPSs (51 percent) support the use of APIs (**Chart III.7** and **Table III.12j**). From a regional perspective, this feature is above global average in the economies in the EAP (67 percent), SSA (67 percent) and LAC (56 percent) regions.

<u>Access to FPS</u>

Globally, commercial banks had the highest levels of direct access to the FPS and its services, being observed in 52 of the 55 reporting systems, or 95 percent (**Table III.12k**). This is followed by banks other than commercial banks (69 percent), supervised NBFIs (33 percent), the National Treasury (27 percent) and the postal network (24 percent). In contrast, direct access was lower for MNOs and other non-bank e-money issuers (20 percent), and even lower for exchange bureaus, International MTOs and Local MTOs (each of them 5 percent or less).

Direct access by MNOs and other non-bank e-money issuers is mostly observed in EAP (40 percent). Postal networks have direct access to the FPS mostly in ECA (40 percent), but in no economy in LAC.

Indirect access to FPS with the ability to enter transactions in the system to FPS is not generally the norm across all kinds of institutions. This form of access ranges from a high of 13 percent (for supervised NBFIs and other non-bank PSPs) to a low of 4 percent (Postal network and exchange bureaus). Other types of institutions fall in between.

PAYMENT CARD SYSTEMS

This section covers payment cards, payment card switches and other related aspects.

The main features of payment card systems are shown in **Chart III.8** and **Table III.13.**

<u>Dominant payment card brands</u>

As shown in **Chart III.8** and **Table III.13**, international brands dominate the domestic card market in 67 of the 90 responding economies (74 percent, same as for the 2018 survey). They are somewhat more dominant in LMICs (78 percent) than in high income economies (69 percent). International brands are very dominant and have an equal or higher than global average market share in the economies of the ECA, LAC and SA regions (94, 93 and 75 percent, respectively), similar to GPSS 2018. They are still a majority in other regions as well but have less than the global average market share in SSA (67 percent), MNA (67 percent), high-income OECD (64 percent), and EAP (57 percent).

Payment card switches operating in the economy

This question was answered by 87 central banks which have at least one operational payment card switch (i.e., in production stage).[24] Globally, 80 percent of these economies indicated there is at least one payment card switch operating in their economy (**Chart III.8** and **Table III.13)**.

Chart III.8 Payment card systems main features

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Which brands dominate the marketplace for payment cards?	1 Local card brands	26% (23/90)	43% (3/7)	6% (1/16)	36% (9/25)	7% (1/14)	33% (3/9)	25% (1/4)	33% (5/15)	22% (12/55)	31% (11/35)
	2 International brands	74% (67/90)	57% (4/7)	94% (15/16)	64% (16/25)	93% (13/14)	67% (6/9)	75% (3/4)	67% (10/15)	78% (43/55)	69% (24/35)
Is there is at least one payment card switch operating inside the country?	YES	80% (70/87)	86% (6/7)	67% (10/15)	87% (20/23)	86% (12/14)	89% (8/9)	75% (3/4)	73% (11/15)	78% (42/54)	85% (28/33)
Is there a domestic card scheme in the country?	YES	68% (58/85)	100% (6/6)	60% (9/15)	63% (15/24)	64% (9/14)	71% (5/7)	75% (3/4)	73% (11/15)	71% (37/52)	64% (21/33)
- Can banks issue co-branded cards with international card schemes	YES	89% (64/72)	83% (5/6)	75% (9/12)	94% (17/18)	92% (12/13)	71% (5/7)	100% (3/3)	100% (13/13)	87% (40/46)	92% (24/26)
- Can cards issued under the domestic scheme be used at POS terminals	YES	84% (58/69)	100% (6/6)	67% (8/12)	94% (15/16)	77% (10/13)	83% (5/6)	100% (3/3)	85% (11/13)	84% (38/45)	83% (20/24)
- If YES, can cards issued under the domestic scheme be used at POS terminals	YES	92% (55/60)	100% (6/6)	78% (7/9)	100% (15/15)	90% (9/10)	80% (4/5)	100% (3/3)	92% (11/12)	92% (36/39)	90% (19/21)
- Does the domestic card scheme support the EMV standard?	YES	80% (51/64)	100% (6/6)	60% (6/10)	94% (15/16)	55% (6/11)	60% (3/5)	100% (3/3)	92% (12/13)	78% (32/41)	83% (19/23)
Can contactless payments with cards be made at POS terminals?	YES	92% (82/89)	100% (7/7)	94% (15/16)	100% (25/25)	87% (13/15)	88% (7/8)	100% (4/4)	79% (11/14)	87% (47/54)	100% (35/35)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

In terms of a region wise comparison on the availability of at least one operational payment card switch, High-income OECD (87 percent), MNA (89 percent), LAC (86 percent), and EAP (86 percent) regions had higher than the global average. This percentage in the SA (75 percent), SSA (73 percent) and ECA (67 percent) regions is lower than the global average, but still represents a majority of the economies in each of those regions (**Chart III.8** and **Table III.13)**.

Domestic Card Schemes

Fifty-eight of the 85 economies (68 percent) reported that there is a domestic card scheme operating in the respective economies (**Chart III.8** and **Table III.13)**. Domestic card schemes are

[24] 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. It is typically used for routing authorization and authentication-related messages between participating institutions and can also generate and distribute clearing and settlement files (and in this last sense it can be considered an ACH).

available in 71 percent of LMICs and 64 percent of high-income economies. From a regional perspective, domestic card schemes are available in all EAP (100 percent) economies and in most of the SA and SSA economies (75 and 73 percent, respectively).

Other relevant features of domestic card schemes include:

- In 64 economies (89 percent), it possible to issue cards issued under the domestic scheme in co-branded form with international card schemes This is common among all income levels and regions, although slightly less so in the MNA region (71 percent).
- In 58 economies (84 percent) it is possible to use cards issued under the domestic scheme at POS terminals. Further, in 92 percent of these economies POS terminals support contactless card payments. The latter feature is available in 100 percent of high-income economies and 87 percent of LMICs.
- Where domestic card schemes are in operation, 51 of 64 economies (80 percent) support EMV standards. Support for EMV standards is highly prevalent across all income level economies and regions.

Interoperability

Central banks were asked to assess the interoperability of ATMs, POS terminals and mobile money (at least for person-to-person transfers) terminals using four broad categories: full interoperability, good interoperability, low interoperability, and no interoperability (**Table III.14a).**

For ATMs and POS terminals, of the 89 central banks that answered these questions, 63 of them (71 percent) reported "full interoperability" for ATMs and 70 percent for POS terminals.[25] If "full interoperability" and "good interoperability" are considered together, globally ATM interoperability stands at 91 percent and POS interoperability at 90 percent. For ATMs, this combination of "full interoperability" and "good interoperability" is common across all income level economies and regional economies, while the combination of "low interoperability" and "no interoperability" is only observed in LMICs (15 percent), and from a regional perspective in economies in LAC and SSA (27 percent each) (**Table III.14a**). Regarding POS terminals, the combination of "full interoperability" and "good interoperability" is high in high-income economies (100 percent), while 15 percent of LMICs assesses their situation as characterized by "low interoperability" or "no interoperability" at all (**Table III.14b**). From a regional perspective, the combination for "low interoperability" and "no interoperability" is found in the economies of LAC and SSA (26 percent each).

Usage of payment card instruments

To understand payment card usage, there was a question on the actual usage of payment cards as payment instruments (other than for cash withdrawals) (**Table III.14d**). Of the 88 economies that answered this question, globally in 77 percent of the economies the payment cards are used to make payments at the point of sale. Extensive usage of payment cards is observed in 91

[25] Separate questions were asked for ATMs and POS terminals, and for this reason it may be that one or more countries reported full interoperability only for ATMs or only for POS terminals.

percent of high-income economies and 69 percent of LMICs. Looked from the lens of regions, the actual usage of cards to make payments is prominent in SA (100 percent), High-income OECD (92 percent), ECA (87 percent) and EAP (83 percent) economies, while it lags in LAC (64 percent), MNA (67 percent) and SSA (53 percent).

<u>Payment services provided through ATMs</u>

In many economies, a growing range of services is offered through ATMs in addition to cash withdrawals. **Chart III.9** and **Table III.15** show the responses for six such services. Globally, cash deposits (95 percent), credit transfers to other accounts within the bank (87 percent), bill payments (72 percent) and credit transfers to other accounts in any other bank (57 percent) are offered through ATMs. Other than cash withdrawal, cash deposit is the most common service offered among LMICs (92 percent), followed by credit transfers to accounts within the same bank (86 percent) and bill payments (76 percent). Other services are much less common in LMICs.

Chart III.9: Payment services other than cash withdrawals provided through ATMs

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. Bill payments	72% (58/81)	83% (5/6)	79% (11/14)	75% (18/24)	91% (10/11)	56% (5/9)	75% (3/4)	46% (6/13)	76% (38/50)	65% (20/31)
b. Cash deposits	95% (81/85)	100% (6/6)	93% (14/15)	100% (24/24)	100% (14/14)	89% (8/9)	100% (4/4)	85% (11/13)	92% (48/52)	100% (33/33)
c.Purchases (e.g. tickets)	42% (28/67)	33% (2/6)	38% (5/13)	59% (10/17)	40% (4/10)	25% (2/8)	33% (1/3)	40% (4/10)	40% (17/43)	46% (11/24)
d. Credit transfers to other accounts within the same bank	87% (72/83)	83% (5/6)	92% (12/13)	88% (21/24)	92% (12/13)	100% (9/9)	75% (3/4)	71% (10/14)	86% (44/51)	88% (28/32)
e. Credit transfers to accounts at any other bank	57% (41/72)	83% (5/6)	36% (4/11)	73% (16/22)	56% (5/9)	50% (4/8)	50% (2/4)	42% (5/12)	56% (24/43)	59% (17/29)
f. Other	35% (12/34)	100% (2/2)	0% (0/0)	50% (5/10)	29% (2/7)	0% (0/0)	67% (2/3)	25% (1/4)	25% (5/20)	50% (7/14)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

When looked from a regional perspective, cash deposits (ranging from 85 to 100 percent) and credit transfers to other accounts within the bank (ranging from 71 to 100 percent) are highly prevalent in all regions. This is followed by bill payments, ranging from 46 to 91 percent in the various regions. EAP economies (83 percent) lead in credit transfers to accounts at any other bank, while ECA (36 percent) and SSA (42 percent) economies lag in this aspect.

<u>Processing and settlement of ATM and POS transactions</u>

In 81 percent of the reporting economies, domestic ATM transactions are processed (including clearing and settlement) within the economy (**Table III.16**). The equivalent figure for the 2018 iteration was 90 percent. The ECA region is the one showing the lower percentage of economies that process ATM transactions domestically, at 62 percent. In contrast, economies in EAP and the LAC regions show the highest percentages at 100 and 92 percent, respectively.

Where transactions are processed within the economy, 43 of 78 respondents (63 percent) indicated that most domestic ATMs networks are interconnected, enabling inter-network customer transactions, which results in inter-network clearing and settlement. This is below the 84 percent reported in the 2018 iteration. Nineteen respondents (28 percent) indicated that all domestic ATMs networks are interconnected, while 9 percent indicated domestic ATM network are not inter-connected. From a regional perspective, lack of interconnected domestic ATM networks is mostly seen in SA (33 percent), LAC (25 percent) and ECA economies (13 percent).

Where transactions are not processed within the economy, 7 of 17 respondents (41 percent) indicated that ATM transactions are cleared and settled through international networks; 6 (35 percent) indicated that ATM transactions are cleared trough international networks and are settled in local currency at a local settlement bank; and 4 (24 percent) indicated that ATM transactions are cleared through international networks but settled in local currency in central bank money. In the 2018 iteration 12 countries indicated ATM transactions were cleared and settled abroad (compared to 17 in this iteration).

Regarding domestic card transaction at POS terminals, in 76 percent of the reporting economies, these are processed (including clearing and settlement) within the economy (**Table III.17**), which is similar to the 80 percent reported in the previous iteration. The SA region is the one showing the lowest percentage of economies that process domestic POS transactions domestically, at 50 percent, while EAP (100 percent), LAC (92 percent), MNA (89 percent) and SSA (79 percent) economies have above global averages.

Where transactions are processed within the economy, 38 of 60 reporting economies (63 percent) indicated that most domestic POS networks are interconnected, enabling internetwork customer transactions which results in inter-network clearing and settlement; 16 (27 percent) economies indicated that all the domestic POS networks are interconnected, while the remaining 6 (10 percent) indicated the domestic networks of POS are not inter-connected. Lack of interconnected domestic POS networks is mostly seen in SA economies (50 percent).

Where transactions are not processed within the economy, 7 of 23 economies (30 percent) indicated that POS transactions are cleared and settled through international networks; 11 (48 percent) economies indicated that POS transactions are cleared trough international networks and settled in local currency at local settlement banks; and 5 (22 percent) economies indicated that POS transactions are cleared through international networks but settled in local currency in central bank money.

Interchange fees and merchant discount rates [26]

A total of 83 economies answered the questions on interchange fees for payment cards (**Table III.18)**. Sixty-five of them (78 percent) indicated that authorities have already taken actions or are

[26] Based on PSDG experience, action in many economies has consisted in authorities limiting the interchange fee (which represents a chunk of the MDR) with the hope that the market will find an optimum MDR, while other authorities have capped the MDR itself forcing the cards schemes to adjust interchange fees.

considering taking actions in connection with interchange fees. This intervention is common at all economy income levels. From a regional perspective, this kind of intervention is high in MNA (100 percent), High-income OECD (96 percent), EAP (83 percent) and ECA (86 percent) regions, and, in contrast, only in 43 and 50 percent in the LAC and SA economies.

There have been instances of litigations on interchange fee brought by the government in 17 percent of the economies, by the central bank in 20 percent of the economies, by merchants in 16 percent of the economies and by others in 10 percent of the economies.

A total of 77 economies answered the questions on merchant discount rates (MDR) for payment cards (**Table III.19)**. Thirty-five of them (45 percent) indicated that authorities have already taken actions or are considering taking actions in connection with the MDR. This intervention is seen in 50 percent of LMICs. From a regional perspective, this kind of intervention is high in MNA region economies (83 percent); only 38 to 50 percent of the economies of other regions reported it.

There have been instances of litigations on the interchange fee brought by the government in 10 percent of the economies; by the central bank in 12 percent of the economies; by merchants in 18 percent of the economies and by others in 2 percent of the economies. These figures are higher than those reported in the previous GPSS iteration.

<u>Main features of domestic payment card switches</u>

This section of the survey asked for detailed features of the main card switches operating in each economy (up to 3 switches per economy). Responses covered 127 switches from 74 economies (**Table III.20b**). Importantly, the analysis in this sub-section is based on the number of switches rather than the number of reporting economies. For information, 41 economies reported information for 1 switch, 13 economies reported information for 2 switches and 20 economies reported information for 3 switches.

Among the type of payment transactions supported by the switches, payment cards acceptance at POS terminals (94 percent), ATMs (96 percent) and acceptance of cards at internet merchants (86 percent) are most observed globally (**Chart III.10** and **Table III.20b**). For the first two variables, data for the current iteration is almost identical data of the previous iteration. In general, economies in MNA showed lower levels of these types of payment card acceptance.

Other types of payment transactions are supported by less than half of switches globally. This includes transactions with mobile /e-money (49 percent of the cases); funds transfers from cards to bank accounts (45 percent of the cases), or fast payments (23 percent), and other transactions (5 percent). Payment card switches supporting transactions with mobile money is mostly observed in low-income economies (100 percent), and from a regional perspective in SSA (73 percent), MNA (64 percent), and EAP (63 percent) economies. Support to funds transfers from cards to bank accounts is mostly observed in in SA (86 percent), SSA (60 percent), ECA (50 percent) and EAP (50 percent) economies. Ability to carry out fast payment transactions ranges from 13 percent to 27 percent across income levels and economies.

In terms of ownership structure of the switches, globally, ownership by "other" private sector entities (48 percent) has the highest share- almost identical to the 50 percent reported for the 2018 iteration-, followed by ownership by a consortium of a few large banks and by a consortium of most of the banks in the economy (21 percent each) (**Chart III.11** and **Table III.20c**). Ownership by central banks and by government bodies is low at 13 and 2 percent, respectively.

Chart III.10: Transactions supported by the switch: authorization, clearing and settlement

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Number of switches	127	8	18	41	26	12	7	15	73	54
a. Acceptance of cards at POS terminals	94% (119/127)	100% (8/8)	100% (18/18)	90% (37/41)	100% (26/26)	75% (9/12)	86% (6/7)	100% (15/15)	95% (69/73)	93% (50/54)
b. Acceptance of cards at ATMs	96% (122/127)	100% (8/8)	94% (17/18)	95% (39/41)	96% (25/26)	92% (11/12)	100% (7/7)	100% (15/15)	96% (70/73)	96% (52/54)
c. Acceptance of cards at Internet merchants (ecommerce)	86% (109/127)	100% (8/8)	94% (17/18)	78% (32/41)	88% (23/26)	75% (9/12)	100% (7/7)	87% (13/15)	90% (66/73)	80% (43/54)
d. Transactions with mobile e-money	49% (62/127)	63% (5/8)	39% (7/18)	41% (17/41)	54% (14/26)	67% (8/12)		73% (11/15)	55% (40/73)	41% (22/54)
e. Funds transfers from cards to bank accounts	45% (57/127)	50% (4/8)	50% (9/18)	41% (17/41)	31% (8/26)	33% (4/12)	86% (6/7)	60% (9/15)	48% (35/73)	41% (22/54)
f. Faster payments	23% (29/127)	13% (1/8)	17% (3/18)	24% (10/41)	23% (6/26)	33% (4/12)	14% (1/7)	27% (4/15)	23% (17/73)	22% (12/54)
g. Other	5% (6/127)		6% (1/18)	2% (1/41)	15% (4/26)				7% (5/73)	2% (1/54)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Data in the chart refer to the number of card switches. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Ownership by "other" private sector entities is concentrated mainly in high-income economies (60 percent). In SA economies, ownership by "other" private sector entities is also seen in a majority of the economies (57 percent).

A consortium of large banks owning switches is mainly observed in LMICs (28 percent) economies as well as LAC (52 percent) regional economies. A consortium of banks (i.e., more than 80 percent of the banks in the economy) owning switches is mainly observed in low-income (60 percent) economies and EAP (38 percent) regional economies. Central bank owning switches is mainly observed in the MNA region (42 percent).

Chart III.11: Ownership of the switches

Global		By Region							By Region	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Consortium of a few large banks	21% (26/126)	13% (1/8)	22% (4/18)	5% (2/40)	52% (13/25)	17% (2/12)	14% (1/7)	19% (3/16)	28% (21/74)	10% (5/52)
Consortium of banks in the country (e.g. 80% or more of all banks)	21% (26/126)	38% (3/8)	17% (3/18)	23% (9/40)	12% (3/25)	17% (2/12)	29% (2/7)	25% (4/16)	18% (13/74)	25% (13/52)
Central Bank	13% (17/126)	25% (2/8)	28% (5/18)	3% (1/40)		42% (5/12)	14% (1/7)	19% (3/16)	20% (15/74)	4% (2/52)
Other Government bodies.	2% (2/126)	13% (1/8)						6% (1/16)	3% (2/74)	
e. Other private sector entities.	48% (61/126)	25% (2/8)	39% (7/18)	70% (28/40)	40% (10/25)	42% (5/12)	57% (4/7)	31% (5/16)	41% (30/74)	60% (31/52)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Data in the chart refer to the number of card switches. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Settlement features

Regarding *settlement of domestic transactions*, in 52 percent of the cases final settlement of net positions occurs in the domestic RTGS system, followed by final settlement in commercial bank money inside the economy (27 percent), in another economy (7 percent) and in central bank money but not in the RTGS system (6 percent) (**Table III.20d**). Settlement of net positions through the domestic RTGS system is fairly common in LMICs (58 percent) and lower than global average in high-income economies (42 percent). High percentages are observed in EAP, MNA and SSA (88, 82 and 63 percent, respectively). Settlement in commercial bank money is mainly observed in high-income economies (31 percent), with SA (71 percent) and ECA (44 percent) in the lead.

Pricing

Full cost recovery plus building a surplus (48 percent) and partial cost recovery (8 percent) are the two most common pricing models adopted by the switches. While 9 percent of economies follow a full cost recovery approach, only 4 percent of the switches offer their services free-of-charge (**Table III.20e)**. Full cost recovery plus building a surplus is observed in 53 percent of LMICs. Such practice is also seen across regions, except MNA (17 percent) and SSA (31 percent).

Other services supported by the switches

Globally, among the various services provided, providing transaction statistics and related analytical reports had the highest share (57 percent), followed by gateway services for foreign transactions on domestic and foreign cards used in the economy (51 percent), operating a payment card brand (47 percent), hosting a platform for prepaid, debit cards, credit cards, mobile money /e-money, and/or fast payments (45 percent), operating POS terminals (41 percent), and operating ATMs (34 percent) (**Chart III.12** and **Table III.20f**). Managing merchant relationships (29 percent), conducting market research (25 percent), providing settlement guarantee to merchants (21 percent), acting as counterparty for transactions cleared through the network (19 percent) and ATM cash management (17 percent) are also observed in different economies.

Chart III.12: Other services supported by card switches (different from payment acceptance)

Global		By Region							By Region	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Gateway for foreign transactions on domestic cards and foreign cards used in the country	51% (64/126)	25% (2/8)	50% (9/18)	63% (25/40)	68% (17/25)	42% (5/12)	14% (1/7)	31% (5/16)	50% (37/74)	52% (27/52)
Operate ATM terminals	34% (43/126)	50% (4/8)	50% (9/18)	25% (10/40)	32% (8/25)	58% (7/12)	14% (1/7)	25% (4/16)	42% (31/74)	23% (12/52)
Operate POS terminals	41% (52/126)	38% (3/8)	50% (9/18)	38% (15/40)	48% (12/25)	50% (6/12)	14% (1/7)	38% (6/16)	47% (35/74)	33% (17/52)
Operate a payment card brand	47% (59/126)	63% (5/8)	50% (9/18)	43% (17/40)	52% (13/25)	25% (3/12)	29% (2/7)	63% (10/16)	55% (41/74)	35% (18/52)
Host platform for prepaid cards, debit cards, credit cards, mobile money/e-money, and/or fast payments.	45% (57/126)	50% (4/8)	44% (8/18)	43% (17/40)	52% (13/25)	33% (4/12)	14% (1/7)	63% (10/16)	51% (38/74)	37% (19/52)
Manage merchant relationships	29% (36/126)	50% (4/8)	22% (4/18)	25% (10/40)	44% (11/25)	25% (3/12)		25% (4/16)	32% (24/74)	23% (12/52)
ATM cash management	17% (21/126)	50% (4/8)	17% (3/18)	5% (2/40)	28% (7/25)	17% (2/12)		19% (3/16)	23% (17/74)	8% (4/52)
Act as counterparty for transactions cleared through the network	19% (24/126)	13% (1/8)	39% (7/18)	3% (1/40)	32% (8/25)	25% (3/12)		25% (4/16)	28% (21/74)	6% (3/52)
Operate mobile money accounts	6% (7/126)				8% (2/25)	25% (3/12)		13% (2/16)	9% (7/74)	
Provide settlement guarantee to merchants	21% (27/126)	38% (3/8)	11% (2/18)	25% (10/40)	24% (6/25)	25% (3/12)		19% (3/16)	20% (15/74)	23% (12/52)
Provide transaction statistics and related analytical reports	57% (72/126)	50% (4/8)	67% (12/18)	63% (25/40)	44% (11/25)	67% (8/12)	57% (4/7)	50% (8/16)	59% (44/74)	54% (28/52)
Conduct market research	25% (32/126)	13% (1/8)	28% (5/18)	38% (15/40)	12% (3/25)		29% (2/7)	38% (6/16)	22% (16/74)	31% (16/52)
Other	6% (7/126)	38% (3/8)	6% (1/18)	5% (2/40)	4% (1/25)				7% (5/74)	4% (2/52)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Data in the chart refer to the number of card switches. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

PSP access to the switches

As with other payment infrastructures discussed earlier, GPSS asked about the types of PSPs that can have direct or indirect access (**Table III.20g**) to the payment cards switch. Commercial banks have extensive direct access (89 percent), followed by other types of banks (66 percent) and in a distant third place by supervised NBFIs (43 percent, compared to 37 percent in the previous iteration) and MTOs (14 percent, compared to 7 percent in 2018). Direct access for other kinds of bank and non-bank PSPs is low, not exceeding 10 percent.

Oversight and other roles of the central bank

Only 14 of the 51 economies that responded this question (14 percent, versus 15 percent in the 2018 iteration) indicated that the central bank has a role of some kind in the operation of the card payment switches (**Chart III.13** and **Table III.21**). In contrast, the central bank oversees payment card switches in 48 of 51 reporting economies (94 percent, versus 91 percent in 2018), acts as operator in 14 percent of them, is a shareholder in 22 percent, a member of the board of directors in 18 percent of them, and provides settlement services in 86 percent of the cases. The operator role was not observed in the ECA, LAC and High-income OECD regions, while the highest prevalence was in the MNA region at 38 percent. Where Central bank has a role as director of the board, in most of the cases it has "voice' and "vote," and only in one case it has only "voice."

Separately, the survey also included questions on whether the central bank *mandates some or all such transactions to be cleared and/or settled domestically*. Specific questions were included for debit and prepaid card transactions at ATMs and at POS terminals, and then also for credit card transactions at these two channels. As shown in **Table III.22**, in most of the economies, there are no such mandates either by the central bank or by the government. Where such a mandate exists, it is mostly observed in LMICs, mainly for debit/prepaid cards usage at ATMs (59 percent) and POS terminals (55 percent). Looked from a regional perspective, such mandates for debit/prepaid cards are observed mostly in the SA, MNA, EAP and SSA economies.

Chart III.13: Roles played by the central bank in payment card switches

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. Overseer	94% (48/51)	100% (5/5)	100% (6/6)	82% (9/11)	100% (7/7)	100% (8/8)	100% (3/3)	91% (10/11)	97% (34/35)	88% (14/16)
b. Operator	14% (7/51)	20% (1/5)				38% (3/8)	33% (1/3)	18% (2/11)	17% (6/35)	6% (1/16)
c. Shareholder	22% (11/51)	20% (1/5)	67% (4/6)			13% (1/8)		45% (5/11)	29% (10/35)	6% (1/16)
d. Member of the board of directors	18% (9/51)	20% (1/5)	67% (4/6)					36% (4/11)	26% (9/35)	
e. Provider of settlement services (e.g. settlement of interbank balances a..	86% (44/51)	100% (5/5)	83% (5/6)	91% (10/11)	71% (5/7)	75% (6/8)	67% (2/3)	100% (11/11)	91% (32/35)	75% (12/16)
f.Other	8% (4/51)			9% (1/11)	14% (1/7)		33% (1/3)	9% (1/11)	9% (3/35)	6% (1/16)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Data in the chart refer to the number of card switches. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

On settlement, the survey asked whether the central bank has designated a national payment cards' switch for the clearing and settlement of all domestic transactions, and, if applicable, the corresponding enforcement mechanism. Of the 27 economies that responded to this question, 17 (63 percent) indicated this practice.

<u>Measures to prevent fraud in payment card transactions</u>

The measures to prevent fraud that were included in the survey were legal requirements on PSPs, industry-led standards (e.g., PCI DSS and EMV compliance, among others), joint efforts of the banking industry and merchants' associations, legal requirements, multi-factor authentication, other strong customer authentication requirements and others (**Table III.24**). Globally, based on the 84 responses received, industry led standards (92 percent), legal requirements applicable to PSPs (87 percent), common efforts by the banking industry and merchant associations (82 percent), muti-factor authentication requirements (71 percent) and other strong customer authentication requirements (33 percent) are the key measures to protect cardholders from fraud. These figures are slightly higher than those of GPSS 2018. While four of these key factors are observed in all economies across different income level economies regions, multi-factor authentication is lagging in LMICs (62 percent) and SSA (46 percent) economies.

GOVERNMENT PAYMENTS

The final part of this section is on the "most widely used" payment instruments for four broad categories of government payments and collections: i) Government to Person (G2P) payments; ii) Person to Government (P2G) payments; iii) Government to Business (G2B) payments; and iv) Business to Government (B2G) payments. The questionnaire asked the respondent economies to indicate for each of the use cases the estimated percentage of the number of payments that are made through cash, paper instruments and electronic instruments. Percentage categories used were: high usage (>= 75 percent), upper medium usage (> 50 percent but ≤ 75 percent), lower medium usage (> 25 but ≤ 50 percent), and low usage (25 percent or less).

Central banks are not generally directly responsible for executing government payments. Therefore, for most of the questions in this sub-section of the survey, responses were received from only about half, or in some cases even less, of the total number of respondents.

<u>G2P payments</u>

G2P payments have 4 main uses cases: i) Public sector payroll; ii) Retirement pension payments; iii) Other disability payments; and iv) Social assistance program payments. The results indicate that electronic payments are by far the most widely used instruments, with "high" levels of use in 89 percent of economies for public sector payroll; in 83 percent of the economies for retirement pension payments; 85 percent of the economies for social assistance program payments and 85 percent of the economies for other disability payments (**Chart III.14** and **Table III.25a**). The corresponding figures in the 2018 iteration (i.e., "high" usage for these use cases) were 85, 94, 79 and 79 percent. Only in 1 economy "high" usage of cash was reported for public sector payroll, and three others reported "high" usage of cash for the remaining use cases.

<u>G2B payments</u>

In the case of G2B payments, the three key use cases are: i) procurement of goods and services; ii) tax refunds; and iii) Government cash subsidies. Just like with G2P payments, "high" usage of electronic payments is by far the most common instrument for these three use cases. In the case of procurement of goods and services, 85 percent of the economies reported "high" levels of usage of electronic payment instruments, which is similar to the 2018 iteration (**Chart III.15** and **Table III.25b**). "High" level of usage of electronic instruments for tax refunds was reported in 82 percent of the economies globally, and in 79 percent of them for government subsidies. "High" usage of cash for procurement of goods and services was reported only in one LMIC. None of the economies reported "high" cash usage for tax refunds or government cash subsidies.

Chart III.14 Use of electronic payments for G2P payment use cases

				By Region							By Income Level	
Government to person (G2P) payments			All Economies	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
G2P payments	Electronic	High (>75%)	89% (41/46)	100% (2/2)	90% (9/10)	100% (12/12)	86% (6/7)	67% (2/3)	67% (2/3)	89% (8/9)	83% (24/29)	100% (17/17)
		Low (<25%)	11% (5/46)		10% (1/10)		14% (1/7)	33% (1/3)	33% (1/3)	11% (1/9)	17% (5/29)	
Other disability payments	Electronic	High (>75%)	85% (34/40)	100% (2/2)	90% (9/10)	100% (11/11)	67% (4/6)	50% (1/2)	50% (1/2)	86% (6/7)	76% (19/25)	100% (15/15)
		Low (<25%)	15% (6/40)		10% (1/10)		33% (2/6)	50% (1/2)	50% (1/2)	14% (1/7)	24% (6/25)	
Retirement Pensions	Electronic	High (>75%)	83% (35/42)	100% (2/2)	90% (9/10)	100% (11/11)	83% (5/6)	67% (2/3)	50% (1/2)	63% (5/8)	73% (19/26)	100% (16/16)
		Low (<25%)	17% (7/42)		10% (1/10)		17% (1/6)	33% (1/3)	50% (1/2)	38% (3/8)	27% (7/26)	
Social Assitance Programs	Electronic	High (>75%)	85% (35/41)	100% (2/2)	89% (8/9)	100% (12/12)	67% (4/6)	67% (2/3)	50% (1/2)	86% (6/7)	75% (18/24)	100% (17/17)
		Low (<25%)	15% (6/41)		11% (1/9)		33% (2/6)	33% (1/3)	50% (1/2)	14% (1/7)	25% (6/24)	

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

P2G payments

The main use case was "taxes and similar payments." Only 66 percent of the economies reported "high" usage of electronic payments for this purpose. In 13 percent of economies there is "high" usage of cash of this purpose, mainly in SA, ECA and LAC economies.

B2G payments

In the case of B2G payments, the three key use cases are: i) taxes; ii) customs duties and similar payments; and iii) contribution to social security / social insurance. "High" usage of electronic payment instruments is by far the most widely seen for these three use cases.

Chart III.15 Use of electronic payments for G2B payment use cases

Government to business (G2B) payments			All Economies	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
				By Region							By Income Level	
Government cash subsidies	Electronic	High (>75%)	79% (30/38)	100% (1/1)	88% (7/8)	91% (10/11)	71% (5/7)	67% (2/3)	50% (1/2)	67% (4/6)	70% (16/23)	93% (14/15)
		Low (<25%)	18% (7/38)		13% (1/8)	9% (1/11)	14% (1/7)	33% (1/3)	50% (1/2)	33% (2/6)	26% (6/23)	7% (1/15)
Procurement of goods and services	Electronic	High (>75%)	85% (39/46)	100% (2/2)	90% (9/10)	100% (12/12)	71% (5/7)	67% (2/3)	33% (1/3)	89% (8/9)	76% (22/29)	100% (17/17)
		Low (<25%)	11% (5/46)		10% (1/10)		14% (1/7)	33% (1/3)	67% (2/3)		17% (5/29)	
Tax refunds	Electronic	High (>75%)	82% (32/39)	100% (1/1)	89% (8/9)	91% (10/11)	71% (5/7)	50% (1/2)	50% (1/2)	86% (6/7)	75% (18/24)	93% (14/15)
		Low (<25%)	15% (6/39)		11% (1/9)	9% (1/11)	14% (1/7)	50% (1/2)	50% (1/2)	14% (1/7)	21% (5/24)	7% (1/15)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Chart III.16 Use of electronic payments for P2G payment use cases

Person to government (P2G) payments			All Economies	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
				By Region							By Income Level	
Taxes and other similar concepts	Electronic	High (>75%)	66% (27/41)	100% (2/2)	56% (5/9)	91% (10/11)	29% (2/7)	50% (1/2)	33% (1/3)	86% (6/7)	60% (15/25)	75% (12/16)
		Upper medium (50-75%)	10% (4/41)		11% (1/9)	9% (1/11)	29% (2/7)				12% (3/25)	6% (1/16)
		Lower medium (25%-50%)	5% (2/41)		11% (1/9)					14% (1/7)	4% (1/25)	6% (1/16)
		Low (<25%)	20% (8/41)		22% (2/9)		43% (3/7)	50% (1/2)	67% (2/3)		24% (6/25)	13% (2/16)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

On contributions to social security/social insurance 78 percent of the economies reported "high" usage of electronic payments. Economies in LAC, EAP and SA lag in this indicator, each rereporting only 50 percent (**Chart III.17** and **Table III.25d**). In the case of customs duties and similar payments, "high" electronic payment usage was reported by 70 percent of the economies, with lower levels seen mostly in MNA (33 percent), SA (50 percent) and EAP (50 percent). In the case of taxes, "high" usage of electronic payments was reported by 67 percent of the economies, with lower levels seen in MNA (0 percent), LAC (29 percent) and SA (33 percent).

Chart III.17 Use of electronic payments for B2G payment use cases

				All Economies	By Region							By Income Level	
					East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Business to government (B2G) payments	Contributions to social security/social insurance	Electronic	High (>75%)	78% (31/40)	50% (1/2)	89% (8/9)	91% (10/11)	50% (3/6)	100% (2/2)	50% (1/2)	75% (6/8)	72% (18/25)	87% (13/15)
			Upper medium (50-75%)	3% (1/40)				17% (1/6)				4% (1/25)	
			Lower medium (25%-50%)	3% (1/40)				17% (1/6)					7% (1/15)
			Low (<25%)	18% (7/40)	50% (1/2)	11% (1/9)	9% (1/11)	17% (1/6)		50% (1/2)	25% (2/8)	24% (6/25)	7% (1/15)
	Customs duties and similar concepts	Electronic	High (>75%)	70% (26/37)	50% (1/2)	63% (5/8)	91% (10/11)	60% (3/5)	33% (1/3)	50% (1/2)	83% (5/6)	68% (15/22)	73% (11/15)
			Upper medium (50-75%)	14% (5/37)		25% (2/8)		20% (1/5)	67% (2/3)			9% (2/22)	20% (3/15)
			Low (<25%)	16% (6/37)	50% (1/2)	13% (1/8)	9% (1/11)	20% (1/5)		50% (1/2)	17% (1/6)	23% (5/22)	7% (1/15)
	Taxes	Electronic	High (>75%)	67% (28/42)	100% (2/2)	63% (5/8)	92% (11/12)	29% (2/7)		33% (1/3)	88% (7/8)	64% (16/25)	71% (12/17)
			Upper medium (50-75%)	14% (6/42)		13% (1/8)		43% (3/7)	100% (2/2)			16% (4/25)	12% (2/17)
			Lower medium (25%-50%)	2% (1/42)			8% (1/12)						6% (1/17)
			Low (<25%)	17% (7/42)		25% (2/8)		29% (2/7)		67% (2/3)	13% (1/8)	20% (5/25)	12% (2/17)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Plans to migrate government payments and collections to electronic

Responses were sought on whether economies have any plans to further shift G2P and G2B payments to electronic with respect to five specific use cases. The outcomes at a global level are summarized in **Chart III.18** below and shown in more detail in **Table III.26a**. Similar questions were included about the intended migration of P2G and B2G payments to electronic. Outcomes at the global level are summarized in **Chart III.19** and are shown in more detail in **Table III.26b**.

Regarding the intended instrument(s) for migration, for G2B and G2P payments, all the economies that are planning this migration indicated bank account and debit card as the instrument of choice (**Table III.26d)**. In connection with social assistance programs though, 91 percent indicated bank account and debit card, while the remaining 9 percent indicated mobile money account. The latter is considered mostly in LAC (14 percent) and SSA (17 percent) regions.

Chart III.18: Plans to further migrate G2P and G2B payments to electronic, by use case

	Does not have a plan to further migrate to electronic	Has plan to further migrate to electronic, but has not started
Public sector payroll	3%	0%
Pensions and social insurance payments	14%	8%
Social assistance programs involving cash transfers	6%	14%
Payments to government suppliers/procurement	6%	12%
Tax refunds	6%	15%

Chart III.19: Plans to further migrate P2G and B2G payments to electronic, by use case

	Does not have a plan to further migrate to electronic	Has plan to further migrate to electronic, but has not started
Customs and duties and other related collections	9%	6%
Payments to the government for schools, universities, hospitals	9%	6%
Social security/social insurance collections	13%	6%
Taxes	6%	6%
Utilities (where applicable)	13%	6%

Among the objectives of migration of government payments to electronic (**Table III.26c**), there were three specific areas of interest: 76 percent of the economies that responded indicated that an explicit objective underlying migration is financial inclusion, compared to 57 percent in the 2018 iteration. This includes 88 percent of LMICs and 45 percent of high-income economies. Further, in 86 percent of the economies the intent is that beneficiaries of G2P payments paid through an account can choose the bank or other PSP in which they want their funds credited. This figure stands similar all income levels, except in SA economies (50 percent). Globally, 95 percent of the economies noted that the main objective for the migration of G2P and G2B payments is to increase the efficiency of the national treasury and/or reduce operational costs.

<u>National Treasury payment and collection processes</u>

GPSS also asked details on the process underlying the disbursement of government payments (**Table III.27a** and **Table III.27b**). For the various payment use cases, “straight-through” payments (i.e., whereby the national treasury pays directly to the account of the end beneficiary upon request by the executing government agency) are still a minority across all country income categories and regions, although preference for this method is growing. The “straight through” payments percentages vary across different use cases: public sector payroll (38 percent), social insurance payments (35 percent), social assistance program involving cash transfers (37 percent) and payments to suppliers of goods and services had the highest (44 percent). These percentages are, in general, slightly higher than those reported in the previous GPSS iteration.

Regarding the use of a Treasury Single Account (TSA), globally, 45 out of 47 economies (96 percent) that provided responses to this question reported having one. The two exceptions are in the SSA region. Further survey outcomes on how the TSA works are reported in **Chart III.20** (see also **Table III.28**). Some of these are slightly higher than those reported in GPSS 2018 (i.e., usage of temporary accounts at commercial banks, government units having access to their accounts sub account at the central bank), while for the other variables they are slightly lower.

Chart III.20 Existence and usage of a Treasury Single Account

		By Region							By Income Level	
	Global	East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a.Does the National Treasury (or equivalent) have a Treasury single account (TSA)?	96% (45/47)	100% (1/1)	100% (11/11)	100% (13/13)	88% (7/8)	100% (3/3)	100% (3/3)	88% (7/8)	93% (28/30)	100% (17/17)
a.1 Are the funds from all collections transferred directly to, and concentrated/consolidated at the TSA in real-time?	68% (32/47)	100% (1/1)	91% (10/11)	54% (7/13)	63% (5/8)	100% (3/3)	67% (2/3)	50% (4/8)	73% (22/30)	59% (10/17)
a.2 Is the usage of temporary accounts at commercial banks allowed, but the transfer of funds to TSA must occur by end of same day or early the next business day at the latest?	49% (23/47)	100% (1/1)	45% (5/11)	54% (7/13)		33% (1/3)	100% (3/3)	75% (6/8)	47% (14/30)	53% (9/17)
a.3 Is the TSA designed to have detailed accounts/subaccounts at the Central Bank (or other bank providing services to the National Treasury) versus having all subaccount details only at the National Treasury itself?	57% (27/47)	100% (1/1)	55% (6/11)	77% (10/13)	38% (3/8)	67% (2/3)	67% (2/3)	38% (3/8)	50% (15/30)	71% (12/17)
a.4 Do government units have access (monitor and print statements) to their account/subaccount at the Central Bank (or another bank of the National Treasury)?	60% (28/47)	100% (1/1)	73% (8/11)	62% (8/13)	38% (3/8)	67% (2/3)		75% (6/8)	53% (16/30)	71% (12/17)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

SECTION IV: FOREIGN EXCHANGE SETTLEMENT SYSTEMS

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. According to the 13th Triennial Central Bank Survey of Foreign Exchange and Over-the-counter (OTC) derivatives markets, data collected by the Bank for International Settlements shows that the USD continued to be the dominant currency, being on one side of 88 percent of all trades in April 2022. This remains unchanged from the previous BIS survey in 2019. Trading in OTC foreign exchange markets reached USD 7.5 trillion per day in April 2022, as compared to USD 6.6 trillion in 2019. This is triennial increase is low; COVID-19 restrictions in place in several reporting economies could have suppressed turnover.[27]

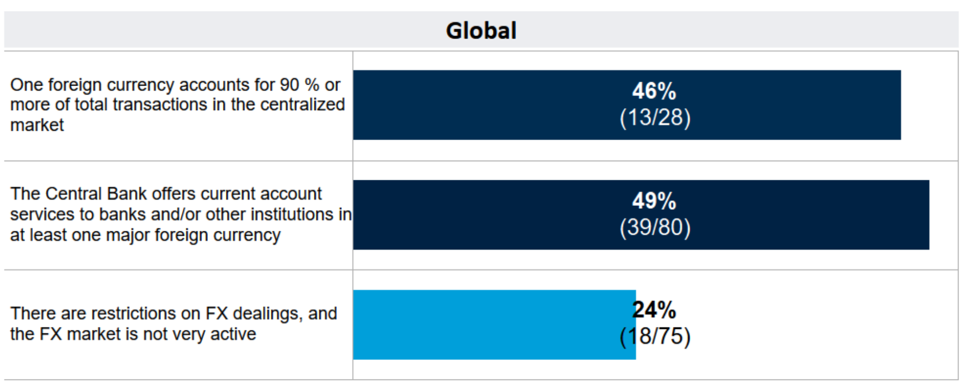
The major risk in the FX market is the potential risk of loss of the principal amount due to the failure of the counterparty to pay the contracted currency (also referred to as principal or Herstatt risk). Principal risk is sought to be mitigated by ensuring that the final settlement of one currency occurs only if the final settlement of the linked currency also occurs – embodied as the principle of payment versus payment (PVP).

GPSS collected information regarding the organization of FX markets, including data on the existence of a centralized FX market as well as details of OTC markets.

General features of the FX market

The pervasiveness of a few currencies that dominate global FX markets is reflected in that in close to a half of surveyed economies (46 percent), one foreign currency accounts for 90 percent or more of total FX transactions (**Table IV.1** and **Chart IV.1**). The prevalence of a single currency is more common in LMICs (50 percent) compared to high-income economies (33 percent).

Chart IV.1 General features of the foreign exchange markets



Regarding foreign currency services offered by central banks, globally, 39 out of 80 central banks (49 percent), indicated that they offer current account services to banks and/or other institutions in at least one major foreign currency. The service is offered by half or more than half of

[27] https://www.bis.org/statistics/rpfx22_fx.htm

respondents across most regions, and in about one-third of the economies in ECA and High-income OECD. Sixty-seven percent of LMICs offer the service.

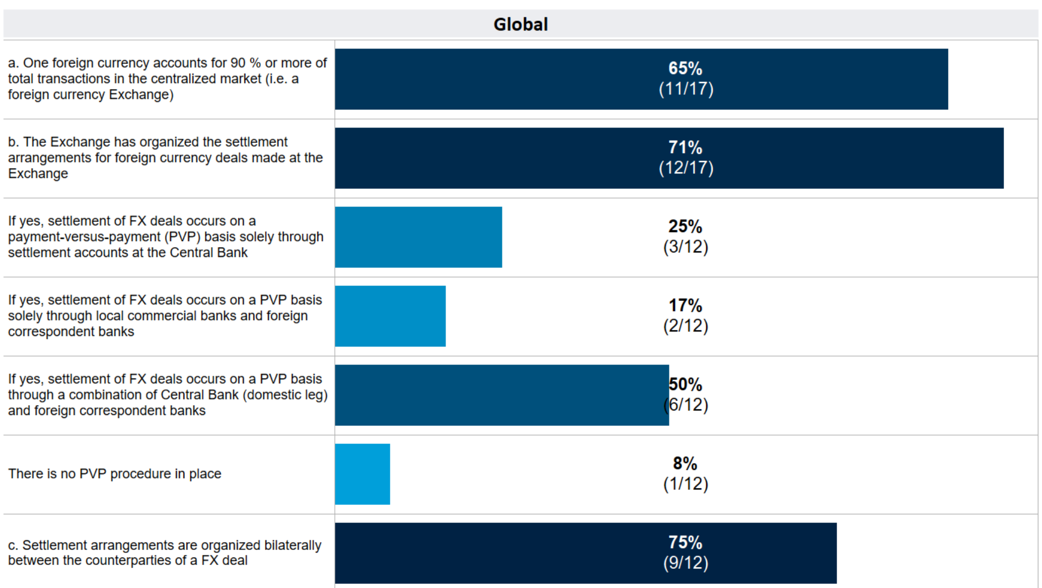
Furthermore, 18 central banks (24 percent of the total that answered this question) indicated that in their economies there are restrictions on FX dealings and the FX market is not very active. This is more common in LMICs (39 percent).

ORGANIZED FX MARKETS AND UNDERLYING SETTLEMENT ARRANGEMENTS

In some countries, the central bank is directly involved in the settlement of the foreign leg of FX transactions. This is the case in most of the jurisdictions where FX transactions are traded in a "centralized market" and settled through foreign currency accounts kept at the central bank. In this report, a centralized market is defined as a structured arrangement for trading at a central location, e.g., an Exchange.

A total of 61 central banks out of 78 (78 percent) indicated that there is no centralized FX market in their economy (**Table IV.2**). A centralized FX market is more common in LMICs: 14 out of 17 respondents that reported having a centralized FX market are from LMICs. Moreover, in 11 out of these 17 respondents, one currency accounts for more than 90 percent or more of total transactions, and in 12 of them settlement arrangements of centralized FX markets are organized by the exchange where FX trading takes place (**Table IV.3 and Chart IV.2**).

Chart IV.2 Settlement features in organized FX markets



Settlement of FX deals can be done on a PVP basis in 11 of the 12 respondent economies in which the settlement arrangement has been organized by an exchange, although in some of these economies there is also the option to settle FX trades bilaterally.[28] In 6 economies, settlement on

[28] There was a total of 9 positive responses to the existence of bilateral settlements, which seems to indicate that several organized FX markets offer both the possibility of the Exchange organizing settlement as well as bilateral settlements.

PVP basis occurs through a combination of central bank accounts (i.e., for the domestic leg) and foreign correspondent bank accounts (for the FX leg). In 3 economies, PVP is solely through settlement accounts at the central bank; while in the remaining 2 economies PVP is through a combination of accounts held with local commercial banks and foreign correspondent banks.

OTC FX MARKETS AND UNDERLYING SETTLEMENT ARRANGEMENTS

Table IV.4 portrays settlement arrangements for OTC FX trades. The two most common solutions are a private FX clearinghouse operated by the private sector and the central bank holding accounts in foreign currency and executing settlement to ensure PVP. Compared to the 2018 iteration, the option of a private FX clearinghouse was slightly more common (11 responses compared to 9), whereas the number of responses for the option involving the central bank was the same.

In the case of OTC markets without a PVP arrangement, additional questions aimed to capture information of the time lag between the confirmation of settlement of the foreign currency leg and that of the domestic currency leg (**Table IV.4**). The parameters that were used were: (i) the lag does not exceed 2 hours; (ii) the lag exceeds 2 hours but is less than 24 hours; and (iii) the lag exceeds 24 hours.

Fifty-five percent of respondents to this question indicated a time lag that exceeds 2 hours but is less than 24 hours. This is a slight increase compared to the previous iteration (48 percent) and it is in line with a decrease of the time lag exceeding 24 hours, that went from 29 percent to 27 percent in this iteration, and a decrease on share of respondents that expressed that the lag does not exceed 2 hours, which went from 24 percent to 18 percent.

SECTION V: INTERNATIONAL REMITTANCES AND OTHER CROSS-BORDER PAYMENTS

International remittance flows to LMICs reached $626 billion in 2022(e), an increase of 4.9 percent over the previous record high of $597 billion in 2021. Global remittances, which include flows to high-income economies, reached $794 billion in 2022(e), up from $781 billion in 2021.[29]

Given that for certain economies international remittances are equivalent to 20 percent or more of their gross domestic product (GDP), significant global attention continues to be paid to reducing transaction costs. In this regard, the global average cost of sending international remittances in Q4 of 2022 was 6.24 percent, which is a reduction of 343 basis points from 2009, when it stood at 9.67 percent.[30] These cost reductions reflect, in part, greater price transparency competitive pressures on pricing, and enhancements to cross-border and domestic payment system infrastructure and payment services.

This section of GPSS 2021 first analyzes international remittances and then discusses other types of cross-border payments and the underlying developments in this area.

INTERNATIONAL REMITTANCES

Recognizing the importance of remittances for economic development, GPSS 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) that operate in various economies, how RSPs are regulated, and the main payment instruments used for international remittances. The survey does not report statistics on the remittance flows by each economy, nor on the cost of sending remittances.[31] The survey captures the perceptions of central banks. The survey findings are discussed below keeping this in mind.

Sending or receiving economies

The survey asks whether respondents belong to the remittance-receiving, remittance-sending, or both remittance-receiving and -sending categories (**Chart V.1** and **Table V.4**). Thirty-five percent of economies self-designated as remittance-receiving, 30 percent as remittance-sending, and another 35 percent deemed to be both. High-income economies are mostly sending economies (55 percent), whereas the situation is quite the opposite for LMICs with only 17 percent being purely remittance-sending countries. From a regional perspective, high-income OECD economies have the highest share of sending economies at 62 percent, whereas economies in ECA (75 percent) had the highest share of receiving economies.

Important types of RSPs

The survey considered different types of institutions that may be allowed to perform the role of RSPs, and responses were requested from participating economies to indicate the three most

[29] World Bank (2022), *Migration and Development Brief, No. 37,* November 2022.

[30] Source: *Remittance Prices Worldwide* database by the World Bank, as of April 2023.

[31] The costs of sending remittances are available for 367 corridors from the World Bank's Remittance Prices Worldwide database at http://remittanceprices.worldbank.org

important types of RSPs in terms of market share, and to rank them in order of importance (**Tables V.7a and V.7b**). Globally, commercial banks (via banking channels) were reported as having the highest market share and being the most important channel with 36 percent, followed by International MTO's with 19 percent, and commercial banks as agents or in partnership with MTOs (14 percent) and local MTOs with 9 percent. In the 2018 iteration, the corresponding figures were 43, 32 and 11 percent, respectively. Other RSPs only had a very limited share in the remittance market. Commercial bank dominance is more pronounced in LMICs (43 percent). From a regional perspective, commercial banks are the top RSP for 55 percent of the respondents in MNA, 50 percent in SSA and 43 percent in EAP.

Chart V.1 Remittance-sending vs. receiving countries

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Both remittance sending and receiving are significant in the country (e.g. one of the two legs is at least 20% of the other)	35% (19/55)	75% (3/4)	13% (1/8)	23% (3/13)	40% (4/10)	57% (4/7)		36% (4/11)	40% (14/35)	25% (5/20)
Mainly a remittance-receiving country	35% (19/55)	25% (1/4)	75% (6/8)	15% (2/13)	40% (4/10)	14% (1/7)	50% (1/2)	36% (4/11)	43% (15/35)	20% (4/20)
Mainly a remittance-sending country	31% (17/55)		13% (1/8)	62% (8/13)	20% (2/10)	29% (2/7)	50% (1/2)	27% (3/11)	17% (6/35)	55% (11/20)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Use of agents / sub agents by RSPs

The survey considered nine different categories of financial and non-financial institutions that may be allowed to perform the role of agents of RSPs and inquired on the legal permission for RSPs to use agents / sub agents. Responses are illustrated in **Chart V.2** and **Table V.6**.

In 91 percent of the economies, the use of agents by RSPs is permitted, compared to 87 percent in the previous iteration. The use of agents by RSPs is 88 percent in LMICs and 97 percent in the high-income economies. From a regional perspective, High-income OECD economies, LAC economies and SA economies have the highest number of economies (100 percent) supporting the use of agents, followed by economies in SSA (93 percent), ECA (86 percent), EAP (80 percent), and MNA (63 percent). The use of sub-agents is permitted in 31 percent of the economies that responded to the survey, down from 52 percent in the 2018 GPSS iteration. From a regional perspective, the usage of sub-agents is mostly observed in SSA economies (53 percent), followed by SA, and High-income OECD (50 and 39 percent, respectively).

Survey results indicate that across 69 percent of the responding economies, commercial banks are permitted to serve as agents of RSPs, followed by local MTOs (61 percent), postal networks (51 percent), exchange bureaus (47 percent), mobile network operators (46 percent), retail outlets such as supermarkets, pharmacies and gas stations (42 percent). Postal networks can also perform the role of agents for RSPs mostly in high-income level economies (56 percent) in contrast, this option is much lower in low- and middle-income economies. From a regional perspective, usage of the postal network as agent for RSPs is mostly seen in the ECA region (67 percent), High-income OECD economies (68 percent) and SSA economies (53 percent).

Chart V.2 Agents of RSPs

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
E6) Is the use of agents of RSPs permitted?	91% (73/80)	80% (4/5)	86% (12/14)	100% (24/24)	100% (12/12)	63% (5/8)	100% (3/3)	93% (13/14)	88% (42/48)	97% (31/32)
a. Commercial banks	69% (64/93)	50% (3/6)	60% (9/15)	82% (23/28)	63% (10/16)	44% (4/9)	100% (4/4)	73% (11/15)	69% (37/54)	69% (27/39)
b. Local MTOs (i.e. acting as agents of international MTOs)	61% (57/93)	33% (2/6)	60% (9/15)	71% (20/28)	69% (11/16)	33% (3/9)	50% (2/4)	67% (10/15)	56% (30/54)	69% (27/39)
c. Exchange bureaus	47% (44/93)	50% (3/6)	33% (5/15)	64% (18/28)	31% (5/16)	33% (3/9)	25% (1/4)	60% (9/15)	43% (23/54)	54% (21/39)
d. Financial cooperatives and credit unions	34% (32/93)	17% (1/6)	27% (4/15)	57% (16/28)	50% (8/16)			20% (3/15)	28% (15/54)	44% (17/39)
e. MFIs	32% (30/93)	17% (1/6)	40% (6/15)	32% (9/28)	31% (5/16)		50% (2/4)	47% (7/15)	37% (20/54)	26% (10/39)
f. Postal network	51% (47/93)	33% (2/6)	67% (10/15)	68% (19/28)	38% (6/16)		50% (2/4)	53% (8/15)	46% (25/54)	56% (22/39)
g. MNOs or other entities providing mobile money services	46% (43/93)	33% (2/6)	47% (7/15)	54% (15/28)	25% (4/16)	33% (3/9)	75% (3/4)	60% (9/15)	48% (26/54)	44% (17/39)
h. Retail outlets (supermarket, pharmacies, gas stations)	42% (39/93)	17% (1/6)	47% (7/15)	61% (17/28)	31% (5/16)		50% (2/4)	47% (7/15)	37% (20/54)	49% (19/39)
i. Other	11% (10/93)		20% (3/15)	11% (3/28)	13% (2/16)	11% (1/9)		7% (1/15)	11% (6/54)	10% (4/39)
If Yes, is the use of sub-agents (i.e. agents of RSPs' agents) permitted?	31% (29/93)	17% (1/6)	13% (2/15)	39% (11/28)	19% (3/16)	22% (2/9)	50% (2/4)	53% (8/15)	30% (16/54)	33% (13/39)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

<u>Authorization for providing remittance services – General analysis</u>

This section looks at the requirements of various kinds of RSPs and the licensing/authorization requirement to offer remittance services (**Tables V.5a** and **V.5b**). The range of RSPs allowed to offer remittances without any specific license and/or registration is very limited globally. In the case of postal networks, globally they are permitted to offer remittance services without a specific license in 10 percent of the economies, compared to 16 percent in the past iteration. All other kinds of RSPs have a lower percentage. This is an indication that more and more economies are tightening the regulation for RSPs for various reasons.

<u>Important payment instruments for remittances</u>

Respondents were also asked to indicate the three most used instruments for remittances purposes in their economy (**Tables V.8a** and **V.8b**). Globally, 38 percent of the economies reported cash (via MTO's, banks or other regulated RSPs) as the most widely used instrument for sending/receiving remittances (compared to 49 percent in the previous iteration), followed by bank accounts (20 percent, compared to 28 percent in the 2018 iteration). Further, another 10 percent of the economies reported cash through unregulated service providers/families/friends as the preferred instrument. The use of other payment instruments was significantly lower.

The use of cash through regulated RSPs is more prevalent in the SA and SSA regions (75 and 63 percent, respectively), and least prevalent in High-income OECD and MNA economies (17 and 22 percent, respectively). In turn, the use of bank accounts is most prevalent in High Income economies (34 percent), and regionally in MNA (33 percent), followed by SA (25 percent).

Survey results also indicate that remittance services offered through payment cards and prepaid cards (e.g., linked to e-money wallet) are not common around the world, with just 2 percent and 1 percent of the economies reporting them, respectively, as one of the most used instruments for remittances purpose.

Transparency in remittance services

Chart V.3 and **Table V.9** provide information on various measures of transparency and disclosure requirements for remittance services. At a global level, in 92 percent of economies RSPs are required by laws/regulations to disclose upfront any fees they apply for remittance services (91 percent) and provide customers with a receipt containing the details of the transactions (also 91 percent). In 89 percent of economies RSPs are required to disclose upfront the FX rate that is applied in the remittance transactions; and in 79 percent of economies RSPs they are required to disclose upfront available complaint mechanisms. The corresponding figures in the previous GPSS iteration were 89, 89, 87 and 78 percent, respectively.

In contrast, for other key aspects relating to transparency the percentages are much lower. These include the availability of a national remittances prices database (17 percent), RSPs being subject to different legal requirements for fee disclosure depending on the destination economy (20 percent), and the use of a standard format for the receipt (36 percent). EAP and SA economies are lagging other regions on the key parameters relating to transparency.

Competitive environment

The majority of the economies have in place several elements that enable competition in the remittances market (**Table V.10**). Among others, agents are allowed to collect funds and initiate a remittance transaction in foreign currency in 64 percent of the economies, and they are allowed to disburse funds in foreign currency in 60 percent of the economies.[32] Moreover, legislation exists to address other types of anti-competitive or monopolistic behaviors for international remittances in 54 percent of the responding economies.

On the other hand, exclusivity agreements for remittances still exist in 32 percent of the economies (up from 26 percent in the 2018 iteration and 18 percent in the 2015 iteration), while laws/regulations that ban such agreements were only reported by 26 percent of the respondents. The latter type of legislation is more common among low-income economies as well as those in

[32] These percentages are lower than those reported in the 2018 iteration though.

MNA, SSA and ECA regions. Overall, survey results show that LMICs have a more limited competitive environment for remittance services.

Chart V.3 Fulfillment of transparency requirements in remittance services

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. RSPs are required by laws/regulations to disclose upfront fees they apply for remittance services	92% (68/74)	75% (3/4)	100% (12/12)	96% (22/23)	82% (9/11)	86% (6/7)	67% (2/3)	100% (14/14)	89% (39/44)	97% (29/30)
b. RSPs are subject to different legal requirements as to fees disclosed, depending on the destination country	20% (14/71)	25% (1/4)	42% (5/12)	13% (3/23)		29% (2/7)		27% (3/11)	22% (9/41)	17% (5/30)
c. RSPs are required by laws/regulations to disclose upfront the FX rate that is applied in the remittance	89% (65/73)	75% (3/4)	91% (10/11)	91% (21/23)	82% (9/11)	86% (6/7)	67% (2/3)	100% (14/14)	86% (37/43)	93% (28/30)
d. RSPs are required by laws/regulations to disclose upfront any applicable taxes	65% (48/74)	25% (1/4)	50% (6/12)	73% (16/22)	58% (7/12)	86% (6/7)	33% (1/3)	79% (11/14)	57% (25/44)	77% (23/30)
e. RSPs are required by laws/regulations to disclose upfront the speed of the remittance transfer	59% (44/74)		75% (9/12)	78% (18/23)	17% (2/12)	71% (5/7)	67% (2/3)	62% (8/13)	51% (22/43)	71% (22/31)
f. RSPs are required by laws/regulations to disclose upfront available complaint mechanisms	79% (57/72)	50% (2/4)	91% (10/11)	91% (21/23)	27% (3/11)	100% (6/6)	67% (2/3)	93% (13/14)	74% (31/42)	87% (26/30)
g. RSPs are required by laws/regulations to provide customers with a receipt containing the details of the transaction	91% (67/74)	75% (3/4)	100% (12/12)	83% (19/23)	92% (11/12)	100% (6/6)	67% (2/3)	100% (14/14)	93% (40/43)	87% (27/31)
h. A standard format for receipts is used	36% (26/72)	25% (1/4)	50% (6/12)	5% (1/21)	50% (6/12)	57% (4/7)	33% (1/3)	54% (7/13)	44% (19/43)	24% (7/29)
i. A national remittance prices database is available on the internet (e.g. indicating the prices of remittances with various RSPs)	17% (12/72)	50% (2/4)	27% (3/11)	14% (3/22)	8% (1/12)	29% (2/7)		8% (1/13)	19% (8/42)	13% (4/30)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

OTHER CROSS-BORDER PAYMENTS

This section explores the current initiatives of regional integration for payments, from basic bilateral links between NPS infrastructures to more advanced forms that imply a unified scheme and a common technical-operational platform, either centralized or decentralized.

Use of the international SWIFT network

SWIFT is a widely used network for transmitting financial messages among participants within and outside economies and is heavily used in correspondent banking and remittances-related financial transactions Globally, in 76 percent of the economies, 90 percent or more of commercial banks are connected to the SWIFT network (slightly higher than the 87 percent reported in the previous iteration) (**Table V.3**). Another 13 percent of the economies reported that at least 50 percent of their commercial banks are connected to SWIFT.

The LAC region reported the highest percentage of economies (93 percent) where more than 90 percent of commercial banks are connected to SWIFT, followed by MNA region (83 percent) and the SA region (80 percent). In terms of income levels, LMICs (77 percent) had the higher share of 90 percent or more commercial banks part of SWIFT network. In about 8 percent of economies, some banks or other financial institutions can use SWIFT through a SWIFT Service Bureau operated by the central bank or other financial institution.

<u>Cross-border integration of payment systems</u>

Interfaces and other forms of integration between payment systems in sending and receiving economies help improve the efficiency of remittances and perhaps even help in reducing the cost of cross border payments. Therefore, respondents were requested to indicate the kind of current forms of integration available (**Chart V.4** and **Table V.1)** and indicate future plans (**Table V.2**).

Chart V.4 Forms of integration between payment systems between different economies

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. Domestic Card Switch with a direct interface to domestic card switch in other country/ies	23% (15/65)	40% (4/10)	33% (2/6)	17% (5/29)		25% (1/4)	50% (1/2)	22% (2/9)	30% (9/30)	17% (6/35)
b. Local ACH with a direct interface to ACH in other country/ies.	25% (16/65)	20% (2/10)	17% (1/6)	38% (11/29)		25% (1/4)		11% (1/9)	10% (3/30)	37% (13/35)
c. Local ACH with a direct interface to RTGS in other country/ies.	5% (3/65)			7% (2/29)				11% (1/9)	3% (1/30)	6% (2/35)
d. Local RTGS with a direct interface to RTGS in other country/ies.	32% (21/65)	30% (3/10)	33% (2/6)	31% (9/29)	80% (4/5)			33% (3/9)	33% (10/30)	31% (11/35)
e. Other.	15% (10/65)	10% (1/10)	17% (1/6)	7% (2/29)	20% (1/5)	50% (2/4)	50% (1/2)	22% (2/9)	23% (7/30)	9% (3/35)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

With respect of integration of payment systems between economies, in 2021, a total of 65 economies have established links for cross-border payment and settlement, a higher number than the total of 56 economies reported in the previous iteration of the survey. Some economies have reported interfaces between their local RTGS system and the RTGS system in other economies (32 percent), between ACH of an economy with RTGS of another economy (25 percent); between domestic card switches (23 percent); between ACH of an economy with ACH of other economy (5 percent); and other interfaces between economy (15 percent). **Table V.2** shows that 45 economies have indicated ongoing or future plans for the integration of payment systems, compared to 40 economies in the previous GPSS iteration. Forty-four percent of the economies that responded this specific question indicated they intend to implement within two years. Thirty-five percent of the economies planning an integration are in the SSA region and 78 percent are LMICs. In terms of the type of integration that is being planned, at a global level integration of RTGS systems is the top priority of economies.

SECTION VI: SECURITIES AND DERIVATIVES CLEARING AND SETTLEMENT SYSTEMS

Securities and derivatives clearing, settlement and recording systems are typically considered systemically important, and as such are FMIs. The systems for clearing and settlement of funds are highly interdependent. For example, provision of liquidity in payment systems depends to a large extent on CSDs/SSSs where securities used as collateral are held in custody and settled.

Moreover, after the 2008-2009 financial crisis, regulators have continued to enhance the requirements and guidance for the risk management practices of FMIs, in particular, central counterparties (CCPs).[33] More recently, CPMI-IOSCO has published reports identifying good practices with respect to client clearing and non-default losses.[34]

The GPSS covers the main aspects of the risk management of these FMIs. The analysis in this section starts by providing an overview of the general features of securities clearing and settlement systems worldwide. Subsequently, the main features and risk management practices of the different types of FMIs for securities and derivatives, including business continuity arrangements, are discussed.

GENERAL FEATURES OF SECURITIES MARKETS

Twenty five percent of a total of 84 respondents indicated that the securities markets in their respective economies are at a nascent stage (**Table VI.1**), this percentage is slightly lower than that of the previous iteration (30 percent out of 108 respondents). Nascent securities markets are found in economies across all regions except for high-income OECD economies. There seems to be a correlation to income level: in 9 percent of LMICs their securities market is at a nascent stage, while for high-income economies this is percentage is only 6 percent.

At least one stock exchange is currently in operation in 93 percent out of 85 economies that responded to this question, across all regions; this percentage being a bit lower in the SSA at 73 percent. The shares are similar in terms of income level with 92 percent of low- and middle-income economies and 94 percent of high-income economies. In the case of CSDs, 78 economies (91 percent) indicated that they have a CSD operating in their economy, again, similar to the 2018 iteration. In the economies that reported having at least one CSD in operation, 87 percent reported that 90 percent or more of negotiable securities are immobilized or dematerialized in one or more CSDs. The economies yet to achieve immobilization or dematerialization are concentrated in the LAC and SSA regions, each with 3 respondents, and High-income OECD with 2 respondents. The settlement of the funds leg of the securities transactions largely happens in central bank money across regions. Regarding existence of CCPs, 37 economies reported having at least one CCP in operation, and in the case of trade repositories this number was 16, same as in the past iteration.

33 Please see https://www.bis.org/cpmi/info_pfmi.htm for the full set of additional guidance.

34 Please see https://www.bis.org/cpmi/publ/d210.htm and https://www.bis.org/cpmi/publ/d217.htm

Chart VI.1 General features of the securities market worldwide

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The securities market (government securities, equities, corporate bonds and derivatives) is at a nascent stage, characterized by only a few or none primary issuances, and few or none secondary market trades	25% (21/84)	33% (2/6)	29% (4/14)		40% (6/15)	14% (1/7)	50% (2/4)	55% (6/11)	39% (19/49)	6% (2/35)
One or more stock exchanges are currently operating in the country	93% (79/85)	100% (7/7)	93% (13/14)	100% (27/27)	88% (14/16)	100% (6/6)	100% (4/4)	73% (8/11)	92% (46/50)	94% (33/35)
The great majority (90% or more) of negotiable securities in the country are immobilized or dematerialized in one or more Central securities depository (CSD)	87% (75/86)	86% (6/7)	100% (14/14)	93% (25/27)	81% (13/16)	86% (6/7)	75% (3/4)	73% (8/11)	86% (43/50)	89% (32/36)
There is one or more Central securities depositories (CSDs) in the country?	91% (78/86)	83% (5/6)	100% (15/15)	93% (25/27)	94% (15/16)	100% (8/8)	75% (3/4)	70% (7/10)	90% (45/50)	92% (33/36)
There is one or more Central counterparty (CCP) operating in the country	46% (37/81)	83% (5/6)	25% (3/12)	73% (19/26)	31% (5/16)	17% (1/6)	25% (1/4)	27% (3/11)	34% (16/47)	62% (21/34)
At least one Securities settlement system (SSS) does not settle in Central Bank money	27% (22/82)	33% (2/6)	25% (3/12)	19% (5/27)	19% (3/16)	33% (2/6)	100% (4/4)	27% (3/11)	33% (15/46)	19% (7/36)
There is one or more Trade repository (TR) operating in the country	21% (16/78)	25% (1/4)	23% (3/13)	27% (7/26)	20% (3/15)		25% (1/4)	9% (1/11)	20% (9/45)	21% (7/33)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

CENTRAL SECURITIES DEPOSITORIES

Note: in this sub-section, the basis of the analysis switches from number of economies to number of systems.

General information

CSDs are operated by central banks in 41 (38 percent) out of 107 the cases **(Table VI.2a and Chart VI.2)**, which is a marginal increase compared to the last iteration (40 economies comprising 33 percent). From a regional perspective, a larger share of CSDs is operated by the central bank in the SA, SSA and LAC regions (67, 50 and 48 percent, respectively).

A majority of the CSDs (59 in all) handle both government and corporate securities. Of the 59 CSDs that handle all types of securities, 21 are in high-income OECD economies followed by 10 in ECA and 11 in LAC. CSDs handling only government securities (34) are found across all income levels, with LMICs having the largest share with 40 percent of economies compared to only 18 percent of high-income economies. ECA, LAC, MENA, SA and SSA regions account for a significant proportion of the CSDs that handle only government securities. Fifteen CSDs handle only corporate securities (**Table VI.2b**).

Lastly, ninety one percent of the reporting CSDs use only one SSS. This trend is evident across all regions and income groups and is consistent with past iterations of the GPSS. Seven out of 9 CSDs that use more than one SSS are in high- income economies.

Chart VI.2 CSDs: General Features

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The CSD is operated by the Central Bank	YES	38% (41/107)	29% (2/7)	38% (8/21)	21% (6/28)	48% (12/25)	44% (4/9)	67% (2/3)	50% (7/14)	45% (31/69)	26% (10/38)
There is more than one SSS for the securities handled by this CSD	YES	9% (9/98)			17% (5/30)	14% (3/22)	13% (1/8)			3% (2/60)	18% (7/38)
Which type of securities is handled by the CSD?	The CSD handles both government and corporate securities	55% (59/108)	86% (6/7)	48% (10/21)	70% (21/30)	46% (11/24)	56% (5/9)		43% (6/14)	46% (31/68)	70% (28/40)
	The CSD handles only corporate securities	14% (15/108)	14% (1/7)	19% (4/21)	17% (5/30)	8% (2/24)	11% (1/9)	33% (1/3)	7% (1/14)	15% (10/68)	13% (5/40)
	The CSD handles only government securities	31% (34/108)		33% (7/21)	13% (4/30)	46% (11/24)	33% (3/9)	67% (2/3)	50% (7/14)	40% (27/68)	18% (7/40)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

<u>CSD main features and direct participation</u>

Chart VI.3 CSD- Main Features

In 94 percent of the cases globally (**Chart VI3** and **Table VI.3**), securities are either in physical but immobilized form or have been dematerialized.[35] In 84 percent of the systems, the CSD is also the official securities registrar, and when this is not so, the reconciliation is done in coordination with relevant entities in 71 percent of the cases.

Daily reconciliation of securities balances (88 percent) as well as prohibition of overdrafts and debit balances in securities accounts (97 percent) are found to be common practices amongst CSDs globally, which follows previous trends of the past GPSS. All these features are common across all regions, with relatively small variances between them, and they are similar across income groups.

As for other features, all CSDs ensure segregation of their own assets from those of their participants. All CSDs segregate assets of the participants' clients as well, with this being a common practice across all regions and almost all economies regardless of income level.

Just like in the previous iteration, 64 percent of the CSDs globally have indicated that the beneficial owner is identified at the level of the CSD. This percentage is higher (between 75 and

[35] In the previous sub-section, it was mentioned that 90 percent of *economies* (in contrast to systems) have achieved immobilization or dematerialization of securities.

83 percent) in the EAP, LAC, MNA and SSA regions, compared to only 39 and 50 percent in the High-income OECD category and in high-income economies, respectively.

Chart VI.3 CSDs: General Features

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Securities are held in physical but immobilized form, OR in dematerialized form	94% (97/103)	86% (6/7)	89% (17/19)	100% (28/28)	88% (21/24)	100% (9/9)	100% (3/3)	100% (13/13)	91% (59/65)	100% (38/38)
The CSD is also the official securities registrar	84% (85/101)	100% (7/7)	83% (15/18)	82% (23/28)	83% (20/24)	89% (8/9)	67% (2/3)	83% (10/12)	83% (52/63)	87% (33/38)
- If No, is daily reconciliation conducted in coordination with other relevant entities?	71% (12/17)		100% (2/2)	80% (4/5)	40% (2/5)	100% (1/1)	100% (1/1)	67% (2/3)	67% (8/12)	80% (4/5)
The CSD conducts at least daily reconciliation of the totals of securities issues held in the CSD for each issuer (or issuing agent)	88% (88/100)	86% (6/7)	84% (16/19)	100% (28/28)	74% (17/23)	88% (7/8)	100% (3/3)	92% (11/12)	87% (55/63)	89% (33/37)
The CSD prohibits overdrafts and debit balances in securities accounts	97% (97/100)	100% (6/6)	95% (18/19)	96% (27/28)	96% (22/23)	100% (9/9)	100% (3/3)	100% (12/12)	97% (61/63)	97% (36/37)
The CSD ensures segregation between its own assets and the securities of its participants	100% (101/101)	100% (7/7)	100% (19/19)	100% (28/28)	100% (24/24)	100% (8/8)	100% (3/3)	100% (12/12)	100% (63/63)	100% (38/38)
The CSD ensures segregation between the securities belonging to the CSD participants and those belonging to the latter's clients	94% (91/97)	100% (7/7)	94% (17/18)	86% (24/28)	96% (23/24)	100% (7/7)	100% (2/2)	100% (11/11)	97% (57/59)	89% (34/38)
Beneficial owners are identified at the individual level in the CSD (i.e. there are sub-accounts at the CSD for each individual holding securities operated by that CSD)	64% (64/100)	75% (6/8)	56% (9/16)	39% (11/28)	83% (20/24)	78% (7/9)	67% (2/3)	75% (9/12)	73% (45/62)	50% (19/38)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

On participation in the CSD (**Table VI.4**) the most commonly observed trend is that commercial banks and broker-dealers are direct participants of the CSD (97 and 82 percent, respectively on a global basis, similar to the 2018 iteration). For commercial banks, the percentages for direct participation are fairly stable across country income level and regions but show more variation in the case of brokers-dealers: the latter entities are direct participants in 92 percent of CSDs in high-income economies, but in only in 76 percent of CSDs in LMICs. Direct participation of brokers-dealers is lower in the SSA, SA and MNA regions. Other types of financial institutions (e.g., mutual fund operators, pension fund operators) having direct participation in the CSD varies even more across regions and income levels, though globally it stands at 77 percent. Globally, 66 percent of the reporting CSDs indicated they allow other CSDs to become direct participants. This feature is observed predominantly in CSDs in EAP (86 percent), high-income OECD economies (84 percent) and in economies in the ECA region (82 percent). 80 percent of the CSDs in high-income economies are participants in other CSDs compared to only 57 percent of CSDs in LMICS.

As for operational links between CSDs (**Table VI.6**), 51 percent of the CSDs Reported having operational links with other CSDs This varies across regions, with CSDs in high-income OECD, EAP and ECA regions reporting such links. This is reflected in CSDs in high income level economies. As for the location of the links, 41 percent mentioned that CSDs have links with local CSDs, while 58 percent have links with foreign CSDs. As for local and foreign links, the majority of the links are within the EAP, MNA and High-income OECD regions and high-income economies.

SECURITIES SETTLEMENT SYSTEMS

General information

Fifty-nine percent of SSSs (out of 100 responses to this specific question) indicated that they handle both government and corporate securities, while 28 handle only corporate securities and 13 only government securities (**Table VI.7 and Chart VI.7**). The highest percentage of SSSs handling all types of securities are in the economies in EAP, High-income OECD and ECA (86 percent, 86 percent and 60 percent, respectively). In high-income economies, most respondents mentioned that SSSs handle all types of securities, while in most low-income economies SSSs handle only government securities.

Eighty-nine percent of the SSSs (out of 102 SSSs for which information was provided to this specific question) are operated by a CSD, with all respondents across the EAP, LAC and MNA regions following this trend, while the rest of regions also have high percentages for this feature. This trend is also evident across all economies irrespective of income-levels.

Chart VI.7 SSS - Main Features

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Which type of securities is handled by the SSS?	The SSS handles both government and corporate securities	59% (59/100)	86% (6/7)	60% (12/20)	86% (30/35)	43% (6/14)	43% (3/7)		15% (2/13)	41% (23/56)	82% (36/44)
	The SSS handles only corporate securities	13% (13/100)	14% (1/7)	10% (2/20)	9% (3/35)		14% (1/7)	50% (2/4)	31% (4/13)	18% (10/56)	7% (3/44)
	The SSS handles only government securities	28% (28/100)		30% (6/20)	6% (2/35)	57% (8/14)	43% (3/7)	50% (2/4)	54% (7/13)	41% (23/56)	11% (5/44)
The SSS is operated by?	Other entity	11% (11/102)		19% (4/21)	11% (4/36)			25% (1/4)	15% (2/13)	12% (7/57)	9% (4/45)
	The CSD	89% (91/102)	100% (7/7)	81% (17/21)	89% (32/36)	100% (14/14)	100% (7/7)	75% (3/4)	85% (11/13)	88% (50/57)	91% (41/45)
The SSS is used regularly to facilitate ownership transfers stemming from secondary market transactions	Yes	94% (93/99)	100% (7/7)	95% (20/21)	100% (34/34)	86% (12/14)	86% (6/7)	100% (4/4)	83% (10/12)	91% (51/56)	98% (42/43)
The SSS is used for the clearing and settlement of securities traded at the stock exchange only	Yes	24% (24/101)	29% (2/7)	24% (5/21)	11% (4/36)	43% (6/14)	29% (2/7)	50% (2/4)	25% (3/12)	29% (16/56)	18% (8/45)
The SSS is used also for the clearing and settlement of OTC transactions	Yes	80% (77/96)	71% (5/7)	86% (18/21)	94% (33/35)	50% (7/14)	100% (5/5)	75% (3/4)	60% (6/10)	72% (39/54)	90% (38/42)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

The SSS is used regularly for facilitating transfer of ownership of secondary market securities transactions in 94 percent of the cases. In 24 percent of the cases, the SSS *only* settles stock exchange transactions, while in 80 percent of the cases it settles both stock exchange *as well as* OTC trades. SSSs settling stock exchange and OTC trades is common across all regions.

Main settlement features

Globally, a small share of the SSSs that handle both government and corporate securities use a different settlement mechanism for each type of security (as indicated by 14 out of 80 entities that answered this question or18 percent, compared to 34 percent in GPSS 2018) (see **Table VI.8a and Chart VI.8**). This is found largely in the SSSs in EAP and MNA, with 50 and 40 percent, respectively. Different settlement mechanisms are also used in 25 percent of SSSs in LMICs and only in 10 percent of SSSs in high-income economies.

The use of rolling shorter settlement cycles to reduce counterparty exposures is a positive measure being adopted across all the regions globally. In around 49 percent of the reporting systems, a rolling settlement cycle of T+2 or shorter period is used for settling *all* securities trades (compared to the 67 percent reported in the previous iteration), while in another 38 percent this same settlement cycle is used for the *"majority"* of securities. SSA and High-income OECD economies are leading in the use of shorter rolling settlement cycles.

Chart VI.8 SSS-Settlement features

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
If the SSS handles both government and corporate securities, is there a separate/different settlement process for each of these ty..	Yes	18% (14/80)	50% (3/6)	25% (4/16)	3% (1/33)	20% (2/10)	40% (2/5)		20% (2/10)	25% (10/40)	10% (4/40)
What settlement cycle is used?	A rolling settlement cycle of T+2 or shorter is used for all securities trades	49% (48/97)	14% (1/7)	43% (9/21)	58% (21/36)	50% (6/12)	43% (3/7)	50% (2/4)	60% (6/10)	46% (24/52)	53% (24/45)
	A rolling settlement cycle of T+2 or shorter is used for the majority of the securities trades	38% (37/97)	71% (5/7)	48% (10/21)	42% (15/36)	25% (3/12)	43% (3/7)	25% (1/4)		33% (17/52)	44% (20/45)
	A rolling settlement cycle of T+3 is used for all securities trades	8% (8/97)	14% (1/7)	10% (2/21)		8% (1/12)		25% (1/4)	30% (3/10)	15% (8/52)	
	A rolling settlement cycle of T+3 is used for the majority of the securities trades	4% (4/97)				17% (2/12)	14% (1/7)		10% (1/10)	6% (3/52)	2% (1/45)
Is the settlement of the cash leg (i.e. money settlements) made in Central Bank money?	Yes	85% (84/99)	86% (6/7)	71% (15/21)	91% (32/35)	86% (12/14)	86% (6/7)	67% (2/3)	92% (11/12)	82% (45/55)	89% (39/44)

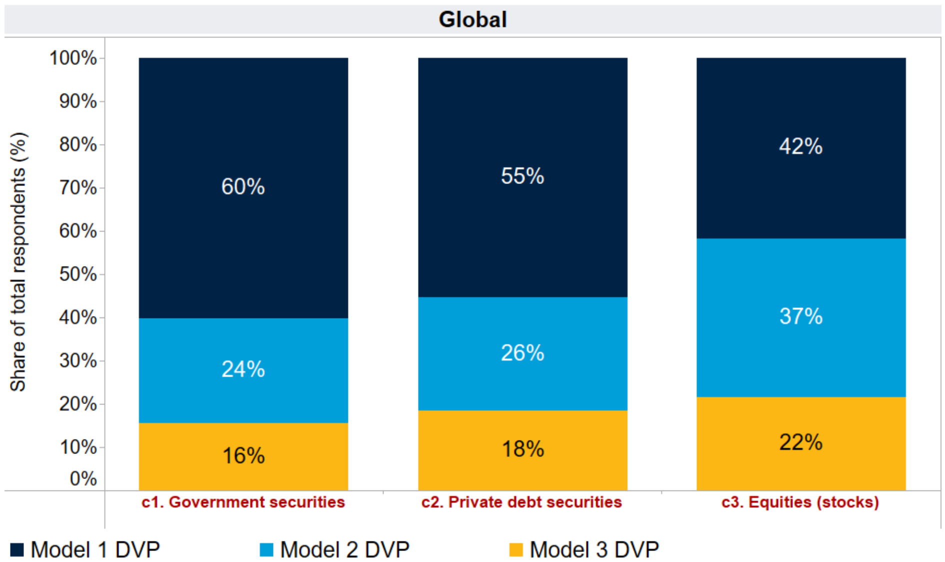
Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

Settlement of the cash leg in central bank money to minimize credit and liquidity risks was reported by 85 percent of the reporting SSSs, across all regions. The global figure is significantly higher than the one observed in the previous iteration, at 65 percent).

Ninety-nine percent of the respondents have DVP mechanism in place (99 of 100 responses) (**Table VI.8b**). All SSSs in all regions except one in ECA have DVP mechanisms in place.

Worldwide, DVP model 1 is widely prevalent for the settlement of government securities, private debt securities and equities (see **Table VI.8a**). In the case of equities, DVP models 2 and 3 are widely used. Also, model 2 is relevant for private debt and government securities, with 26 and 24 percent, respectively (**Chart VI.9**).

Chart VI.9 DVP models used on the types of securities



Sixty-one percent of 51 responding systems using DVP model 2 or model 3 indicated that there is a guarantee fund or other risk management mechanism in place (other than the CCP) to ensure settlement will take place in the event the participant with the largest debit obligation is unable to settle its position. Moreover, a securities lending mechanism has been implemented in 36 percent of the SSSs on a global basis, with the EAP region holding the largest share (71 percent).

Finally, regarding direct participation in the SSS, commercial banks and brokers-dealers are direct participants in most of the responding SSSs with 96 and 85 percent, respectively (**Table VI.9**). This is followed with participation of other types of financial institutions (73 percent) and of non-financial institutions (43 percent). Direct participation of commercial banks reaches 100 percent in the SSSs in High-income OECD economies and in the economies of the EAP, LAC and MNA regions, while for brokers-dealers it reaches 100 percent in the SSSs in ECA and MNA. The direct participation of banks, broker dealers and other financial institutions is high in high-income countries, with 100, 96 and 91 percent each. However, such participation is lower for LMICs.

CSD-SSS RESILIENCE AND BUSINESS CONTINUITY AND GOVERNANCE

Resilience and business continuity

Consistent with what is observed for RTGS systems, and previous GPSS iterations, resilience and business continuity are a top-of-mind issue for CSD-SSSs operators and regulators globally (**Table VI.10**). Ninety-seven percent of all CSD-SSS responded that the roles and responsibilities for addressing operational risk have been explicitly defined by the Board of Directors or its equivalent, while 94 percent of operators also reported that the operational risk management framework has been endorsed by the Board or its equivalent. Periodical review and testing are conducted by almost all CSD-SSS globally, although this percentage is somewhat lower in the SSA where only 75 percent reported carrying out such periodical reviews and tests.

On a global basis 89 percent of the CSD-SSSs reported that there is a Specialized Unit within the organization operating/managing the CSD-SSS that is responsible for the identification, protection, and detection of cyber threats to information security (**Table VI.12**).

Globally, almost all respondents indicated that they have routine procedures in place for periodic data back-ups (**Table VI.10**). Ninety-seven percent of the CSD-SSS reported housing tapes and storage media in sites other than the main processing site. Eighty-six percent of respondents reported deploying back-up servers at the main processing site, with lower percentages being reported for the SA region (75 percent) and LMICs (83 percent).

Most CSD-SSSs both regionally and across income-levels reported having a fully equipped alternate processing site. In contrast, a third processing site is not yet common across respondents, with the exception being the EAP region (83 percent of CSD-SSSs). In the remaining regions the percentage is 58 percent or lower.

Almost all the respondents reported having a documented, formal business continuity plan with business continuity arrangements being regularly reviewed and tested (94 percent in the 2018 iteration). Ninety-six percent of the CSD-SSSs reported that their business continuity arrangements include procedures for crisis management and information dissemination. Notwithstanding the above, it is observed that only 68 percent of the CSD-SSSs globally coordinate their business continuity plans with other interdependent FMIs.

Ninety-one percent of CSD-SSS globally have risk management and audit functions that are independent from the organization's business units (93 percent in GPSS 2018) (**Table VI.11**). this is observed in 98 percent of high-income economies compared to 85 percent in LMICs.

Cyber resilience

Cyber resilience measures are applied by 92 percent of the CSD-SSS globally, and 93 percent of the CSD-SSS have reported that a cyber resilience framework has been integrated into their respective operational risk management frameworks. CSD-SSS across regions and income levels reported having such an integrated framework. Ninety-two percent of the CSD-SSS reported applying cyber resilience measures. (**Chart VI.10** and **Table VI.12**)

Governance arrangements

More than 90 percent of the CSD-SSSs globally have reported that they have documented governance arrangements that include policies on Board's (or equivalent) and board committees' responsibilities and functioning (95 percent was reported in the previous iteration) (**Table VI.10**). Eighty-one percent of respondents reported that the Board (or equivalent) includes one or more independent board members. This percentage is lower in LMICs with 74 percent of CSD-SSSs. A documented risk-management framework has been established by the Board in 92 percent of the CSD-SSSs globally. (**Table VI.11**).

The roles and responsibilities of management are clearly specified in almost all CSD-SSSs globally (97 percent). Over 90 percent of the CSD-SSSs reported that they have a risk management function and an audit function that are independent from the organization's business units. This last percentage drops to 85 percent in the case of CSD-SSSs in LMICs.

Globally, 60 percent of economies indicate that they have completed the publication of the disclosure framework in line with the CPMI-IOSCO PFMIs (60 percent, compared to the 71 percent reported in the previous iteration). This figure drops to 45 percent for LMICs. Furthermore, 84 percent reported having implemented a mechanism for involving stakeholders in decision-making.

Chart VI.10 CSD-SSS Cyber-resilience

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The operational risk-management framework includes a specific cyber resilience framework	93% (88/95)	100% (6/6)	90% (18/20)	97% (32/33)	88% (15/17)	100% (4/4)	100% (4/4)	82% (9/11)	91% (50)	95% (38)
There is a committee (or similar structure) involving the operator, regulator, system participants and other relevant stakeholders to enhance the CSD-SSS's cyber resilience	57% (54/95)	67% (4/6)	30% (6/20)	59% (19/32)	56% (9/16)	50% (2/4)	75% (3/4)	85% (11/13)	59% (33)	54% (21)
There is a Specialized Unit within the organization operating/managing the CSD-SSS that is responsible for the identification, protection and detection of cyber threats to info..	89% (87/98)	83% (5/6)	81% (17/21)	97% (33/34)	94% (16/17)	75% (3/4)	100% (4/4)	75% (9/12)	84% (48)	95% (39)
Cyber resilience measures are applied	92% (88/96)	83% (5/6)	85% (17/20)	97% (32/33)	88% (14/16)	100% (4/4)	100% (4/4)	92% (12/13)	91% (52)	92% (36)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. The calculations in each line item refer to the number of systems.*

CENTRAL COUNTERPARTIES

General information

Thirty-seven economies have reported having at least one or more CCPs operating in the country, compared to 41 in the previous GPSS iteration. The general information sought from CCPs included type(s) of asset classes cleared and details on novation and open offer and whether they operate in more than one economy. Answers to the questions in this section were provided by 54 CCPs, with 12 CCPs reporting that they operate in more than one economy.

As shown in **Table VI.13 and Chart VI.11**, CCPs clear a wide variety of asset classes comprising corporate equities, corporate bonds, government securities, FX spots, REPOS, and derivatives (both exchange-traded and OTC). Globally, 65 percent of CCPs clear corporate equities; 52 percent corporate bonds; 57 percent clear government securities; 54 percent REPOS; 19 percent FX spots; 65 percent clear exchange-traded derivatives; and 44 percent OTC traded derivatives.

CCP clearing of corporate equities is prevalent across all income levels, though it is lower in high-income economies compared to LMICs. A similar trend is observed in the clearing of corporate bonds. Central clearing of government securities is observed in all regions and is more prevalent in LMICs. Clearing of exchange-traded derivatives is more common in high-income economies, with clearing of OTC traded derivatives exhibiting a similar trend. The various asset classes are not mutually exclusive, which means that the same CCP can clear OTC and exchange-traded of derivatives, and/or certain derivatives and cash products, several types of cash products, etc.

The process of novation is followed by 82 percent of CCPs (87 percent in GPSS 2018) while open offer is followed by 22 percent of CCPs. Novation appears to be less common for LMICs with only

68 percent compared to 93 percent in high-income economies. Inversely, LMICs have a higher share of open offer use (36 percent) compared to high-income economies (11 percent).

Finally, CCPs operating in more than one economy are mainly in high-income OECD economies (34 percent).

Chart VI.11 CCP – General Information

		Global	By Region						By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	South Asia	Sub-Saharan Africa	LMIC	High income
Asset classes cleared by the CCP	Corporate equities	65% (33/51)	60% (3/5)	83% (5/6)	61% (17/28)	78% (7/9)		50% (1/2)	68% (15/22)	62% (18/29)
	Corporate Bonds	52% (27/52)	80% (4/5)	83% (5/6)	41% (12/29)	56% (5/9)		50% (1/2)	64% (14/22)	43% (13/30)
	Government securities	57% (29/51)	60% (3/5)	83% (5/6)	50% (14/28)	56% (5/9)	100% (1/1)	50% (1/2)	64% (14/22)	52% (15/29)
	REPOs (Classical, Buy Sell-Back & Tri-party)	54% (28/52)	40% (2/5)	67% (4/6)	48% (14/29)	67% (6/9)	100% (1/1)	50% (1/2)	64% (14/22)	47% (14/30)
	FX Spots	19% (9/47)	20% (1/5)	17% (1/6)	4% (1/25)	63% (5/8)	100% (1/1)		38% (8/21)	4% (1/26)
	Exchange-traded derivatives	65% (33/51)	60% (3/5)	50% (3/6)	75% (21/28)	67% (6/9)			55% (12/22)	72% (21/29)
	OTC-traded derivatives	44% (22/50)	20% (1/5)	33% (2/6)	48% (13/27)	56% (5/9)	100% (1/1)		41% (9/22)	46% (13/28)
	The CCP legally becomes the buyer to every seller, and the seller to every buyer via Novation	82% (42/51)	80% (4/5)	50% (3/6)	93% (26/28)	89% (8/9)	100% (1/1)		68% (15/22)	93% (27/29)
	The CCP legally becomes the buyer to every seller, and the seller to every buyer via Open offer	22% (11/50)	20% (1/5)	33% (2/6)	11% (3/27)	33% (3/9)		100% (2/2)	36% (8/22)	11% (3/28)
	The CCP operates in more than one jurisdiction	24% (12/51)	20% (1/5)		36% (10/28)	11% (1/9)			9% (2/22)	34% (10/29)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question. No responses were provided for CCPs by economies in the MNA region.*

Membership

Members in CCPs are mainly commercial banks, broker-dealers and other financial institutions. Globally, 83 percent of CCPs provide membership to commercial banks, 88 percent to brokers-dealers and 63 percent to other financial institutions (see **Table VI.14 and Chart VI.12**)

The membership type could vary depending on whether the member can: i) enter transactions directly with the CCP (type "a"); ii) act as a direct settlement member, settling transactions on its own account (type "b"); iii) act as a direct settlement member and settle transactions on its own account and also on behalf of other participants (type "c"); and (iv) settle transactions indirectly through another member (type "d"). In this regard, for all types of entities, the most used participation model is type "c," with 64 percent for commercial banks, 56 percent for brokers-dealers and 47 percent for other financial institutions. The second most popular type of participation model for all institutions is type "a."

Chart VI.12: participation in the CCP

	Commercial Banks	Broker-dealers	Other financial institutions
CCP Membership	**83%** (46/52)	**88%** (43/52)	**63%** (32/51)
Type of membership (as % of the number of respondents in each category):			
Enter transactions directly with the CCP	**23%** (10/44)	**27%** (12/45)	**22%** (7/32)
As a direct settlement member, settling transactions on its own account	**14%** (6/44)	**16%** (7/45)	**19%** (6/32)
As a direct settlement member, settling transaction on its own account AND on behalf of other participants of the CCP	**64%** (28/44)	**56%** (25/45)	**47%** (15/32)
Can ONLY settle transactions indirectly through another member	**0%** (0/44)	**2%** (1/45)	**13%** (4/32)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to number of systems.*

<u>Management of credit exposures</u>

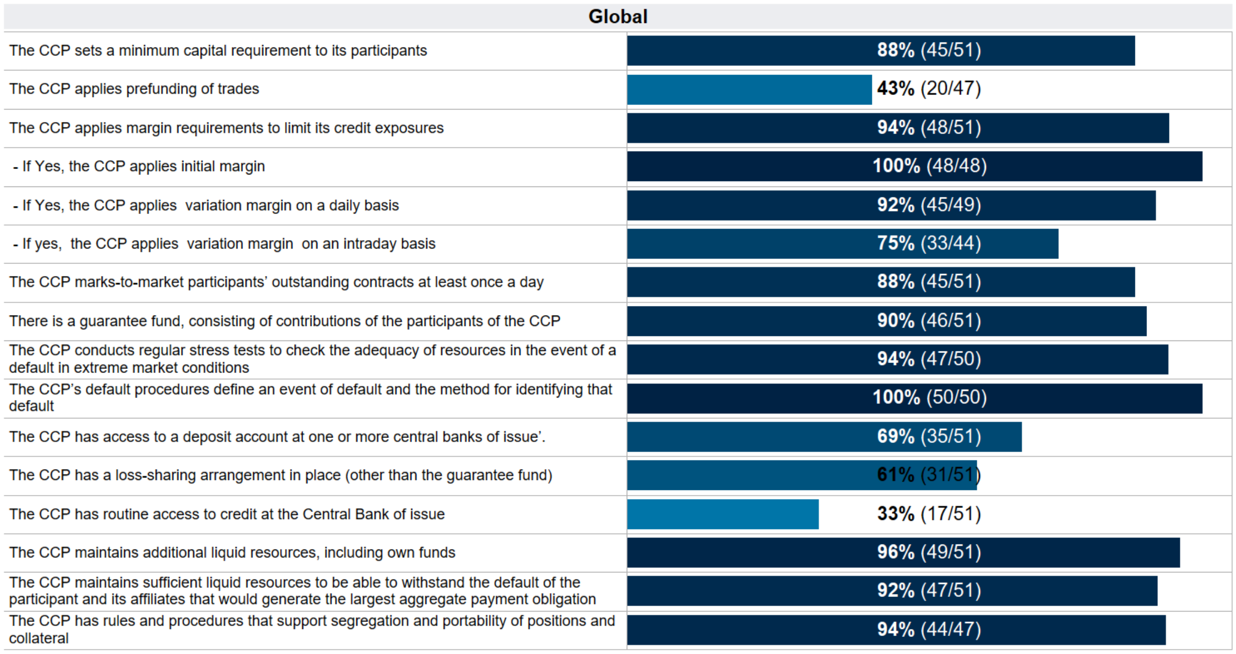
Most of the CCPs worldwide have put in place risk management measures to manage their credit exposure. The most relevant findings are shown in **Chart VI.13** and in **Table VI.16**. Of the more than 50 CCPs that answered this part of the survey, 100 percent of them have a method to identify defaults, 96 percent have additional liquid resources, including own funds (49 CCPs), 94 percent conduct regular stress tests (47 CCPs), and a similar share have rules and procedures that support segregation and portability of positions and collateral, and/or apply margin requirements (94 percent, which is almost identical to data reported in GPSS 2018 of 93 percent).

As for margin requirements, 48 CCPs require initial margin, and 45 require variation margin. Of the latter, 33 require variation margin on an intra-day basis.

On the lower end, only 17 CCPs (33 percent) have routine access to credit from the central bank of issue and 20 apply prefunding of trades. Routine access to central bank credit is more common in CCPs in the ECA region (67 percent).

Another key measure is whether a CCP maintains sufficient liquid resources to be able to withstand the default of the participant and its affiliates that would generate the largest aggregate payment obligation. This measure is observed in 92 percent of the reporting CCPs, compared to the 81 percent from the previous iteration. The same share and number of respondents have a guarantee fund made-up with participant contributions. Only 82 percent of CCPs in LMICs have this guarantee fund, compared to 97 percent in high-income economies.

Chart VI.13 CCPs – Management of credit exposures



Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. The calculations in each line item refer to the number of systems.*

Custody and settlement of securities and funds

Another facet of CCP risk management involves the safe custody of the CCPs' own assets and of the collateral pledged by participants, and whether settlement occurs in commercial bank money or central bank money (**Table VI.17** and **Chart VI.14**).

In the case of securities, globally, 46 CCPs representing 90 percent of the sample size hold their own securities and those pledged as collateral by their participants at a supervised and regulated CSD. In the 2018 iteration this percentage was slightly lower at 84 percent. The sample-wide percentage shows some variations across regions, ranging from 100 percent in LAC, SA and SSA, to 80 percent of CCPs in EAP.

Regarding funds, 52 percent of CCPs hold their own funds and those pledged as collateral by their participants with commercial banks, while 48 percent do so with the central bank.

Seventy-three percent of CCPs conduct their money settlements in central bank money, a percentage that rises to 90 percent in high-income economies and only 50 percent in LMICs.

Chart VI.14 CCPs: Custody and settlement of securities and funds

Global			By Region						By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	South Asia	Sub-Saharan Africa	LMIC	High income
The CCP holds its own securities and those pledged as collateral by its participants at a supervised and regulated CSD	Yes	90% (46/51)	80% (4/5)	83% (5/6)	89% (25/28)	100% (9/9)	100% (1/1)	100% (2/2)	91% (20/22)	90% (26/29)
The CCP holds its own funds and those pledged as collateral by its participants at?	Commercial banks	52% (26/50)	100% (4/4)	50% (3/6)	36% (10/28)	89% (8/9)		50% (1/2)	76% (16/21)	34% (10/29)
	The central bank	48% (24/50)		50% (3/6)	64% (18/28)	11% (1/9)	100% (1/1)	50% (1/2)	24% (5/21)	66% (19/29)
Money settlements of the CCP are effected in Central Bank money	Yes	73% (38/52)	60% (3/5)	17% (1/6)	90% (26/29)	67% (6/9)	100% (1/1)	50% (1/2)	50% (11/22)	90% (27/30)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

Links between CCPs

The phenomenon of links between CCPs is predominantly observed in CCPs in high-income OECD economies as 5 out of the 6 that answered positively this question item are classified under this category (**Table VI.18**). Further, 7 CCPs reported having links with one or more foreign CCPs, with 6 of them being in high-income OECD economies.

Resilience and business continuity

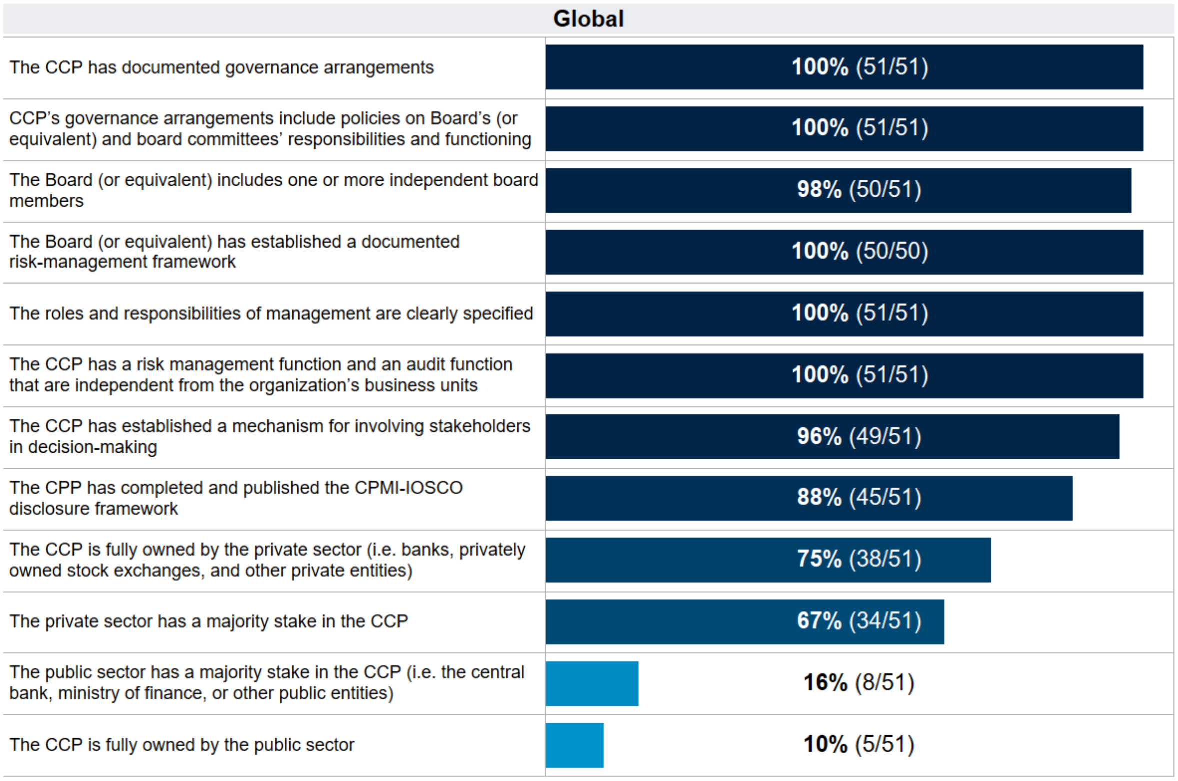
In line with the past GPSS iteration and similar to CSD-SSSs, answers to this part of the survey reveal positive figures (**Table VI.20**). Overall, the LAC region is weaker in these specific aspects.

All 51 CCPs that answered this section have a documented formal BCP, with such plans covering all necessary arrangements as well as conducting periodic reviews and testing. Also, all CCPs have an operational risk management framework endorsed by the organization’s Board of Directors, with clear roles and responsibilities, and this framework is tested and reviewed periodically. Almost all CCPs, 94 percent, have integrated cyber resiliency aspects into their operational risk management frameworks. Practically all CCPs (98 percent) have alternate processing sites and they use tapes and other storage media, which are kept in sites away from the main processing site. In the lower end, only 33 percent have a third alternate processing site, 64 percent have a multi-stakeholder committee to address cybersecurity concerns related to the CCP, and 73 percent arrange business continuity procedures in coordination with interdependent FMIs. This is further developed in section VIII.

Governance and ownership

All CCPs (51) indicated that they have documented governance arrangements, and these governance arrangements include policies on the responsibilities and functioning of the Board of Directors and its committees. Further, 98 percent of the reporting CCPs have one or more independent board members (see **Table VI.19 and Chart VI.15**).

Chart VI.15 CCPs – Governance



Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

All reporting CCPs have a documented risk management framework, and have independent risk management and audit functions, which are separate from the organization's business units. Ninety-six percent of CCPs have established a mechanism for involving stakeholders in the decision-making process. The CPMI-IOSCO PFMIs Disclosure Framework has been completed and published by 88 percent of the CCPs, with most exceptions being found in LMICs, and, from a regional perspective, in the ECA and SSA regions.

As for ownership, globally, 75 percent of the CCPs are fully owned by the private sector, this being more evident in High-income OECD economies (93 percent) and in the LAC region (89 percent). In comparison, only 10 percent of CCPs globally are fully owned by the public sector.

<u>Tools to mitigate counterparty credit exposures in the absence of a CCP</u>

In this iteration of the GPSS, additional questions were included about how counterparty credit exposures are managed if market participants do not have access to a CCP. Such exposures exist across three markets: the exchange-traded derivatives market, the OTC derivatives market, and the securities market (**Table VI.22**).

Without a CCP, mitigation of counterparty credit exposures can be executed in various forms, with the GPSS covering: i) initial and/or variation margins held by individual banks that take part on the trade, ii) guarantee funds held by the exchange or the SSS, or the exchange acting as both administrator of the funds and guarantor, and iii) provision of covered or uncovered intraday credit by the SSS to guarantee settlement.

It is important to highlight that the only regions that answered questions related to exchange-traded derivatives were economies across the ECA, High-income OECD, LAC regions and SSA. For OTC derivatives, responses were obtained from economies across ECA and High-income OECD regions. Credit risk management for securities had responses from all regions.

Globally, for derivatives markets (both exchange-traded and OTC), use of initial and variation margins held by individual banks that take part in trade is the preferred mechanism to mitigate counterparty credit exposures, in 56 percent of the responses for exchange-traded derivatives transactions and in 50 percent of the responses for OTC derivatives (**Chart VI.16** and **Table VI.22**). The second most used measure for managing credit exposures in derivatives markets is posting initial or variation margins, with exchange-traded derivatives and OTC both at 33 percent share.

Chart VI.16 Tools with which counterparty credit exposures are mitigated in the absence of a CCP

Global	Exchange-traded derivatives market	OTC derivatives market	Securities market
a. Initial margin AND variation margin held by the individual banks (or other participant) that are part of the trade	56% (5/9)	50% (5/10)	16% (4/25)
b. Initial margin OR variation margin held by the individual banks (or other participant) that are part of the trade	33% (3/9)	33% (3/9)	35% (9/26)
c. There is guarantee fund in place, with the Exchange as administrator	22% (2/9)		21% (6/28)
d. There is a guarantee fund in place, with the Exchange as administrator AND guarantor	11% (1/9)		
e. There is a guarantee fund with the SSS operator as administrator	11% (1/9)		14% (4/28)
f. The SSS operator guarantee settlement through provision of intraday credit	11% (1/9)	10% (1/10)	18% (5/28)
f1. If YES to item "f", is intraday credit provided on a collateralized basis?	33% (1/3)		36% (4/11)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. Calculations in each line item refer to the number of systems. Blanks should be interpreted as zero positive responses for the specific question.*

Securities markets mostly use initial or variation margins, held by counterparts of the trade, with 35 percent, followed by guarantee funds held by the exchange, with 21 percent. The role of the SSS, as either administrator of a guarantee fund, or provider of intraday liquidity is more prevalent in securities markets, with 4 economies going for the first option and 5 economies for the latter. As for the exchange acting as both administrator of guarantee funds and guarantor this measure is only applied in one economy.

TRADE REPOSITORIES

Sixteen economies have reported having at least one or more trade repositories operating in the country (as indicated in **Table VI.1**). As seen in GPSS 2018, trade repositories are yet to take strong roots in various regional economies as only a small number of them were reported as being in operation. In contrast to GPSS 2018, from a regional perspective now all regions have at least one trade repository.

Of the 21 reported trade repositories, aggregate data is provided to the public by 76 percent, and this is common across almost all regions, except for ECA, with 33 percent (**Table VI.21** and **Chart VI.17**). Seventeen out of 20 trade repositories (85 percent) provide aggregate and categorized data over the internet.

Ninety-five percent of trade repositories (19 of 20) have formal procedures in place to provide data to relevant authorities, with the same share for authorities having access to participant-level data. Ninety percent of 19 trade repositories reported that they provide aggregate data on open positions and transaction volumes and values and categorized data (e.g., aggregate breakdowns of trading counterparties, reference entities, or currency breakdowns of products).

Finally, 18 trade repositories have business continuity arrangements that are regularly tested, and routine procedures are in place for periodic data backups.

Chart VI.17 Trade repositories – General Information

Global		By Region						By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	South Asia	Sub-Saharan Africa	LMIC	High income
The TR provides aggregate data on open positions and transaction volumes and values to the public	76% (16/21)	100% (3/3)	33% (2/6)	83% (5/6)	100% (4/4)	100% (1/1)	100% (1/1)	73% (11/15)	83% (5/6)
The TR provides categorized data (for example, aggregate breakdowns of trading counterparties, reference entities, or currency breakdowns of products)	89% (17/19)	100% (3/3)	75% (3/4)	83% (5/6)	100% (4/4)	100% (1/1)	100% (1/1)	92% (12/13)	83% (5/6)
The TR has a formal procedure in place to provide data to relevant authorities	95% (18/19)	100% (3/3)	75% (3/4)	100% (6/6)	100% (4/4)	100% (1/1)	100% (1/1)	92% (12/13)	100% (6/6)
In addition to data in items "a" and "b" above, authorities have routine access to participant-level data	95% (18/19)	100% (3/3)	75% (3/4)	100% (6/6)	100% (4/4)	100% (1/1)	100% (1/1)	92% (12/13)	100% (6/6)
Data in items "a" and "b" above are available on the Internet	84% (16/19)	100% (3/3)	50% (2/4)	83% (5/6)	100% (4/4)	100% (1/1)	100% (1/1)	85% (11/13)	83% (5/6)
Business continuity arrangements are regularly tested at the level of the TR	100% (18/18)	100% (3/3)	100% (4/4)	100% (5/5)	100% (4/4)	100% (1/1)	100% (1/1)	100% (13/13)	100% (5/5)
Routine procedures are in place for periodic data back-ups	100% (18/18)	100% (3/3)	100% (4/4)	100% (5/5)	100% (4/4)	100% (1/1)	100% (1/1)	100% (13/13)	100% (5/5)

Note: *Each line item in the chart refers to a standalone question, thus the number of total responses may vary. The calculations in each line item refer to the number of systems.*

SECTION VII: OVERSIGHT ARRANGEMENTS

As payment and settlement systems and services evolve, the objectives and scope of oversight change over time, as evidenced by previous GPSS report issues. In the early 2000s, this function mostly focused mainly on systems for the execution, clearing and settlement of large-value transactions. Nowadays, its scope has progressively extended to retail payment systems as well as payment services, involving a growing set of heterogeneous stakeholders, and its mandate has expanded over time to reflect a broader range of objectives.

This section of GPSS 2021 explores the main aspects of the NPS oversight function, including its institutionalization, legal support, the clarity and transparency in communicating oversight policies, the ambit of oversight, and the instruments used in its execution. This section also looks at cooperation arrangements involving financial sector authorities as well as market players.

NPS OVERSIGHT: GENERAL ISSUES

A robust NPS oversight function relies, among other elements, on legal empowerment and an appropriate internal organizational structure. Ninety-five percent of central banks have established their oversight function, and 93 percent already have a specific unit responsible for it, both figures being slightly higher than those of GPSS 2018. Also, as shown in **Chart VII.1** and **Table VII.1**, 89 percent of respondents have adopted specific organizational arrangements for NPS oversight separate from operational tasks (85 percent in GPSS 2018), and 82 percent use independent lines for reporting on oversight activities. Overall, the data show that the high-income economies and, at the regional level, the economies from ECA, have the highest percentages for these aspects, while the economies from the SSA and SA region appear to be those with relatively weaker oversight arrangements.

Chart VII.1 Payment system oversight: General issues

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The Central Bank's payment system oversight function has been established and it is performed regularly and in an on-going basis	95% (89/94)	100% (6/6)	100% (17/17)	100% (28/28)	88% (14/16)	100% (9/9)	67% (2/3)	87% (13/15)	93% (52/56)	97% (37/38)
There is a specific unit or department within the Central Bank responsible for payment system oversight	93% (86/92)	83% (5/6)	100% (17/17)	100% (28/28)	94% (15/16)	89% (8/9)	100% (2/2)	79% (11/14)	91% (49/54)	97% (37/38)
The payment system oversight function is segregated from payment system operational tasks through a specific organizational arrangement	89% (78/88)	100% (5/5)	100% (15/15)	92% (24/26)	87% (13/15)	78% (7/9)	100% (3/3)	73% (11/15)	89% (47/53)	89% (31/35)
The payment system oversight function is segregated from payment system operational tasks through via independent reporting lines	82% (59/72)	100% (6/6)	83% (10/12)	91% (21/23)	67% (6/9)	88% (7/8)	33% (1/3)	73% (8/11)	77% (33/43)	90% (26/29)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

OBJECTIVES OF THE OVERSIGHT FUNCTION

Ninety percent of the responding central banks indicated that their objectives in carrying out the payment system oversight function are enshrined in a regulation, or a policy document approved by the central bank Governor or by senior management, and 87 percent reported that their oversight objectives are publicly disclosed (**Chart VII.2** and **Table VII.2**).

Regarding the specific objectives of oversight, almost all the responding central banks (99 percent) include safety and efficiency. Yet, as noted in previous iterations, additional items were reported as oversight objectives and their relevance has further grown since the latest survey. The new objectives include promoting financial inclusion (69 percent, compared to 37 percent in the 2018 iteration), avoiding collusive practices and promoting market competition (76 percent, compared to 66 percent), and avoiding market fragmentation (70 percent, compared to 32 percent). Mostly LMICs consider these additional objectives, while high-income economies seem to focus on safety and efficiency.

Chart VII.2 Payment system oversight and its objectives

		Global	By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
	Has the Central Bank set down its objectives in carrying out the payment system oversight function in a regulation or a policy document approved by the central bank's Governor/top management?	90% (83/92)	83% (5/6)	100% (17/17)	96% (27/28)	69% (11/16)	100% (9/9)	100% (2/2)	86% (12/14)	89% (48/54)	92% (35/38)
	If Yes, are these objectives publicly disclosed?	87% (71/82)	100% (4/4)	94% (15/16)	96% (26/27)	73% (8/11)	78% (7/9)	67% (2/3)	75% (9/12)	83% (39/47)	91% (32/35)
Central Bank's objectives of payment system oversight	Safety and efficiency of payment systems	99% (88/89)	100% (4/4)	100% (17/17)	100% (28/28)	100% (13/13)	100% (9/9)	100% (3/3)	93% (14/15)	98% (51/52)	100% (37/37)
	Financial inclusion	69% (42/61)	100% (2/2)	78% (7/9)	15% (2/13)	83% (10/12)	100% (7/7)	67% (2/3)	80% (12/15)	81% (34/42)	42% (8/19)
	Consumer protection	73% (48/66)	100% (4/4)	90% (9/10)	20% (3/15)	75% (9/12)	100% (7/7)	100% (3/3)	87% (13/15)	89% (40/45)	38% (8/21)
	Avoid collusive practices and promote market competition	76% (45/59)	100% (3/3)	100% (7/7)	40% (6/15)	83% (10/12)	100% (6/6)	100% (2/2)	79% (11/14)	87% (34/39)	55% (11/20)
	Avoid market fragmentation	70% (37/53)	100% (2/2)	88% (7/8)	15% (2/13)	73% (8/11)	100% (6/6)	100% (2/2)	91% (10/11)	86% (31/36)	35% (6/17)
	Others	42% (13/31)		60% (3/5)	25% (3/12)	40% (2/5)	100% (2/2)	0% (0/0)	60% (3/5)	53% (9/17)	29% (4/14)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Scope of Oversight

Ninety-eight percent of the responding central banks indicated that oversight covers all SIPS, regardless of who the operator is (compared to 93 percent from the previous iteration). Also, a growing number of central banks extend their oversight to retail payment systems (93 percent in 2020 compared to 78 percent in 2018) and to banks in their role as PSPs (**Table VII.3a**). On the other hand, the coverage of critical service providers under oversight remains relatively limited at the global level (47 percent); it is more prevalent in high-income economies (57 percent). Payment services are overseen by 74 percent of the responding central banks globally, similar to the 2018 figure. Yet, there is a marked difference between high-income economies (60 percent) and LMICs (83 percent). This seems to confirm that LMICs have a broader scope of NPS oversight.

As regards the oversight of FMIs other than payment systems (**Table VII.4a** and **Table VII.4b**), for CCPs the central bank is the primary overseer in 49 percent of the economies, while in 60 percent of the economies the role of primary regulator and supervisor is played by another financial authority.[36] In the case of CSD-SSSs for government securities, the central bank is the primary overseer in 74 percent of the cases, while this percentage drops to 60 percent for CSD-SSSs that handle corporate securities (both figures being similar to those of the 2018 iteration), and further down to 31 percent for trade repositories. The role of the central bank, as overseer for FMIs other than payment systems, is more frequently observed in high-income economies.

OVERSIGHT INSTRUMENTS

Eight instruments of oversight were included in the questionnaire to gauge the preference of the central banks surveyed (**Table VII.5**). The responses to the questionnaire show the following order of preferences at the global level: performing assessments based on CPSS-IOSCO standards (73 percent); monitoring (72 percent), issuing of regulations (67 percent); collection of statistics and reports (66 percent); licensing or no-objection for the operation of systems and services (64 percent); dialogue and moral suasion (52 percent) and on-site inspections (47 percent).

As with the 2018 iteration, it is observed that the use of policy dialogue and assessment of standards as oversight instruments is by far preferred by central banks of high-income economies, while the use of regulatory and compliance tools is, conversely, much more prevalent in LMICs.

SYSTEM DESIGNATION CRITERIA AND PRACTICES

Chart VII.3 Criteria for central bank to designate FMIs as systemically important

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The value or number of transactions that the system process exceeds or may exceed in the future certain threshold.	95% (70/74)	100% (3/3)	93% (14/15)	96% (23/24)	92% (11/12)	86% (6/7)	100% (2/2)	100% (11/11)	95% (40/42)	94% (30/32)
Being the only system operating certain instrument or certain type of transactions and having no alternate in the market	79% (56/71)	100% (3/3)	71% (10/14)	68% (15/22)	82% (9/11)	100% (5/5)	50% (1/2)	93% (13/14)	81% (34/42)	76% (22/29)
The nature of the transactions that the system presently processes or is likely to process in the future (i.e. being wholesale)	79% (53/67)	100% (3/3)	75% (9/12)	71% (17/24)	91% (10/11)	100% (5/5)	50% (1/2)	80% (8/10)	83% (30/36)	74% (23/31)
The significance of the system stemming from its relationship and linkages to other systems	89% (68/76)	100% (3/3)	71% (10/14)	92% (22/24)	83% (10/12)	100% (7/7)	100% (2/2)	100% (14/14)	87% (39/45)	94% (29/31)
Other criteria	62% (29/47)	100% (2/2)	38% (3/8)	82% (18/22)	57% (4/7)		67% (2/3)		43% (10/23)	79% (19/24)
These criteria are publicly disclosed	79% (54/68)	100% (2/2)	85% (11/13)	85% (22/26)	70% (7/10)	100% (3/3)	50% (1/2)	67% (8/12)	73% (27/37)	87% (27/31)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

[36] This clearly has implications for cooperation between the central bank and other financial sector regulators.

Designation of an FMI as systemically important is a common central bank practice and plays a critical role in signaling the intensity of central bank action on oversight. As per **Chart VII.3** and **Table VII.11**, most of the responding central banks (95 percent) have reported using the value or number of transactions that a system processes (vis-à-vis a predetermined threshold) as their preferred criterion for designation, followed by the significance of a system stemming from its relationship and linkages to other systems (89 percent). Both figures are higher than those observed as part of the previous GPSS iteration. Also, 79 percent of the respondents disclose publicly the criteria used for designation. These findings are relatively similar across all regions and income levels.

REQUIREMENTS FOR PAYMENT SYSTEM OPERATORS

Central banks typically adopt specific requirements for payment systems and other FMIs, as a means to induce their operators (PSOs) to manage and mitigate risks. The survey identified seven such requirements (**Table VII.10a** to **Table VII.10g**).

For ACHs, the most utilized requirements are those calling on PSOs to set up cyber risk management frameworks (59 percent of responding central banks), sending regular reports (59 percent), implementing minimum operational provisions (59 percent), adopting cyber strategies (54 percent), and conducting oversight on-site inspections (54 percent). Fit and proper requirements for members of the Board of Directors and senior management (45 percent), and a minimum paid-in capital (34 percent) are less common. Similar preferences and percentages hold for FPSs, while percentages for international and domestic card schemes and switches are, on average, lower across all requirement types. In the case of mobile money platforms, the most utilized requirement is that of sending reports to the overseer (24 percent), followed by minimum operational requirements (22 percent), fit and proper requirements for Board of Directors' members and senior management (21 percent), cyber risk management framework (21 percent) and on-site inspections (20 percent).

Figures from GPSS 2018 are not directly comparable as questions were structured differently.

REQUIREMENTS FOR PAYMENT SERVICE PROVIDERS

To the extent that retail payment services fall within the oversight mandate, central banks adopt requirements for PSPs. In addition to requirements used for FMI operators, those for PSPs typically also include provisions for consumer protection and appropriate risk management (**Table VII.9a** to **Table V.9f**). The intensity of use of these requirements varies across specific PSP functions, however. Prudential requirements (i.e., fit & proper, and minimum paid-in capital) are used relatively more frequently for functions that involve issuing and managing accounts than for functions that are more operational in nature (e.g., payment processing). This is a constant in all previous GPSS iterations that have addressed these elements.

As regards provisions for consumer protection (**Table VII.12**), these consist mainly of upfront disclosure requirements (99 percent), dispute resolution mechanisms (97 percent), and customer protection against unauthorized transactions (95 percent). Less frequent but still commonly used is the requirement that PSPs disclose to customers the potential uses and sharing of their personal and/or transactional data (84 percent). These findings hold similarly across regions and income levels. Only requirements on transaction and data protection are less frequently used by central banks in LMICs, while they are used by almost the totality of central banks in high-income economies.[37]

COMPETITION POLICY

About half (45 percent) of the responding central banks do not engage in competition policy for payment services provision. This is significantly more frequent in high-income economies.

Another 24 percent actively regulate competition between PSPs, 21 percent limit their role to voicing opinions on competition between PSPs or using moral suasion, and the remaining 10 percent only collect and disseminate information on competition between PSPs (**Chart VII.4** and **Table VII.13**). There is no comparable from previous GPSS iterations.

Chart VII.4 Involvement of the central bank in competition policy for payment service provision

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
The Central Bank actively regulates competition between payment services providers if and when deemed necessary	24% (20/84)	40% (2/5)	12% (2/17)	8% (2/26)	36% (5/14)	71% (5/7)	33% (1/3)	25% (3/12)	32% (16/50)	12% (4/34)
The Central Bank role is limited to collection and dissemination of information on competition between payment service providers	10% (8/84)		29% (5/17)	12% (3/26)					10% (5/50)	9% (3/34)
The Central Bank role is limited to voicing opinions with regard to the competition between payment service providers - moral suasion	21% (18/84)	20% (1/5)	12% (2/17)	12% (3/26)	21% (3/14)	14% (1/7)	33% (1/3)	58% (7/12)	28% (14/50)	12% (4/34)
There is no involvement at all from the Central Bank in the competition between payment service providers	45% (38/84)	40% (2/5)	47% (8/17)	69% (18/26)	43% (6/14)	14% (1/7)	33% (1/3)	17% (2/12)	30% (15/50)	68% (23/34)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

INVOLVEMENT OF CENTRAL BANKS IN THE PRICING OF PAYMENT SERVICES TO END-USERS

Consistently with the broad picture provided by NPS oversight and central bank involvement on promoting competition, as **Table VII.8 and Chart VII.5** show, central banks intervene only to a limited extent in the pricing of payment services to end-users: 22 percent intervene on the pricing of payment card transactions (mainly for interchange fees or MDRs), 16 percent intervene on the pricing of payments with e-money accounts, and 18 percent on credit transfers and debit cards. Twenty-five percent of central banks reported that they regulate the pricing of customer payments made via the RTGS system and 11 percent regulate the price of remittances.

Overall, by comparing these responses with those of the previous GPSS iteration, it appears that an increasing number of central banks are taking a more active stance on the pricing of services to end-users.

[37] This might be reflecting an evolution that will take ground following the spread of technology developments and the consequent legal and regulatory adaptations in the realm of data privacy and protection.

Chart VII.5 Involvement of the central bank in the pricing of payment systems

Global	Credit transfers / direct debits (interbank)	Customer payments made via the RTGS system	Payment card transactions, including interchange fees or MDRs	Payments with e-money accounts or mobile money accounts	Remittances
The Central Bank actively regulates prices of payment services if and when deemed necessary	17% (11/66)	25% (16/64)	22% (14/63)	16% (10/61)	11% (7/62)
The Central Bank role is limited to collection and dissemination of information on prices of payment services	12% (8/69)	11% (7/63)	12% (8/65)	11% (7/61)	9% (6/64)
The Central Bank role is limited to voicing opinions with regard to the pricing of payment services – moral suasion	13% (9/69)	3% (2/61)	18% (11/62)	13% (8/62)	8% (5/64)
There is no involvement at all from the Central Bank in the pricing of payment services to end-users	24% (16/68)	30% (19/63)	19% (12/64)	32% (20/62)	35% (24/68)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

COOPERATION IN THE CONTEXT OF OVERSIGHT

In the last item of this section of GPSS 2021, the survey inquired on whether there is relevant cooperation of the central bank as overseer with other regulatory and supervisory authorities for NPS oversight (**Chart VII.6** and **Table VII.6**), as well as with other stakeholders, and on how cooperation with stakeholders is organized (**Chart VII.7** and **Table VII.7**).

Globally, cooperation is quite relevant with bank supervisors (75 percent), other securities regulators (59 percent), and other central banks (79 percent), and this practice of cooperation is similarly widespread across regions and income levels. Less intensive is cooperation with other financial authorities (38 percent), and even less so with consumer protection authorities (23 percent), telecom regulators (27 percent), and data protection authorities (27 percent).

Two findings deserve special attention: First, cooperation with telecom authorities was reported as being more prevalent in the SSA region, where there is significant development of the mobile money business relative to other world regions. Second, cooperation with data protection authorities shows a remarkable (more than two-fold) increase vis-à-vis the latest GPSS iteration. Here, too, the increase is concentrated in the SSA region, and it is somewhat prevalent in all regions except for High-income OECD economies.

Regarding cooperation with other stakeholders, 40 percent of the responding central banks reported having established a formal National Payments Council (NPC) or similar arrangement, with no change from the previous GPSS iteration (**Chart VII.7** and **Table VII.7**). These central banks are mostly from the ECA region and from high-income economies.

Twenty-five percent indicated that they hold regular meetings with stakeholders at a senior level to discuss strategic issues for the payment system, although not in an institutionalized context (such as an NPC). On the other hand, 16 percent of the responding central banks engage stakeholders on a limited basis (such as consulting only banks, or consulting stakeholders only at the operational level).

Chart VII.6 Cooperation with other relevant authorities and other stakeholders

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Is there a significant degree of cooperation with bank supervisors in the context of payment system oversight activities?	75% (67/89)	83% (5/6)	63% (10/16)	67% (18/27)	79% (11/14)	88% (7/8)	100% (3/3)	87% (13/15)	79% (42/53)	69% (25/36)
Is there a significant degree of cooperation with consumer protection authorities in the context of payment system oversight activities?	23% (19/84)	20% (1/5)	25% (4/16)	7% (2/27)	36% (5/14)	40% (2/5)		33% (5/15)	34% (17/50)	6% (2/34)
Is there a significant degree of cooperation with data protection authorities in the context of payment system oversight activities?	27% (22/83)	40% (2/5)	27% (4/15)	4% (1/26)	29% (4/14)	50% (3/6)	50% (1/2)	47% (7/15)	37% (18/49)	12% (4/34)
Is there a significant degree of cooperation with other central banks in the context of payment system oversight activities?	79% (66/84)	60% (3/5)	79% (11/14)	85% (23/27)	71% (10/14)	71% (5/7)	100% (2/2)	80% (12/15)	76% (37/49)	83% (29/35)
Is there a significant degree of cooperation with other national financial regulators in the context of payment system oversight activities?	38% (32/84)	20% (1/5)	27% (4/15)	23% (6/26)	64% (9/14)	33% (2/6)	33% (1/3)	60% (9/15)	44% (22/50)	29% (10/34)
Is there a significant degree of cooperation with securities regulators in the context of payment system oversight activities?	59% (50/85)	60% (3/5)	40% (6/15)	63% (17/27)	64% (9/14)	50% (3/6)	67% (2/3)	67% (10/15)	54% (27/50)	66% (23/35)
Is there a significant degree of cooperation with Telecom Authority in the context of payment system oversight activities?	27% (23/86)	20% (1/5)	13% (2/16)		14% (2/14)	33% (2/6)	100% (3/3)	87% (13/15)	43% (22/51)	3% (1/35)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Chart VII.7 Cooperation with other stakeholders

Global		By Region							By Region	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
A formal National Payments Council or similar arrangement is in place	40% (35/88)	17% (1/6)	41% (7/17)	43% (12/28)	43% (6/14)	40% (2/5)	33% (1/3)	40% (6/15)	33% (18/54)	50% (17/34)
Although not formalized, the Central Bank holds regular meetings with stakeholders at a senior level to discuss strategic issues for the payment system	25% (22/88)	33% (2/6)	18% (3/17)	25% (7/28)	29% (4/14)	20% (1/5)	33% (1/3)	27% (4/15)	28% (15/54)	21% (7/34)
The Central Bank consults almost exclusively with the bankers' association	11% (10/88)	17% (1/6)	18% (3/17)	11% (3/28)	7% (1/14)	20% (1/5)		7% (1/15)	13% (7/54)	9% (3/34)
The Central Bank consults stakeholders only at the operational level (i.e. on particular operational issues), but these consultations occur sporadically and/or mostly on a bilateral basis	6% (5/88)		6% (1/17)	4% (1/28)	21% (3/14)				7% (4/54)	3% (1/34)
The Central Bank consults stakeholders only at the operational level (i.e. on particular operational issues). These consultations are regular and sometimes include the creation of an ad-hoc task force or working group	10% (9/88)		6% (1/17)	7% (2/28)		20% (1/5)	33% (1/3)	27% (4/15)	13% (7/54)	6% (2/34)
Other	8% (7/88)	33% (2/6)	12% (2/17)	11% (3/28)					6% (3/54)	12% (4/34)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

SECTION VIII: CYBERSECURITY AND CYBER-RESILIENCY

The 2018 GPSS included some specific questions on cybersecurity and cyber-resiliency within some the existing sections of the survey (e.g., the operational risk management sub-section of the large-value payment systems section). Considering the growing digitization of payments, however, which was accelerated by the COVID-19 pandemic, together with the growing cost and prevalence of cybersecurity breaches and attacks in the financial sector,[38] GPSS 2021 expanded this coverage by having a dedicated section aiming at capturing more information on the efforts of national authorities and other stakeholders in these areas. More specifically, this section provides data on the adoption of national and financial sector-level cybersecurity strategies, the components of cyber-risk management frameworks in central banks, the use of international standards and guidance, information sharing and crisis simulation practices, and cybersecurity oversight of financial institutions and FMIs.

GENERAL ISSUES

At the global level, 80 percent of respondents stated that their economies have a national strategy to address cybersecurity and/or cyber-resiliency, with 71 percent having a strategy at the financial sector-level and 85 percent at the central bank-level. The adoption of cyber strategies at the national level is similar across income levels, with 80 percent in LMICs and 81 percent in high-income economies (see **Chart VIII.1** and **Table VIII.1**). But this is not true for financial sector strategies, where high-income economies have higher shares (at 78 percent) compared to LMICs (65 percent). From the regional angle, some regions are more advanced when it comes to national-level strategies, with a 100 percent share in EAP and 93 percent in High-income OECD economies, while other regions have significatively lower rates: 63 percent in MNA and 33 percent in SA. When looking at financial sector cyber strategies, economies in the LAC and SSA regions are lagging with 60 percent and 58 percent, respectively, for the sectorial strategy.

Chart VIII.1 Cybersecurity strategy documents

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a.National strategy to address cybersecurity (and/or cyber resilience)	80% (69/86)	100% (7/7)	87% (13/15)	93% (25/27)	64% (9/14)	63% (5/8)	33% (1/3)	75% (9/12)	80% (40/50)	81% (29/36)
b. Financial sector strategy to address cybersecurity (and/or cyber resilience)	71% (58/82)	67% (4/6)	67% (8/12)	85% (22/26)	60% (9/15)	71% (5/7)	75% (3/4)	58% (7/12)	65% (30/46)	78% (28/36)
c. Central bank strategy to address cybersecurity (and/or cyber resilience)	85% (72/85)	86% (6/7)	75% (9/12)	92% (24/26)	80% (12/15)	89% (8/9)	100% (3/3)	77% (10/13)	80% (39/49)	92% (33/36)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

[38] World Bank (2022). *Legal framework for cybersecurity in the financial sector: A comparative study on existing domestic or regional legislation on cybersecurity.* World Bank: Washington, DC.

ROLES AND RESPONSIBILITIES FOR CYBER RESILIENCE

The GPSS included specific questions on entities or units in charge of cybersecurity-related responsibilities at the national and financial sector levels (incident response, cyber threat intelligence sharing and general cybersecurity operations management, such as information gathering) (**Table VIII.10**).

When respondents provided an answer, they indicated that at the financial sector-level, the central bank holds the largest share of responses for incident response (40 percent) and cyber threat intelligence sharing functions (42 percent). Out of the listed institutions, the Ministry of Defense held the largest share for national-level functions, except in the case of the economies in the EAP region, where it is the central bank the one that holds the largest share.

CYBER-RISK MANAGEMENT FRAMEWORK IN CENTRAL BANKS

Regarding the components included in the cyber-risk management framework of central banks (**Table VIII.2b**), most respondents described a homogeneous structure reflecting industry best practices and international standards that include: 1. the identification of critical business functions, information, and assets; 2. protection, detection, response and recovery; and 3. monitoring components, with the latter covering penetration and program testing. Because it is aligned with international standards and practices, the structure of the cyber-risk management framework is homogeneous across almost all regions, with almost all of them including or planning to include the aforementioned components in the structure of their framework. The one area that many respondents still have not implemented or are not in the process of implementing is penetration testing.

It should be noted that one-quarter of respondents still do not have in place a specific framework to manage cyber risks (19 percent are planning or considering implementing one, and 7 percent do not have a cyber-risk management framework) (**Table VIII.2a**). In terms of the principles that guide the cybersecurity efforts of central banks, the framework that is most used is the SWIFT Customer Security Programme (CSP) with 88 percent, followed by the NIST Cyber Security Framework (CSF) with 61 percent and the CPMI-IOSCO Guidance on cyber resilience of FMIs, with 56 percent (**Chart VIII.2** and **Table VIII.3**).[39]

It should be noted that, while the level of adoption of the NIST framework is the same across income levels, the adoption of CPMI-IOSCO Guidance on cyber resilience of FMIs is higher in high-income economies, and so is the use of the ECB Cyber Resilience Oversight Expectations (CROE) since it is an operationalizing tool for the CPMI-IOSCO Guidance.

In central banks, the responsibility of cyber risk management rests with a risk committee for 63 percent of respondents, followed by a specialized technology committee with 53 percent, and the full Board of Directors (51 percent). These are followed by a board member with relevant expertise, an operations continuity committee, or an audit committee (about 19 to 28 percent for each of the latter options) (**Table VIII.4**).

[39] The various international guiding frameworks are shown in Chart VIII.2

Chart VIII.2 International standards, guidance or similar applied by the central banks in their cybersecurity efforts

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. CPMI-IOSCO Guidance on cyber resilience of FMIs	56% (47/84)	60% (3/5)	47% (7/15)	85% (23/27)	27% (4/15)	71% (5/7)		45% (5/11)	45% (21/47)	70% (26/37)
b. CPMI Endpoint security toolkit	29% (24/84)	40% (2/5)	20% (3/15)	37% (10/27)	27% (4/15)	14% (1/7)		36% (4/11)	26% (12/47)	32% (12/37)
c. ECB Cyber Resilience Oversight Expectations (CROE)	33% (28/84)		40% (6/15)	63% (17/27)		43% (3/7)		18% (2/11)	19% (9/47)	51% (19/37)
d. NIST Cyber Security Framework (CSF)	61% (51/84)	80% (4/5)	53% (8/15)	52% (14/27)	67% (10/15)	71% (5/7)	75% (3/4)	64% (7/11)	60% (28/47)	62% (23/37)
e. US FFIEC Cybersecurity Assessment Tool (CAT)	15% (13/84)	20% (1/5)	13% (2/15)	11% (3/27)	7% (1/15)	14% (1/7)	25% (1/4)	36% (4/11)	19% (9/47)	11% (4/37)
f. Basel Committee on Banking Supervision Principles for the Sound Management of Operational Risk (PSMOR) and/or Principles for..	32% (27/84)	20% (1/5)	33% (5/15)	33% (9/27)	20% (3/15)	29% (2/7)		64% (7/11)	36% (17/47)	27% (10/37)
g. SWIFT Customer Security Programme (CSP)	88% (74/84)	80% (4/5)	93% (14/15)	81% (22/27)	87% (13/15)	100% (7/7)	75% (3/4)	100% (11/11)	91% (43/47)	84% (31/37)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Chart VIII.3 Information sharing and crisis simulation

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a. Have any financial sector cyber crisis simulation (incident response) exercises been done?	No, no plans	19% (16/84)	17% (1/6)	29% (4/14)	12% (3/26)	21% (3/14)	13% (1/8)	25% (1/4)	25% (3/12)	24% (12/49)	11% (4/35)
	No, but planning.	33% (28/84)	33% (2/6)	57% (8/14)	12% (3/26)	36% (5/14)	50% (4/8)	25% (1/4)	42% (5/12)	45% (22/49)	17% (6/35)
	Yes, one-off	8% (7/84)		7% (1/14)	8% (2/26)	14% (2/14)	13% (1/8)		8% (1/12)	6% (3/49)	11% (4/35)
	Yes, periodically	39% (33/84)	50% (3/6)	7% (1/14)	69% (18/26)	29% (4/14)	25% (2/8)	50% (2/4)	25% (3/12)	24% (12/49)	60% (21/35)
b. Is the central bank is a member of a cyber threat information-sharing mechanism (local, regional, or international)?	No, no plans	12% (10/85)	20% (1/5)	7% (1/15)	8% (2/26)	7% (1/15)	22% (2/9)	25% (1/4)	18% (2/11)	16% (8/49)	6% (2/36)
	No, but planning.	12% (10/85)		13% (2/15)		27% (4/15)	11% (1/9)	25% (1/4)	18% (2/11)	20% (10/49)	
	Yes, one-off	5% (4/85)		7% (1/15)	8% (2/26)			25% (1/4)		2% (1/49)	8% (3/36)
	Yes, periodically	72% (61/85)	80% (4/5)	73% (11/15)	85% (22/26)	67% (10/15)	67% (6/9)	25% (1/4)	64% (7/11)	61% (30/49)	86% (31/36)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Two topics of specific interest are information sharing and crisis simulation arrangements. As shown in **Chart VIII.3** and **Table VIII.5**, for cyber-crisis simulation exercises, at a global level, almost half of the respondents have conducted at least one cyber-crisis simulation exercise (39 percent periodically and 8 percent as one-off), and another 33 percent responded that, if they have not done it yet, they are planning to. The interest for such simulation is high, with about half of respondents in lower income economies indicating their interest in them. Still, most respondents across regions do not perform regular, periodic cyber-crisis simulations, except for high-income OECD economies (69 percent are doing periodic simulations), followed by EAP and SA with 50 percent each.

Similarly, in high-income economies, the rate of participation of the central bank in cyber threat information-sharing mechanisms reaches 86 percent, compared to 61 percent in LMICs. Only 12 percent of respondents indicated that they have no plans for participating in such arrangements.

From a regional perspective, periodic participation is high across High-income OECD, EAP and ECA economies (85, 80 and 73 percent each), followed by LAC, MNA and SSA economies (67, 67 and 64 percent each) and lastly SA with only 25 percent. Ten economies in five regions, all LMICs, expressed that they are planning to participate in an information-sharing mechanism in the future, 4 of which are from LAC.

CYBERSECURITY AND OVERSIGHT OF PAYMENT SYSTEMS AND OTHER FMIS

Most central banks exercise cybersecurity oversight for Financial Institutions (FIs) and FMIs through on-site and off-site oversight (**Charts VIII.4** and **VIII.5**, as well as **Tables VIII.6a** and **VIII.6b**). The majority of respondents have made significant changes to their operational risk management framework for FIs as well as FMIs to address cybersecurity:

- For FIs, 54 percent report having made significant changes, 31 percent some changes, against 15 percent that have not made changes thus far.
- For FMIs, 56 percent report having made significant changes, 29 percent some changes and 14 percent no changes so far.

Significant changes to the operational risk management oversight framework for both FIs and FMIs have been implemented mostly by high-income economies (73 and 65 percent, respectively). As for authorities that have not made changes thus far, LMICs have the highest share with 20 percent for FMIs.

A large share of respondents answered that they require reporting of cyber incidents from FIs and FMIs, for purposes of data collection (92 percent) and supervisory follow-up (86 percent) to ensure adequate resolution of incidents. In terms of who are the entities that FIs and FMIs need to report information to, most respondents expressed that such information needs to be reported to bank supervisors (83 percent) and payments oversight units (82 percent).

The cybersecurity risk management requirements for FMIs includes the same elements as the cyber-risk management framework for other financial institutions (i.e., identification of critical business functions, information, and assets; protection; detection; response; recovery; monitoring components -penetration testing and program testing) (**Table VIII.8**). The biggest difference between LMICs and high-income respondents is with the use of program testing and penetration testing, with an adoption rate of about 94 percent for high-income respondents against 73 percent for LMICs. The difference is smaller for the other elements of the cyber-risk management framework.

Chart VIII.4 Cybersecurity and payments oversight of FIs

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a.Is cybersecurity addressed in on-site oversight?	Yes	81% (59/73)	80% (4/5)	100% (13/13)	77% (17/22)	71% (10/14)	71% (5/7)	75% (3/4)	88% (7/8)	84% (37/44)	76% (22/29)
b.Is cybersecurity addressed in off-site oversight?	Yes	80% (60/75)	80% (4/5)	79% (11/14)	96% (22/23)	71% (10/14)	86% (6/7)	50% (2/4)	63% (5/8)	71% (32/45)	93% (28/30)
c. Has the oversight authority made changes to the operational risk management oversight in recent years to reflect cybersecurity?	Yes, significant	54% (40/74)	40% (2/5)	62% (8/13)	65% (15/23)	47% (7/15)	43% (3/7)	25% (1/4)	57% (4/7)	47% (20/43)	65% (20/31)
	Yes, somewhat	31% (23/74)	60% (3/5)	31% (4/13)	26% (6/23)	33% (5/15)	29% (2/7)	50% (2/4)	14% (1/7)	37% (16/43)	23% (7/31)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Chart VIII.5 Cybersecurity and payments oversight of FMIs

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
a.Is cybersecurity addressed in on-site oversight?	Yes	74% (53/72)	80% (4/5)	83% (10/12)	65% (15/23)	62% (8/13)	71% (5/7)	75% (3/4)	100% (8/8)	79% (33/42)	67% (20/30)
b.Is cybersecurity addressed in off-site oversight?	Yes	83% (62/75)	80% (4/5)	77% (10/13)	88% (22/25)	85% (11/13)	86% (6/7)	50% (2/4)	88% (7/8)	77% (33/43)	91% (29/32)
c. Has the oversight authority made changes to the operational risk management oversight in recent years to reflect cybersecurity?	Yes, significant	56% (44/78)	50% (3/6)	54% (7/13)	72% (18/25)	50% (7/14)	43% (3/7)	25% (1/4)	56% (5/9)	44% (20/45)	73% (24/33)
	Yes, somewhat	29% (23/78)	50% (3/6)	23% (3/13)	24% (6/25)	36% (5/14)	29% (2/7)	50% (2/4)	22% (2/9)	36% (16/45)	21% (7/33)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

SECTION IX. INNOVATIVE PAYMENT INSTRUMENTS AND SERVICES

This section was included for the first time in GPSS 2018 to cover innovative payment services that are provided directly to end-customers. In GPSS 2021, this section is divided in three main types of payment services: i) mobile money services, ii) access points, and iii) payments intermediaries. Several questions have changed from GPSS 2018 to GPSS 2021, and therefore some of the results are not comparable across iterations. As with the past iteration, while this section covers all types of PSPs, it places a special focus on non-bank PSPs.

MOBILE MONEY SERVICES

Fifty-five percent out of 84 economies reported to have mobile money services in their economy (compared to 69 percent in GPSS 2018). The highest presence (100 percent) is observed in the EAP, SA and SSA regions, and the lowest in high-income OECD economies, with 30 percent. This is consistent with the distribution across income groups (**Chart IX.1** and **Table IX.1**).

Chart IX.1 – Mobile Money Services

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Mobile money services are available in your country	65% (55/84)	100% (6/6)	57% (8/14)	30% (7/23)	75% (12/16)	63% (5/8)	100% (4/4)	100% (13/13)	82% (42/51)	39% (13/33)
Is there interoperability among mobile money service providers?	43% (23/54)	40% (2/5)	11% (1/9)	43% (3/7)	42% (5/12)	100% (4/4)	25% (1/4)	54% (7/13)	43% (18/42)	42% (5/12)
Is the protocol for interoperability based on a central interoperable platform (versus bilateral agreements)?	37% (18/49)	40% (2/5)		50% (3/6)	33% (3/9)	75% (3/4)	25% (1/4)	50% (6/12)	36% (14/39)	40% (4/10)
If Yes, is interoperability based on a scheme? the central switch the same as the national payment cards switch?	48% (13/27)	33% (1/3)		100% (2/2)		100% (3/3)	100% (1/1)	67% (6/9)	42% (10/24)	100% (3/3)
- Does the scheme have a brand?	57% (12/21)	50% (1/2)		100% (3/3)	20% (1/5)	67% (2/3)	100% (1/1)	67% (4/6)	53% (9/17)	75% (3/4)
- Are there scheme rules?	76% (16/21)	100% (2/2)		100% (3/3)	40% (2/5)	100% (3/3)	100% (1/1)	83% (5/6)	71% (12/17)	100% (4/4)
- Does the scheme governance allow for a sort of voting power to scheme participants even if the participant is not a share holder?	20% (4/20)			33% (1/3)	40% (2/5)			17% (1/6)	19% (3/16)	25% (1/4)
- Do the scheme rules cover person-to-merchant interoperability among different providers?	71% (15/21)	100% (2/2)		100% (2/2)	60% (3/5)	100% (3/3)	100% (1/1)	57% (4/7)	67% (12/18)	100% (3/3)
- Do the scheme rules cover agents' interoperability for cash-in and cash-out?	33% (6/18)				60% (3/5)	50% (1/2)		29% (2/7)	31% (5/16)	50% (1/2)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Regarding the interoperability of mobile money service providers, 31 out of 54 economies (57 percent) reported having no interoperability amongst them. Interoperability is more common in the MNA region, and less common elsewhere, reaching 11 percent in ECA, 25 percent in SA and around 40 percent in EAP, 42 percent in LAC and 43 percent High-income OECD. Only 37 percent of respondents reported having interoperability through a central platform. In terms of mobile money service providers that are interoperable through schemes, globally, in 57 percent of such schemes these are represented through a brand. In 76 percent of the cases the schemes are governed by a set of rules: person-to-merchant interoperability among providers in 71 percent of the schemes governed by rules. In contrast, only 33 percent of cases scheme rules cover agent's interoperability for cash-in and cash-out services.

Types of transactions that can be performed via e-money or mobile money products

Globally, cash-in and cash-out services are allowed in almost all economies (96 percent) (**Chart IX.2** and **Table IX.2**). Moreover, 88 percent of respondents noted that these services can be provided by agents. However, it is important to mention that interoperability for these transactions across PSPs is very low, at 38 percent.

Chart IX.2 – Types of transactions that can be performed via e-money or mobile money products

	a. Cash-in / deposits	b.Cash-out/ withdrawals	c. Top-ups from bank accounts	d. Funds transfers to bank accounts	e. P2P domestic transfers	f. International remittances	g. Bill payments	h. Public sector payrolls	i.Other government payments	j. Tax payments	k. Registration of new customers, including performing CDD
Transaction can be performed	96% (52/54)	96% (53/55)	98% (49/50)	91% (50/55)	100% (56/56)	72% (34/47)	96% (52/54)	67% (30/45)	76% (35/46)	73% (35/48)	77% (24/31)
Can also be provided by agents	88% (42/48)	90% (44/49)	60% (24/40)	52% (23/44)	69% (31/45)	49% (20/41)	80% (37/46)	36% (13/36)	40% (14/35)	43% (17/40)	79% (30/38)
Transaction is interoperable with those of other PSPs	38% (14/37)	42% (15/36)	46% (16/35)	53% (20/38)	58% (22/38)	30% (10/33)	44% (15/34)	26% (8/31)	29% (9/31)	30% (10/33)	19% (5/26)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Bill payments follow this trend, with almost all respondents (96 percent) stating that it is allowed, 80 percent noting that such payments can be done through agents and 44 percent answering that there is interoperability for bill payments.

Top-ups from bank accounts and funds transfers to bank accounts share a similar trend. They are allowed for 98 percent of respondents, but only around 60 percent of respondents let agents perform such transactions, with 46 percent answering that there is interoperability across PSPs for such transactions.

P2P transfers are allowed in all economies, with 69 percent of respondents saying that these can be performed by agents. In 58 percent of cases, there is interoperability for such transactions.

Seventy-two percent of responding economies allow international remittances to be terminated in e-money/mobile money accounts, and 49 percent of the respondents answering this question allow agents to perform these transactions. Interoperability is not very common (30 percent).

Most economies allow government payments to be done via e-money or mobile money. Public sector payrolls, G2P payments and tax payments are all allowed by around two-thirds of respondents, with around 40 percent of them allowing such payments to be delivered or received through agents, and 30 percent stating that these are interoperable across PSPs.

Agents are allowed to register new customers for CDD purposes in 77 percent of economies.

ACCESS POINTS

Response rates for this sub-section for GPSS 2021 were much higher than for GPSS 2018. Therefore, comparing outcomes between the two iterations may be misleading.

ATMs

Seventy-eight economies answered the specific questions on white-label ATM networks,[40] with 30 of them stating that they have such networks (**Table IX.3**). From a regional perspective, eighty-one percent of the High-income OECD economies reported they have these networks, while none of the responding economies in the MNA region have such networks. Around 30 percent of the responding economies have only one white label provider, while the rest have more than one.

Two additional questions aimed at obtaining information on the relative importance of white-label ATMs. These were answered by only 19 and 13 economies, respectively. The first question covers the share of ATMs that are white-label: one economy reported 100 percent of their ATMs being of a white-label type or belonging to a white-label arrangement, one economy reported this share is above 70 percent, ten others reported having between 10 and 70 percent, and five economies reported less than 10 percent. The second question referred to the share of banks in the economy that are using white-label ATM networks. Two economies reported that all banks are using these networks, while five economies reported that this share is below 10 percent.

POS terminals

Twenty-six economies reported having white-label POS networks or non-bank POS acquirers (**Table IX.4**). Economies from High-income OECD, EAP, LAC and ECA regions show the highest percentages with 60, 50, 43 and 31 percent, respectively. In contrast, none of the reporting economies from the MNA and SA regions reported having white-label POS networks.

As for the number of networks and the share that such networks hold, of the 13 respondents to this specific question, only two economies reported a single white-label network operating in their economy, while other economies reported to have 4 networks or more. As for share, out of 11 respondents, two economies reported that all POS terminals are run by a white-label POS provider, and two economies out of nine reported that all banks use white-label POS providers.

PAYMENTS INTERMEDIARIES

Bill payment aggregators

Two-thirds of respondents indicated that bill aggregators operate in their economy (**Chart IX.3** and **Table IX.5a**). Forty-two percent of the reporting economies do not require bill aggregators to be licensed.

[40] White-label ATMs typically are ATMs that are not owned, managed, or controlled by a bank or a bank consortium, and do not display the logo of a bank or the consortium.

Chart IX.3 Bill payment aggregators

Global			By Region							By Income Level	
			East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Do Bill Aggregators operate in your jurisdiction?	Yes	62% (48/78)	100% (3/3)	53% (8/15)	82% (18/22)	64% (9/14)	14% (1/7)	67% (2/3)	50% (7/14)	57% (27/47)	68% (21/31)
Do Bill Aggregators need to be licensed or registered?	Aggregators are not required to be licensed	42% (20/48)	50% (2/4)	22% (2/9)	44% (7/16)	83% (5/6)	100% (1/1)		30% (3/10)	37% (11/30)	50% (9/18)
	Aggregators need to be licensed if size of activities exceeded certain threshold	2% (1/48)			6% (1/16)						6% (1/18)
	Aggregators need to be licensed only if they accept electronic payments	10% (5/48)	25% (1/4)	11% (1/9)		17% (1/6)			20% (2/10)	17% (5/30)	
	All aggregators need to be licensed	46% (22/48)	25% (1/4)	67% (6/9)	50% (8/16)			100% (2/2)	50% (5/10)	47% (14/30)	44% (8/18)
Are Bill Aggregators allowed to keep funds paid by customers for bills overnight or for longer?	Yes	52% (22/42)	75% (3/4)	67% (6/9)	62% (8/13)	40% (2/5)		50% (1/2)	25% (2/8)	48% (13/27)	60% (9/15)
Are Bill Aggregators required to provide a guarantee against funds collected?	Yes	25% (9/36)	25% (1/4)	29% (2/7)	18% (2/11)	17% (1/6)			50% (3/6)	29% (7/24)	17% (2/12)
- If YES, is it required that the guarantee be equal or more than collected funds at any point of time?	Yes	50% (6/12)	100% (1/1)	33% (1/3)	100% (2/2)	33% (1/3)			33% (1/3)	40% (4/10)	100% (2/2)
Is Bill Payment integrated with National Card Switch as an add-on service?	Yes	13% (5/39)			8% (1/12)	33% (2/6)			29% (2/7)	16% (4/25)	7% (1/14)
Is Bill Payment integrated with Fast Payment System as an add-on service?	Yes	18% (7/39)	25% (1/4)	25% (2/8)	15% (2/13)	17% (1/6)			20% (1/5)	21% (5/24)	13% (2/15)
Are the fees of the bill payment aggregator separated from the bill fee in the voucher?	Yes	51% (19/37)	75% (3/4)	67% (4/6)	55% (6/11)	33% (2/6)	100% (1/1)		43% (3/7)	50% (12/24)	54% (7/13)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

As for the features of bill aggregators, GPSS 2021 looks into the type of payments bill aggregators receive, the different channels they provide to collect payments and other operational features, such as guarantees and integration to payment arrangements (**Table IX.5c**). In line with GPSS 2018, the economic sectors that are more commonly covered by bill aggregators are utilities, cable TV, Internet services and mobile telephony, while the lowest shares are related to the transportation segment, including public transportation and toll roads.

The channels that bill payment aggregators use to collect payments vary widely (**Table IX.5d**). Cash payments at agents of bill aggregators is an important channel for bill payments. However, using internet and mobile banking to pay bills is more commonly available than cash, with both holding a share of 95 percent across 43 and 41 respondents, respectively. Nevertheless, cash usage is still high, at 86 percent of respondents. Paying via POS terminals, ATMs and mobile money are also relevant, with each of these channels surpassing 60 percent incidence.

As for other features of bill payment aggregators, 52 percent of the responding economies stated that bill aggregators are allowed to keep funds paid by customers for bills, even if only on a temporary basis. Only 25 percent of the respondents required the bill aggregators to provide a guarantee (e.g., collateral) against the collected funds. Fifty percent of the respondents indicated that the guarantee must be equal or more than the collected amount.

In terms of integration to other payment arrangements as an add-on service, 13 percent of the respondents (5 out 39) indicated that bill payments aggregators are integrated to the national card switch, and 18 percent indicated that they are integrated to the FPS.

As an indicator of transparency, 51 percent of the respondents stated that they require the separation of aggregator fees from the original bill in the voucher.

<u>Merchant aggregators</u>

Twenty-eight economies reported having merchant aggregators.[41] **Chart IX.4** and **Table IX.6** provides the summary statistics.

Chart IX.4 – Merchant aggregators

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Are there any Merchant Aggregators in your jurisdiction?	28	2	4	7	8	1	2	4	18	10

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Is there a maximum turnover value for a merchant under the aggregator?	5% (1/20)							50% (1/2)	8% (1/12)	
Are aggregators obliged to provide merchant information to the acquirer bank?	59% (17/29)	50% (1/2)	60% (3/5)	57% (4/7)	57% (4/7)	100% (1/1)	100% (2/2)	40% (2/5)	63% (12/19)	50% (5/10)
Are aggregators/facilitators allowed to perform Simplified due diligence (SDD) on small merchants (in contrast to full CDD)?	52% (13/25)	50% (1/2)	33% (2/6)		57% (4/7)	100% (1/1)	100% (2/2)	75% (3/4)	63% (12/19)	17% (1/6)
- If YES, are small merchants allowed to be identified through a single registry document?	38% (5/13)		50% (1/2)		67% (2/3)	100% (1/1)	50% (1/2)		33% (4/12)	100% (1/1)
- If YES, are small merchants allowed to be identified as Individuals in case they lack business documentation?	45% (5/11)				67% (2/3)	100% (1/1)	50% (1/2)	33% (1/3)	40% (4/10)	100% (1/1)
Are there any regulations that oblige the transfer of funds to the recipient merchant within a certain period after settlement has occurred on the Aggregator's account?	46% (12/26)	50% (1/2)	40% (2/5)	57% (4/7)	17% (1/6)	100% (1/1)	100% (2/2)	33% (1/3)	44% (7/16)	50% (5/10)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Questions on regulatory requirements and merchant aggregator features were answered by a small number of economies. In 52 percent of the economies (13 out of 25), merchant aggregators are allowed to perform simplified due diligence (SDD) of their merchants. When SDD is allowed, 38 percent out of 13 respondents mentioned that small merchants are allowed to be identified

[41] Merchant aggregators are entities that enter into a single merchant agreement with an acquiring institution for a number of smaller merchants whom they represent. The merchant aggregator typically handles all the typical merchant acquiring processes including onboarding and settlement. Merchant aggregators exists both in the physical and ecommerce space.

through a single registry document,[42] and 45 percent indicated that small merchants are allowed to be identified as individuals if they lack business documentation.

Fifty-nine percent (17 out of 32 respondents) reported that aggregators are obliged to provide merchant information to the acquirer bank. Forty-six percent require the aggregator to transfer funds to the merchant account after a certain period has passed since settlement on the aggregator's account, and only one economy out of 20 reported about having a maximum turnover rate per merchant if working through an aggregator.

QR CODE USAGE FOR PAYMENTS[43]

Twenty-six economies reported having QR code payment acceptance (**Table IX.7**). Currently, QR code payments are more common in the LAC, High-income OECD, ECA and SSA regions.

In practically all cases there are multiple QR code service providers for payments, in some cases exceeding five or even more than 10. Interoperability among them is still low: only 47 percent of the central banks (21 out 45 respondents) reported they have issued regulations enforcing EMV or other standards to ensure interoperability among QR code schemes. On the other hand, five economies reported to have more than one QR code standard, with one of them having as many as 10 different standards operating in the economy.

[42] For example, aggregators can accept a single document to identify the merchant, and in some cases, they can accept the personal ID of the owner to register a micro or even a small enterprise.

[43] QR codes is a relatively innovative method use mostly in person-to-business payments. It offers a low-cost alternative to traditional POS terminals by leveraging the mobile (smart) phone channel.

SECTION X. REFORMING THE NATIONAL PAYMENTS SYSTEM

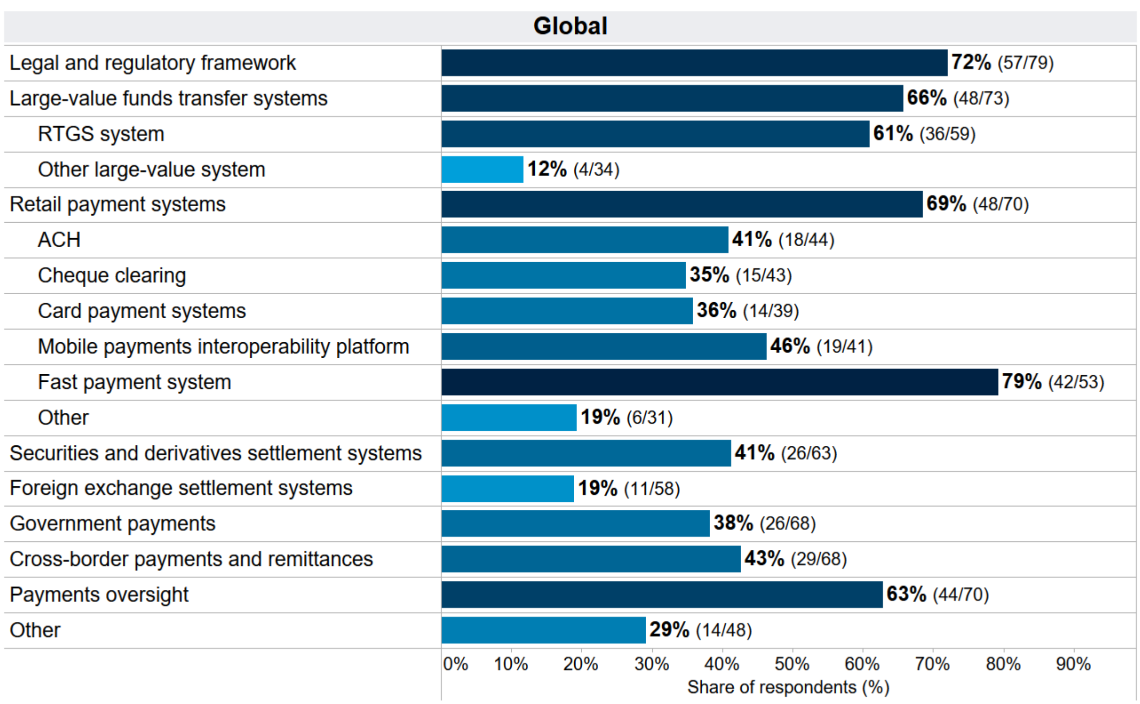
Reforming the NPS requires a sharp focus on main elements, ranging from payment instruments and infrastructure, FIs and non-FIs, and the legal and regulatory framework and market arrangements (such as conventions and contracts) that define the playing field, among others. Based on WB experience, reform efforts have proved more effective when a holistic approach is adopted rather than a piecemeal one.

This section looks closely at the current trends in reforming the NPS across these elements. It starts with a landscape of reforms efforts by area. It continues with the analysis of factors that triggered these reforms. Finally, it focuses on the approaches followed in the latest reform effort.

ELEMENTS OF THE NPS BEING REFORMED

Globally, most common reform areas involve reforms to the legal and regulatory framework, retail payments (especially related to the introduction or enhancement of FPSs), large-value funds transfer systems and payments oversight. In general, the legal and regulatory framework dominates the reform agenda with 72 percent of the respondents actively working on this front (**Table X.0** and **Chart X.1**). Regions with the largest shares are SSA, ECA and LAC, and those with the lowest share are in MNA and EAP. A higher share of LMICs (82 percent) are actively reforming their legal and regulatory framework, compared to only 55 percent of high-income economies.

Chart X.1 Elements of the national payments systems being reformed



Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Notably, payments oversight related reforms have taken a more prominent role when compared to the previous GPSS iteration: sixty-three percent of the economies are actively reforming their payments oversight, four times more than the previous iteration when only 14 percent of respondents reported working on this. In contrast, government payments reforms were not indicated by respondents to be as relevant as they were in the 2018 iteration of GPSS.

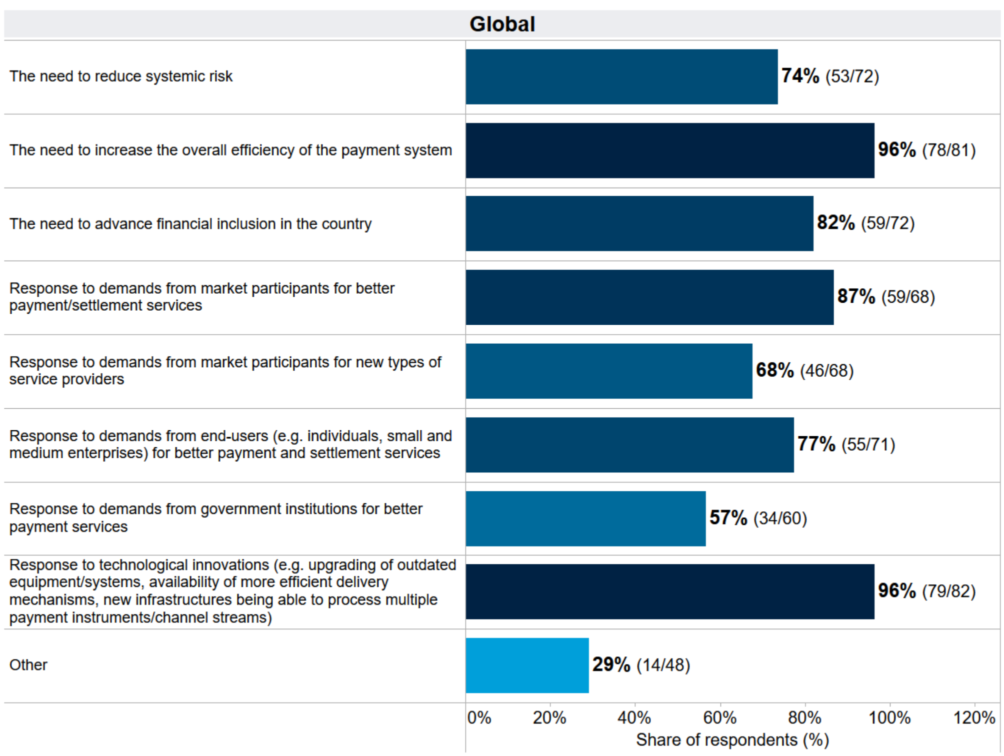
Reforms to retail payments are also prominent for 69 percent of respondents, who are mainly located in LMICs, with ECA, LAC and SA holding the largest shares. Under this umbrella, FPSs dominate the reform agenda, with 42 respondents (79 percent) working on this element, compared to only 30 economies that were doing so in the previous iteration. More than half of respondents in each region and income group are now working towards FPS implementation.

Two-thirds of respondents are also working to continue to reform their large-value funds transfer systems, particularly RTGS systems (61 percent). Except for MNA, RTGS reforms are being conducted in more than half of the economies for each grouping.

Factors that triggered reforms

Increasing efficiency and keeping up to date with the most recent technological advancements are the top motivations for engaging in NPS reforms, cited, respectively, by 96 percent of reforming economies (slightly higher than in the previous GPSS iteration), with almost all participants across all regions mentioning such topics as triggers (**Chart X.2** and **Table X.2**). The third most important reason was the need to respond to demands from market participants for better payment and settlement services, with 87 percent.

Chart X.2 Factors that triggered reforms



Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

Increasing financial inclusion is still a top priority for 82 percent of the respondents across the board, except for high-income OECD economies.

Other reasons for reforms include the need to reduce systemic risk (74 percent) and demands from the government institutions for better payment services (57 percent). These less common reasons display clear geographic patterns. For example, almost all respondents across most regions, except for high-income OECD economies, indicated the need to reduce systemic risk as a motivation. Also, response to demands from government institutions for better payment services drives reforms in 76 percent of LMICs, compared to only 26 percent of high-income.

APPROACH TO REFORMS

Reported NPS reforms mostly follow a goal-driven, strategic approach. This is the case for 85 percent of all economies (76 percent in GPSS 2018), while for only 15 percent the "operational particularities of the economy" formed the starting point for modernization (**Chart X.3** and **Table X.3**). The latter was uniformly low across all regions and economies by income level.

Chart X.3 Approaches followed in the reforms

Global		By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Broad/holistic approach	54% (42/78)	50% (2/4)	50% (7/14)	73% (16/22)	33% (5/15)	67% (4/6)	50% (2/4)	46% (6/13)	47% (22/47)	65% (20/31)
System-specific approach	46% (36/78)	50% (2/4)	50% (7/14)	27% (6/22)	67% (10/15)	33% (2/6)	50% (2/4)	54% (7/13)	53% (25/47)	35% (11/31)
"Big bang" approach	25% (19/75)	50% (2/4)	29% (4/14)	43% (9/21)	23% (3/13)			8% (1/13)	18% (8/45)	37% (11/30)
Gradualist approach	75% (56/75)	50% (2/4)	71% (10/14)	57% (12/21)	77% (10/13)	100% (6/6)	100% (4/4)	92% (12/13)	82% (37/45)	63% (19/30)
Starting from the operational particularities in the country	15% (12/79)		13% (2/15)	9% (2/23)	29% (4/14)	17% (1/6)	25% (1/4)	15% (2/13)	19% (9/47)	9% (3/32)
Strategic (goal-based)	85% (67/79)	100% (4/4)	87% (13/15)	91% (21/23)	71% (10/14)	83% (5/6)	75% (3/4)	85% (11/13)	81% (38/47)	91% (29/32)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Fifty-four percent of economies followed a "holistic" approach, while 46 percent are planning or are executing reforms that are system-specific. This, however, shows variations depending on economy income levels and regions: 47 percent of LMICs and 65 percent of high-income economies adopted the holistic approach. Likewise, 73 percent of high-income OECD economies and 67 percent MNA respondents subscribed to a holistic approach, while 50 percent or more of economies in the EAP, LAC, SSA and SA have opted for system-specific reforms.

Finally, most economies preferred adopting a "gradualist" approach to their reform(s) compared to a "big bang" approach. Globally, the gradual approach is followed by 75 percent of economies planning or implementing reforms. LMICs have a stronger preference for the gradualist approach (82 percent) compared to high income economies (63 percent).

ANNEX A. EFFECTS OF THE COVID-19 PANDEMIC ON PAYMENT SYSTEMS

This iteration of the GPSS devoted attention to the actions taken by financial authorities worldwide to strengthen the recovery and resilience capacity of the NPS in response to the COVID-19 pandemic, in particular by facilitating the adoption of digital payments. This section also looks at the impact and coping mechanisms that regulators have adopted on the cybersecurity and remittances fronts.

DIGITAL PAYMENTS

Various measures have been implemented to this purpose (**Table SA.1a**). Most notably, the measures taken by more than half of the respondents included the increase of maximum transaction limits, the promotion of new digital payment mechanisms (e.g., payment acceptance via QR codes), and the implementation of remote onboarding for account-opening for individuals and firms. More than one-third of the respondents indicated that measures were taken to accelerate the digitalization of G2P and P2G payments, improve the payment infrastructures, implement e-KYC, and improve the interoperability of payment instruments and services.

In most cases, the measures taken became permanent. However, most actions to encourage or mandate lower fees by PSPs were enacted on a temporary basis by 86 percent of the regulators that enacted them. Measures to increase transaction limits were adopted on a temporary basis for 39 percent of the reporting economies (**Table SA.1b**).

More than half of the economies that did not adopt these measures during the pandemic, reported planning on their adoption during 2022. Specifically, these entities are focusing on promoting new digital payment mechanisms, improving interoperability of payment instruments and services and improving payment infrastructures.

Most financial authorities have also taken action (or were considering taking action over the next 12 months) to enhance crisis preparedness as well as operational and cyber resilience (see **Table SA.2**). Actions considered included a broad range of measures, such as reviewing and enhancing cyber-resiliency plans, mechanisms, and processes (79 percent), operational continuity plans at the payment system level (76 percent) and incrementing oversight and supervision of PSOs (72 percent) and PSPs (72 percent).

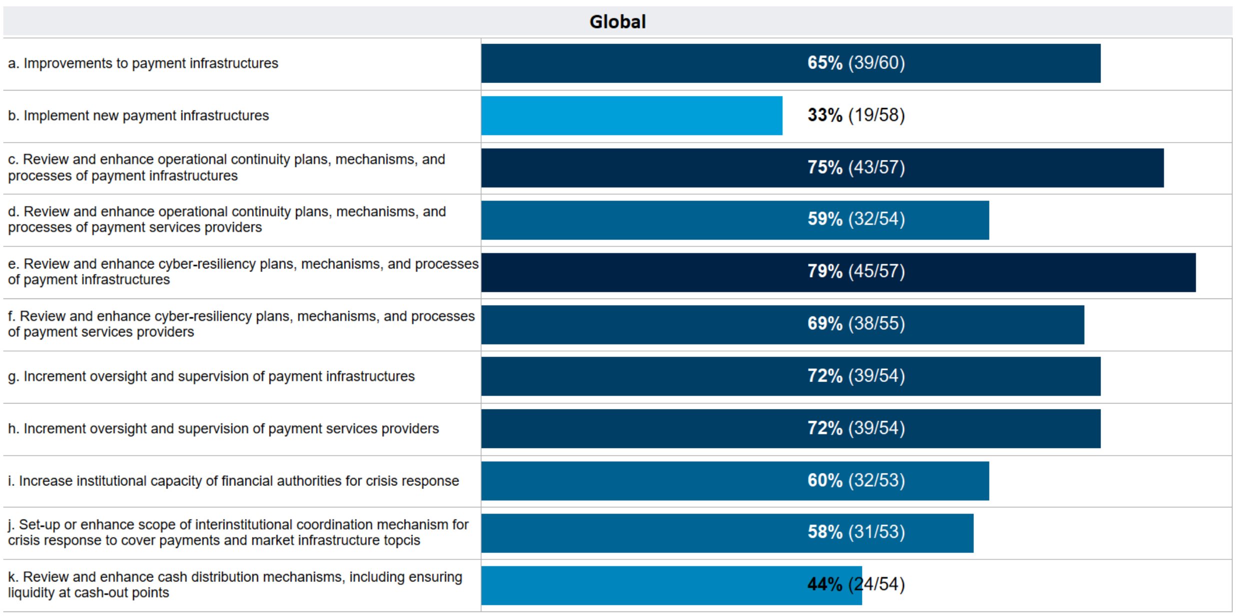
Only a relative minority of economies are working towards the enhancement of cash distribution mechanisms (44 percent) or towards implementing new payment infrastructures (33 percent).

As regards the steps taken to incentivize, or ease, the use of digital payment instruments (**Table SA.7b**), 54 percent of the responding authorities mentioned ensuring ATMs and agents have enough liquidity, 35 percent facilitated the opening of basic accounts for the purposes of receiving remittances, 33 percent ensured that agent locations remain open extra hours, and 24 percent facilitated the opening of basic accounts for the purpose of sending remittances.

Data shows that lower-middle income countries and upper-middle income countries are more invested in such reforms, with over 85 percent of the respondents working on the highest ranked areas. Most of these economies are in EAP, SA and SSA. However, almost all entities in the ECA region are working to enhance cyber-resiliency and business continuity plans and mechanisms. This is further explored in the next sub-section of this Supplement A.

Most of the economies that saw a surge in digital payments consider the increase permanent. Similarly, for over half of the economies, the spike in digital payments was accompanied by an increase in cyber risks and fraud in digital transactions during the pandemic.

Chart SA.1 Actions that financial authorities have implemented or are considering implementing in the next 12 months to increase crisis preparedness and operational and cyber resilience



Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

CYBERSECURITY

In the aftermath of the COVID-19 pandemic, 58 percent of the economies have reported an improvement in the level of security of information on communications technology in the financial sector, and only 3 percent of them reported a “less secure” environment (**Table SA.3**). Improvements were reported mostly by LMICs (67 percent), particularly from the MNA (86 percent) and EAP (80 percent) regions.

Also,72 percent of respondents indicated a moderate increase of 0 to 25 percent in reported cyber incidents in the financial sector during the COVID-19 pandemic (against a comparable time immediately prior to the start of the pandemic (**Table SA.5**). Seventy-eight percent of the economies have reported increased cyber risks due to the COVID-19 pandemic, but only 31 percent reported higher risks for the financial sector. All economies in LAC have reported increased risks, 55 percent of which reported higher risks for the financial sector.

Overall, 45 percent of LMICs are reportedly more exposed to increased cyber risks for the financial sector (**Table SA.5**). Ninety-three percent of the economies have experienced more cyber incidents since the COVID-19 pandemic outbreak, and for 19 percent the number of incidents has increased by over 23 percent. The major spikes (over 25 percent increase rates) in cyber incidents were reported by economies in EAP (60 percent), LAC (26 percent), High-Income OECD countries (24 percent) and SSA (18 percent).

International Remittances

The COVID-19 pandemic had a major impact on the remittance markets worldwide, with 75 percent of the economies reporting significant shifts in remittance volumes. The shift in remittance volumes was widespread across regions, but more pronounced for lower income countries, reflecting the level of dependency on these flows. While many entities reported an increase in the overall flows for specific corridors, many of them reported a temporary decline during the immediate months following the pandemic outbreak.

Sixty-one percent of economies reported an increase in digital payments for remittances, which was more widespread in High Income OECD (75 percent), SA (75 percent), ECA (71 percent) and LAC (67 percent) economies. The increase in digital payments was overall higher in high-income economies (75 percent), compared to LMICs (55 percent). Furthermore, 47 percent mentioned that RSPs provided specific incentives to promote this increase in digital payments, including in 80 percent of the economies in ECA. These incentives were much more common in LMICs (57 percent) compared to high-income economies (22 percent).

ANNEX B. CENTRAL BANK DIGITAL CURRENCIES

A central bank digital currency (CBDC) is a central bank liability, issued in digital form, whereby in the case of retail, it is accessible by all actors in the economy (individuals, businesses, government agencies, financial institutions, and other PSPs), similar to cash, while in the case of wholesale, it is accessible only by a pre-defined set of actors (mainly financial institutions). Some economies have also been exploring CBDC for cross-border use cases.

There has been a wide range of motivations among central banks to explore CBDC initiatives: financial inclusion, payments efficiency in a domestic and cross-border context (speed and cost), innovation (broader shift toward digital assets and competition), monetary and fiscal policy, and strengthened role of the central bank. The benefits, advantages, and risks of CBDC versus other payment solutions, would all depend on the specific characteristics of each country situation.

Given the interest among central banks on CBDCs in the past few years, both retail and wholesale, this iteration of GPSS included a dedicated section on CBDC for the first time. GPSS included questions related to both retail and wholesale CBDC, and also collected data on ongoing and planned work on cross-border CBDC.

PLANS TO ISSUE CBDC

Of the economies that responded this section, 33 percent indicated that they plan to issue a retail CBDC (**Chart B.1 and Table B.1**). When broken down by income level, there is a uniform distribution. When looked at by region, the lowest percentage is observed in EAP economies, and the highest one for MNA economies. From an income perspective, 36 percent of LMICs plan to issue a retail CBDC compared to 29 percent of high-income economies.

Chart B.1 Financial authorities plans to issue CBDC

	Global	By Region							By Income Level	
		East Asia & Pacific	Europe & Central Asia	High Income OECD	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	LMIC	High income
Retail CBDC	33% (23/70)	20% (1/5)	33% (4/12)	19% (4/21)	42% (5/12)	60% (3/5)	33% (1/3)	42% (5/12)	36% (15/42)	29% (8/28)
Wholesale CBDC	21% (13/63)	50% (3/6)	18% (2/11)		25% (3/12)	50% (2/4)	33% (1/3)	33% (2/6)	26% (9/34)	14% (4/29)
Cross-Border CBDC	20% (11/55)	20% (1/5)	33% (3/9)	5% (1/20)	11% (1/9)	60% (3/5)	50% (1/2)	20% (1/5)	24% (7/29)	15% (4/26)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

On the equivalent question for wholesale CBDC issuance, 21 percent of the responding economies responded positively. This is more common among LMICs with 26 percent, compared to 14 percent of high-income economies. At the regional level, 50 percent of the economies in EAP and MNA responded positively, compared to only 18 percent among ECA economies.

Regarding plans to issue a cross-border CBDC, 20 percent of respondents globally responded positively: 24 percent among LMICs and 15 percent among high-income economies. Percentages were especially high across MNA and SA economies (although the total number of responses is low for both regions). Only 1 out of 20 High-income OECD economies reported it has such a plan.

GPSS also included questions on the likelihood of issuing a CBDC in the short-term (1-3 years) or medium-term (3-6 years) (**Chart B.2 and Table B.2**). Regarding issuance of a retail CBDC in the short-term, 31 percent of responding economies indicated this is likely/very likely, while 42 percent indicated it is likely/very likely for the medium-term. On the likelihood of wholesale or cross-border CBDC issuance in the short-term, 19 and 22 percent of economies responded as likely/very likely, respectively; 26 and 34 percent, respectively, provided such an answer for the medium-term.

Chart B.2 Likelihood of issuing CBDC in the short and medium term

	Likelihood of issuance in the short term (1-3 years)			Likelihood of issuance in the medium term (3-6 years)		
	Retail CBDC	Wholesale CBDC	Cross-Border CBDC	Retail CBDC	Wholesale CBDC	Cross-Border CBDC
Very likely	**14%** (5/35)	**4%** (1/27)	**9%** (2/23)	**15%** (5/33)	**13%** (4/30)	**13%** (3/24)
Likely	**17%** (6/35)	**15%** (4/27)	**13%** (3/23)	**27%** (9/33)	**13%** (4/30)	**21%** (5/24)
Somewhat likely	**3%** (1/35)	**4%** (1/27)	**4%** (1/23)	**30%** (10/33)	**27%** (8/30)	**29%** (7/24)
Unlikely	**66%** (23/35)	**78%** (21/27)	**74%** (17/23)	**27%** (9/33)	**47%** (14/30)	**38%** (9/24)

Note: *Each column in the chart refers to a standalone question, thus the number of total respondents may vary.*

Chart B.3 The legal authority to issue CBDC lies with the central bank

	1 Yes	2 No	3 Uncertain	4 Legislation is currently being changed to allow for it
Retail CBDC	**30%** (23/76)	**18%** (14/76)	**42%** (32/76)	**9%** (7/76)
Wholesale CBDC	**34%** (24/70)	**21%** (15/70)	**39%** (27/70)	**6%** (4/70)
Cross-border CBDC	**16%** (10/63)	**24%** (15/63)	**54%** (34/63)	**6%** (4/63)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary.*

On legal aspects, 30 percent of respondent central banks indicated that they have the legal authority to issue a retail CBDC, while 18 percent mentioned they do not have it and 42 percent indicated there is uncertainty on this legal empowerment. The remaining 9 percent indicated that legislation is currently being amended to allow for issuance. The corresponding figures for wholesale and cross-border CBDC are shown in **Chart B.3 and Table B.3**.

MOTIVATORS FOR AND RISKS FROM ISSUING CBDC

Economies were also asked to rank the importance they place on specific motivators/drivers pertaining to the exploration of CBDC. The importance scale included four options: 1) not so important; 2) somewhat important; 3) important; and 4) very important. Respondents were asked to select one of these options for each motivator provided. The motivators included: financial stability; monetary policy implementation; financial inclusion; domestic payments efficiency; cross-border payments efficiency; payments safety; financial integrity; enabling access to central bank money during times of emergency; enabling access to central bank money in general; serving as a payment channel for public funding programs; complementing cash and in-person payment methods; providing an alternative to payment methods in case of a credit crisis.

Chart B.4 and Table B.4 show that for retail CBDC, domestic and cross-border payments efficiency stand out as motivators of utmost importance. Economies ranked as important/very important (jointly) the following motivators (ranked from highest to lowest percentage): domestic payments efficiency (76 percent); cross-border payments efficiency (59 percent); payments safety (71 percent); enabling access to central bank money in general (70 percent); financial inclusion (68 percent); complementing cash and in-person payment methods (64 percent); enabling access to central bank money during times of emergency (61 percent); financial integrity (63 percent); monetary policy implementation (47 percent); financial stability (48 percent); serving as a payment channel for public funding programs (40 percent); and, providing an alternative to payment methods in case of a credit crisis (40 percent).

For wholesale CBDC, the motivators that stand out (indicated as important or very important) include financial integrity and cross-border payments efficiency. Then, for cross-border CBDC, the motivators that stand out are cross-border payments efficiency and domestic payments efficiency. The rankings of the various motivators for both wholesale and cross-border CBDC are shown in **Chart B.4.**

Lastly, economies were also asked to rank the risks they need to pay attention to when issuing a CBDC in terms of importance. The importance scale included four options (not so important, somewhat important, important, very important) and respondents were asked to select an option for each type of risk provided. The risks included: monetary policy risks; financial stability risks; data privacy; counterfeiting; cyber risk; illicit finance; financial and digital illiteracy.

For all three types of CBDC explored in GPSS 2021, cyber risk and data privacy rank as the risks that most economies consider important/very important. The risks that were indicated with the highest percentages for each type of CBDC are shown in **Chart B.5** and **Table B.5**.

Apart from the standard categories of risk used in the survey, other risks indicated by some of the responding economies included: users not accepting/adopting CBDC, offline payment risks, unexpected or unintended changes in the financial sector, and lack of regulatory powers of the central bank and other authorities.

Chart B.4 Areas where central banks exploring CBDC expect it to have a positive effect

	a. Financial stability	b. Monetary policy implementation	c. Financial inclusion	d. Payments efficiency (domestic)	e. Payments efficiency (cross-border)	f. Payments safety, robustness	g. Financial integrity	h. Enable access to central bank money during times of emergency	i. Enable access to central bank money in general	j. Serve as a payment channel for public funding programs	k. Complement to cash and in-person payment methods when social distancing is required	l. Provide an alternative to payment systems in case of a credit crisis	m. Other
Retail CBDC	48% (30/63)	47% (29/62)	68% (44/65)	76% (50/66)	59% (16/27)	71% (45/63)	63% (39/62)	61% (39/64)	70% (45/64)	40% (25/63)	64% (41/64)	40% (25/62)	69% (9/13)
Wholesale CBDC	45% (20/44)	42% (18/43)	35% (15/43)	64% (29/45)	67% (12/18)	63% (27/43)	68% (13/19)	44% (20/45)	43% (18/42)	33% (6/18)	47% (8/17)	38% (16/42)	
Cross-border CBDC	46% (19/41)	31% (12/39)	48% (19/40)	77% (10/13)	86% (36/42)	58% (23/40)	54% (22/41)	28% (11/39)	32% (12/37)	17% (2/12)	33% (4/12)	27% (3/11)	33% (2/6)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

Chart B.5 Risks that central banks which are exploring CBDC think need specific attention

		a. Monetary policy risks	b. Financial stability risks	c. Data privacy	d. Counterfeiting	e. Cyber risk	f. Illicit finance	g. Financial and digital illiteracy
Retail CBDC	Important/Very Important	71% (47/66)	83% (55/66)	93% (64/69)	74% (48/65)	96% (66/69)	70% (45/64)	71% (48/68)
Wholesale CBDC	Important/Very Important	51% (22/43)	61% (27/44)	63% (29/46)	47% (20/43)	98% (45/46)	48% (20/42)	41% (18/44)
Cross-border CBDC	Important/Very Important	63% (25/40)	70% (28/40)	86% (36/42)	70% (28/40)	95% (40/42)	79% (31/39)	59% (24/41)

Note: *Each line item in the chart refers to a standalone question, thus the number of total respondents may vary. Blanks in the chart should be interpreted as zero positive responses for the specific question.*

ANNEX C. LIST OF RESPONDENTS

Country	Income group	Region
Albania	Upper middle income	Europe & Central Asia
Algeria	Lower middle income	Middle East & North Africa
Angola	Lower middle income	Sub-Saharan Africa
Argentina	Upper middle income	Latin America & Caribbean
Armenia	Upper middle income	Europe & Central Asia
Aruba	High income	Latin America & Caribbean
Australia	High income	High Income OECD
Azerbaijan	Upper middle income	Europe & Central Asia
Bahamas, The	High income	Latin America & Caribbean
Bangladesh	Lower middle income	South Asia
Barbados	High income	Latin America & Caribbean
Belarus	Upper middle income	Europe & Central Asia
Belgium	High income	High Income OECD
Belize	Lower middle income	Latin America & Caribbean
Bosnia and Herzegovina	Upper middle income	Europe & Central Asia
Brazil	Upper middle income	Latin America & Caribbean
Bulgaria	Upper middle income	Europe & Central Asia
Burundi	Low income	Sub-Saharan Africa
Cabo Verde	Lower middle income	Sub-Saharan Africa
Canada	High income	High Income OECD
Central Bank of West African States (BCEAO)	Lower middle income	Sub-Saharan Africa
Centrale Bank van Curaçao en Sint Maarten	High income	Latin America & Caribbean
Chile	High income	High Income OECD
China	Upper middle income	East Asia & Pacific
Colombia	Upper middle income	Latin America & Caribbean
Croatia	High income	Europe & Central Asia
Cyprus	High income	Europe & Central Asia
Czech Republic	High income	High Income OECD
Denmark	High income	High Income OECD
Eastern Caribbean Central Bank (ECCB)	High income	Latin America & Caribbean
Ecuador	Upper middle income	Latin America & Caribbean
Egypt, Arab Rep.	Lower middle income	Middle East & North Africa
Eswatini	Lower middle income	Sub-Saharan Africa
Ethiopia	Low income	Sub-Saharan Africa
European Central Bank	High income	High Income OECD
Fiji	Upper middle income	East Asia & Pacific
Finland	High income	High Income OECD
France	High income	High Income OECD

Country	Income group	Region
Georgia	Upper middle income	Europe & Central Asia
Germany	High income	High Income OECD
Ghana	Lower middle income	Sub-Saharan Africa
Greece	High income	High Income OECD
Guatemala	Upper middle income	Latin America & Caribbean
Guinea	Low income	Sub-Saharan Africa
Guyana	Upper middle income	Latin America & Caribbean
Honduras	Lower middle income	Latin America & Caribbean
Hong Kong SAR, China	High income	East Asia & Pacific
Hungary	High income	High Income OECD
Iceland	High income	High Income OECD
India	Lower middle income	South Asia
Indonesia	Lower middle income	East Asia & Pacific
Iran, Islamic Rep.	Lower middle income	Middle East & North Africa
Iraq	Upper middle income	Middle East & North Africa
Israel	High income	High Income OECD
Italy	High income	High Income OECD
Jamaica	Upper middle income	Latin America & Caribbean
Japan	High income	High Income OECD
Jordan	Upper middle income	Middle East & North Africa
Korea, Rep.	High income	High Income OECD
Kosovo	Upper middle income	Europe & Central Asia
Kuwait	High income	Middle East & North Africa
Latvia	High income	High Income OECD
Liberia	Low income	Sub-Saharan Africa
Lithuania	High income	High Income OECD
Madagascar	Low income	Sub-Saharan Africa
Malawi	Low income	Sub-Saharan Africa
Malaysia	Upper middle income	East Asia & Pacific
Maldives	Upper middle income	South Asia
Malta	High income	Middle East & North Africa
Mauritius	Upper middle income	Sub-Saharan Africa
Mexico	Upper middle income	Latin America & Caribbean
Moldova	Upper middle income	Europe & Central Asia
Mongolia	Lower middle income	East Asia & Pacific
Montenegro	Upper middle income	Europe & Central Asia
Morocco	Lower middle income	Middle East & North Africa
Namibia	Upper middle income	Sub-Saharan Africa
Nepal	Lower middle income	South Asia
Netherlands	High income	High Income OECD
New Zealand	High income	High Income OECD

Country	Income group	Region
North Macedonia	Upper middle income	Europe & Central Asia
Norway	High income	High Income OECD
Oman	High income	Middle East & North Africa
Pakistan	Lower middle income	South Asia
Paraguay	Upper middle income	Latin America & Caribbean
Peru	Upper middle income	Latin America & Caribbean
Poland	High income	High Income OECD
Portugal	High income	High Income OECD
Romania	Upper middle income	Europe & Central Asia
Russian Federation	Upper middle income	Europe & Central Asia
Rwanda	Low income	Sub-Saharan Africa
São Tomé and Príncipe	Lower middle income	Sub-Saharan Africa
Slovak Republic	High income	High Income OECD
Slovenia	High income	High Income OECD
South Africa	Upper middle income	Sub-Saharan Africa
Spain	High income	High Income OECD
Sudan	Low income	Sub-Saharan Africa
Suriname	Upper middle income	Latin America & Caribbean
Sweden	High income	High Income OECD
Tajikistan	Lower middle income	Europe & Central Asia
Thailand	Upper middle income	East Asia & Pacific
Trinidad and Tobago	High income	Latin America & Caribbean
Türkiye	Upper middle income	Europe & Central Asia
Uganda	Low income	Sub-Saharan Africa
Ukraine	Lower middle income	Europe & Central Asia
United States	High income	High Income OECD
West Bank and Gaza	Lower middle income	Middle East & North Africa
Zimbabwe	Lower middle income	Sub-Saharan Africa