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The impact of financial sanctions
on the Russian economy ☆

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Abstract

This paper examines the impact of the current Western financial sanctions on the Russian economy. Modeling the capital flow components (accounting for the influence of other factors, including falling oil prices) reveals that sanctions have directly affected sanctioned state-controlled banks, oil, gas and arms companies by severely constraining foreign funding and have indirectly affected non-sanctioned companies by reducing inflows of foreign direct investment and causing funding conditions to deteriorate. The overall negative effect on gross capital inflow over 2014–2017 is estimated at approximately $280bn. However, the effect on net capital inflow is significantly lower ($160–170bn) due to Russian companies' self-adjustment, which is evidenced by their utilization of foreign assets accumulated earlier for debt repayment and an overall decrease in gross capital outflow. The sanctions' estimated effect on GDP is significant (–2.4 p.p. by 2017, compared with a hypothetical scenario with no sanctions) but 3.3 times lower than the estimated effects of the oil price shock.
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1. Introduction

In March 2014, the EU, the U.S. and a number of other states introduced the first sanctions against Russia in connection with the situation in the Crimea

and eastern Ukraine. At first, these were individual sanctions against specific people and companies that were not significant to the Russian economy as a whole. However, in July 2014, additional sectoral sanctions were imposed that limited foreign financing for leading public banks and oil and gas companies and restricted Russian oil and gas companies' access to advanced production technologies. In response, Russia imposed an embargo on a wide range of agricultural products from Western countries in August 2014. Today, there seems to be no chance of the sanctions being lifted any time soon, although the situation in Ukraine has somewhat stabilized: in June 2015, the EU announced the extension of the sanctions until at least the end of the year (and in December 2015, they were further prolonged until July 31st, 2016 at the very least), while the U.S. actually expanded the list of companies falling under its sectoral sanctions. In turn, Russia prolonged its food embargo for another year.

Although the sanctions have now been in force for quite some time, there still has been no convincing evaluation of their effects, and there is no consensus on their qualitative impact. For example, speaking before the U.S. Congress in January 2015, B. Obama said that "the Russian economy is in tatters,"[1] although some economists believe that the sanctions are of little or no significance. An IMF (2015) report on the Russian economy indicates that the sanctions and retaliatory sanctions may lead Russia to experience a reduction in GDP of 1.0%–1.5% over the short term, although the accumulated loss may reach 9.0% of GDP over the medium term. However, this report fails to explicate what is considered "short term" and "medium term". A. Shirov et al. place the direct impact of the sanctions between 8% and 10% of Russia's GDP but posit that compensating measures may reduce this figure significantly. However, the Shirov study does not explicate the time horizon over which this effect may be achieved (Shirov et al., 2015). According to experts at the Bank of Russia, the sanctions chipped away 0.5% of Russia's GDP during the first year they were in effect and 0.6% during the second year (Sinyakov et al., 2015). However, the immediate effects of the sanctions were assessed rather tentatively: these authors assumed only that Russia's private sector lost all access to the foreign capital markets. Rautava (2014) and Vercueil (2014) consider the overall effects of the uncertainty associated with Ukraine. The first study (published before the sectoral sanctions were adopted) estimated the impact as a 1 p.p. reduction in the 2014 GDP growth rate (Rautava, 2014). The second study indicates that in a "de-escalation" scenario in which financial sanctions were gradually lifted, GDP would grow an additional 2 p.p. in 2015 than it would under the scenario of a standing conflict in eastern Ukraine. However, no method of evaluating this effect was cited. Boulanger et al. (2015) considered only the impact of Russia's retaliatory sanctions on public welfare: based on their static model, the authors estimated a reduction of 0.25%.

This paper aims to study the financial channel of the sanctions' impact on the Russian economy that is associated with limits on foreign borrowing. As a result of their economic nature, such borrowing limitations are similar to a sudden stop of capital inflow, i.e., a precipitous decrease in foreign capital inflow. Indeed, the value of foreign capital inflow changed dramatically: in 2014, foreign liabili-

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[1] https://www.whitehouse.gov/the-press-office/2015/01/20/remarks-president-state-union-address-january-20-2015.

ties in the private sector decreased by USD 37 billion, which sharply contrasted with an increase of USD 115 billion in 2013. An important feature of this drop is that capital flow reversals typically occur as a result of decisions made by investors that are driven by economic logic, whereas in this case, the drop occurred due to administrative restrictions.

First, we evaluate the impact of the sanctions on the basic components of the financial account and calculate how sanctions influence the net outflow of capital from Russia. Then, we conduct a scenario analysis (for the medium term) of the impact of additional capital outflow on certain macroeconomic and fiscal indicators.

We assume that there are only limited effects over the medium term with respect to oil and gas sanctions (due to reduced production) and technological sanctions (due to slower productivity growth caused by problems with importing dual-use products). Thus, the changes in capital flows and the corresponding adjustments in balance of payments considered in this paper are likely to be the most significant consequences of the sanctions in the foreseeable future. The prevalence of the financial effects of the sanctions during the first years, resulting in reduced investment and consumption, is also noted in other works (IMF, 2015; Sinyakov et al., 2015; Shirov et al., 2015). Unlike these studies, our research presents a more detailed analysis of the impact of sanctions on basic macroeconomic indicators as well as on the components of the balance of payments.

2. General approach to evaluating the impact of sanctions on capital flows

The sanctions were mostly directed at banks (Sberbank, VTB, Gazprombank, Rosselkhozbank, Vneshekonombank, Bank of Moscow) and major publicly owned companies in the fuel/energy sector (Rosneft, Transneft, Gazpromneft) and in the military-industrial complex (Uralvagonzavod, Oboronprom, OAC, etc.). The financial sanctions for those companies in the real sector are expressed in the ban on borrowing with a maturity that exceeds 30 days. However, according to Orlova (2014), there are actually two additional forms of sanctions. First, there are the more severe SDN sanctions that prohibit foreign exchange payments (affecting banks and companies whose owners were subjected to personal sanctions). Second, many Russian banks are affected by the so-called "soft" sanctions, which means stricter technical control over transactions that typically slows down their execution, thereby significantly increasing transaction costs.

The main channels of the sanctions' influence on the real sector (the next "stage" of their impact on the economy) are considered by Ulyukaev and Mau (2015). Their classification includes the following components:

- Increasing uncertainty (beginning even before the sectoral sanctions were introduced) slows down consumption due to rising precautionary savings (often in USD) and dwindling investments due to higher risk premiums;
- Increased cost of debt financing limits access to refinancing, thereby affecting investment opportunities for companies. Moreover, restrictions on technology exports to the Russian Federation constrain the potential growth of total factor productivity; and
- Production in sectors dependent on imported components suffers from the ruble's sharp fall.

The effects of the financial sanctions were magnified because the Russian financial system was consistently opening up and gradually integrating into global capital markets during the preceding period. In 2006, the main restrictions on capital account transactions were lifted, and net inflow began to grow. The 2008 global financial crisis put an end to that; however, the values of both gross inflow and outflow of capital for Russia remained quite high, i.e., between 3% and 6% of GDP.

In the end, by the time the sanctions were imposed, borrowers had accumulated debt to non-residents of USD 733 billion (equivalent to 35% of GDP in 2013) (see Table 1). Of that debt, 10% was owed by the public sector (as narrowly defined), 29% by banks and 62% by the non-financial sector. According to the Bank of Russia, 12% of the total amount consisted of short-term debt that was to be repaid within a year, with over 25% of such debt in the banking sector. Notably, at that moment, the assets accumulated by Russian economic agents exceeded liabilities by 15%. However, the assets and liabilities were differentially distributed among the various sectors: banks and the public sector had positive net assets (USD 38 billion and USD 472 billion, respectively), whereas the non-financial sector had negative net assets (–USD 318 billion).

This paper considers only the effects of the first group of sanctions—the financial sanctions—as the most significant. Concurrently, further analysis shows that restrictions on credit to Russian borrowers are having substantial additional implications that should also be taken into account to evaluate the full effect of the sanctions. We offer the following classification of the effects of the financial sanctions.

Direct effects mean restrictions placed on the foreign borrowings of Russian issuers. In theory, Russian banks and companies can find alternative creditors, but this option is limited in practice as a result of the globalization of the financial

Table 1

Balance of foreign assets and liabilities across various sectors of the Russian economy (USD billion).

	as of July 1, 2014
Net	192
Assets	1513
Liabilities	1321
Including foreign debt	733
Including short-term	86
General government and the Central Bank	472
Assets	548
Liabilities	76
Including foreign debt	73
Including short-term	8
Banking sector	38
Assets	309
Liabilities	272
Including foreign debt	209
Including short-term	54
Other sectors	–318
Assets	656
Liabilities	973
Including foreign debt	451
Including short-term	24

Source: Bank of Russia.

system, which has actually become a single marketplace. For example, the likelihood of redirecting borrowings to the financial markets of East and Southeast Asia is low due to the weak starting positions of Russian borrowers in Asian markets, in addition to Asian investors' concerns about possible negative reactions from U.S. regulators.

Indirect effects. The persistent geopolitical tension, the potential for new sanctions or an expanded interpretation of existing sanctions by U.S. and EU regulators, in addition to the chance that Russia will impose changes to the "rules of the game" (e.g., restrictions on capital transactions) are viewed by investors as an important source of additional economic risk. Thus, the attractiveness of the Russian economy for Russian and foreign investors has been significantly reduced. As a result, the direct effects of restricted access to foreign borrowings are magnified by the indirect effects of reducing the net capital inflow into Russia due to higher financial risk. While the direct effects limit foreign borrowings for issuers that are subject to the sanctions, the indirect effects have more components: reduced borrowings for all other issuers, a decreased inflow of foreign direct and portfolio investment and (possibly) increased outflow of Russian capital.

Reaction to the sanctions. The direct and indirect effects that prevent foreign debt from being refinanced are different from other effects due to their personalized nature, i.e., they affect specific issuers, as well as the economy as a whole. The "affected" issuers can react to the sanctions in a number of ways, ranging from buying in domestic foreign exchange market funds to repay the debt, to selling accumulated foreign exchange assets in an amount that is sufficient to make foreign debt payments. As shown in our further analysis, each of these areas plays an important role in determining the overall estimated effects of the sanctions.

Second-order effects involve changes in key macroeconomic indicators (exchange rates, prices, exports and imports, etc.) in response to reduced net capital inflow. Such a shock should be followed by an adjustment in the balance of payments by means of a combination of an increase in the current account and the spending of FX reserves by the Central Bank. The mechanisms for these adjustments were considered by Gurvich and Prilepskiy (2013), who note, in particular, that capital inflow in developing countries depends mostly on its foreign supply rather than on domestic demand.

The impact of the sanctions cannot always be definitively decomposed into the aforementioned channels. For example, it is clear that a sharp decrease in the debt liabilities of banks not specifically targeted by the sanctions can be explained as an indirect effect. However, a similar reduction in the liabilities of banks on the sanction list may be caused by both direct and indirect effects, i.e., the unwillingness of countries that did not impose sanctions to lend to them due to their concerns about the potential negative reactions by U.S. and EU regulators. As a result, we attempt to evaluate the overall changes in capital flows after sanctions were imposed. Thus, to the best of our ability, we define certain categories of effects that can be identified. For example, we separately calculate the impact of sanctions on gross capital inflow (mainly associated with the actions of foreign investors) and gross outflow (which we consider to be a reaction of Russian banks and companies to changes in capital inflows).

The direct effects of the sanctions during the first months are shown in Table 2: the amount of foreign debt securities and public banks' syndicated loans was re-

Table 2

Repayment of foreign loans by banks subject to sanctions during the second half of 2014 (USD billion).

Bank	Debt securities	Syndicated loans	Total
Sberbank	0.9	4.2	5.1
VTB	0.1	3.1	3.2
Gazprombank	1.7	1.2	2.9
Total	2.7	8.5	11.2

Note: The Bank of Moscow and Rosselkhozbank had no foreign liabilities to be repaid during the second half of 2014.

Source: C-bonds.

duced by USD 11.2 billion during the second half of 2014[2]. This result demonstrates that those banks and companies affected by the sanctions were, to a great extent, forced to forego refinancing their foreign liabilities.

However, the direct effect alone cannot account for the sharp decrease in gross capital inflows into the Russian economy. Thus, the amount of foreign liabilities in the banking sector dropped by USD 30.8 billion during the second half of 2014. This finding means that the extent of the indirect effects in terms of debt financing might have been twice as significant for the banking sector as the extent of the direct effects. In turn, foreign liabilities in the non-financial sector decreased by more than USD 15 billion despite the fact that the major companies affected by the sanctions (e.g., Rosneft and Gazpromneft) had no foreign debt securities to be repaid during that period.

Moreover, according to the Bank of Russia, during the second half of 2014, the foreign debt of the banking and non-financial sectors decreased by USD 83.6 billion and that of banks and companies that were more than 50% publicly owned fell by USD 41.1 billion (without considering liabilities to direct investors). Although the Bank of Russia does not provide information regarding the contribution of transactions and FX revaluation to changes in foreign debt by private and public companies separately, we can conclude that on a qualitative basis, the effect for private banks and companies (those not directly affected by the sanctions) is at least comparable to that for public companies, even if only debt obligations are counted. Thus, we stress the high significance of the other channels of the sanctions' impact, which include, in particular, the decreased availability of borrowing options for the private sector as a whole. As a result, the share of refinancing for foreign liabilities has decreased significantly. As shown in Table 3, during the last few quarters, this share has been considerably lower than historical indicators for both the banking and non-financial sectors: the "trough" for the non-financial sector was reached during the first quarter of 2015 against the background of generally increasing uncertainty concerning the prospects for the Russian economy related to falling oil prices, and this rate remains close to zero for the banking sector.

Notably, indirect reactions to the sanctions include reduced gross capital inflows not only to the financial and non-financial sectors but also to the public

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[2] Hereinafter, when we speak of the changing amounts of foreign liabilities, we mean their changes through transactions, not through FX revaluation. Sources for such statistics include the Bank of Russia and C-bonds. This analysis enables the impact of sanctions on capital flows (which are reflected in changes in foreign debt) to be distinguished from changes in debt due to a weaker ruble (which is significant under conditions in which approximately $^1/_5$ of the foreign debt of Russian issuers is denominated in rubles).

Table 3
Estimated indicators of refinanced foreign debt under sanctions (%).[a]

Period	Banks	Other sectors
2Q 2015	5	98
1Q 2015	7	60
4Q 2014	19	74
3Q 2014	56	93
Average for 2Q 2013 through 4Q 2013[b]	120	120
For reference:		
2010	157	113
2011	144	183
2012	174	142

[a] The change in foreign debt from transactions, divided by anticipated foreign debt repayments (from the schedule published by the Bank of Russia).
[b] Changes in the capital inflow during the first quarter of 2013 were primarily caused by the deal between BP and Rosneft and are not included in the calculations for this reason.
Source: authors' calculations based on Bank of Russia data.

sector. According to the Bank of Russia, non-residents began to sell government bonds as early as the first quarter of 2014 against the backdrop of the initial escalation of the Ukraine situation and resumed selling during the third quarter of 2014, which was likely due to concerns about the possibility of Western sanctions and capital flow restrictions by Russian regulators. The capital outflow from the public sector broke a record during the first quarter of 2015 (–USD 7.8 billion); in this case, however, a significant contribution was made by the downgrading of Russia's sovereign rating, which was likely to have automatically led to sales of securities by many institutional investors.

Apart from the effects related to changes in the behavior of economic agents investing in Russian assets, the sanctions also resulted in changes to the decisions made by Russian banks and companies regarding investment in foreign assets, i.e., in an active *reaction.* This effect was most noticeable during the third quarter of 2014, when the banking sector reduced its foreign asset holdings by USD 29.9 billion in anticipation of major foreign debt repayments during the fourth quarter (by comparison, an average of USD 1.1 billion in assets was accumulated between the second and fourth quarters of 2013). A similar trend was observed in the non-financial sector: beginning in the third quarter of 2014, asset accumulation slowed abruptly (both in terms of direct and portfolio investment and in the "grey" outflow, including balance of payments categories such as "net errors and omissions" and "fictitious transactions related to foreign merchandise trade, etc.").

The overview of the changes in capital flows following the imposition of sanctions is presented in Table 4, which contains financial account indicators for the four quarters of the sanctions (i.e., the second half of 2014 and first half of 2015[3]), as well as for similar periods from preceding years. These data show an increase in net capital outflow from Russia after sanctions were imposed. Borrowing and foreign direct investment were reduced the most.

However, all of the observed changes in capital flows cannot be attributed to the effects of the sanctions. The magnitude of these changes depends on many

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[3] We will call this period the "sanction period" for brevity.

Table 4
Certain components of the balance of payments (USD billion).

Sector	July 2010–June 2011	July 2011–June 2012	July 2012–June 2013	July 2013–June 2014	July 2014–June 2015
General government	3.5	8.1	13.8	1.5	–9.9
Liabilities	3.5	8.1	13.8	1.5	–9.9
Banks	1.8	5.0	–13.7	–19.2	–8.5
Debt liabilities	31.6	24.3	33.8	0.1	–37.3
Assets	–29.8	–19.3	–47.5	–19.3	28.8
Other sectors (without cash foreign currency)	–14.9	–2.9	–23.2	–1.0	–55.8
Direct investment	–16.8	–19.2	–18.2	–12.6	–35.7
Liabilities	45.6	38.3	70.6	39.3	2.2
Assets	–62.3	–57.5	–88.8	–51.9	–37.9
Loans	1.8	16.3	41.4	11.5	–20.2
Liabilities	1.8	16.3	41.4	11.5	–20.2
Cash foreign currency	6.7	0.2	4.0	–17.2	–10.9
Total	–3.0	10.5	27.2	–36.0	–85.1
Liabilities	82.5	87.0	159.6	52.5	–65.1
Assets	–85.5	–76.6	–132.4	–88.4	–20.0

Note: The signs are used in accordance with the Fifth Edition of the IMF's Balance of Payments and International Investment Position Manual (BPM5).

factors, such as export revenues (most importantly) as well as the exchange rate, interest rates, investment demand, etc. Next, we examine the basic factors that must be taken into account in evaluating the effects of the sanctions:

- The considerable impact on capital flows during the period since the third quarter of 2014 was caused not only by restrictions on foreign financing but also by falling oil prices and the associated revised forecasts of the prospects and investment attractiveness of the Russian economy;
- A significant portion of registered capital flows (approximately 40% according to some experts' estimates) is related to funds transferred from Russian companies to their foreign affiliates (often offshore) and vice versa. Obviously, such transfers should only notionally be considered capital inflows or outflows; and
- The reduction of capital outflows (primarily from the non-financial sector) can be explained not only by the reaction to the sanctions but also by the measures taken by the government and the Bank of Russia to "de-offshorize" the economy and to prevent "grey" capital outflow.

The analysis must also consider that capital flows are traditionally characterized by high quarterly volatility (e.g., since the 2008–2009 crisis — and even before the sanctions — the standard deviations for both gross inflows and outflows were approximately 50% of their mean values). This volatility cannot be explained by changes in the variables generally used in the models by leading expert organizations, such as the IMF (Nier et al., 2014), ECB (Fratzscher, 2011), or IIF (Koepke, 2013): first, the differential between interest rates in Russia and those in developed countries and, second, the VIX volatility index calculated by the Chicago Board Options Exchange.

Thus, to correctly evaluate the effects of the sanctions, we must distinguish between their effects and those of other factors. The general approach applied in this paper is as follows. For the main components of the financial account, we calculated "normal" values of capital inflow and outflow during the sanction

period, which means that we calculated values that might have been observed without the sanctions but with the actual values of the rest of the exogenous indicators (such as oil prices and the foreign debt repayment schedule). We view the deviation from "normal" by the actual indicators of the financial account as the full impact of the financial sanctions.

Notably, we excluded the fourth quarter of 2014 from the sanction period in determining the estimated effects because the combination of sanctions, falling oil prices and the transition to a floating exchange rate led to panic in the FX market during that period (particularly in December). As a result, the exchange rate was not consistent with the fundamentals (i.e., a clear overshooting occurred), which was confirmed by the ensuing rebound in the exchange rate. This effect, in turn, had a positive feedback with the demand for foreign exchange cash, leading to excessive capital outflow — even when taking the sanctions into account. In other words, the situation at the end of 2014 was caused not only (and not to the greatest extent) by the combination of objectively measured economic factors and sanctions but also by the panic that defies any attempts at modeling.

In the end, for purposes of evaluating the effects for 2014 (more precisely, for the second half of 2014), we used data calculated for the third quarter of 2014, whereas the simulations for 2015 through 2017 were based on the calculated values of deviation for the components of the balance of payments from the "norm" in the third quarter of 2014 and the first and second quarters of 2015. In fact, those periods reflect different external conditions: the continued high oil prices (3Q 2014), the passing of the price "trough", the very high uncertainty regarding economic prospects (1Q 2015), a slight rebound in prices and reduced uncertainty (2Q 2015). The last period is likely to reflect development conditions for 2015 through 2017 most precisely, but the traditionally significant further revision of the balance of payments data by the Bank of Russia and the previously discussed "background" volatility of indicators do not allow the analysis to be solely based on the indicators for the second quarter of 2015. The tentative data for the third quarter of 2015 were used to verify the stability of changes in the balance of payments components that were observed during the preceding quarters.

Of course, the above approach does not eliminate all of the estimation issues. For example, the assumption regarding the influence of internal factors on capital flows still must be taken into account (see below). Accordingly, the evaluations obtained in this manner offer only a general view of the extent of the sanctions' effects.

The scenario analysis of the impact of sanctions on macroeconomic and fiscal indicators, which is to be performed in the second stage, must consider that the effects of the sanctions immediately lead to deviations from the "normal" trajectory of the macroeconomic indicators. For example, the inability to refinance foreign debt will lead at every stage (the unit of time is one quarter) to a reduction in its value compared with the hypothetical "normal" scenario. For this reason, we built two versions of the forecast. The first, the "baseline," provides a step-by-step description of the potential development trajectory without the sanctions and assuming continuously high oil prices (at USD 100 per barrel). In the second version, at every step, the foreign capital not received as a result of the sanctions is deducted. The macroeconomic indicators are then found for the next step, the capital not received is again calculated and deducted, etc. Comparing the indicators for the two versions provides an evaluation of the sanctions' effects.

We also consider two additional scenarios that are characterized by reduced oil prices (between USD 50 and USD 53 per barrel) and that correspond to the Ministry of Economic Development forecast dated October 26, 2015.[4] Considering these scenarios enables us to evaluate the effects of falling oil prices and the sanctions separately, with high and low oil prices. Thus, we can understand whether any synergy occurs when the two negative factors are combined, or if their effects are just added to one another.

3. A quantitative evaluation of the sanctions' effects on capital flows

Next, we will evaluate the effects of sanctions on the financial account. As Fig. 1 shows, the imposition of the sanctions led to a qualitative change in capital flows: the gross inflow became persistently negative for the first time since the 2008–2009 crisis (reflecting the sanctions' direct and indirect effects), whereas gross outflows decreased sharply[5] (reflecting Russian investors' reaction).

We now consider each of the separate components of the balance of payments under the sanctions.

3.1. Changes in debt liabilities

To determine the impact of the sanctions on foreign debt liabilities, we used the indicators of foreign debt refinancing from Table 3, which show that it is gradually decreasing. We believe that this trend can be explained by the reduction in investment demand under conditions of decreasing (see Fig. 2) expected growth rates for the Russian economy (and for growth in domestic demand, ac-
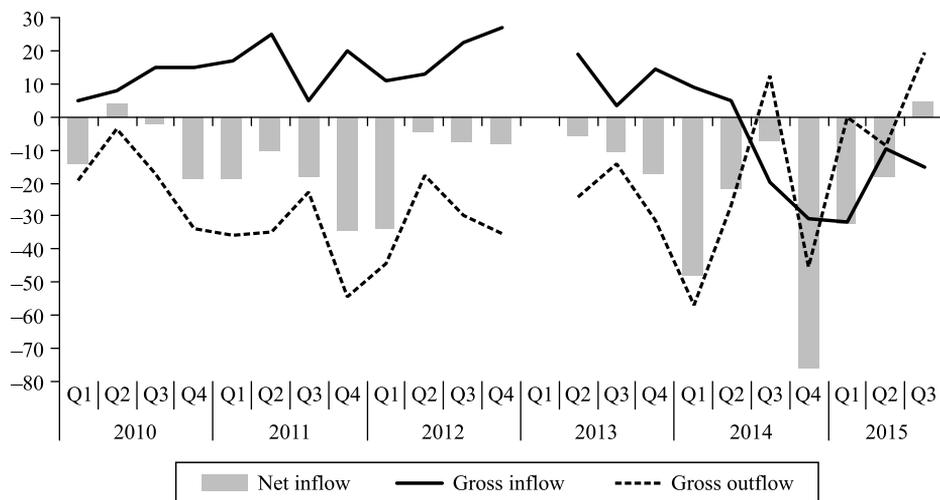

Fig. 1. Private sector capital flows (USD billion).

Source: Bank of Russia. The first quarter of 2013 is excluded because of the effects from the BP-Rosneft deal.

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[4] http://economy.gov.ru/minec/about/structure/depMacro/20151026.

[5] Notably, in accordance with the BPM5, capital outflow is recorded with a minus, which is why a decrease in outflow looks like an increase in its value in the Fig. 1.
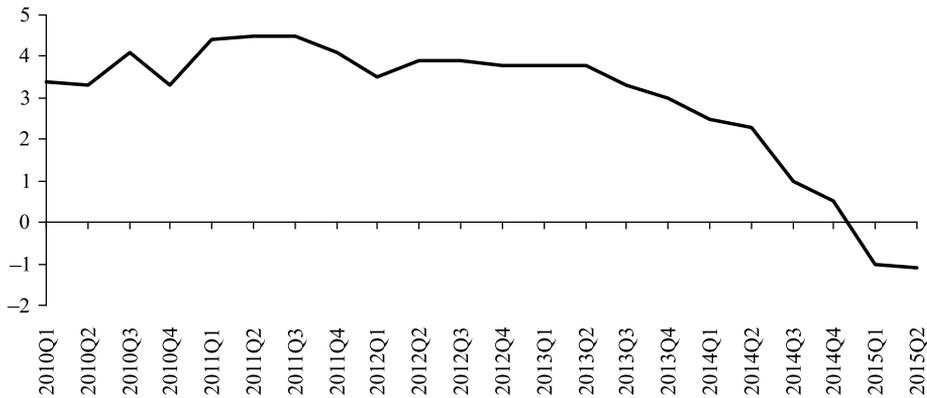
Fig. 2. IMF forecasts of Russian GDP growth for the next calendar year (%).

Source: IMF.

cordingly). However, these expectations had stabilized by 2013, so that the 2013 refinancing value was assumed to be "normal" (as discussed above, the first quarter was excluded from our calculations). During that period, refinancing was at 120% on average for both the financial and non-financial sectors, i.e., the previous debt was refinanced in full, and new debt was added that equaled 20% of the previous debt.

In accordance with the above approach, the share of refinancing of foreign debt under the sanctions was calculated as an average indicator for the sanction period, excluding the fourth quarter of 2014. The resulting refinancing shares are 23% for banks and 84% for the non-financial sector. Thus, the effect due to the sanctions has two components: first, Russian borrowers can only refinance their foreign debt partially rather than in full (as before) and, second, Russian borrowers cannot secure additional loans beyond their refinancing requirements. A preliminary evaluation of the third quarter of 2015 (based on the assumption that the share of debt liabilities in the overall reduction of foreign liabilities for the banking sector during the period was the same as in the second quarter) produces similar estimates of refinancing shares, i.e., 20% for banks and 84% for the non-financial sector, thereby confirming their adequacy.

To evaluate the effects of the sanctions in this area, we applied the calculated indicators of refinancing to the foreign debt repayment schedule that is published by the Bank of Russia. For the second half of 2014, we used data as of July 2014; for subsequent years, we used data as of January 2015.[6] As a result, the first component of the effect of sanctions (reduced foreign borrowing) is evaluated at approximately USD 60 billion in annual terms. The majority of this amount (USD 44.3 billion) consists of borrowings by banks, while the losses in the non-financial sector are only USD 15.6 billion, i.e., slightly more than one-fourth of the total. A comparison of the actual and hypothetical (without the sanctions) trends of foreign borrowing is presented in Fig. 3.

With regard to other components of the financial account, we used a somewhat different method of analysis. To obtain "normal" indicators of capital inflow and

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[6] For 2017, we estimate debt repayments by applying the average maturity estimated on the data for 2015–2016.
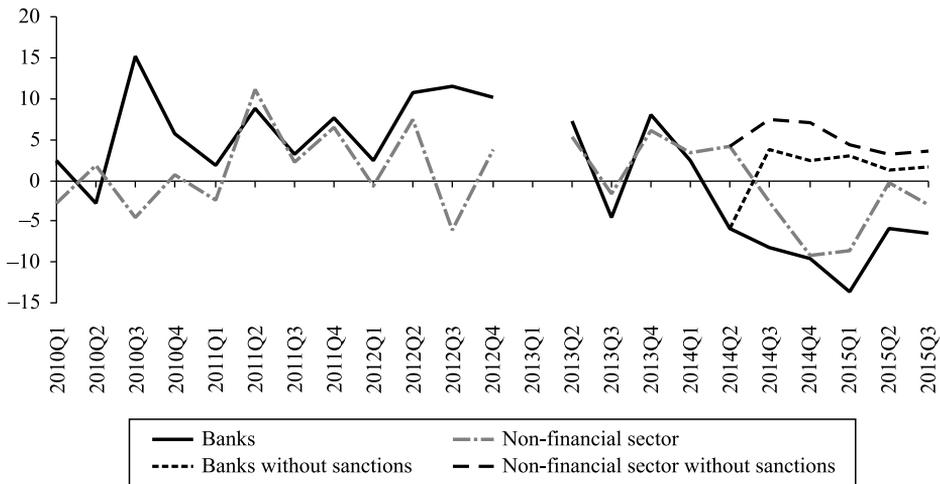
Fig. 3. Changes in the foreign debt of banks and the non-financial sector (USD billion).

Notes: As a result of transactions, not including debt to direct investors. 3Q 2015, tentative estimates.
Source: Authors' calculations based on data from Bank of Russia.

outflow for each component of the balance of payments, we built equations using the quarterly data from after the 2008–2009 crisis to describe the changes in assets and liabilities in the non-financial sector (separately, in USD billion) based on oil prices, GDP, expected economic growth rates, etc. It should be noted that simulations over the short term reduce the precision of the estimates. However, in our opinion, this approach is justified because of the qualitative change in monetary policy by the Bank of Russia, which pursued a gradual transition to inflation targeting and a floating exchange rate. This policy shift, in particular, discouraged the inflow of short-term capital during the post-crisis period due to lower predictability of the ruble's exchange rate.

3.2. Direct investment inflow

For this component, we obtained the following equation (hereinafter, the *t*-statistic values are given in parentheses under the coefficients):

$$fdi\_in = \underset{(5,15)}{7{,}17} + \underset{(2,18)}{0{,}289}\, gdp\_g(-1) + \underset{(1,94)}{0{,}705}\, gdp\_gf + \underset{(36,4)}{25{,}8}\, d\_2013q1 \qquad (1)$$

The direct investment inflow *fdi_in* was determined based on the economic development prospects that we characterized using IMF growth forecasts for the current year (*gdp_gf*) that are published on a quarterly basis (January, April, July, October) and lagged GDP growth rates, *gdp_g*(−1), or the year preceding the current quarter. The dummy variable *d_2013q1* was added to take into account the colossal BP-Rosneft transaction mentioned above.

The modeling results are presented in Fig. 4. The actual inflow was below "normal" by USD 8.8 billion in the third quarter of 2014 and by an average of USD 4.5 billion in the third quarter of 2014 and in the first and second quarters of 2015 (this estimate is used in the medium-term simulation below). The tenta-
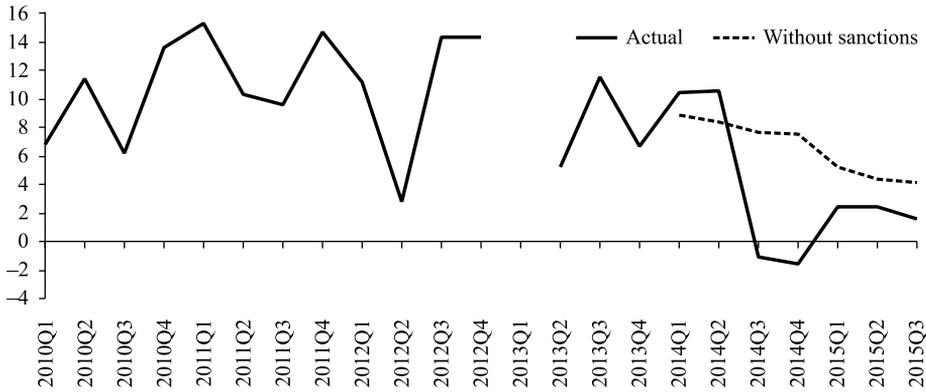
Fig. 4. Direct investment inflow (USD billion).

Source: Authors' calculations based on data from Bank of Russia.

tive evaluation for the third quarter of 2015 produces a slightly lower value of USD 2.5 billion.

3.3. *Portfolio investment inflow (participation in capital; debt instruments are accounted for by the refinancing share)*

This component of capital inflow is substantially affected by the lagged GDP growth rates (quarterly, seasonally adjusted) *gdpsa_g*(−1). Additionally, following the 2008–2009 crisis, a general downward trend in the accumulated portfolio investment and a noticeable seasonality emerged (the inflow is higher in the first quarter, which is taken into account using the dummy variable *d_q*1). The equation for the expected capital inflow uses the following form:

$$p\_in = -3{,}55 + 1{,}16\, gdpsa\_g(-1) + 2{,}36\, d\_q1$$
$$\quad(-4{,}92)\quad\;(2{,}57)\qquad\qquad\quad(3{,}23)$$

(2)

The resulting forecast (see Fig. 5) shows that the actual inflow of portfolio investment was USD 1.7 billion lower than predicted in the third quarter of
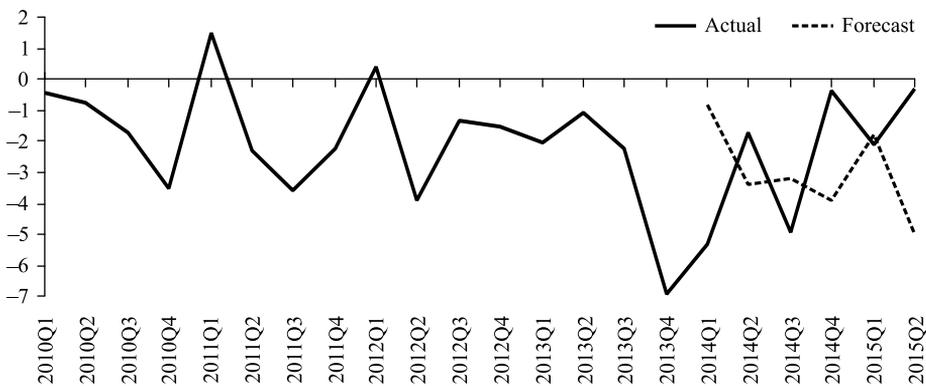

Fig. 5. Portfolio investment inflow (USD billion).

Source: Authors' calculations based on data from Bank of Russia.

2014, USD 0.3 billion lower than predicted during the first quarter of 2015 and USD 4.7 billion higher than in the second quarter of 2015 (the last quarter for which report data are available). The average estimate is low in terms of absolute value; in fact, we consider this component of the overall effect of the sanctions to be insignificantly different from zero and exclude it from further calculations.

3.4. Changes in the foreign liabilities of the public sector

This indicator is relatively stable when measured as a percentage of GDP. From 2010 through 2013, the capital inflow to the government bond market averaged 0.46% of GDP per quarter:

$$public\_in / gdp\_doll = 0{,}00457 \qquad (3)$$
$$(3{,}69)$$

In the third quarter of 2014, this amount was USD 6.2 billion lower than predicted. In the first quarter of 2015, the deviation was even greater (USD 8.9 billion; see Fig. 6), which appears to have been caused by the downgrading of Russia's sovereign rating by Standard and Poor's. Although the revision of the rating was also caused by the sanctions against Russia, the main factor is most likely the drop in oil prices (which is partially confirmed by the calculations below, whose results demonstrate the weak negative impact of the sanctions on fiscal revenues in the medium term). Accordingly, we take into account the impact of the sanctions on capital inflow to the public sector in 2014 but not for 2015 through 2017.

3.5. Direct investment outflow

This component of the balance of payments is determined mainly by GDP in U.S. dollar terms:

$$fdi\_out / gdp\_doll = 0{,}0275 + 0{,}109 d\_2013 q1 \qquad (4)$$
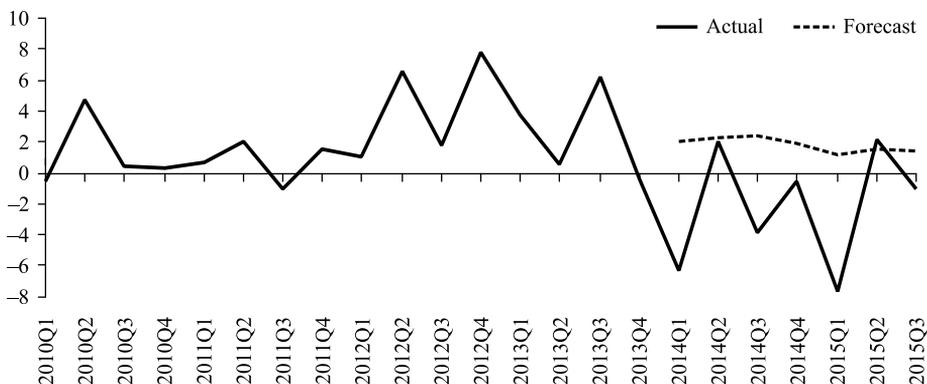$$(8{,}79) \qquad (8{,}70)$$

Fig. 6. Portfolio Investment in Russian government bonds (USD billion).

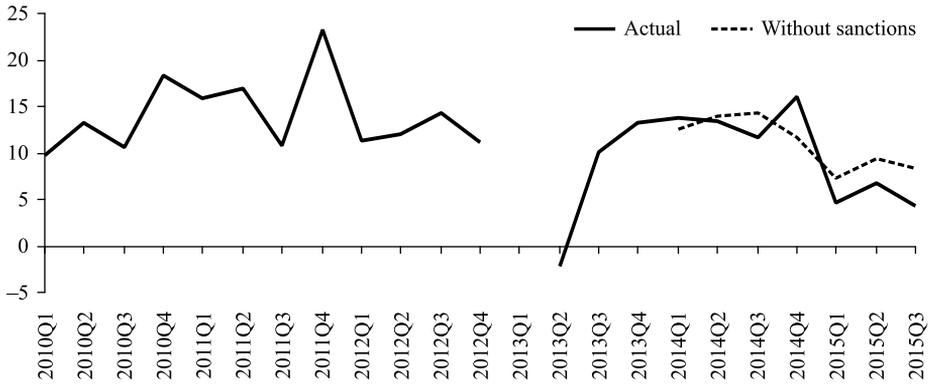*Source:* Authors' calculations based on data from Bank of Russia.

Fig. 7. Direct Investment outflow (USD billion).

Source: Authors' calculations based on data from Bank of Russia.

The outflow was USD 2.6 billion lower than predicted in the third quarter of 2014 (see Fig. 7) and was, on average, USD 3.0 billion lower throughout the sanction period (excluding the fourth quarter of 2014). The tentative estimate for the third quarter of 2015 is USD 4.0 billion.

3.6. Portfolio investment outflow

Oil prices (the *urals* variable) significantly affect the outflow of portfolio investment, probably through the channel of foreign investment by oil and gas companies:

$$p\_out = -2{,}08 + 0{,}026\,urals \qquad (5)$$
$${(-1{,}94)} \quad {(2{,}22)}$$

The outflow was USD 0.5 billion lower than predicted in the third quarter of 2014; and is consistent with the forecast on average for the third quarter of 2014 and the first and second quarters of 2015 (see Fig. 8; according to the tentative estimate, the outflow is USD 0.8 billion higher in the third quarter of 2015). Accordingly, additional deviations in this component are not included in the forecast.
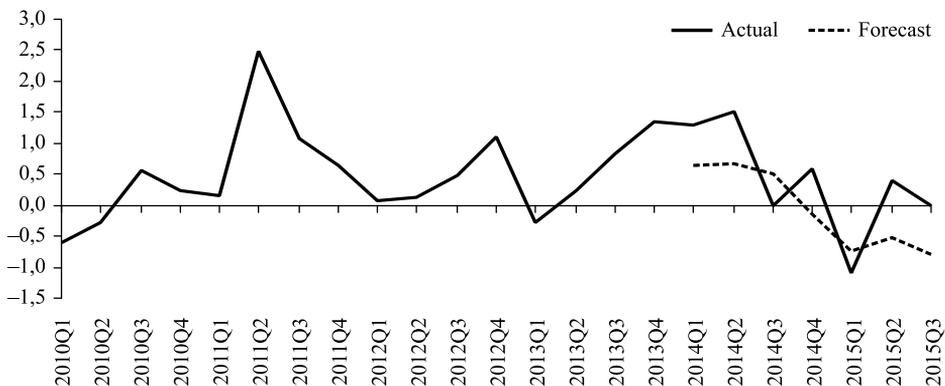

Fig. 8. Portfolio investment outflow (USD billion).

Source: Authors' calculations based on data from Bank of Russia.

3.7. Changes in assets in the form of cash foreign currency

The following equation describes demand for foreign exchange *cash* changes, depending on the nominal exchange rate of the U.S. dollar (the *er* variable).

$$cash = -0{,}141 + 0{,}598\,cash(-1) + 32{,}1(er/er(-1)-1) \qquad (6)$$
$$(0{,}207) \qquad (3{,}13) \qquad\qquad (1{,}82)$$

When estimating the effects of the sanctions in this case, it should be noted that households began to buy foreign currency cash as early as in the first half of 2014, due to the escalation of tensions in Ukraine and the pressure on the ruble from the termination of quantitative easing by the U.S. Federal Reserve. As a result, the increase in the respective assets was considerably higher than predicted (see Fig. 9), and the sanctions imposed in the third quarter did not lead to additional acceleration. On average, for three quarters of 2014, accumulated foreign exchange cash was USD 4 billion higher than predicted. The valuations for the first and second quarters of 2015 are not sufficiently representative in this case because they largely reflect the rebound after the foreign currency purchases caused by the panic during the fourth quarter of 2014 (the rebound continued into the third quarter of 2015). Due to the insufficiency of data used to simulate the period from 2015 through 2017, we do not include the effects of the sanctions in the form of increased foreign currency purchases for this period.

3.8. Other assets

In our opinion, the trends for the other assets of the private sector (which include the "grey" outflow) reflect mostly the reaction by Russian banks and companies to the sanctions. Thus, with respect to the banking sector, these assets decreased by USD 40 billion beginning in the third quarter of 2014, which is close to the amount of the payments under the un-refinanced debt during the period (USD 44 billion). However, the quarterly dynamics were quite volatile. These assets decreased during the third quarter of 2014 for the most part, which was possibly associated with initial concerns about introducing more severe sanctions,
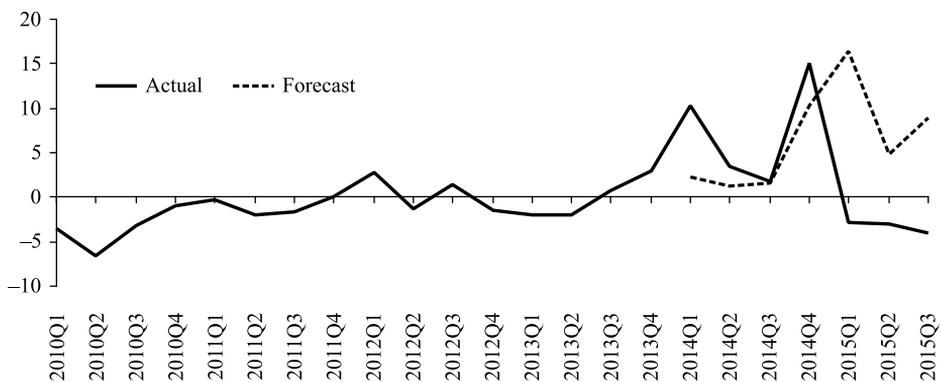

Fig. 9. Asset growth in the form of foreign exchange cash (USD billion).

Source: Authors' calculations based on data from Bank of Russia.

up to and including freezing Russian assets. Subsequently, in the medium-term simulation, we ignored this volatility and simply assumed that the foreign assets of the banking system decrease by the value of the un-refinanced debt (the banks offset losses from insufficient refinancing by means of lower accumulation of other assets).

In the non-financial sector, there was also a tendency toward lower accumulation of other assets (see Fig. 10). However, this trend began even before the sanctions: whereas throughout the period from 2010 through 2013, the outflow of Russian capital through this channel averaged 9.6% of goods and services exports, it has remained consistently below this mark since the fourth quarter of 2013 (and reached a "trough" level of 0.4% of exports in the second quarter of 2014, before the introduction of sectoral sanctions). As noted above, this trend was probably associated with the Bank of Russia's struggle against "grey" capital outflow schemes; however, because it is now difficult to distinguish between this trend and the secondary effects of the sanctions, we assumed that the accumulation of other assets in our estimates decreases regardless of the sanctions. Thus, we consider the secondary effects for the non-financial sector to be zero, which might result in slightly overestimating the overall impact of the sanctions.

3.9. Overall effect for 2014 and the sanction year

In Table 5 and Table 6, we sum up the estimated effects of the sanctions on the financial account components for 2014 and the sanction year. The estimates for direct investment and public sector liabilities were simply multiplied by four to put them into annual terms. We derived estimates for debt liabilities for 2014 based on the refinancing level in the third quarter and the debt repayment schedule for the second half of 2014, subsequently doubling them; for the second half of the sanction year, we used actual refinancing shares. The decrease in bank asset accumulation was calculated as the funds required to repay the un-refinanced
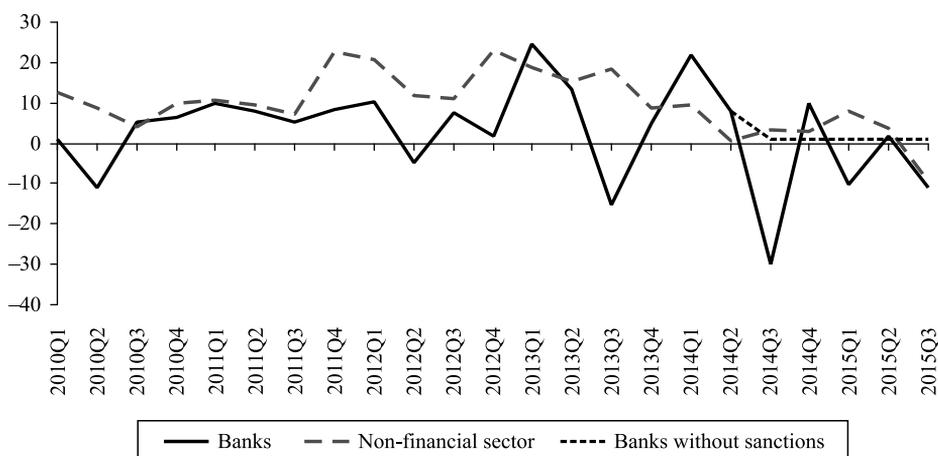

Fig. 10. Other assets increase (USD billion).

Note: We assume that, in the absence of sanctions, asset accumulation by the banking sector would correspond to the average level during the period between the second and fourth quarters of 2013 (USD 1.1 billion).
Source: Authors' calculations based on data from Bank of Russia

Table 5
Actual and calculated capital flows for 2014 (USD billion).

Sector	3Q 2014	Calculated value for 3Q 2014	Estimated effect of the sanctions (in annual terms)
Federal government	−3.9	2.3	−24.8
Liabilities	−3.9	2.3	−24.8
Assets			
Banks	21.7	2.6	−12.2
Liabilities	−8.2	3.7	−38.9
Assets	29.9	−1.1	26.7
Other sectors (without cash foreign currency)	−15.3	0.9	−63.0
Direct investment	−12.6	−6.6	−24.0
Liabilities	−1.1	7.7	−35.2
Assets	−11.7	−14.3	10.4
Loans	−2.7	7.5	−39.1
Liabilities	−2.7	7.5	−39.1
Cash foreign currency	−1.8	−1.7	−16.0
Total	0.7	4.1	−116.8
Liabilities	−15.9	21.2	−138.0
Assets	16.6	−17.1	21.1

Source: Authors' calculations based on data from Bank of Russia.

Table 6
Actual and calculated capital flows for the sanction year (USD billion).

Sector	Average for 3Q 2014, 1Q 2015 and 2Q 2015	Average calculated values for the above quarters	Estimated effects of the sanctions during the sanction year
Federal government	−3.1	1.7	−12.4
Liabilities	−3.1	1.7	−12.4
Assets			
Banks	3.6	1.5	−10.0
Liabilities	−9.2	2.6	−47.2
Assets	12.8	−1.1	37.2
Other sectors (without cash foreign currency)	−10.3	0.1	−41.2
Direct investment	−6.5	−4.9	−6.0
Liabilities	1.2	5.8	−18.0
Assets	−7.7	−10.7	12.0
Loans	−3.8	5.0	−35.2
Liabilities	−3.8	5.0	−35.2
Cash foreign currency	1.4	−7.6	−8.0
Total	−8.4	−4.3	−71.6
Liabilities	−14.9	5.1	−112.8
Assets	6.5	−19.4	41.2

Source: Authors' calculations based on data from Bank of Russia.

debt. In terms of foreign exchange cash, we also considered the effects of the uncertainty during the first half of 2014.

The analysis of these valuations demonstrates that the volume of transactions was dramatically reduced for all items connected with gross capital inflow. The total calculated (annual) decrease in gross foreign capital inflow was USD 138 billion in 2014,

which was equal to 7.3% of the GDP. Approximately 28% of this drop is attributed to the banking sector, 18% to the reduction in public sector liabilities and 54% to the non-financial sector. Thus, the actual reduction in foreign capital inflow has far exceeded the direct effects of the lending restrictions on public banks and companies.

The reductions in foreign capital inflow were partly offset (i.e., by 16%) by a decrease in the outflow of capital, mainly from the banking sector. We estimated the net effect of the sanctions for 2014 as a whole (after taking into account the actions of businesses) as an accelerated capital outflow of USD 116 billion in annual terms (6.2% of the GDP).

The estimates are slightly lower for the sanction year, as Table 6 shows. However, this result is largely explained by methodological factors: as noted above, the downgrading of Russia's credit rating during the first quarter of 2015, and the overshooting of the exchange rate during the fourth quarter of 2014 make it difficult to estimate the effects of the sanctions on "public sector liabilities" and "cash foreign currency" during the first half of 2015. The estimates provided for them in Table 4 only correspond to the second half of 2014, which is why the data in Table 4 can be understood on the whole as the minimum estimate for the impact of the sanctions. Thus, the decrease in the foreign capital inflow was USD 112.8 billion during the sanction year, which equals 5.4% of 2013 GDP. Approximately 42% of this reduction is attributable to the banking sector, 11% to the drop in public sector liabilities and 47% to the non-financial sector. The offset through decreased capital outflow grew over time and reached 37% on average during the sanction year. The net effect of the sanctions (including reactions by Russian investors) is estimated as an accelerated net capital outflow of USD 72 billion (3.4% of 2013 GDP).

4. Evaluation of the sanctions' effects in the medium-term

The above models of the financial account components depend on exogenous (oil prices) and internal (GDP dynamics) factors that, in turn, depend on oil prices and sanctions. Therefore, estimates of the medium-term impact of the sanctions cannot be obtained independently: instead, step-by-step scenario calculations are required (the macroeconomic indicators obtained at each step are used to determine the inflow and outflow of foreign capital).

4.1. Scenario assumptions

We considered several combinations of oil price dynamics and the effects of sanctions from 2015 through 2017 (see Table 7). For 2014, annual average oil prices equal actual prices (USD 97.6 per barrel) in all scenarios.

Table 7
Basic parameters of forecast scenarios.

Scenario No.	Scenario code	Scenario description	Oil prices for 2015–2017, USD per barrel	Sanctions
1	B	Baseline without sanctions	100—100—100	No
2	BS	Baseline with sanctions	100—100—100	Yes
3	S	Shock without sanctions	53—50—52	No
4	SS	Shock with sanctions	53—50—52	Yes

The baseline scenario corresponds to the hypothetical version in which oil prices remain stable and no sanctions are imposed. The second scenario is a combination of stable oil prices and financial sanctions. The third and fourth scenarios are similar to the first two but with low oil prices (corresponding, as noted, to the medium-term forecast for social and economic development of October 2015). A comparison of the B and BS scenarios shows the effect of the sanctions with high oil prices, and the S and SS versions show their consequences with low oil prices. Similarly, a comparison of the indicators in the S and B (SS and BS) scenarios yields estimates for the effect of falling oil prices without and with the sanctions.

Below, we list the other assumptions used in formulating the scenarios.

- All financial sanctions are effective throughout the forecast period. We cannot rule out the possibility that they (particularly those imposed by the EU) will be lifted sooner. However, it is important to understand how long their effect will extend if they remain.

- For the non-financial sector, in all scenarios, we assumed de-offshoring (whether resulting from the sanctions or from anti-offshore government policies): accumulation of other assets is not 9.6% of export revenues (as it was in 2010 through 2013), but only 4.5% (which corresponds to the average value for the third quarter of 2014 and the first and second quarters of 2015).

- In terms of fiscal policy, we assumed that the expenditures in the B and BS scenarios are consistent with the initial version of the budget for 2015 through 2017, as adopted in December 2014;[7] for the S and SS scenarios, the 2015 expenditures are taken from the modified version adopted in April 2015;[8] and, finally, for 2016 and 2017, they are taken from the budget bill for 2016 through 2018.[9] The same assumptions concern the changes in the volumes of the Reserve Fund.

- Although the Guidelines for the Single State Monetary Policy in 2015 and for 2016 and 2017[10] indicate that the Bank of Russia should engage in foreign exchange interventions in response to increases or expenditures of the Reserve Fund, such actions have not yet been observed in practice. Moreover, during the second quarter of 2015, the Bank of Russia purchased foreign currencies against a backdrop of Reserve Fund spending. Our calculations use an intermediate scenario between the Guidelines and practice: The Bank of Russia is not making foreign exchange interventions in response to transactions involving Russia's sovereign wealth funds.

- A number of experts expressed the opinion that the sanctions imposed on Russia encouraged a "preventive" reduction in the foreign debt, while other countries only faced a sharp deterioration in foreign borrowing conditions in 2015, against the backdrop of an expected increase in the U.S. Federal Funds rate (in terms of the scenarios considered, this would have meant an "addition" to the net capital outflow from 2015 through 2017 in both the B and S scenarios). As noted above, we could not find a significant correlation between the U.S. monetary policy rate and the inflow of capital into Russia. Thus, this

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[7] http://www.kremlin.ru/acts/bank/39268.
[8] http://www.minfin.ru/ru/document/?id_4=60503.
[9] http://asozd2.duma.gov.ru/main.nsf/%28SpravkaNew%29?OpenAgent&RN=911755-6&02.
[10] http://cbr.ru/publ/ondkp/on_2015(2016-2017).pdf.

effect is not included in the calculations, although it may become significant to some extent in 2016 and 2017.

4.2. Calculations for 2015 through 2017

Table 8 and Table 9 contain the main forecasts obtained from the capital inflow calculations. Of course, they are somewhat notional because, in the case of other actions by banks, non-financial companies and monetary authorities the particular indicators may be different. However, we considered that the magnitude of the impact (determined by comparing the scenarios) seemed plausible.

The EEG model on which the calculations are based is built upon econometric (including cointegrating) estimates of the relationships between the basic macroeconomic and fiscal variables from 1995 through 2013 and the macroeconomic identities connecting them. In particular, we can obtain estimates for the impact of the balance of payments shocks (foreign trade and financial shocks) on the components of GDP, the exchange rate, CPI and fiscal revenues.

These results show that the capital inflow losses are, on the whole, approximately USD 160–170 billion over the period under review. Table 10 shows that these losses are approximately 2.5 times lower than the total losses from decreasing oil prices (by the end of the period, the losses from low oil prices are 4 times higher than the losses from sanctions), although the losses for the current account and financial account can only be compared notionally. It should also be noted that the impact of the sanctions on capital flows is almost identical at high or low oil prices.

Table 8
The full estimated impact of the sanctions on capital flows at high oil prices (USD billion).

	2H2014	2015	2016	2017	Total for 2014–2017
Gross capital inflow, total	−69.0	−84.8	−57.9	−64.3	−276.0
Debt liabilities	−39.0	−67.3	−33.8	−44.0	−184.1
Foreign direct investment	−17.6	−17.5	−24.1	−20.3	−79.5
General government liabilities	−12.4	–	–	–	−12.4
Gross capital outflow	−10.6	−46.2	−26.4	−31.1	−114.3
Net effect from the sanctions	−58.4	−38.6	−31.5	−33.2	−161.7
For reference: net effect from the sanctions as a percentage of GDP	−2.9	−1.8	−1.4	−1.5	−1.9

Source: Hereinafter, authors' calculations.

Table 9
Full estimated impact of the sanctions on capital flows at low oil prices (USD billion).

	2H2014	2015	2016	2017	Total for 2014–2017
Gross capital inflow, total	−68.8	−89.4	−58.0	−65.3	−281.5
Debt liabilities	−39.0	−67.3	−33.8	−44.0	−184.1
Foreign direct investment	−17.6	−22.1	−24.2	−21.3	−85.2
General government liabilities	−12.4	–	–	–	−12.4
Gross capital outflow	−10.6	−45.6	−26.1	−30.9	−113.2
Net effect from the sanctions	−58.2	−43.8	−31.7	−34.4	−168.1
For reference: net effect from the sanctions as a percentage of GDP	−2.9	−3.3	−2.4	−2.4	−2.8

Table 10
An evaluation of the effects of the sanctions and falling oil prices on balance of payments indicators (USD billion).

	2014	2015	2016	2017	Total
Changes in net capital inflow as a result of the sanctions	−58	−44	−32	−34	−168
Oil and gas export value	0	−122	−141	−135	−398

Note: This and subsequent tables and figures show the effects from the sanctions (unless otherwise stated) at low oil prices and the effects from falling oil prices with sanctions.

The net effect of the sanctions consists of a reduced capital inflow of roughly USD 280 billion and a reduction in capital outflow that partially offsets the reduced inflow (by approximately 40%). Two-thirds of the decrease in gross capital inflow is associated with reductions in debt financing. However, losses in this area include direct effects (through borrowing by banks and companies affected by the sanctions) as well as indirect effects related to the rest of the borrowers. If we notionally assume that these two components are roughly equal, then the total reduction in gross capital inflow is approximately three times that of the direct effects of the sanctions.

The increased outflow of capital slows down domestic demand. As a result, given low oil prices, in the scenario with sanctions, gross fixed capital investment is, on average, 3.5% lower than in the scenario without sanctions from 2014 through 2017, while retail sales turnover is 2.6% lower (these calculations, in accordance with the estimates earlier obtained by the Economic Expert Group, assume a fiscal multiplier value of 0.18). However, the impact of the sanctions on investment growth rates is mostly limited to 2014 and 2015. As Fig. 11 shows, falling oil prices have a more profound impact on investment (mainly due to producers' reduced profits, which are the main source of savings). Investment drops most significantly in 2015, although by 2017 the impact of cheap oil is practically eliminated. The comparison of investment forecasts as of the end of the period in question for each scenario (characterizing the accumulated effects of exogenous shocks) demonstrates that the sanctions reduced investment by 5% on the whole throughout the period, whereas falling oil prices reduced investment by 24%.

The increased capital outflow naturally and predictably brings down the ruble exchange rate (see Fig. 12). Thus, according to our estimates, the sanctions increased
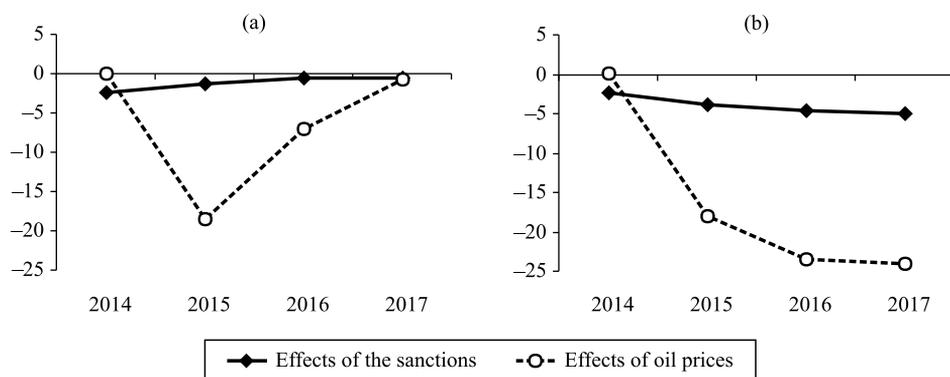

Fig 11. Impact of shocks on (a) investment growth rates (p.p.) and (b) investment volume (%).
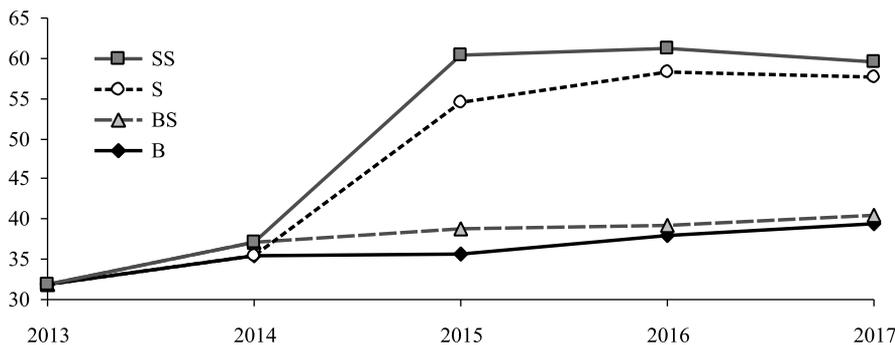
Fig. 12. Annual average USD rate under different scenarios (RUB/USD).

the exchange rate of the USD by approximately 6 rubles in 2015. This effect declines over time as greater outflow of capital is associated with improved net foreign assets and, accordingly, improved balance of investment income (thus, by 2017, the impact of the sanctions on the annual average USD rate is estimated at as low as 2 rubles).

A weaker ruble provides certain support to net exports: thus, the imports in the BS scenario in 2014 through 2017 are, on average, lower than in the baseline scenario (B) by 3.8%, whereas in the SS scenario they are 3.9% lower than in the shock scenario (S). Nevertheless, the effects from reduced domestic demand prevail, as expected, and the GDP in scenarios without the sanctions is higher than in scenarios with the sanctions (see Fig. 13). Notably, the effect of both shocks remains significant throughout the period under review (at –0.4 p.p. for the sanctions and –1.1 p.p. for falling oil prices). GDP losses that have accumulated over the period amount to 2.4% for the first shock and 8.0% for the second shock. Thus, the annual average estimated GDP losses due to the financial sanctions (0.4–0.6 p.p.) are close to the results obtained by Sinyakov et al. (2015) (0.5–0.6 p.p.) and, to the best of our judgment, are lower than the vaguely formulated IMF estimates (according to which, the effect would "initially" be 1.0–1.5 p.p. and 9 p.p. "in the medium-term").

It should be noted that the considerable decrease in GDP in response to falling oil prices reflects the "passive" adjustment to such shocks prevailing in the Russian economy. The real depreciation of the ruble due to deteriorating terms of trade only slightly increased the volume of exports (because they are dominated by
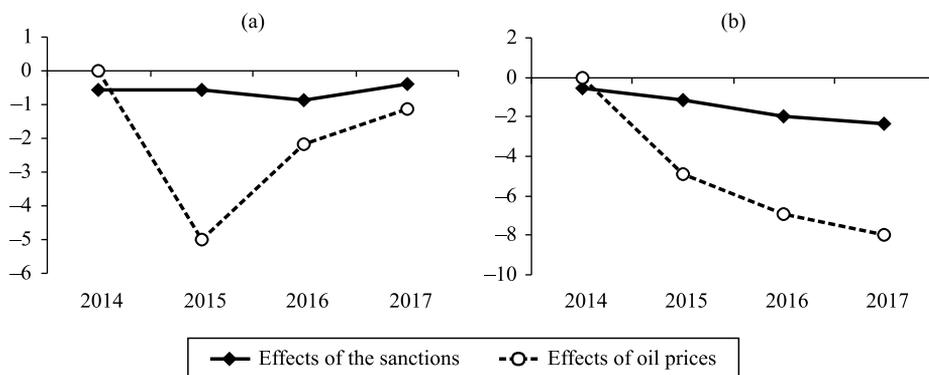

Fig 13. Impact of shocks on (a) GDP growth (p.p.) and (b) GDP volume (%).

oil and gas exports which are not particularly sensitive to the exchange rate) (see Gurvich, Prilepskiy, 2013). The lower real exchange rate does not have a significant effect on the supply of tradable domestic goods to the domestic market (see Blank et al., 2006). Thus, the main reaction to falling oil prices was decreased production of non-tradable goods resulting from falling domestic demand.

Scenarios with sanctions are also characterized by higher inflation (see Fig. 14), which is related to the consequences of the food embargo (the effect of which, according to estimates by E. Gurvich et al. (2014), was 1.2 p.p. in 2014 and 0.8 p.p. in 2015) and to the exchange rate pass-through. However, the additional contraction in domestic demand under the scenarios with sanctions restrains inflation to a certain extent. The impact of both shocks on inflation is mostly confined to 2014 and 2015, whereas the combined effect on consumer prices is estimated at approximately 4% for the sanctions and 8% for falling oil prices. Comparing the accumulated growth of CPI for 2014 through 2017 reveals that the sanctions add 5.7 p.p. to it, whereas falling oil prices add 11.0 p.p.

A weaker ruble and higher inflation under the scenarios with the sanctions provide substantial support for fiscal revenues in nominal terms (which are no less important for the government than real revenues in the first and second years after the shocks) (see Fig. 15). Moreover, in 2014 and 2015, as a result of
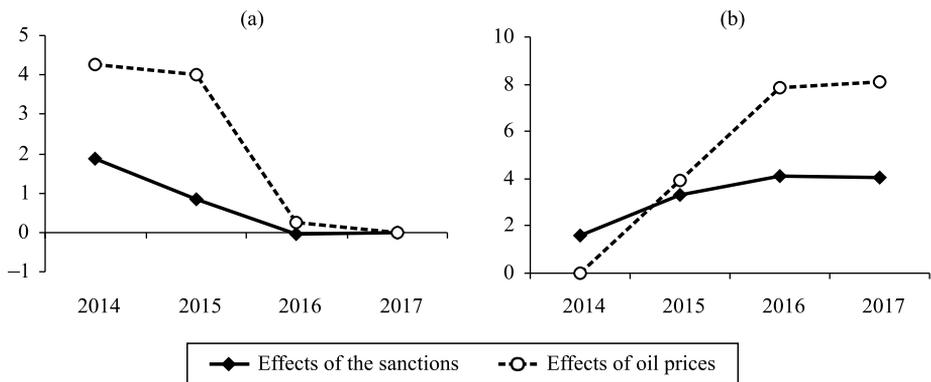

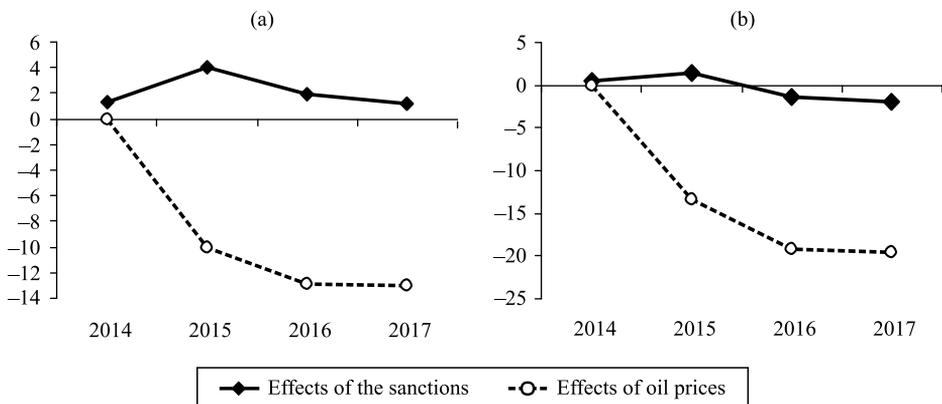Fig 14. Impact of shocks on (a) inflation rate (p.p.) and (b) consumer price index (%).

Fig 15. Impact of shocks on fiscal revenues in (a) nominal and (b) real terms (% of the 2013 level).

the weaker ruble, the sanctions even increased the real value of fiscal revenues. In other words, we are facing a paradox: *In their initial years, the financial sanctions help the government overcome possibly the most painful consequences of falling oil prices, i.e., the sharp reduction in fiscal revenues*, whose real value falls by almost 20% over two years, mainly due to cheaper oil.

Because the Bank of Russia will not intervene in the FX market from 2015 through 2017, based on the assumptions above, adjusting the balance of payments to the increase in the net capital outflow caused by the sanctions boils down to a mirroring increase in the current account. It consists of three main components: increased exports due to the stimulating effects of the weaker ruble; lower imports (also due to the overall contraction of domestic demand); and improved balance of investment income. The results presented in Table 11 showing the relative contribution of these components (i.e., comparing scenarios with both high and low oil prices) confirm the point proven previously (see Gurvich and Prilepskiy, 2013) that imports play a considerably more important role in adjusting to external shocks than exports (the so-called "internal" mechanism of adjustment prevails over the "external" mechanism). Table 11 also reflects the fact noted above that investment income improves over time under those scenarios with the sanctions.

By 2017, adjustment in the primary and secondary income balances almost completely neutralizes the sanctions' impact on the real exchange rate (see Table 12). On the one hand, this finding reflects the general result of the calcula-

Table 11
Components of the relative increase in the current account under scenarios with sanctions.

	2015	2016	2017
High oil prices (2–1), USD billion	38.6	31.5	33.2
including (%)			
Exports of goods and services	10.9	6.2	4.3
Imports of goods and services	60.8	39.5	32.1
Balance of primary and secondary income	28.3	54.3	63.6
Low oil prices (4–3), USD billion	43.8	31.7	34.4
including (%)			
Exports of goods and services	12.4	7.2	4.7
Imports of goods and services	47.3	39.4	36.5
Balance of primary and secondary income	40.3	53.3	58.9

Table 12
Medium-term consequences of financial sanctions and oil shocks (estimated changes in macroeconomic and fiscal variables for 2017, %).

Variable/shock	Sanctions		Falling oil prices	
	with high oil prices	with low oil prices	without sanctions	with sanctions
Fixed capital investment	–3.2	–5.0	–22.6	–24.1
Retail sales turnover	–2.4	–3.7	–17.1	–18.2
GDP volume	–1.5	–2.4	–7.1	–8.0
Consumer prices at the end of the period	3.1	4.1	7.1	8.1
Real ruble exchange rate against the USD	–0.5	–0.3	26.9	–26.8
Nominal fiscal revenues	1.1	1.2	–13.1	–13.0
Real fiscal revenues	–1.2	–2.0	–18.9	–19.5

tions, i.e., that the medium-term effects of the sanction shock are weaker than those of the oil price shock. On the other hand, it means that the comparative GDP gain from the dynamics of net exports in scenarios with the sanctions will also be close to zero by 2017, and over the longer term, low oil prices are a significantly more important factor in increasing external competitiveness and encouraging import substitution than the sanctions.

As noted above, the effect of the financial sanctions on net capital inflow does not depend on oil prices. However, comparing macroeconomic indicators under different scenarios shows that the sanctions have a significantly stronger impact on economic development at low oil prices than at high oil prices (see Table 12). Similarly, the sanctions aggravate the impact of falling oil prices on the economy. This "synergy" emerges because similar reductions (in USD terms) in capital inflow in the scenario with low oil prices become considerably larger as a percentage of the GDP components (investment, consumption, etc.), which can be illustrated by a comparison between the bottom lines of Table 8 and Table 9.

5. Conclusion

Based on the results of the quantitative evaluation of the effects of the sanctions, we draw several conclusions.

- Aside from their direct effects, i.e., limited foreign borrowing opportunities for banks and companies in the fuel and energy and military-industrial sectors that are publicly held, the financial sanctions *have considerable indirect effects on the Russian economy in the form of decreasing foreign direct investment, fewer borrowing opportunities for companies and banks not directly targeted by the sanctions and lower capital inflow into the government debt market.* These indirect effects roughly triple the direct effects of the sanctions.
- *The consequences of the sanctions are to a large extent (by approximately 40%)* offset by decreased Russian capital outflow. As a result, the total additional net capital outflow related to the sanctions can be estimated at USD 58 billion in 2014 and USD 160–170 billion over the period from 2014 through 2017.
- The sanctions against Russia are quite painful for *real sector indicators*: by 2017, accounting for their financial component alone will yield losses of 2.4% of pre-crisis GDP by 2017 (when oil prices are approximately USD 50 per barrel), with a simultaneous reduction in investment and consumption.
- Nevertheless, *the drop in oil prices had a much larger effect on the Russian economy.* Indeed, according to our estimates, the drop in prices leads to GDP losses of 8.5 p.p. cumulatively from 2014 through 2017.
- *The difference between the effects of the two shocks on fiscal revenues is particularly large.* Although the fall in oil prices decreases their real value by 19–20% by 2016–2017, the sanctions decrease them insignificantly (by 1–2%). Moreover, at the beginning of the period, government revenues even grow in real terms.
- *The comparatively limited effect of the financial sanctions compared with the fall in oil prices* is largely explained by the active self-adjustment in the first case (in particular, through reduced capital outflow from Russia), whereas in the second case, there is mainly "passive" adjustment.

- *The impact of the financial sanctions has been aggravated by the falling oil prices because the price drop led to increased loss in capital inflow relative to GDP.* In particular, when speaking of real sector indicators, i.e., GDP, investment and retail sales, the effect of the sanctions has been increased by more than 50%.
- However, we should note the *considerable ability of the Russian economy to adjust as a result of the transition to a floating exchange rate regime.* According to our calculations, the total net capital inflow losses due to the sanctions from 2014 through 2017 will amount to 8% of 2013 GDP (with low oil prices), whereas the accumulated GDP losses (the total difference in output between the S and SS scenarios from 2014 through 2017) are estimated at 6 p.p. of 2013 GDP.

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