August 2012
IMF Country Report No. 12/218

Russian Federation: Selected Issues

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International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

RUSSIAN FEDERATION

Selected Issues

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July 11, 2012

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I. Russian Federation—Potential Growth: the Past and the Future[1]

Russia's fast growth in the past decade was driven mainly by TFP growth. The increased demand for capital was mostly met by heavier utilization of the existing stock. While some moderation of TFP growth is expected in the next decade, the scope for more intense use of capital is limited, implying that investment and capital accumulation should play a bigger role than in the past. Given the unfavorable demographic trend in Russia, this highlights the urgent need for structural reforms to improve the investment climate and labor participation.

A. Introduction

1. **After almost a decade of impressive growth performance, Russia suffered a sharp contraction in 2009 with GDP falling by 8 percent.** The sharp and costly adjustments during the crisis raise important but hard-to-answer questions: how would Russia's potential growth in the next decade be compared to that in the past; and what needs to be done to help the Russian economy grow again at the impressive pace during the inter-crisis period.

2. **Projecting Russia's potential growth generally requires a careful examination of the past growth experience.** With a clear understanding about the sources of the past growth, one can assess how the underlying forces will change in the future and how the growth path will respond to the changes. Based on a growth accounting approach, this paper will analyze the key sources of Russia's growth in the last decade and evaluate Russia's growth potential in the future. Relevant questions include:

- What are the main forces that drove Russia's growth in the last decade?
- How did Russia's efficiency level evolve in the last decade and how large is the remaining scope for catch-up?
- What will be the main source of Russia's growth in the next decade and how will the growth path respond to the different environment?
- What should be done to raise Russia's growth potential?

3. **The paper is organized as follows.** Section B will provide an overview of conceptual issues regarding potential growth and the analytical framework. Section C will present the growth accounting results for Russia in the past decade. Section D will describe an exogenous growth model, which provides the analytical framework for the growth accounting exercise in Section C and simulations in the following section. Section E will evaluate Russia's potential growth based on the simulation results, and it will highlight the importance of structural reforms to achieve sustained high growth.

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[1] Prepared by Daehaeng Kim.

B. Potential Growth and Productivity

4. **Potential growth in this paper refers to a long-run GDP growth forecast.**
Potential growth is often used to describe related, but logically distinct, concepts.[2] In this
study, potential growth means a "steady-state" growth as defined in growth literature, and the
optimal transition path toward the steady state. While analyzing the source of Russia's
growth in the past and the future, the paper offers a forecast for Russia's sustainable long-run
growth rate, with a particular emphasis on the transition path under specific assumptions on
productivity growth and efficiency enhancement.

5. **In assessing Russia's potential growth, this paper relies on a growth-accounting
framework, which has been widely used in growth literature.** By linking GDP growth to
the changes in production inputs, a growth-accounting framework provides a useful means to
decompose GDP growth into the contributions from capital accumulation, changes in labor
supply, and a residual factor, commonly known as total factor productivity (TFP). Further,
the growth-accounting framework can be used to project potential growth in the longer term,
by forecasting the future evolution of labor, capital and TFP.

6. **However, it should be noted that growth accounting shows only the source of
growth and is not intended to determine the causes of growth.** This can be best explained
with an example. Consider a country where both capital per worker and factor productivity
have increased rapidly. The growth-accounting exercise will show the relative importance of
each factor in GDP growth, but it cannot determine whether the productivity growth caused
the capital deepening (as suggested by exogenous growth theories) or whether the capital
accumulation made additional innovation possible (as suggested by endogenous growth
theories). This implies that a simulation-based projection in this study will need an explicit
assumption on the causality, which allows us to trace the optimal responses of endogenous
variables to exogenous developments.

7. **In this study, we follow a Solow-type approach**—economic growth is directly
linked to efficiency/technological progress and labor supply, which are exogenous in our
framework. These exogenous factors determine the optimal paths of all endogenous variables
such as consumption, investment, and income growth. The 'exogenous'
efficiency/technological progress is captured as improvements in TFP, which we view as
closely related to structural reforms.

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[2] In addition to the definition used in the paper, there are two other concepts that potential growth often
describe. In a short-term macroeconomic context, potential growth refers to the output growth that an economy
would have if there were no nominal rigidities but all other (real) frictions and shocks remained unchanged.
This concept, often called "trend" growth, corresponds to the older Keynesian notion of potential growth, which
is the maximum growth rate that an economy can achieve without causing inflationary pressure. Potential
growth sometimes refers to the "optimal rate of growth" without distortionary taxes and other market
imperfections. For more details, see Basu and Fernald (2001).

C.   Source of Growth in Russia: 2001–11

8.   **Russia's GDP grew by about 5 percent annually during 2001–11.** However, the investment to GDP ratio remained relatively unimpressive at around 20 percent during this period, and labor growth was not as significant as in other fast growing economies. This implies that factor accumulations were not the main source of growth, which was also suggested by earlier studies by Oomes and Dynnikova (2006) and Tiffin (2009). The relatively solid growth performance in the last decade raised Russia's PPP GDP per capita from 29 percent of the OECD average in 2001 to 41 percent in 2010.[3] However, with Russia's per capita income level still below the half of the OECD average, large scope for further catch-up remains.

Sources: *World Economic Outlook*; and IMF staff calculations.

Sources: *World Economic Outlook*; and IMF staff calculations.
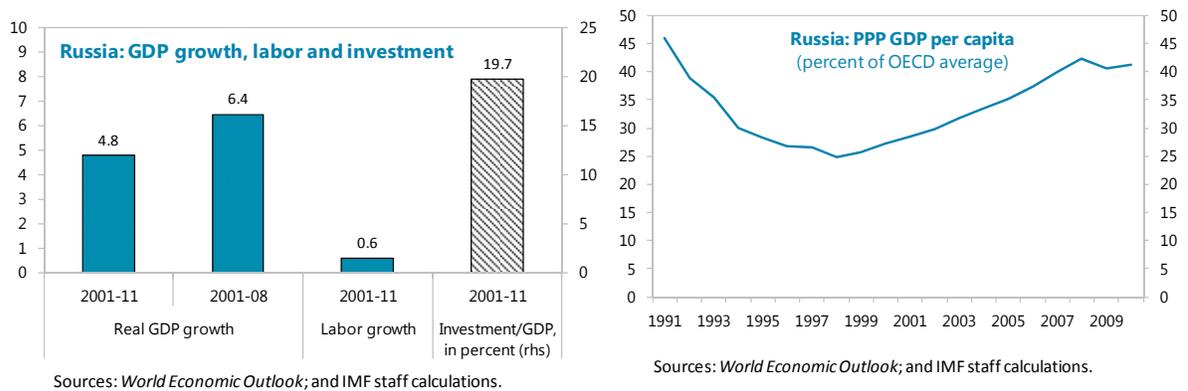
9.   **The efficiency of the Russian economy has also improved from 35 percent of its "best-practice" frontier in 2001 to 50 percent in 2011.[4]** There are five main factors that contribute to an improvement of labor productivity *at an aggregated level*: (i) improvements in the general efficiency/technology; (ii) variable factor utilization; (iii) resource reallocation across sectors; (iv) widespread imperfect competition and increasing returns; and (v) capital accumulation (Basu and Fernald, 2000). The full decomposition of these factors requires more detailed sectoral data than currently available for Russia. Given this data constraint, the paper focuses on the role of capital utilization and TFP growth in explaining the Russia's productivity improvement in the last decade.

10.   **A typical growth accounting assumes that factor utilizations are stable over a longer time period.** In this case, the productive use of capital stock and labor would be proportional to the size of capital stock and the number of workers, and thus the growth rate

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[3] Comparing Russia's output level today with that of the early period is subject to several measurement problems. For a summary, see e.g., Shleifer and Treisman (2005).

[4] The efficiency ratio is defined as the ratio between Russia' actual labor productivity and its efficiency frontier, which is estimated using a stochastic frontier model. The efficiency frontier is the production level when the economy uses all the available inputs in the most productive manner, given the current state of worldwide technology. For details, see Tiffin (2006).

of factor service flows can be proxied by that of the stock of production factors. However, it is well known that factor utilizations vary significantly over a business cycle, and this approximation does not hold in the short to medium run. For this reason, a growth accounting framework is generally recommended to analyze growth experiences over longer-run periods of a decade or more, assuming that factor utilization fluctuates around the mean without showing any trend in the long run.

11.   **The conventional growth-accounting exercise suggests that about 86 percent of Russia's growth in 2001–11 was contributed by TFP growth.[5]** During this period, GDP grew by 4.8 percent per year, while capital stock and labor grew by less than 1 percent per year. This level of TFP contribution is unusually high, although there seem to have been easy technological catch-up opportunities for Russia during this period. The TFP contribution to GDP growth was even higher for the period between 2001 and 2008, implying that investment during this period was just enough to cover the depreciation of capital stock.

Source: IMF staff estimates.

Source: Russian Economic Barometer
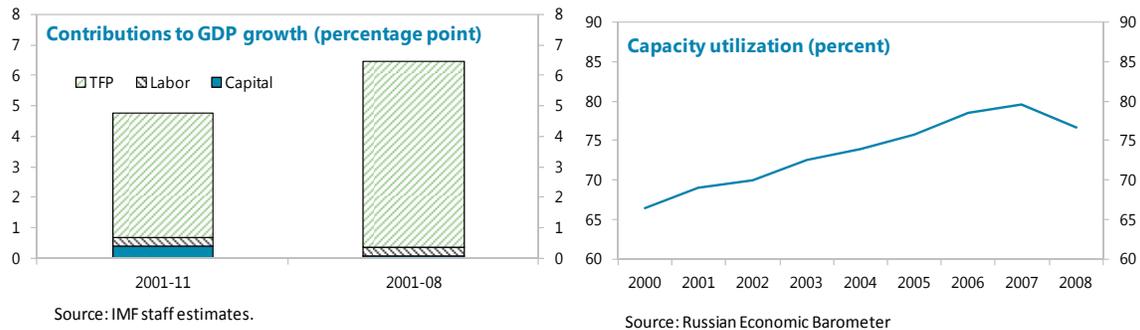
12.   **However, many empirical and theoretical studies suggest that capacity utilization in a fast growing economy can exhibit an increasing trend over an extended period.** In fact, according to the survey data (Russian Economic Barometer), capacity utilization in Russia increased from 66½ percent in 2000 to 79½ percent in 2007 before falling to 76½ percent in 2008.[6] Under this circumstance, failure to reflect the increasing trend of capacity utilization in the growth accounting will lead to an overestimation of the TFP contribution to GDP growth.

13.   **To address this measurement issue, the following section will propose an exogenous growth model where the level of capacity utilization is determined**

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[5] Russia's capital stock is estimated based on a perpetual inventory method, starting from the capital stock in 2000 estimated by Tiffin (2006). The extension uses the actual real fixed capital investment data, with the depreciation of capital stock assumed at 6½ percent per year. Following Oomes and Dynnikova (2006), we assume that the capital share is 0.5.

[6] The survey has been conducted by the Institution of World Economy and International Relations of the Russian Academy of Science since 1991. The survey result has been published in the bulletin Russian Economic Barometer. The survey covers around 500 enterprises. For more details, see Oomes and Dynnikova (2006).

endogenously. The model will provide an analytical framework to answer the following questions: What was the true growth contribution by TFP? Was the increasing capacity utilization an optimal response to the changes in the exogenous environment or more of an anomaly? How would Russia's growth path in the next decade respond to any changes in TFP growth?

D. Growth Model with Variable Capital Utilization

14.   **The special feature of the growth model in this section is that capital utilization is an endogenous variable, and the cost of heavier capital utilization is borne through accelerated depreciation.**[7] Specifically, the model is a variant of a Ramsey-type growth model with endogenous capital utilization (u) and depreciation (δ):

$$Q_t = (u_t \cdot K_t)^\alpha \cdot (A_t \cdot N_t)^{1-\alpha}$$
$$\delta_t = \delta(u_t) = \delta_0 + \delta_1 \cdot u_t^{1+\theta}$$
$$K_{t+1} = (1 - \delta_t) \cdot K_t + I_t$$

where Q is output, u is the intensity of capital utilization, K is capital stock, N is labor, A is labor augmenting technology (efficiency), I is investment, and δ is depreciation. δ_0 represents the depreciation that is independent of the intensity of capital utilization (also known as "rust and dust"), while $\delta_1 \cdot u_t^{1+\theta}$ stands for the depreciation that increases with capital utilization (known as "wear and tear").[8]

Source: IMF staff estimates.

Sources: Russian Economic Barometer; and IMF staff estimates.
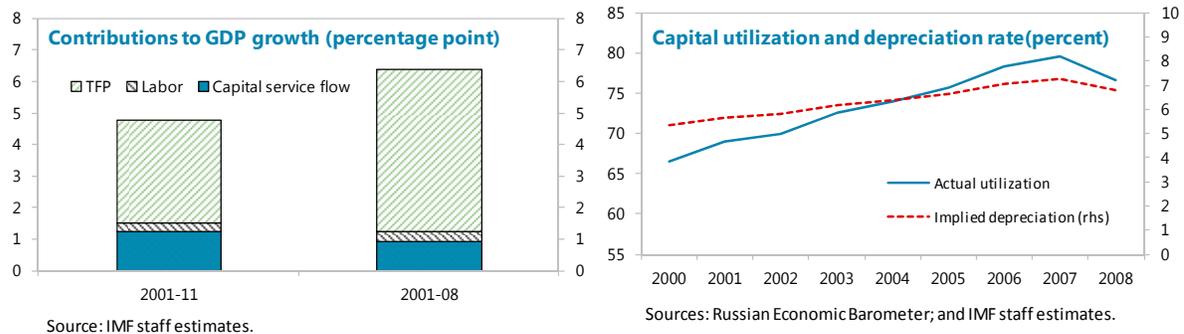
15.   **The growth-accounting exercise based on variable capital utilization shows that the more intensive use of capital stock contributed significantly to GDP growth in the last decade.** With capital utilization and depreciation assumed to vary over time, TFP

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[7] The labor cost of capital utilization could also be significant at the extensive margin (e.g., a higher wage rate for night shifts). However, the labor cost of capital utilization is not considered in the model, as labor market conditions (wages and unemployment rates) in the last decade indicate limited labor cost pressures associated with more intense use of capital in Russia.

[8] Details of the model, optimality conditions, and calibration can be found in Technical Appendix.

growth accounted for about 68 percent of GDP growth during 2001–11 and 70 percent of the growth during 2001–08, significantly lower than the TFP contribution derived from the conventional growth accounting.[9] The lower TFP contribution is the reflection of the higher growth contribution by capital, estimated at 26½ percent of the total GDP growth in 2001–11. This is significantly higher than the estimate based on the conventional approach (8½ percent), entirely because of the more intense use of capital stock.

16.   **The simulation of the model also indicates that the increasing trend of capital utilization in the last decade is fully consistent with TFP growth.** For the simulation, we first calculate the TFP growth rates based on the actual utilization, investment, implied depreciation, and labor growth. Then, we calculate the optimal path of capital utilization, assuming that the economy faces exogenous shocks to the TFP growth rate, as estimated by the growth accounting.[10] As shown in the chart, the predicted path of capital utilization is very similar to the actual utilization.
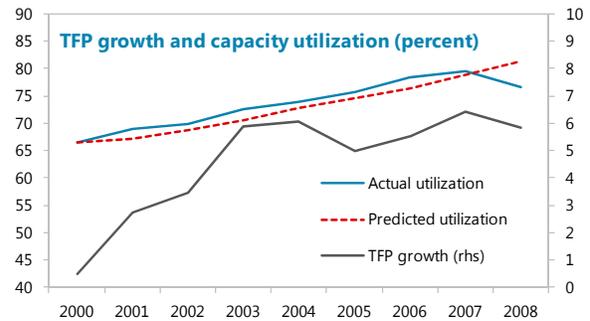
Sources: Russian Economic Barometer; and IMF staff estimates.

17.   **The simulation results suggest that the increasing trend of capital utilization in the last decade was an optimal response to the changes in external conditions.[11]** With the sharp increase in the TFP growth rate during the first half of the last decade, the production possibility frontier of the Russian economy expanded faster, meaning higher marginal productivity of capital. The increased demand for capital would be met through more intense use of the existing capacity and/or a faster accumulation of capital stock.[12] Especially, when large idle capacity exists due to overinvestment in the past or a large negative TFP shock as

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[9] With the assumption that the production technology is linearly homogenous, and the labor share is 0.5, the TFP contribution to growth should be 50 percent at the steady state. In this regard, the TFP contribution in the last decade estimated for Russia remains very high even after correcting for the increasing trend of capital utilization. There are several possibilities that contribute to an overestimation of TFP growth. First, there could be measurement problems in estimating capital stock and investment. Second, the capital utilization data may not reflect the actual trend of more intense use of capital accurately. Lastly, as noted in Section C, an explicit consideration of resource reallocation and increasing returns to scale would reduce the TFP contribution further.

[10] In the simulation, we assume that TFP growth is random walk.

[11] While the model shows that an increasing capital utilization, as observed in Russia during 2001–11, is the optimal response to technological catch-up, it has also been argued that it could reflect the decreasing distortions in factor markets (Kwon, 1986) and rent-seeking behaviors (Krueger, 1974).

[12] In the equilibrium, the level of capital utilization is determined by the existing capital stock and the anticipated TFP growth rates, and the cost of heavier utilization becomes identical to the value of the depreciated portion of the existing capital stock.

at end-1990s in Russia, the increasing demand for capital service flow would be more likely to be met with higher utilization of the existing capacity for an extended period. This also explains why the investment to GDP ratio in Russia remained relatively low in the last decade, despite the jumpstart of economic catch-up.

E. Russia's Long-Run Growth Path and Economic Catch-up

18.   **It is difficult to forecast the long-run growth path of an economy, given the complex interlinks among variables that are known as determinants of long-run growth.** Further, as the forecasting horizon is getting longer, the future development depends more on what will happen than what has already been in place. Against this caveat, a scenario-based projection—the projected path of endogenous macroeconomic variables given the assumption on the exogenous forces—would be a reasonable alternative to an econometric exercise.

19.   **Four scenarios are considered, including the staff's current baseline projections.** Scenario 1 assumes that TFP will grow at the annual rate of 3 percent during 2012–20, similar to the average rate during 2001–11. Scenarios 2 and 3 are less optimistic than Scenario 1, assuming that TFP will grow at the annual rate of 1 and 2 percent, respectively. Staff's baseline scenario does not make an explicit projection on the TFP growth rates. However, for comparison with the other scenarios, we calculate them using the projected investment-to-GDP ratio and GDP growth rates.

20.   **In all scenarios, labor supply is assumed to be constant throughout the period under consideration.** UN projections suggest that the Russia's population of age between 15 and 64 will decline from about 103 million in 2010 to 89 million in 2030, a decline of about 0.7 percent per year. Given the declining population, it will be challenging to keep labor supply constant in the long run. However, the effect of the projected adverse demographic change on labor supply could be limited in the medium term, as there still remains a

significant gap in labor participation between the average upper middle income country and Russia. Pension reforms and more general labor market reforms would help more people remain active in labor, and more immigration from neighboring countries could also ease the pressures.
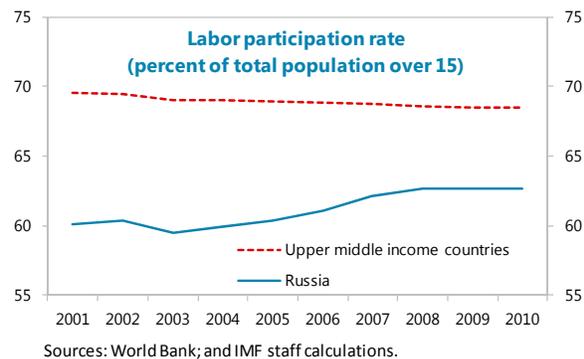
21.   **As expected, the medium to long-term growth rates depend on the underlying TFP growth.** When TFP grows at the pre-crisis rate of 3 percent, the Russian economy is expected to grow at 5 percent or more in the next 8 years, very close to the average growth

rate during 2001–11. If TFP growth slows to 1 percent (Scenario 2), the growth rate will decline to around 2½ percent per year during 2013–20, converging to the long-run rate of 2 percent. Growth will be very similar to the staff's baseline projection when TFP grows at 2 percent per year, about ⅔ of the TFP growth rate estimated for the last decade.[13]

Source: IMF staff estimates.

Source: IMF staff estimates.
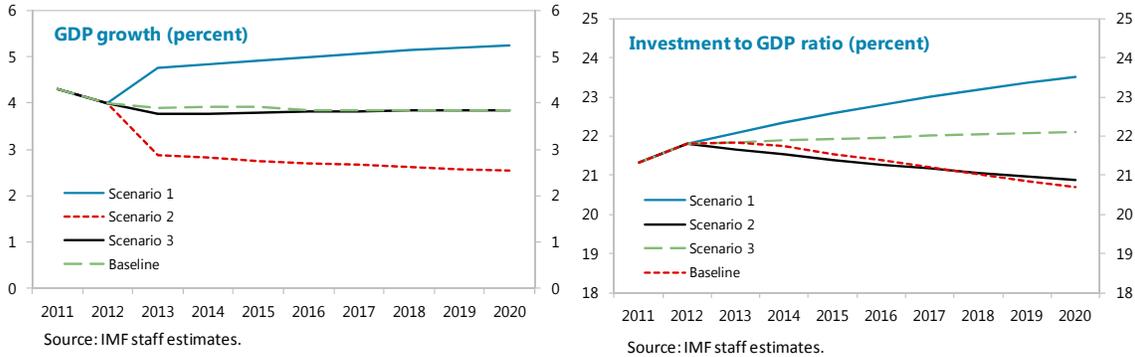
22.   **Under all scenarios, the efficiency gap between Russia and the frontier is projected to decline.** The efficiency frontier is measured as defined in Tiffin (2006, 2009). After the impressive efficiency catch-up from about 35 percent to 50½ percent of the frontier, Scenario 1 suggests a continuing improvement to 69 percent by 2020. The staff baseline and scenario 3 project the efficiency catch-up to around 64 percent of the frontier level. Even in the least optimistic scenario,

Source: IMF staff estimates.
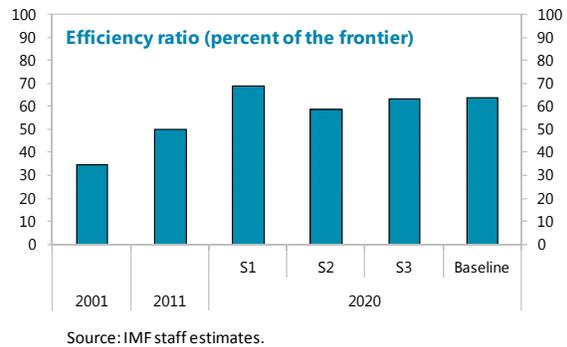
Russia's efficiency level is projected to increase to 58½ percent of the frontier. These results suggest that the room for Russia's efficiency catch-up gains remains substantial.

23.   **However, the simulation results suggest that the composition of the GDP growth in 2012–20 will be significantly different from that of the last decade.** TFP growth will account for around 65–69 percent of the projected GDP growth during 2012–20, which is broadly in line with 68 percent in the last decade. However, the composition of the input growth—capital and labor services—is projected to be substantially different from that of the last decade.

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[13] The baseline investment to GDP ratio after 2014 is slightly lower than the level projected by the model (Scenario 3), which makes no material difference in the conclusion of this paper.

Contributions to GDP growth, variable capacity utilization

Contributions to GDP growth, percent of GDP growth

Source: IMF staff estimates.

Source: IMF staff estimates.
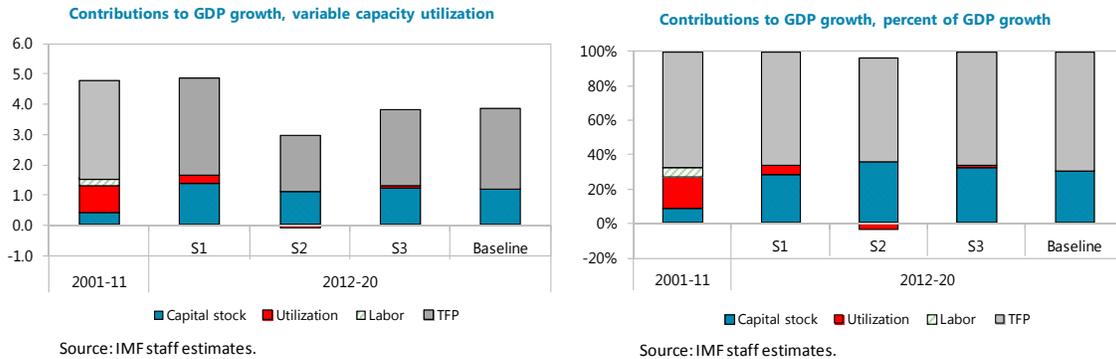
24.   **In all scenarios, scope for further increase in capacity utilization is limited.** This implies that growth in the future will require a faster accumulation of capital stock through higher investment. Unlike the growth experience in the last decade, when the increase of capital services was made possible through higher utilization, growth in the next decade will require a significant increase in the capital stock to meet the demand for capital services.

25.   **Improving the investment climate will be essential to realize the growth potential.** Even with good potential and right economic incentives, policy distortions and unstable macroeconomic environments could hamper the realization of the growth potential, particularly through their negative effects on investment. Capital utilization, which was the main source of capital input growth in the last decade, is generally less sensitive to the investment climate, because it can be easily reversed whenever needed. However, fixed capital investment—the main contributor in the next decade—is well known to be sensitive to the investment climate, including the strength of property right and macroeconomic stability, as it is more costly to reverse the investment decisions.

26.   **This reinforces the need for steadfast implementation of structural reforms in Russia.** There has been no shortage of reform plans, but their effective implementation has been insufficient to change the investors' perception on the Russian economy. Reforms can help materialize Russia' growth potential through their direct impact on TFP as well as removing distortions affecting investment decisions. Further, given the significant inefficiency in the state-owned enterprises and considerable state interference in the economy, scope for efficiency gains through resource reallocation seems to remain large. Reforms to reduce the state interference in the economy (including through transparent and more decisive privatization of state-owned companies), improve the labor market flexibility, and ensure a stable fiscal regime for the investment in the new industries will be essential to materialize easy catch-up gains. Russia's accession to the WTO should be a catalyst for these reforms, making the business environment more predictable and rule-based.

Appendix I.1. Growth Model with Variable Capital Utilization

1.   An economy maximizes the welfare (measured as a function of per capita consumption) over an infinite horizon. The labor supply (or population) and technology growth are determined exogenously. In conventional terms, the optimization problem can be written as follows:

$$\text{Max } \sum_{t=0}^{\infty} \left(\frac{1}{1+\beta}\right)^t \cdot u\left(\frac{CN_t}{N_t}\right), \text{ where } u(c) = \frac{c^{1-\frac{1}{\eta}}}{1-\frac{1}{\eta}}$$

$$\text{subject to } K_{t+1} - (1-\delta_t) \cdot K_t = Q_t - CN_t$$

$$Q_t = (u_t \cdot K_t)^\alpha \cdot (A_t \cdot N_t)^{1-\alpha}$$

$$\delta_t = \delta(u_t) = \delta_0 + \delta_1 \cdot u_t^{1+\theta}$$

$$N_t = N_0 \cdot (1+n_t)^t$$

$$n_t = (1-\rho_n) \cdot n_0 + \rho_n \cdot n_{t-1} + En_t$$

$$A_t = A_0 \cdot (1+g_t)^t$$

$$g_t = \left(1-\rho_g\right) \cdot g_0 + \rho_g \cdot g_{t-1} + Eg_t$$

2.   Here, *CN* is the aggregate consumption, *N* is population (identical to labor supply), *K* is capital stock, δ is the depreciation rate of capital stock, which is a function of capital utilization, *u*, *n* is the population growth rate, *A* is the labor-augmenting technology level, and *g* is the technology growth rate. *En* and *Eg* represent random shocks to population and technological growth rates, respectively.

To transform the optimization problem to one with a steady state solution, define:

$$c_t \equiv \frac{CN_t}{A_t \cdot N_t}; \ k_t \equiv \frac{k_t}{A_t \cdot N_t}; \ y_t \equiv \frac{Q_t}{A_t \cdot N_t}$$

Then, the optimization problem can be rewritten as follows:

$$\text{Max } \sum_{t=0}^{\infty} \gamma_t \cdot \frac{c_t^{1-\frac{1}{\eta}}}{1-\frac{1}{\eta}}, \text{ where } \gamma_t \equiv \frac{A_0^{1-\frac{1}{\eta}} \cdot (1+g_t)^{t \cdot \left(1-\frac{1}{\eta}\right)}}{(1+\beta)^t}$$

$$\text{subject to } y_t = u_t^\alpha \cdot k_t^\alpha$$

$$k_{t+1} \cdot (1+g_{t+1}) \cdot (1+n_{t+1}) - (1-\delta_t) \cdot k_t = y_t - c_t$$

$$n_t = (1-\rho_n) \cdot n_0 + \rho_n \cdot n_{t-1} + En_t$$

$$g_t = \left(1-\rho_g\right) \cdot g_0 + \rho_g \cdot g_{t-1} + Eg_t$$

$$\delta_t = \delta(u_t) = \delta_0 + \delta_1 \cdot u_t^{1+\theta}$$

The optimal solution of the problem satisfies the following equations, simultaneously.

$$(1) \quad c_t = c_{t+1} \cdot \left[\frac{(1+g_{t+1}) \cdot (1+n_{t+1})}{R_{t+1} + (1-\delta_{t+1})} \cdot \frac{1}{\Gamma_{t+1}} \right]^{\eta}$$

$$(2) \quad u_t = \left[\frac{\alpha}{\delta_1 \cdot (1+\theta)} \cdot k_t^{\alpha-1} \right]^{\frac{1}{\theta+1-\alpha}}$$

$$(3) \quad \delta_t = \delta(u_t) = \delta_0 + \delta_1 \cdot u_t^{1+\theta}$$

$$(4) \quad n_t = (1-\rho_n) \cdot n_0 + \rho_n \cdot n_{t-1} + En_t$$

$$(5) \quad g_t = (1-\rho_g) \cdot g_0 + \rho_g \cdot g_{t-1} + Eg_t$$

$$(6) \quad y_t = u_t^{\alpha} \cdot k_t^{\alpha}$$

$$(7) \quad \Gamma_t \equiv \frac{(1+g_t)^{1-\frac{1}{\eta}}}{1+\beta}$$

$$(8) \quad k_t = \frac{1}{1-\delta_t} \cdot [k_{t+1} \cdot (1+g_{t+1}) \cdot (1+n_{t+1}) - y_t + c_t]$$

$$(9) \quad R_t = \alpha \cdot \frac{y_t}{k_t}$$

The model consists of 9 endogenous variables, 2 exogenous variables (shocks to the growth rate of labor and technology, En_t and Eg_t) and 8 parameters.[14]

Parameter	Value	Note
α	0.5	Capital share in the production function
β	0.02	Discount rate
δ_0	0.02	Depreciation due to rust and dust
δ_1	0.093	Depreciation coefficient for wear and tear
θ	1.5	Elasticity of the marginal rate of depreciation
ρ_n	0.999	Persistence of labor supply shock (near random walk)
ρ_g	0.999	Persistence of labor augmenting technology shock (near random walk)
η	1	Intertemporal elasticity of substitution

Among others, the parameter values of the depreciation equation (3) warrants further elaboration. There are few econometric studies on the depreciation parameters. We assume capital stock depreciates by 2 percent per year, independent of the intensity of its utilization (δ_0=0.02). The coefficient for the wear-and-tear part of depreciation (δ_1) is set to make the total depreciation rate at the actual utilization in 2000 equal to about 5 percent: i.e., $\delta_1 = \{x : \delta = 0.02 + x \cdot u^{2.5}, where\ \delta = 0.05\ and\ u = 0.67 \}$.[15]

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[14] The (forward-looking) Euler equations are solved using the stacked-time algorithm in TROLL.

[15] The annual depreciation of 5 percent is commonly assumed in growth accounting studies (e.g., Collins, 2007) and consistent with the depreciation rate implied by Russia's capital stock and real investment during 1995–97, as estimated in Tiffin (2006).

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II. MAKING RUSSIAN MONETARY POLICY MORE EFFECTIVE

A. The CBR's Policy Interest Rate Corridor—How Wide Should It Be?[1]

Over the past 12 months or so, the Russian money market has moved from a structural surplus of liquidity to a structural shortage, as reduced foreign exchange interventions coupled with a reduction in net credit to government drained the surplus liquidity. The central bank has taken the opportunity to introduce active use of an open market operation to guide short-term rates, and to provide a greater degree of short-term stability. This should enhance the effectiveness of the central bank's interest rate levers, improve monetary transmission, and promote market development. The change in market structure provides an ideal occasion to review the operational framework of monetary policy, rationalizing the number of instruments and reviewing the width of the policy rate corridor.

1.   Most central banks use interest rate levers—the interest rate on transactions between the central bank and its financial market counterparties—to guide short-term interest rates in the wholesale money markets and thus, indirectly, to influence both longer-term money market rates and the interest rates used by banks and other financial intermediaries in their transactions with the wider economy.

2.   The Central Bank of Russia (CBR) has for some years been working to increase the effectiveness of interest rate levers in the Russian economy, allowing it to move from the reliance on a stabilized exchange rate which had characterized the CBR's approach in the 1990s. From 2000 onwards until mid-2011, the Russian money market had a substantial surplus of liquidity,[2] and the CBR made available standing facilities for both credit and deposits. Under the circumstances of surplus liquidity, short-term interest rates tended to be anchored by the central bank's liquidity absorption rate and at a relatively low level—as in many other emerging markets. But when there was a capital outflow, the CBR—like many central banks—sold foreign exchange to smooth the impact on the exchange rate, with the counterpart to the sale of foreign exchange seen in a reduction in commercial bank balances at the central bank. In periods of strong capital outflows, there has been a large degree of interest-rate volatility, as the market experienced a temporary shortage of reserve money and short-term interest rates consequently jumped to (and on occasion above) the ceiling rate—as can be seen in Figure 1 below.[3]

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[1] Prepared by Simon Gray.

[2] Liquidity is used here to mean commercial bank ruble current account balances at the CBR.

[3] The central bank's refinancing rate normally sets a ceiling to overnight interbank rates, but only if the bank which is short of liquidity holds eligible collateral. Sometimes banks are reluctant to use a standing facility if there is a perceived stigma associated with its use. It is therefore not uncommon for markets to see overnight rates spike above the standing credit facility rate.

Figure II.1. Russian Money Market Daily Interest Rates
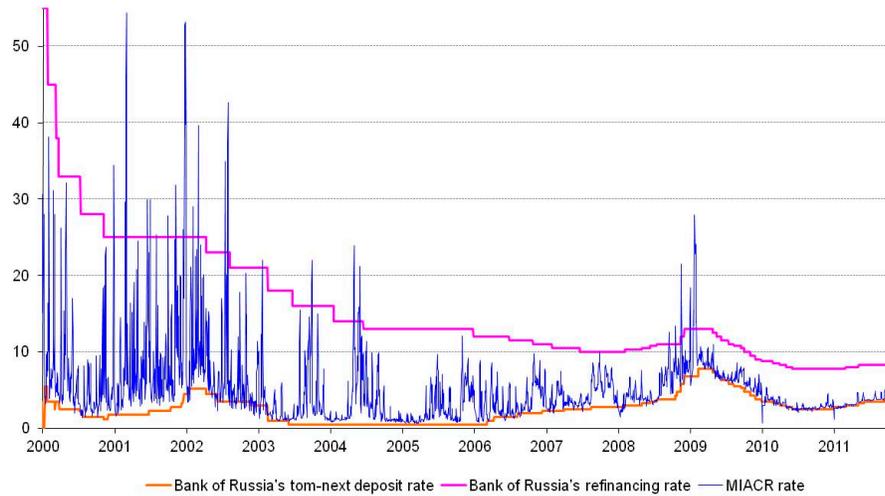
Source: Central Bank of Russia data

3.   In order to increase the effectiveness of monetary policy interest rates, many central banks find it important to provide greater clarity on the setting of policy rates (clarifying the central bank's monetary policy reaction function) and to reduce the volatility of very short-term rates. This allows the market to take a view on future policy rate developments, and means the "noise" of short-term volatility does not obscure the pass-through from short-term rates to longer-term yields. Narrowing the policy interest rate corridor will, mechanically, reduce short-term interbank rate volatility. But achieving a stable market rate in conditions where the market will reliably pass the policy rate on to the rest of the yield curve also requires enhanced liquidity management by the central bank, and in many cases also benefits from a move away from structural surplus liquidity to a shortage. The move in 2011 to a shortage of reserve money in the Russian market has set the stage for a reduction in short-term rate volatility. This chapter discusses the width of policy rate corridors as part of the central bank's operational framework to implement monetary policy effectively.

Background

4.   Central bank monetary policy setting prior to the outbreak of the financial crisis in 2008 would normally be centered on the targeted level for short-term interbank or wholesale money-market interest rates. Some central banks expressed policy in precisely such terms (e.g., the U.S. Federal Reserve Bank, the Bank of Canada, the Reserve Bank of Australia). Others announced policy in terms of an open market operation rate at which the central bank would transact with its counterparties, with an expectation that short-term market rates would trade close to this level—perhaps within 5–10 basis points (the ECB, the

Bank of England, the Reserve Bank of New Zealand but also a number of Emerging Market (EM) central banks).[4]

5.   In other cases, the central bank would announce a standing credit facility rate,[5] but market rates traded—and were expected to trade—well below this level.[6] Virtually all central banks make available a standing credit facility, as this is important from a payment systems point of view. It prevents the risk that a shortage of reserve money at one bank might force the unwinding of payment orders made throughout the day. In practice, its role as a payment system safety valve means that the interest rate on the credit SF does not have a central function for monetary policy purposes. Reflecting this purpose, the credit SF is nearly always for an overnight maturity, and carries a penalty rate high enough to motivate effective liquidity management by commercial banks.

6.   But not all central banks make available a deposit SF. It is not necessary from a payment system point of view (because excess reserves balances do not cause a payment systems problem); and provided liquidity can be managed sufficiently well (typically via a combination of OMO and reserve requirement averaging), interest rates may still be guided by the OMO rate. The USA was an example of this prior to October 2008.[7]

7.   Systems which use standing credit and deposit facilities to inject and to withdraw reserve money are typically referred to as either "corridor" systems, or "floor" systems.

Corridor System

8.   The term "corridor" system is used where the central bank sets upper and lower bounds for (most) overnight wholesale money market transactions by making available standing credit and standing deposit facilities, with overnight maturities. In most cases, these are set at symmetric margins around the announced policy rate. But the expectation—at least pre-crisis—was that actual short-term market rates would be steered within a much narrower band, in line with the policy target and in the middle of the corridor, by use of open market operations (OMO).

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[4] The ECB set the *minimum bid rate* for its short-term open market lending operations.

[5] Sometimes referred to as a refinancing rate, or Lombard rate, or Discount Window rate.

[6] Historically, a number of Advanced Economy central banks operated this way, announcing a fixed rate for the standing credit facility, but operating—often in a nontransparent manner —in the secondary market for short-term trade bills, in order to guide market rates towards the desired level.

[7] That said, an increasing number of central banks, perhaps because of difficulties in managing liquidity via OMO, offer a deposit standing facility to prevent an excess of reserve balances pushing interest rates too low. This matters both for Inflation Targeting and Exchange Rate Targeting. Where the exchange rate is the main target of monetary policy, and particularly where this takes the form of a hard peg, short-term interest rates are more often market-determined, since the central bank cannot fix both the external price of money (the exchange rate) and the internal price (the short-term interest rate) unless it imposes effective capital controls.

9.   The U.K. provides an interesting example of the introduction of a corridor system in 2006. A decision was taken in 2004 to restructure the operational framework for monetary policy implementation in order to deliver a relatively stable overnight interbank rate in line with the policy target. High volatility could obscure the monetary policy stance. Moreover, by setting a high barrier to market participation,[8] it reduced competition in the interface between the central bank and the wider economy. Because the full money market reform—involving averaging of contractual reserves, amongst other features—would take some time to implement, a narrow corridor was introduced as an interim measure. This reduced but could not eliminate volatility (cf., the narrowing of the corridor in Russia over the past decade or so, shown in Figure 1). With the introduction in May 2006 of enhanced liquidity management under the new monetary policy framework,[9] a substantial degree of market stability was achieved, permitting the central bank to widen the policy rate corridor from +/-25bp to +/-100bp, stimulating more market activity but without causing interest rate volatility.

Figure II.2. U.K. Policy Rate Corridor and Overnight Interbank Rates
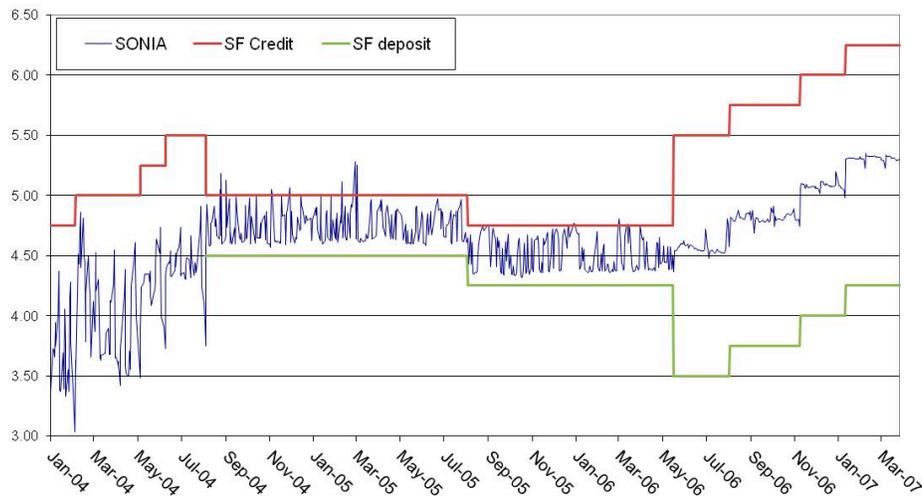
Source: Bank of England data

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[8] Many smaller banks were reluctant to rely on the interbank market, fearing that the difficulty of coping with the short-term volatility would leave them exposed to potential losses.

[9] The new system included averaging of voluntary, contractual reserve balances over a 4–5 week period (the period between MPC meetings), weekly short-term liquidity OMO, and provisions to minimize liquidity risk on the final day of the reserve maintenance period.

Floor System

10.   The term "floor" system is used where there is an asymmetric corridor. The upper and lower bounds to market rates are still set by standing facilities; but there is no OMO undertaken at the middle of the corridor (or at least, not in sufficient volume to steer interest rates to this level); and the expectation is consequently that market rates will be close to, but somewhat above, the deposit SF. Central banks do not run "ceiling" systems in normal times, though when faced with exchange rate pressures central banks will for a period allow interest rates to rise towards the ceiling of the policy rate corridor. A floor system may be a result of weak liquidity management, or a policy decision not to pay the price of draining reserve balances surplus to demand, or a policy of Quantitative Easing (QE) or unsterilized exchange rate intervention.

11.   Pre-crisis, floor systems were more common in EM countries, though they were also used in a few Advanced Economies (Norway is the notable example). The chart (Figure 3, below) of interest rates in India shows distinct phases: a floor system in 2009 and early 2010, with rates close to or below the floor; a "floor system" but reacting to periodic shortages of liquidity as a result of foreign exchange flows, from mid-2010 until mid-2011; and the introduction of a "corridor" system from mid-2011. The overall picture is very similar to that for Russia. (Note that on occasions in India the overnight market rate was below the floor. This can happen if, for example, the overnight deposit facility is not available until the payment system closes; a bank may not be aware it holds surplus liquidity until too late in the day to make use of the facility.)

Figure II.3. India: Policy Interest Rate Corridor and Overnight Interbank Rates
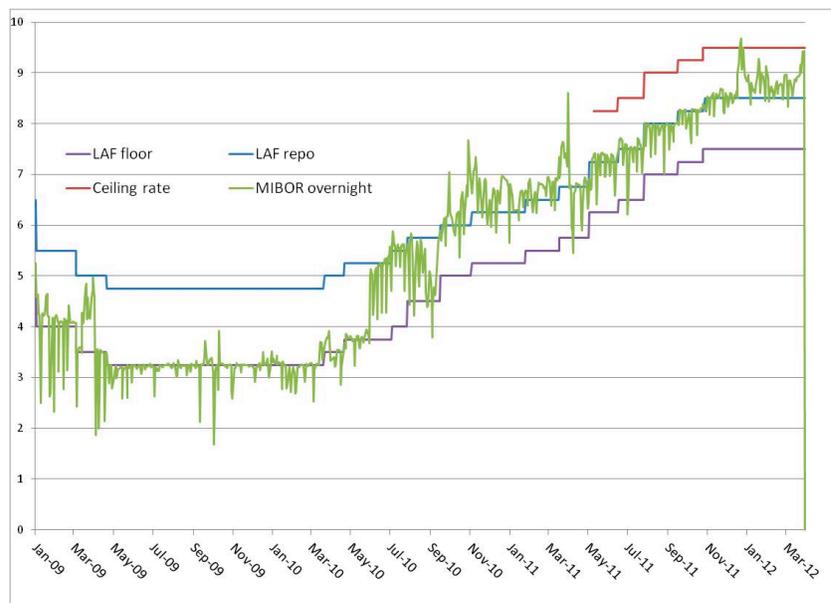
Source: Reserve Bank of India data

12.   A market with a structural surplus of reserve money which is not fully drained by the central bank's open market operations will effectively operate as a floor system, because banks expect to have to leave a significant volume of reserves in the overnight deposit facility. By contrast, markets with an ex ante reserve money shortage are most likely to operate as a "corridor" system—where OMO are used actively to keep short-term market rates in line with the targeted policy rate. In part, this is because some central banks are more willing to inject liquidity via OMO than to drain it, since they earn a return by lending but have to pay the cost of draining. More generally, central banks typically view the standing credit facility as "last resort" borrowing, which should carry a penal rate; and by definition it would not be a penal rate if the market regularly traded at that level. In any case, the central bank will virtually always supply reserve money via one channel or another—notably, to prevent disruptions in the payment system—so "ceiling" systems are not found.[10]

13.   This suggests that what matters most for monetary policy implementation is the marginal rate at which the market expects to transact in substantial volume with the central bank. Some of the literature suggests that the market rate is determined as the average of the SF rates, rather than being determined by the OMO rate. But this is not borne out by the evidence, either in Russia or elsewhere.

•   If there is no OMO, market rates tend to trade either around the floor or, in times of market stress, around the ceiling, rather than being stable around the average of the two (as illustrated in Figures 1 and 3, above).

•   If an OMO is actively used, but the central bank did not (or do not) set a floor rate, the short-term market rate is rarely the average between the credit SF rate and zero; it is typically either around the OMO rate, or close to zero (the floor).

14.   In summary, regular and substantial use of one or other of the SFs will tend to push the market rate to the boundary of the "corridor" (typically, the floor), whereas if there is an expectation that use of standing facilities will be trivial, then the SF rate is unlikely to impact the market rate directly: the OMO rate should then guide the market.

15.   If the central bank could manage liquidity perfectly, so that the market always expected to transact with the CB only at the policy rate and never at the SF rates, it would not matter how wide the corridor is, since the SF rates would effectively be irrelevant. The corridor width is relevant, however, whether because the CB cannot manage liquidity perfectly—especially in times of severe market stress—or because it uses a floor system rather than targeting the center of the corridor.

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[10] Some central banks will allow market rates to move to the ceiling in times of capital outflows, as a form of automatic stabilizer.

Temporary Switch from Corridor to Floor

16.   In the context of the financial crisis, some Advanced Economy (AE) central banks have moved, temporarily, from corridor to floor systems, as reserve money balances have been expanded substantially—whether as a counterpart to Quantitative Easing (QE) purchases of government securities, or central bank intermediation between banks in face of a continued weakness of the interbank market. The U.S., the Euro area and the U.K. are examples of this. For these central banks, a change in circumstances—in this case, a major financial sector shock—means that a temporary move to a floor system makes good sense, as the demands of financial sector stability outweigh the benefits for monetary policy transmission and market development of a corridor system. The weakened transmission from short-term policy rates to the wider economy is not an immediate concern, in view of weak inflationary pressures against a background of low economic growth; but will make policy implementation more complex if inflationary pressures arise before the surplus reserve balances have been absorbed.

Several Countries Have Moved From a Floor to a Corridor System

17.   In Russia, a structural shift in market liquidity was seen through 2011, starting in April but being evidenced most clearly from late September when the repo OMO lending came regularly and substantially into play, with a consequent impact on the overnight market rate.[11] A marked slowdown in the level of official foreign exchange purchases—and occasionally net sales of reserves in the face of continued capital outflows—coupled with a reduction in net credit to government had drained surplus reserve money balances from the commercial banks, resulting in an overall market shortage and facilitating a move towards a corridor system. When the CBR sold foreign exchange to support the foreign exchange markets in the late summer of 2011, this operation drained domestic currency reserves (because the commercial banks have to pay for the foreign exchange). At the same time, an increase in net government balances with the CBR and an increase in currency in circulation together drained some rubles 2.3 trillion liquidity from the market in 2011. Figure 4 below indicates a few points from April to September 2011 when the market was temporarily short of liquidity, resulting in a spike in interbank rates; and then from September 2011a consistent move to a shortage allowed the shift to a corridor system of operation, with interbank rates trading much closer to the overnight repo OMO than to the floor.

18.   A number of other EM countries experiencing capital outflows in 2008–09 or later saw a similar shift in structural liquidity balances. In such conditions, when the central bank becomes a regular supplier of liquidity to the market, it tends to be easier to operate a corridor system.

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[11] The overnight market rate used here is the Moscow Interbank Average Credit Rate, known as MIACR. MIACR has been around the middle of the corridor in January–February 2009 when use of the repo OMO was also substantial, but for a briefer period.

Figure II.4. Russia, Short-Term Interest Rates in 2011
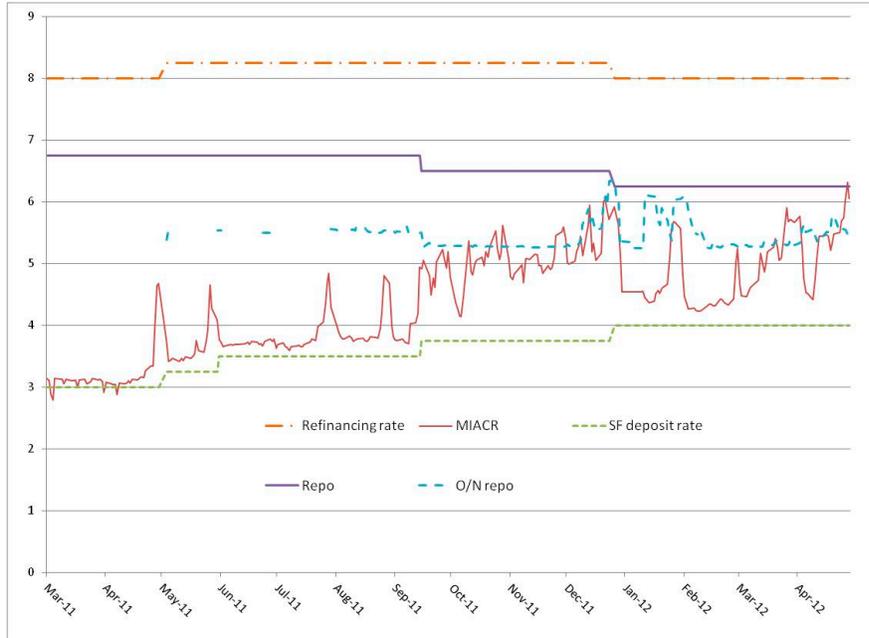
Figure II.5. Russia, Key Items in CBR Balance Sheet, 2011 in Rubles Billions
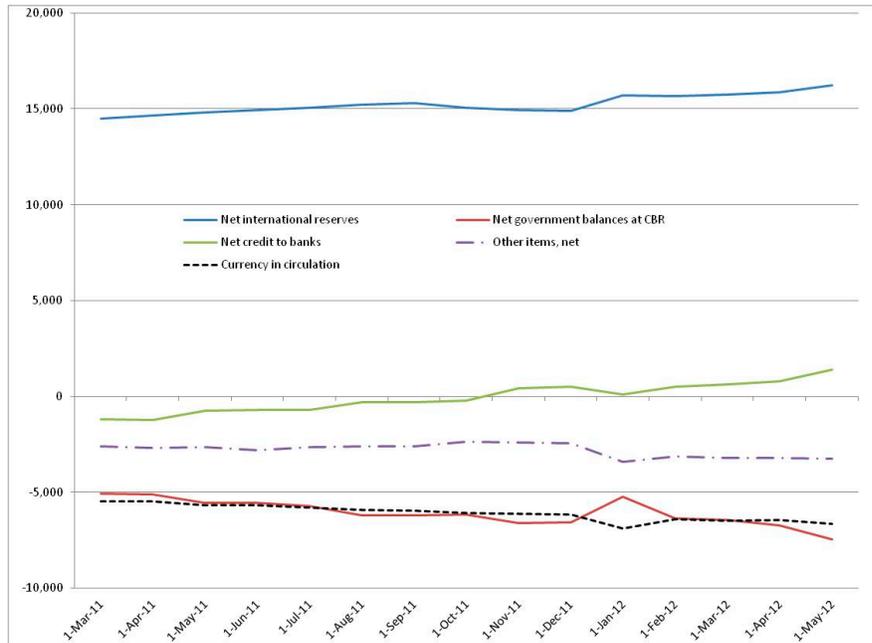
Source: Central Bank of Russia data

19.   A similar pattern can be seen in India. In this case, there were two important factors in bringing the overnight interbank rate into the middle of the interest rate corridor. First, the central bank took a policy decision to pull back from exchange rate intervention, allowing greater market determination of the exchange rate, and sold some foreign exchange when dollar funding pressures were high in 2008–09. Since official purchases of foreign exchange were no longer generating domestic currency liquidity, the trend increase in demand for reserve money quickly moved the market to a structural shortage, giving the central bank stronger leverage. Second, and following on from this, the central bank adjusted the structure of its operations, using an open market operation to guide market rates to the middle of the corridor and so reduce volatility—Figure 6 below.[12]

Figure II.6. India, Short-Term Interest Rates in 2011
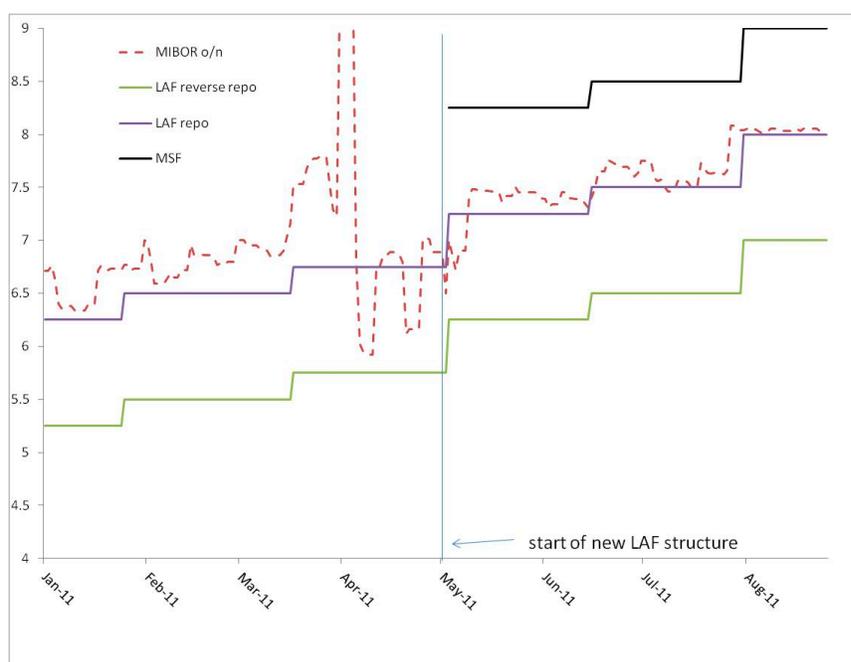
Source: Reserve Bank of India data

20.   In this case, the RBI took advantage of the change in circumstances to introduce a permanent enhancement to its operational framework. Another, somewhat older, example is that of the Croatian National Bank which in 2005 adjusted the way in which reserve requirements are met in order to move the market from a structural surplus to a structural

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[12] A Working Group on Operating Procedure of Monetary Policy, constituted in July 2010, published its report in March 2011. The May 3, 2011 Monetary Policy Statement 2011–12 of the RBI details changes introduced.

deficit of domestic currency reserves, and giving the central bank greater control over short-term market rates through the use of liquidity-providing OMO.[13]

Determining the Corridor Width

21.   Global practice regarding the width of policy rate corridors varies substantially.

Table II.1. Policy Rate Corridors

+/- 25bp	Australia, Canada, Chile, Israel, Malaysia	**Symmetrical**
+/- 50bp	Egypt, New Zealand, Singapore, South Africa, Sweden, Switzerland, Thailand	**Not all symmetrical**
+/- 100bp (pre-crisis)	Czech Republic, ECB, Bank of England[14], US Federal Reserve, Hungary, India, Korea	**Mostly symmetrical** **US not a clear case**
More than 100bp	Bolivia, Poland, Azerbaijan, Brazil	

Too Wide?

22.   If liquidity management is potentially difficult, so that a lending bank has a material degree of uncertainty regarding its own liquidity management, and may assume that counterparts also face similar uncertainties, the probability of needing to access the central bank's standing credit facility will be increased. If the marginal cost of accessing this facility is too high (too "penal"), then banks have an incentive to increase liquidity buffers in order to avoid this cost, instead of trading. (This behavior is sometimes described as 'liquidity hoarding'; but is often a rational response to market circumstances, including the central bank's operational structure, rather than perverse behavior.) For instance, a gain of 50bp in

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[13] See Croatian National Bank Annual Report 2005, Chapter 2. "Open market operations were introduced for the purpose of promoting monetary management and establishing a more active role of the Croatian National Bank in banking system liquidity management. Over a short-term, the objective of open market operations was to achieve stabilization of the overnight interest rate and create a reference interest rate on the money market. Over a longer term, the aim of monetary policy is to establish a transmission mechanism that involves the operation of an interest rate channel. With the introduction of open market operations, the central bank redefined its existing monetary policy instruments and introduced new ones."

[14] The Bank of England, pre-crisis, narrowed the corridor on the last day of the reserve maintenance period: in the system operational from May 2006 until the financial crisis (when the BoE has effectively ended short-term operations), the SF corridor was narrowed from +/-100bp during the RMP to +/-25bp on the last day of the RMP. Theory (the so-called 'Martingale property') suggests that if interbank rates can be tightly anchored on the final day of the RMP, then inter-termporal arbitrage will operate to keep overnight rates in line with the policy rates on other days of the RMP.

interbank overnight lending every day of the week would be more than offset if the lending bank had to access a credit SF at 300bp over the effective policy rate once a week, even without taking account of the cost of holding eligible collateral.

Too Narrow?

23.   Does it matter if the corridor is too narrow, such that the market has no incentive for short-term market trades? This may be of secondary importance from an immediate policy perspective: short-term rates should still be in line with the policy goal. But central bank intermediation is collateral intensive, since the central bank will demand collateral from borrowing banks. This places a deadweight cost on financial intermediation, and may reduce the secondary market liquidity of securities accepted as collateral. There is also a risk that the central bank may be inclined to offset these costs by accepting second-rate collateral. This could result in a degradation of the quality of collateral held by the banking system as a whole.

24.   The above reasoning suggests that both corridors that are too narrow and those that are too wide will discourage interbank trading, and will tend to dampen market and yield-curve development, weakening the transmission of interest-rate based monetary policy.

What Size of Interest Rate Spread is Significant?

25.   It is common to argue that Standing Facility rates should be "penal," in order to discourage market intermediation via the central bank. This indicates the central bank needs to be able to judge what "penal" implies for a given market. In normal market conditions, important factors to take into consideration are: the size of trades, the cost of trading, and the cost of alternatives.[15]

26.   Even if it is assumed that there is zero credit and liquidity risk associated with the trade, the back-office costs of settling may well exceed such a return. This is even more likely to be the case if the deal is secured (e.g., by repo) as the settlement costs of repo transactions (including any fees payable to the securities depository) are greater than those for unsecured interbank transactions. If there is a perception of liquidity risk, the return will need to be correspondingly higher. There may also be a matter of convenience: if transacting with the central bank has a low opportunity cost, it may be cheaper than paying for a dealing room and the middle office necessary to use the interbank or wholesale markets.

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[15] For example, an overnight trade yielding a gain of 25bp on US$1 million equates to a gain of US$6.85.

Central Bank of Russia Rate Structure

27.   In Russia, as in many countries, there appears to be certain segmentation in the interbank markets, particularly for bilateral deals.[16] A small number of large banks will deal with each other in large volume (perhaps several billion rubles), whereas the greater number of small banks may deal for a hundred million rubles or less. A spread which was (reasonably) penal for small banks may be excessively penal for the larger market participants. In such a case, it may be best for the central bank to structure its system in a way that takes more account of the large trades, because they will have a greater impact on the overall economy. For Russia, this would point to a narrower spread in order to optimize incentives for the larger banks to trade in the market, even if a number of smaller banks then became more reliant on central bank lending facilities.

28.   The Central Bank of Russia's policy rate structure at end 2011—see Table 2, below— indicates the use of several different interest rates each for Standing Facility lending, Standing Facility deposit, and Open Market Operations, as well as a range of different maturities and collateralization models. The multiplicity of official rates in Russia, while reduced from earlier levels, remains unusual by international comparison. This makes it difficult to know if the corridor (or corridors) is/are too wide or too narrow, whether for certain types of banks or for the banking system as a whole. It significantly complicates the task of assessing whether the rate spreads are appropriate, as well as complicating the transmission from overnight rates to longer-term market rates, since it will not be clear to the market precisely what the central bank is aiming to achieve with this complex structure of instruments. Indeed, shifts in structural liquidity mean that the structure will have a varying impact over time.

29.   Narrowing the focus to overnight transactions, the overnight (up to 7 day) repo OMO rate was 5¼ percent: this was 125bp above the overnight deposit SF, but 275bp below the higher of the overnight credit rates. This gives a 400bp wide, asymmetric corridor for overnight operations—assuming this is the most appropriate general indicator of the operational framework for the market as a whole—which is a wide spread by comparison with other markets.

30.   This said some progress has been made in recent periods with the shift of the effective policy rate to the middle of the corridor. When the framework was operating as a floor system—until 2011 QIV—the spread of nearly 400bp between MIACR and the higher Standing Facility ceiling appeared to be too high (since it would motivate banks to "hoard" liquidity rather than risk paying such a high rate). With the move to a more symmetric corridor system, the spread between MIACR and the Standing Facility ceiling was halved; and for banks which could use the fixed-rate repo facility at 6.25 percent, the effective spread

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[16] Trading costs on platforms such as MICEX will tend to be lower, and so allow for smaller deals.

Table II.2. Central Bank of Russia Interest Rates

Центральный
банк
Российской
Федерации

Interest rates on the Bank of Russia operations
(% p.a.)

Purpose	Type of instrument	Instrument	Term	Rate since 28.02.11	Rate since 03.05.11	Rate since 31.05.11	Rate since 15.09.11	Rate since 26.12.11
Liquidity provision	Standing facilities (fixed rates)	Overnight loans	1 day	8.00	8.25	8.25	8.25	8.00
		FX swaps (rouble rate)	1 day	8.00	8.25	8.25	8.25	8.00
		Lombard loans, REPO	1 day, 7 days[1]	6.75	6.75	6.75	6.50	6.25
		Lombard loans	30 days[2]	6.75	6.75	6.75	6.50	6.25
		REPO	12 months[2]	7.75	8.00	8.00	7.75	7.75
		Loans secured by gold	Up to 90 days	—	—	—	6.75	6.75
			From 91 to 180 days	—	—	—	—	7.25
		Loans secured by non-marketable assets and guarantees	Up to 90 days	7.00	7.25	7.25	7.00	7.00
			From 91 to 180 days[3]	7.50	7.75	7.75	7.50	7.50
			From 181 to 365 days[2]	8.00	8.25	8.25	8.25	8.00
	Open market operations (minimum interest rates)	REPO auctions	1 day	5.25	5.50	5.50	5.25	5.25
		Lombard and REPO auctions	7 days	5.25	5.50	5.50	5.25	5.25
			3 months	6.75	7.00	7.00	6.75	6.75
			6 months[2]	7.25	7.50	7.50	7.25	7.25
			12 months[2]	7.75	8.00	8.00	7.75	7.75
Liquidity absorption	Open market operations (maximum interest rates)	Deposit auctions	1 month	5.00	5.25	5.50	5.50	5.50
			3 months[2]	6.00	6.25	6.50	6.50	6.50
	Standing facilities (fixed rates)	Deposit operations	1 day, 7 days, call	3.00	3.25	3.50	3.75	4.00
Memo item:								
Refinancing rate				8.00	8.25	8.25	8.25	8.00

[1] 7 days fixed rates REPO operations have been suspended.

[2] Operations have been suspended.

[3] Operations were suspended from 10 February 2011, resumed from 1 November 2011.

Updated December 23, 2011.

was little over 100bp. With a broadly symmetric and smaller opportunity cost of using the Standing Facilities in case of need, banks should be more likely to make use of the interbank market. However, further progress can likely be made, including by simplifying the policy rate structure.

Narrowing of the Corridor?

31.   Whatever the rationale for determining the corridor width in normal times, the width should at least be reviewed periodically, to ensure the structure takes account of market developments; and in times of market stress. Since 2007, a number of central banks have reduced the corridor width temporarily, judging that there is value in reducing short-term rate volatility from heightened levels, and that while interbank markets have become dysfunctional, or at least are weaker than previously, a wider corridor would not address the main causes of problems in the interbank market (increased perception of credit risk, increased liquidity risk). As liquidity uncertainties in the market meant that market intermediation could not be relied on to manage liquidity, the SF rates took on a new importance. This is a temporary phenomenon, but important for use during stressed circumstances.

- The U.S. Federal Reserve Bank cut the spread between its target rate (the Fed Funds Rate) and the credit SF (the Primary Credit Facility, known as the Discount Window) from 100bp to 50bp in August 2007, and further reduced it to 25bp in March 2008.[17] It was increased back to 50bp in early 2010 as interbank pressures eased (in part because of the large volume of liquidity injection arising from the Quantitative Easing program). Published data indicate that when the spread was increased to 50bp, banks made less use of the PCF and increased the volume of interbank transactions. Note that in the USA at present, 50bp represents the full width of the corridor between the rate paid on excess reserves (25bp) and the rate charged for SF credit (75bp).

- The ECB[18] operated a corridor of +/-100bp from 1999 to 2008. This was narrowed to +/-50bp in October 2008 in face of strong short-term rate volatility; restored to +/-100bp in January 2009 but then narrowed to +/-75bp as the markets failed to sustain a recovery. However, it may be argued that, since the introduction of fixed-rate, full-allotment OMO tenders in October 2008, the OMO lending rate has functioned in large measure as an SF rate, so that the effective corridor width is 75bp.

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[17]The U.S. Fed was not by law permitted to pay remuneration of reserves balances until October 2008, so did not operate a corridor system until that point.

[18] As an exceptional measure, the ECB operated a narrow corridor when the euro was introduced. Between January 4–21, 1999, a narrow corridor of 50 basis points was applied between the interest rates for the marginal lending facility and the deposit facility, aimed at facilitating the transition to the new regime.

- The Bank of England introduced a narrow corridor of +/-25bp in 2004, prior to the introduction of a reserves averaging system in May 2006, in order to limit overnight interbank rate volatility ahead of the introduction of the new system. Once the reserves averaging system was introduced, the corridor was widened to +/-100bp as liquidity management was from that point capable of keeping actual overnight rates within a tight bank around the policy rate. The spread was narrowed to +/-25bp in 2008, in the face of strong market volatility. When the policy rate was cut to 50bp in March 2009, the corridor effectively became 25bp wide, as all reserves are remunerated at the policy rate, so this operates as a deposit SF.

32. With a floor system, the width of the corridor needs to be re-evaluated, since the gap between the market rate and the credit SF is no longer half the width of the corridor, but (almost) the whole width.

Conclusions

33. The width of corridor matters more to the extent that (i) market participants expect to use standing facilities more, whether because there is no OMO, or because OMO and other liquidity management tools cannot be relied on to keep the balance between supply of and demand for reserve money within a sufficiently narrow band; and (ii) the width of corridor matters more if the market is segmented, such that liquidity-rich banks may not be prepared to lend to liquidity-short banks.

34. In addition, it seems clear that transactions in the interbank market will be discouraged if the corridor is (i) too narrow, because the benefits for liquidity-rich banks from dealing in the market do not outweigh the benefits of using the central bank as an intermediary; or (ii) too wide, because the opportunity cost of being short of reserve balances motivates a "hoarding" of liquidity.

35. Further, it appears that, for all markets, a corridor narrower than +/-25bp is too narrow to motivate interbank transactions. If the corridor is to be wider than+/-100bp, the central bank should be reasonably clear that a wider spread will incentivize interbank transactions (or reduce exchange rate pressures), rather than motivating hoarding of liquidity.

36. For Russia (as with some other countries), where there is a case for reducing the corridor width in order to facilitate more interbank activity, it is not possible to be certain ex ante what the ideal corridor width is. Russia is in a 'learning mode', as the central bank and the market adjust to a structural liquidity shortage, on top of coping with a very uncertain international environment. It makes sense for the central bank, in such a situation, to reduce the corridor width gradually and monitor the market response. Where—as in Russia at present—the system is operating as a corridor system, raising the floor and lowering the ceiling may be a largely technical move, as there should be no expectation that market rates would change (though the central bank would nevertheless need to communicate clearly to

the market that this was intended as a technical move reflecting the changed market structure). By contrast, raising the floor rate in a floor system would imply a policy change; and lowering the ceiling rate—even if the standing credit facility was rarely used—would risk being interpreted as a policy easing, especially if the central bank has in the past referred to this rate as the "policy" rate. Our judgment is that a reduction in the corridor width to around 200bp would be appropriate for the Russian markets at the current juncture; but, while the central bank is in "learning mode" and account needs to be taken of a number of changing factors in both the domestic and international markets, the central bank should proceed cautiously and with regular re-evaluation of the situation.

37.   Finally, rationalizing (reducing) the number of policy rates and maturities should make it easier to interpret the market's response to any adjustments, and thus to gauge whether further changes would be beneficial.

B.   Managing Expectations—Improving the CBR's Communication Policy[19]

Good communication can greatly improve the effectiveness of monetary policy. In recent years, the CBR has made important progress in its communication but considerable room for further improvement remains. In particular, the CBR could usefully publish its inflation projections and minutes of policy meetings. Overall communication would also benefit from consistency in the messages sent by the CBR and others.[3]

38.   **Communication policy is an important instrument in a central bank's toolbox**. This is because central bank communication can shape *expectations* about monetary policy, future market conditions, the levels of interest and exchange rates, and, crucially, inflation.

39.   **Central banks have been moving to greater transparency.** In the past, central banks have often been rather secretive and it was believed that policy effectiveness depended on "taking markets by surprise." Over the past twenty years, however, mainstream economic thinking on this matter has changed drastically, and many central banks—in particular inflation targeting central banks—have moved to much greater transparency.[20]

40.   **Good communication can improve the effectiveness of monetary policy.** In part, the trend toward greater transparency has been driven by a call for accountability of increasingly independent central banks. However, an equally important driver has been the realization that central bank communication can greatly enhance the effectiveness of

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[19]Prepared by David Hofman.

[20]For a useful overview of the history of central bank communication and a broad discussion of relevant issues see Blinder et al. (2008) *Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence,* NBER Working Paper No. 13932, and Woodford (2005) *Central Bank Communication and Policy Effectiveness,* NBER Working Paper No. 11898.

monetary policy. Relatively few transactions in the economy take place against the overnight interbank interest rate that is the operational target of many central banks and the main mechanical point of traction for monetary policy. For economic activity, it is generally more important how long-term interest rates and the overall yield curve are affected by the central bank's actions. This, in turn, critically depends on the public's expectations about the future path of short-term interest rates and the future policies of the central bank. Indeed, leaving aside quantitative easing, it is only via expectations that the central bank can influence long-term rates. Managing expectations is therefore a key task of any central bank.

41.   **Anchoring expectations is key for commodity exporters.** In commodity exporters—many of which in advanced economies are inflation targeters (e.g., Australia, Canada, New Zealand)—managing, and anchoring, expectations about future conditions and inflation may be even more important, so as to dampen the short-term macroeconomic volatility that can ensue from volatile commodity prices.

42.   **Central banks can communicate on several topics.** In order to shape expectations about future conditions and policies, central banks may consider communicating in a few broad areas.

- First, a central bank can communicate its policy **objective and strategy**. For instance, an inflation targeting central bank would typically reveal in rather precise terms its inflation target, as well as the time horizon over which the target is to be achieved. A well-known example is the ECB's objective to keep the inflation rate below, but close to, 2 percent over the medium term.

- Second, a central bank can explain, in various degrees of detail, the rationale for current and past **policy decisions** and the process through which decisions have been reached. Examples of this type of communication include post policy meeting statements (CBR) or press conferences (ECB) to explain interest rate decisions, and the publication of central bank meeting minutes (Federal Reserve, Bank of England).

- Third, a central bank can share its views on current **economic conditions and the economic outlook**. Owing to their specific expertise and resources, central banks may have superior information about economic conditions and prospects and sharing this information with the public can help the latter better understand the state of the economy.[21] In addition, such information reveals the central banks interpretation of current and future conditions, which allows the public to understand and anticipate potential future policy actions. For instance, in this context most inflation targeting

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[21] Some evidence for the assumption that central banks possess information superior to that of others can be found, e.g., in Romer and Romer (2000), Federal Reserve Information and the Behavior of Interest Rates, *American Economic Review*, 90(3):pp. 492–457.

central banks publish inflation forecasts, sometimes in the form of "fan charts" that also give a sense of inflation risks surrounding the baseline forecast (e.g., Bank of England, Norges Bank). Information about inflation expectations of the public can also be highly informative and is published by some central banks (e.g., Federal Reserve Bank of New Zealand).

- Fourth, a central bank may communicate directly on the **outlook for future monetary policy**. For instance, some central banks have indicated easing or tightening biases in anticipation of future policy actions. Another example is the Fed's repeated statement that it will keep interest rates low for a protracted period. And some central banks—e.g., Sveriges Riksbank, Norges Bank—go even further and publish a projected path for future interest rates.

43. **Consistent communication in these areas allows the public to learn over time about the reaction function of the central bank.** This makes monetary policy more predictable, and it can thereby help its effectiveness, including by enhancing the credibility of the inflation target and by anchoring inflation expectations.

Communication by the Central Bank of Russia

44. **In recent years, the CBR has made important progress in its communication.** The annually adopted and published monetary policy guidelines (with a 3-year horizon) give an adequate sense of the CBR's inflation objectives. The monthly inflation reports analyze elaborately past and current economic conditions. And the monthly post policy meeting statements provide an explanation of policy decisions and reveal, to some extent, information about the outlook for future policy. The latter statements have recently become more sophisticated by including references to the cyclical position of the economy such as capacity utilization and the output gap.

45. **Still, considerable room for improvement remains.** Four areas for improvement are of particular relevance.

- **Inflation projections**. Thus far the CBR's inflation reports have been largely backward looking. While the reports are thus useful for the public to understand past conditions and policy actions, they provide little guidance with respect to future conditions and policies. For this purpose, it is important that the CBR follows through with its plans to add a forward-looking section to the inflation reports. Eventually, this forward looking section should also include inflation projections over a reasonable horizon. Such projections would provide important information to the public that would allow it to anticipate and understand CBR policies and make monetary policy more predictable. Such predictability, in turn, might help further insulate monetary policy from political influences, thereby strengthening the CBR's de facto independence.

- **Minutes**. To reinforce and support the policy explanations provided in the monthly policy statements and to provide additional information on the decision making process, the CBR could also usefully start publishing minutes of past policy meetings of its Board. This would also enhance the CBR's accountability to the general public. At the start, minutes could be published with a relatively long lag such as to minimize potential sensitivities. Going forward the CBR could experiment with shorter lags, depending on experience and usefulness (the Fed, for example, gradually stepped up the speed of the release of its FOMC meeting minutes, and currently makes them available before the subsequent meeting).

- **"Noise reduction**." For monetary policy communication to be effective, it is important that the various different communications in this area are mutually consistent so that they help guide, and not confuse, the public. In this context, it is important that other government agencies such as the ministry of finance and the ministry of economy respect the CBR's mandate in the area of monetary policy. This implies that generally related communication would be the exclusive domain of the CBR and that any communications by the MoF or MoE on the monetary policy stance or liquidity situation in the banking system will need to be closely coordinated with the CBR.

III.   BANKING SECTOR AND FINANCIAL MARKET CONDITIONS[1]

A.   Recent Developments

Financial Market Developments

1.   **Russian financial markets have been volatile in line with global financial and commodity markets.** Russian equities, sovereign bonds, and the exchange rate largely follow oil prices. Asset prices have been deteriorating since end 2011 in the context of renewed distress in euro area, and oil price volatility; however, they are still well above the trough recorded in 2008/09 when oil prices declined to $40 levels.

Figure III.1. Financial Markets

Russia Equity and Oil prices
(Micex January 2007 = 100, Oil in US dollars)

Sources: Bloomberg

Russia Exchange Rate and Sovereign CDS
(Ruble USD and Euro Basket (0.55 and 0.45), CDS spread in bsp)

Sources: Bloomberg
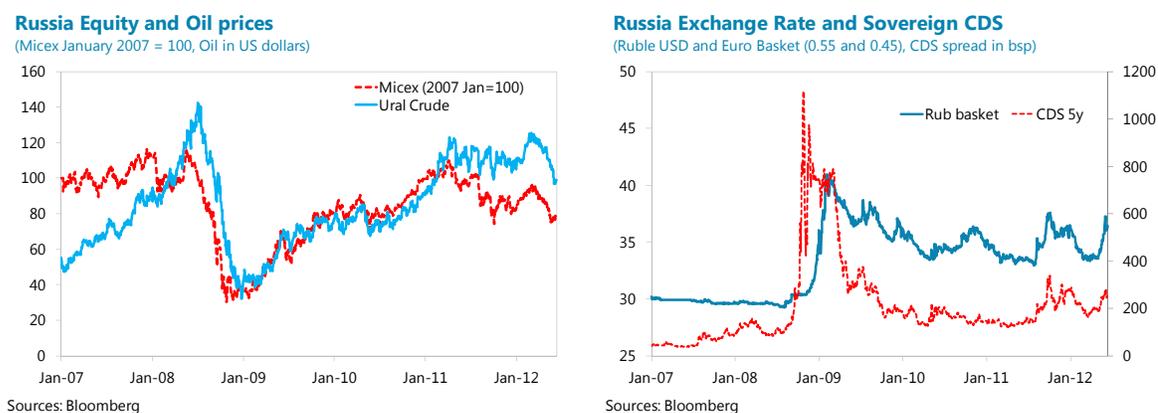
Liquidity Conditions

2.   **The global market turbulence in 2008/09 triggered a systemic liquidity squeeze among Russian banks and corporate.** The systemic liquidity squeeze in global funding markets and oil price declines hit Russian private sector hard. The sharp oil price declines and contraction in global trade reduced cash inflows to the economy. While Russian corporate and banks' external debts are mostly medium- and long-term Eurobonds, the sharp increases in the Libor triggered sudden repayment needs because these bonds are usually issued with embedded options that allow creditors to request early repayment when underlining interest rate exceeds a certain threshold (Figure 2).[2] In addition, bank deposits declined by about 8½ percent, leading to a decrease in the deposit-to-GDP ratio in 2008; some banks experienced about 20 percent declines in household deposits in a matter of

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[1] Prepared by Hiroko Oura.

[2] The spread between the (unsecured) U.S. dollar Libor and euribor and the secured rate (overnight index swap –OIS– rate) is a standard measure of interbank funding distress. It increases when concerns over counterparty risks rise, even with global top-tier financial institutions.

1–2 months (Figure 2). Russian interbank market also exhibited systemic liquidity squeeze with sharp increases in rates, bid-ask spreads, and interest rate volatility (Figure 2).

Figure III.2. Liquidity, Official Funding, and Banks' External Positions

Pressures in global funding markets: Libor-OIS spread 3 month (In basis points)
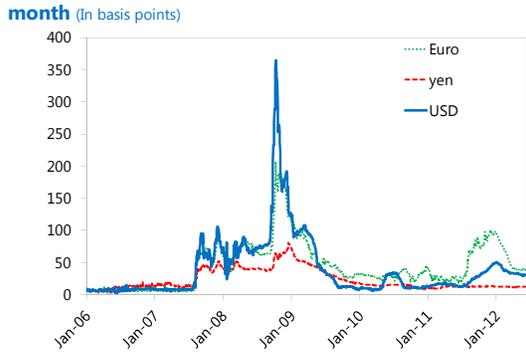
Sources: Bloomberg

Russia-- Moscow Interbank market liquidity, 1 day (In percent)
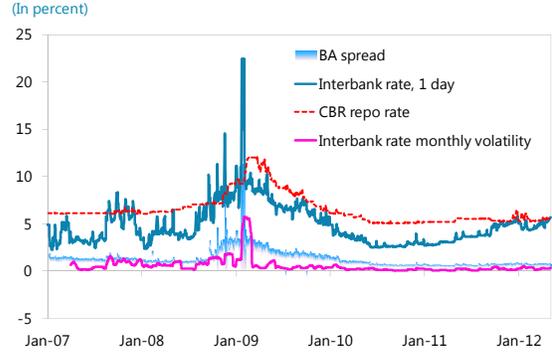
Sources: Bloomberg L.P.

Russia--Bank asset and deposit growth (y/y change in percent)
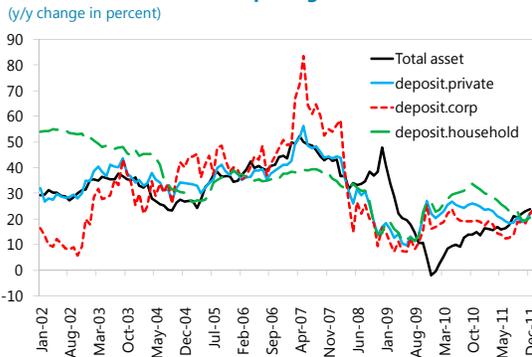
Sources: Haver Analytics

Russia--Deposit from the Private Sector Outstanding (In percent of GDP, end of period)
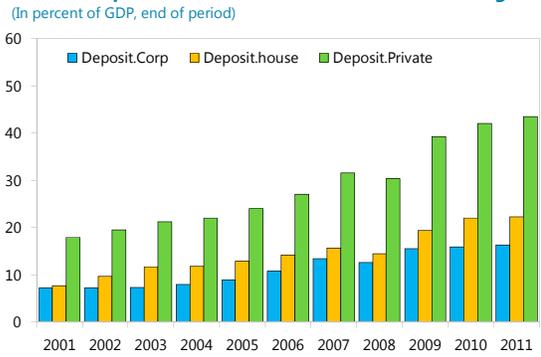
Sources: Haver Analytics

Russia--Banks' position vis-a-vis the CBR (In percent of total assets)
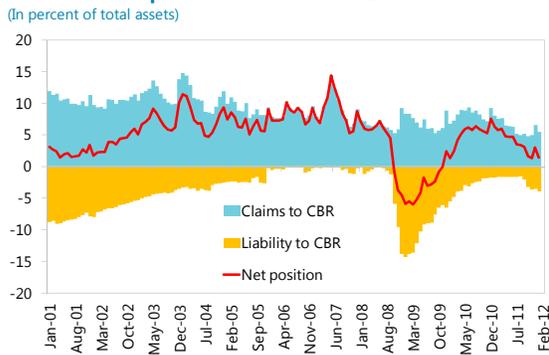
Sources: Haver Analytics

Russia--Banks' position vis-a-vis the General Government (In percent of total assets)
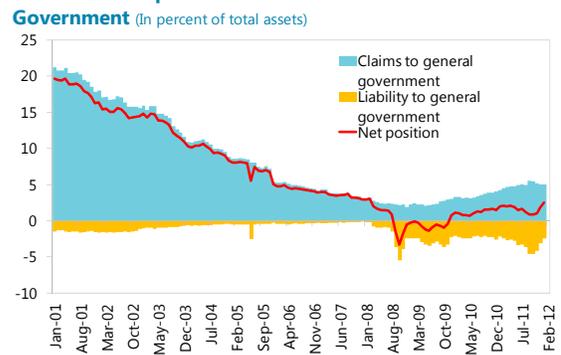
Sources: Haver Analytics

Figure III.2. Liquidity, Official Funding, and Banks' External Positions

Russia--Credit Institutions' Balance Sheet: Foreign Claims
(In percent of total assets)

Sources: Haver Analytics

Russian Banks--Geographical Distribution of Interbank Claims (In percent of total)

Sources: CBR
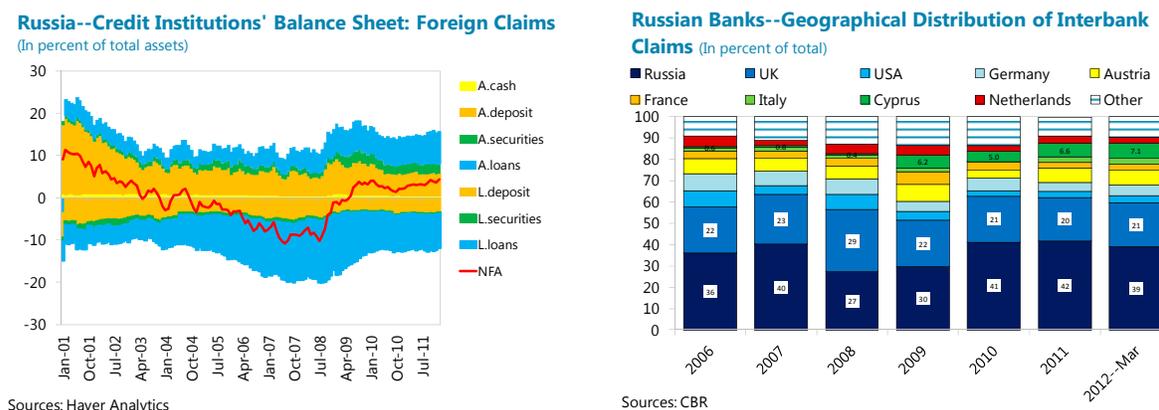
3.   **The emergency official liquidity injection and government commitment to continue providing emergency liquidity if needed successfully limited the impact of the systemic liquidity shock in 2008/09**. The CBR provided liquidity amounting to 10 percent of GDP (Figure 2) by easing existing monetary instruments, introducing new instruments, and helping reduce counterparty risk in the interbank market.[3] Its initial efforts to maintain Ruble value through intervention also eased the FX liquidity need for banks and corporate. The government also supported liquidity conditions by placing its deposit in commercial banks (Figure 2). Going forward, the CBR has made the emergency liquidity assistance a permanent feature of its institutional framework.

4.   **In contrast to 2008/09, banks have weathered the distress in global market since end-2011 well.** The magnitude of external shocks has been moderate so far with smaller declines in oil prices than in 2008/09 (Figure 1) and moderate funding market distress that is more concentrated in euro area (Figure 2, Libor-OIS spread). At the same time, banks have reduced external funding liquidity risks as well: the stock of foreign borrowing has remained subdued since the last crisis time and banks are now a net foreign creditor (Figure 2). Banks also maintains net FX asset position and their FX assets are mostly liquid assets with less than 1 year maturity and held vis-à-vis counterparties located in major financial centers (Figure 2). In addition, solid customer deposit growth continued, raising deposit-to-GDP

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[3] The CBR expanded the list of assets useable as collateral on the Lombard list, including lower-rated securities, non-resident securities, shares, non-marketable assets (loans), and guarantees. The CBR also provided unsecured liquidity and partial guarantee of losses on interbank transactions if the license of the counterparty was revoked during the crisis. The Technical Note on Crisis Management and Crisis Preparedness Frameworks for 2011 FSAP provides more details.

ratio (Figure 2) and interbank market liquidity was broadly maintained with both bid-ask spreads for interbank rates and interest rate volatility remaining at low levels.[4,5]

5.   **The official liquidity support in late 2011 mostly aimed at providing sufficient liquidity to the corporate sector through the banking sector.** Liquidity conditions for Russian non-financial corporate sector tightened in the context of lower oil prices and closure of external funding markets, which made them turn to domestic bank credit instead. As banks' deposit-credit balance tightened through the course of 2011 at the back of strong credit growth (see the next section) and excess liquidity in the system was reduced, the CBR and the government provided liquidity to the banks, which helped ensure financing for the corporate sector.

Credit Growth and its Funding

6.   **Credit growth and bank balance sheet expansion have been strong in 2011.** Nominal credit to the non-financial private sector grew by 25 percent (Figure 3) in 2011 (20 percent in real terms), though the increase in the credit-to-GDP ratio (2 percentage points to 47 percent) appeared less alarming (Figure 3) and the pace was still below the pre-crisis peak of about 40 percent (year on year).[6] The total asset of banks also grew strongly by 23 percent in 2011, indicating that credit grew in tandem with overall balance sheet expansion, rather than asset substitution away from other types of investment, such as securities (Table 1).

7.   **Growth has been particularly strong in the household segment, though from a low base**. Household credit growth continued to accelerate to over nominal 40 percent (year-on-year) in the first months of 2012, though this segment is still small, amounting to 11 percent of GDP (Figure 3). Within household credit, about 20 percent is mortgage and the credit growth has been equally strong in both mortgages and other types of consumer loans (Table 1). Corporate loans grew at more modest rate of nominal 24 percent in 2011, and a significant part of this growth appears to reflect substitution away from foreign funding. Exposures to the commercial real estate segments (construction) are small at about 6 percent of total loans (Table 1), although some market participants consider higher exposure (15–20 percent) once on-lending is considered.[7]

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[4] The authorities indicated there were some pressures in interbank money market that were not picked up by the Bloomberg data. However, these pressures were minor compared to the 2008/09 stresses.

[5] The rise in interbank market rate to the middle of CBR's policy rates corridor reflects structural changes in CBR's monetary policy framework away from foreign exchange targeting and effects from fiscal balances, rather than systemic liquidity shortages in the interbank market.

[6] In 2011, the real GDP growth rate was 4.3 percent, average CPI inflation was 8.4 percent, and the GDP deflator growth rate was 15.4 percent.

[7] Sectoral credit distribution data could be biased as the lack of strict consolidated supervision and monitoring of related party lending could mask the nature of ultimate borrowers.

8.   **The strong credit growth is mostly funded by deposits, though the reliance on central bank funding is rising at the margin.** Household and corporate deposits are over 60 percent of banks' balance sheets, while customer loans amount to 56 percent of the balance sheet (Table 1). Solid deposit growth since the 2008/09 crisis has supported bank funding, but loan-to-deposit ratios started to rise in 2011, comparing less favorable to Russia's peers (Figure 3). Therefore, Russian banks are becoming more dependent on non-deposit funding, especially central bank funding (3.1 percent of the balance sheet in March 2012) at the margin (Table 1).[8] Russia's liquidity indicator scores favorably to other EMs but the banks' maturity gap is marginally rising, reflecting the increasing reliance on the central bank funding (Figure 3).

Financial Soundness of the Banking Sector

9.   **Russian banks regained their strong profitability and the NPL ratio has declined noticeably since the 2008/09 crisis (Figure 4, Table 1)**. Return on assets (ROA) recovered to over 2 percent in 2011. While this is still lower than before the crisis, it is the highest among comparator[9] countries[10,11] The NPL ratio declined from over 10 percent in 2009 to below 7 percent in 2011. However, this decline is due to rapid credit growth, and the amount of overdue and nonperforming loans have not been reduced. Russia's NPL ratio also remains one of the highest among the peer group. In addition, the NPL ratio itself could be underreported due to (i) overvaluation of the foreclosed assets on bank balance sheets, (ii) the transfer of distressed assets to affiliated off-balance sheet entities that are not subject to consolidated supervision,[12] and (iii) doubtful quality of restructured loans.

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[8] The main source of wholesale funding is interbank transactions (10 percent of balance sheet). However, interbank liabilities are mostly offset by interbank claims on the asset side, leaving the net borrowing from interbank sources at 1 percent of the assets (Table 2).

[9] Comparator countries include Brazil, China, India, Turkey, South Africa, Hungary, Czech Republic and Poland.

[10] Return on equity is 18 percent, about median of the range observed for Russia's peers (13–21 percent, excluding Hungary with negative profits), because some countries have more equity capital relative to assets and hence higher capital adequacy ratio.

[11] Strong profitability is the major source for strengthening capital for Russian banks as they have rather limited room for issuing new capital in markets because of state-ownership and limited capital market development. With 2.4 percent ROA, Russian banks can increase their total and core capital ratios by 2.7 percentage points every year, assuming zero dividend payout. Russian banks tend to pay small dividends and have limited pressures for payout due to state-ownership or concentrated ownership.

[12] See 2011 FSAP's Financial System Stability Assessment for details. The FSAP pointed major deficiencies with Russia's practice of consolidated supervision mainly because the definition of consolidated entities is not comprehensive enough.

Figure III.3. Credit Growth and its Funding

Russia--Bank asset and credit growth
(y/y change in percent)
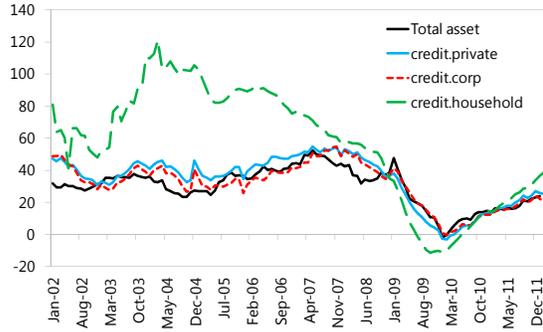
Sources: Haver Analytics

Russia--Credit to the Private Sector Outstanding
(In percent of GDP, end of period)
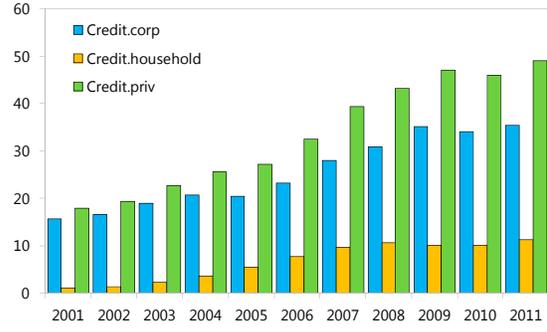
Sources: Haver Analytics

Russia--Loan to Deposit based on Banking Data
(In percent, end of year)
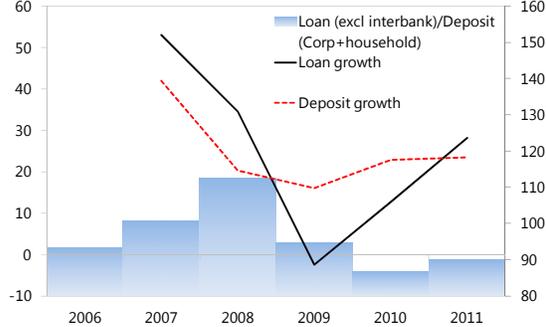
Sources: CBR

Selected EM: Customer Deposit to non-interbank loans 2011 (In percent)
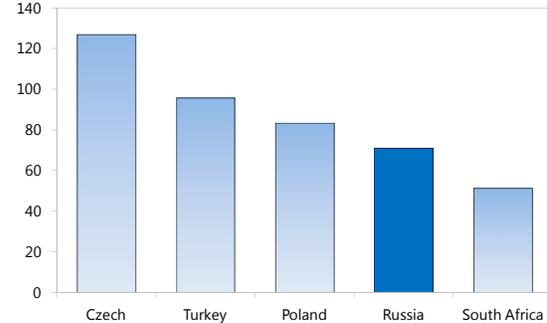
Sources: IMF FSI database.

Russia--Bank Liquidity Indicators
(In percent, end of year)
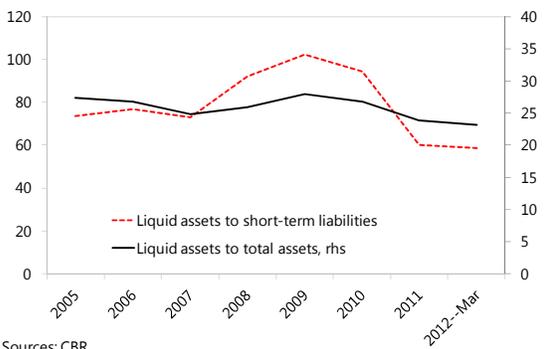
Sources: CBR

Selected EM: Liquid Asset to ST Liabilities 2011
(In percent)
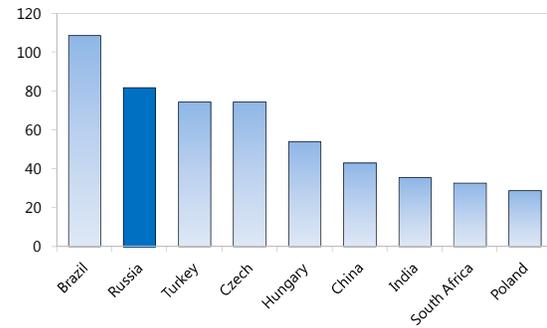
Sources: IMF FSI database.

10.   **Based on reported data, the provision coverage for NPLs appears reasonable, though it may fall short if reporting weaknesses are accounted for.** The total provisions (including those set aside for performing loans) exceeds NPLs, and NPL ratio net of provisions to capital is about 10 percent (median in the peer group). Provision coverage for each of loss and problem loans has also improved slightly. However, as indicated by 2011 FSAP, there is notable uncertainy over the adequacy of provisions owing to substantial discretions allowed to banks regarding the provisioning ratio and the widely varying quality of collateral.[13]

11.   **Rapid credit growth is weighing on capital adequacy.** The regulatory capital ratio for the system declined to 14.7 percent from the peak of above 20 percent in 2009 right after state capital injection. The decline is larger for state-owned banks and foreign banks, with about 4 percentage points decline each in a year since end 2010 (Table 2). The stock of capital remained constant (Figure 4) and the declines are owing to rapid expansion of credit and some tightening of risk weights. This is just about the median of the peer group, but the quality of capital is relatively weak compared to the peers and the core capital ratio is 9.2 percent (Table 1). The introduction of Basel 2.5 and Basel III framework starting in 2013 is expected to reduce capital adequacy further as risk weights will be tightened and the definition of capital will become stricter. Since the minimum total capital ratio will continue to be set at 10 percent,[14] the changes will effectively raise minimum capital ratio requirements.

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[13] The CBR requests all banks to report both on local GAAP and IFRS basis, although regulatory ratios are based on local GAAP.

[14] In emerging and developing economies, minimum capital requirements are often set much higher than Basel requirement (8 percent) partly in order to compensate for larger economic and financial volatilities (NPL ratios in these economies tend to show much larger jumps than those in advanced economies) and for regulatory and supervisory weakness.

Figure III.4. Financial Soundness Indicators for Banks

Russia--Capital Adequacy of Banks
(In percent, in billions of Rubles)
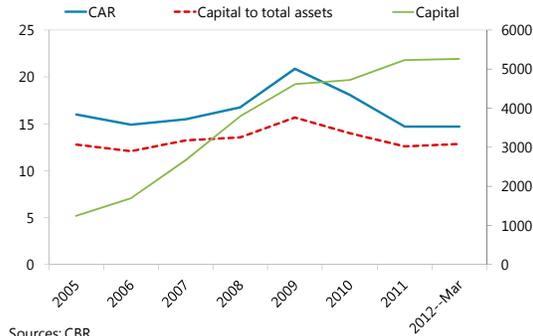
Sources: CBR

Selected EM: Capital Adequacy Ratio 2011
(In percent)
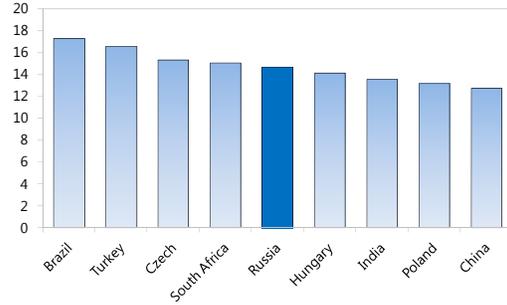
Sources: IMF FSI database.

Russia--Credit Quality
(In percent (left scale) and in trillions of Rubles (right scale))
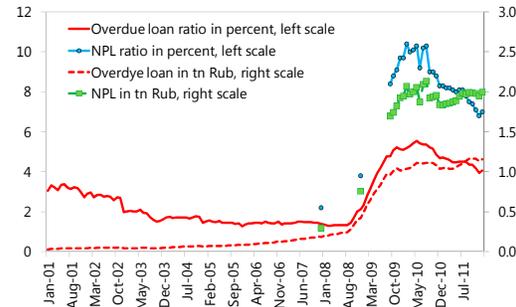
Sources: Haver Analytics

Selected EM: NPL Ratio 2011
(In percent)
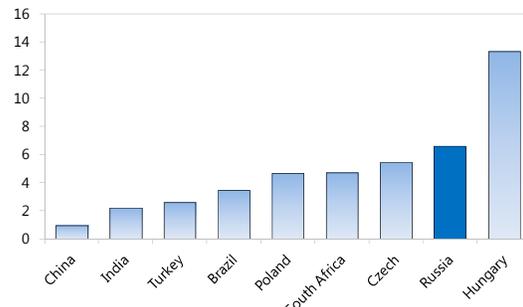
Sources: IMF FSI database.

Russia--Credit Quality and Provision Coverage
(In percent)
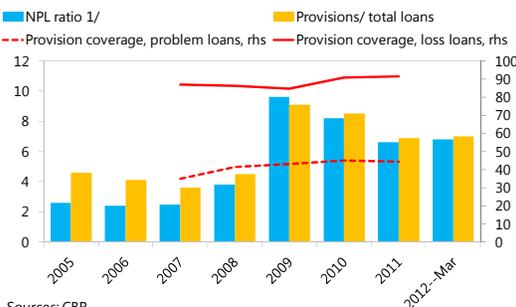
Sources: CBR
1/NPL ratio is defined as the share of problem and loss loans over total loans

Selected EM: NPL net of Provisions to Capital 2011
(In percent)
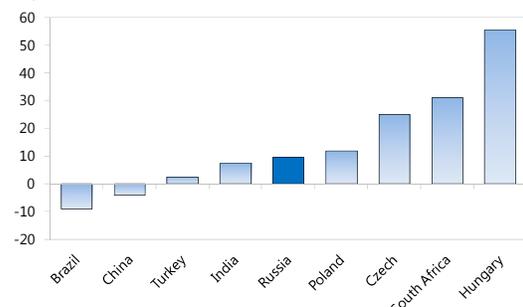
Sources: IMF FSI database.

Russia--Profitability
(In percent)
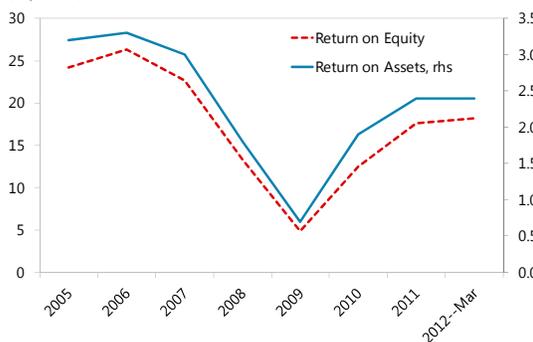
Sources: CBR

Selected EM: Return on Assets 2011
(In percent)
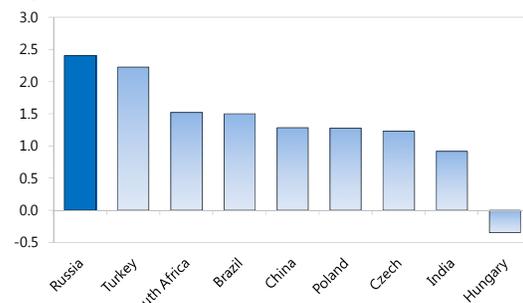
Sources: IMF FSI database and the CBR.

B.   Economic Risks and Resilience Going Forward

Oil Prices: Major Risk

12.   **Volatile external conditions, especially in oil prices, continue to be the main source of risks for Russian banks.** The Russian economy and asset prices are largely driven by oil prices. Declines in oil prices (to US$50–70) with corresponding sharp declines in the GDP growth rate were the main stress scenario considered in the stress testing exercises for the 2011 FSAP. Credit risks are the key risk factors for Russian banks, and oil prices and the exchange rate (which is highly correlated with oil prices (Box 1) are the key drivers for credit quality (Figure 5). According to the results of the tests, the system was broadly resilient with overall capital ratio declining from 18.1 percent to 14.1 percent. However, given the reduced levels of current capital ratio at 14.7 percent (Table 1), the similar magnitude of shocks could make larger number of banks undercapitalized.

Figure III.5: Elasticities of NPL ratio vis-à-vis Macro Risk Factors

Elasticity of Corporate sector NPL ratio
(The impact of one standard deviation shock of each macro variables in percentage points)

Elasticity of Household NPL ratio
(The impact of one standard deviation shock on each variable in percentage point)
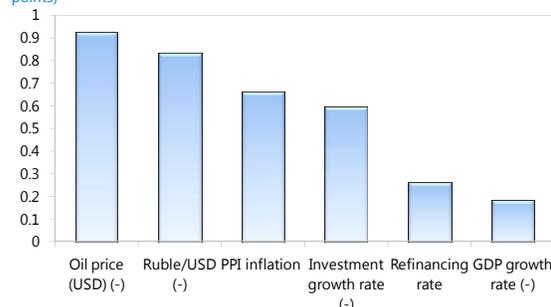
Source: CBR, Technical Note on Stress Testing for 2011 FSAP for Russian Federation
(-) indicates the impact of - one standard deviaiton shock
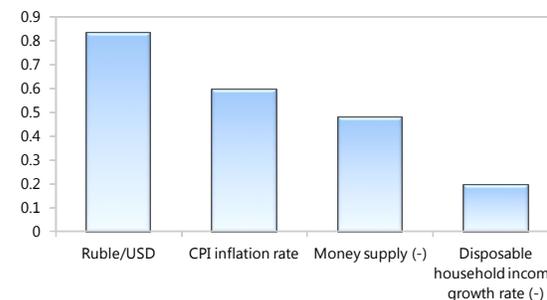
Source: CBR, Technical Note on Stress Testing: 2011 FSAP for Russian Federation.
(-) indicates the impact of - one standard deviaiton shock

Exchange Rate: Manageable Risk

13.   **Russia's exchange rate volatility has risen appreciably since the global financial crisis**. The RUB/USD volatility is highly correlated with economic fundamentals for Russia because oil prices are denominated in U.S. dollars (Box 1). This implies that, as long as the oil market remains volatile, ruble exchange rate volatility is likely to stay at a high level. In addition, the change in CBR's policy framework away from exchange rate targeting could allow more volatility, which would provide the economy an important instrument for absorbing macroeconomic and external shocks.

Selected EM: Net Open FX Position to Capital 2011 1/
(In percent)
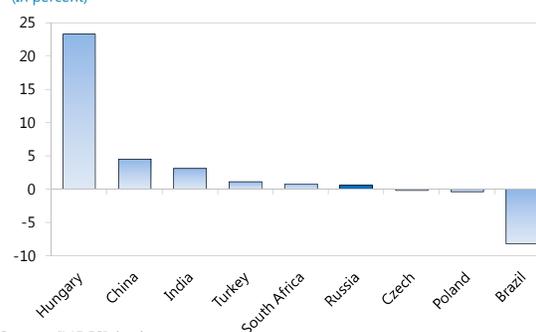
Sources: IMF FSI database.
1/ (FX assets - FX liabilities)/ Capital

14.   **However, Russian banks appear to be well prepared for the direct impact of higher exchange rate volatility**. Russian banks' net open FX position to capital is extremely small at 0.6 percent of capital; and moreover, the banks are now net FX creditors (Figure 2). This means ruble depreciation, on aggregate, is beneficial to banks.

15.   **Indirect impact through credit quality does not appear higher than for ruble loans.** Exchange rate movement could have an impact on banks through its indirect effects: NPL ratio might rise if borrowers obtain FX loans without corresponding FX income.

- About a quarter of total loans are denominated in FX. Most of these loans are to nonresident borrowers, including corporations, banks, and individuals. Resident corporations and financial institutions borrow about 20 percent of their loans in FX, but many Russian corporations have matching FX income. Resident individuals are least likely to have matching FX income, but only 5 percent of their loans are denominated in FX. All loans for the Russian government and government agencies are in rubles (text chart: share of FX loans by borrower type).

Russia: Share of FX loans by borrower type
(In percent, as of March 2012)

Sources: CBR

- Overdue loan ratios by currency indicate a relatively better credit quality of FX loans, despite the increased exchange rate volatility in recent periods. The overdue loan ratio is lower for FX loans for all types of borrowers except for individuals. However, FX lending to individuals (resident and nonresident) are just one percent of total loans.
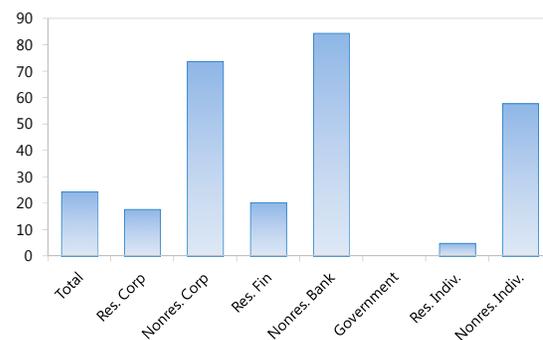
Russia: Overdue loan ratio by borrower type and currency (In percent, as of March 2012)
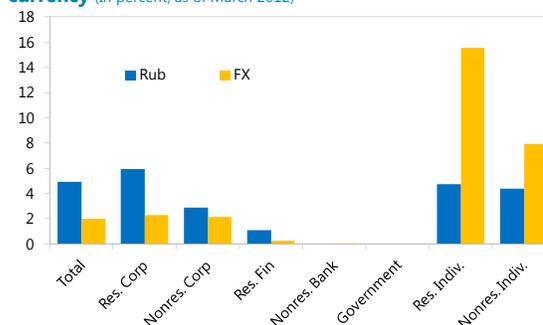
Sources: CBR

Potential Contagion from Exposures to Europe: Manageable

16.   **While overseas investments by Russian banks are rising, the majority of the exposures are vis-à-vis entities that are ultimately Russian, limiting risks from direct spillovers**. Overseas and nonresident investments amount to 14 percent of total assets. Out of this, roughly 40 percent is interbank exposures, 30 percent is loans to nonresident corporations, 14 percent is in cash, and 13 percent is in securities.

- **Interbank exposures**: The country destination of interbank loans by group of banks (Table 2) indicates that (1) most of the exposures are concentrated in state-owned, foreign and large private banks and in major financial centers (U.K. in particular); (2) apart from exposures to banks in London financial center, state-owned banks' exposures appear to be concentrated in Cyprus, where one of the major banks has its subsidiary; (3) and foreign banks' exposures seem to pick-up those vis-à-vis their group companies (Austria and Italy in particular).[15] There

Geographical distribution of interbank exposures: Foreign-owned banks (In percent)

Sources: CBR

is little evidence that foreign banks in Russia are shipping more liquidity abroad: share of interbank exposures within Russia for foreign-owned banks broadly remained constant, although these banks now have larger exposures in Italy and Austria by reducing exposures in U.K., Germany, and other countries.

- **Securities exposures:** The CBR estimates that about 60 percent of the exposures are vis-à-vis ultimately Russian entities. These exposures are in securities issued by entities incorporated in Luxembourg, Ireland, and Cyprus where many Russian banks and corporate establish SPVs for the purpose of issuing Eurobonds.
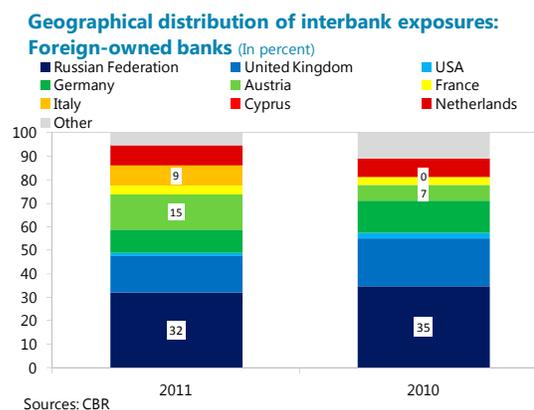
Monetary Tightening in Russia: Manageable

17.   **Risks from higher interest rates appear manageable**. The latest stress test for the top 17 banks (65 percent of the system by assets) conducted in April 2012 indicates that potential losses from higher interest rates are very small compared to capital. In addition, the CBR and market participants see relatively little transmission from policy rates to other interest rates, limiting the impact of higher costs of central bank funding (which is relatively small, at 3 percent of liabilities, Table 1).

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[15] There are over 100 foreign owned banks in Russia, which collectively hold 17 percent of the system's assets (Table 2). However, each bank has very small share of assets. The largest foreign banks include Unicredit (2 percent by assets), Raiffeisen Bank (1.8 percent by assets), and Citibank (0.7 percent by assets).

Box III.1. What Drives Ruble Exchange Rate Volatility?

The ruble exchange rate volatility has evolved, apparently in line with massive market pressures during the 2008-09 crisis time and changes in the CBR's exchange rate policy.[1]

- RUB/EUR volatility was fairly high in early 2000 but then it declined appreciably towards the mid 2000s and remained at much lower levels from 2004 up to the crisis.

- At the same time, RUB/USD volatility was kept at very low levels in early 2000 in the context of exchange rate targeting framework, but then it rose somewhat in mid 2000.

- During the 2008–09 crisis times, the CBR initially raised exchange rate and intervened in FX market substantially in order to defend the exchange rate. However, as the crisis deepened, the exchange rate was let go, the policy rate was cut down, and the CBR pumped liquidity in the banking system. As a result, volatility jumped enormously; 3–5 times of the pre-crisis averages (these differences are strongly statistically significant). The difference between the post-crisis period and pre-crisis period is significant only for RUB/USD volatility, though.

Volatilities of annualized monthly changes in ruble exchange rates (standard deviation in percent 1/)

Period	Average Volatility	
	USD	EUR
00-04	10	33
05-June 08	15	15
Crisis 2/	81	61
May 09-now	37	29
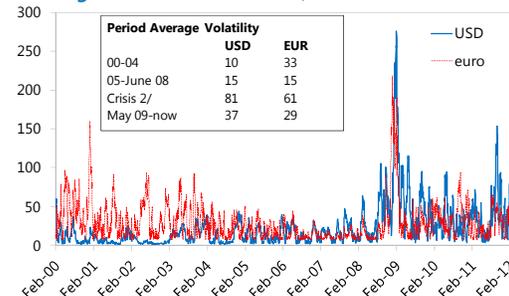
Sources: Bloomberg and Staff Calculation
1/ Volatility is estimated by applying GARCH(1,1) without exogenous variables.
2/ Crisis time is defined as July 2008-April 2009.

In addition to the changes in policy framework, fundamentals, such as oil price movement, also contribute to exchange rate volatility, particularly for RUB/USD.

- The RUB/USD volatility is closely linked to oil price volatilities. A simple empirical model indicates that oil price volatility is closely related to RUB/USD volatility. Oil price volatility dominates the impact of other variables proxying for global risk appetite and financial market distresses (such as stock index volatility indices and Euribor-OIS spreads).[2]

- Overall, the model (with crisis period dummy) explains over 80 percent of the movement of RUB/USD volatility. Much of the pickup in exchange rate volatility is indeed in line with the higher volatility of fundamentals (oil price volatility).

- On the other hand, the oil price volatility plays only a small role in explaining RUB/EUR volatility. Indeed, EUR/USD volatility contributes most to RUB/EUR movement throughout all periods, explaining 30 percent of the total movement. This indicates that, in Russia, RUB/USD variability primarily reflects economic fundamentals and RUB/EUR rate movement picks up the residual volatility in line with EUR/USD.

For both RUB/USD and RUB/EUR, the unexplained residual seems to becoming more volatile, implying that exchange rates have been increasingly driven by factors other than fundamentals or global currency market trends since the global financial crisis. This could be consistent with an interpretation that, among other things, the CBR has become more tolerant for exchange rate volatilities since the crisis.

Box III.1. What Drives Ruble Exchange Rate Volatility? (Continued)

Volatilities of monthly changes in Ruble‑USD exchange rate (standard deviation in percent)
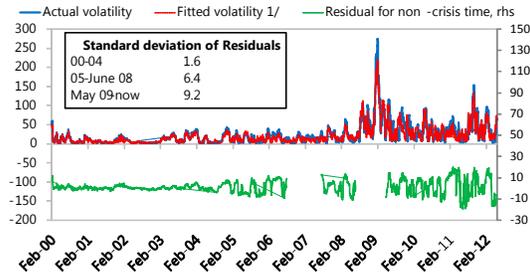
— Actual volatility — Fitted volatility 1/ — Residual for non‑crisis time, rhs

Standard deviation of Residuals	
00-04	1.6
05-June 08	6.4
May 09-now	9.2

Sources: Bloomberg and Staff Estimation

1/ Estimated by regressing actual volatility for monthly exchange rate changes (estimated using simple GARCH (1,1) without exogenous variables) on oil price volatility, with period dummies for 2000 -04, 05-June 08, July 08-April 09, and May 09 -May 2012.

Volatilities of monthly changes in Ruble‑EUR exchange rate (standard deviation in percent)
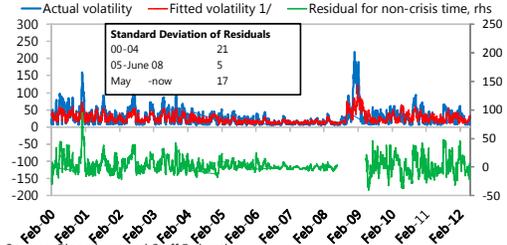
— Actual volatility — Fitted volatility 1/ — Residual for non-crisis time, rhs

Standard Deviation of Residuals	
00-04	21
05-June 08	5
May -now	17

Sources: Bloomberg and Staff Estimation

1/ Estimated by regressing actual volatility for monthly exchange rate changes (estimated using simple GARCH (1,1) without exogenous variables) on oil price volatility, Euro-USD level and volatility, Euribor-OIS spread, and implied volatility for stock index with with period dummies for 2000-04, 05-June 08, July 08-April 09, and May 09-May 2012.

_____

1/ Volatility is estimated by applying GARCH(1,1) process without any exogenous variables to monthly changes in exchange rate. The GARCH estimates capture time-varying nature of volatility more effectively than rolling-window standard deviations.

2/ The short-term changes in Ruble exchange rate are close to random walk, as is typically the case with other exchange rates, and it is hard to establish reasonable empirical relationship with macroeconomic variables. On the other hand, the second moment (volatility) tends to exhibit more sensible empirical relationship with other macroeconomic and financial variables.

Table III.1. Russia Financial Soundness Indicators of Banks, 2007–12

	2007	2008	2009	2010	2011	2012--Mar
Capital adequacy						
Capital to risk-weighted assets	15.5	16.8	20.9	18.1	14.7	14.7
Core capital to risk-weighted assets	11.6	10.6	13.2	11.1	9.3	9.2
Capital to total assets	13.3	13.6	15.7	14.0	12.6	12.9
Risk-weighted assets to total assets	85.6	81.0	75.2	77.4	85.9	87.7
Credit risk						
NPLs to total loans	2.5	3.8	9.6	8.2	6.6	6.8
Loan loss provisions to total loans	3.6	4.5	9.1	8.5	6.9	7.0
Large credit risks to capital	211.9	191.7	147.1	184.6	228.4	222.6
Distribution of loans provided by credit institutions						
Agriculture, hunting and forestry	3.8	4.2	4.9	5.1	4.8	4.8
Mining	3.1	3.3	3.9	3.6	2.9	2.9
Manufacturing	13.5	14.4	15.7	16.0	15.2	15.2
Energy, gas and water	1.7	1.9	2.4	2.6	2.9	3
Construction	6.0	6.1	6.2	5.9	5.6	5.6
Wholesale and retail trade	18.0	17.4	18.4	17.1	15.6	15.8
Transport and communication	3.7	4.3	3.4	3.8	5.4	5.1
Other economic activities	23.3	23.3	21.9	23.7	22.3	21.6
Individuals[2]	24.8	25.1	23.0	23.7	25.3	26.1
of which mortgage loans	5.1	6.6	6.5	6.6	6.7	6.9
Geographical distribution of interbank loans and deposits						
Russian Federation	40.0	27.1	29.5	41.1	41.6	38.8
United Kingdom	23.3	29.1	21.7	21.4	20.2	20.8
USA	4.1	7.1	4.1	2.5	3.0	3.2
Germany	6.8	7.5	4.7	6.0	4.2	5.1
Austria	6.1	5.7	8.2	3.7	6.6	7
France	3.5	4.0	5.7	4.0	2.7	2.5
Italy	1.7	1.5	1.8	0.1	2.7	3.1
Cyprus	0.8	0.4	6.2	5.0	6.6	7.1
Netherlands	2.6	4.6	4.6	2.6	3.2	2.7
Other	11.0	13.1	13.4	13.6	9.0	9.7
Liquidity						
Highly liquid assets to total assets		14.5	13.3	13.5	11.8	12
Liquid assets to total assets	24.8	25.9	28.0	26.8	23.9	23.2
Liquid assets to short-term liabilities	72.9	92.1	102.4	94.3	60.1	58.7
Ratio of client's funds to total loans	94.8	84.6	99.9	109.5	105.3	102.2
Return on assets	3.0	1.8	0.7	1.9	2.4	2.4
Return on equity	22.7	13.3	4.9	12.5	17.6	18.2
Balance Sheet Structure						
Total asset. y/y change in percent	44.1	39.2	5.0	14.9	23.1	…
Total customer loans, y/y change in percent	53.0	34.5	-2.5	12.6	28.2	…
Asset side, in percent of total assets						
Total customer loans	61.1	59.0	54.8	53.7	55.9	56.5
Accounts with CBR and other central banks	6.4	7.4	6.0	5.4	4.2	3.2
Interbank lending	7.0	8.9	9.3	8.6	9.5	9.1
Securities holdings	11.2	8.4	14.6	17.2	14.9	15.3
Liability side, in percent of total assets						
Funds from CBR	0.2	12.0	4.8	1.0	2.9	3.1
Interbank liabilities	13.9	13.0	10.6	11.1	11.0	10.1
Fund raised from organizations	35.0	31.3	32.5	32.9	33.6	32.2
Individual deposits	25.6	21.1	25.4	29.0	28.5	28.9
Bonds, PN and bank acceptance	5.5	4.0	3.9	3.9	3.7	4.3

Source: Central Bank of Russia.

Table III.2. Russia Financial Soundness Indicators Across Banks, end 2011

	All	State-owned	Foreign-owned	Large private	Small-Medium, Moscow	Small-Medium, regional
Market structure						
Number of banks	978	26	108	132	301	355
Share in the sector by assets	100	50.2	16.9	27.5	2.5	2.5
Financial Soundness Indicators (in percent)						
Capital adequacy						
Capital to risk-weighted assets	14.7	14.6	15.6	13.2	22.0	19.5
Tier 1 capital to risk-weighted assets	9.3	8.3	11.6	8.4	18.0	15.2
Capital to toal assets	12.6	12.7	13.1	11.4	17.2	15.3
Credit risk						
NPLs to total loans	6.6	6.7	7.0	6.1	5.7	7.1
Loan loss provisions to total loans	6.9	6.9	6.5	7.0	8.2	8.0
Large credit risks to capital 1/	228.4	186.0	180.8	346.0	266.9	220.6
Share of loans to largest 5 borrowers/total loans	9.0	7.3	9.1	10.8	21.2	17.6
Share of loans to largest 10 borrowers/total loans	13.6	10.8	13.4	16.9	32.9	26.7
Share of loans to largest 20 borrowers/total loans	18.9	14.7	18.3	24.4	44.5	35.4
Distribution of loans provided by credit institutions						
Agriculture, hunting and forestry	4.8	7.4	1.3	2.1	1.2	3.7
Mining	2.9	2.7	3.4	3.3	0.7	0.6
Manufacturing	15.2	16.5	16.5	12.9	6.3	9.5
Production and distribution of energy, gas and water	2.9	3.2	1.2	3.5	0.5	0.9
Construction	5.6	5.0	3.7	7.4	8.8	8.1
Wholesale and retail trade	15.6	13.4	16.0	17.4	36.2	25.5
Transport and communication	5.4	7.2	3.3	3.5	1.9	2.9
Other economic activities	22.3	21.5	19.3	26.2	23.1	17.7
Individuals	25.3	23.1	35.2	23.6	21.3	31.0
Geographical distribution of interbank loans and deposits (asset side)						
Russian Federation	41.6	43.3	32.1	43.8	89.0	98.6
United Kingdom	20.2	28.6	15.4	8.8	0.1	0.0
USA	3.0	2.7	1.4	7.1	1.0	0.0
Germany	4.2	0.8	10.0	4.1	1.5	0.2
Austria	6.6	0.8	14.8	9.9	3.7	0.4
France	2.7	3.0	3.7	0.7	0.1	0.0
Italy	2.7	0.2	8.7	0.0	0.0	0.0
Cyprus	6.6	12.6	0.2	2.1	0.0	0.5
Netherlands	3.2	0.0	8.4	4.0	0.0	0.0
Other	9.0	8.0	5.3	19.4	4.6	0.4
Liquidity						
Highly liquid assets to total assets	11.8	8.3	14.1	15.1	21.8	20.3
Liquid assets to total assets	23.9	18.0	29.7	29.3	36.9	34.5
Interbank loan assets to total assets, excl. CBR	9.5	9.3	16.8	6.2	5.5	6.1
Of which						
Vis-à-vis non-residents	5.6	5.3	11.4	3.5	0.6	0.1
Deposits from individuals to total assets	28.5	33.0	19.3	25.6	26.8	40.6
Funds from organizations to total assets	30.7	25.6	32.0	38.3	38.5	33.0
Interbank loan liabilities to total assets	11.0	10.0	19.3	9.2	4.2	2.4
Of which						
Vis-à-vis non-residents	5.9	4.3	13.5	5.1	0.5	0.1
Ratio of highly liquid assets to demand liabilities	60.1	51.4	80.2	60.8	63.0	64.9
Liquid assets to short-term liabilities	81.6	72.0	92.1	85.8	92.1	95.7
Ratio of client's funds to total loans	105.3	100.3	95.8	114.6	134.7	141.9
Return on asset	2.4	2.8	2.4	1.7	1.5	1.7
Return on equity	17.6	20.6	17.4	14.2	8.0	10.4

Sources: Central Bank of Russia and IMF staff estimates.
1/ Large borrowers are those with loans exceeding 5 percent of regulatory capital.

IV. FISCAL RULES AND RUSSIA'S BUDGET FRAMEWORK[1]

1.   As discussed in [Strengthening Russia's Fiscal Framework](#), Russia already has in place many elements of a budget framework that can help Russia to face future challenges. Unfortunately however, due in part to the crisis, but even before the crisis, this framework has not been implemented in a steadfast way.

2.   For oil producing countries such as Russia, the key challenges are to delink the economy from oil price volatility, ensure that the oil wealth is enjoyed equally by all generations (i.e., intergenerational equity), and promote balanced and diversified economic growth. Best practice suggests this would require:

- Saving some of the oil revenue during an oil boom (and conversely, drawing on savings to protect public services in a (temporary) downturn

- Basing spending decisions on a longer-term perspective (i.e., a credible medium-term fiscal framework)

- Focusing on nonoil indicators, rather than the overall balance, to assess the true stance of fiscal policy

3.   Staff has endorsed the long-term nonoil deficit target of 4.7 percent of GDP specified in the budget code as an appropriate anchor for fiscal policy in Russia and see the multi-year budget approach as in line with best policy. Also, there are two oil funds, a "rainy day" fund—the Reserve Fund—to help smooth out the effects of large swings in oil prices and the National Wealth Fund to save part of the oil wealth for future generations.

4.   Recently however, Russia has been moving away from these positive elements. Fiscal policy has focused excessively on the overall balance, rather than on the nonoil balance, leading to procyclical policies (with the exception of 2009). When the crisis hit, the Reserve Fund was drawn down to finance the budget deficits in 2009 and 2010, as it was intended to do. But as a result, there is now a much smaller buffer left to cushion any sudden drop in oil prices—which is not an unlikely event in the current uncertain global environment—and Russia could be forced to rely on market financing at unfavorable rates (or to cut spending). Last, the medium-term anchor for fiscal policy was suspended during the crisis and the Ministry of Finance has presented a proposal to the government to institute an oil-price rule starting with the 2013 budget. The rule proposed would include a ceiling on expenditures (total revenue at the "base" oil price, plus all nonoil revenues, plus a net borrowing limit of 1 percent of GDP), and oil revenues above the "base" oil price would be saved in the Reserve Fund until it reaches 7 percent of GDP—once the Reserve Fund reaches this threshold, at

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[1] Prepared by Charleen Gust.

least half of excess oil revenues should go to the National Wealth Fund, while the remaining resources would be channeled to the budget to finance infrastructure and other priority projects. If oil prices are below the "base" oil price, the Reserve Fund would be used to finance the resulting budget deficit. Starting in 2013, the rule will use a 5-year backward-looking average of oil prices as the base, which will gradually increase to a 10-year average by 2018.

5.   There are several broad approaches to long-term management of oil wealth. The desirability of any approach depends on the country's specific circumstances, and the role of country institutions. In the case of Russia, looming demographic challenges imply significant fiscal risks—stemming from potentially sizeable future pension and healthcare expenditures due to expected increases in population aging and longevity—and hence, there is a need to preserve a share of today's oil wealth to ensure future generations can also benefit, particularly once oil reserves have been depleted.[2] Calls on contingent liabilities, both explicit and implicit, can also have major fiscal costs (Box 1). Best practice calls for a periodic reassessment of the long-term target implied by any rule, based on oil-price stress tests and developments in the oil markets, oil price futures, and probable reserve estimates. In the short run, fiscal policy may need to deviate from the long-term anchor for stabilization purposes, implying that it could be more desirable to have a higher (lower) overall deficit than indicated by the nonoil balance target during a cyclical downturn (upturn). However, such a policy can be difficult to reverse in practice (i.e., a "deficit bias" problem, meaning countercyclical policies implemented during a downturn are not reversed during an upturn), and to avoid this the government should have a clear and credible plan on how to return to a sustainable fiscal position over the medium term.

6.   The advantages of a nonoil deficit target are that it: (i) focuses on a measure of fiscal policy that excludes oil revenues to give a better picture of the true fiscal stance; (ii) delinks the economy from short-term oil price volatility; (iii) over time reduces fiscal risks while ensuring intergenerational equity; and (iv) encompasses both changes in oil prices and volumes. The drawbacks are that (i) the rule may be difficult to communicate and (ii) the appropriate level of the nonoil deficit needs to be reassessed periodically (see Table 1).

7.   An oil-price rule, appropriately designed, may be a useful alternative for Russia. If supplemented by a ceiling on borrowing or expenditure, it can ensure fiscal sustainability. However, it in principle ignores exhaustibility issues and changes in resource production and fiscal regimes so would need to set the oil price in a way to explicitly address these issues. The advantages of the oil-price rule are that it: (i) can delink the economy from oil price volatility and (ii) may be easy to communicate (or allow for more focused communication).

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[2] Staff estimates suggest that the old-age dependency ratio (the ratio of the population age 65 and older to the working age population) is projected to nearly double from around 18 percent to 36 percent between 2010 and 2050, about the same pace as in advanced economies.

The drawbacks are that (i) extra constraints are needed to ensure both fiscal sustainability and intergenerational equity, which could make the rule harder to communicate, and (ii) the rule only reacts to changes in oil prices, not oil volumes (see Table 1).

Box IV.1. Fiscal Risks in Russia

In addition to policy and macroeconomic shocks, calls on contingent liabilities have major implications for fiscal sustainability. Contingent liabilities can be either explicit or implicit. Explicit contingent liabilities are obligations based on contracts, laws, or clear policy commitments. They include, for example, state loan guarantees and export guarantees. Implicit contingent liabilities sometimes arise from expectations that the government would intervene in the event of a crisis or disaster or when the opportunity cost of not intervening is considered to be unacceptable. Implicit contingent liabilities include, among others, bailouts of public enterprises, financial institutions, subnational governments, and private firms that are either strategically important or "too big to fail."

Research by IMF staff (see Contingent Liabilities: Issues and Practice) suggests that in terms of incidence, the most widespread form of contingent liabilities is guarantees, particularly loan guarantees, which exist in virtually all countries. In terms of the overall impact, however, implicit liabilities are the most serious, especially financial system bailouts.

To help mitigate fiscal risks and their potential costs, international experience and best practice (see Fiscal Risks: Sources, Disclosure and Management and Contingent Liabilities: Issues and Practice) suggests a set of guidelines for fiscal risk disclosure and management:

- Fiscal risks to which the government is exposed should be identified and disclosed, so as to facilitate an effective conduct of fiscal policy;
- Fiscal risks should be mitigated in a cost effective manner;
- There should be a clear legal and administrative framework to regulate overall fiscal management and the government's exposure to fiscal risks; and
- Fiscal risks should be systematically incorporated into fiscal analysis and the budget process.

In Russia, fiscal risks are not systematically identified and disclosed nor systematically incorporated into fiscal analysis and the budget process. To date, events such as the failure of the Bank of Moscow in summer 2011 and the subsequent $14.2 billion recapitalization operation paid for through the state deposit insurance corporation (DIA) have not entailed a cost to the state budget. However, they clearly illustrate the need for Russia to put in place structures to identify, disclose, and manage fiscal risks. Other research suggests that including the debt of quasi-sovereigns (e.g. companies and banks of which the government is a shareholder) would increase Russia's public-debt-to-GDP ratio by an extra 10 percentage points by 2020.

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8.   With respect to the flexibility of the rules to a structural (or fundamental) break in oil price dynamics, the nonoil deficit target could be more effective in delinking the budget from oil price cycles. If the benchmark oil price is linked to past oil prices (e.g., a moving average) as currently considered, the fiscal stance implied by the rule would only reflect a permanent

shift in oil prices with a lag. For example, if oil prices are expected to converge to a lower level of long-run prices compared to current prices, the fiscal stance implied by an oil price rule would be expansionary until the moving average fully captured the shift to lower prices. For this reason, some countries (e.g., Mexico) use an oil price rule that incorporates both past and future oil prices. In contrast, the nonoil deficit rule relies on the present value of oil wealth and thus is forward-looking by design if the rule is reassessed periodically in line with best practice.

Table IV.1. Pros and Cons of Nonoil Deficit Target vs. Oil Price Rule		
	Pros	**Cons**
Nonoil deficit target	• Focuses on the nonoil deficit which is the relevant variable for an oil-producing country • Delinks the economy from oil price volatility • Ensures both fiscal sustainability and intergenerational equity • Encompasses both changes in oil prices and volumes	• May be difficult to communicate • Needs to be reassessed periodically
Oil price rule	• Delinks the economy from oil price volatility • Easy to communicate	• Needs to be supplemented with additional constraints (e.g. expenditure ceiling, "reverse-engineered" oil price) in order to ensure both fiscal sustainability and intergenerational equity, which could make the rule more difficult to communicate • Does not explicitly take account of changes in oil volumes

9.   Staff's assessment is that the currently-suspended nonoil deficit target of 4.7 percent remains an appropriate anchor for Russia. Based on assumptions from the April 2012 WEO, a Permanent Oil Income Model using a real criterion rule (i.e., one where the government provides a constant stream of services in real terms) would be consistent with a nonoil deficit of about 6 percent of GDP by 2015, allowing for greater consumption of oil wealth up front, but would mean a lower level of consumption of the oil wealth in the outer years (see text chart).[3] Stress testing suggests that the appropriate range for the nonoil deficit by 2015 would be between 4 and 8 percent of GDP—as such, 4.7 percent of GDP appears to be appropriately conservative and would allow the Reserve Fund to be gradually rebuilt out of the resulting overall surpluses (see Table 2 and text chart). Staff's estimates suggest that the rule currently under consideration by the ministry of finance would lead to a nonoil deficit that would be higher than under a POIM-real rule through 2020 and would not generate sufficient surpluses to rebuild the Reserve Fund in a meaningful way (see text chart).

Transition Paths: General Government Nonoil Primary Balance

Source: IMF staff estimates.

Reform Scenario: Nonoil Balance, Reserve Fund and Target (Percent of GDP)

Source: IMF staff estimates.

Oil Price Rule: Nonoil Balance, Reserve Fund and Target (Percent of GDP)
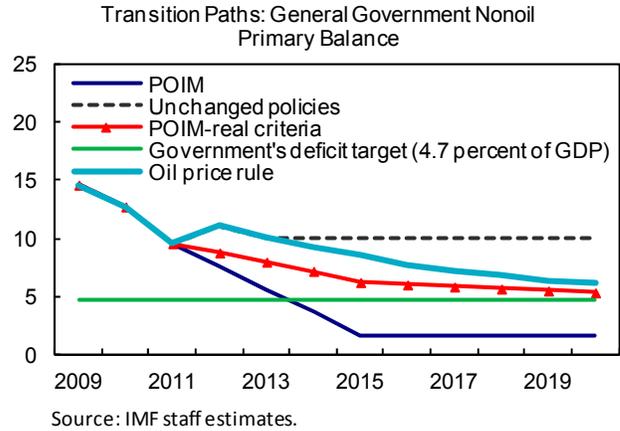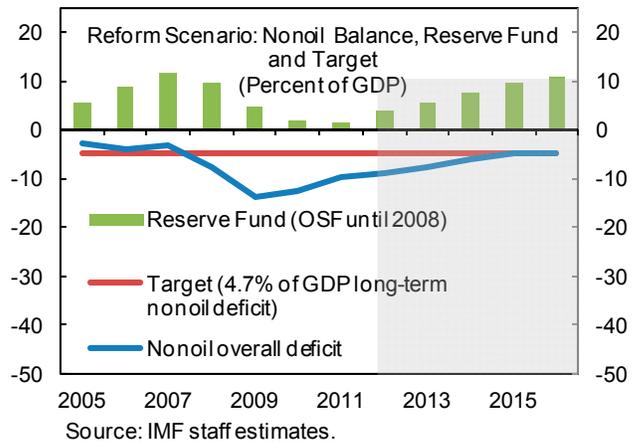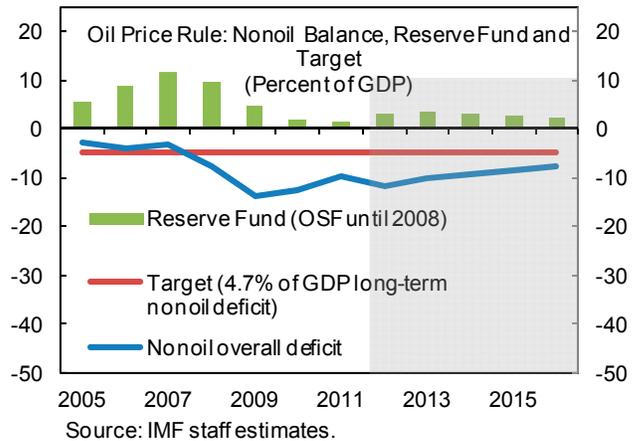
Source: IMF staff estimates.

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[3] A standard POIM rule, which implies a stable nonoil deficit on average over time, is also shown for completeness. Such a rule would imply a very large consolidation in the medium-term but would allow a higher level of consumption of oil wealth in the outer years (i.e. after oil runs out) than under the POIM-real criterion rule.

Table IV.2. Sensitivity Analysis for POIM-Real Approach

Nonoil primary deficit by 2015 (in percent of GDP)	
Scenario	Result
Baseline parameters	6.2
Sensitivity tests	
Long-run Urals oil price (baseline = US$95/barrel)	
Higher oil prices (US$120/barrel)	7.3
Lower oil prices (US$70/barrel)	5.2
10-year average price (2011-2002, US$55.70/barrel)	4.7
Long-run gas price (baseline = US$330/tcm)	
Higher gas prices (US$400/tcm)	6.8
Lower gas prices (US$260/tcm)	5.7
10-year average price (2011-2002, US$203.40/tcm)	5.3
Combined shocks to oil and gas prices	
Higher oil and gas prices (US$120/barrel and US$400/tcm)	7.8
Lower oil and gas prices (US$70/barrel and US$260/tcm)	4.7
10-year average price (2011-2002, US$55.70/barrel and US$203.40/tcm)	3.7
Oil reserves (baseline = 100, oil runs out in 2049)	
Higher oil reserves (130, oil runs out in 2061)	6.8
Lower oil reserves (70, oil runs out in 2038)	5.4
Gas reserves (baseline = 100, gas runs out in 2091)	
Higher gas reserves (130, gas runs out in 2116)	6.3
Lower gas reserves (70, gas runs out in 2067)	6.0
Effective oil and gas tax take (baseline = 35%)	
Higher oil tax take (+5 ppt)	7.3
Higher oil tax take (-5 ppt)	5.2
Long-run real interest rate on financial assets (baseline r = 4.0)	
Higher r = 4.5	6.5
Higher r = 3.5	5.9
Long-run real growth rate (baseline y = 3.0)	
Higher y = 3.5	6.2
Higher y = 2.5	6.3

Source: IMF staff simulations

10.   To be credible and lasting in an uncertain environment, fiscal anchors and associated targets need to be flexible. As noted in Fiscal Frameworks for Resource Rich Developing Countries, there is a tension between rigid fiscal rules that have a high risk of becoming obsolete and allowing too much discretion to undermine credibility. To reduce this tension, the following practices can be considered:

- The focus should be on procedural rules rather than on fixed numerical targets; for example, Chile's framework identifies the fiscal variable to be targeted (structural balance) and lays out the process by which specific targets are determined;

- The reliance should be on a "flexible" guideline instead of a rule (e.g., Timor-Leste and Norway); and

- There should be explicit revision clauses (e.g., targets to be reassessed every four years).

11.   Ultimately, the main lesson to be drawn from international experience is that the specific form of any rule to guide the formulation of fiscal policy frameworks is less important than consistent implementation of the rule. In this regard, while staff see Russia's current budget framework as good with no real need to change it, whatever fiscal rule Russia decides to choose, the key to success will be to apply it as steadfastly as possible.

12.   In terms of how to reduce the nonoil deficit to a level consistent with intergenerational equity, simulations using the IMF's Global Integrated Monetary and Fiscal (GIMF) Model may be instructive.[4] The current 2012–14 medium term budget would leave the nonoil deficit at about 9 percent of GDP by 2014, nearly double the level of 4.7 percent of GDP that staff considers appropriate. If instead the authorities were to reduce the nonoil deficit gradually to 4.7 percent of GDP by 2015 (i.e., adjustment of about 1.5 percent per year, starting this year) using growth-friendly instruments, in this case, reductions in government consumption and transfers, while there would be a short-term drag on growth, there could be a positive effect on growth in the medium term.

Table IV.3. Additional Budget Consolidation Measures by GIMF Instrument To Reach Nonoil Deficit Target
(percent of GDP)

	2012	2013	2014	2015	4-year total	Share of total consolidation
Government consumption	0.229	0.385	0.367	0.319	1.3	24.4
General transfers	0.711	1.197	1.139	0.990	4.0	75.6
Total	**0.940**	**1.582**	**1.505**	**1.309**	**5.3**	**100.0**

Source: IMF staff estimates

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[4] See "Is Russia's 2011–13 Budget Growth-Friendly" in Russian Federation: 2011 Selected Issues Paper for details of the GIMF model and how it has been applied in the Russian context.

13.   Potential measures to achieve the needed fiscal savings of 5.3 percent of GDP include:

Government consumption:

- Reducing wages as part of civil service reform (the 2011–13 medium-term budget had envisaged savings of 0.9 percent of GDP);

- Further reducing subsidies to support public or private enterprises (1.3 percent of GDP was originally part of the crisis-related stimulus in 2010, of which only 0.4 percent of GDP was included in the 2011-13 medium-term budget);

- Improving the efficiency of expenditures at the regional level (1.1 percent of GDP as estimated by the World Bank's 2011 Public Expenditure Review);

General transfers:

- Gradually phasing out poorly-targeted social assistance programs (1 percent of GDP as estimated by the World Bank's 2011 Public Expenditure Review);

- Increasing the pension age to 65 for both men and women by 2050 and reducing early pensions (potential savings by 2020 would be about 2.7–3.7 percent of GDP based on simulations from Reforming the Public Pension System in the Russian Federation (forthcoming Working Paper));

- Reduce/eliminate tax expenditures (estimated by the Russian Ministry of Finance to be 1.5 percent of GDP in 2010).

14.   The credibility of the consolidation package matters greatly for the effects on growth. In a scenario where the package is immediately credible, among other effects, agents perfectly foresee the reduction in interest rates that would follow such a consolidation and immediately increase consumption and investment which boosts growth. A more realistic approach might be for agents to fully believe that the amount of consolidation they see in each period is permanent ("earned credibility"). In this case, the initial contractionary effects of the consolidation package are muted (since agents perfectly foresee the benefits of the consolidation). In Russia, since the

Impact of credibility on reform scenario

- change in deficit (percent of GDP, RHS)
- real GDP (credible immediately)
- real GDP (credible in 2016)
- real GDP ("earned credibility")
- real GDP (credible in 2014)
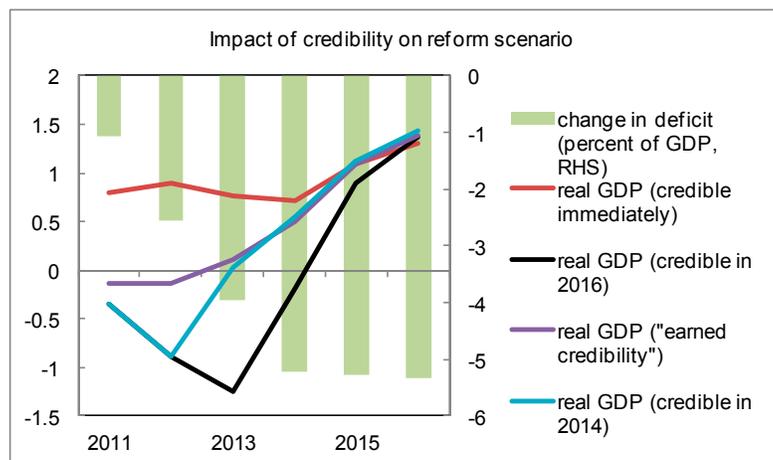
fiscal policy framework needs strengthening, it is more likely that the authorities would have to build "credibility by doing." In this case, agents see the consolidation as credible starting in 2014. The impact on growth is initially more negative than in the "earned credibility" case, but becomes positive in 2013 and converges to the "earned credibility" case subsequently. Last, if agents only believe that the consolidation package is credible once the entire package has been put in place (i.e., in 2016), the short-term contractionary growth effects are the largest. But even in this case, the impact on growth is positive starting in 2015 (i.e., even before credibility is fully achieved).