Annex 1. E-Money Issuance—Specific Risks

General business risk: any potential impairment of the financial condition (as a business concern) of an EMI owing to declines in its revenue or growth in its expenses, resulting in expenses exceeding revenues and a loss that must be charged against capital. These risks arise from an EMI's administration and operation as a business enterprise.

Legal risks: the risk of losses, following legal uncertainty. For example, when the liability toward customers in case of transaction failure is subject to uncertainty. It may include claims against the EMI for failing to comply with laws, as well as providing legal protection of customer funds that are pooled in trust accounts. Legal risk may also arise if multiple laws and authorities are involved, creating potential inconsistencies and legal uncertainty (Khiaonarong 2014).

Governance risks: the risk of losses following a lack of good governance and internal controls, for example, the lack of a trust board, the absence of good oversight by the trust board, inadequate governance of the risk management and treasury functions, or general absence of proper oversight by the board.

Operational risks: deficiencies in information communication and technology systems or internal processes and policies, or external events, cause disruptions to the e-money platform of the EMI, the connections to banks and agents, or the telecom network, which result in a reduction or unavailability of the EMI's services. Disruptions can occur in the EMI's own systems, as well as systems from third-party providers. The main types of operational risk are business continuity risk, cyber risk, internal and external fraud, and agent risk.

Financial risks: the risk that EMI customers lose access to the funds entrusted to the e-wallets because of (1) bankruptcy of the bank holding the customers' funds; (2) insufficient protection against the failure of an EMI, for example, because the funds have not been adequately isolated; and (3) EMIs' failure to manage the entrusted funds prudently, for example, the funds are invested in relatively illiquid assets. Risks can be subdivided as follows:

a. Liquidity risk: risk that clients' funds are not available for payout.

b. Credit risk: risk that clients' funds are invested in assets of issuers that fail.

c. Interest rate risk: risk of mismatch in interest rates between assets and liabilities.

d. Market risk: risk of loss on investments due to a fall in the value of the assets.

Money laundering/terrorism financing risks: e-money accounts and transactions may be used to launder criminals' money and/or to finance terrorist activities. Hence, compared to cash, mobile money may be considered a good tool for reducing reliance on anonymous cash, as mobile money is generally more traceable and can be subjected to requirements limiting this risk (monitoring and limits).

Consumer risk: loss of customers, or customer confidence, due to ineffective or no disclosure of key information, unfair contractual terms and conditions, product and service failures, unfair sales practices, and a lack of redress mechanisms. Data privacy risks fall under this category as well, which is the risk of potential loss of control over personal information, such as when information about a customer is used without his or her knowledge or permission, and the risk that customer information is not treated in a fair and responsible manner.

Annex 2. Basic Payment Statistics

Annex Table 2.1. Use of Payment Services/Instruments: Volume of Cashless Payments per Inhabitant[1]

2019	Credit transfers	Direct debits	Checks	Card and e-money payments: Total volume	By card with a debit function	By card with a delayed debit function	By card with a credit function	E-money payments	Other payment instruments
	(units)								
Argentina	8	2	2	49	24	nap	23	2	0
Australia	86	37	2	409	292	nap	118	nap	16.1
Belgium	148	46	0	210	179	16	9	6	0.1
Brazil	57	29	3	109	52	nap	48	10	nap
Canada	39	25	12	322	167	nap	154	nap	0
China	6	0	0	217	nap	nap	nap	nap	0
France	66	67	25	226	156	38	32	1	0.2
Germany	80	131	0	76	57	17	2	0	nap
Hong Kong SAR	nap	nap	nap	nap	22	nap	110	833	nap
India	14	1	1	9	4	0	2	4	nap
Indonesia	21	0	0	23	3	nap	1	20	0.1
Italy	25	16	2	77	41	nap	20	16	4.2
Japan	13	nap	0	nav	3	nap	nav	56	nap
Korea	114	33	2	458	171	nap	286	1	0
Mexico	13	1	2	31	23	nap	9	nap	nap
The Netherlands	164	85	0	294	281	13	nap	0	0
Russia	16	1	0	284	248	nap	19	17	12
Saudi Arabia	5	0	0	46	42	nap	4	nap	7.9
Singapore	26	11	8	804	101	nap	104	599	nap
South Africa	17	15	0	64	nap	nap	nap	nap	nap
Spain	31	51	1	119	83	37	nap	0	5.6
Sweden	145	39	0	360	299	6	56	0	0.1
Switzerland	124	8	nav	192	124	nap	62	7	nap
Turkey	9	nap	0	79	26	nap	52	1	nap
United Kingdom	76	67	4	337	278	6	54	nap	nap
United States	39	54	38	392	237	nap	134	21	nap

Source: BIS.
[1]Please refer to the individual country tables for a detailed explanation

Annex Table 2.2. Use of Payment Services/Instruments: Average Value of Cashless Payments per Inhabitant[1]

2019	Credit transfers	Direct debits	Checks	Card and e-money payments: Total value	By card with a debit function	By card with a delayed debit function	By card with a credit function	E-money payments	Other payment instruments
	(USD)								
Argentina	21,830	248	2,688	1,497	496	nap	940	62	41
Australia	205,974	88,643	14,874	18,343	9,215	nap	9,127	nap	12,789
Belgium	800,735	13,692	508	10,460	8,106	1,443	660	251	205
Brazil	63,448	6,249	1,836	2,200	807	nap	1,355	38	nap
Canada	65,740	17,390	54,642	16,890	5,154	nap	11,736	nap	9
China	279,674	5,197	13,829	80,802	nap	nap	nap	nap	289
France	434,043	29,510	14,049	10,510	6,804	2,194	1,503	10	8,077
Germany	757,156	51,340	976	4,730	3,121	1,479	119	12	nap
Hong Kong SAR	nap	nap	nap	nap	5,765	nap	12,950	3,421	nap
India	3,006	83	847	180	77	4	75	23	nap
Indonesia	9,107	–	35	214	88	nap	88	38	165
Italy	135,623	8,577	6,961	4,759	2,447	nap	1,632	679	10,696
Japan	213,190	nap	13,381	5,973	133	nap	5,341	500	nap
Korea	357,685	3,224	70,361	15,159	3,237	nap	11,906	15	358
Mexico	132,542	237	2,922	1,044	591	nap	453	nap	nap
The Netherlands	1,252,223	17,809	38	9,573	8,386	1,186	nap	1	–
Russia	85,536	241	–	6,862	6,378	nap	332	151	1,192
Saudi Arabia	375,714	6	3,049	2,211	1,909	nap	302	nap	3,467
Singapore	62,539	14,493	73,305	13,539	4,543	nap	8,611	385	nap
South Africa	35,446	2,009	164	1,570	nap	nap	nap	nap	nap
Spain	237,196	16,092	8,088	5,037	3,107	1,930	nap	–	9,283
Sweden	189,424	6,396	–	11,584	8,475	454	2,656	–	20
Switzerland	544,402	10,336	nav	12,113	6,287	nap	5,475	352	nap
Turkey	40,941	nap	1,940	2,070	276	nap	1,786	8	nap
United Kingdom	1,708,119	25,333	8,113	15,871	11,895	578	3,398	nap	nap
United States	134,550	77,725	78,479	21,905	9,193	nap	12,042	670	nap

Source: BIS.
[1]Please refer to the individual country tables for a detailed explanation

Annex Table 2.3. Number of Mobile Money Transactions per 1,000 Adults

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cambodia	340	354	1,369	3,832	5,815	3,332	9,137	12,945	16,884
Cameroon	11	111	81	697	1,438	6,168	21,953	39,734	nav
Chad	nav	nav	nav	2	0	1	1	nav	nav
Colombia	nav	nav	nav	nav	nav	nav	nav	3	107
Fiji	423	629	1,116	172	760	1,066	1,926	3,912	3,780
Ghana		1,135	2,503	6,751	15,468	31,170	54,207	78,299	nav
India	NA	NA	36	117	272	633	1,679	3,067	4,130
Kenya	17,655	22,700	27,944	33,607	39,741	52,647	51,513	56,210	57,528
Mozambique	nav	nav	nav	358	916	9,819	16,011	12,145	31,809
Myanmar	nav	nav	nav	0	0	1	533	954	1,653
Namibia	51	69	64	102	3,840	7,285	1,685	1,896	5,057
Nigeria		25	166	282	434	453	447	nav	nav
Pakistan	426	1,023	1,582	2,236	2,932	3,654	4,828	6,952	9,309
Philippines	2,495	2,902	3,087	4,019	4,732	5,188	5,413	5,507	8,350
Qatar	0	1	5	225	425	1,335	194	319	356
Rwanda	116	3,579	8,958	15,960	24,964	29,538	35,046	40,619	49,811
Samoa	nav	nav	808	1,324	1,579	1,585	1,608	1,219	1,404
Senegal	nav	nav	1,324	2,349	3,438	8,560	17,186	33,093	49,510
Togo	nav	nav	30	160	2,309	4,657	8,487	13,567	19,493
Tonga	5	105	167	245	808	1,450	1,508	2,005	nav
Uganda	5,117	13,644	21,733	25,983	34,884	46,985	50,089	82,865	119,950
Zambia	88	505	1,192	146	332	678	1,234	28,750	52,195
Zimbabwe	306	1,796	15,449	22,822	28,755	37,118	92,355	200,849	228,876

Source: IMF, Financial Access Survey.

Annex Table 2.4. Total Amount of Outstanding Balances on Mobile Money Accounts (In Millions of National Currency)

Country	2015	2016	2017	2018	2019
Afghanistan	200	435	707	559	696
Albania	23	36	nav	44	64
Armenia	124	302	678	1,158	1,281
Bangladesh	10,695	17,861	27,285	27,812	32,009
Botswana	44	48	81	108	142
Cameroon	4,656	22,354	53,129	90,887	nav
Fiji	1	5	2	4	1
Ghana	548	1,257	2,321	2,634	nav
Guinea	33,153	9,270	251,500	468,370	691,157
Guyana	4	14	24	19	21
India	576	3,884	14,054	26,957	31,847
Indonesia	737,786	982,360	2,421,094	4,033,008	6,142,712
Madagascar	78,068	112,514	161,483	85,241	nav
Myanmar	369	603	4,797	5,735	56,267
Namibia	5	667	15	18	28
Pakistan	8,827	11,717	21,139	23,678	28,770
Philippines	14,372	13,831	14,629	17,343	22,420
Romania	1	2	0	1	4
Rwanda	17,023	19,865	17,446	19,960	28,532
Thailand	345	596	941	1,435	2,076
Uganda	325,293	353,733	468,437	338,207	417,594
Zambia	46	96	267	874	1,218
Zimbabwe	89	130	325	542	1,830

Source: IMF, Financial Access Survey

Annex 3. Application of the PFMI to E-Money Under the PISA

As the retail payments ecosystem is constantly evolving due to innovation, as well as technological and regulatory change, the PISA framework aims to address these developments and builds on past experience in the oversight of payment schemes and payment instruments. Accordingly, its scope includes digital payment tokens (for example, stable coins), alongside "traditional" payment instruments and schemes. Another new feature is the inclusion of payment arrangements in the framework. Importantly, the PISA framework follows the principle of proportionality and aims in particular to set requirements for those entities that play a more significant role in the euro area.

The PISA framework is aimed at the governance bodies of payment schemes or arrangements, which are expected to adhere to the oversight principles. It defines criteria to identify the payment schemes or arrangements to be overseen taking into account their relevance for the overall payment system and those which are exempt. These criteria consider the size, market penetration and geographical relevance of a payment scheme/arrangement within the euro area.

The PISA assessment methodology complements the oversight principles of the framework by specifying key considerations and assessment questions. Following are the 16 applicable principles:

- **Principle 1: Legal basis.** A payment scheme/arrangement should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdiction.
- **Principle 2: Governance.** A payment scheme/arrangement should have governance that is clear and transparent, promotes the safety and efficiency of the payment scheme/arrangement, and supports the objectives of relevant stakeholder.
- **Principle 3: Framework for the comprehensive management of risks.** A governance body should have a sound risk management framework for comprehensively managing a payment scheme/arrangement's legal, credit, liquidity, operational and other risk.
- **Principle 4: Credit risk.** A payment scheme should effectively measure, monitor, and manage its credit exposures to payment service providers (PSPs) and/or end users as well as those arising from its payment, clearing and settlement processes. A payment scheme/arrangement should maintain sufficient financial resources to fully cover its credit exposure to each PSP with a high degree of confidence.
- **Principle 5: Collateral.** A payment scheme that requires collateral to manage its or its payment service providers' credit exposures should accept collateral with low credit, liquidity, and market risk.
- **Principle 7: Liquidity risk.** A payment scheme should measure, monitor, and manage its liquidity risk effectively. A payment scheme should maintain sufficient liquid resources in all relevant currencies to meet its payment obligations in a timely manner with a high degree of confidence. This should be under a wide range of potential stress scenarios that should include, but not be limited to, the default of the PSP and its affiliates that would generate the largest aggregate liquidity obligation for the payment scheme under extreme, but plausible, market conditions.
- **Principle 8: Settlement finality and crediting end users.** A payment scheme should define clear rules for final settlement.
- **Principle 9: Money settlement.** If central bank money is not used for the money settlement of the obligations of the end users or the PSPs of a payment scheme, the governance body should minimize and strictly control the credit and liquidity risk arising from the use of commercial bank money.
- **Principle 13: PSP default rules and procedures.** A payment scheme should have effective and clearly defined rules and procedures for managing the default of a PSP. These rules and procedures should be designed to ensure that a payment scheme can take timely action to contain losses and liquidity pressures and, thereby, continue to meet its obligation.

- **Principle 15: General business risk.** A payment scheme/arrangement should identify, monitor, and manage its general business risk and it should hold sufficient liquid net assets funded by equity to cover potential general business losses. This would allow it to continue operations and provide services as a going concern if such losses were to materialize.
- **Principle 16: Custody and investment risk.** A payment scheme should safeguard its end-users' assets and minimize the risk of losses on these assets or delayed access to them. A payment scheme should invest in instruments that carry minimal credit, market, and liquidity risk.
- **Principle 17: Operational risk.** Payment schemes/arrangements, PSPs and technical service providers should identify the plausible sources of operational risk, whether internal or external, and mitigate impact by implementing appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and the fulfilment of the obligations of the payment scheme/arrangement, the PSPs or the technical service providers, including in the event of a widescale or major disruption.
- **Principle 18: Access and participation requirements.** A payment scheme/arrangement should have objective, risk-based and publicly disclosed criteria for participation, which permit fair and open access.
- **Principle 21: Efficiency and effectiveness.** A payment scheme/arrangement should be efficient and effective in meeting the requirements of the PSPs, end users and the markets it serves.
- **Principle 22: Communication procedures and standards.** A payment scheme/arrangement should use, or at least accommodate, relevant internationally accepted communication procedures and standards to facilitate the efficient transfer of value between end users.
- **Principle 23: Disclosure of rules, key procedures, and market data.** A payment scheme/arrangement should have clear and comprehensive rules and procedures and it should provide sufficient information to enable PSPs, technical service providers and end users to reach an accurate understanding of the risks, fees, and other material costs they incur by participating in/making use of the payment scheme/arrangement. All relevant rules and key procedures should be publicly disclosed, bearing in mind those rules and procedures which, if disclosed, could pose a threat to the security of a scheme or arrangement. The latter should only be disclosed to scheme or arrangement stakeholders on a "need to know" basis.

Notes: Principles 6, 10–12, 14, 19–20, and 23 are nonapplicable for the purpose of assessing payment schemes/arrangements under the PISA framework.

Source: ECB (2020).

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