

AMEM: Tailoring the QPM to Azeri Economy

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Review of Findings

Overall good job.

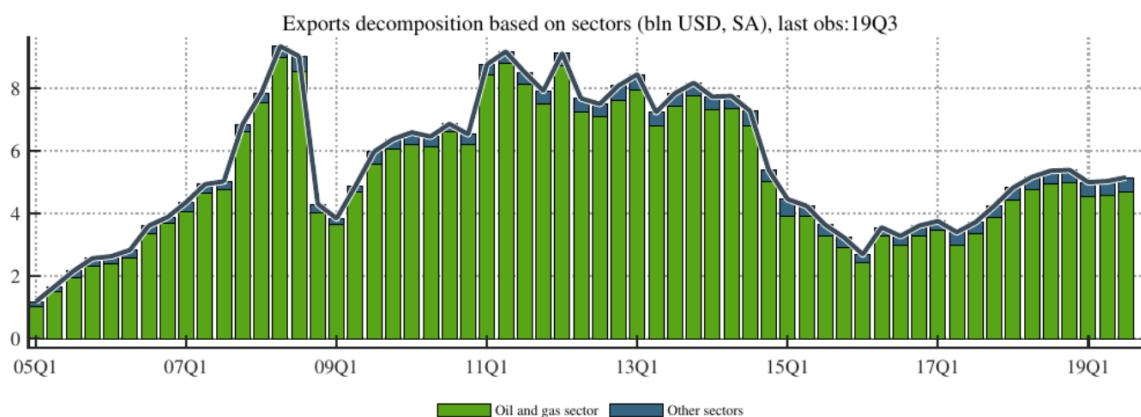
Key role of oil

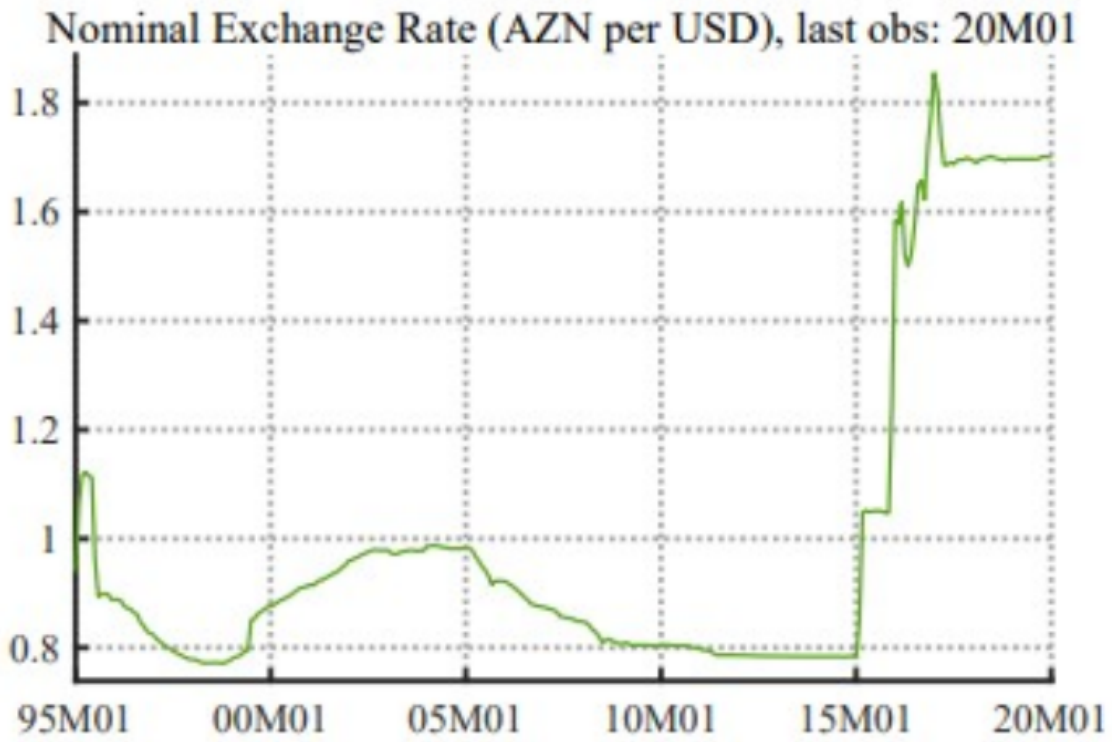
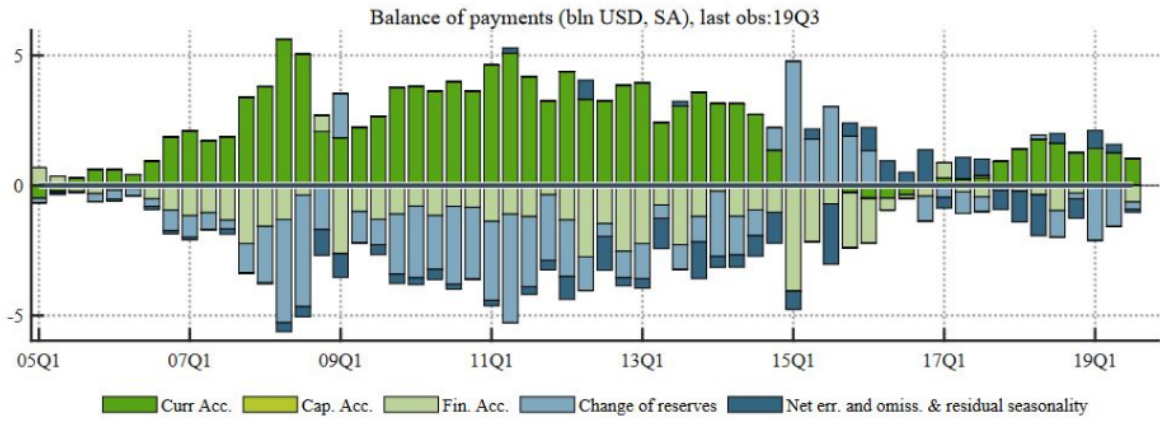
- Large determinant of GDP
 - Fiscal effects (output gap)
 - Investment (output trend)
- Large determinant of REER
 - money inflow, real appreciation
 - but monetary policy decides the FX vs CPI split

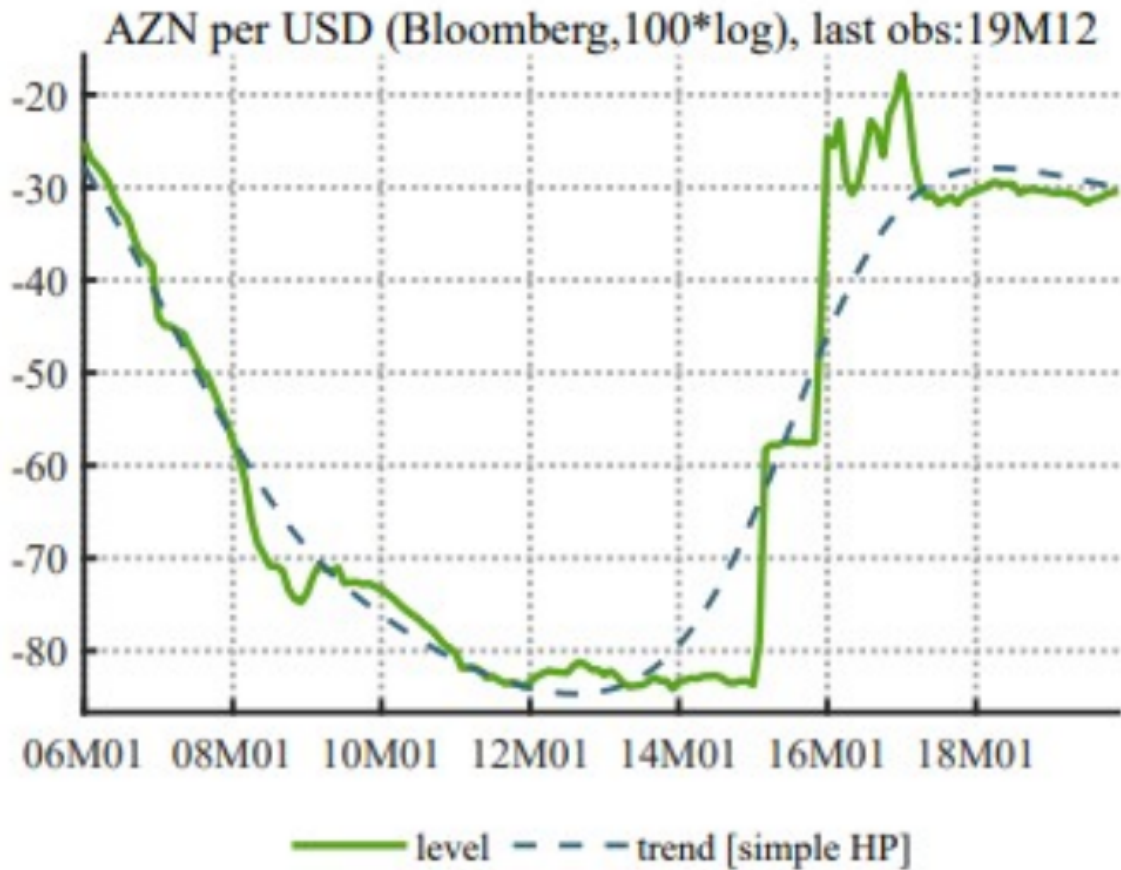
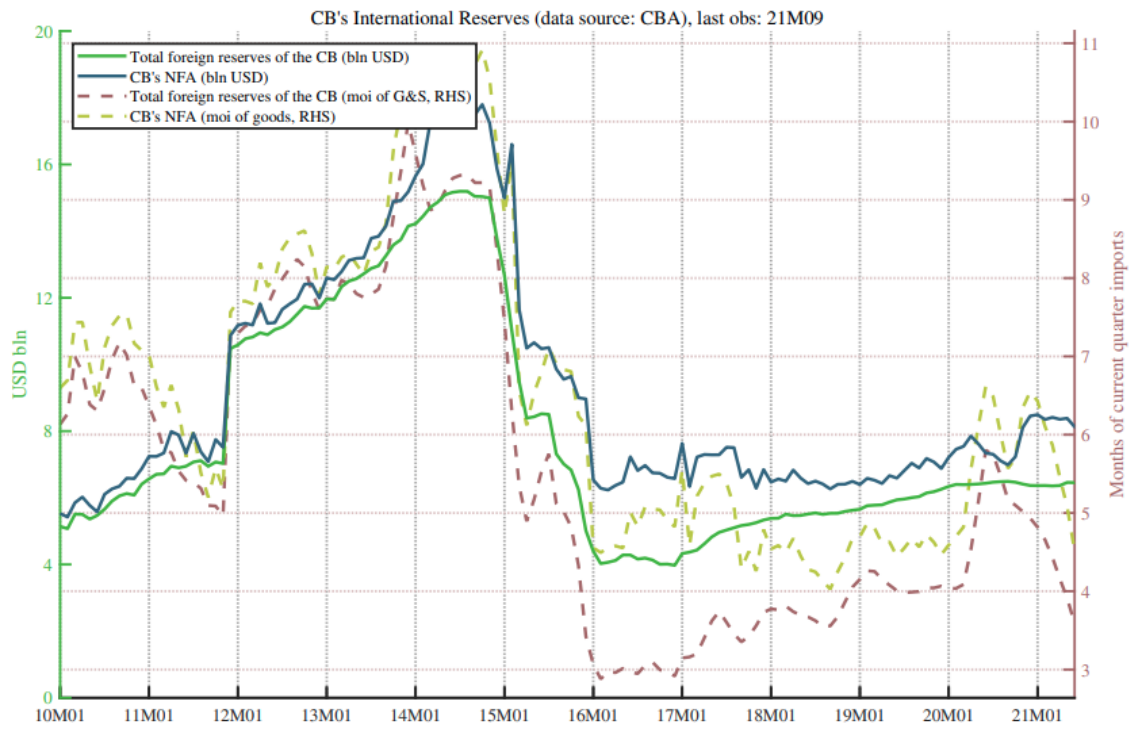
Different monetary policy regime

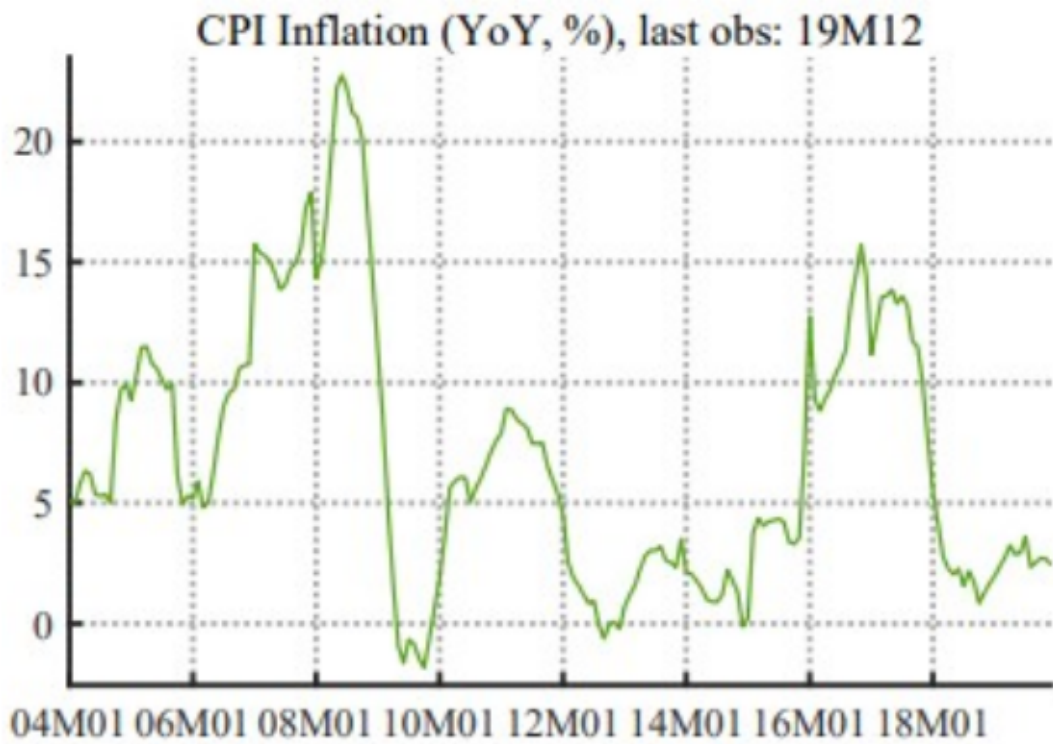
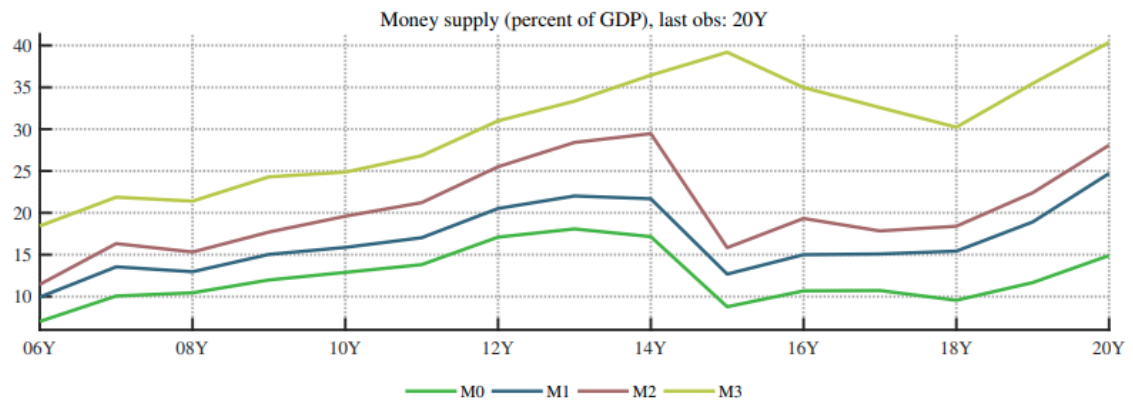
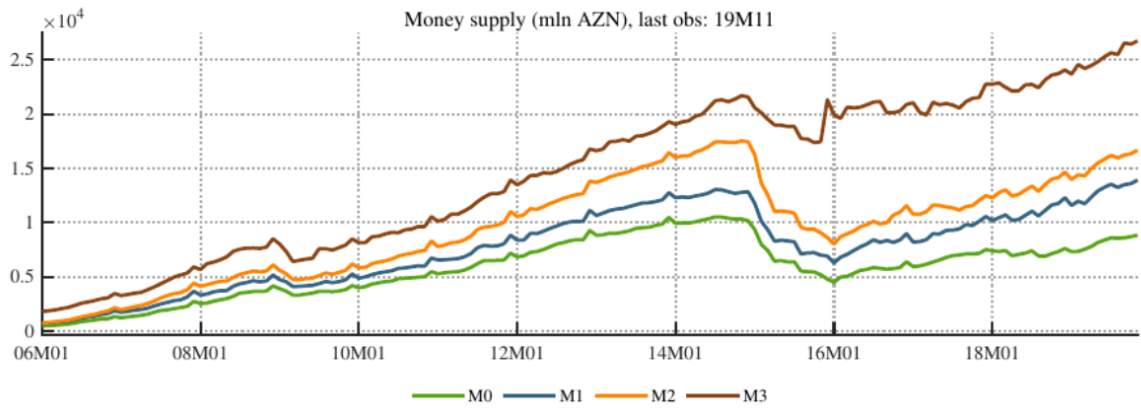
- No inflation targeting
- Explicit preference for stable FX rate
- Closed capital account
- How is this different from vanilla QPM?

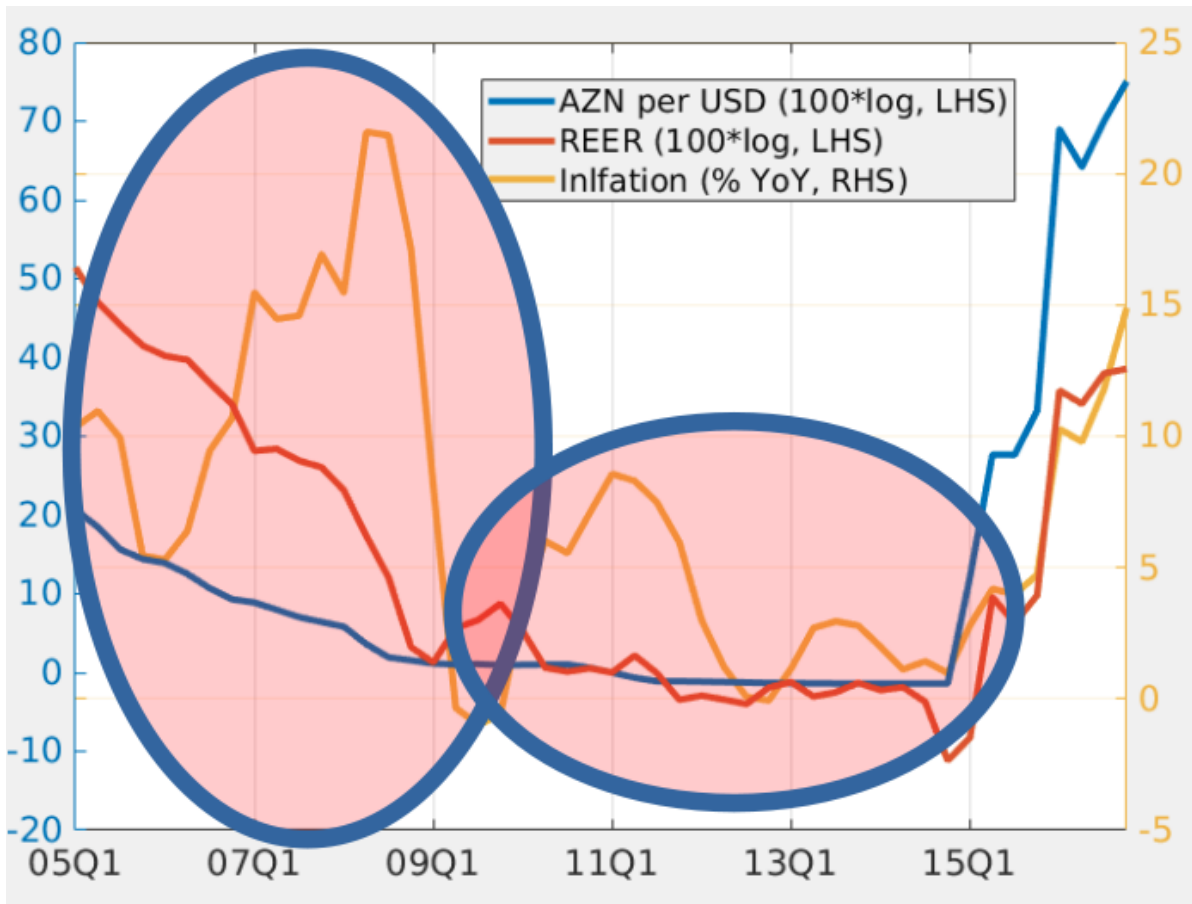
Charts for discussion



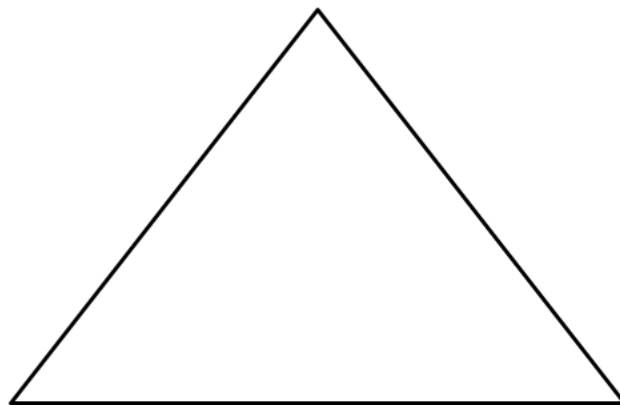








Autonomy of monetary policy



Fixed exchange rate

Capital flow mobility

Introducing Oil

No need to be sophisticated. Oil prices will be taken over from another model and imposed externally.

Simple gap-trend decomposition.

$$\begin{aligned}
 qoil_t &= oil_t - p_t^* \\
 qoil_t &= \overline{qoil}_t + \widehat{qoil}_t \\
 \Delta \overline{qoil}_t &= \rho_1 \Delta \overline{qoil}_{t-1} + (1 - \rho_1) \Delta \overline{qoil}_{ss} + \varepsilon^1 \\
 \widehat{qoil}_t &= \rho_2 \widehat{qoil}_t + \varepsilon^2
 \end{aligned}$$

We can do the same for world price of food.

$$\begin{aligned} qfood_t &= oil_t - p_t^* \\ qfood_t &= \overline{qfood_t} + \widehat{qfood_t} \\ \Delta \overline{qfood_t} &= \rho_1 \Delta \overline{qfood_{t-1}} + (1 - \rho_1) \Delta \overline{qfood_{ss}} + \varepsilon^1 \\ \widehat{qfood_t} &= \rho_2 \widehat{qfood_t} + \varepsilon^2 \end{aligned}$$

Oil and food are important determinants of consumer prices and we usually plug them in some way directly into Phillips Curves (same as REER).

Note:

- oil = Brent oil price
- food = FAO food price index

Modifying Equations

Note that small changes in equations can cause large changes in model properties.

Phillips Curve

Oil prices are regulated in AZ, but we can add food prices (again via two channels, refer back to REER channels):

$$\begin{aligned} \pi_t &= \beta_1 E_t \pi_{t+1} \\ &+ (1 - \beta_1) \pi_{t-1} \\ &+ \beta_2 \hat{y}_t \\ &+ \beta_3 (\hat{z}_t - \hat{z}_{t-1}) \\ &+ \beta_4 \hat{z}_t \\ &+ \alpha_5 \widehat{qfood_t} \\ &+ \alpha_6 (\widehat{qfood_t} - \widehat{qfood_{t-1}}) \\ &+ \epsilon_t^\pi \end{aligned}$$

Monetary Policy

Clear preference for FX stability over inflation.

Simple equation - does it work?

$$s_t = s_{t-1} + \varepsilon_t$$

- AZ did not have a strictly fixed FX rate
- we want some link to other variables

New exchange rate rule

$$\begin{aligned}
s_t &= \kappa_1 * ((s_{t-1} + \Delta s_t^{tar} - \kappa_2 \hat{z}_t) \\
&\quad + (1 - \kappa_1) (E_t[s_{t+1}] + (i_t^* + prem_t - i_t)/4 - \kappa_3 \widehat{oil}_t)) \\
\Delta s_t^{tar} &= \Delta \bar{z}_t + \pi_t^{tar} - \bar{\pi}_t^*
\end{aligned}$$

Parameter κ_1 controls how much the FX is flexible ($\kappa_1 = 0$) vs controlled ($\kappa_1 = 1$). Parameters κ_2, κ_3 allow for impact of REER and oil.

Domestic Demand

Oil is an important determinant (fiscal effects):

$$\begin{aligned}
\hat{y}_t &= \alpha_1 E_t \hat{y}_{t+1} \\
&\quad + \alpha_2 \hat{y}_{t-1} \\
&\quad - \alpha_3 \cdot \hat{r}_t \\
&\quad + \alpha_4 \cdot \hat{z}_t \\
&\quad + \alpha_5 \cdot \hat{y}_t^{US} \\
&\quad + \alpha_6 \widehat{qoil}_t \\
&\quad + \epsilon_t^y
\end{aligned}$$

Trends

Oil price impacts investment: both GDP and REER trend.

$$\begin{aligned}
\Delta \bar{z}_t &= \rho \cdot \Delta \bar{z}_{t-1} + (1 - \rho) \cdot \Delta \bar{z}_{ss} + c_1 (\Delta \overline{qoil}_t - \Delta \overline{qoil}_{ss}) + \epsilon_t^{\bar{z}} \\
\Delta \bar{y}_t &= \rho \cdot \Delta \bar{y}_{t-1} + (1 - \rho) \cdot \Delta \bar{y}_{ss} + c_1 (\Delta \overline{qoil}_t - \Delta \overline{qoil}_{ss}) + \epsilon_t^{\bar{y}}
\end{aligned}$$