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Research Report

What do simple short-term models say about the latest economic trends in Russia?

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Abstract

We consider the applicability of simple statistical models to Russia's short-term economic trends in a wartime context. We develop several composite indicators combining economic variables to predict Russian GDP trends both before and after the invasion of Ukraine in 2022. In addition, our SVAR model estimations highlight the exceptionality of wartime. Russia's actual GDP performance in 2022 is considerably weaker than predicted by our model. The situation then reverses in 2023 and particularly at end-2024 the GDP outperforms model predictions.

Keywords: Russian economy, statistics, principal component analysis, SVAR

1. Introduction

Russia's full-scale invasion of Ukraine in 2022 has made monitoring and predicting Russian economic trends quite challenging. In addition to Russia's wartime economic restructuring (Korhonen et al., 2025), Russian authorities have ceased or restricted publication of many key economic statistics. Moreover, even with the lack of any compelling evidence of systematic and large-scale manipulation of economic statistics, the uncertainty surrounding official Russian statistics has increased (Simola, 2024). Pressure on officials to fudge the numbers could also potentially increase if Russian economic growth continues to slow.

A number of nowcasting and short-term forecasting models for the Russian economy were developed prior to the invasion (Mikosch & Solanko, 2019; Mäkinen, 2016). In this brief, we complement and update this literature focusing on simple tools that can be easily and rapidly updated to reflect the recent developments and examine whether such tools are useful in evaluating short-term trends in Russia's current wartime economy.

Our assessment starts with the construction of several principal component analysis indicators in the spirit of those developed e.g. by the Federal Reserve Bank of Chicago (FRBoC, 2024) summarizing key statistical information on the development of the Russian economy. We compare the predictive capability of Russian GDP trend indicators that include real and monetary variables, those that rely solely on real variables, as well indicators that rely on variables not sourced from Rosstat. We then apply a small SVAR model developed for forecasting short-term development of the Russian economy (Rautava, 2013) to the recent time periods to see how it performs in predicting wartime economic trends.

We find that our composite indicators combining various economic variables do a fairly good job in predicting Russian GDP trend both in pre- and post-invasion periods. The highest correlations with GDP are observed for the most extensive indicator and the indicator that excludes variables published by Rosstat. Our SVAR model estimations also highlight the exceptionality of wartime. In 2022, Russia's GDP development was much weaker than predicted by the model, but in 2023 the

situation reversed. For end-2023, actual GDP levels closely aligned with model predictions.

In general, Russia's GDP trends are largely in line with other economic indicators or model predictions. While we detect signs of irregularities (particularly in the most recent data), the data gives no compelling evidence to conclude that these irregularities indicate large-scale manipulation of GDP numbers. In any case, our results bolster the view that Russia's GDP has grown relatively robustly in recent years. This largely reflects massive increases in government spending and other government support measures to boost war-related industries (for detailed discussion, see Korhonen et al., 2025).

The discussion starts with a presentation of our principal component analysis indicators. We then apply our SVAR model to recent Russian data and offer concluding remarks.

2. Principal component indicator analysis

A simple measure summarizing information from various fields of the economy can be obtained applying principal component analysis. We find inspiration in the approach of the Chicago Fed National Activity Index (CFNAI), a weighted average of 85 indicators constructed by the Chicago Fed (FRBoC, 2024). As in the CFNAI, we collect relevant data series from various sources and combine them to obtain a few general indicators depicting Russia's overall economic development. As our focus here is on monthly frequency, we aggregate higher frequency data to the monthly level and exclude lower frequency data.

Our wide indicator covers data from the real side of the economy (e.g. employment and industrial production), as well as financial data (e.g. consumer credit and stock exchange index). We also construct an index that only uses real indicators and an index that draws exclusively on sources other than Rosstat. To complete the exercise, we construct a narrow indicator that includes variables for which we have data only for a relatively short time period (e.g. CBR financial flow data).

We construct all our indicators as weighted averages of the first four principal components, and then compare these indicators against Russia's official GDP

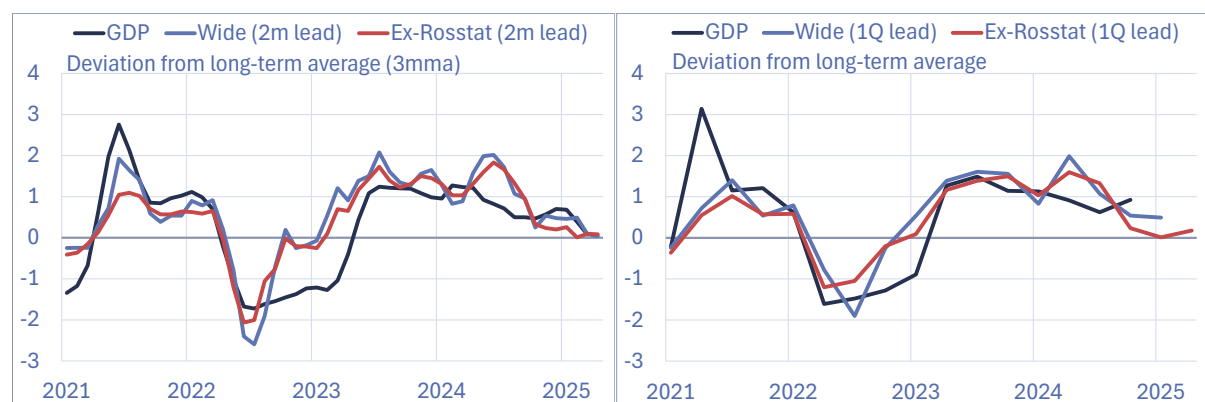
figures, i.e. the monthly GDP growth rate estimates published by Russia's Ministry of Economic Development (MER) and the official quarterly national accounts statistics published by Rosstat.

All our indicators paint a similar picture on the development of the Russian economy. They generally move in line with MER growth estimates, both pre- and post-invasion, and tend to slightly lead the GDP indicator (Figure 1A). The highest correlations with the MER GDP indicator are with the 2-month leads for our wide estimate at 0.53 (pre-invasion) and 0.67 (post-invasion), as well as the non-Rosstat indicator at 0.68 (pre-invasion) and 0.76 (post-invasion).¹ Both the GDP estimate and our indicators suggest a notable slowdown in growth in the first months of this year.

For comparison with GDP data, we aggregate our indicators to the quarterly level by averaging the monthly values across quarters. The indicators also closely track GDP development with a slight lead (Figure 1B). The highest correlation with the GDP data has our wide estimate with one quarter lead at 0.73 (pre-invasion) and 0.86 (post-invasion), as well as the non-Rosstat indicator at 0.78 (pre-invasion) and 0.90 (post-invasion). However, the latest observation of the GDP (4Q24) deviates more clearly on the trend implied by our composite indicators. The direction should correct downwards with the next observation as implied by the monthly MER estimate.

¹ While the high correlation with the non-Rosstat indicator is a bit surprising, it is well in line with the findings of Mikosch & Solanko (2019), who find that financial variables performed particularly well in predicting Russian GDP trends during 2012–2016.

Figure 1. A) Trends in Russian monthly GDP estimate of MER and principal component indicators and B) Trends in Russian quarterly GDP data and principal component indicators.



Note: The wide indicator refers to a composite indicator based on 31 economic variables. The Ex-Rosstat indicator is based on a subsample that excludes all variables provided by Rosstat (detailed information in the Appendix).

Sources: Author's calculations based on various statistical sources.

3. SVAR-model

We now examine the wartime predictive abilities of a small SVAR model of the Russian economy that earlier performed relatively well in anticipating Russian GDP trends. The exogenous variables affecting Russia's GDP development in the model are the oil price and a variable reflecting uncertainty that is based on the exchange rate of the ruble (Rautava, 2013).

It is difficult to capture abrupt changes in economic trends in a modeling framework based on historical relations between variables that mainly cover "normal" times. The current situation is even more challenging due to Russia's invasion and the subsequent tightening and expansion of sanctions on Russia.

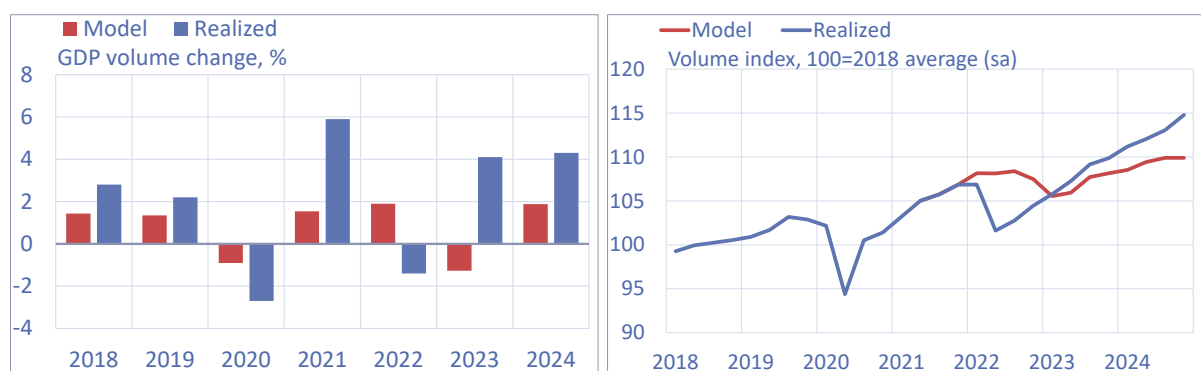
We start by estimating the model with Russia's quarterly GDP data for 2011–2017 and constructing forecasts for the following years. We can see that for most years the model comes fairly close into the realized numbers in predicting GDP outcomes (Figure 2A). The actual changes in GDP, however, are larger than the model anticipates. The sole exception, where the model gives very different predictions compared to the realized developments are for the years 2022 and 2023. In 2022, the model predicts continued robust growth for Russian GDP, when in fact GDP declined. The model predicts a contraction of GDP for 2023, when realized figures show GDP growth.

The model predictions reflect oil price trends. Oil prices were high in 2022 (the sanctions concerning Russian oil exports entered into force only in December 2022) and declined substantially in 2023. Even with high oil prices, actual GDP declined in 2022 due to the shock caused by the war and sanctions. In 2023, the fall in oil prices was offset by huge increases in government spending that boosted GDP.

We next estimate the model up to 2021 and construct forecasts for the most recent years. Extending the estimation period to a longer time period and to more recent years should improve the predictive ability of the model. We can again see a similar discrepancy between model predictions and realized GDP development in 2022 and 2023 (Figure 2B). Despite the different timing of the fall in GDP, the realized level of GDP at end-2023 is only 1 % higher than predicted by the model.

In 2024 (particularly towards the end of the year), the realized GDP trend begins to decouple from the level predicted by the model. By end-2024, the level of realized GDP is 4 % higher than that predicted by the model. This could reflect the exceptionally rapid public spending growth seen in 2024, or it might indicate increasing pressures to make the numbers look more positive as the economic situation deteriorated. Nevertheless, the model still predicts moderate GDP growth for Russia last year.

Figure 2. Comparison of model predictions and Russia's actual GDP growth in A) annual terms in 2018–2024 and B) in quarterly terms in 2022–2024.



Note: The panel A model was estimated with 2011–2017 data and predictions were compiled for 2018–2024. The panel B model was estimated with 2011–2021 data and predictions compiled for 2022–2024.

Source: Author's calculations.

4. Concluding remarks

Despite increasing difficulties in monitoring trends of the Russian economy since the full-on invasion of Ukraine, our results suggest that the economic indicators available for Russian economy have been largely in line with the official GDP figures. The oil price remains an important determinant in Russia's economic development even when its effects are temporarily diluted by other factors.

Russia's latest GDP figures suggest even greater uncertainty. The numbers could be revised or this could reflect increasing pressures to manipulate numbers, as growth is slowing down. Nevertheless, our results imply that Russia's output has continued to grow even in recent months. This growth largely reflects huge increases in government spending to boost war-related industries. Reducing Russia's economic growth further would require more pressure on the Russian economy from the sanctioning countries.

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Appendix. Data description

Table 1. Variables included in the analysis

Variable	Time	Source	Transformations
Employment	1M2010-3M2025	Rosstat	sa, ln, d
Bankruptcies	1M2010-3M2025	Rosstat	sa, ln, d
Unemployment	1M2010-3M2025	Rosstat	sa, ln, d
Consumer loans	1M2010-3M2025	CBR	sa, ln, d
Corporate loans	1M2010-3M2025	CBR	sa, ln, d
M2X	1M2010-3M2025	CBR	sa, ln, d
Cargo transport	1M2010-3M2025	Rosstat	sa, ln, d
MOEX	1M2010-3M2025 ¹	Moscow Stock Exchange	ln, d
RUB/USD	1M2010-3M2025 ¹	CBR	ln, d
Financial flows	4M2020-3M2025 ²	CBR	d
Oil price	1M2010-3M2025	OPEC	ln, d
CBR industry confidence	1M2010-3M2025	CBR	none ³
CBR construction confidence	1M2010-3M2025	CBR	d ³
CBR trade confidence	1M2010-3M2025	CBR	none ³
CBR service sector confidence	1M2010-3M2025	CBR	none ³
Construction	1M2010-3M2025	Rosstat	sa, ln, d
Federal budget expenditure	1M2010-3M2025	MoF	sa, ln, d
Real wage	1M2010-2M2025	Rosstat	sa, ln, d
Industrial production	1M2015-3M2025	Rosstat	sa, ln, d
Retail trade	1M2010-3M2025	Rosstat	sa, ln, d
Wholesale trade	1M2010-3M2025	Rosstat	sa, ln, d
Car sales	1M2010-3M2025	AEB	sa, ln, d
Export value	1M2010-3M2025	CBR	sa, ln, d
Import value	1M2010-3M2025	CBR	sa, ln, d
Levada consumer sentiment	1M2010-3M2025	Levada	sa, ln, d
FOM consumer sentiment	7M2017-3M2025	FOM	sa, ln, d
Services	1M2010-3M2025	Rosstat	sa, ln, d
Agricultural production	1M2010-3M2025	Rosstat	sa, ln, d
Oil production	1M2010-3M2025	IEA	sa, ln, d
CBR consumer sentiment	1M2015-3M2025	CBR	sa, ln, d
Corporate profits	1M2010-2M2025	Rosstat	sa

Note: 1) monthly average of daily data, 2) monthly average of weekly data, 3) original data seasonally adjusted. Most data sourced from Macrobond, except original sources used for CBR confidence indicators and oil production.

Table 2. Variables included in individual indicators

Variable	Wide	Real	Latest	Ex-Rosstat
Employment	x	x	x	
Bankruptcies	x	x	x	
Unemployment	x	x	x	
Consumer loans	x		x	x
Corporate loans	x		x	x
M2X	x		x	x
Cargo transport	x	x	x	
MOEX	x		x	x
RUB/USD	x		x	x
Financial flows	x		x	x
Oil price	x			x
CBR industry confidence	x		x	x
CBR construction confidence	x		x	x
CBR trade confidence	x		x	x
CBR service sector confidence	x		x	x
Construction	x	x	x	
Federal budget expenditure	x		x	x
Real wage	x	x		
Industrial production	x	x	x	
Retail trade	x	x	x	
Wholesale trade	x	x	x	
Car sales	x	x	x	x
Export value	x		x	x
Import value	x		x	x
Levada consumer sentiment	x		x	x
FOM consumer sentiment	x		x	x
Services	x	x	x	
Agricultural production	x	x	x	
Oil production	x	x		x
CBR consumer sentiment	x		x	x
Corporate profits	x			

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