

**FOR
INFORMATION**

FO/DIS/20/117

May 21, 2020

To: Members of the Executive Board

From: The Secretary

Subject: **Republic of Belarus—Technical Assistance Report—Enhancing Monetary Policy Modeling Capacity, Monetary Policy Implementation, and the Forecasting and Policy Analysis System**

Board Action: Executive Directors' **information**

Publication: Yes, after Friday, May 29, 2020

Questions: Ms. Marina, MCM (ext. 34850)

INTERNATIONAL MONETARY FUND

Monetary and Capital Markets Department



REPUBLIC OF BELARUS

ENHANCING MONETARY POLICY MODELING CAPACITY, MONETARY POLICY IMPLEMENTATION, AND THE FORECASTING AND POLICY ANALYSIS SYSTEM

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May 2020

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GLOSSARY

ARIMA	Auto-regressive Integrated Moving Average
BOP	Balance of Payment
BPS	Basis Points
FPAS	Forecasting and Policy Analysis System
FT	Forecasting Team
FX	Foreign Exchange
IMF	International Monetary Fund
IT	Inflation Targeting
MCM	Monetary and Capital Markets
MPEAD	Monetary Policy and Economic Analysis Directorate
NBRB	National Bank of the Republic of Belarus
NTF	Near Term Forecasting
RMP	Reserve Maintenance Period
QPM	Quarterly Projection Model
SIDA	Swedish International Development Cooperation Agency
TA	Technical Assistance

PREFACE

At the request of the National Bank of the Republic of Belarus (NBRB), a follow-up MCM TA (Technical Assistance) mission comprising Mr. Nils Maehle (IMF, MCM Department) and Mr. Karel Musil (external expert, Czech National Bank) visited Minsk during November 11–20, 2019, to help the NBRB further enhancing its modeling; forecasting and policy-analysis capacity; and the forecasting and policy analysis system. The mission (i) assessed the progress made with the help of the earlier eight missions and two in-country customized training events during the first phase of this “Building Capacity in Monetary Policy Modeling and Analysis” project funded by the Swedish International Development Cooperation Agency (SIDA) to help the NBRB with enhancing its medium-term inflation forecasting and policy analysis and related tools and integrated them into the policy making process, and to assist with the planned transitioning to inflation targeting; (ii) initiated the second phase of the project that will last until end-2020 and focus more on improving the sectoral analysis and the near-term forecasting (NTF) tools; (iii) assessed the internal and external communication; (v) discussed how to further enhance the foreign exchange intervention framework; and (iv) discussed the improvements made and NBRB’s further plans for enhancing liquidity forecasting and interbank money market operations to ensure that short-term market interest rates are well aligned with the policy rate.

The mission team met with Mr. Dmitry Kalechits, Deputy Chairman of the NBRB; Mr. Dmitry Murin, Head of the Monetary Policy and Economic Analysis Directorate (MPEAD); Mr. Zhanna Snopkova, Head of the Forecasting Department of the MPEAD; Mr. Andrey Golodushko, Head of Strategic Development and Cooperation with International Financial Institutions Department; Ms. Natalia Mironchik, Head of the Research Department; Mr. Denis Goregliad, Head of Financial Markets Operations Directorate (FMOD); Mr. Dmitry Ostanin; Head of Domestic Foreign Exchange Market Department of the FMOD; Mr. Dmitry Vanitskiy, Head of Liquidity Regulation Department of the FMOD; Mr. Sergey Salak, Deputy head of Information and Public Relations Department; and other senior officials and staff of the NBRB.

The mission would like to express its appreciation to the management and staff of the NBRB and to Ms. Julia Lyskova at the IMF Office in Belarus for her assistance during the mission.

EXECUTIVE SUMMARY

The NBRB has made substantial progress in improving its forecasting and policy analysis system (FPAS) and integrating it into monetary policy decision-making. The FPAS, and the model-based forecasts and policy analysis, is now well integrated into the policy-making process. Staff are well trained and have become experienced in using the tools developed for policy analysis and forecasting. The forecasting and decision-making process is well structured and has helped increase the two-way interaction between staff and the NBRB board—additional and less formal interaction between staff and board members in between the formal meetings may help enhance the process further.

NBRB's internal communication also has been much improved. The internal board presentations reviewed were well focused and technically solid, with a reasonably clear story line. However, they continue to present the medium-term forecasts as a fairly mechanical extrapolation of current developments instead of, as they are, driven by the monetary policy stance needed to achieve the policy objective. The external monetary policy statements suffered from the same weakness. They could also benefit from some streamlining and sharper focus on the key message and a simplification of the language used so that the intended message can be more easily understood by the press and the general non-expert audience.

The de facto monetary policy framework is already close to inflation targeting (IT), or what often is referred to as IT lite. The framework suffers however, from three main weaknesses: (i) the inflation target is revised annually; (ii) the target is not continuous but for the end-of-year inflation rate; and (iii) the target is set as a ceiling (the current target is to keep inflation below 5 percent at end-2019) while technically treated as a point target, which leaves the NBRB with no buffer against unpredictable shocks to inflation that it might be too late for policy to address or that might require a too aggressive policy adjustment. Replacing the current target with a continuous medium-term point inflation target should help improve internal and external communications, should better anchor expectations, and would provide the NBRB with more flexibility in responding to temporary shocks.

The set up for sectoral analysis, nowcasting, and near-term forecasting is technically sophisticated, fairly detailed and elaborated, but also somewhat too mechanical. While the univariate time-series models developed may have good forecasting properties most of the time, a more structural approach that allow for drawing inference from known developments in the economy as well as for incorporating expert knowledge and judgment, often provides more accurate near-term forecasts and particularly so when there are large shocks or changes in the economy.

NBRB operations in the foreign exchange (FX) market may not be fully consistent with its published intervention framework. Because of the need to accumulate reserves, the NBRB risk having to do so in a way that is not fully consistent with the published foreign exchange intervention rule. This can cause confusion in the market about the NBRB's real

intentions as well as its volatility tolerance. Aligning the modality of the FX market operations with their purpose can help the central bank avoid sending conflicting signals. It can thereby also help enhance the impact of any intervention aimed at addressing disorderly market conditions and excessive exchange rate volatility.

The current interest rate focused fixed-rate full-allotment operating—or implementation—framework is working reasonably well. The recently introduced overnight open market operation on the last day of the reserve maintenance period (RMP) should help address the tendency of interbank rates to drop well below the policy rate on the last day of the RMP, but should ideally take place at the end of the trading day and not in the morning or middle of the day. The tendency of the interbank rate to be above the policy rate during the earlier part of the RMP is due to a few trades by some smaller less creditworthy banks that are structurally short and subject to a large counterpart risk premium in the market and may not be material. Development of a secured interbank market, including a FX exchange swap or FX repo interbank market, may be needed to address this issue. Ensuring that banks properly understand the NBRB’s operating framework and that the seven-day securities are issued at the policy rate and that the NBRB is committed to fully satisfy the demand in this quantity tender is important for ensuring that the framework works properly.

Table 1. Key Recommendations

Action	Timing ¹	Priority ²	Comments
Replace the current end-of-year inflation target with a continuous medium-term inflation target.	Medium Term	1	
Increasing the quality of the external communication documents, including particularly their English version.	Short Term	1	
Further improve the NTF tools and introduce structural models that facilitate more of a story-telling approach.	Medium Term	3	Gradual process. Further technical assistance to help with this is planned under this project.
Further enhance the internal board presentations along the lines discussed.	Short Term	3	
Aligning the modality of the FX market operations with their intended purpose.	Medium Term	4	
Conduct the newly introduced overnight open market operation at the end of the trading day and not in the morning or middle of the trading day of the last day of the reserve maintenance period.	Medium Term	3	
Ensure that banks properly understand the NBRB’s operating framework for keeping short-term market interest rates aligned with the policy rate, including that the seven-day securities are issued at the policy rate and that the NBRB is committed to fully satisfy the demand in this quantity tender.		2	
¹ The timing horizon for the short-term period is understood to be up to two quarters, the medium-term horizon is three to six quarters.			
² The prioritization ranks the action from the most important (1) to the least important (4).			

I. PROGRESS DURING THE MONETARY POLICY MODELING CAPACITY PROJECT

1. **The NBRB has made substantial progress in improving its FPAS and integrating it into monetary policy decision-making.** The FPAS, and the model-based forecasts and policy analysis, is now well integrated into the policy making process. The quarterly full model-based forecasting and policy decision rounds have become a routine and key input into the NBRB's decision making process. Staff are well trained and have become experienced in using the tools developed for policy analysis and forecasting, including in particular the core medium term policy analysis model—the quarterly projection model (QPM)—at the center of the FPAS. The forecasting unit also has been expanded with several newly recruited young economists with solid technical skills. The forecasting and decision-making process is well structured and has helped increase the two-way interaction between staff and the NBRB board—additional and less formal interaction between staff and board members in between the formal meetings may help enhance the process further.

2. **NBRB's internal communication also has been much improved since the last mission under this project.** The three internal board presentations used for the 2019:Q3 round were well focused and technically solid, with a reasonably clear story line. However, they continue to present the medium-term forecasts as a fairly mechanical extrapolation of current developments instead of, as they are, driven by the monetary policy stance needed to achieve the policy objective. The external monetary policy statements suffered from the same weakness. Both set of documents tended to describe the monetary policy stance as neutral. While this is consistent with the NBRB's current estimate of a 4–5 percent real equilibrium interest rate,¹ it may not help change the populations perception of the NBRB's true policy objective, enhance its credibility, and anchor inflation expectations, and therefore may have real economic costs.

3. **The de facto monetary policy framework has become close to IT, or what often is referred to as "IT lite."** The framework suffers however, from three main weaknesses: (i) the inflation target is revised annually; (ii) the target is not continuous but for the end-of-year inflation rate (that is, the December-to-December rate); and (iii) the target is set as a ceiling (the current target is to keep inflation below 5 percent at end-2019) while technically treated as a point target, which leave the NBRB with no buffer against unpredictable shocks to inflation that it might be too late for policy to address or that might require a too aggressive policy adjustment. Replacing the current end-of-year inflation ceiling with a continuous medium-term inflation target—say keeping inflation around 5 percent over the medium term—should help improve internal and external communications, should better anchor expectations, and would provide the NBRB with more flexibility in responding to temporary shocks. Increased central bank credibility and better anchored expectations should also eventually cause the non-inflationary equilibrium real interest rate to decline. This does

¹ This estimate of the equilibrium real interest rate is relatively high given the perceived low potential output growth in Belarus and the indications that equilibrium interest rates are much lower, and declining, in most other countries.

require, however, that the NBRB is in a position to shift to a more transparent forward-looking external communication, including by being allowed to publish forecasts.

II. ENHANCING THE NEAR-TERM FORECASTING, SECTORAL ANALYSIS, AND FORECAST DISAGGREGATION TOOLS

4. The set up for sectoral analysis, nowcasting, and near-term forecasting is technically sophisticated, fairly detailed and elaborated, but also somewhat mechanical.

While the univariate time-series models developed may most of the time have good forecasting properties, a more structural approach that allow for drawing inference from known developments in the economy as well as for incorporating expert knowledge and judgment, often provides more accurate near-term forecasts and particularly so when there are large shocks or changes in the economy. Sophisticated but mechanical trend-extrapolation tools, like Auto-regressive Integrated Moving Average (ARIMA) models, both risks being pulled by recent outliers in the data and missing the larger trend-cycle changes in the economy that more expert judgment-based approaches may help detect. Separating outliers from trend-cycle changes and timely detecting trend-cycle changes is critical both for the near-term forecasts and, importantly, for the assessment of the economy's position in the business cycle and the estimates of the initial conditions for the medium-term forecasts and policy analysis.

5. Further efforts to incorporate structural information and expert knowledge should in particular be made with respect to:

- (a) **Inflation.** The current ARIMA and factor models should be supplemented by more structural short-term models and expert judgment. This may likely require working on a somewhat more aggregated level.
- (b) **Real GDP.** While the current aggregate time-series models appear to perform relatively well, a more structural and detailed approach based on the main supply and demand side GDP components would help build a more detailed story about the “nowcast” and near-term forecast, and thus provide a better understanding of the current conditions for the forecasts and policy analysis.
- (c) **Nominal Wages.** Again, the near-term forecasts would benefit from more of a story-telling approach, deeper analyses of the driving force behind the tariff and bonus components of the private sector wages, and from establishing a link between wage and productivity dynamics and the passthrough from government to private sector wages

6. The progress made in enhancing the fiscal policy analyses and calculating the fiscal impulse is encouraging. Further analyses and testing may be needed, but the approach taken is promising. An iterative process among the fiscal sector experts and the QPM team is needed to properly estimate the fiscal impulse.

7. **The newly developed recursive macroeconomic model can potentially provide the basis for a more structured approach to near-term forecasting.** It can also potentially be used for disaggregating the output from the QPM. This may, however, require some simplification and a reformulation of the current model version. Error-correction econometric models like this one can have good near-term forecasting properties and support a more structural approach; but they are not suitable for forward-looking policy analysis and central bank medium-term forecasting as they lack an explicit role for policy and de facto are largely backward-looking.

8. **The level of disaggregation of the output from the QPM needs some careful consideration.** The current approach—which is largely based on the legacy financial programming exercise, while producing a full set of detailed tables—is resource intensive; forces staff produce detailed projections of highly questionable quality and of details of possibly limited analytical value; and causes policy makers to spend valuable time discussing them, thereby distracting attention from the more important aspects of the story. This may particularly be the case for the very detailed balance of payment projections. While a degree of detail can help relating the discussion of both the current conditions and the forecasts and policy analysis to developments known from other sources, a too disaggregated approach can have negative consequences. The challenge is to find the right balance.

9. **The planned one-year second phase of this project would aim to help the NBRB staff enhancing these tools along the lines outlined above.**

III. ENHANCING INTERNAL AND EXTERNAL COMMUNICATION

10. **Both internal and external communication should be developed further to sharpen the policy message.** Greater prominence in the external communication should be given to the price stability objective and to the role of monetary policy in achieving it. There is scope: to make the language clearer and less technical; to introduce more forward-looking elements; to streamline, shorten, and increase the internal consistency of the text; and to better highlight the main points of the intended message. In particular the mission suggests:

- (a) **Internal presentations.** The forecasting team should highlight the main messages of the forecast and remove details that might distract the attention from the main story line; this is crucial in particular for the presentation introducing the first version of the forecast to the Board members during every forecasting round. While the three internal board presentations used for the 2019:Q3 round were well focused and technically solid, with a reasonably clear story line they did present the medium-term forecasts as a fairly mechanical extrapolation of current developments instead of, as they are, driven by the monetary policy stance needed to achieve the policy objective.
- (b) **External communication.** The external communication documents, including importantly the Board meeting press release and the Chairman's monetary policy statement, would benefit from some streamlining and sharper focus on the key

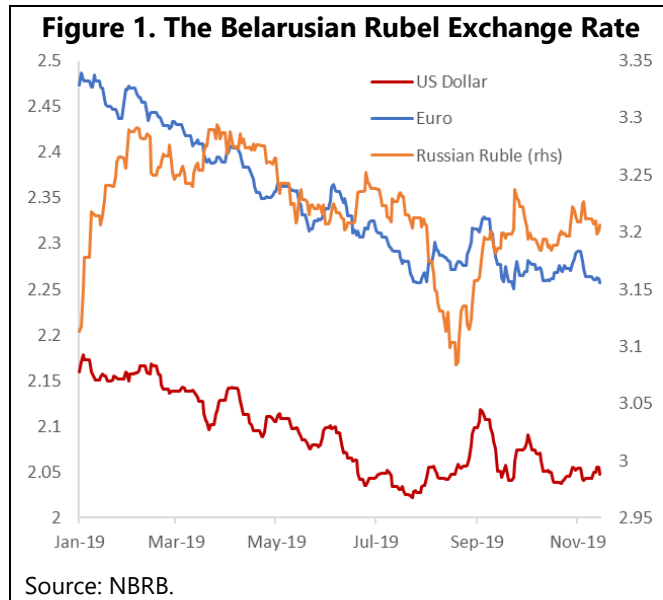
message and a simplification of the language used so that the intended message can be more easily understood by the press and general non-expert audience. Use of headlines, topical sentences, and single-sound bit sentences that can be easily reused by the press would help ensure that the press picks up the intended message and broadcast it. Use of an executive top-down drafting approach with topical sentences highlighting the core message of the paragraph that the rest of the paragraph elaborates on, instead of the more academic bottom up approach, would help ensure that the reader pick up the key message even when only reading the first part of the document or just the topical sentences.

- (c) **The English version of these documents, and of the of the mainly backward-looking inflation report, were hard to read and understand.** While this may reflect a too mechanical translation of the original Russian text, it may also be due to an overly wordy, technical, and unclear original text. Taking well-drafted English text from central banks that are viewed as being on the forefront of monetary policy communication and translate them into (good) Russian may be instructive and help improve the drafting of the original Russian text. This may also help ensure full consistency between the (well-drafted) Russian text and a well-drafted English version of the same text.
- (d) **A more forward-looking orientation of the press release and the Chairman's statement focusing on the policy objective—that is the inflation target—and why the policy decision would help achieve the policy objective, would help better anchor expectations, build policy support, and strengthen transmission.** Enhanced transparency, including by clarifying the central bank's policy reaction function, supports forward-looking behavior, reduces the risk of adverse market reactions when policy needs to be adjusted, helps discipline policy and keeping it focused on the primary policy objective, and through these channels helps anchor expectations and eventually result in a decline in the non-inflationary equilibrium interest rate thereby allowing a decline in nominal market interest rates as well.
- (e) **Educating the press, policy makers, and public at large that inflation targeting with a continuous medium-term inflation target does not mean hitting the target every single month is essential for ensuring trust and anchoring expectations.** Because of unexpected shocks inflation will fluctuate. Monetary policy when properly implemented should ensure that it will fluctuate around that target and thus on average over the medium term be close to the target.

IV. FOREIGN EXCHANGE INTERVENTIONS

11. **NBRB operations in the FX market may not be fully consistent with its published intervention framework.** The exchange rate is flexible (Figure 1), and the NBRB has a published intervention rule in place developed with the help of earlier IMF TA that clarifies that the NBRB may within daily intervention limits intervene to smooth the daily fluctuations of the Belarusian ruble exchange rate against an unspecified basket of currencies

when the change in the exchange rate relative the previous day are outside a non-specified band. The NBRB does, however, also need to accumulate international reserves. While it currently purchases FX for reserve accumulation purposes opportunistically, the NBRB risk having to do so in a way that is not fully consistent with the published smoothing rule, thereby risk confusing the market about its real intentions as well as its volatility tolerance. Aligning the modality of the FX market operation with its purpose can help the central bank avoid sending conflicting signals. That can thereby also enhance the impact of any interventions aimed at addressing disorderly market conditions and excessive exchange rate volatility. In countries with a deep and liquid FX market and a well-established trading platform, the central bank may choose for reserve accumulation purposes to purchase each day a relatively small amount throughout the day based on the offer quotes in the market as any other market player as anonymously as possible² and use more highly visible transaction forms such as flash auctions when it want to maximize its impact on market conditions and volatility. The central bank may want to clearly communicate this operation framework to the market in advance and that it would cancel the buy operation if it on the same day would have to do a flash sale auction to address disorderly market conditions.



V. LIQUIDITY FORECASTING AND INTERBANK MONEY MARKET OPERATIONS

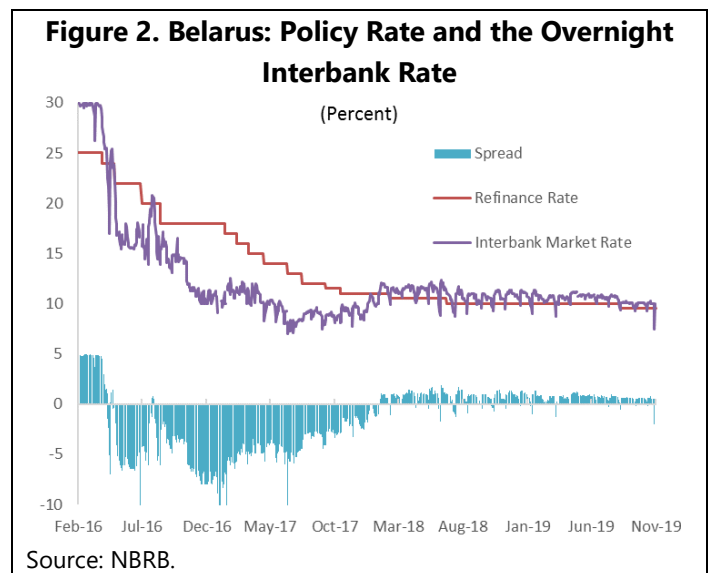
12. **The current interest rate focused fixed-rate full-allotment operating—or implementation—framework is working reasonably well.** An effectively implemented operational framework ensures that banks can predictably place surplus liquidity with, and obtain short-term funding from, each other or the central bank at rates that are reasonably stable. The current NBRB implementation framework largely achieves this. It uses seven-day NBRB securities that de facto are issued at the policy rate with full allotment to mop up excess reserves and to keep short-term interest rates aligned with the policy rate. The policy rate is set in the middle of a 200-basis points (bps) corridor formed by full-access standing facilities. The operations are properly sequenced within a 4–5 week reserve maintenance period (RMP) with averaging. Trading is, as expected under a fix-rate full-allotment operating framework, concentrated towards the end of the RMP and overnight interbank rates then tended to drop well below the policy rate (Figure 2). This is also common under a fix-

² Small, regular, and preannounced purchase auctions may serve the same purpose when the market is not that well developed.

rate full-allotment set up. The recently introduced overnight open market operation on the last day of the RMP should help address this problem.

13. **The overnight interbank market rate does also tend to be above the policy rate during the earlier part of the RMP.** This may not be material though. It is due to a limited number of transactions by one or two smaller and less-creditworthy banks that are structurally short and subject to a large counterparty risk premium in the market.³ These banks are also frequently forced to access the NBRB lending facility (using FX-denominated assets as collateral). Development of a secured interbank market, including a FX exchange swap or FX repo interbank market, may be needed to address this issue.

14. **Fixed-rate full-allotment operations is a set up that is commonly recommend.**⁴ The configuration chosen by the NBRB is with the introduction of the overnight operation on the last day of the RMP largely in line with what's considered best practice for such a framework. However, to fully address the end-of-the-RMP problem, the newly introduced overnight operation on the last day of the RMP should ideally take place at the end of the day when all aggregate autonomous flows and retail settlement transactions have taken place and not in the morning or the middle of the day. Publishing the central bank's forecast of the autonomous flows that may change the liquidity conditions in the market while clarifying that the central bank aim at keeping the system structurally long may also help reduce this problem. Finally, for a fix-rate full-allotment system to work optimally, banks need to fully understand the framework, including that the key interest rate is a fixed rate, at which seven-day securities are issued and not a maximum rate in Dutch or American fixed-quantity flex-price auction, and that the central bank is committed to fully satisfy the demand in the quantity tender. Making sure that banks are confident that they can freely access the NBRB standing lending facility when needed if they have the collateral required, and that there should be no stigma associated with accessing it is also important for



³ Volatility in the interbank rate due to varying counterparty risk premiums depending on who is borrowing in the market may create a communication challenge though. While the risk-free rate may be well aligned with the policy rate, the volatility in the observed rate may suggest otherwise. Clarifying that the objective is not to keep one rate at the policy rate but to keep all short-term interest rates, aligned with the policy rate may help with this communication challenge.

⁴ The framework is simple, robust, and do not require highly accurate liquidity forecasting or a perfectly functioning overnight interbank market. It may provide more incentives for short-term interbank trading than the similarly simple and robust floor system.

containing interest rate volatility and ensuring that market rates stay aligned with the policy rate.

15. Sophisticated liquidity forecasting models have been developed but the accuracy of the liquidity forecasts may not be sufficient to base the high-frequency operations on it. Shifting to a conventional fixed-quantity flex-price open market operation framework for keeping excess reserves stable, and close to zero, and market interest rates aligned with the policy rate does require having a very accurate framework for forecasting the daily autonomous liquidity flows over the RMP. While such a framework would increase banks need for overnight interbank trading and thus stimulate overnight interbank market activity, it is a demanding framework to operate. The benefits of increased overnight interbank market activity when it comes to the strength of the policy transmission may, moreover, be limited and could even be negative if inaccurate liquidity forecasts result in poorly calibrated operations and higher volatility in short-term interest rates. The current practice of commercial bank bidding for parts of the government deposits both complicate liquidities forecasting and reduces the NBRB's ability to control liquidity conditions using fixed-quantity flex-price operations, rendering the current fixed-rate full-allotment system or a floor system the only viable options. The main role of liquidity forecasting under these operating frameworks is to support structural operations using longer-term instruments to ensure that the system stays sufficiently long or short—that is, under (i) the floor system sufficiently long so that interest rates are consistently pushed down to the floor formed by the central bank's deposit facility and (ii) under the fixed-rate full-allotment system, sufficiently long or short so that there's no risk of having to shift the sign of the high-frequency operations from either persistently mopping up excess reserves to having to inject reserves or from persistently injecting reserves to having to mop up excess reserves.