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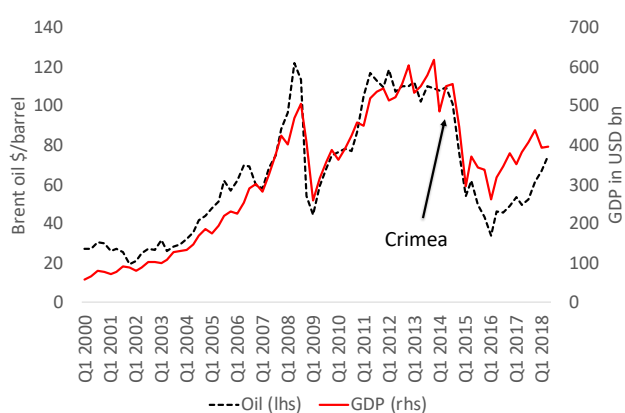
# Russia's Real Cost of Crimean Uncertainty

The annexation of Crimea has real costs to the Russian economy beyond what is measured by some items in the armed forces' budget; social spending in the occupied territories; or the cost of building a rather extreme bridge to solve logistics issues. Russia's real cost of the annexation of Crimea is also associated with the permanent loss of income that the entire Russian population is experiencing due to increased uncertainty, reduced capital flows and investment, and thus a growth rate that is significantly lower than it would have been otherwise. Since the years of lost growth are extremely hard to make up for in later years, there will be a permanent loss of income in Russia that is a significant part of the real cost of annexing Crimea and continuing the fighting in Eastern Ukraine. It is time to stop not only the human bleeding associated with Ukraine, but also the economic.



Estimating the real cost of Russia's annexation of Crimea and the continued involvement in Eastern Ukraine is complicated since there are many other things going on in the Russian economy at the same time. In particular, oil prices fell from over \$100/barrel in late 2013 to \$30/barrel in 2016 (Figure 1). Becker (2016) has shown that 60-80 percent of the variation in GDP growth can be explained by changes in oil prices, so this makes it hard to just look at actual data on growth to assess the impact of Crimea and subsequent sanctions and counter sanctions.

Figure 1. Russian GDP and oil price



Source: Becker (2019)

The approach here is instead to focus on one channel that is likely to be important for growth in these circumstances, which is uncertainty and its impact on capital flows and investment.

## From uncertainty to growth

The analysis presented here is based on several steps that link uncertainty to GDP growth. All the details of the steps in this analysis are explained at some length in Becker (2019). Although this brief will focus on the main assumptions and estimates that are needed to arrive at the real cost of Crimea, a short description of the steps is as follows.

First of all, in line with basic models of capital flows, investors that can move their money across different markets (here countries) will look at relative returns and volatility between different markets. When relative uncertainty goes up in one market, capital will leave that market.

The next step is that international capital flows affect investment in the domestic market. If capital leaves a country, less money will be available for fixed capital investments.

The final step is that domestic investments is important for growth. Mechanically, in a static, national accounts setting, if investments go down, so does GDP. More long term and dynamically, investments have a supply side effect on growth, and if investments are low, this will affect potential as well as actual growth negatively.

These steps are rather straightforward and saying that uncertainty created by the annexation of Crimea leads to lower growth is trivial. What is not trivial is to provide an actual number on how much growth may have been affected. This requires estimates of a number of coefficients that is the empirical counterparts to the theoretical steps outlined here.

## Estimates to link uncertainty to growth

In short, we need three coefficients that link: domestic investments to growth; capital flows to domestic investments; and uncertainty to capital flows.

There are many studies that look at the determinants of growth, so there are plenty of estimates on the first of these coefficients. Here we will use the estimate of Levine and Renelt (1992), that focus on finding robust determinants of growth from a large set of potential explanatory variables. In their preferred specification, growth is explained well by four variables, initial income, population growth, secondary education and the investments to GDP ratio. The coefficient on the latter is 17.5, which means that when the investment to GDP ratio increases by 10 percentage points, GDP grows an extra 1.75 percentage points per year. Becker and Olofsgård (2018) have shown that this model explains the growth experience of 25 transition countries including Russia since 2000 very well, which makes this estimate relevant for the current calculation.



The next coefficient links capital flows to domestic investments. This is also a subject that has been studied in many empirical papers. Recent estimates for transition countries and Russia in Mileva (2008) and Becker (2019) find an effect of FDI on domestic investments that is larger than one, i.e., there are positive spillovers from FDI inflows to domestic investments. Here we will use the estimate from Becker (2019) that finds that 10 extra dollars of FDI inflows are associated with an increase of domestic investments of 15 dollars.

Finally, we need an estimate linking uncertainty with capital flows. There are many studies looking at risk, return and investment in general, and also several studies focusing on international capital flows and uncertainty. Julio and Yook (2016) look at how political uncertainty around elections affect FDI of US firms and find that FDI to countries with high institutional quality is less affected by electoral uncertainty than others. Becker (2019) estimates how volatility in the Russian stock market index RTS relative to the volatility in the US market's S&P 500 is associated with net private capital outflows. The estimate suggests that when volatility in the RTS goes up by one standard deviation, this is associated with net private capital outflows of \$30 billion.

These estimates now only need one more thing to allow us to estimate how much Crimean uncertainty has impacted growth and this is a measure of the volatility that was created by the annexation of Crimea.

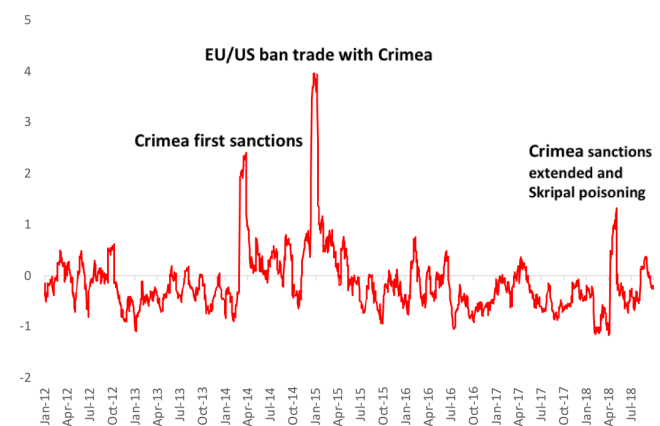
### Measuring Crimean uncertainty

In Becker (2019), the measure of volatility that is used in the regression with net capital outflows is the 60-day volatility of the RTS index. Since we now want to isolate the uncertainty created by Crimea related events, we need to take out the volatility that can be explained by other factors in order to arrive at a volatility measure that captures Crimean induced uncertainty. In Becker (2019) this is done by running a regression of RTS volatility on the volatility of international oil prices and the US stock market as represented by the S&P 500.

The residual that remains after this regression is the excess volatility of the RTS that cannot be explained by these two external factors. The excess volatility of the RTS index is shown in figure 2.

It is clear that the major peaks in excess volatility are linked to Crimea related events, and in particular to the sanctions introduced at various points in time. From March 2014 to March 2015, there is an average excess volatility of 0.73 standard deviations with a peak of almost 4 when the EU and the USA ban trade with Crimea. This excess volatility is our measure of the uncertainty created by the annexation of Crimea.

Figure 2. RTS excess volatility



Source: Becker (2019)

### From Crimean uncertainty to growth

The final step is simply to use our measure of Crimean induced uncertainty together with the estimates that link uncertainty in general to growth.

The estimated excess volatility associated with Crimea is conservatively estimated at 0.7 standard deviations. Using this with the estimate that increasing volatility by one standard deviation is associated with \$30 billion in capital outflows, we get that the Crimean uncertainty would lead to \$21 billions of capital outflows in one quarter or \$84 billions in one year. If this is in the form of reduced FDI flows, we have estimated that this means that domestic investments would fall by a factor of 1.5 or \$126 billions.



In this period, Russia had a GDP of \$1849bn and fixed capital investments of \$392bn. This means that \$126 billions in reduced investments correspond to a reduction in the investments to GDP ratio of 7 percentage points (or that the investments to GDP ratio goes from around 21 percent to 14 percent).

Finally, using the estimate of 17.5 from Levine and Renelt, this implies that GDP growth would have been 1.2 percentage points higher without the estimated decline in investments to GDP.

In other words, the Crimean induced uncertainty is estimated to have led to a significant loss of growth that has to be added to all the other costs of the annexation of Crimea and continued fighting in Eastern Ukraine. Note that recent growth in Russia has been just barely above 1 percent per year, so this means that growth has been cut in half by this self-generated uncertainty.

Of course, the 1.2 percentage point estimate of lost growth is based on many model assumptions, but it provides a more sensible estimate of the cost of Crimea than we can get by looking at actual data that is a mix of many other factors that have impacted capital flows, investments and growth over this period.

## Policy conclusions

The annexation of Crimea and continued fighting in Eastern Ukraine carry great costs in terms of human suffering. In addition, they also carry real costs to the Russian economy. Not least to people in Russia that see that their incomes are not growing in line with other countries in the world while the value of their rubles has been cut in half. Some of this is due to falling oil prices and other global factors that require reforms that will reorient the economy from natural resource extraction to a more diversified base of income generation. This process will take time even in the best of worlds.

However, one “reform” that can be implemented over night is to stop the fighting in Eastern

Ukraine and work with Ukraine and other parties to get out of the current situation of sanctions and counter-sanctions. This would provide a much-needed boost to foreign and domestic investments required to generate high, sustainable growth to the benefit of many Russians as well as neighboring countries looking for a strong economy to do trade and business with.

## References

- Becker, T. (2019), “Russia’s macroeconomy—a closer look at growth, investment, and uncertainty”, forthcoming SITE Working paper.
- Becker, T. and A. Olofsgård, (2018), “From abnormal to normal—Two tales of growth from 25 years of transition”, *Economics of Transition*, vol. 26, issue 4.
- Becker, T. (2016), “Russia and Oil – Out of Control”, FREE policy brief, October.
- Julio, B. and Yook, Y. (2016), ‘Policy uncertainty, irreversibility, and cross-border flows of capital’, *Journal of International Economics*, Vol. 103, pp. 13-26.
- Levine, R. and Renelt, D. (1992). ‘A Sensitivity Analysis of Cross-Country Growth Regressions’, *American Economic Review*, 82(4), pp. 942–963.
- Mileva, E. (2008), ‘The Impact of Capital Flows on Domestic Investment in Transition Economies, ECB Working Paper No. 871, February.





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