Center for a New American Security

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Russia Sanctions: Current Effectiveness and Potential Future Steps

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Thank you, Chairman Crapo and Ranking Member Brown, for giving me the opportunity to testify before this committee on the effectiveness of sanctions on Russia and potential next steps.

Russia's economy has largely adjusted to sanctions imposed by the U.S. and Europe, despite recurrent pressures on its financial markets when new measures are imposed. This adjustment has sparked debate about whether existing tools are insufficient and need to be extended or merely implemented more stringently. Given the significant measures being considered by Congress, I will lay out some of the factors that have shaped the impact of sanctions on Russia's economy and the drivers of Russian economic resilience to sanctions, in the hope of better targeting measures to achieve political, rather than just economic, objectives.

Given the sources of resilience and adjustment in Russia's economy, there are grave potential consequences to the global economy and key U.S. allies from significantly tighter broad-based sectoral sanctions on Russia. These could include risks to global energy supply and spillover effects on other financial markets, especially in emerging economies. Russia has become more resilient to U.S. and European sanctions in the last three years, thanks to higher global oil prices and output, sound management of Russian macroeconomic policy (fiscal, currency, banking, and monetary), and the deepening of Russia's supply and financing channels at home and abroad, particularly from China and the Middle East.

Paradoxically, many of the factors that cap Russian long-term economic growth potential at around the current 1.5-2% pace have contributed to its resilience to economic sanctions. These include concentration of assets in its state banks, inefficiencies of selected state-owned enterprises, and difficulty attracting long-term capital. At the same time, Russia has used the last four years to build up its domestic resilience, maintaining a tighter fiscal stance to reduce its reliance on foreign capital markets, liberalizing its currency regime to allow the currency to be part of its adjustment toolkit, and deepening relationships with other state-led economies, including China and Saudi Arabia. These countries have fewer governance or other demands on Russia and empower those in Russia who are more focused on self-reliance and extending state capitalism. The combination of sanctions and the oil price shock helped Russia indigenize and bring home selected financial assets and supply chains. Russia's economy may not be thriving, but it is surviving. This increases the challenge of imposing broad-based sanctions, as it diminishes U.S. leverage. Russian resilience suggests that the sort of blunt measures that might impose meaningful economic stress on Russia might also create damaging global spillovers, primarily by increasing energy prices. This, in turn, could dampen global consumption, spread contagion to emerging markets, and extend U.S. dollar strength that challenges U.S. exports. Such measures are also more likely to be seen by the Russian government as acts of war, and by others, including U.S. allies, as disproportionate, thus limiting their impact.

That said, Russia does have vulnerabilities that proposed financial sanctions would target. It has drawn down much of its sovereign wealth savings, has many structural rigidities, and has low potential for growth. The main source of vulnerability for Russia's economy lies in its dependence on natural resource exports, especially oil and gas, but also agriculture and metal production, which collectively account for the bulk of government revenues, trade revenues, and performance of its financial markets. This implies that the sort of severe economic shock that would prompt a recession in Russia might require significant reductions in demand for Russian resources, including oil and gas. A shock severe enough to force significant quantities of Russian oil and gas off the market (a much more aggressive outcome than being considered by current legislation), would come with significant global costs, including potential sharp increases in energy prices for U.S. and global consumers. These energy-price spikes, in turn, could provide a potential windfall to Iran, undercutting U.S. policy toward that country. Such measures should not be considered now given their significant costs to the global economy and potentially international stability.

The Russia sanctions program, at its most effective, has been targeted and coordinated with allies, traits that contributed to its initial economic and financial impact. This Committee, and Congress more broadly, have an opportunity to refocus on targeting those responsible for malign behavior by the Russian state, rather than broad punitive actions, which would be less effective in achieving U.S. policy with respect to Russia and could undermine the effectiveness of future sanctions tools.

Impact of Past Economic Sanctions and Sources of Russian Resilience

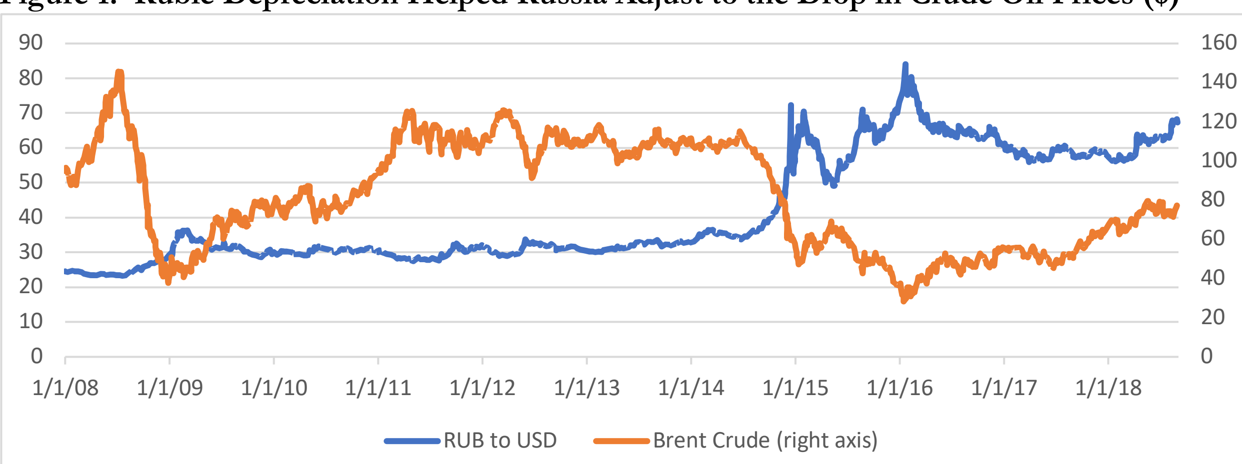
The main macroeconomic impact of the financial sanctions implemented since 2014 has been a financing shock that contributed to capital outflows and more restrictive policy. Pressure on Russian capital markets increased risk premiums, exacerbated capital outflows, and amplified the economic pressures of the coincident oversupply of global oil markets. Together these trends contributed to a rise in inflation and contraction in real gross domestic product and earnings in 2014-5. Russia gradually exited recession in 2016, economic activity began to expand modestly in 2017, helped by the revival in energy prices, and more recently volumes. Further sanctions, including some of those implemented this year, have again triggered pressure on the exchange rate and other securities, though these impacts have tended to fade, due to Russia's by-the-book macroeconomic policy choices and the stronger resource environment. The coincidence of these shocks provided domestic political cover for Russian government officials who wanted to take tough decisions including fiscal cuts, pension reform, and restrained investment.

U.S. and EU sanctions contributed to a major shock to Russia's financial markets in 2014 and 2015, amplifying the impact of the sharp decline in oil and gas prices in 2014, which weakened Russia's nominal GDP, and lead to a contraction in economic output. Sanctions to restrict the duration of finance, high interest rates at home to retain capital, and austere fiscal policy all contributed to a mild recession and left Russia reliant on financing from China and the Gulf States. However, the economic output loss was much milder than it had been during the global financial crisis or the Russian crisis of 1998, both of which had sharper financial pressure, liquidation of inventories and uncertainty about global demand. Several reasons explain the relative resilience of Russia's economy to the twin shocks of sanctions and falling energy prices. These include the lack of inventory rebuilding by firms after the global financial crisis, the decision not to control the exchange rate, and the availability of domestic financing to avoid defaults. The Russian government's adherence to orthodox macroeconomic policies, while surprising to some at the time, helped it emerge from this crisis and adjust to the economic sanctions over time.

Energy, and to a lesser extent other commodities (metals and agriculture), remain key transmission channels of global shocks to the Russian economy and financial markets. This trend holds, despite the diversification of the economy, because export revenues and government funding remain based on commodities. Oil and natural gas prices and demand, which hit Russian revenues, remain critical drivers of Russian macroeconomic and market performance. Orthodox economic policymaking, including tight fiscal and monetary policy and ample banking-sector liquidity, helped Russia adjust to the economic sanctions and avoid default. Indeed, Russia's external (foreign currency) debt was much lower than most emerging-market peers (Turkey, Brazil) in 2014, and it stands even lower today.

Depreciation of the ruble was a major tool of adjustment, facilitating a drop in imports and helping to maintain the domestic value of most resource exports. As the global energy market rebalanced, due in part to the pact between Russia, OPEC and other energy producers, oil revenues began to increase. Now in 2018, Russia is one of the few countries which has spare capacity to deploy to meet increased global demand. As Brent crude currently approaches $80/barrel, up from a low in the mid-$30s in late 2014, Russian global and local revenues have increased significantly. Indeed, periods of weaker ruble value due to sanctions uncertainty actually can increase the local currency value of these exports, helping the Russian government meet its local spending needs and gain higher revenues for its non-energy exports (including other resources, military equipment, and technology). Such unintended consequences may limit the effectiveness of sanctions.

Figure 1: Ruble Depreciation Helped Russia Adjust to the Drop in Crude Oil Prices ($)



Source: Macrobond

Russian economic growth has averaged a lackluster 1.5% for the last three years after exiting recession. The 2017 pace of 2% was above what economists estimate to be its potential suggesting that continued growth at that level is not sustainable without incurring a major inflation shock, or unless there is a major change that prompts a productivity jump. While not a high rate of growth, 1.5% is not far from the Russian government's admittedly conservative estimates of growth from the mid 2010s. [1] This suggests that Russia adjusted to sanctions (and the oil price shock) and that some of the weak growth reflects limited capital investment, productivity, and low labor force participation, all chronic for Russia.

In addition to the ruble flexibility, other elements of Russia's policymaking contributed to its resilience including its textbook adoption of restrained fiscal and monetary policy. Russia sped up planned implementation of inflation targeting, which kept interest rates high and retained capital. It also chose to follow a conservative fiscal policy, reducing its need to issue additional debt. Finally, Russian state companies and banks faced political pressure to return capital and to buy up local assets rather than send it abroad. That coordination helped to meet the end of 2014 financing pressures, and would likely be used in the Future.

Russia's increasing financial ties with China and the Middle East have provided another important lifeline. Russia's sovereign development platform, the Russia Direct Investment Fund (RDIF), has been a major vehicle for attracting foreign investment. The RDIF, created in 2011 to entice wary foreign capital via co-investment with the Russian government, has been the means through which most greenfield investment has entered Russia in the last 4 years. The RDIF has established joint funds with many sovereign funds and pension funds, allowing them to access assets not available on public markets and to ensure Russian government skin in the game to reduce expropriation risk, another example of a tool created to temper Russia's governance vulnerabilities and build its resilience against sanctions and other shocks. Pledges include $10 billion co-investment funds with entities like Abu Dhabi's Mubadala, Saudi Aramco, various Chinese public and private companies, and smaller funds with European, South Korean, and Japanese entities.[2] Even if not all of these measures have been implemented these sovereign-to-sovereign co-investments appear to have helped Russia mitigate the effect of sanctions, reinforcing the concentration of financing.

Potential Future Economic Effects of Sanctions

Energy sector sanctions, which included shortening the duration of lending to Russia's main energy companies, seem to have had more impact on long-term investment than short-term output. The latter already benefited from pre-2014 investment programs, high prices, and tax changes that

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[1] Alexei Kudrin and Evsey Gurvich, "A New Growth Model for the Russian economy," *Russian Journal of Economics* 1 no 1 (March 2015), https://www.sciencedirect.com/science/article/pii/S2405473915000033 provide a review of these drivers and propose measures which could change the low productivity environment, few of which seem likely to be implemented, even in the absence of sanctions. More recently these were reviewed in Martin Russell, EU Parliament Members Research Service, 2018, http://www.europarl.europa.eu/RegData/etudes/IDAN/2018/625138/EPRS_IDA(2018)625138_EN.pdf and numerous analyses by the EBRD, World Bank and IMF.

[2] For a full list of co-investment vehicles, sub-funds and holdings, please see the RDIF website https://rdif.ru/Eng_Partnership/.

incentivized production. The reduction in investment from European and U.S. energy companies and servicing firms is likely to restrain oil and gas output in Russia beyond 2020. While Russian energy companies have been able to find new financing from China, among others, enabling them to procure capital and parts, the quality of investment has likely declined.

Looking ahead, now that Russia has mostly recovered from the recession of 2014-15, growth is likely to average around 1.5% in the remainder of 2018 and 2019. What factors might prompt a slowdown? The most likely negative shock would be a reduction in oil or natural gas export volumes, which would cause a terms-of-trade shock and hit to local revenues as well as weaker currency and higher interest rates. A sharp decline in the ruble and selloff of Russian sovereign, sub-sovereign, and financial sector assets would likely increase local interest rates, dampening growth. However, local actors (financial firms and pensions) would likely be willing to purchase these assets. Other foreign actors, including state-linked vehicles in China, elsewhere in Asia, and the Middle East might also be interested. The net result would likely empower actors in Russia who look inward and resent Western influence, and might increase the influence of U.S. competitors like China.

Potential Consequences of Proposed Sanctions on Sovereign Debt, the Energy Sector, and the Financial Sector

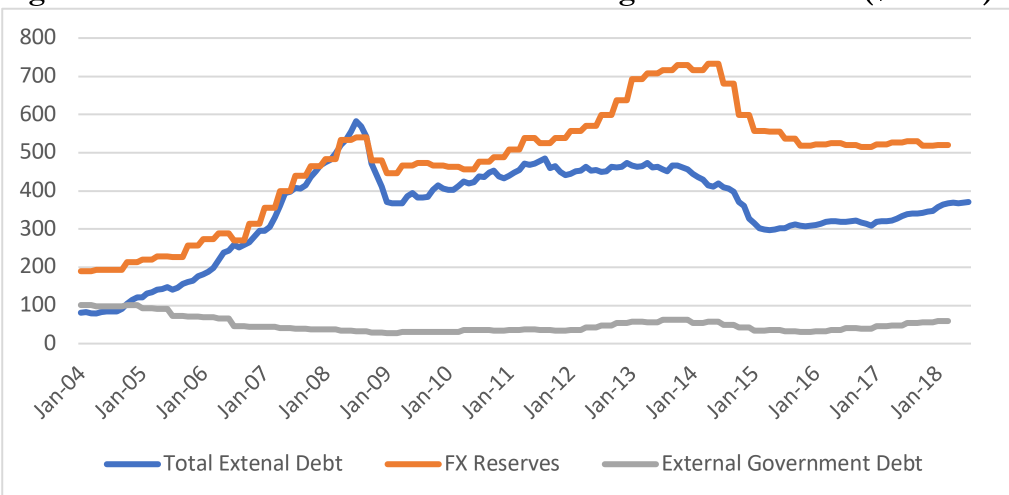
This Committee is currently considering several pieces of legislation that would give the administration powers to increase sanctions on Russian entities or mandate additional sanctions. As written, they would add to the powers present in past legislation (like the Countering America's Adversaries through Sanctions Act [CAATSA]) which have yet to be fully implemented by the administration. While the economic and financial impact would vary based on implementation and enforcement, it is possible to map the transmission mechanisms to assess the impacts on Russian entities and potential spillovers to the global economy and financial markets.

Sovereign Debt: Limiting the holding of newly-issued Russian debt by U.S. persons, either in the primary or secondary market would likely reduce local liquidity as well as raising risk premia on other Russian assets, state-owned or not. Merely the prospect of U.S. sovereign debt sanctions has contributed to recent price pressures and capital outflows, though these have been short-lived. Implementing these measures would reduce the Russian government's monetary and fiscal policy space, but would be unlikely to cause a major financing challenge for Russia given the significant availability of liquidity in the banking system, the country's net asset position, and some of the savings available both from local actors and Asian/MENA governments that have provided capital.

In short, imposing sanctions on sovereign debt might further increase Russia's reliance on Chinese and GCC funding, as well as prompting government efforts to repatriate capital from the U.S. and Europe, including via dedicated sovereign bonds.

Targeting Russian sovereign debt would also raise some important precedents for global markets. Some people have looked to other sanctions cases for comparison, especially Venezuela – where sanctions were imposed on new sovereign debt – and Iran, which has no foreign owned debt and has been excluded from much of the global banking system due to sanctions and severe money laundering violations. In Venezuela, sovereign bonds were already trading well into default territory and thus had very low correlations with other sovereign debt, given the idiosyncratic risks of limited payment of debt, sizeable arrears, and nationalization. Venezuela by its actions had already cut itself off from the global financial markets in a way that Russia has not, suggesting that there could be portfolio contagion effects if concentrated emerging market investors look to exit Russia quickly, selling to local actors. This in turn could add to volatility (rallies and selloffs) of a range of mostly European, Middle Eastern, and African higher-yielding assets, adding to political uncertainty.

Figure 2: Russia has Modest Levels of Sovereign External Debt ($ billion)



Source: Central Bank of Russia via Macrobond

As such, sovereign debt sanctions would likely imply some spillover risk, as investors look to sell some of their other emerging market and European, Middle Eastern, and African assets to compensate for losses in Russia. While the U.S. itself might be relatively resilient to these trends, the net result might be a weaker global economy, greater uncertainty for U.S. exports, and greater impetus towards new payment systems. In turn these might increase safe-haven flows toward USD-denominated assets, strengthening the dollar and reducing these countries' purchasing power and ability to maintain purchases including of U.S. goods.

The Russian government has also acted to build its resilience: issuance of new sovereign debt has been falling due to its conservative fiscal stance, with the bulk of the issuance in rubles rather than U.S. dollars or euros. Conservative Russian fiscal policy suggests that the country has the ability to reduce its issuance further if needed. This might not be an ideal sustainable long-term solution, but could temper the short-term impact on Russia. Foreign investors, including U.S. actors and financial actors in Europe and Asia, who are more likely to have U.S. persons among their investors and counterparts, would bear the brunt, something members of this Committee may want to consider and weigh against possible damage to Russia.

Another possible unintended consequence might be increased pressure to develop new payments and clearing systems, including measures that China and Russia have been considering. While these measures are far from being realized at this point, new sanctions on sovereign debt might accelerate their development.

Banking Sector measures: Proposed legislation would extend and increase measures to restrict finance to Russia's major banks, especially state-owned banks, in the hope that this would prompt policy change and reduce cash flow. Some of these banks already face restrictions issuing debt in European and U.S. markets, but have largely been able to continue to finance themselves. Targeting the larger banks not only would increase global counterparty risks but might also be seen as a disproportionate act, reducing the willingness of third-party states to comply.

Russian banks continue to operate in a liquidity surplus, especially the big banks, and are cautious about lending to local actors, especially the private sector. This liquidity surplus reduces the need of state banks to issue debt locally or abroad as they are funded with local deposits. Private sector banks are more vulnerable due to domestic reasons. Since the global financial crisis, Russian state banks like Sberbank have been winning the war for deposits and loans over their smaller counterparts, who are struggling to grow profits. Foreign banks too, have struggled to attract deposits, and tend to be subject to more restrictions. Russian authorities might respond to new sanctions with greater regulatory burdens on global banks in retaliation.

The large state-owned banks like Sberbank have increased their assets, liabilities, and share of the local market since 2008, and have been a beneficiary of the government's efforts to close down selected small and medium-sized banks. These smaller banks tend to have more money-laundering allegations, terror financing risks and in some cases related party lending to the conglomerates to which they are linked. The central bank has been effective in dealing with a series of bank failures, including some of the medium-sized private banks which were more involved in high-risk lending, but the net result has been modest credit growth due to supply and demand of credit restraints, which has limited the willingness of local banks to pass on the additional liquidity. As a result, restrictions on their foreign finance would likely dent but not cripple Russia's banks who would likely be able to find local finance. If so, the net result could be a further consolidation of Russia's bank finance domestically and in the hands of state actors.

It is worth briefly discussing the potential impacts of excluding select Russian entities from the SWIFT payments system, something that I believe is not currently being considered due to the potential risk to this payment system. I share a concern about their potential risks, which reflects Russia's role as a significant global counterparty, its domestic financing notwithstanding. Looking to restrict Russian banks from SWIFT would likely cause a real challenge for U.S.- EU relations, potentially increasing the costs and uncertainties if the transatlantic stance becomes less aligned. The heavy integration between the U.S. and European banking systems argues against imposing new regulations that would boost counterparty risk, hamper efforts to monitor money laundering and terrorist finance violations and assess systemic risks. Such divides could again encourage the development of new payments systems, not only from entities like China and Russia, but also eventually from Europe for select transfers. , resulting in barriers that might increase costs for U.S. actors, and make it harder for U.S. policy makers to assess financial risks or impose sanctions. These are not near-term risks, but could undermine the long-term leverage of the United States not only on Russia but also other entities.

Energy sector: Proposed energy sanctions under consideration would extend existing measures to limit investment in and access to capital for Russian energy firms, which are mostly state-owned. As with other sanctions, the impact would be more likely to come in medium-term production as underinvestment and lack of access to state-of-the-art equipment might make it more difficult for Russia to replace depleting fields.

Russia has been a major beneficiary of the recent rebalancing of the global oil market, which stems in part from supply collapse in Venezuela, smaller outages elsewhere, including in Africa, and, more recently, the reduction in Iranian crude oil and product exports[3]. Russia, along with Saudi Arabia and other oil producers in the Gulf Cooperation Council, are among the few countries with sufficient spare capacity to increase production, which has boosted Russia's U.S. dollar and local currency earnings. This suggests that measures to temper investment in the energy sector might have limited impact on Russian policy decisions. This committee would need to weigh several objectives and risks to U.S. security, including the impact of even greater Chinese influence on the Russian, Central Asian and Middle East/North Africa energy sectors, as well as the priority placed on countering Russian activity versus Iranian activity. Measures to counter Russian energy sector finance might increase the incentive of Russian actors to become involved with smuggling operations in Iran.

Proposed legislation does not seem to aim at measures that would restrict current energy production, which I see as the most meaningful potential shock to the Russian economy, and also to the global economy through the risk of increased costs to consumers. Efforts to restrict energy exports and revenue would likely be viewed by Russian officials as a disproportionate response to U.S. concerns about Russian policy. Moreover any efforts to restrict energy output would likely undermine the already difficult task of restricting Iranian oil output. Russia, along with the Gulf Cooperation Council and the U.S. are among the few countries likely to increase oil production meaningfully in 2018-9. I would see a high risk of damaging unintended consequences of any moves to sharply restrict Russian resource exports, on U.S. consumers and on U.S. allies in Asia and Europe, who are the primary buyers of Russian supplies. Given the tightening balance of global oil supplies, and the fact that OPEC+ is struggling to replace production declines in Venezuela and Iran, the United States might need to choose among its priorities or risk sharp increases in costs to consumers.

Impact of Potential Retaliation and Counter-sanctions from Russia

Russian countermeasures and policy choices are a major factor when assessing the economic and political impact of sanctions. In 2014, Russian counter sanctions on European food products contributed to non-negligible declines in EU food production, especially for countries like Poland and Finland. [4]These countermeasures amplified the impact of the ruble depreciation (which would have discouraged imports to some extent on its own) and helped to support a previously stated Russian objective of deepening its domestic production on food production and manufacturing sectors. Funding to support greater local production in these areas was one of the few areas of increased government funding in the austere budget of 2015. Despite the increase in trade-related inflows, Russian import growth has remained soft, growing much more slowly and perpetuating its

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[3] Ziemba, Rachel Edoardo Saravalle and Elizabeth Rosenberg, 2018. "The Trump administration's Iran strategy may be high-cost, low-return" Center for a New American Security
https://www.cnas.org/publications/commentary/the-trump-administrations-iran-strategy-may-be-high-cost-low-return

[4] Iikka Korhonen, Heli Simola and Laura Solanko, 2018, Sanctions, counter-sanctions and Russia – Effects on economy, trade and finance, Bank of Finland,
https://helda.helsinki.fi/bof/bitstream/handle/123456789/15510/bpb0418.pdf?sequence=1

trade and current account surplus. While trade ties between the U.S. and Russia remain very small and investment flows have fallen, European firms and those in Korea could bear some increased costs.

This trend of import substitution (replacing imports with local production via new policies and boycotts) remains a major Russian policy priority. There is more evidence of success in the military production and energy technology sectors. Efforts that look to eliminate Russia's access to global markets would be welcomed by some members of the Putin government and Russian officials who are looking to make Russia more self-sufficient, and thus would be unlikely to prompt policy change.

One area of recent concern has been Russia's holdings of U.S. Treasurys and other US assets. While any sharp drop in foreign holdings would be meaningful and concerning, if it sparked a broader trend among larger holders like China or the pension funds of Europe and Japan. Official U.S. data suggested holdings fell from a recent peak of $98 billion in early 2018 to $48 billion in April 2018 and $9 billion in May 2018 – the biggest two month drop since the global financial crisis, when Russia sold its reserves to prop up the currency. The drawdown in US-denominated assets may reflect outflows following the implementation of sanctions on Rusal and other designees in April. The data may overestimate the drop, though.[5] Even if Russia did sell its holdings, the volume is small compared to the monthly treasury issuance (which is set to increase in 2019) and small compared to potential Fed action should there be a notable sign of yields rising. Holdings at their peak were $144 billion in 2011 and fell to $108 billion at the end of 2014 due to currency intervention, capital outflows and diversification of reserves to better match Russian trading partners. The Russian sales would more meaningful impact if they sparked a greater sales by China or other actors, but do not seem to be a major concern for U.S. financial stability on their own. China has several reasons not to sell its Treasurys including concern about the resulting appreciation of their own currency and domestic financial stability, a topic better addressed in another venue.

Conclusion

In conclusion, further sanctions would undoubtedly cause pain to Russian actors and financial markets, but should take account of the growing sources of resilience within Russia, especially the stabilization of the global oil market and associated increase in revenues. In fact, the recurrent financial and currency shocks following sanctions implementation have helped Russia maintain the local currency value of exports without meaningfully impacting ample domestic liquidity. Furthermore economic stress does not necessarily trigger political change, particularly in the case of a country like Russia, when sanctions may provide political cover for domestic priorities such as deepening of supply chains and reducing foreign exposure. This resilience suggests that measures that target Russia as a whole may need to be increasingly blunt, increasing the risk to the global economy. This suggests that an effort to retarget sanctions to the individuals involved in malign behavior may be warranted. This would prevent mission creep, more closely tie penalties to the actions involved and provide more incentives for compliance. It would also limit the risk of empowering the very actors (Russian and foreign) who seek to harm U.S, interests and security.

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[5] The U.S. Treasury (TIC) data does not report holdings through overseas custodians, something that complicates monitoring. Russia did sell down agency holdings at a pivotal economic and political time ahead Benn Steil, Council on Foreign Relations, 2018, https://www.cobdencentre.org/2018/08/benn-steil-did-russia-really-dump-its-u-s-debt/

U.S. policymakers may need to weigh the costs of blunt measures towards Russia as they may challenge coincident efforts to choke off financing to Iran, or add to price volatility of fuel for American and global consumers. Russia's increased reliance on local financing, and that from China and Middle Eastern autocracies challenges U.S. influence. Efforts to exclude Russia from select global financial markets might not only contribute to additional pressure on emerging markets economies and the energy markets, but might deepen the common interests between Russia and the GCC, Turkey, and China in ways that may reduce U.S. influence in all of these countries. The activities Russia is involved in are serious and a threat to our institutions, so too might be blunt U.S. measures that escalate pressure on Russia. One way to temper these risks might be to increase U.S. policy coordination with allies in Europe, as well as developed Asia, especially those that have been at risk from these policies. Further sanctions targeting of Russian actors involved in specific malign activities might assist in building this coalition.

Thank you for your time and attention. I look forward to your answering your questions.

Biography

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RACHEL ZIEMBA is an Adjunct Senior Fellow at the Center for a New American Security (CNAS). Her research focuses on the interlinkages between economics, finance and security issues. This includes significant research on coercive economic policies such as sanctions, economic resilience and the role of state-owned investors including sovereign wealth funds in China, Russia and the Gulf Cooperation Council Countries (GCC).

She is the founder of Ziemba Insights, a macroeconomic research firm that connects global policy and macro risks for investors and policy makers. She also serves as strategic advisor at Alpha Z Advisors, an equity futures fund, advisor at Globalwonks, an expert network and teaches at New York University's Center for Global Affairs.

She previously served as head of emerging and frontier markets and co-head of research at Roubini Global Economics, a global macro strategy and country risk firm, where she wrote extensively about global economic risks, country resilience and scenarios. While there, she also closely tracked the impact of economic sanctions on Iran, Russia and North Korea, participating in several sanctions taskforces as a private sector representative. Before that, Rachel also worked for the Canadian International Development Agency in Cairo, Egypt, and the International Development Research Centre in Ottawa, Canada on development economic issues.

She has a particular interest in the macroeconomic and foreign policy of China and oil-exporting nations, including sovereign wealth management and energy-sector supply risks and resilience. She also does extensive work on global macroeconomic issues, including foreign-exchange reserve accumulation, economic imbalances and trade and investment policy.

Rachel regularly serves as an expert commentator in key media outlets, and her research on sovereign wealth funds and sanctions has been cited by a range of international financial institutions and government bodies. She is the co-author of "Scenarios for Risk Management and Global Investment Strategies" (with William T. Ziemba), published by Wiley in January 2008.

She holds a bachelor's degree from the University of Chicago with honors, and a Master of Philosophy degree in international relations with a specialization in international political economy from St. Antony's College, Oxford University.