

# **Diagnostic Handbook for Money Market Development**

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# Introduction

In every economy money markets serve many important functions. They help in managing liquidity and reducing the liquidity and interest rate risk of commercial banks, they are a source of funding and provide pricing signals by setting the marginal cost of funding, and serve as the starting point in the monetary policy transmission mechanism and efforts to safeguard liquidity and stability of the financial system. In emerging markets and developing countries, the importance of deep and liquid money markets is more pronounced by the fact that most of the financial sector functions are served by commercial banks, which play a critical role in creating money and deposits and also in extending loans and matching the needs of the borrowers and investors. A deep and liquid interbank money market supports the commercial banks in this financial intermediation function and in particular in the maturity transformation between savings and investments. A part of this transformation, the banks are able to provide the borrower with a fixed cost of capital for a longer period of time than a depositor or small investor is willing to commit to. Managing this interest rate mismatch is a key function of the bank and requires well-functioning money and derivatives markets (together with predictable interest rate policy).

The core of the money market in emerging and frontier economies is represented by the interbank market for liquidity.<sup>1</sup>

Therefore, money market operations of central banks are a key ingredient to effective interbank markets<sup>2</sup>. However, central banks in many developing countries are struggling to find the most effective balance of money market instruments.

- If the operational framework of the central bank is consistent with the monetary policy framework and matches the stage of development of the money markets, then chances are much better that the central bank will be able to effectively manage liquidity and arrest inflation. At the same time, it will foster commercial banks' risk management, mitigate their market and liquidity risks and provide for an efficient balance sheet structure for them.
- If, on the contrary, the operational framework is inconsistent with monetary policy or the level of development of the money markets, e.g. where there is a lack of trust among interbank market participants, the money market activities of the central bank can have adverse effects on a country's interbank markets. In these circumstances, the interbank markets often freeze and without effective risk management options the banking sector will not be able to facilitate payments and finance the country's businesses and households effectively.

Many developing market central banks are uncertain how to cope with the lack of well-functioning money markets. In general, there is a lack of practical information that can guide authorities how to approach the development of their money and financial markets, what is the appropriate

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<sup>1</sup> Quote from "Framework for Developing Money Markets in Frontier and Emerging Market Economies" (EBRD, 2016).

<sup>2</sup> The term "interbank market" is used in the Handbook as a synonym to "money market", since banks are still the most important market players in money markets of emerging and frontier economies. This formulation also stresses the fact that we are taking into account transactions between market participants, but not with the central bank.

sequencing of the necessary steps. In particular, there is a demand for analysis on money market development, describing the lessons learned and the best practices in money market operations and their effect on interbank market dynamics.

There does not appear to be any existing research let alone practical guidance to regulators on this topic. Authorities are frequently unaware whose fault is that the money market does not operate properly and what should be made to make it work. This problem can be traced down to a general lack of understanding of how interbank markets work, which makes it next to impossible to identify what are the actual gaps in operations, regulations or infrastructure that hinder development.

The Money Market Diagnostic Handbook (Handbook henceforth) aims at eliminating this lack of knowledge and serving as a solid basis to EMDC-based regulatory authorities upon which they can improve their understanding of money and interbank markets and improve their operations. This, in turn, is expected to lead to increased interbank liquidity and efficiency.

The Handbook builds on a recent document entitled, "Framework for Developing Money Markets in Frontier and Emerging Market Economies", which describes money markets and outlines the policies, targets and instruments that are available to central banks and what might be the consequences of applying them under certain circumstances. The Handbook primarily serve as i) a diagnostic tool for the state of the money market development, and ii) a practical guide for establishing objectives and milestones in a money market reform agenda in emerging and frontier market economies. In addition, the Handbook will be an important source of information for local commercial banks, international investors and the development finance community to understand the existing infrastructure and the problems in the local money and interbank markets.

## **The structure of the diagnostic handbook**

The aim of the diagnostic handbook is to help central banks, decision makers and international financial institutions to assess the level of development of the money market in emerging and frontier economies.

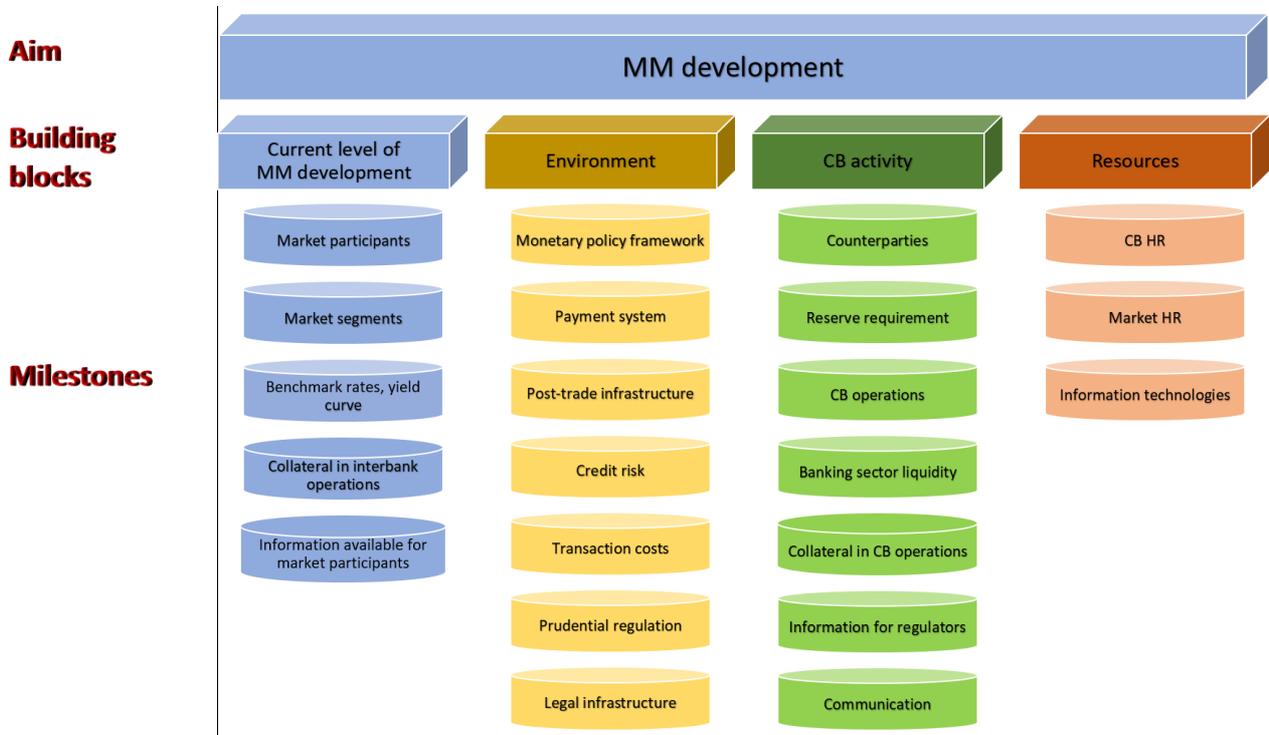
The handbook is organized around a large set of questions and check boxes, which are designed to provide answers to general and qualitative questions that relate to the development of the money market. The general questions are directly linked to milestones during the money market development and constitute the elementary building blocks of the handbook.

The milestones are grouped together by their functional topics, e.g. central bank as a market maker, market participants or risk management, etc. Consequently, the large building blocks create consistency with the Money Market Report as they follow the structure of the report.

The diagnostic handbook aspires to transform the answers to the different, often qualitative questions into numerical scores automatically using corresponding weights and grade points in an Excel spreadsheet and then aggregate them. The Handbook seeks to come up with a single numerical score for the level of money market development and the importance of different factors explaining the score. All of these scores can be broken down to elementary building blocks.



Figure 1: Summary of the structure of the questionnaire



# I. Current level of money market development

## 1. Market participants

### 1.1. Money market participants

#### Rationale

The number and diversity of participants being active in the money market can tell much about the stage of development. On underdeveloped money markets the variety of available financial assets is limited and it is possible that only larger banks participate with only sporadic interbank and government securities secondary market trading taking place. Small banks may refrain from participating at all, hoarding liquidity and relying on CB's standing facilities while other investors may be missing completely in the absence of financial assets in which they can invest. As a rule of thumb, the higher the number and variety of participants in the money market, the more developed the market is. It should be noted though that there is usually a trade-off between the number of participants and the level of market segmentation. Small participants often trade among their groups, thus too many small banks in the market can impede the development of the entire market.

Though the core of the money market is the interbank market, more developed money markets encompass short-term securities markets as well, which a variety of institutional investors (e.g. pension funds, insurance companies, etc.) can use for their own liquidity management.

In general, markets serve their purpose more efficiently if there are a large number of participants none of which having a significant effect on the market price. However, in many emerging markets with small national banking system, the money market will possibly be oligopolistic and trading will be dominated by a few large banks. It does not render development impossible, but requires special attention from the CB since an oligopolistic money market can distort market outcomes. It is customary to measure the level of concentration in the market by concentration indicators such as the popular Herfindahl-index (the indicators are to be provided for each market segments in the corresponding section, table 3).

- If some market participants are much bigger than the rest, then their operations will determine or at least have a significant influence on the liquidity of the whole market and the money market interest rates. The big participants have the capacity to move the market price thus have private information on possible future price movements. This makes the smaller participants exposed to a large risk and they may refrain to do business in the market.
- The market may become segmented as large banks refuse to provide credit limits to smaller banks. It may be reasonable decision on the part of the large banks if the small ones do not really help them to cope with their own liquidity management.

Market activity may be held back and remain muted if there is a lack of trust between market participants, who are reluctant to deal bilaterally. Trading can initially be catalyzed by the central bank stepping in as a central counterparty but in more developed markets there are specialized financial institutions that serve to alleviate this problem, e.g. primary dealers or interdealer brokers. Primary dealers can facilitate market activity by providing two-way quoted prices while interdealer brokers foster trading by ensuring anonymity of participants. The presence of these participants in itself implies that the money market is relatively developed.

The central counterparty (CCP) is a clearing house that acts like an intermediary between counterparties to standardized financial products traded in financial markets. It acts as the seller to each buyer and as the buyer to each seller, i.e. it replaces contractual relations between separate participants with relevant contracts with the CCP. The CCP deals with credit risk, but setting it up is very costly therefore it is usually found in large markets only.

A central securities depository (CSD) is an institution which serves as a central point for depositing securities and it provides securities accounts and asset services, like administration of different corporate actions with a certain security (redemption, interest or dividend payment, etc.). The main advantage of a CSD for interbank market purposes is that it allows for easy transfer of security ownership through a book entry system and therefore it fosters the development of collateralized markets, e.g. repo markets (please, see section 8.4 for more details on the functioning of CSD).

## Questionnaire

Table 1: Checks for market participants

Respondent: central bank, operational unit

No.	Question	Answer		
i)	How many banks have licenses in the country?	number		
a.	What was the share of banks participating in the money market during the last month to total number of banks in the domestic banking sector?	percent		
b.	Are there large dominating participants in the market? If yes, put the number	yes (number) / no		
c.	If you can, please estimate concentration in the deposits of the banking sector in terms of the Herfindahl-index (HHI):	number		
d.	If you can, please estimate concentration in the loans provided by the banking sector in terms of the Herfindahl-index (HHI):	number		
ii)	Is there a primary dealer system?	yes/no		
iii)	How many primary dealers are there?	number		
iv)	Are there inter-dealer brokers?	yes/no		
v)	Is there a Central Counterparty in the market?	yes/no		
vi)	Is there a Central Securities Depository in the market?	yes/no		
vii)	What other types of investors, besides already mentioned, participate in the local financial market? Please, estimate their role in the financial market and in the money market	Answer	Total assets / Total assets of financial sector (banks and non-bank financial institutions)	Share in the turnover of local interbank market
a.	All non-bank participants	yes/no	percent	percent
b.	Insurance companies	yes/no	percent	percent
c.	Pension funds	yes/no	percent	percent
d.	Investment funds/companies (total)	yes/no	percent	percent

## Main outcomes and recommendations

- For cases of few large participants dominating the market (high concentration) the first task for the regulator is to reveal if there's market segmentation, which should be addressed in order to let all participants have unrestricted access to the market;

- The system of primary dealers can lead to more efficient trading environment and can speed up market development but the responsibilities (costs) and the gains must be carefully balanced.
- Interdealer brokers can be very useful for markets characterized by problems with trust but their existence assumes a certain, relatively high market turnover, and they cannot solve issues with high credit risk.<sup>3</sup>
- The CSD is a very important institution for reducing the costs and risks of transactions (see also section "Payment system"). If it is unavailable, then the purpose of establishing them is to be put in the list of priorities (short-term or long-term, depending on the current stage of market development).

## 1.2. Foreign participants

### Rationale

In the world of globalized capital markets, which facilitate cross-border investment flows, attracting foreign participants creates an opportunity to raise the depth of local financial markets, including the money market. Foreign banks and other foreign financial firms bring expertise and capital and may connect the local financial markets to the rest of the world. The presence of a global custodian bank – a bank providing custody services in a multitude of markets by having access to the CSDs of these markets – can greatly increase the attractiveness of local markets. The global custodian may either have a direct access to the local CSD(s) by physical presence in the local market (usually in case of rather large markets) or have an indirect reach through employing a network of sub-custodians. Since investing in less developed emerging and frontier markets is inherently more risky, the presence of global custodians as safekeeping agents is a crucial development.

Foreign participants may be either directly present in the local financial markets or may operate off-shore. In the first case the foreign market participants became partly local, i.e. they are functioning constantly in the domestic market as branches of non-resident banks. Foreign banks are often different from local ones as they are less rooted in the domestic economy and rely much less on the local money market. Foreign banks may only be interested in providing services to large local corporates using funding from their parents or, on the contrary, may be interested in acquiring local savings and using them for funding their international operations. Either way, they tend to manage liquidity vis-à-vis their parent and less with the domestic players. Large domestic banks usually have access to a retail customer deposit base which, as a rule, is the main source of funding for them, while foreign banks are more reliant on wholesale and interbank markets (especially the FX-swap segment) to ensure funding.

The presence of foreign banks may be either beneficial or detrimental to the development of the money market.

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<sup>3</sup> A permanently lower credit risk can be attained only by establishing a legal environment that provides for the enforceability of collateralized transactions (e.g. FX swaps or repo), by ensuring that a sufficient amount of collateral is available and by strengthening the banking sector in general (see section 9 later)

- Foreign banks are beneficial if they bring knowhow of trading practices and risk management procedures that can be adopted by the local banks. Foreign banks can also foster trading due to their different balance sheet and financing structures.
- However, foreign banks may hinder money market development if they act like islands in the domestic money market, using financing from or providing liquidity to exclusively their parent banks and refusing to trade or trading only to very limited degree with local banks. In extreme cases, foreign banks may not even have any formal credit limits for local banks.

In the second case, foreign market participants are non-residents, based off-shore and involved mostly in short-term operations. They are very different from local players, less attached to the local markets as their local exposure is usually negligible relative to their balance sheet. On the other hand, they can have offsetting positions to local market participants and, partly related to their relatively small exposure, may have more risk appetite. The bottom line is that they can bring diversity to the market.

Often pursuing the strategy of carry trade, foreign participants operate in different segments (FX swaps, deposits, repo transactions, derivatives, gov't securities secondary market) of the money market, hence increasing market activity and turnover. In this context, they are playing a positive role by adding depth to the market and making the market more efficient by exploiting and reducing arbitrage opportunities. On the other hand, they exacerbate potential market volatility due to the short-term character of their activity. On balance, the presence of non-resident investors is assessed positively, especially in frontier markets.

## Questionnaire

*Table 2: Checks for foreign market participants*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Can foreign investors reach the local market through a global custodian bank? (1 – yes, the global custodian is present in the local market; 2 – yes, the global custodian functions through local sub-custodians; 3 – no)	1/2/3
ii)	Are there local branches of foreign banks / majority foreign owned banks (LBFB) in the national banking sector?	yes/no
a.	Where the parent bank comes from?	big global bank; bank from a neighboring developed country; bank from a neighboring developing country
b.	Do LBFB deal with domestic banks (have credit limits on them)?	yes/no
c.	What is the share of LBFB in total assets of the banking sector?	percent

d.	What is the share of LBFB in total deposits of the banking sector?	percent
e.	What is the share of LBFB in the turnover of local FX market?	percent
f.	What is the share of local branches of foreign banks in the turnover of local interbank market?	percent
g.	What is the percentage share of LBFB in the primary (auctions of) government securities market?	percent
h.	What is the percentage share of LBFB in the turnover of local secondary government securities market?	percent
iii)	Please, give an estimate of the degree of non-resident participation in the local market.	
a.	What is the percentage share of non-residents in the turnover of local FX market?	percent
b.	What is the percentage share of non-residents in the turnover of local interbank market? If data is available, please give shares in the turnover for different segments	percent
	- segment 1 (specify, e.g. FX swaps)	percent
	- segment 2 (specify, e.g. repo)	percent
c.	What is the percentage share of non-residents in the primary (auctions of) government securities market?	percent
d.	What is the percentage share of non-residents in the turnover of local secondary government securities market?	percent

### **Main outcomes and recommendations**

- Foreign banks may need special treatment and attention as they are not only existing market participants, but also potential ones. The potential entry of new market participants is of special importance for countries with narrow local markets.

## **2. Money market segments and their liquidity**

### **2.1. Unsecured and secured cash instruments**

#### **Rationale**

Money market is defined as the market for short-term funds. However, within that there are many different potential segments and, in general, the more segments are active and the more liquid and deep these markets are the more developed the money market is. Liquidity can be measured by many different indicators, for example the relative size of market turnover, number of transactions, bid-ask spread, etc.

In many countries, the largest segment is the secured or unsecured interbank market. Before the GFC unsecured lending was widespread (though it started to retreat), but in the wake of the GFC secured lending became the norm. Besides interbank market, the other segment of the money market, usually large and important even in frontier economies, is the short-term government securities market.

Collateralized markets became more important after the GFC as they are more resilient in the face of financial crises, however they are still dependent on markets of relevant collateral. The functioning of collateralized markets is more complex and implies the smooth functioning of a collateral management infrastructure. Collateralized transactions include repo deals, i.e. repurchase agreements, secured by securities, FX-swaps, where the collateral in effect is the foreign exchange.

## **2.2. Money market derivatives**

### **Rationale**

On top of the cash products, there are a number of different money market derivatives as well: short-term interest rate futures, forward rate agreements (FRAs) and interest rate swaps (IRS). They are usually not functioning or not well developed in emerging and frontier markets, though these instruments play an important role in financial markets.

Short-term interest rate futures are futures contracts with an interest bearing instrument as the underlying asset (e.g. Treasury-bill futures). Futures are listed and traded on exchanges.

On the contrary, forward rate agreements (FRAs) are OTC contracts, which determine an interest rate (either lending or borrowing) to be paid on an agreed principal amount for a predetermined future period. The forward is non-deliverable, i.e. when it matures, only one net payment is effected, corresponding the difference between the FRA rate and market rate for the same period.

The interest rate swap (IRS) is an agreement to exchange a series of interest rate cash flows on an agreed principal amount, typically involving the exchange of a fixed interest rate for a floating rate, or vice versa. The IRS can also be used to exchange a floating rate against another floating rate based on different repricing periods (different basis). Moreover, the cash-flows can be in different currencies (cross currency IRS). The IRS markets in developed economies can extend to well over one year, to 10 or 20 years. The long-term IRS typically involves a number of payments through the life of the contract, made on specific dates. The short-term IRS may only involve one net payment at maturity, similarly to an FRA. One particular type of interest rate swap, the overnight interest rate (index) swap (OIS), recently became a very important instrument in several (mostly developed) money markets.

The OIS is a fixed-to-float IRS where the floating portion is determined by compounding an overnight interest rate (e.g. the EONIA in the Eurozone) for the relevant period. For the market participants, the OIS is an effective tool for managing interest rate risk. For the central bank, the OIS facilitates the implementation of monetary policy, because the pricing of the OIS provides information on market expectations about the future path of the policy rate.

There is an important innovation related to the OIS and promoted by the EBRD, the fixing of the OIS swap points for different tenors (e.g. for one week, one month, three months, six months). The OIS fixings support the extension of the yield curve, since they can be used as the floating rate leg for longer term IRSs. The OIS rates may also be a more reliable constituent of the short end of the yield curve than usual money market reference rates because (i) the O/N rate is usually the most actively traded instrument; (ii) the OIS carries little counterparty credit risk; and (iii) liquidity risk is minimal due to netting. For more information about the advantages of OIS please see (EBRD, 2016).

## Questionnaire

Table 3: Checks for money market segments and their liquidity

Respondent: central bank, operational unit

Please, mark those which are available and, if you can, estimate the following indicators for each of them

No.	Question	Answer	Measure of trading activity: annual market turnover in the segment to nominal GDP	Total number of deals in the segment (during last three months)	Coefficient of variation of the price indicator (ratio of the standard deviation to the absolute value of the average)	Bid/ask spread (ratio between the spread and the underlying interest rate)	Concentration: Herfindahl index (HHI), value from 0 to 10000
i)	Unsecured lending	yes/no					
ii)	Secured (collateralized) lending:	yes/no					
	repo (actual buy and resell)	yes/no					
	lending against a pledge of securities						
	FX-swap (a spot and a forward transaction done at the same time)	yes/no					
	lending against FX as collateral (two parallel deposit placements in different currencies)	yes/no					

iii)	Short-term gov't securities market	yes/no					
iv)	Short-term market for other types of securities (commercial papers etc.)	yes/no					
v)	Money market derivatives	yes/no					
a.	FRA (Forward Rate Agreement)	yes/no					
b.	IRS (Interest Rate Swap)	yes/no					
c.	short-term interest rate futures	yes/no					
d.	FX-swap	yes/no					
e.	onshore FX-forward	yes/no					
f.	NDF (non-deliverable forward)	yes/no					
	Other, please, specify						

### **Main outcomes and recommendations**

- Both unsecured and secured segments of the market should be developed simultaneously. Unsecured transactions are often more convenient for banks under normal market conditions, while secured deals are more resilient in the face of market tension and when market participants lack confidence in each other;
- Money market derivatives are rarely present in emerging and frontier markets, however their development, especially the OIS and its fixings, should be on the agenda, since they contribute to the reliable benchmark yield curve, thus could be very beneficial for market development.

## **3. Benchmark market rates and the yield curve**

### **3.1. Benchmark market rates**

#### **Rationale**

Reliable and credible benchmark market rates support money market development in many ways:

- by greater pricing transparency and consistency, reflecting aggregate market conditions;
- by allowing the regulator to monitor transmission of their monetary policy and influence the market;
- by benefiting the development of longer term instruments as pricing transparency applies for all assets and liabilities linked to such benchmark; and
- by allowing for the development of longer dated floating rate assets and liabilities as well as capital efficient derivatives, i.e. promoting the process of maturity transformation (see the introduction).

The primary rate to be available is for O/N deals, which is usually used as a starting point for the local currency yield curve, and it should be calculated by the CB or by some specialized financial market infrastructure firm or institution. Depending on the calculation methodology the rate will include or exclude certain risks, have advantages and drawbacks in terms of correct price reflection. The conventional approach to O/N interest rates adopted by many CBs is to calculate the average rate of unsecured deposits traded over a specific period (generally over a full business day), thus making it independent from collateral issues.

Developing a reliable unsecured benchmark for longer tenors than O/N will be challenging in most markets, especially after the GFC. Different markets may start indexing transactions using different term indices (whether LIBOR type indices, T-bills or even Central Bank rates which may be deemed more or less reliable), which is not conducive for market development. The credibility of such indices will depend largely on the method of calculation, the transparency of the calculation methodology and on the governance of the index. For example, the credit spread, embedded in term unsecured offered rates quoted by banks contributing to LIBOR type indices, can be particularly volatile in times of financial turmoil and can thereby hurt the index credibility. Likewise for the credit and liquidity premium reflected in T-bill yields. Stakeholders may therefore prefer developing credible term risk free indices as markets develop (e.g. OIS fixing).

With regard to the calculation methodology, cutting-off distribution tails is sometimes required to avoid excess volatility that could appear due to extreme rates on some deals. The algorithm of calculation is to be publicly available and the rate should be published on a daily basis, with a small lag.

The accompanying transparency and informational support matters as well, since it increases market participants' confidence in the rate, promoting it to really serve as a benchmark. The central bank, when starting the process of introduction the benchmark, is advised to organize a working group, together with market participants, on the implementation of the method and publishing a money market benchmark rate. It is crucial to include market participants from the very beginning, so that they have enough trust in the new methodology and indicator and start actively using it.

Publishing a reliable money market benchmark rate would be a significant step towards increasing market transparency. It would help in achieving a higher number of market transactions and

liquidity, which in turn would make the calculation of benchmarks more reliable and credible over time.

## Questionnaire

*Table 4: Checks for benchmark market rates*

*Respondent: central bank, monetary policy unit / operational unit*

No.	Question	Answer
i)	Is there a benchmark/reference market rate?	yes/no
ii)	What is the maturity of the benchmark rate (in days)?	number
iii)	Is the benchmark rate based on secured or unsecured transactions? (1 – secured; 2 – unsecured)	1/2
iv)	Is the benchmark rate calculated on the basis of actual deals or bid offers? (1 – actual; 2 – bids)	1/2
a.	If it is on the basis of actual deals, is there a mechanism to calculate the rate in the absence of deals?	yes/no
b.	If it is on the basis of bids, is there a disciplinary mechanism ensuring the integrity of the submitted bids, e.g. the contributing panel participants have to transact at the contributed price, etc.?	yes/no
v)	What is the approximate market share of participants which are included to its calculation (share in total assets)?	number
vi)	Is there a mechanism for cutting off extreme values or limiting the range of transactions included in the calculation?	yes/no
vii)	Is the calculation of it transparent for market participants (publicly available methodology, etc.)? (1 – publicly available methodology, list of participants; 2 – brief description of calculation; 3 – no description)	1/2/3
viii)	Is it published on a daily basis? If no, then how often?	yes/no (specify)
ix)	What is the lag of publishing?	days
x)	Are there any derivatives in the market linked to this rate?	yes/no

*Table 4.1: Checks for benchmark market rates*

*Respondent: market participants*

No.	Question	Answer
i)	Do you currently use any benchmark rate for pricing floating rate assets and liabilities?	yes/no
a.	If yes, please specify the benchmark	specify
ii)	Do you reckon the benchmark rate reliable and reflecting money market rates well? Please, give your assessment on a scale from 1 to 4	1/2/3/4

iii)	What is the basis for pricing bank deposits and loans? Choose from below	
a.	interbank rate only (other than the benchmark)	yes/no
b.	policy rate only	yes/no
c.	T-bill yield only	yes/no
d.	mix of rates excluding T-bill yield	yes/no
e.	mix of rates including T-bill yield	yes/no
f.	other	yes/no
g.	please specify	
h.	If you use a mix of rates, which rate is dominant/driving it? (1 – interbank rate, 2 – CB policy rate, 3 – T-bill rate, 4 – other)	1/2/3/4

### **Main outcomes and recommendations**

- O/N rate is the most important benchmark rate in the money market, both for monitoring money market conditions and for the local benchmark yield curve;
- The rate has to be calculated by the CB (or specified market participant), and the approach to its calculation should take into account market specifics, be transparent and publicly available;
- The benchmark rate should be published regularly with a small lag.

### **3.2. Yield curve**

#### **Rationale**

In developed countries, interbank markets usually extend to plenty of different maturities besides overnight, but for emerging and frontier markets interbank deals are often concentrated in the O/N segment, with hardly any transactions take place beyond one week. In many cases, interbank rates are even not quoted for maturities more than 1 month. But in case of availability of deals with more than 1 week maturity, the CB is advised to monitor them and have some benchmarks. Benchmark maturities for the money market can also come from the short-term government securities market, shaping the yield curve (together with all other maturities, i.e. long-term ones), which should serve as a basis for pricing of deposits and loans by banks.

#### **Questionnaire**

*Table 5: Checks for the yield curve*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Please, mark all the maturities for active trading in the interbank market from the list below and estimate shares in total volumes of trading separately for each available maturity	

a.	o/n	
b.	from 2 days to 1 week	
c.	from 8 days to 1 month	
d.	more than 1 month	
ii)	Do you have any benchmark rates, besides the main benchmark rate from tab 4? If yes, please, specify	yes (specify) / no
iii)	Are government securities issued regularly?	yes/no
iv)	Is there a secondary market for gov't securities trading?	yes/no
v)	How many benchmark maturities are there in the short-term government securities market?	number
vi)	What are the benchmark maturities in the short-term government securities market?	specify (text)
vii)	How many actual maturities are there in the long-term government securities market?	number
viii)	What are the maturities in the long-term government securities market?	specify (text)

*Table 5.1: Checks for the yield curve*

*Respondent: market participants*

No.	Question	Answer
i)	Please, mark all the maturities for active trading in the interbank market from the list below and estimate shares in total volumes of trading separately for each available maturity	
a.	o/n	
b.	from 2 days to 1 week	
c.	from 8 days to 1 month	
d.	more than 1 month	
ii)	Do you have any benchmark rates, besides the main benchmark rate from tab 4? If yes, please, specify	yes/no
a.	If yes, please specify	text
iii)	Are government securities issued regularly?	yes/no
iv)	Is there an active secondary market for gov't securities trading?	yes/no
v)	How many benchmark maturities are there in the government securities market?	number
vi)	What are the benchmark maturities in the government securities market?	specify

vii)	How many benchmark maturities are there in the short-term government securities market?	number
viii)	What are the benchmark maturities in the short-term government securities market?	specify
ix)	Are there large differences between yields at neighboring maturities?	yes/no
x)	Is there a yield curve published by the central bank?	yes/no
a.	Do you find it a reliable representation of the market situation? (1 – yes, 2 – no, 3 – no opinion)	1/2/3
b.	Do you know how it is calculated?	yes/no
c.	Do you regularly follow it?	yes/no

### **Main outcomes and recommendations**

- The presence of transactions and rates with maturities more than O/N in the interbank market is a sign of rather developed market, however O/N deals usually count for the bulk of the market;
- Local yield curve, shaped by money market rates together with gov't securities rates, serves as a basis for pricing of bank deposits and loans, thus plays an important role for the transmission of financial conditions into real sector development.

## **4. Collateral in interbank market operations**

### **Rationale**

The acceptance of a security as collateral by the CB will promote its acceptance in interbank market operations. A broad range of collateral is therefore assumed to facilitate market trading. At the same time, banks should continue to evaluate underlying risks. Absence of proper price indicators (e.g. if assets are not actively traded) may also force banks to refuse from using some asset classes. This is an additional reason for developing of government securities market as the most relevant collateral provider.

### **Questionnaire**

*Table 6: Checks for collateral in interbank market operations*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Does the CB publish the list of eligible collateral?	yes/no
ii)	For marketable collateral: which collateral (by type of issuer) do you accept in your operations? Please, choose all relevant from the list below	
a.	Government	yes/no
b.	State companies	yes/no

c.	Corporate sector	yes/no
d.	Non-bank financial institutions	yes/no
e.	FX assets (issued by supranational organizations, foreign governments, foreign corporates)	yes/no
f.	Other, e.g. gold, FX cash. Please specify	text
iii)	Are shares accepted as collateral?	yes/no
iv)	Do you use non-marketable collateral?	yes/no
a.	For which operations is it utilized? Please, specify	text
v)	Do you use haircuts in your operations?	yes/no
vi)	How do you estimate the sufficiency of collateral (gov't securities) available on the market, i.e. if it's enough for active interbank trading or not? (On scale from 1 to 4, where 1 is absolutely insufficient, shallow market for collateral assets, and 4 is fully sufficient)	1/2/3/4
a.	How much government securities you have on your balance sheet that is not encumbered (not used as collateral)?	number
b.	What was the average amount of unsecured funding with maturity less than 31 days over the last year?	number

### **Main outcomes and recommendations**

- A broad range of collateral facilitates market trading, but at the same time banks have to evaluate underlying risks, especially in the absence of respective market prices (under fragile market activity).

## **5. Information available for market participants**

### **Rationale**

Up-to-date market information, provided by the regulator(s), the CB and the government, is important for market participants to support their decisions on business strategy, pricing, asset-liability management and risk management. The information that the CB should provide, includes both statistical data (macroeconomic and financial) and the regulations on all relevant operations for which the CB is responsible. Macroeconomic statistics compiled by the CB typically include monetary statistics (the monetary survey) and the balance of payments statistics, but in some cases the CB actually produces other statistics the usually is the responsibility of the statistics agency, e.g. price statistics, industrial production, foreign trade, etc. Moreover, since in emerging and frontier economies the timely availability of macroeconomic data is often not ensured due to underfunding of the statistics agency, the publishing of core statistical indicators by the CB on its web-site can be helpful for market participants. Availability of information is also a part of communication strategy (see below), necessary for increasing the efficiency of the CB policy, including measures aimed at money market development.

## Questionnaire

Table 7: Checks for information available for the market

Respondent: central bank, monetary policy unit

No.	Question	Answer	
i)	What kind of data is available on the CB web page?	Is it regular?	Lag
a.	Annual macroeconomic data		
b.	Quarterly macroeconomic data		
c.	Monthly macroeconomic data		
d.	Daily exchange rates		
e.	Daily interest rates		
f.	Monthly or quarterly FX-interventions, FX-reserves		
g.	Daily data on other CB operations		
h.	Are CB regulations, affecting the counterparties, available on the web page? (1 – all are available; 2 – some but not all; 3 – not available)	1/2/3	
i.	Are regulations, available on the web page, up-to-date?	yes/no	
ii)	Does the CB publishes data on ...		
a.	... financial market prices by market segments?	yes/no	
b.	... financial market turnover by market segments?	yes/no	
iii)	Are there available data which is compiled by data vendors or market organizations (e.g. benchmark rates, market rates, turnover, etc.)?		
a.	Is data on indicative real-time market prices/rates available?	yes/no	
b.	Is data on actual market prices/rates available?	yes/no	
c.	Is data on actual market volumes available?	yes/no	
d.	Is data on actual market positions available?	yes/no	

Table 7.1: Checks for information available for the market

Respondent: market participants

No.	Question	Answer	
i)	Do you estimate market information as sufficient for decision-making? (from 1 to 4, where 1 – little information, even some basic is missing, and 4 – absolutely sufficient)	1/2/3/4	
ii)	What kind of data is available on the CB web page, according to your knowledge?	Is it regular?	Lag
a.	Annual macroeconomic data		
b.	Quarterly macroeconomic data		
c.	Monthly macroeconomic data		
d.	Daily exchange rates		
e.	Daily interest rates		

f.	Monthly or quarterly FX-interventions, FX-reserves		
g.	Daily data on other CB operations		
h.	Are CB regulations, affecting the counterparties, available on the web page? (1 – all are available; 2 – some but not all; 3 – not available)	1/2/3	
i.	Are regulations, available on the web page, up-to-date?	yes/no	
ii)	Does the CB publishes data on ...		
a.	... financial market prices by market segments?	yes/no	
b.	... financial market turnover by market segments?	yes/no	
iii)	Are there available data which is compiled by data vendors or market organizations (e.g. benchmark rates, market rates, turnover, etc.)?		
a.	Is data on indicative real-time market prices/rates available?	yes/no	
b.	Is data on actual market prices/rates available?	yes/no	
c.	Is data on actual market volumes available?	yes/no	
d.	Is data on actual market positions available?	yes/no	

### **Main outcomes and recommendations**

- Ensure that as much up-to-date information is available to market participants as possible;
- Encourage the use of online trading platforms that facilitate the compilation of market data.

## **II. Environment**

### **6. Monetary policy operational framework**

#### **Rationale**

The actual monetary policy regime is crucial for understanding the challenges and constraints which the central bank (CB henceforth) faces if it wants to develop money market. In this sense the information on the monetary policy operational framework does not directly describe the level of development of the money market, rather it helps identifying the possible causes for an underdeveloped money market.

In frontier and emerging market economies, money market and liquidity management can be either i) of secondary importance compared to exchange rate management or ii) overshadowed by fiscal dominance. If the exchange rate is heavily managed and FX-reserves are sufficiently high, then it may be relatively easy and cheap for commercial banks to manage their liquidity through the foreign money market using FX-transactions with the central bank (e.g. in a currency board). In this

case the incentives for developing the local money market or transacting on it are very low. However, it is more likely in frontier markets that the level of FX-reserves is too low and thus the exchange rate management requires rationing of FX-supply. In this case, the exchange rate is not clearing the FX market and the prevailing interest rates are not fully market determined. Fiscal dominance often manifest itself in opportunistic debt management practices where the supply of government securities is manipulated with the aim of influence local yields to ensure lower financing costs for the government, which disrupts local money market.

Consequently, of the different monetary policy regimes<sup>4</sup> monetary targeting and exchange rate targeting are inherently less conducive for the growth of money market and pose natural constraints to a central bank's intention to foster its development. Nevertheless, in each monetary policy framework there are always opportunities for developing the interbank money market and financial markets in general. The good understanding of the monetary policy framework helps to reveal what the constraints and opportunities are and to find out relevant practical measures for implementation.

Besides getting the general picture of money market operational framework, the actual role of the interest rate is also revealing. Even in non-IRT frameworks policy-makers often monitor the dynamics of a money market interest rate. This interest rate may not be a target according to the standard definition, but may still be an important indicator that influences the decision-making process, e.g. it may affect debt financing or banks' pricing of deposits and loans.

In contrast, even if the CB declares that it targets inflation, the actual state of affairs can sometimes be quite different. In such a case the issue is one of CB credibility: firstly, does the CB actually follow the rules of the declared regime - e.g. raises interest rates when the inflation forecast indicates a need for tightening - and secondly, are the necessary preconditions in place to pursue the operational goals within the chosen policy framework - e.g. is there a long enough inflation forecast; does the CB have the analytical capacities to prepare a trusted forecast, etc. Commercial banks and other market participants can witness the level of CB credibility and assess what is the de facto monetary policy framework.

Irrespective of the formal or official declaration, some structural features of the domestic economy, e.g. dollarization<sup>5</sup>, may overwrite the nature of the monetary policy operational framework. High degree of dollarization works as if the monetary policy operational framework was ERT and hinders local currency money market development (see EBRD, 2016).

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<sup>4</sup> Detailed description of money market functioning under different policy regimes (ERT, RMT, IRT) is available in (EBRD, 2016)

<sup>5</sup> The standard measure for dollarization is the ratio between FX deposits and total deposits

## Questionnaire

Table 8: Checks for money market operational framework<sup>6</sup>

Respondent: central bank, monetary policy unit

No.	Question	Answer
i)	How would you define CB's monetary policy operational regime? Choose from below:	
a.	Exchange rate targeting (ERT)*	yes/no
b.	Reserve money targeting (RMT)*	yes/no
c.	Interest rate targeting (IRT)	yes/no
ii)	If it's ERT, please specify:	
a.	Currency board	yes/no
b.	Fixed exchange rate (peg)	yes/no
c.	Managed floating	yes/no
d.	What is the daily volatility of the local currency over a 3 month window which is perceived as normal? (in percent). (Please note, that here we mean the volatility of the local currency against a hard currency (USD, EUR etc.) or against a basket, which is pre-specified by the CB under an ERT regime)	percent
iii)	If it's RMT, please specify:	
a.	The length of period for the target to be achieved (month, quarter, year, etc.)	month/quarter/year
b.	Should the target be achieved for: 1 – end of period, 2 – period moving average, 3 – other (specify)	1/2/3
iv)	The role of interest rate in current framework:	
a.	Is there an interest rate that the CB monitors in the decision-making process?	yes (specify) /no
b.	If you roughly estimate the weight of interest rate in decision-making process, then what would it be in percent? (For example, exchange rate is 70% and interest rate is 30%, then 30% is the answer)	percent
vi)	Give an estimation of the dollarization in the national economy:	
a.	ratio of FX deposits to total deposits in nominal terms (for last available data), percent	percent
b.	ratio of FX loans to total loans in nominal terms (for last available data), percent	percent

*CHECK: Actual daily volatility of the local currency over a 3 month window*

<sup>6</sup> For automatic processing of data the final version of check-boxes is put in Excel, then most items in the check-boxes, i.e. responds get the grade and the weight of importance. Grades are multiplied by the weights, and the total score for each small building block is calculated. In case of quantitative answers we reference them to some categorical grades (e.g. according to ranges). Then, the more the resulting number, the better is the evaluation of money market development blocks. All scores are aggregated in the total one, so we can assess the level of market development, observing the structural factors, contributing positively and negatively. The results have visual graphical representation.

Table 8.1: Checks for money market operational framework<sup>7</sup>

Respondent: market participants

No.	Question	Answer
i)	How would you define CB's monetary policy operational regime? Choose from below:	
a.	Exchange rate targeting (ERT)*	yes/no
b.	Reserve money targeting (RMT)*	yes/no
c.	Interest rate targeting (IRT)	yes/no
ii)	If it is not ERT,	
a.	Does the CB still manages the ER?	yes/no
b.	How often does the CB makes transactions in the FX-market (during the last year)?	1/2/3/4
c.	How influential is the CB on the FX-market?	1/2/3/4
iv)	The role of interest rate in current framework:	
a.	Is there an interest rate that the CB monitors in the decision-making process?	yes (specify) /no
b.	If you roughly estimate the weight of interest rate in decision-making process, then what would it be in percent? (For example, exchange rate is 70% and interest rate is 30%, then 30% is the answer)	percent
v)	Central bank credibility	
a.	How do you estimate the CB credibility (number from 1 to 4, where 1 is not credible, declaring one policy regime while actually conducting the other, and 4 is totally credible)?	1/2/3/4
b.	How does the most traded money market rate move together with the central bank key rate? Please, estimate as a number from 1 to 4, where 1 is almost no co-movement, and 4 is tight co-movement (4 - if the market rate is most of the time within +/- 10 bp from the policy rate, 3 - if the market rate is most of the time within +/- 50 bp from the policy rate, 2 - if the market rate is most of the time within +/- 100 bp from the policy rate and they move together to some extent, 1 - if the market rate does not move together with the market rate or deviates regularly more than 100bp)	1/2/3/4

<sup>7</sup> For automatic processing of data the final version of check-boxes is put in Excel, then most items in the check-boxes, i.e. responds get the grade and the weight of importance. Grades are multiplied by the weights, and the total score for each small building block is calculated. In case of quantitative answers we reference them to some categorical grades (e.g. according to ranges). Then, the more the resulting number, the better is the evaluation of money market development blocks. All scores are aggregated in the total one, so we can assess the level of market development, observing the structural factors, contributing positively and negatively. The results have visual graphical representation.

## ***Main outcomes and recommendations***

- The monetary policy framework is a key determinant for the development of the money market. Monetary policy or financial stability goals can supersede the objective of developing the money market, but at the same time the development of the money market can become an argument for revision of the whole operational framework and regime;
- The importance of interest rates in the decision-making process should be understood and market rates have to be taken into account in any monetary policy regime;
- CB credibility, i.e. the trust of market participants, is required for the successful implementation of the monetary policy framework.

## **7. Payment system**

### ***7.1. Central bank payment system processes***

#### ***Rationale***

Functioning of the national payment system determines boundaries of money market development, because underdeveloped infrastructure may reduce all other efforts to almost zero. In the following sections we give a brief description of the milestones in this field.

Straight-through processing (STP) stands for the concept of continuous, fully automated processing of transaction information, which does not require manual intervention. Payment settlement operations involve at least two parties and their automated systems constantly interact, as the data generated by one system is electronically transmitted to another automated system. In order to exclude manual intervention at all stages of data processing, it is necessary to apply standards of information exchange, providing full interoperability between automated systems. Therefore, STP can be understood as a strategy to provide uniform technical rules and standards in the field of financial information exchange, for efficient automated processing and minimizing the need for manual intervention.

In this section we pay attention to STP inside of the CB, while the same applies to the entire banking system. The expansion of STP, especially for the case of cross-border operations, is usually hampered by incomplete compatibility of the formats of electronic banking messages used by the national banking system with formats adopted in international payment systems. For example, the international standards call for the use of BIC (or SWIFT code, or ISO 9362 code) for the identification of banks, which cannot be the case in the local financial system. Thus, the main way to ensure a high level of STP is to encourage market participants and their customers to use the international standards of financial transactions fully and correctly.

In order to increase efficiency of its operations when RTGS is not available yet, the CB may allow for payment netting, which means that, e.g. in case of rolling-over the loan the CB conducts one transaction instead of two (i.e. instead of repaying the loan and getting a new one). However this

practice is not wide-spread as it requires elaborate prudential supervision of individual banks and is not suitable for all types of market instruments.

The issue of manual and slow information processing occurs in the context of how the CB collects applications from banks. Paper applications are still not a rare case in emerging and frontier markets, though this is an archaic way of doing business worth getting rid of.

## Questionnaire

*Table 9: Checks for central bank payment system processes*

*Respondent: central bank, payment system unit*

No.	Question	Answer
i)	Is Straight Through Processing (STP) possible?	yes/no
ii)	How does the CB collect applications from banks for the main instrument? Choose all relevant, please.	
a.	paper	yes/no
b.	telephone/fax	yes/no
c.	e-mail	yes/no
d.	trading platform	yes/no
iii)	How does the CB collect applications from banks for standing facilities? Choose all relevant, please.	
a.	paper	yes/no
b.	telephone/fax	yes/no
c.	e-mail	yes/no
d.	trading platform	yes/no
iv)	Does the CB allow netting in its operations?	1/2/3/4
v)	Is there an intraday liquidity facility?	yes/no
a.	If yes, is it secured?	yes/no

## Main outcomes and recommendations

- Measures to raise the STP level, i.e. the share of transactions without manual intervention, are required (expansion of international standards usage).

## 7.2. Payment system

### Rationale

The promotion of financial and money market development can be facilitated by the integration of the national payment system into the global one and the adoption of international standards. To

connect to the global financial markets, the CB and the commercial banks all should be able to send and receive SWIFT messages.

Transactions should be processed as quickly as possible. The best practice is to have an RTGS (real-time gross settlement) system. An RTGS system ensures that the transfer of money from one bank (or financial institution) to another occurs in a “real time” and on a “gross” basis. The RTGS system often comes as an alternative to a net settlement system which handles transactions in batches, usually at the end of the day, which substantially impede money market development. The netting implies less liquidity is needed during the day but transactions only clear with a considerable lag. RTGS systems cater mostly for large value payments but the developed world is moving fast towards real time payments in retail transactions as well.

In contrast, in most developing countries, the use of cheques is still widespread. Processing payments through cheques usually requires considerable time (it may take up to 2 days to finalize settlement) and involves high costs. In this case, making the payment system more efficient should start with the setting up of an automated clearing house (ACH), which is an electronic funds-transfer system for retail payments. It is equally important to create incentives for customers and the commercial banks to use the ACH for payments instead of the cheques.

Paper certificates of government securities is another archaic peculiarity and impediment to the payment system. In this case the first task is the dematerialization of securities, which means that they are not in the form of paper certificates, but only as electronic records. The process of dematerialization should be done through the setup of a registry of securities accounts. It reduces transactions costs and shortens settlement period. Dematerialization is also essential for functioning of the CSD (see section 8.4).

The opening hours of the different payment system institutions have a bearing on the efficiency of commercial banks’ liquidity management. For example, an early closing of the RTGS system relative to the ACH or the cheque-processing system will make it impossible for commercial banks to offset the liquidity effects stemming from the transactions of their customers, especially big corporates.

## Questionnaire

*Table 10: Checks for payment system*

*Respondent: central bank, payment system unit*

No.	Question	Answer
i)	Is there an RTGS system?	yes/no
ii)	Is there a retail payment system (e.g. Automated Clearing House or ACH)?	yes/no
iii)	Is SWIFT used in international transactions?	yes/no
iv)	Is Straight Through Processing (STP) possible?	yes/no
v)	Are cheques used in payment system?	yes/no
a.	Is there an electronic cheque clearing system?	yes/no
vi)	Are securities dematerialized (no paper certificates in use)?	yes/no

vii)	Opening times of different payment system institutions:	open	close
a.	RTGS		
b.	Retail		
c.	Cheque-clearing		
d.	CSD		
viii)	Cut-off times in the RTGS	cut-off time	
a.	Cut-off time for customer transactions		
b.	Cut-off time for interbank transactions		
ix)	How much time can it take to clear transactions?	average	max
a.	Large value transactions		
b.	Retail payments		
c.	Cheque clearing		
d.	Securities settlement (days)		
e.	FX transactions		

*Table 10.1: Checks for payment system*

*Respondent: market participants*

No.	Question	Answer	
i)	Do you use SWIFT in international transactions?	yes/no	
ii)	Is your institution capable for Straight Through Processing (STP)?	yes/no	
iii)	Do you use cheques?	yes/no	
iv)	Cut-off times	cut-off time	
a.	Cut-off time for customer transactions		
b.	Cut-off time for interbank transactions		
v)	How much time can it take to clear transactions?	average	max
a.	Large value transactions		
b.	Retail payments		
c.	Cheque clearing		
d.	Securities settlement (days)		
e.	FX transactions		

### **Main outcomes and recommendations**

- If the local payment system is a non-RTGS one, introduction of RTGS is recommended;
- Dematerialization of securities along with introduction of securities accounts.

## 8. Post-trade infrastructure

The functioning of the national payment system influences operational risks in the interbank money market as well as the risks associated with the transfer of collateral. A central securities depository (CSD), which serves as a securities settlement system, gives significant benefits in terms of risk and cost reduction, especially if securities are dematerialized. The process of dematerialization should be done through the setup of a registry of securities accounts. It reduces transactions costs and shortens settlement period.

Core functions of CSDs are a) notary, related to the securities issuance process, b) central safekeeping, c) processing of corporate actions, d) settlement of securities transactions and e) collateral management, including f) pledging and repo, g) securities lending and substitutions, and h) valuations (mark-to-market) and margin calls. When securities are transferred against payment (e.g. repo deal), the delivery versus payment (DVP) service can reduce risks while facilitating quick payments. DVP ensures that the delivery of the security occurs only if the payment occurs.

If the above is not the case, then the purpose is to start developing a CSD in order to improve settlement procedures for cash and securities and, especially, shorten the settlement period. When the dematerialization of government securities is operational, the central depository system will handle the settlement of transactions between securities accounts in the registry.

In some emerging and frontier markets, there can be the problem of a “declarative” CSD, i.e. the institution declared to be the CSD does not perform all the inherent functions of a CSD. For instance, the function of collateral management may not be performed properly and no legal framework protects the interest of the pledgers and pledgees. In the absence of a proper CSD, it might be impossible to achieve DVP. The other possible challenge comes from multiple CSDs: two (or more) of them claiming to have settlement finality, which leads to confusion amongst market participants, possible fragmentation of trading or even legal uncertainty on title transfer.

Another important component of post-trade infrastructure is a central counterparty (CCP), discussed in the next section, devoted to credit risk (section 8.5).

### Questionnaire

*Table 11: Checks for post-trade infrastructure*

*Respondent: central bank, payment system unit*

No.	Question	Answer
i)	Is there a Central Securities Depository (CSD)?	yes/no
ii)	How many institutions perform CSD functions? Please, give the number	number
iii)	If there're several CSD-functioning institutions, do you deem there simultaneous functioning to be problematic/misleading for market participants?	yes/no
iv)	Is the CSD capable of DVP?	yes/no
v)	Which services from the list below does local CSD provide? Please, choose all relevant.	

a.	notary, related to the securities issuance process	yes/no
b.	central safekeeping	yes/no
c.	processing of corporate actions	yes/no
d.	settlement of securities transactions	yes/no
e.	pledging and repo	yes/no
f.	substitution and securities lending	yes/no
g.	valuations and margin calls	yes/no

*Table 11.1: Checks for post-trade infrastructure*

*Respondent: market participants*

No.	Question	Answer
i)	Is there a Central Securities Depository (CSD)?	yes/no
ii)	How many institutions perform CSD functions? Please, give the number	number
iii)	If there're several CSD-functioning institutions, do you deem there simultaneous functioning to be problematic/misleading for market participants?	yes/no
iv)	Is the CSD capable of DVP?	yes/no
v)	Is there any service that you miss from the CSD?	yes/no
a.	If yes, please specify.	text

### **Main outcomes and recommendations**

- Developing of CSD (together with securities dematerialization) is required in order to improve settlement procedures for cash and securities and shortening of the settlement period.

## **9. Credit risk**

### **Rationale**

Credit risks in the interbank money market are reflected in the size of credit limits on counterparties. Credit risk concerns amongst market participants may hinder the development of the money market. The first solution to small counterparty credit limits comes from the strong legal environment, which ensures that a secured transaction is enforceable, especially under bankruptcy. The concept of close-out netting is important here. Netting is the offsetting of multiple payments or transactions (of opposite directions), creating a single, residual value (position) and thereby reducing settlement risk. Close-out netting *"refers to a process involving termination of obligations under a contract with a defaulting party and subsequent combining of positive and negative*

*replacement values into a single net payable or receivable*<sup>8</sup>. It mainly mitigates credit risks associated with OTC derivatives. But since its concept comprises several legal notions, specific netting legislation must be enacted first to make the elements of the netting process being recognized in bankruptcy proceedings (see the section “Legal infrastructure”).

The second solution for mitigating credit risk is providing the wide opportunity of entering secured transactions, by ensuring the sufficiency of acceptable collateral. For this purpose the CB should collaborate with the Ministry of Finance on the development of the government securities market as the most trustworthy asset for pledging. Settlement risk in securities transactions can be tackled by DVP (delivery versus payment) system under which the settlement procedure ensures that delivery occurs only if payment occurs (see also section 8), i.e. assets (securities) are not delivered prior to the payment for them and vice versa. The opposite to DVP practice is the pre-settlement, when a buyer of the security has to pay for it prior, e.g. has to post cash to the seller’s account one day before the asset delivery. This clearly points to the lack of trust amongst counterparties and stipulates the necessity of introducing of DVP.

The more general, but probably the most effective in the long run, approach for addressing the issue of credit risk is to strengthen the banking system, so that the risk of counterparty bankruptcy would be considered as negligible.

One more option is to have a central counterparty in the market. The CCP, by acting as the seller to each buyer and as the buyer to each seller, ensures the future performance of open contracts by guaranteeing performance of obligations to a non-defaulting member irrespectively of how other market members perform their obligations. The advantage of dealing with CCP is that it exempts market participants from the necessity to estimate risks and set credit limits on each other and allows them to assess credit limits only on CCP. Since CCP “gather” market risks by trading with all market participants, it has to impose effective risk controls on all of them and implement advanced risk management. Moreover, a CCP has the potential to reduce market risks substantially by multilaterally netting trades. This way the CCP helps to maintain stability in the market and reduces systemic risk in the market.

But the presence of the CCP implies quite a developed and large money markets with standardized products. The benefits of risk diminution are not costless and the creation of this institution requires significant initial investment and effort. The CCP should also be permanently supervised and stress-tested by the regulator (central bank or another prudential authority). In case of inadequate risk management and problems inside the CCP, the CCP could increase systemic risk in the market. As a financial institution, the CCP can access liquidity management instruments of the central bank and get funds from the interbank market. The CCP may serve several market segments at the same time.

In general, the setting up of a CCP is not recommended for less developed economies, especially not as a first step. It is highly likely that the legal framework for the CCP is not in place and the CCP is too expensive to set up in most emerging markets and frontier countries. Therefore, setting up a

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<sup>8</sup> See <http://www.isda.org>.

CCP in these countries is not a viable option, and the abovementioned other credit risk mitigating techniques should be adopted.

It is also noteworthy that sometimes there are attempts by central banks to become a practical alternative of the CCP. In such a framework, banks are required to quote prices and make deals among themselves but in the execution phase the CB steps in and the settlement will be against the CB by both participants. This way, the CB assumes the counterparty risk. But this practice may lead to the emergence of moral hazard in the behavior of market participants, thus this approach cannot be recommended universally.

## Questionnaire

*Table 12: Checks for credit risk*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Please, estimate, the average number of counterparties for 3 biggest banks during last month	number
ii)	Please, estimate, the average number of counterparties for 10 biggest banks during last month	number
iii)	Is credit risk an obstacle to market development? Does it prohibit some market participants to trade with each other?	yes/no
iv)	Is there a Central Counterparty in the market?	yes/no
a.	Estimate the average share of transactions, conducted with its participation, in the total volume of transactions (during last year)	percent
v)	If there is no Central Counterparty in the market, is there a project under way to establish it?	yes/no
vi)	Is netting of payments possible?	yes/no
vii)	Is close-out netting (case of counterparty insolvency) available?	yes/no
viii)	Is DVP adopted?	yes/no
ix)	Is pre-settlement of securities necessary/widespread?	yes/no

*Table 12.1: Checks for credit risk*

*Respondent: market participants*

No.	Question	Answer
i)	What is the number of banks, on which your financial institution has credit limits?	number
ii)	What is the overall size of credit limits your financial institution has on others? Limits as a ratio to total assets	value
iii)	Is credit risk an obstacle to market development? Does it prohibit some market participants to trade with each other?	yes/no

a.	If yes, on which market? Please, specify.	text
iv)	Do you have counterparty credit limits for repo (or lending against a pledge of securities)?	yes/no
v)	Do you have a limit on overall repo (or lending against a pledge of securities) position?	yes/no
vi)	Do you see a Central Counterparty necessary in the market?	yes/no
vii)	Is netting of payments possible?	yes/no
viii)	Is close-out netting (case of counterparty insolvency) available?	yes/no
ix)	Is DVP adopted?	yes/no
x)	Is pre-settlement of securities necessary/widespread?	yes/no

### ***Main outcomes and recommendations***

- Credit risks are reflected in the size of credit limits on counterparties. The issue of strict and insufficient limits can be partially tackled by establishing of the CCP.

## **10. Transaction costs**

### ***Rationale***

There are many components contributing to the transaction costs in the money market but the most evident are those connected to prices of basic services: CSD, participation in RTGS and the services provided by intermediaries, i.e. brokers. High costs certainly restrain market development. In cases when trading is forced to go through securities exchange with additional commissions, banks can completely refrain from active trading. Note that transaction costs are not independent in terms of their values: they are tightly linked to the width of the interest rate corridor (see section "Central bank standing facilities") as they are alternative costs to the utilizing of SLPFs (and vice versa, SLPFs rates shape alternative costs to interbank trading).

Since the system of tariffs is usually rather complicated, the respondents are requested to estimate the transaction costs using two approaches. The first approach is give the approximate fixed and variable components of cost separately. The second approach is to estimate the size of a typical transaction and the total costs incurred for this transaction. Additional costs may appear also due to taxes imposed on money market transactions.

## Questionnaire

Table 13: Checks for transaction costs

Respondent: market participants

No.	Question	Answer
i)	Do you deem costs of transaction to be an obstruction to your participation in the market / entire market development? Please estimate as a number from 1 to 4, where 1 is almost no obstruction, and 4 is a crucial obstacle.	1/2/3/4
ii)	Are there any transaction taxes?	yes/no
iii)	Tariffs for participating in RTGS	
a.	fixed cost (in local CCY)	
b.	variable cost (percent of transaction volume)	
c.	typical transaction volume	
d.	total costs incurred by a typical transaction	
iv)	Tariffs for services of CSD	
a.	fixed cost (in local CCY)	
b.	variable cost (percent of transaction volume)	
c.	typical transaction volume	
d.	total costs incurred by a typical transaction	
v)	Tariffs for brokers' services ("voice" brokers etc.)	
a.	fixed cost (in local CCY)	
b.	variable cost (percent of transaction volume)	
c.	typical transaction volume	
d.	total costs incurred by a typical transaction	

### Main outcomes and recommendations

- It is useful to have clear view on all the transaction costs lying behind interbank money market operations, since they can be a strong obstacle on the way to active participation in the market.

## 11. Prudential regulation

### Rationale

Regulation and prudential oversight influence financial markets development, including the money market. Too tight regulation aimed at providing financial stability may become an impediment to

free resources allocation and trading. The trade-off between regulation and free market evolving is always present, so in each case all the benefits and shortcomings of changing prudential measures should be evaluated.

Any obligations for banks to hold government securities forces banks just to “buy and hold” them instead of actively trading and utilizing in the interbank market, so potential collateral is “locked”. It distorts market demand for them, making it captive, and constrains liquidity management. Captive demand for government or other high-graded securities is sometimes created by different restrictions, e.g. on financial institutions’ holding foreign assets (including outright ban).

Short-selling is a general practice in most developed markets, but in emerging markets there are often restrictions on such operations. If no significant restrictions exist, short-selling is used mainly by primary dealers and custodians (if available), i.e. big infrastructural participants. Short-selling is of special importance in the interbank repo market, where participants borrow securities to short-sell them. This type of deal is widely used for hedging purposes or to make a market and hence influential on market development.

Restrictions on credit deals with offshore entities can close the market for foreign participants. For example, foreign banks wishing to deal in the local market can be pressed out from it by such regulation or at least be subject to credit rationing and have difficulties with managing their liquidity.

A high level of dollarization can have a substantial detrimental effect on money market development. As macroeconomic stabilization being the prerequisite for reducing the level of dollarization is beyond the scope of this paper, we consider measures of prudential regulation, which could help somehow to promote the use of domestic currency. Among the basic measures are limits on open foreign currency position (for financial institutions, for non-financial corporations or for both of them), restrictions on providing FX loans to borrowers with LCY income (in other words, FX loans can be provided only to large exporters) or/and additional capital and provisioning requirements on FX loans, compared to LCY ones. This kind of regulation may support money market development in the early stages and can be removed at a later stage.

Prudential measures supporting term market are important since money market development is sustained by the stability of banking sector deposit base. Stable deposit base allows banks to rely on it as on long term funding to project liquidity needs and to participate in the money market to balance books.

## Questionnaire

*Table 14: Checks for regulation and prudential impediments/support for market development*

*Respondent: central bank, banking supervisor/regulator*

No.	Question	Answer
i)	Are there any direct obligations for banks to hold government securities?	yes/no
ii)	Short-term capital control:	

a.	Are there bans or tight restrictions on banks' holding foreign assets? If yes, please, specify	yes/no
b.	Are there bans or tight restrictions on credit deals with offshore entities? If yes, please, specify	yes (specify)/no
iii)	Is short selling allowed for banks and dealers? (1 – yes, no any restrictions, 2 – yes, but with some restrictions, 3 – no, not allowed)	1/2/3
iv)	Measures supporting de-dollarization:	
a.	Are there any limits on open foreign currency position for financial institutions? If yes, what is the allowed share of open FX position to the capital?	yes (percent) / no
b.	Are banks allowed to provide FX loans to borrowers with local currency income?	yes/no
c.	Are capital and provisioning requirements on FX loans higher than on LCY loans?	yes/no
v)	Measures supporting term market:	
a.	Are there penalties for breaking term deposits by depositors? (1 – no, penalties are absent; 2 – yes, but penalties are not significant, 3 – yes, penalties are significant)	1/2/3
vi)	Are there any direct obligations for banks to hold government securities?	yes/no
vii)	Do current banking regulations stipulate banks to manage their currency and interest rate risk? (from 1 to 4, where 1 – doesn't stipulate at all, and 4 – regulation is supportive)	1/2/3/4

*Table 14.1: Checks for regulation and prudential impediments/support for market development*

*Respondent: market participants (banks)*

No.	Question	Answer
i)	Are there any direct obligations for banks to hold government securities?	yes/no
ii)	Short-term capital control:	
a.	Are there bans or tight restrictions on banks' holding foreign assets? If yes, please, specify	yes/no
b.	Are there bans or tight restrictions on credit deals with offshore entities? If yes, please, specify	yes (specify)/no
iii)	Is short selling allowed for banks and dealers? (1 – yes, no any restrictions, 2 – yes, but with some restrictions, 3 – no, not allowed)	1/2/3
iv)	Measures supporting de-dollarization:	
a.	Are there any limits on open foreign currency position for financial institutions? If yes, what is the allowed share of open FX position to the capital?	yes (percent) / no
b.	Are banks allowed to provide FX loans to borrowers with local currency income?	yes/no

c.	Are capital and provisioning requirements on FX loans higher than on LCY loans?	yes/no
v)	Measures supporting term market:	
a.	Are there penalties for breaking term deposits by depositors? (1 – no, penalties are absent; 2 – yes, but penalties are not significant, 3 – yes, penalties are significant)	1/2/3
vi)	Are there any direct obligations for banks to hold government securities?	yes/no
vii)	Do current banking regulations stipulate you to manage your currency and interest rate risk? (from 1 to 4, where 1 – doesn't stipulate at all, and 4 – regulation is supportive)	1/2/3/4

### ***Main outcomes and recommendations***

- Prepare the list of regulation and prudential measures which could prevent banks from trading to each other with special attention to collateral holding issues;
- Assess the place and the role of foreign assets and foreign participants in the market, restrictions regarding them, and how this state of affairs relates to desired goals.

## **12. Legal infrastructure**

### ***12.1 General legal infrastructure***

#### ***Rationale***

Legal risks, originating from underdeveloped legal framework, can substantially hinder market development. These risks arise from uncertain application of laws and regulations. Money market issues rely on both appropriate specific regulation and overall quality of legal infrastructure for business. The overall quality of legal infrastructure can be measured by such proxies as procedures required for contract enforcement and bankruptcy procedures (Doing business index by the World Bank suits mostly for this purpose).

The main issues in the context of market development are settlement finality and transfer of title over assets (collateral), including transfer of full ownership. Settlement finality should precisely determine the point at which transaction is irrevocable, so legal infrastructure has to prevent unilateral revocation of deals after this point. Transfers of collateral ownership, or rights to use and dispose it also should be under clear legal regulation. Otherwise even in secured markets their participants behave as if transactions are not fully secured, which is reflected in very strict credit limits on counterparties. One possible reason for this is when local courts do not recognize financial collateral as a type of security.

One of the basic questions here is whether the national legal system includes specific laws on securities, collateral, bank resolution etc. The second "level" is whether all types of deals are regulated by these laws, because, for instance, in contract law some types of deals may be not fully described (e.g. OTC deals). In case of any problems between counterparties these deals may be

treated as illegal or unenforceable. Then, the legal infrastructure has to protect assets and positions of customers in a Central Security Depository (CSD) and Central Counterparty (CCP). All CSD's and CCP's contracts, rules and procedures are to be beyond legal dispute. The best way to achieve this is to prepare a special law regulating each of these institutions. Special attention is to be paid on the enforceability of legal regulations in the relevant jurisdiction (especially in cases of one counterparty default or insolvency). If these laws are present, but do not specify all necessary issues, then the legal uncertainty will at least partly prevail. Incompleteness of these laws may lead to invoking other laws which increases the chances of conflicts between different normative acts, aggravating the situation.

One of the ways to improve legal support of money market deals is the adoption of Global Master Repurchase Agreement (GMRA) – a model legal agreement designed for parties transacting repos – by the International Capital Market Association (ICMA). The advantage of GMRA is that it *“consists of a pre-printed master agreement that contains standard provisions, which are generic to the market and should not need further negotiation by the parties, and Annex I, which lists specific choices that need to be made by the parties”*<sup>9</sup>. Hence the use of GMRA helps to standardize the legal aspect of repo transactions and lowers uncertainty risks for counterparties.

As noted in section 8.3, the concept of close-out netting may be not recognized in national bankruptcy law proceedings, which could render the ISDA and GRMA unenforceable in case of insolvency of a counterparty. Consequently, the use of ISDA and GMRA may lose its potential advantages and appeal for the market, leading to a lack of interbank activity. If this is the case, regulatory authorities have to work on rules ensuring the enforceability of close-out netting arrangements. A law on bank insolvency conducive to interbank activity is important in many other aspects. Lengthy and complicated insolvency proceedings or legal uncertainty of any kind will lead to increased levels of perceived credit and contingent market risk and ultimately to inactivity of money market participants.

The enforceability of GMRA and ISDA documentation in the local jurisdiction should be tested by obtaining a legal opinion from a reputable local law firm and ultimately may require amendments to national laws and regulations.

Another possible source of legal weakness is uncertainty regarding the different regulators' responsibilities, e.g. overlapping regulatory roles and responsibilities between the monetary authority, the local CSD and the capital markets authority. This is often the case in frontier markets when trying to develop the local securities exchange by mandating all trading of bonds to go through the exchange. This mandate rather complicates the whole process, endowing the exchange with many functions, which could already be assigned to other infrastructural market participants. Moreover, conducting all transactions through the exchange involves additional commissions (for brokers, etc.), which could be avoided under OTC trading (see section 8.6 on transaction costs). OTC trading in turn is held back hindering the development of the entire money market.

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<sup>9</sup> <http://www.icmagroup.org>

Overlapping of the functions can be illustrated also by the example of multiple local CSDs, discussed in section 8.4. Thus cooperation between different financial authorities is crucial to provide precise rules and divide responsibilities.

Tax regime issues likewise can rise. Governments in many countries treat interest income and capital gains differently in the tax regime. In terms of money market development, this difference in taxation leads to a bias in the pricing of bonds, investors preferring high (low) coupon bonds where interest income is taxed less (more) than capital gains, making the calculation of a yield curve more cumbersome. This issue becomes important at later stages of financial market development and even then it is most likely to slow down progress rather than blocking it.

All legal rules and regulations should be publicly disclosed enabling participants to have all relevant information on fees, costs and possible outcomes of deals for understanding their risks and effective prices of interbank market trading. The absence of clarity and legal certainty will seriously hinder market development.

## Questionnaire

*Table 15: Checks for general legal infrastructure*

*Respondent: central bank, payment system unit*

No.	Question	Answer
i)	Is the sanctity of contracts ensured? (WB EoDB Enforcing Contracts, Quality of judicial processes index)	value
ii)	Is finality of payments/settlement ensured?	yes/no
iii)	Is there a law on collaterals?	yes/no
a.	Is financial collateral recognized as a type of security by local courts?	yes/no
iv)	Is there a law on securities?	yes/no
v)	Is there a law on the payment system?	yes/no
vi)	Is there a law on bankruptcy?	yes/no
a.	Is close out netting enforceable under domestic bankruptcy law?	yes/no
b.	Average time of bankruptcy procedures: WB EoDB ranking of the Ease of Doing Business index (by World Bank) on Resolving Insolvency	value
vii)	Is there a law on bank resolution?	yes/no
viii)	Is the tax treatment of interest and capital gain equal?	yes/no
ix)	Is GMRA widely adopted on the market?	yes/no
x)	Would a master repurchase agreement be legally enforceable? please evaluate from 1 to 4, where 1 is hardly legally enforceable, and 4 is legally enforceable without any obstacles	1/2/3/4
a.	If you don't choose 4, please, clarify the problems behind	

xi)	Are taxation and accounting issues clearly defined for all money market products?	yes/no
xii)	Are market participants required to publish financial accounts according to IFRS (International Financial Reporting Standards) or the local accounting standards? 1 – IFRS; 2 – local standards; 3 – both	1/2/3

*Table 15.1: Checks for general legal infrastructure*

*Respondent: market participants*

No.	Question	Answer
ix)	Is GMRA widely adopted on the market?	yes/no
x)	Would a master repurchase agreement be legally enforceable? please evaluate from 1 to 4, where 1 is hardly legally enforceable, and 4 is legally enforceable without any obstacles	1/2/3/4
a.	If you don't choose 4, please, clarify the problems behind	
xii)	Are taxation and accounting issues clearly defined for all money market products?	yes/no

### **Main outcomes and recommendations**

- Settlement finality, transfer of title over assets (collateral) and close-out netting should be ensured;
- GMRA is recommended to be adopted.

## **12.2 Legal infrastructure and accounting of derivatives**

### **Rationale**

Legal and accounting treatment of derivatives deserves a separate consideration, since in underdeveloped markets the concept of a "derivative" can be either ambiguous or completely absent in the local legislation. The lack of a proper legal definition may make the recognition and enforcement of a derivative transaction impossible.

There are deliverable and non-deliverable derivatives, depending on the nature of the final settlement. Most of the deals are of non-deliverable nature, but an inadequate regulation may treat only deliverable transactions as enforceable, since only they contain an obligation of transferring an underlying asset. On the contrary, non-deliverable derivative transactions may be recognized as wagering ones. Another issue can arise when a party of the derivative agreement is required to prove that the transaction is not for "speculation" purposes, but intended for the "real economy", e.g. hedging purposes, and thus must be linked to a corresponding "real economy" transaction. In the absence of proper regulation, the derivatives may not be regarded as such for accounting

purposes, hence the parties to the transaction may not be able to set the losses resulting from the derivative contract against the gains on the underlying instrument.

Some regulatory deficiencies can be corrected by the specialized agreements of participants in relevant markets. If the relevant local legislation is of poor quality, then unless the contract itself includes provisions for all potential issues that may emerge (quite unlikely), it can be practically impossible to solve problems on the basis of the general norms of securities law and contract law. Therefore, the participants of the derivative market must conceive an agreement that contains the most complete and detailed regulation of all possible situations that may arise. While the transactions, conducted on the exchange, contain all the essential terms of the contract due to the rules of the exchange, for the OTC transactions counterparties have to sign such an agreement. The equivalent of the GRMA for OTC derivatives transactions is the ISDA Master Agreement (ISDA MA, where ISDA stands for International Swaps and Derivatives Association).

However, similarly to the GMRA, the enforceability of the ISDA MA also depends on the existence of the concept of "close-out netting" in the national bankruptcy law. Ideally, it should be tested by a reputable local law firm, identifying the restrictions under the local regulation. Any local firms or institutions may be exposed to legal risk when dealing cross-border, because the laws of different jurisdictions can be in conflict. The ISDA MA is usually the solution for this type of conflict due to its international nature.

Accounting of derivatives is also recommended to follow international standards. Complying with IFRS is beneficial, first, due to existing already elaborated rules, second, by raising general corporate governance culture and attractiveness for foreign market participants.

## Questionnaire

*Table 16: Checks for legal infrastructure and accounting of derivatives*

*Respondent: central bank (payment system unit and regulatory unit), independent regulator*

No.	Question	Answer
i)	Are derivatives regulated under local law?	yes/no
ii)	Are specialized law provisions applicable to the purchase and sale of money market derivatives?	yes/no
iii)	Is there a local documentation, developed for money market derivatives?	yes/no
a.	If you answered "yes" above, please, specify for which market segments (FX-swap, FX-forward, IRS, OIS, IR futures, FRA, etc.).	
iv)	Are derivatives allowed for hedging purposes?	yes/no
v)	Is there a need to formally link a derivative transaction to another "real economy" transaction to show that it is for hedging purposes?	yes/no
vi)	Is there a prohibition to use derivatives for speculation purposes?	yes/no

vii)	Is there an issue with the enforceability of OTC derivative contracts in the local jurisdiction (e.g. due to the prohibition of wagering contracts or an Islamic prohibition of Maisir, etc.)?	yes/no
a.	If you answered "yes" above, please, specify what is the specific issue	
viii)	Is the treatment of financially settled transactions (i.e. which require or allow net settlement) different from physically settled ones (i.e., where the underlying product is delivered)?	yes/no
ix)	Are there mandatory risk management standards designed particularly for the OTC trading of derivatives (e.g. extra capital requirements, additional reporting, etc.)?	yes/no
x)	How are derivatives contracts traded (OTC, exchange or both)?	1/2/3
xi)	Is ISDA master agreement widely adopted on the market?	yes/no
xii)	Would the ISDA master agreement be legally enforceable with respect to netting? please evaluate from 1 to 4, where 1 is hardly legally enforceable, and 4 is legally enforceable without any obstacles	1/2/3/4
a.	If you did not choose "4" above, please, clarify the problems behind	yes/no
xiii)	Are there any issues with foreign law (mainly English and New York law) governed contracts when used for cross-border transactions into your jurisdiction (e.g. when state-owned companies are involved, etc.)?	yes/no
xiv)	Is it necessary to comply with international financial reporting standards (IFRS) for firms that use or trade derivatives?	yes/no
xv)	Is it possible to use hedge accounting (i.e. to link the accounting performance of the underlying and the hedge instruments)?	yes/no
xvi)	Is there a fair-value accounting requirement for derivatives?	yes/no
xvii)	Is there a mandatory accounting standard governing the calculation of the fair value?	yes/no
xviii)	Are there accounting differences between 'held-to-maturity', 'trading' and 'available for sale' securities?	yes/no
xix)	Is there a need for reporting all derivatives transactions?	yes/no
xx)	Is there a central trade repository (data warehouse) of all derivatives transactions, maintained by the regulator?	yes/no
xxi)	Are there available private training courses on derivatives, covering practical issues of use, accounting and risk management in a sufficient detail?	yes/no
xxiii)	Do you think that the local regulation of derivatives is satisfactory from a market development point of view for the market segments listed below?	
a.	FX swaps	1/2/3/4
b.	FX-forwards	1/2/3/4
c.	interest rate swaps (IRS, OIS)	1/2/3/4
d.	forward rate agreements (FRA)	1/2/3/4
e.	short-term interest rate futures	1/2/3/4
xxiii)	In your opinion, what are the reasons for non-existent/poor trading of money market derivatives?	1/2/3/4

a.	If "other" was selected above, please specify the reasons	
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*Table 16.1: Checks for legal infrastructure and accounting of derivatives*

*Respondent: market participants*

No.	Question	Answer
i)	Are derivatives regulated under local law?	yes/no
ii)	Is there local documentation, developed for money market derivatives (FRAs, IR futures, OIS)?	yes/no
iii)	Are specialized law provisions applicable to the purchase and sale of money market derivatives?	yes/no
iv)	Is the treatment of financially settled transactions (i.e. which require or allow net settlement) different from physically settled ones (i.e., where the underlying product is delivered)?	yes/no
v)	How are derivatives contracts traded? 1 – OTC; 2 – on the stock exchange; 3 – both	1/2/3
vi)	Is there an issue with the enforceability of OTC derivative contracts in the local jurisdiction (e.g. due to the prohibition of wagering contracts or an Islamic prohibition of Maisir)?	yes (specify) /no
vii)	Are there mandatory risk management standards designed particularly for the OTC trading of derivatives (e.g. extra capital requirements, additional reporting, etc.)?	yes/no
viii)	Are derivatives allowed for hedging purposes?	yes/no
ix)	Is there a prohibition to use derivatives for speculation purposes?	yes/no
x)	Is there a need to formally link a derivative transaction to another “real economy” transaction to show that it is for hedging purposes?	yes/no
xi)	Is ISDA master agreement widely adopted on the market?	yes/no
xii)	Would the ISDA master agreement be legally enforceable with respect to netting? please evaluate from 1 to 4, where 1 is hardly legally enforceable, and 4 is legally enforceable without any obstacles	1/2/3/4
a.	If you don't choose 4, please, clarify the problems behind	
xiii)	Are there any issues with foreign law (mainly English and New York law) governed contracts when used for cross-border transactions into your jurisdiction (e.g. when state-owned companies are involved)?	yes/no
xiv)	Is it necessary to comply with international financial reporting standards (IFRS) for firms that use or trade derivatives?	yes/no
xv)	Is it possible to use hedge accounting (i.e. to link the accounting performance of the underlying and the hedge instruments)?	yes/no
xvi)	Is there a fair-value accounting requirement for derivatives?	yes/no
xvii)	Is there a mandatory accounting standard governing the calculation of the fair value?	yes/no

xviii)	Are there accounting differences between 'held-to-maturity', 'trading' and 'available for sale' securities?	yes/no
xix)	Is there a need for reporting all derivatives transactions?	yes/no
xx)	Is there a central trade repository (data warehouse) of all derivatives transactions, maintained by the regulator?	yes/no
xxi)	Are there available private training courses on derivatives, covering practical issues of use, accounting and risk management in a sufficient detail?	yes/no
xxii)	Do you think that local regulation of derivatives is satisfactory from a market development point of view? (from 1 to 4, where 1 is absolutely non-satisfactory, and 4 is supportive for the development)	
a.	FX swaps	1/2/3/4
b.	interest rate swaps (OIS)	1/2/3/4
c.	forward rate agreements (FRA)	1/2/3/4
d.	short-term interest rate futures	1/2/3/4
xxiii)	In your opinion, what are the reasons for non-existent/poor trading of money market derivatives? 1 – underdeveloped legal infrastructure; 2 – narrow demand for essential money market instruments; 3 – lack of market participants' experience in using advanced instruments; 4 – other (please, specify)	1/2/3/4

#### **Main outcomes and recommendations**

- The concept of a "derivative" has to be properly defined and described in local legislation. Financially settled (non-deliverable) derivative transactions shouldn't be recognized as wagering ones;
- ISDA is recommended to be adopted.

### **III. The central bank's activities in the market**

Central banks are crucial for the money market: i) they are market makers of the last-resort and guarantors of solvency and trustworthiness of the market participants, and ii) they act as the market makers upholding the market activity by providing basic standards in terms of operational framework and mitigating the pricing risks.

When assessing the potential for further development of the money market, it is vital to understand how the operational framework of the CB looks like. In general, it is more conducive for market development if the CB uses instruments that give incentive to banks to trade among each other. Having an appropriately sized O/N interest rate corridor, reserve averaging over a sufficiently long period and infrequent main liquidity operations together with fine-tuning operations around

periods of large liquidity shortages or surpluses gives tremendous incentive for trading and therefore are deemed to be the desirable.

Questions about how developed is the money market and what the CB can do to foster development, depend crucially on how close is the operational framework to the one just described and what we call benchmark in the rest of the handbook. Specific properties of CB instruments reveal where exactly the potentially important changes are.

It is important to note at this point that the benchmark operational framework may be more difficult to operate by the CB than another framework. There is sometimes a trade-off between monetary policy goals and the goal of financial market development. If the CB manages liquidity very closely then it will probably be easier to achieve its interest rate target, but this will not be good for the longer-term development of the local financial market.

## 13. Central Bank counterparties

### *Rationale*

For the central bank, conducting operations in the money market, there are two ways of dealing with its counterparties. The first way is to deal directly with all market participants (with relevant exclusions) and the second is to introduce a primary dealership system. On the benefits of primary dealership system please see "Market participants" section below. The more widespread practice is to transact with all financial institutions without intermediaries.

In order to be an eligible counterparty of the CB, an institution must comply with a number of requirements. These may include financial requirements (e.g. no shortfall in required reserves (RR)), technical ones (e.g. have an account with the CB, have access to special trading system, etc.) and other eligibility conditions linked to the balance sheet or the market activity of the counterparties (e.g. volume of assets or the share in market turnover if the CB does not want to trade with small market players).

These requirements should not be too strict, as it is desirable to have as broad range of counterparties as possible the early stages of market development. Another important principle is to treat all the participants equally on the basis of clear rules, so that the transparency and non-discriminating approach would promote trust in the CB and facilitate market activity.

If the CB operations includes only deposits and (collateralized) lending, then having an account with the CB would be a natural eligibility criterion. If the CB also carries out securities auctions, then it might consider including large securities market players, e.g. large corporates or foreign investment funds, among its counterparties as well. As a rule of thumb, having distinct eligibility criteria for different operations signals more efficient market operations, which in turn is more conducive to market development.

## Questionnaire

Table 17: Checks for CB counterparties

Respondent: central bank, operational unit

No.	Question	Answer
i)	How many counterparties does the CB have for ...	
a.	the standing facilities	number
b.	main instrument	number
c.	fine-tuning instrument	number
d.	structural liquidity management operations	number
e.	FX-spot transactions	number
f.	FX-swap transactions	number
ii)	Are non-bank financial institutions or non-financial corporations allowed to participate in CB operations? If yes, choose below	yes/no
a.	non-bank financial institutions	yes/no
b.	non-financial corporations	yes/no
iii)	Does the CB engage in OTC transactions with counterparties?	yes/no
a.	If yes, does the CB ask for prices from all of its counterparties at the same time when it wants to make a deal on the market?	yes/no
c.	If not, how does the CB decide on which counterparty to deal with? (1 – The CB deals with all counterparties in turn on rotational basis, 2 – The dealers can decide which counterparty to deal with, 3 – No preset criteria or rule exists for which counterparty to choose, 4 – Other)	1/2/3/4
	If other, please specify:	text
iv)	What are the requirements for banks to participate in CB operations? Please choose all that applies from the list below:	
a.	none (except for having an account with the CB)	yes/no
b.	CB financial restrictions: like no shortfall in RR, no overdue liabilities to the	yes/no
c.	banks that meet certain criteria related to their size or market activity	yes (specify) /no
d.	banks that are participants (able to use) specified trading/payment system	yes/no
e.	other (please, specify)	yes (specify) /no
v)	Is there a primary dealer system for any of the CB's operations? If yes, choose from the list below.	yes/no
a.	main instrument	yes/no
b.	fine-tuning instrument	yes/no
c.	structural liquidity management operations	yes/no
d.	FX-spot transactions	yes/no
e.	FX-swap transactions	yes/no

Table 17.1: Checks for CB counterparties

Respondent: market participants

No.	Question	Answer
i)	Does the CB engage in OTC transactions with counterparties?	yes/no
a.	If yes, in which market? 1 - unsecured (deposit placement) 2 - secondary government securities market 2 - secondary CB-security (bill, bond, etc.) market 3 - repo (actual buy and resell) market 4 - market of secured lending against a pledge of securities 5 - FX-swap (a spot and a forward transaction done at the same time) market 6 - FX-spot market 7 - market of secured lending against FX as collateral (two parallel deposit placements in different currencies) 8 - other	1/2/3/4/5/6/7/8
b.	If yes, does the CB ask for prices from all of its counterparties at the same time when it wants to make a deal on the market?	yes/no
c.	If not, how does the CB decide on which counterparty to deal with? 1 - The CB deals with all counterparties in turn on rotational basis 2 - The dealers can decide which counterparty to deal with 3 - No preset criteria or rule exists for which counterparty to choose 4 - Other	1/2/3/4
d.	If other, please specify:	text

### Main outcomes and recommendations

- Broad range of counterparties is a goal (in case of absence of the primary dealer system);
- Rule-based operations: participants get equal treatment.

## 14. Reserve requirement

### Rationale

The parameters of mandatory minimum reserve requirements (MRR), especially its flexibility, the size of the MRR rate, the remuneration, the length of the maintenance period (MP) and whether it can be used for settlement purposes, are crucial determinants for banks' liquidity management.

In general, it is preferable that banks should only have one account at the central bank in contrast to systems where banks must have distinct accounts for maintaining required reserves and for settlements purposes. Having several accounts by banks hinders them to manage liquidity efficiently as it incurs additional costs if funds are not in use and just "hang" in the balance sheet.

Historical experience shows that changing the MRR rate too often, i.e. using it as a monetary policy tool, will lead to liquidity hoarding by banks. In modern monetary management, required reserves function only as a component of the operational liquidity management system, buffering against unexpected and substantial liquidity shocks. The MRR system may also serve prudential reasons though this purpose is also in retreat as there are usually better alternatives. Changing the MRR rate under exceptional circumstances, e.g. to offset a large negative liquidity shock, will remain an option but banks' liquidity management is hindered by frequent changes of the MRR rate.

Averaging of reserves means that banks do not have to meet the minimum required level every day, but it is sufficient to meet it on average over the whole maintenance period (MP). Averaging will stabilize money market interest rates without frequent operations by the central bank. Averaging also adds stimulus for money market activity as banks with liquidity surplus can lend to others in deficit. Averaging can be full or partial, in the latter case only some predetermined share of cash balances is allowed to vary. For example, the bank according to MRR must have 100 million of reserves, and 40 million are to be held permanently (minimum allowed balance) and other 60 million should be achieved on average during the MP. In general, full averaging is preferred as that opens more room for banks to manage their liquidity. On the other hand, there can be the case when banks are able to manage their liquidity solely by the use of averaging, and for this particular case full averaging is not supportive for interbank trading activity. Limitations on the flexibility of averaging are expected to induce the banks to utilize market opportunities more.

The CB may have to carry out fine-tuning operations on the last day(s) of the MP to help banks manage their liquidity successfully and to avoid high volatility of interbank rates during this period. Fine-tuning operations should only take into account the aggregate liquidity situation, not individual bank positions. The CB may decide not to offset the liquidity shortage/surplus if banks' own activity, e.g. speculation, is seen responsible for the specific liquidity situation.

The execution of fine-tuning operations may be guided by specific internal rules when the CB does not have a sufficiently accurate liquidity forecast. These rules serve to prevent too frequent CB intervention in the money market. Without a proper liquidity forecast the CB may tend to intervene heavily by fine-tuning operations. This is not desirable because it could crowd-out market participants and create moral hazard with banks relying on the CB and not investing in proper liquidity management. The internal rules may be linked to the interbank rate so that fine-tuning operations are triggered when the average interbank rate within a maintenance period achieves a pre-determined threshold. Such rules can assure consistency of operations across time, but should stay internal and not being disclosed to the public.

The length of the MP can vary from one to several weeks. In practice, averaging works best if the MP is around 1 month long so that it can smooth out seasonal fluctuations from salary, pension and tax payments. A shorter MP may also work fine but, in this context, the relationship (the ratio) between the length of the MP, the maturity of the main policy instrument and the timing of the CB main operation becomes more important. In an extreme case, when the main liquidity operation is longer than the MP, the operation affects most of the given MP and the next MP as well. This makes banks cautious when participating in the main operation and leads to liquidity hoarding. Having a short MP combined with a main operation positioned around the end of the MP will exacerbate

these problems. More frequent operations will ease the pain but may compromise market development. Consequently, from the perspective of the money market development, the optimal setup in most cases is seen as a MP of around 1 month length, a 1 or 2 week maturity main instrument provided once a week. With shorter MPs the frequency of operations should be higher and it becomes important that the first main operation occurs at the beginning of the MP.

The remuneration of required reserves is intended to decrease banks' costs of holding them, otherwise zero payment on these funds works like a tax on banking intermediation. At the same time paying interest on reserve balances is costly for the CB, which is an important factor in many emerging countries in the decision not to remunerate required reserves. The tax/cost depends on both the MRR rate and the interest rate level, which in itself calls for the lowering of the MRR rate as much as possible.

## Questionnaire

*Table 18: Checks for reserve requirements (RR) system*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	How many accounts does each bank have with the CB?	number
ii)	RRR	
a.	What is the RRR for LCY liabilities?	number
b.	What is the RRR for FX liabilities?	number
c.	Do the banks have to maintain the RR in LCY for all liabilities?	yes/no
d.	What is the ratio of the average daily outflow from banks' settlement account relative to the RR?	number
iii)	Is there a system of averaging?	yes/no
a.	How is the first and last day of the reserve maintenance period defined? 1 - fixed relative to a week only (e.g. every Monday or every second Wednesday, etc.) 2 - fixed relative to a month only (e.g. first day or 15th day of the month, etc.) 3 - fixed relative to both a month and week (e.g. first Wednesday or second Monday of the month, etc.)	1/2/3
b.	What is the (minimum) length of maintenance period?	number of days
c.	What is the ratio of the length of the maintenance period to the maturity of the main instrument? (number)	number
d.	Do banks average total amount of reserves or a certain share? (number from 0 to 1, where 1 means full averaging)	number
d.	Does the CB carry out operations on the last day of the maintenance period?	yes/no
iv)	Are required reserves remunerated by the CB?	

a. Reserves maintained in local currency	yes/no
b. Reserves maintained in foreign currency	yes/no

*Table 18.1: Checks for reserve requirements (RR) system*

*Respondent: market participants*

No.	Question	Answer
i)	Is the regulation of the RR ratio used as an instrument to sustain price stability or financial stability? (1 – price stability; 2 – financial stability; 3 – both; 4 – none)	1/2/3/4
ii)	What is the ratio of the average daily outflow from your bank's settlement account relative to the RR?	number
a.	Can you manage your liquidity effectively (i.e. without large excess) only using your own reserve balances and averaging and without interbank borrowing or lending?	yes/no
iii)	Does the CB carry out operations on the last day of the maintenance period?	yes/no

### **Main outcomes and recommendations**

- Banks should only have one account at the CB (merge settlement and MRR accounts);
- Introduction of reserve averaging provision;
- Introduction of fine-tuning operations on the last day(s) of the maintenance period;
- Longer (4-5 weeks) MP or more frequent main operations.

## **15. Central bank operations**

The purpose of this section is to get an overall picture of the CB policy toolbox and the characteristics of available market instruments. The focus is on details such as who initiates transactions, whether operations are multilateral or bilateral, frequency of operations and the relationship between different operations as well as the relationship between instruments and the aggregate liquidity situation.

### **15.1. Standing facilities**

#### **Rationale**

CB's corridor system is the system of interest rates around the policy rate, usually at O/N or 1-day maturity. It consists of a standing liquidity providing facility (SLPF) and a standing liquidity absorbing facility (SLAF). It reduces interest rate volatility by restraining the extreme moves in the o/n interbank rates.

Sometimes CB can have more than one level of SLPF. These levels are usually different by the opening time of the window and the collateral eligible for them: e.g. "SLPF level 1" can be for cases when first tier collateral is offered and "SLPF level 2" - when second tier collateral is offered. Such a measure should motivate market participants to hold appropriate market collateral and to use the CB special facilities only in emergency cases, as last resort.

Several levels of SLPFs can be a proper decision at the beginning of money market development process, but later on they should be replaced by one level.

Using the SLPF (often) can lead to supervisory attention and regulatory investigation, which may negatively affect a bank's perceived credit risk by other market participants. In this case, banks will be reluctant to use the SLPF and the SLPF rate will not serve as a proper upper bound for O/N market rates.

The width of the interest rate corridor is a separate issue in the context of money market development. It should depend on the volume of trades and costs of trading, since the width of the corridor determines alternative transaction costs. If transacting with the central bank has low cost compared to paying for dealers (supporting middle office etc.) and brokers, then a bank can refrain from using the interbank market.

*For example, if a bank wants to borrow 1 million USD O/N, and the difference between the market rate and SLPF rate is 50bp, then using the SLPF instead of the interbank market will cost 13.7 USD<sup>10</sup>. So in case of small trading volumes it will be optimal for the bank to use CB facilities instead of the interbank market. In case of secured market transactions (repo, FX swaps), the interest rate also has to cover the transaction costs related to the use of an exchange or CCP. The example above demonstrates not only the issue of costs but also the issue of trust. If banks do not trust each other, they will not lend at all because risk-adjusted returns are not worth it.*

If the cost of using the SLPFs is high, banks will have an incentive to trade among each other at rates close to the policy rate. However, a too wide interest rate corridor may not serve its original purpose of limiting the volatility of interbank rates. Accordingly, as far as the width of the interest rate corridor is concerned, there is always a trade-off between the market development and the monetary policy aspects and thus each case should be judged individually.

Many CBs traditionally use a corridor of +/-100bp (so the total corridor width is 200bp), though this spread could be narrow for markets with high nominal rates. In many emerging and frontier markets high rates are quite frequent, so a wider corridor may be more practical. However a width of more than 400-500bp is reckoned to be excessive under any circumstances as they do not limit interbank rates effectively. When a CB is only willing to introduce a very wide, e.g. 800-1000bp, O/N corridor then usually the issue is one of credibility as the CB does not want to foot the bill for proper liquidity absorption (i.e. the interest cost of the absorbed liquidity, sometimes called as sterilization cost) due to fiscal dominance or lack of independence.

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<sup>10</sup> Don't forget that 50bp is the annual rate, and for the O/N calculation it should be divided by 365.

The interest rate corridor is not always symmetric, though, symmetry is the most widespread practice. Some CBs choose the so-called floor system which fits for countries with permanent liquidity surplus. In this case the absorbing instrument is of the main importance. If the interbank rate is mostly in the upper part of the corridor (closer to the “ceiling” – SLPF) then it points to tensions in the functioning of the interbank market.

An asymmetric corridor is not only suitable for the floor system, but also for liquidity management in special cases. For instance, if banks hoard liquidity thus pushing the interbank rate lower than needed for monetary policy purposes, then the CB can introduce an asymmetric corridor whereby the upper part of the corridor is narrower than the lower one, i.e. the rate for SLPF is closer to the main policy rate than the SLAF rate. This kind of asymmetry creates an incentive for being short of liquidity and using the SLPF as this will be cheaper than being in surplus and using the SLAF.

The last type of SLPF is the intraday credit. Intraday credit makes interbank payments smoother by making the synchronization of payments and receipts easier. Banks do not have to hold their balances large enough to cover all expected outflows of funds as intraday credit will allow for closing any timing gaps within business hours. Intraday credit is usually free of charge.

## Questionnaire

*Table 19: Checks for CB's standing facilities (SF)*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	O/N interest rate corridor	
a.	Is there an O/N SF for providing liquidity?	yes/no
b.	Is there an O/N SF for absorbing liquidity?	yes/no
ii)	What is the instrument used for O/N liquidity provision? 1 - repo (actual buy and resell) 2 - lending against a pledge of securities 3 - FX-swap (a spot and a forward transaction done at the same time) 4 - lending against FX as collateral (two parallel deposit placements in different currencies) 5 - unsecured 6 - other	1/2/3/4/5/6
a.	if other, please specify	text
iii)	What is the instrument used for O/N liquidity absorption? 1 - reverse repo (actual buy and resell) 2 - borrowing against a pledge of securities 3 - deposit 4 - FX-swap (a spot and a forward transaction done at the same time) 5 - borrowing against FX as collateral (two parallel deposit placements in different currencies) 6 - other	1/2/3/4/5/6/7
a.	if other, please specify	text
iv)	How many tiers of SFs are there?	number

a.	If more than 1, please, specify the difference	text
v)	Are there any negative consequences for banks using SFs? (e.g. supervisory check etc.)	yes/no
vi)	What is the total width of the SF corridor (main corridor in case of levels)?	number of basis points
a.	Is the corridor symmetric?	yes/no
b.	In which part of the corridor the interbank rate was for the most time during last year? (1 – closer to “floor”, 2 – closer to “ceiling”, 3 – neither)	1/2/3
vii)	Are there intraday credits?	yes/no
a.	If yes, are they interest free?	yes/no

### ***Main outcomes and recommendations***

- Introducing/improving corridor system by adding lacking instruments with special attention to the corridor width;
- Introduction of intraday credit if it is absent.

## ***15.2. Central bank windows of operations***

### ***Rationale***

The time of CB operations influences the intraday liquidity management pattern of commercial banks, since the liquidity position of a bank can vary during the day. There are a few possible situations when timing issues can cause problems. Below, we describe two typical problems frequently encountered in frontier markets.

First, if all available normal CB’s facilities are closed before the national payment system is closed (e.g. CB’s facilities close at 5 p.m. while payment system – at 6 p.m.), then it means that unforeseen payments in the end of the day will result in market tension and will possibly force banks to preliminary hoard liquidity (or in the opposite case will bring rates down, lower than the CB’s target). The problem worsens if there is no emergency lending facility or it also closes earlier than payment system.

Second, the situation when auction results come with lag after the auction is conducted. During this time gap auction participants are in substantial uncertainty, which reduces the effectiveness of the instrument for liquidity management purpose. Consequently, if results appear not only with a lag but also in the second half of the business day, banks may have too little time to manage their position (especially if they are not in the list of auction winners).

A potential solution for mitigating these problems is the free intraday credit (see section “Central Bank as a market-maker”). However, fixing of above described time inconsistencies remains first best solution because intraday credit does not solve all the problems caused by timing gaps.

## Questionnaire

Table 20: Checks for CB windows of operations

Respondent: central bank, operational unit

No.	Question	Answer	
	Opening time for CB instruments:	open	close
i)	Time of auctions of the main liquidity management instrument (if there're several auctions per day then specify each) (open: start of the auction time; close: time of publishing the auction results)	HH:MM	HH:MM
		HH:MM	HH:MM
		HH:MM	HH:MM
a.	How many main liquidity operations are there during a reserve maintenance period?	number	
b.	On which day of the reserve maintenance period, does the CB conduct the first main liquidity operation?	number	
c.	How many days before the end of the reserve maintenance period, does the CB conduct the last main liquidity operation?	number	
d.	Did it ever happen in the last year that the result of the auction is published later than the official time?	yes/no	
e.	How often does this happen? (1 - very rarely, 2 - a few times a year, 3 - once a month on average, 4 - several times a month)	1/2/3/4	
f.	What was the biggest delay (in hours)?	number	
ii)	Time window of outright market operations	HH:MM	HH:MM
iii)	Time window of SFs	HH:MM	HH:MM
iv)	Usual time of FX-interventions (FX-spot transactions)	HH:MM	HH:MM
v)	Closing time of emergency lending facility (if available)	HH:MM	

### Main outcomes and recommendations

- The system of opening time of CB's windows and operations and opening time of the entire payment system should be well thought out, because there can be many issues stemming from time inconsistency.

### **15.3. Main instrument, key policy rate, target interest rate**

#### **Rationale**

In developed monetary policy frameworks, market operations are usually initiated by the CB, while in emerging and frontier economies market participants may sometimes act as initiators, i.e. the CB may conduct operations by request. This is usually the case if the operations are not carried out for monetary policy reasons but rather serve a different purpose, e.g. to supply (or ration) certain assets (government securities, FX, etc.) to the market. However, generally this does not support market development and CBs should strive for limiting and if possible eliminating this practice and do their operations on their own initiative based on information available to them.

Market operations may be executed multilaterally, through auctions or on exchanges, or bilaterally, over the counter (OTC). In general, the multilateral approach is preferable as it can provide equal treatment to counterparties. In some cases, when efficiency and fast execution is very important, bilateral operations may be better. Consequently, main regular (planned or expected) operations should be executed multilaterally, while bilateral transactions may be more suitable for ad hoc operations that are intended to react quickly to an unexpected liquidity shock.

In terms of market development, the more the central bank is on the market the less it helps its development. Therefore, the frequency of operations can be very revealing about the potential for market growth. The frequency of operations can vary from a few hours to several months.

If the CB uses multiple instruments with different frequencies and conditions it can be either an advantage, if they complement each other, or a drawback, if they send confusing signals or offset each other's effect, depending on many details. The main recommendation in this regard is to construct a clear and well-planned system, where each instrument has its own unique, precisely defined goal. More specifically, the CB can be advised to act as a price taker on all maturities of its operations other than the maturity of its key policy (or refinancing) rate. In addition to that, there should be no mismatch between the frequency and the maturity of the operations (for example, there is no sense in conducting one-week operations on a daily basis, or vice versa overnight operations conducted once a week are also of little efficiency).

The liquidity management framework should be consistent with the actual liquidity situation of the banking sector, i.e. if the banking sector on aggregate is under the surplus, then the CB has to apply liquidity absorbing instrument as the main one, and for the aggregate shortage – liquidity providing instrument. Otherwise it will complicate the banks' liquidity management and create confusion in the market.

The policy rate is usually the rate on the main policy instrument or a market interest rate closely monitored and targeted by the CB. In an ERT or MRT regime there may be no policy rate as the CB targets the exchange rate or the reserve money, respectively, and accepts the resulting changes in the interest rates.

As the CB moves towards an interest rate targeting framework, it becomes more important to pin down the main policy rate. Absent this, the CB will most probably find articulating its policy stance and giving signals to the market increasingly difficult.

If there are “too many” CB instruments then it may not be straightforward even for the CB to determine which one in the toolbox should be the main instrument. This can happen, for example, when the CB conducts the same type of operations at several maturities. The resulting yield curve will not reflect market expectations and may even supply arbitrage opportunities for the market participants<sup>11</sup>.

In case the CB employs as its main instrument a standing facility available continuously for its counterparties with extremely narrow O/N corridor, there would be no need for active liquidity management on the part of the CB as commercial banks can easily close their liquidity gaps with the CB any time they want. While comfortable for both commercial banks and the CB, this approach does not support money market development.

The key policy rate may not be linked directly to any CB instrument if it is only a target rate<sup>12</sup>. Targeting a market rate requires highly advanced CB liquidity management. However, it is generally not enough for promoting the development of interbank money market. If the target for the rate is achieved by frequent CB liquidity operations, e.g. operations carried out several times a day routinely, then the interbank money market will remain underdeveloped as market participants will most probably transact with the CB and not among themselves. The development of the money market assumes that banks manage their liquidity on their own, so the CB has to give them the room to do this.

## Questionnaire

*Table 21: Checks for main instrument, key policy rate, target interest rate*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Is there a main policy instrument?	yes/no
a.	If yes, is it liquidity providing or absorbing? 1 - if liquidity providing 2 - if liquidity absorbing	1/2
ii)	What is the instrument used if it is for liquidity provision? 1 - repo (actual buy and resell) 2 - lending against a pledge of securities 3 - FX-swap (a spot and a forward transaction done at the same time) 4 - lending against FX as collateral (two parallel deposit placements in different currencies) 5 - other	1/2/3/4/5
a.	if other, please specify	

<sup>11</sup> This is especially true if the CB uses fixed rates on all maturities.

<sup>12</sup> For example the Fed targets the O/N market rate (Fed funds rate) while the National Bank of Switzerland targets the 3 month CHF LIBOR rate.

iii)	What is the instrument used if it is for liquidity absorption? 1 - CB's own security (bill, bond, etc.) 2 - reverse repo (actual buy and resell) 3 - borrowing against a pledge of securities 4 - deposit 5 - FX-swap (a spot and a forward transaction done at the same time) 6 - borrowing against FX as collateral (two parallel deposit placements in different currencies) 7 - other	1/2/3/4/5/6/7
a.	if other, please specify	
iv)	Who initiates the main operation? (1 – CB, 2 – counterparties)	1/2
v)	What is the form of the main operation? (1 – auction, 2 – bilateral deal (OTC))	1/2/3
vi)	Does the CB operates the main instrument at one maturity only?	yes/no
a.	If yes, what is the maturity?	days
b.	If not, how many maturities are used?	number
vii)	Does the CB set different rates for different maturities by explicitly fixing the rates or by using a mechanism (e.g. minimum bid rates) which implicitly fixes the rates?	
viii)	How many times a week does the CB operate on the market with its main instrument?	number
ix)	Is there an official key policy rate? If yes, then choose from below	yes/no
a.	rate on the main instrument	yes/no
b.	rate on SF	yes/no
c.	target rate	yes/no
d.	other (please, specify)	
x)	Do you have a target (explicit or implicit) market rate?	yes/no

### ***Main outcomes and recommendations***

- CB market instruments may be combined in various ways and each case should be considered separately in a wider context, since the efficiency of the combination depends much on monetary policy regime, collateral availability, aggregate banking sector liquidity, infrastructural issues etc.;
- In general, too complicated system of instruments is a shortcoming, and the best decision is a clear unified system where each instrument is used for precisely defined goal;
- Try to limit opportunities for counterparties to initiate transactions;
- Review and limit the frequency of operations. Note that sometimes an increase may be recommended, e.g. if the MRR maintenance period is too short relative to the maturity of the main instrument;

- Existence of a non-market yield curve (i.e. existence of interest rates for various maturities, determined by the CB) is not recommended;
- The CB should determine its main policy instrument according to the aggregate liquidity situation, the key policy rate (if it is possible under the existing monetary policy regime) or the “target” market rate, which can be “targeted” only implicitly, as a secondary but still important indicator.

## 15.4. Fine-tuning operations

### Rationale

Fine-tuning operations are used to get rid of excessive fluctuations within the interest rate corridor. If the demand for aggregate banking sector liquidity deviates significantly from the supply, the central bank may conduct fine-tuning operations (auction-based, i.e. market operations). In practice banks use them mostly around the end of the reserve maintenance period, with the tenors not extending over the maintenance period.

### Questionnaire

Table 22: Checks for fine-tuning operations

Respondent: central bank, operational unit

No.	Question	Answer
i)	Does the CB carry out fine-tuning operations?	yes/no
a.	If yes, is it usually liquidity providing or absorbing? 1 - liquidity providing; 2 - liquidity absorbing; 3 - depends on the situation (both)	1/2/3
ii)	What is the instrument used for liquidity provision? 1 - repo (actual buy and resell) 2 - lending against a pledge of securities 3 - FX-swap (a spot and a forward transaction done at the same time) 4 - lending against FX as collateral (two parallel deposit placements in different currencies) 5 - other	1/2/3/4/5
a.	if other, please specify	
iii)	What is the instrument used for liquidity absorption? 1 - reverse repo (actual buy and resell) 2 - borrowing against a pledge of securities 3 - FX-swap (a spot and a forward transaction done at the same time) 4 - deposit 5 - lending against FX as collateral (two parallel deposit placements in different currencies) 6 - other	1/2/3/4/5/6/7
a.	if other, please specify	
iv)	Who initiates the fine-tuning operations? 1 - CB	1/2

	2 - counterparties	
v)	What is the form of the main operation? 1 - auction 2 - bilateral deal (OTC)	1/2/3
vi)	What is the maturity typically? 1 - very short-term: O/N or a few days long 2 - 1 or 2 weeks 3 - longer	1/2/3
vii)	How often does the CB carry out fine-tuning operations? 5 - every day 4 - every week, unrelated to maintenance periods 3 - a few times a month, unrelated to maintenance periods 2 - a few times a year, unrelated to maintenance periods 1 - usually around the end of the reserve maintenance period + at times of large liquidity shocks	1/2/3/4/5
viii)	Does the CB set the rates for the fine-tuning operations?	yes/no
ix)	How does the CB set the volumes for the fine-tuning operation? 1 - based on the daily liquidity forecast 2 - based on expert judgement 3 - other	1/2/3
a.	if other, please specify	

## 15.5. Structural (longer term) liquidity operations

### Rationale

Structural (longer term) liquidity operations are needed to provide or absorb banking sector liquidity over an extended time frame (more than a month, up to one year). Central bank's own securities is the most widely used instrument for absorbing structural medium-term liquidity surplus. The tool amplifies the impact of the main operations on interbank interest rates and is flexible, because if banks face liquidity deficit, they can use these securities as collateral to attract funds or just sell them on the secondary market. Under the situation of liquidity shortage, usually conduct auction-based loan-providing operations with the maturity of a few months.

It is worth noting that conducting structural liquidity operations have to rely on good forecast, while only projecting the existing trends into the future can be very misleading.

### Questionnaire

Table 23: Checks for structural (longer term) liquidity operations

Respondent: central bank, operational unit

No.	Question	Answer
i)	Does the CB carry out structural liquidity operations?	yes/no

a.	If yes, is it liquidity providing or absorbing? 1 – liquidity providing; 2 – liquidity absorbing; 3 – depends on the situation (both)	1/2/3
ii)	What is the instrument used for structural liquidity provision? 1 - repo (actual buy and resell) 2 - outright purchase of government and other securities 3 - lending against a pledge of securities 4 - FX-swap (a spot and a forward transaction done at the same time) 5 - lending against FX as collateral (two parallel deposit placements in different currencies) 6 - other	1/2/3/4/5/6
a.	if other, please specify	
iii)	What is the instrument used for liquidity absorption? 1 - Outright sale of government securities 2 - CB's own security (bill, bond, etc.) 3 - reverse repo (actual buy and resell) 4 - borrowing against a pledge of securities 5 - FX-swap (a spot and a forward transaction done at the same time) 6 - deposit 7 - lending against FX as collateral (two parallel deposit placements in different currencies) 8 - other	1/2/3/4/5/6/7/8
a.	if other, please specify	
iv)	Who initiates the structural liquidity operations? 1 – CB, 2 – counterparties	1/2
v)	What is the form of the structural liquidity operation? 1 – auction, 2 – bilateral deal (OTC)	1/2
vi)	What is the maturity typically? 1 - up to 2 weeks 2 - up to 1 month 3 - 2 to 3 months 4 - longer	1/2/3/4
vii)	How often does the CB carry out structural liquidity operations? 1 - every day 2 - every week 3 - every 2 weeks 4 - every month 5 - every quarter 6 - rarely, max a few times a year	1/2/3/4/5/6
viii)	Does the CB set the rates for the structural liquidity operations?	yes/no
ix)	How does the CB set the volumes for the structural liquidity operation? 1 - based on the liquidity forecast 2 - pre-set amounts from monetary program 3 - based on expert judgement 4 - relative to previous auction size 5 - other	1/2/3/4/5
a.	if other, please specify	
x)	Does the government issue securities for the sole purpose of liquidity management?	yes/no

a.	if yes, do market participants know which auction is for liquidity management purposes?	yes/no
b.	If yes, what is the size of the outstanding govt securities issued for liquidity management purposes?	number
c.	Is there any conflict between the CB and the government regarding the issue of gov't securities for liquidity management purposes?	yes/no
d.	Is there an official debt limit for the government?	yes/no
e.	If yes what is the difference between the debt limit and actual debt? (in percentage of the GDP)	number

## 16. Aggregate banking sector liquidity

### *Rationale*

The CB can manage liquidity and influence the market interest rates regardless whether the banking sector as a whole is in situation of liquidity surplus or deficit. When facing a liquidity deficit, commercial banks probably put larger emphasis on liquidity management to avoid frequent use of SLPF or any other CB emergency credit line, which is more beneficial for market development. Moreover, in situation of liquidity surplus, CBs are often unwilling to absorb all excess liquidity, which leads to both a downward push on market rates and a lack of incentive for banks to trade, thereby being negative from both monetary policy and market development aspects. Unwillingness is usually driven by misunderstanding of origins of liquidity surplus (previous CB operations) or concerns about costs of sterilization or both.

Liquidity deficit is the situation when banks cannot meet the imposed minimum reserve requirements without liquidity provision by the CB. Consequently, banks usually do not have significant excess reserves in this case. Liquidity surplus is the situation when banks have ample reserves to meet the imposed minimum reserve requirements even in the absence of additional CB liquidity provision. It is this situation when problems with CB liquidity management or forecasting may lead to (operational) excess liquidity, i.e. banks regularly maintaining higher reserve balances than necessary for fulfilling the MRR.

Such situations can be remedied by improving liquidity forecasting capacities and liquidity management operations in the CB. For this, it is important to understand what the main drivers of liquidity are and where the largest liquidity shocks come from.

What is usually called liquidity (or demand for liquidity) is commercial banks' current accounts with the CB (required and excess reserves). The supply of liquidity is formed by all other items in the CB's balance sheet.

Stylized CB's balance sheet

Assets	Liabilities
International (FX) reserves	Cash in circulation
CB Portfolio of gov't securities	Government's account
Loans to banks (Lending facility)	<b>Banks' settlement accounts</b>
Other assets	<b>Reserve requirements</b>
	<b>Excess reserves</b>
	Deposit facility
	Other liabilities
	Capital
Total Assets =	= Total Liabilities and Capital

Thus, the change of liquidity (CA – correspondent accounts) is:

$$\Delta CA = \Delta AF + \Delta CBO, \text{ where}$$

*AF* – autonomous factors of liquidity:

$$\Delta AF = \Delta \text{FX reserves} + \Delta \text{Government's account} + \Delta \text{Cash in circulation} + \Delta \text{Other factors}$$

*ΔCBO* – central bank's liquidity providing and absorbing operations (including SLPFs).

The main autonomous factors are usually those already pointed: FX reserves, Government's account and cash while others are usually minor, however in some cases other factors can also contribute substantially. For instance, if the CB changes the RRR, e.g. raises it, the instantaneous effect of this measure is that banks will need more reserves (liquidity) to meet new requirements.

According to the formula above, the necessary data on contributions of different factors to the total banks' liquidity can be calculated on the basis of balance sheet, but for proper liquidity management the data should be more frequent (daily or weekly) and in terms of all balance sheet items' operations, e.g. CB interventions in the domestic FX market, which corresponds to *ΔFX reserves* in *ΔAF*.

The Treasury of the Ministry of Finance provides or absorbs liquidity in three main ways, assuming that it has its accounts with the CB. Provision of liquidity is conducted by executing budget spending, reducing local borrowings and placing deposits with commercial banks. Absorbing of liquidity takes place through the channel of opposite operations: budget revenues, issuing of the new domestic debt or returning deposits from banking system.

The situation is more complicated if the Treasury does not have a single account in the CB only, but instead also has accounts at commercial banks. This hampers liquidity management by the CB. When Treasury conducts its payments via its non-CB accounts, funds are redistributed between banks' correspondent accounts, i.e. inside of one item of the balance sheet (while Gov't account in

CB can stay unchanged). It can cause, for example, liquidity surplus for few banks and liquidity deficit for all others. If the interbank market does not function well, this in turn could lead to tension in the market. Therefore, the Treasury must provide up-to-date information on its operations to the CB. However, establishment of a single account in the CB remains preferable. If the Treasury already has a single account (or the most of its funds is in the CB's account), then there is an opportunity of placing temporarily free budget funds to commercial banks' deposits (this requires close interaction and coordination of actions between Treasury and the CB).

Provision of information from the Treasury should be well-coordinated. Best practice is to have a platform for regular communication between the Treasury and the monetary authority, including a daily low level informal communication channel. Good cooperation between these two institutions stands for better liquidity management and improved debt management practices that are conducive for market development.

## Questionnaire

*Table 24: Checks for aggregate liquidity situation*

*Respondent: central bank, operational unit*

No.	Question	Answer			
		last available date (T)	the month before (T-1)	the year before (T-12)	coefficient of variation of the component (during last 3 months)
i)	Estimate contributions of the following components to the CB balance for the given periods (in percent)				
a.	Liabilities: Government account with the CB / Total CB balance value	value	value	value	value
b.	Liabilities: Cash in circulation / Total CB balance value	value	value	value	value
c.	Liabilities: Banks' settlement accounts with the CB / Total CB balance value	value	value	value	value
d.	Assets: Gross International Reserves / Total CB balance value	value	value	value	value
e.	Assets: CB's outstanding credit to financial sector / Total CB balance value	value	value	value	value
f.	Assets: CB portfolio of gov't securities / Total CB balance value	value	value	value	value
ii)	Does Government have accounts in commercial banks (besides the account in the CB)?	yes/no			
a.	If there are gov't accounts in banks, is there any rule which only allows the government to spend from its CB account?	yes/no			
b.	If there are gov't accounts in banks, is there any rule which requires shifting government funds from commercial banks to the CB after some time?	yes/no			
c.	If there is a rule for shifting the funds, what is the deadline?	1/2/3			

	1 – by COB; 2 – by COB next day; 3 – later (COB = close of business day)	
iii)	If no, is there a single treasury account in the CB?	yes/no
iv)	Is there a practice to auction/place the Treasury's free funds to commercial banks?	yes/no
v)	How would you describe the liquidity situation now? 1 - Structural deficit of liquidity 2 - Structural surplus of liquidity 3 - There are shifts from deficit/surplus to surplus/deficit	1/2/3
vi)	How do you estimate the liquidity situation for the last year? 1 - Structural deficit of liquidity 2 - Structural surplus of liquidity 3 - There are shifts from deficit/surplus to surplus/deficit	1/2/3

Structural liquidity position: CB liabilities to the banking sector – CB claims on the banking sector; negative value means liquidity deficit, positive value means liquidity surplus.

Dynamics of the CB balance sheet's main components is required (highest available frequency).

*Table 24.1: Checks for aggregate liquidity situation for banks*

*Respondent: market participants*

No.	Question	Answer
i)	Does Government have accounts in your bank (besides the account in the CB)?	yes/no
a.	If there are govt accounts in banks, is there any rule which only allows the government to spend from its CB account?	yes/no
b.	If there are govt accounts in banks, is there any rule which requires shifting government funds from commercial banks to the CB after some time?	yes/no
c.	If there is a rule for shifting the funds, what is the deadline? 1 – by COB; 2 – by COB next day; 3 – later (COB = close of business day)	1/2/3
ii)	How would you describe your bank's liquidity situation now? 1 - aggregate liquidity shortage 2 - excess liquidity on aggregate 3 - there are shifts from deficit/surplus to surplus/deficit	1/2/3
iii)	How would you describe the aggregate liquidity situation now? 1 - aggregate liquidity shortage 2 - excess liquidity on aggregate 3 - there are shifts from deficit/surplus to surplus/deficit	1/2/3
iv)	How would you describe your bank's liquidity situation for the last year? 1 - aggregate liquidity shortage 2 - excess liquidity on aggregate 3 - there are shifts from deficit/surplus to surplus/deficit	1/2/3

v)	How do you estimate the liquidity situation for the last year? 1 - aggregate liquidity shortage 2 - excess liquidity on aggregate 3 - there are shifts from deficit/surplus to surplus/deficit	1/2/3
vi)	Do you find the CB's liquidity management operations appropriate/effective?	yes/no
a.	If not, please, specify your reasons.	text
vii)	Does it happen that both the O/N liquidity providing and absorbing instruments are used at the same time by the banking sector?	yes/no
a.	If yes, how often? 1 - only a few times a year 2 - close to once per month 3 - several times a month	1/2/3
viii)	How often do you use the CB's standing facilities? 1 - never 2 - only a few times a year 3 - almost every month 4 - several times a month 5 - several times a week	1/2/3/4/5

### **Main outcomes and recommendations**

- Aggregate liquidity deficit and aggregate liquidity surplus often generate quite different challenges for liquidity management by the CB, so this information (as the information on the main reasons for deficit/surplus) is necessary for formulation of reform agenda;
- Following the statistics of banking sector liquidity is a primary task in terms of liquidity management and money market development.

## **17. Collateral in CB operations**

### **Rationale**

CB credit operations require collateral and hence collateral management is a task for both the CB and market participants. CB from its side should provide publicly available list of eligible collateral. The existence of several lists, different by operations, is usually not a good practice as it produces operational heterogeneity and lack of transparency. Collateral lists are however allowed to be different in terms of asset classes: marketable and non-marketable assets.

Marketable assets are financial instruments which can be bought and sold without any significant restrictions. Marketable assets can be classified by type of issuer. The first distinction is between state and non-state securities. Government securities are the most conventional type due to their low risk, but in some economies their availability is very limited due to fiscal surpluses or just underdeveloped government bonds market. Thus, restrictions originating from gov't securities market may become an obstacle to the development of money market and call for the use of a wider range of assets that could serve as collateral. At the same time the CB should advocate the

development of primary and secondary government securities markets to the government (Ministry of Finance or its equivalent).

Another type of state securities are bonds issued by state-owned companies. Non-state collateral instruments include those issued by corporate sector and non-bank financial institutions. Then, FX assets are also sometimes included in the list, but this measure may require additional regulation (or deregulation) under controls on capital flows.

Even a wider range of eligible collateral may prove insufficient sometimes to guarantee access for all counterparties to refinancing. One way to solve this is including shares into the collateral list. An alternative solution is to use non-marketable assets, credit claims and deposits from eligible counterparties (plus non-marketable retail mortgage backed debt instruments, if available). But the CB has to be aware of risks associated with the wide use of non-marketable collateral: acceptance of it in large scale can undermine incentives for banks to prudently manage their liquidity risks and hold collateral of higher quality. The CB can restrict the use of a broader collateral list.

Any security included in the collateral list should have its own fixed haircut rate, calculated according to the level of acceptable market risk in order to sufficiently cover it.

## Questionnaire

*Table 25: Checks for collateral in CB operations*

*Respondent: central bank, operational unit*

No.	Question	Answer
i)	Is there a publicly available list of eligible collateral?	yes/no
ii)	Is there one or more collateral lists for operations? Please, give number of lists	number
iii)	For marketable collateral: which collateral by type of issuer is eligible	
a.	Government	yes/no
b.	State companies	yes/no
c.	Corporate sector	yes/no
d.	Non-bank financial institutions	yes/no
e.	FX assets (issued by supranational organizations, foreign governments, foreign corporates)	yes/no
f.	Other, e.g. gold, FX cash. Please specify	text
iv)	Are shares accepted as collateral?	yes/no
v)	For non-marketable collateral: is it utilized?	yes/no
a.	For which operations is it utilized? Please, specify	text
v)	Does the CB use the system of haircuts?	yes/no
v)	Is there a publicly available list of haircuts?	yes/no

vii)	How do you estimate the sufficiency of collateral (gov't securities) available on the market, i.e. if it's enough for active interbank trading or no (from 1 to 4, where 1 is absolutely insufficient, shallow market for collateral assets, and 4 is fully sufficient)	1/2/3/4
a.	<b>Give data for</b>	
	- volume of outstanding government securities	number
	- monthly gov't securities market turnover	number
	- banking sector's unencumbered government securities	number
	- banking sector's unsecured funding with maturity less than 31 days (average over the last year)	number
viii)	Does the CB collaborate with the government on issues regarding the development of primary and secondary markets of gov't securities (regularity of auctions, volumes of issuance, maturities)?	yes/no

### **Main outcomes and recommendations**

- The basic recommendation is to have single collateral list, consisting of two asset classes (if these two are used: marketable and non-marketable collateral). The list should be based on the evaluation of price risks, so include haircuts for each type of eligible assets;
- Non-marketable collateral is to be used in cases when there is a lack of marketable assets or for emergency refinancing operations;
- Collaboration between CB and Ministry of Finance on developing of government securities market is required, especially when local government securities market is shallow.

## **18. Information for regulators**

### **Rationale**

In order to be able to address any emerging challenges the CB must have relevant information and statistics, the same applies to the money market. The ordered, structured database of interbank deals on transaction basis is of great importance. The information should be collected regularly and for all market participants, to avoid the appearance of blind spots. These data is useful to spot irregular activities in the market. The CB can collect market data entirely by itself or use the data, provided by the exchange (in the latter case data on OTC deals should be gathered additionally).

Daily data on all major items that affect bank sector liquidity should also be collected. Most of these are easily accessible to the CB as they are part of its balance sheet. However, data on government cash-flow operations are needed in more detail than available from the CB systems, which calls for good cooperation between the government and the CB at the operational level.

One of the main applications for the database on liquidity factors is liquidity forecasting. If the CB conducts market operations daily, then the forecast is necessary to be prepared on a daily basis. The forecast horizon is advised to be as long as possible, because it allows the CB to think

strategically on potential future issues and start solving them today or, on the contrary, prevent the CB from wrong actions. For instance, to forecast liquidity till the year end enables CB to track the impact of seasonality in government operations and changes in monetary base. The forecasts are also to be stored as they will help to assess forecast errors and, as a result, improve the forecast further.

## Questionnaire

*Table 26: Checks for information available for regulators*

*Respondent: central bank, operational unit/monetary policy unit*

No.	Question	Answer
i)	Does the CB have an ordered database of interbank deals?	yes/no
a.	Does the CB collect the information on transaction basis?	yes/no
b.	Does the CB collect the information on a daily basis? If no, put the frequency	yes/frequency
c.	Do all banks provide this information?	yes/no
d.	Is this information processed to reveal market segmentation (i.e. to understand if there're groups of banks trading only between each other)?	yes/no
ii)	Does CB collect daily information from banks on their expected liquidity position on the current day?	yes/no
iii)	Does the CB prepares the liquidity forecast on a daily basis? If no, put the frequency	yes/frequency
a.	If no, please put a frequency	days
b.	Does the CB has any model for forecasting the path of autonomous factors of liquidity?	yes/no
c.	Does the CB receive detailed historical information from Treasury on its operations?	yes/no
d.	Does the CB receive from Treasury forecast on its operations?	yes/no
e.	What is the horizon of liquidity forecast? 1 – less than 1 week; 2 – up to 1 month; 3 – up to 3 months; 4 – more than 3 months	1/2/3/4

## Main outcomes and recommendations

- Structured and ordered database on the transaction basis is necessary for understanding and analyzing the processes in the money market;
- Liquidity forecasting on the basis of models has to be introduced in case of absence.

## 19. Communication

### Rationale

The CB communication strategy in the field of money market development and the exchange of information with the market participants should include activities aimed at raising the confidence and trust in the local banking system and promoting interbank trading. The clarity and transparency of rules and procedures can substantially facilitate trading. Communication regarding monetary policy decisions likewise matters in the context of money market given the importance of the predictability of the interest rate path for market participants.

On early stages of market development, banks may have difficulties in liquidity management and may require educational support from the CB. Informational and analytical materials explaining the fundamentals and factors behind changes in liquidity are important in this context. Published liquidity forecasts may be useful and limit banks uncertainty regarding future operations.

Communication should be two-way, not only from the CB towards the banks, but also in reverse so that the CB could get feedback on its actions and their potential effect on the market. Conducting surveys and organizing professional workshops are among available ways of efficient communication.

Daily interaction and the speed and convenience of which are also important issues. The CB should devote resources to set up a market intelligence function, which provides timely information on the market situation and possible early warning on irregularities or impending financial troubles.

### Questionnaire

*Table 27: Checks for exchange of information*

*Respondent: central bank, operational unit/monetary policy unit*

No.	Question	Answer
i)	Is there a publicly available regulation on the system of reserve requirements? 1 – yes, detailed description; 2 – yes, short description; 3 – no	1/2/3
ii)	Are there publicly available regulations on the instruments? 1 – yes, detailed description on all instruments; 2 – yes, short text on all instruments or detailed description of most instruments; 3 – yes, short text on the majority of instruments or detailed description of a few instruments; 4 – not available	1/2/3/4
iii)	Does the CB publish any materials regarding liquidity situation?	
a.	Does the CB publish information on correspondent account balances of credit institutions with the CB on a daily basis? <b>Answer options for a.-e.</b> 1 – yes, this is available for public access 2 – the information is provided to market participants only, on a regular basis 3 – the information is provided to market participants only, unregularly 4 – no	1/2/3/4

b.	Is the description of liquidity factors available?	1/2/3/4
c.	Does the CB publish historical dynamics of liquidity factors?	1/2/3/4
d.	Does the CB publish liquidity forecast?	1/2/3/4
e.	Does the CB publish any analytical reports on money market?	1/2/3/4
iv)	Does the CB conduct surveys for market participants regarding their view of market situation?	yes/no
v)	Does the CB publish the schedule of forthcoming monetary policy meetings?	yes/no
vi)	Does the CB publish minutes of monetary policy meetings?	yes/no
vii)	What is the main channel of communication of the CB (choose from list)?	
a.	Email	yes/no
b.	Web-page	yes/no
c.	Phone	yes/no
d.	Post	yes/no
e.	Messages over trading system (Bloomberg, Reuters)	yes/no

*Table 27.1: Checks for exchange of information*

*Respondent: market participants*

No.	Question	Answer
viii)	Do you see the CB communication policy as sufficient and effective in terms of allowing banks to forecast liquidity and interbank interest rates? (from 1 to 4, where 1 is absolutely insufficient, and 4 is quite sufficient for proper liquidity management)	1/2/3/4

### **Main outcomes and recommendations**

- CB is advised to provide publicly available regulations on its instruments and facilities and to publish information on aggregate liquidity and functioning of the interbank market, which could be useful for commercial banks managing their own liquidity;
- CB is advised to receive feedback from commercial banks on money market issues from time to time by means of conducting surveys or other forms of sharing opinions: workshops, professional community conferences etc.;
- Set up a market intelligence function.
-

## IV. Resources

### 20. Human resources

The money market is operated by humans; decisions on investing or borrowing on the money market, making of actual transactions, analysis of market opportunities or of the liquidity situation is all done by the staff employed by financial institutions. Therefore, the number and quality of human resources determine the level of sophistication of the money market. It is equally important what HR capacities are available in the CB as in other market participants.

#### 20.1. CB human resources

##### *Rationale*

As the CB is a major participant in the money market and has the potential to catalyze or actively push forward money market development, the level and quality of staff devoted to these tasks are extremely important for the success of any money market development strategy.

The starting point for a meaningful market presence of the CB is to have a separate Treasury unit which integrates all staff used for conducting market operations or for monetary operations with the CB counterparties. This allows for streamlining operations and accumulating and sharing market information and experience within one unit which will lead to higher efficiency and more market impact.

Especially in the early stages of development, having dedicated staff (unit) for analysis of the liquidity situation, effects of CB instruments on market participants and market pricing or issues about money market development itself, is absolutely crucial. This staff should optimally be highly trained (at least have an MA from a reputable university) and experienced in financial market issues (previous work experience in market operations, participation in trainings offered by CBs with developed markets or international organization). To the extent that these requirements are lacking there is a clear way how to improve money markets.

##### *Questionnaire*

*Table 28: Checks for CB human resources for money market development*

*Respondent: central bank, operational unit/monetary policy unit*

No.	Question	Answer
i)	Is there an integrated Treasury unit managing all market transactions of the CB?	yes/no
a.	if yes: how many staff is employed in the Treasury?	number

b.	if not: how many units are involved in conducting transactions with market participants and counterparties?	number
c.	if yes: is the treasury a profit center?	yes/no
ii)	Is there a dedicated unit or staff in the CB responsible for ... (please, mark available)	
a.	... collecting market data, e.g. data on trades, reports from banks	yes/no
b.	... analyzing market data	yes/no
c.	... analyzing the actual liquidity situation	yes/no
d.	... liquidity forecasting and maintaining the underlying model	yes/no
e.	... preparing analytical materials money market development	yes/no
f.	... preparing decision support materials for market operations	yes/no
g.	Total number of people involved	number
h.	Full time equivalent (FTE)	value
iii)	Do you evaluate the regular (daily) decision-making procedure on CB's operations as rule-based and convenient for all its participants?	yes/no

### **Main outcomes and recommendations**

- Human resources are crucial for speeding-up of the market development process. The best way is to have a separate unit responsible for liquidity management and money market issues;
- Trainings for people involved are required if the money market is on early stages of its development;
- If the decision-making process (for corresponding issues) suffers from significant imperfections, then it should be reformed: hierarchy in decision-making, strict rules and clear procedures.

## **20.2. Market human resources**

### **Rationale**

Educational level and human capital, involved in liquidity management in commercial banks and non-bank market participants also matters in terms of money market development. This concerns especially employees of the treasuries and asset-liability management (ALM) units, which are both in charge of managing liquidity and collaborate in related issues. The treasury is responsible for daily operations and short-term funding, while the ALM is for longer-term management of assets and liabilities. There are several traditional indicators which could inform about human capital: education, experience, trainings, special courses, publications, membership in professional societies etc. One of the most objective indicator of professional skills is to what extent the staff managed

to obtain international certifications (ACI, CFA). Market participants are expected to answer these questions regarding their staff.

The CB will possibly be required to provide some trainings for people from commercial banks on liquidity management and money market operations. Though all the participants are expected to benefit from such trainings, it can be non-beneficial for each entity to start trainings and to teach staff on their own, especially within the underdeveloped market framework. Hence the CB should act as an initiator, engaging with relevant industry representative bodies to ensure proper training at all disciplines and levels in the market.

## Questionnaire

*Table 29: Checks for HR capacities on the market for money market development*

*Respondent: market participants*

No.	Question	Answer
i)	Staff level in the institution	number
ii)	Staff level in Treasury	number
a.	How many from the staff have foreign experience?	number
b.	How many from the staff have relevant professional certificates (e.g. ACI dealing or treasury certificate, etc.)	number
c.	How many from the staff have already traded repo, FX swaps, other money market instruments?	number
ii)	How many market desks are within the Treasury?	number
a.	Which market segments have distinct desks?	list
iii)	Is there an ALM function/unit?	yes/no
a.	Staff in ALM	number
b.	How many from the staff have foreign experience?	number
c.	How many from the staff have work experience in market operations?	number
d.	How many from the staff have experience in managing collateral calls?	number
iv)	Is the financial market institution a member in a relevant professional society, e.g. a local or international banking association, etc.	yes/no
v)	Is there a dedicated association for local treasury staff and financial market experts?	yes/no
vi)	Is there a local forum for networking between treasury staff and financial market experts of different institutions and for discussion of issues related to the money market?	yes/no

### Main outcomes and recommendations

- Staff human capital in Treasuries and ALM units in commercial banks matters for general market development. The CB may be required to conduct trainings and prepare special courses for the relevant staff.

## 21. Information technology support

### Rationale

Efficient execution of money market operations is impossible without flawless IT solutions. Using dedicated software or IT solutions for dealing and for the documentations and risk management of transactions is a must. For dealing the most commonly used platforms are Bloomberg and Reuters. The widespread adoption of professional trading platforms enhances market transparency. In addition, there are dedicated software systems for treasury procedures that enable the smooth functioning of and coordination between the front-, mid and back-offices.

One particular issue for smaller markets typically is the cost of Bloomberg and Reuters systems. For this reason a number of countries have introduced their own trading platforms (usually central bank owned) for trades with the CB, MOF and for interbank trades, which is a useful for market development practice. These development projects are usually carried out by a vendor winning the contract. A particular issue worth emphasizing is how additional development and extension of the system is regulated by the contract. The client should be able to introduce new financial instruments into the system and to design new queries on the existing data without extra costs.

In some countries the physical infrastructure also poses challenges, including the speed of servers, the availability of broadband internet or continuous power supply. Proper treasury performance assumes appropriate hardware and power generation solutions that can ensure uninterrupted operations.

### Questionnaire

Table 30: Checks for IT supporting money market operations

Respondent: central bank, operational unit; market participants

No.	Question	Answer
i)	Does your institution use a professional trading platform (e.g. Bloomberg or Reuters Dealing)?	yes/no
a.	How many terminals/licenses does the treasury have?	number
ii)	Does your institution use a professional treasury systems software?	yes/no
a.	Which treasury systems software do you use?	
iii)	Is there a local trading platform in the market?	yes/no
a.	If yes, please specify	specify

iv)	How often do you experience power outages?	number
v)	Is internet available at every work desk?	yes/no
a.	Estimate the internet connection reliability	number

***Main outcomes and recommendations***

- Broadband internet connection;
- Using of professional software and contemporary IT.