Norges Bank

1 | 2026

Documentation Note

Documentation of Method in Bankplassen Blog Post "Hvordan påvirker høyere oljepris inflasjonen i Norge?"

20 April 2026

Author:
Mathis Mæhlum

About the publication

Documentation Notes provide concise documentation of analyses or calculations featured in the Monetary Policy Report, speeches, and other publications where opportunities for further elaboration are constrained. An important goal of the Documentation Notes is to make the analyses more accessible to a broader audience, thereby contributing to verifiability and transparency. In some cases, related code and datasets will also be included.

Documentation Notes are an analytical publication. The conclusions and views expressed in this Documentation Note are those of the author and do not necessarily reflect the views of Norges Bank. Any errors or omissions are the responsibility of the author.

Documentation of Method in Bankplassen Blog Post "Hvordan påvirker høyere oljepris inflasjonen i Norge?"

Mathis Mæhlum, Norges Bank

April 20, 2026

1 The oil supply news shock

The oil supply news shock is constructed in two steps.First, Känzig identifies oil supply news shocks from high-frequency price movements around OPEC announcements. Specifically, for each scheduled OPEC meeting, he measures the change in the Brent crude oil futures price in a narrow window around the announcement. These surprise movements isolate the component of OPEC decisions that was not anticipated by the market, and therefore constitute valid instruments for oil supply shocks under the assumption that no other macroeconomically relevant news is systematically released at the same time. The monthly instrument is constructed by summing daily surprises within each month.

The surprise series z_t is then used as an external instrument (proxy) in a structural VAR to recover the oil supply news shock. The VAR includes six variables in log levels, including the real oil price, world oil production and industrial production. The VAR is estimated with 12 lags and a constant. The structural impact vector is identified by an external instruments procedure: the instrument z_t is projected onto the reduced-form VAR residuals to recover the column of the structural impact matrix corresponding to the oil supply news shock. The recovered structural shock is normalized so that a one-unit shock raises the real oil price by 10 percent on impact.

The shock captures news about future oil supply — for example, an OPEC announcement of production cuts that the market did not expect. A positive shock means tighter expected oil supply and higher oil prices. The shock is "news" in the sense that it shifts expectations about future supply; actual production may not change immediately.

Because Norway is not an OPEC member, Norwegian macroeconomic variables do not enter the VAR used to identify the shock. The Norwegian responses are therefore estimated in a second step, conditional on the shock, without feedback from Norwegian variables to the shock itself.

I do not re-estimate the VAR or re-identify the shock. The final shock series is taken from Känzig (2021), updated through 2025M06.[1]

[1]The updated series is available at `https://github.com/dkaenzig/oilsupplynews`.

2 Local projections specification

We estimate impulse response functions using local projections (Jordà, 2005). For each Norwegian outcome variable y_i and horizon $h = 0, 1, \ldots, H$, we run the regression:

$$y_{i,t+h} - y_{i,t-1} = \alpha_{i,h} + \psi_{i,h} \cdot s_t + \sum_{j=1}^{p_i} \beta_{i,h,j}\, y_{i,t-j} + \sum_{j=1}^{p_i} \gamma_{i,h,j}\, s_{t-j} + \mathbf{D}'_{i,t}\boldsymbol{\delta}_{i,h} + \varepsilon_{i,t,h}$$

where:

- s_t is the oil supply news shock (normalized to generate a 10% oil price increase immediately).
- $y_{i,t+h} - y_{i,t-1}$ is the cumulative change from $t-1$ to $t+h$.
- p_i lags of the outcome variable y_i and the shock s are included as controls.
- $\mathbf{D}_{i,t}$ is an optional vector of seasonal dummies that will pick up seasonal patterns in the outcome variable (see below).
- The regression is estimated over the horizon $h = 0, 1, \ldots, 48$ (4 years) for monthly variables and $h = 0, 1, \ldots, 20$ (5 years) for quarterly variables

The coefficient of interest is $\psi_{i,h}$: the total change in y_i from period $t-1$ to $t+h$ caused by the oil supply news shock.

The number of lags p_i is selected by the Bayesian Information Criterion (BIC) at horizon $h = 0$, searching over $p \in \{1, 2, \ldots, 12\}$ for monthly variables and $p \in \{1, 2, \ldots, 8\}$ for quarterly variables. The selected p_i is then used for all horizons $h = 0, \ldots, H$. Both outcome lags and shock lags use the same lag length p_i.

Standard errors are computed using the Newey–West heteroskedasticity and autocorrelation consistent (HAC) estimator with the Bartlett kernel. The bandwidth is selected using the Newey and West (1994) automatic plug-in procedure. The bandwidth is floored at h to account for the MA($h-1$) structure that arises from overlapping horizons in local projections.

Confidence bands are constructed as:

$$\text{90\% CI:} \quad \hat{\psi}_{i,h} \pm 1.645 \times \widehat{\text{SE}}(\hat{\psi}_{i,h}) \tag{1}$$

$$\text{68\% CI:} \quad \hat{\psi}_{i,h} \pm 1.0 \times \widehat{\text{SE}}(\hat{\psi}_{i,h}) \tag{2}$$

Monthly seasonal dummies (11 dummies, December as reference) are included for price variables only: CPI, CPI-JAE, Brent crude oil price, all COICOP subindices, and the approximate goods/services CPI aggregates. Non-price variables (industrial production, exchange rates, policy rate) and seasonally adjusted national accounts variables (GDP, consumption, investment, trade) do not receive seasonal dummies.

For quarterly variables, the monthly shock is aggregated to quarterly frequency by summing within each quarter:

$$s_t^Q = s_{t,m_1} + s_{t,m_2} + s_{t,m_3} \tag{3}$$

where m_1, m_2, m_3 are the three months of quarter t. This follows the approach in Känzig (2021) for quarterly augmented VARs.

3 Data

All variables are in log × 100, except the policy rate (level, in percentage points). Table 1 lists all outcome variables.

Table 1: Outcome variables.

Variable	Source	Period	Seasonal
Monthly			
KPI (CPI all items)	SSB 03013	1979M01–2025M6	Dummies
KPI-JAE (core CPI)	SSB 05327	2002M12–2025M6	Dummies
Trade-weighted index I-44	Norges Bank	1979M01–2025M6	No
Brent crude oil price	FRED	1987M05–2025M6	Dummies
CPI COICOP 01–12 (12 series)	SSB 03013	1979M01–2025M6	Dummies
Quarterly			
GDP Mainland Norway	SSB 09190	1978Q1–2025Q2	No
Household consumption	SSB 09190	1978Q1–2025Q2	No
Gross investment, mainland	SSB 09183	1978Q1–2025Q2	No
Petroleum investment	SSB 09183	1978Q1–2025Q2	No
Petroleum exports	SSB 09190	1978Q1–2025Q2	No
Imports total	SSB 09190	1978Q1–2025Q2	No
Mainland exports	SSB 09190	1978Q1–2025Q2	No

References

Jordà, Ò. (2005). Estimation and Inference of Impulse Responses by Local Projections. *American Economic Review*, 95(1):161–182.

Känzig, D. R. (2021). The Macroeconomic Effects of Oil Supply News: Evidence from OPEC Announcements. *American Economic Review*, 111(4):1092–1125.

Mertens, K. and Ravn, M. O. (2013). The Dynamic Effects of Personal and Corporate Income Tax Changes in the United States. *American Economic Review*, 103(4):1212–1247.

Newey, W. K. and West, K. D. (1994). Automatic Lag Selection in Covariance Matrix Estimation. *Review of Economic Studies*, 61(4):631–653.

Ramey, V. A. (2011). Identifying Government Spending Shocks: It's all in the Timing. *Quarterly Journal of Economics*, 126(1):1–50.

Stock, J. H. and Watson, M. W. (2012). Disentangling the Channels of the 2007–2009 Recession. *Brookings Papers on Economic Activity*, 2012(1):81–135.

Stock, J. H. and Watson, M. W. (2018). Identification and Estimation of Dynamic Causal Effects in Macroeconomics Using External Instruments. *Economic Journal*, 128(610):917–948.