

Appendix – Outlook 2018 – Geopolitical risks

<https://economie.rabobank.com/publicaties/2017/december/visie-op-2018-gevolgen-geopolitieke-risicos-en-crisis-voor-nederland/>

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Oil price shock

Using the global macro model NiGEM, we estimate the impact of an oil price shock on the Dutch economy.

We assume that, due to an exogenous supply shock, oil prices increase from our baseline estimate of 59 dollars per barrel in the first quarter of 2018 to 184 dollars per barrel in the second quarter of 2018. In terms of the rate of change, this increase is consistent with the oil price shock in the early 1970s, when oil prices more than tripled in less than a year. The oil price level that is attained after this shock is about the same as the oil price peak in 2008 in terms of current prices.

Using a vector autoregression (VAR) model we estimate the joint evolution of oil prices and new drilling facilities in the United States after the initial price shock. We use the WTI oil price and monthly rig count for the US since 1985. The VAR is estimated for standard specifications in EViews with 24 lags of the monthly changes in the natural logs of the oil price and rig count.

Due to new oil production facilities coming online, oil prices decrease after an initial shock. The decrease happens at a fairly constant pace, to a new equilibrium price of 123 dollars per barrel, 24 months after the initial price shock.

We use these results as a path for oil prices that we can plug into NiGEM. We allow all variables in the model to evolve endogenously, save for ECB monetary policy rate, which we assume will stay on the baseline path, rather than increase as a result of higher price pressures. Without this restriction NiGEM assumes the ECB will hike rates, which would lead to even lower growth than reported.

In our oil price shock scenario, Dutch GDP grows by 1.9 percent in 2018, by 0.8 percent in 2019 and by 1.2 percent in 2020. The baseline forecasts are 2.8, 2.2 and 1.6 percent respectively. The cumulative difference with the baseline forecast is 2.7 percent growth. The impact on GDP in 2018 is smaller than perhaps expected, because the oil shock takes place in the second quarter, meaning that first quarter growth and carry-over effects from 2017 contribute positively to 2018 GDP growth. The full brunt of the effect is not felt until 2019, when the oil price shock shaves off a full 1.4 percent of the baseline forecast.

Geopolitical risk and the Dutch economy

We apply similar techniques to [Caldara and Iacoviello \(CI\)](#) to assess the impact of geopolitical risk on the Dutch economy.

We do three different exercises.

1. A monthly VAR of the historical GPR with Dutch industrial production since 1956. The VAR is estimated using the standard specifications in EViews and has 12 monthly lags in the changes of the historical GPR and log industrial production. We examine an impulse of a 100 point increase in the historical GPR, which is about the increase from late 2016 to early 2017. This results in a statistically significant 1% decline in industrial production after 9 months. This is about a third larger than the impact of CI's results for the US, but this is plausible given the Dutch economy is more globalized than the US.
2. We are more interested in the impact of GDP than industrial production, so we also use a quarterly VAR of the historical GPR with Dutch GDP since 1960, using OECD data. The VAR is estimated using standard specification in EViews and has 4 quarterly lags. We run one version of the VAR with the changes of the historical GPR and log GDP and another on the (log) levels. We use the same shock as above and observe, respectively, a 0.3% decline in GDP after three quarter and a 0.6% decline after three quarters. The former effect is not statistically significant, but the latter is at the 10% level.
3. The VAR does not allow for a contemporaneous response of the GPR on GDP. Given that CI show evidence that the GPR is exogenous to economic variables, we do not see any problem with an OLS regression of GDP on GPR. We use the same specification CI use for equity prices, namely GDP regressed on the residuals of a 1-period autoregressive process for the GPR. Under this specification we get an effect of a 0.6% decline in GDP for a 100-point increase in the GPR. (A straightforward regression of GDP on 4 quarters of GPR (i.e. from t to $t-3$) instead of the CI specification also produces a significant relationship.)

We have several reasons to believe that there is an effect of GPR on economic output in the Netherlands.

- CI find a statistically significant effect of changes in the GPR on US industrial production, employment and equity prices
- They also find an significant effect on industrial production of advanced economies as a whole
- CI find a statistically significant effect on Dutch equity prices
- We find a statistically significant effect on Dutch industrial production
- In two of our three specification, we also find a statistically significant effect on GDP

While it is likely there is an effect on GDP, the estimates of the scale of the impact vary. We settle on 0.5% as a reasonable approximation based on the estimates reported above (i.e. 0.3%, 0.6% and 0.6%).