

Technical appendix: Equations, variables, parameters

Daniel Baksa

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Equations

GDP gap - production side

$$\hat{y}_t = w^{y,agr} \cdot \hat{y}_t^{agr} + w^{y,min} \cdot \hat{y}_t^{min} + (1 - w^{y,agr} - w^{y,min}) \cdot \hat{y}_t^{core} + \sigma \cdot \varepsilon_t^{\hat{y}} \quad (1)$$

$$\hat{y}_t^{agr} = \rho^{\hat{y}^{agr}} \cdot \hat{y}_{t-1}^{agr} + \varepsilon_t^{y^{agr}} \cdot \sigma \quad (2)$$

$$\hat{y}_t^{min} = \rho^{\hat{y}^{min}} \cdot \hat{y}_{t-1}^{min} + (1 - \rho^{\hat{y}^{min}}) \cdot (\psi_1 \cdot \hat{y}_t^{FD} + \psi_2 \cdot \hat{r}p_t^{Commodity}) + \varepsilon_t^{y^{min}} \cdot \sigma \quad (3)$$

GDP gap - demand side

$$\hat{y}_t = w^{y,c} \cdot \hat{c}_t + w^{y,inv} \cdot \hat{inv}_t + w^{y,gov} \cdot \hat{gov}_t + w^{y,ex} \cdot \hat{ex}_t - w^{y,im} \cdot \hat{im}_t + \varepsilon_t^{y^{c\hat{re}}} \cdot \sigma \quad (4)$$

$$\hat{d}_t = (w^{y,c} \cdot \hat{c}_t + w^{y,inv} \cdot \hat{inv}_t + w^{y,gov} \cdot \hat{gov}_t) / (w^{y,c} + w^{y,inv} + w^{y,gov}) + \varepsilon_t^{\hat{d}} \cdot \sigma \quad (5)$$

$$\hat{c}_t = \alpha_1 \cdot \hat{c}_{t-1} + (1 - \alpha_1) \cdot \hat{c}_{t+1} - \alpha_2 \cdot \hat{r}_t + \alpha_3 \cdot \hat{inc}_t + \alpha_4 \cdot \hat{y}_t^{agr} + \varepsilon_t^{\hat{c}} \cdot \sigma \quad (6)$$

$$\hat{inv}_t = \beta_1 \cdot \hat{inv}_{t-1} + (1 - \beta_1) \cdot \hat{inv}_{t+1} + \beta_2 \cdot Q_t + \varepsilon_t^{inv} \cdot \sigma \quad (7)$$

$$Q_t = \beta_3 \cdot Q_{t+1} + \beta_4 \cdot \hat{y}_t + \beta_5 \cdot \hat{r}p_t^{Commodity} - \beta_6 \cdot \hat{r}_t \quad (8)$$

$$\hat{gov}_t = \rho^{gov} \cdot \hat{gov}_{t-1} + \varepsilon_t^{gov} \cdot \sigma \quad (9)$$

$$\epsilon_t^{\hat{c}} = \varepsilon_t^{\hat{c}} \quad (10)$$

$$\epsilon_t^{inv} = \varepsilon_t^{inv} \quad (11)$$

$$\hat{ex}_t = (1 - w^{ex,min}) \cdot \hat{ex}^{non-min}_t + w^{ex,min} \cdot \hat{ex}^{min}_t \quad (12)$$

$$\hat{ex}^{non-min}_t = \gamma_1 \cdot \hat{ex}^{non-min}_{t-1} + \gamma_2 \cdot \hat{ex}^{non-min}_t^e + \gamma_3 \cdot \hat{z}_t + \gamma_4 \cdot \hat{y}_t^{min} + \gamma_5 \cdot \hat{y}_t^{FD} + \varepsilon_t^{ex^{non-min}} \cdot \sigma \quad (13)$$

$$\hat{ex^{mine}}_t = \rho^{\hat{ex^{mine}}} \cdot \hat{ex^{mine}}_{t-1} + (1 - \rho^{\hat{ex^{mine}}}) \cdot (\gamma_7 \cdot \hat{z}_t + \gamma_8 \cdot \hat{y}_t^{mine} + \gamma_9 \cdot \hat{r}p_t^{Commodity}) + \varepsilon_t^{\hat{ex^{mine}}} \cdot \sigma \quad (14)$$

$$\hat{i^m}_t = w^{im,c} \cdot \hat{i^m}_t^c + w^{im,inv} \cdot \hat{i^m}_t^{inv} + (1 - w^{im,c} - w^{im,inv}) \cdot \hat{i^m}_t^{ex} + \varepsilon_t^{\hat{i^m}} \cdot \sigma \quad (15)$$

$$\hat{i^m}_t^c = \gamma_{10} \cdot \hat{i^m}_t^c_{t-1} + \gamma_{11} \cdot \hat{i^m}_t^c_{t+1} + \gamma_{12} \cdot (\hat{c}_t - \gamma_{13} \cdot \hat{z}_t) \quad (16)$$

$$\hat{i^m}_t^{inv} = \gamma_{14} \cdot \hat{i^m}_t^{inv}_{t-1} + \gamma_{15} \cdot \hat{i^m}_t^{inv}_{t+1} + \gamma_{16} \cdot \hat{i^m}_t^{inv} \quad (17)$$

$$\hat{i^m}_t^{ex} = \gamma_{17} \cdot \hat{i^m}_t^{ex}_{t-1} + \gamma_{18} \cdot \hat{i^m}_t^{ex}_{t+1} + \gamma_{19} \cdot \hat{e^x}_t \quad (18)$$

GDP trend - production side

$$\Delta \bar{y}_t = w^{y,agr} \cdot \Delta \bar{y}_t^{agr} + w^{y,mine} \cdot \Delta \bar{y}_t^{mine} + (1 - w^{y,agr} - w^{y,mine}) \cdot \Delta \bar{y}_t^{core} + \varepsilon_t^{\Delta \bar{y}} \cdot \sigma \quad (19)$$

$$\Delta \bar{y}_t^{agr} = \rho^{\Delta \bar{y}^{agr}} \cdot \Delta \bar{y}_{t-1}^{agr} + (1 - \rho^{\Delta \bar{y}^{agr}}) \cdot ss^{\Delta \bar{y}^{agr}} + \varepsilon_t^{\Delta \bar{y}^{agr}} \cdot \sigma \quad (20)$$

$$\Delta \bar{y}_t^{mine} = \rho^{\Delta \bar{y}^{mine}} \cdot \Delta \bar{y}_{t-1}^{mine} + (1 - \rho^{\Delta \bar{y}^{mine}}) \cdot (ss^{\Delta \bar{y}^{mine}} + \omega_{10} \cdot (\Delta ex^{mine}_t - ss^{\Delta ex^{mine}})) + \varepsilon_t^{\Delta \bar{y}^{mine}} \cdot \sigma \quad (21)$$

GDP trend - demand side

$$\Delta \bar{y}_t = w^{y,c} \cdot \Delta \bar{c}_t + w^{y,inv} \cdot \Delta \bar{i^nv}_t + w^{y,gov} \cdot \Delta \bar{g\bar{o}v}_t + w^{y,ex} \cdot \Delta \bar{e\bar{x}}_t - w^{y,im} \cdot \Delta \bar{i^m}_t + \varepsilon_t^{\Delta \bar{y}^{c\bar{o}re}} \cdot \sigma \quad (22)$$

$$\Delta \bar{d}_t = (w^{y,c} \cdot \Delta \bar{c}_t + w^{y,inv} \cdot \Delta \bar{i^nv}_t + w^{y,gov} \cdot \Delta \bar{g\bar{o}v}_t) / (w^{y,c} + w^{y,inv} + w^{y,gov}) + \varepsilon_t^{\Delta \bar{d}} \cdot \sigma \quad (23)$$

$$\Delta \bar{c}_t = \rho^{\Delta \bar{c}} \cdot \Delta \bar{c}_{t-1} + (1 - \rho^{\Delta \bar{c}}) \cdot (ss^{\Delta \bar{c}} - \omega_1 \cdot (\bar{r}_t - ss^{\bar{r}}) + \omega_2 \cdot (\Delta e\bar{m}p_t^{total} + \Delta \bar{w}_t^{total} - ss^{\Delta e\bar{m}p^{total}} - ss^{\Delta \bar{w}^{total}})) + \varepsilon_t^{\Delta \bar{c}} \cdot \sigma \quad (24)$$

$$\Delta \bar{i^nv}_t = \rho^{\Delta \bar{i^nv}} \cdot \Delta \bar{i^nv}_{t-1} + (1 - \rho^{\Delta \bar{i^nv}}) \cdot (ss^{\Delta \bar{i^nv}} - \omega_3 \cdot (\bar{r}_t - ss^{\bar{r}}) + \omega_4 \cdot (\Delta \bar{y}_t - ss^{\Delta \bar{y}})) + \varepsilon_t^{\Delta \bar{i^nv}} \cdot \sigma \quad (25)$$

$$\Delta \bar{g\bar{o}v}_t = \rho^{\Delta \bar{g\bar{o}v}} \cdot \Delta \bar{g\bar{o}v}_{t-1} + (1 - \rho^{\Delta \bar{g\bar{o}v}}) \cdot (ss^{\Delta \bar{g\bar{o}v}}) + \varepsilon_t^{\Delta \bar{g\bar{o}v}} \cdot \sigma \quad (26)$$

$$\Delta \bar{e\bar{x}}_t = w^{ex,mine} \cdot \Delta \bar{ex^{mine}}_t + (1 - w^{ex,mine}) \cdot \Delta \bar{ex^{non-mine}}_t \quad (27)$$

$$\Delta ex^{\bar{mine}}_t = \rho^{\Delta \bar{ex}^{mine}} \cdot \Delta ex^{\bar{mine}}_{t-1} + (1 - \rho^{\Delta \bar{ex}^{mine}}) \cdot (ss^{\Delta \bar{ex}^{mine}} + \omega_5 \cdot (\Delta \bar{y}_t^{mine} - ss^{\Delta \bar{y}^{mine}}) + \omega_6 \cdot \Delta \bar{r}p_t^{Commodity}) + \varepsilon_t^{\Delta ex^{\bar{mine}}} \cdot \sigma \quad (28)$$

$$\begin{aligned} \Delta ex^{\bar{non-mine}}_t &= \rho^{\Delta \bar{ex}^{non-mine}} \cdot \Delta ex^{\bar{non-mine}}_{t-1} + (1 - \rho^{\Delta \bar{ex}^{non-mine}}) \cdot (ss^{\Delta \bar{ex}^{n,mine}} + \omega_7 \cdot (\Delta \bar{z}_t - ss^{\Delta \bar{z}}) + \omega_8 \cdot (\Delta \bar{y}_t^{FD} - ss^{\Delta \bar{y}^{FD}}) - \omega_9 \cdot \\ &(\Delta ex^{\bar{mine}}_t - ss^{\Delta \bar{ex}^{mine}})) + \varepsilon_t^{\Delta ex^{\bar{non-mine}}} \cdot \sigma \end{aligned} \quad (29)$$

$$\Delta i^{\bar{m}}_t = \rho^{\Delta i^{\bar{m}}} \cdot \Delta i^{\bar{m}}_{t-1} + (1 - \rho^{\Delta i^{\bar{m}}}) \cdot (w^{im,c} \cdot \Delta \bar{c}_t + w^{im,inv} \cdot \Delta i^{\bar{m}}_{inv} + (1 - w^{im,c} - w^{im,inv}) \cdot \Delta i^{\bar{m}}_{ex} + \varepsilon_t^{\Delta i^{\bar{m}}} \cdot \sigma) \quad (30)$$

$$\Delta i^{\bar{m}}_{ex} = \rho^{\Delta i^{\bar{m},ex}} \cdot \Delta i^{\bar{m}}_{ex,t-1} + (1 - \rho^{\Delta i^{\bar{m},ex}}) \cdot \Delta \bar{ex}_t \quad (31)$$

Inflation block

$$\Delta cpi_t = \nu_1 \cdot \Delta cpi_{t-1} + (1 - \nu_1 - \nu_2) \cdot \Delta cpi_{t+1} + \nu_2 \cdot \Delta cpi_t^F + \nu_3 \cdot (\nu_4 \cdot \hat{c}_t + (1 - \nu_4) \cdot \hat{z}_t) + \nu_5 \cdot \hat{r}p_t^{Food} + \nu_6 \cdot \hat{r}p_t^{Fuel} + \varepsilon_t^{\Delta cpi} \cdot \sigma \quad (32)$$

$$\Delta \hat{cpi}_t = \Delta cpi_t - tar_t \quad (33)$$

$$tar_t = \rho^{tar} \cdot tar_{t-1} + (1 - \rho^{tar}) \cdot ss^{tar} + \varepsilon_t^{tar} \cdot \sigma \quad (34)$$

$$\hat{r}p_t^{Fuel} = \nu_7 \cdot \hat{r}p_{t-1}^{Fuel} + (1 - \nu_7) \cdot \nu_8 \cdot (\hat{z}_t + \nu_9 \cdot \hat{r}p_t^{Oil} + (1 - \nu_9) \cdot \hat{r}p_{t-1}^{Oil}) \quad (35)$$

Taylor rule based policy rate

$$i_t^{pol} = \rho^{i^{pol}} \cdot i_{t-1}^{pol} + (1 - \rho^{i^{pol}}) \cdot (\bar{r}_t + tar_t + \theta_1 \cdot (\Delta_4 cpi_t^e - tar_t^e) + \theta_2 \cdot \hat{y}_t^{core} + \theta_3 \cdot (\Delta s_t^{e,MNT/USD} - \Delta \bar{s}_t^{e,MNT/USD})) + \varepsilon_t^{i^{pol}} \cdot \sigma \quad (36)$$

$$i_t^{uip} = \tilde{\Delta} s_{t+1}^{MNT/USD,fix} + i_t^{US} + Prem_t \quad (37)$$

$$i_t^{eff} = (1 - w^{FX}) \cdot i_t^{pol} + w^{FX} \cdot i_t^{uip} \quad (38)$$

$$\hat{r}_t = i_t^{eff} - \Delta cpi_t^e - \bar{r}_t \quad (39)$$

$$\hat{i}^{pol}_t = i_t^{pol} - \bar{r}_t - tar_t \quad (40)$$

Nominal exchange rate and UIP

$$\tilde{\Delta}s_t^{MNT/USD,fix} = 4 \cdot (s_t^{MNT/USD,fix} - s_{t-1}^{MNT/USD}) \quad (41)$$

$$\tilde{\Delta}s_t^{MNT/USD,float} = 4 \cdot (s_t^{MNT/USD,float} - s_{t-1}^{MNT/USD}) \quad (42)$$

$$\tilde{\Delta}s_t^{MNT/USD,fix}/4 = (\theta_4 \cdot \Delta s_{t-1}^{MNT/USD}/4 + (1 - \theta_4) \cdot \Delta \bar{s}_t^{MNT/USD}/4) + \theta_5 \cdot (-\hat{z}_{t-1}) \quad (43)$$

$$\tilde{\Delta}s_t^{MNT/USD,float}/4 = \theta_6 \cdot (\tilde{\Delta}s_{t+1}^{MNT/USD,float}/4 + \Delta s_{t+1}^{MNT/USD}/4) + (1 - \theta_6) \cdot (2/4 \cdot \Delta \bar{s}_t^{MNT/USD}) - i_t^{pol}/4 + i_t^{US}/4 + Prem_t/4 + \sigma \cdot \varepsilon_t^{MNT/USD}/4 \quad (44)$$

$$\Delta s_t^{MNT/USD} = w^{FX} \cdot \tilde{\Delta}s_t^{MNT/USD,fix} + (1 - w^{FX}) \cdot \tilde{\Delta}s_t^{MNT/USD,float} \quad (45)$$

$$\Delta \bar{s}_t^{MNT/USD} = \Delta \bar{z}_t + tar_t - (w^{CN,CPI} \cdot (-ss^{\Delta s^{CNY/USD}} + ss^{\Delta cpi^{CN}}) + w^{EU,CPI} \cdot (-ss^{\Delta s^{EUR/USD}} + ss^{\Delta cpi^{EU}}) + (1 - w^{CN,CPI} - w^{EU,CPI}) \cdot ss^{\Delta cpi^{US}}) \quad (46)$$

$$\bar{r}_t = \bar{r}_t^{US} + Prem_t + \Delta \bar{z}_t + w^{CN,CPI} \cdot (-ss^{\Delta s^{CNY/USD}} + ss^{\Delta cpi^{US}} - ss^{\Delta cpi^{CN}}) + w^{EU,CPI} \cdot (-ss^{\Delta s^{EUR/USD}} + ss^{\Delta cpi^{US}} - ss^{\Delta cpi^{EU}}) \quad (47)$$

$$Prem_t = \rho^{prem} \cdot Prem_{t-1} + (1 - \rho^{prem}) \cdot (ss^{prem} - \theta_7 \cdot (pby_t - ss^{p\bar{b}y}) - \theta_8 \cdot (\Delta \bar{y}_t - ss^{\Delta \bar{y}})) + \varepsilon_t^{prem} \cdot \sigma \quad (48)$$

Real Exchange Rate

$$\Delta \bar{z}_t = \rho^{\Delta \bar{z}} \cdot \Delta \bar{z}_{t-1} + (1 - \rho^{\Delta \bar{z}}) \cdot (ss^{\Delta \bar{z}} - \theta_9 \cdot \Delta \bar{p}_t^{Commodity}) + \varepsilon_t^{\Delta \bar{z}} \cdot \sigma \quad (49)$$

$$\Delta z_t = \Delta s_t^{MNT/USD} + \Delta cpi_t^{F,USD} - \Delta cpi_t \quad (50)$$

Fiscal policy

$$pby_t^{yearly} = (pby_t + pby_{t-1} + pby_{t-2} + pby_{t-3})/4 \quad (51)$$

$$\hat{pby}_t = \rho^{p\hat{b}y} \cdot p\hat{b}y_{t-1} + (1 - \rho^{p\hat{b}y}) \cdot (\mu_1 \cdot \hat{c}_t + \mu_2 \cdot \hat{inc}_t + \mu_3 \cdot (\hat{rp}_t^{Commodity} + \hat{y}_t^{mine}) - \mu_4 \cdot \hat{gov}_t) + \varepsilon_t^{p\hat{b}y} \cdot \sigma \quad (52)$$

$$\bar{p}\bar{b}y_t = \rho^{p\bar{b}y} \cdot p\bar{b}y_{t-1} + (1 - \rho^{p\bar{b}y}) \cdot (ss^{p\bar{b}y} + \mu_5 \cdot \Delta \bar{p}_t^{Commodity}) + \varepsilon_t^{p\bar{b}y} \cdot \sigma \quad (53)$$

Labor market block

$$\hat{inc}_t = \hat{emp}_t^{total} + \hat{w}_t^{total} \quad (54)$$

$$emp_t^{total,yearly} = (emp_t^{total} + emp_{t-1}^{total} + emp_{t-2}^{total} + emp_{t-3}^{total})/4 \quad (55)$$

$$\hat{emp}_t^{total} = w^{emp,agr} \cdot \hat{emp}_t^{agr} + w^{emp,mine} \cdot \hat{emp}_t^{mine} + (1 - w^{emp,agr} - w^{emp,mine}) \cdot \hat{emp}_t^{core} + \varepsilon_t^{\hat{emp}^{total}} \cdot \sigma \quad (56)$$

$$\Delta \bar{emp}_t^{total} = w^{emp,agr} \cdot \Delta \bar{mp}_t^{agr} + w^{emp,mine} \cdot \Delta \bar{mp}_t^{mine} + (1 - w^{emp,agr} - w^{emp,mine}) \cdot \Delta \bar{mp}_t^{core} + \varepsilon_t^{\Delta \bar{mp}^{total}} \cdot \sigma \quad (57)$$

$$emp_t^{core,yearly} = (emp_t^{core} + emp_{t-1}^{core} + emp_{t-2}^{core} + emp_{t-3}^{core})/4 \quad (58)$$

$$\hat{emp}_t^{core} = \rho^{\hat{emp}^{core}} \cdot \hat{emp}_{t-1}^{core} + (1 - \rho^{\hat{emp}^{core}}) \cdot \zeta_1 \cdot \hat{y}_t^{core} + \varepsilon_t^{\hat{emp}^{core}} \cdot \sigma \quad (59)$$

$$\Delta \bar{mp}_t^{core} = \rho^{\Delta \bar{mp}^{core}} \cdot \Delta \bar{mp}_{t-1}^{core} + (1 - \rho^{\Delta \bar{mp}^{core}}) \cdot \zeta_2 \cdot \Delta \bar{y}_{t-1}^{core} + \varepsilon_t^{\Delta \bar{mp}^{core}} \cdot \sigma \quad (60)$$

$$emp_t^{agr,yearly} = (emp_t^{agr} + emp_{t-1}^{agr} + emp_{t-2}^{agr} + emp_{t-3}^{agr})/4 \quad (61)$$

$$\hat{emp}_t^{agr} = \rho^{\hat{emp}^{agr}} \cdot \hat{emp}_{t-1}^{agr} + (1 - \rho^{\hat{emp}^{agr}}) \cdot \zeta_3 \cdot \hat{y}_t^{agr} + \varepsilon_t^{\hat{emp}^{agr}} \cdot \sigma \quad (62)$$

$$\Delta \bar{mp}_t^{agr} = \rho^{\Delta \bar{mp}^{agr}} \cdot \Delta \bar{mp}_{t-1}^{agr} + \varepsilon_t^{\Delta \bar{mp}^{agr}} \cdot \sigma \quad (63)$$

$$emp_t^{mine,yearly} = (emp_t^{mine} + emp_{t-1}^{mine} + emp_{t-2}^{mine} + emp_{t-3}^{mine})/4 \quad (64)$$

$$\hat{emp}_t^{mine} = \rho^{\hat{emp}^{mine}} \cdot \hat{emp}_{t-1}^{mine} + (1 - \rho^{\hat{emp}^{mine}}) \cdot \zeta_4 \cdot \hat{y}_t^{mine} + \varepsilon_t^{\hat{emp}^{mine}} \cdot \sigma \quad (65)$$

$$\Delta \bar{mp}_t^{mine} = \rho^{\Delta \bar{mp}^{mine}} \cdot \Delta \bar{mp}_{t-1}^{mine} + \varepsilon_t^{\Delta \bar{mp}^{mine}} \cdot \sigma \quad (66)$$

$$\hat{w}_t^{total} = w^{emp,agr} \cdot \hat{w}_t^{agr} + w^{emp,mine} \cdot \hat{w}_t^{mine} + (1 - w^{emp,agr} - w^{emp,mine}) \cdot \hat{w}_t^{core} \quad (67)$$

$$\Delta \bar{w}_t^{total} = w^{emp,agr} \cdot \Delta \bar{w}_t^{agr} + w^{emp,mine} \cdot \Delta \bar{w}_t^{mine} + (1 - w^{emp,agr} - w^{emp,mine}) \cdot \Delta \bar{w}_t^{core} \quad (68)$$

$$\hat{w}_t^{core} = \rho^{\hat{w}^{core}} \cdot \hat{w}_{t-1}^{core} + (1 - \rho^{\hat{w}^{core}}) \cdot \zeta_5 \cdot \hat{y}_t^{core} + \varepsilon_t^{\hat{w}^{core}} \cdot \sigma \quad (69)$$

$$\Delta \bar{w}_t^{core} = \rho^{\Delta \bar{w}^{core}} \cdot \Delta \bar{w}_{t-1}^{core} + (1 - \rho^{\Delta \bar{w}^{core}}) \cdot (ss^{\Delta \bar{w}^{core}} + \zeta_8 \cdot (\Delta \bar{y}_t^{core} - ss^{\Delta \bar{y}^{core}})) + \varepsilon_t^{\Delta \bar{w}^{core}} \cdot \sigma \quad (70)$$

$$\hat{w}_t^{agr} = \rho^{\hat{w}^{agr}} \cdot \hat{w}_{t-1}^{agr} + (1 - \rho^{\hat{w}^{agr}}) \cdot \zeta_6 \cdot \hat{y}_t^{agr} + \varepsilon_t^{\hat{w}^{agr}} \cdot \sigma \quad (71)$$

$$\Delta \bar{w}_t^{agr} = \rho^{\Delta \bar{w}^{agr}} \cdot \Delta \bar{w}_{t-1}^{agr} + (1 - \rho^{\Delta \bar{w}^{agr}}) \cdot ss^{\Delta \bar{w}^{agr}} + \varepsilon_t^{\Delta \bar{w}^{agr}} \cdot \sigma \quad (72)$$

$$\hat{w}_t^{mine} = \rho^{\hat{w}^{mine}} \cdot \hat{w}_{t-1}^{mine} + (1 - \rho^{\hat{w}^{mine}}) \cdot \zeta_7 \cdot \hat{y}_t^{mine} + \varepsilon_t^{\hat{w}^{mine}} \cdot \sigma \quad (73)$$

$$\Delta \bar{w}_t^{mine} = \rho^{\Delta \bar{w}^{mine}} \cdot \Delta \bar{w}_{t-1}^{mine} + (1 - \rho^{\Delta \bar{w}^{mine}}) \cdot ss^{\Delta \bar{w}^{mine}} + \varepsilon_t^{\Delta \bar{w}^{mine}} \cdot \sigma \quad (74)$$

Foreign Demand

$$\hat{y}_t^{FD} = w^{CN} \cdot \hat{y}_t^{CN} + w^{EU} \cdot \hat{y}_t^{EU} + (1 - w^{CN} - w^{EU}) \cdot \hat{y}_t^{US} \quad (75)$$

$$\hat{y}_t^{CN} = \rho^{\hat{y}^{CN}} \cdot \hat{y}_{t-1}^{CN} + \varepsilon_t^{\hat{y}^{CN}} \cdot \sigma \quad (76)$$

$$\hat{y}_t^{EU} = \rho^{\hat{y}^{EU}} \cdot \hat{y}_{t-1}^{EU} + \varepsilon_t^{\hat{y}^{EU}} \cdot \sigma \quad (77)$$

$$\hat{y}_t^{US} = \rho^{\hat{y}^{US}} \cdot \hat{y}_{t-1}^{US} + \varepsilon_t^{\hat{y}^{US}} \cdot \sigma \quad (78)$$

$$\Delta \bar{y}_t^{CN} = \rho^{\Delta \bar{y}^{CN}} \cdot \Delta \bar{y}_{t-1}^{CN} + (1 - \rho^{\Delta \bar{y}^{CN}}) \cdot ss^{\Delta \bar{y}^{CN}} + \varepsilon_t^{\Delta \bar{y}^{CN}} \cdot \sigma \quad (79)$$

$$\Delta \bar{y}_t^{EU} = \rho^{\Delta \bar{y}^{EU}} \cdot \Delta \bar{y}_{t-1}^{EU} + (1 - \rho^{\Delta \bar{y}^{EU}}) \cdot ss^{\Delta \bar{y}^{EU}} + \varepsilon_t^{\Delta \bar{y}^{EU}} \cdot \sigma \quad (80)$$

$$\Delta \bar{y}_t^{US} = \rho^{\Delta \bar{y}^{US}} \cdot \Delta \bar{y}_{t-1}^{US} + (1 - \rho^{\Delta \bar{y}^{US}}) \cdot ss^{\Delta \bar{y}^{US}} + \varepsilon_t^{\Delta \bar{y}^{US}} \cdot \sigma \quad (81)$$

$$\Delta \bar{y}_t^{FD} = w^{CN} \cdot \Delta \bar{y}_t^{CN} + w^{EU} \cdot \Delta \bar{y}_t^{EU} + (1 - w^{CN} - w^{EU}) \cdot \Delta \bar{y}_t^{US} \quad (82)$$

Foreign CPI

$$\Delta cpi_t^{CN} = \rho^{\Delta cpi^{CN}} \cdot \Delta cpi_{t-1}^{CN} + ((1 - \rho^{\Delta cpi^{CN}}) \cdot ss^{\Delta cpi^{CN}} + \kappa_1 \cdot \hat{y}_t^{CN} + \kappa_2 \cdot \hat{r}p_t^{Food} + \kappa_3 \cdot \hat{r}p_t^{Oil}) + \varepsilon_t^{\Delta cpi^{CN}} \cdot \sigma \quad (83)$$

$$\Delta cpi_t^{EU} = \rho^{\Delta cpi^{EU}} \cdot \Delta cpi_{t-1}^{EU} + ((1 - \rho^{\Delta cpi^{EU}}) \cdot ss^{\Delta cpi^{EU}} + \kappa_4 \cdot \hat{y}_t^{EU} + \kappa_5 \cdot \hat{r}p_t^{Food} + \kappa_6 \cdot \hat{r}p_t^{Oil}) + \varepsilon_t^{\Delta cpi^{EU}} \cdot \sigma \quad (84)$$

$$\Delta cpi_t^{US} = \rho^{\Delta cpi^{US}} \cdot \Delta cpi_{t-1}^{US} + ((1 - \rho^{\Delta cpi^{US}}) \cdot ss^{\Delta cpi^{US}} + \kappa_7 \cdot \hat{y}_t^{US} + \kappa_8 \cdot \hat{r}p_t^{Food} + \kappa_9 \cdot \hat{r}p_t^{Oil}) + \varepsilon_t^{\Delta cpi^{US}} \cdot \sigma \quad (85)$$

$$\Delta s_t^{CNY/USD} = \rho^{\Delta s^{CNY/USD}} \cdot \Delta s_{t-1}^{CNY/USD} + (1 - \rho^{\Delta s^{CNY/USD}}) \cdot ss^{\Delta s^{CNY/USD}} + \varepsilon_t^{s^{CNY/USD}} \cdot \sigma \quad (86)$$

$$\Delta s_t^{EUR/USD} = \rho^{\Delta s^{EUR/USD}} \cdot \Delta s_{t-1}^{EUR/USD} + (1 - \rho^{\Delta s^{EUR/USD}}) \cdot ss^{\Delta s^{EUR/USD}} + \varepsilon_t^{s^{EUR/USD}} \cdot \sigma \quad (87)$$

$$i_t^{US} = \rho^{i^{US}} \cdot i_{t-1}^{US} + (1 - \rho^{i^{US}}) \cdot (\bar{r}_t^{US} + ss^{\Delta cpi^{US}}) + \varepsilon_t^{i^{US}} \cdot \sigma \quad (88)$$

$$\bar{r}_t^{US} = \rho^{\bar{r}^{US}} \cdot \bar{r}_{t-1}^{US} + (1 - \rho^{\bar{r}^{US}}) \cdot ss^{\bar{r}^{US}} + \varepsilon_t^{\bar{r}^{US}} \cdot \sigma \quad (89)$$

$$\Delta cpi_t^{F,USD} = w^{CN,CPI} \cdot (\Delta cpi_t^{CN} - \Delta s_t^{CNY/USD}) + w^{EU,CPI} \cdot (\Delta cpi_t^{EU} - \Delta s_t^{EUR/USD}) + (1 - w^{CN,CPI} - w^{EU,CPI}) \cdot \Delta cpi_t^{US} \quad (90)$$

$$\Delta cpi_t^F = \Delta s_t^{MNT/USD} + \Delta cpi_t^{F,USD} - \Delta \bar{z}_t \quad (91)$$

Commodities

$$\hat{r}p_t^{Commodity} = w^{Com} \cdot \hat{r}p_t^{Copper} + (1 - w^{Com}) \cdot \hat{r}p_t^{Iron} \quad (92)$$

$$\Delta \bar{r}p_t^{Commodity} = (1 - w^{Com}) \cdot (\Delta \bar{r}p_t^{Iron} - ss^{\Delta \bar{r}p^{Iron}}) + w^{Com} \cdot (\Delta \bar{r}p_t^{Copper} - ss^{\Delta \bar{r}p^{Copper}}) \quad (93)$$

$$\Delta r p_t^{Food} = \Delta p_t^{Food} - \Delta cpi_t^{F,USD} \quad (94)$$

$$\Delta r p_t^{Oil} = \Delta p_t^{Oil} - \Delta cpi_t^{F,USD} \quad (95)$$

$$\Delta r p_t^{Copper} = \Delta p_t^{Copper} - \Delta cpi_t^{F,USD} \quad (96)$$

$$\Delta r p_t^{Iron} = \Delta p_t^{Iron} - \Delta cpi_t^{F,USD} \quad (97)$$

$$\hat{r}p_t^{Food} = \rho^{\hat{r}p^{Food}} \cdot \hat{r}p_{t-1}^{Food} + \varepsilon_t^{\hat{r}p^{Food}} \cdot \sigma \quad (98)$$

$$\Delta \bar{r}p_t^{Food} = \rho^{\Delta \bar{r}p^{Food}} \cdot \Delta \bar{r}p_{t-1}^{Food} + (1 - \rho^{\Delta \bar{r}p^{Food}}) \cdot ss^{\Delta \bar{r}p^{Food}} + \varepsilon_t^{\Delta \bar{r}p^{Food}} \cdot \sigma \quad (99)$$

$$\hat{r}p_t^{Oil} = \rho^{\hat{r}p^{Oil}} \cdot \hat{r}p_{t-1}^{Oil} + \kappa_{10} \cdot (w^{Commodity,CN} \cdot \hat{y}_t^{CN} + w^{Commodity,EU} \cdot \hat{y}_t^{EU} + (1 - w^{Commodity,CN} - w^{Commodity,EU}) \cdot \hat{y}_t^{US}) + \varepsilon_t^{\hat{r}p^{Oil}} \cdot \sigma \quad (100)$$

$$\Delta \bar{r}p_t^{Oil} = \rho^{\Delta \bar{r}p^{Oil}} \cdot \Delta \bar{r}p_{t-1}^{Oil} + (1 - \rho^{\Delta \bar{r}p^{Oil}}) \cdot ss^{\Delta \bar{r}p^{Oil}} + \varepsilon_t^{\Delta \bar{r}p^{Oil}} \cdot \sigma \quad (101)$$

$$\hat{r}p_t^{Copper} = \rho^{\hat{r}p^{Copper}} \cdot \hat{r}p_{t-1}^{Copper} + \kappa_{11} \cdot (w^{Commodity,CN} \cdot \hat{y}_t^{CN} + w^{Commodity,EU} \cdot \hat{y}_t^{EU} + (1 - w^{Commodity,CN} - w^{Commodity,EU}) \cdot \hat{y}_t^{US}) + \varepsilon_t^{\hat{r}p^{Copper}} \cdot \sigma \quad (102)$$

$$\Delta \bar{r}p_t^{Copper} = \rho^{\Delta \bar{r}p^{Copper}} \cdot \Delta \bar{r}p_{t-1}^{Copper} + (1 - \rho^{\Delta \bar{r}p^{Copper}}) \cdot ss^{\Delta \bar{r}p^{Copper}} + \varepsilon_t^{\Delta \bar{r}p^{Copper}} \cdot \sigma \quad (103)$$

$$\hat{r}p_t^{Iron} = \rho^{\hat{r}p^{Iron}} \cdot \hat{r}p_{t-1}^{Iron} + \kappa_{12} \cdot (w^{Commodity,CN} \cdot \hat{y}_t^{CN} + w^{Commodity,EU} \cdot \hat{y}_t^{EU} + (1 - w^{Commodity,CN} - w^{Commodity,EU}) \cdot \hat{y}_t^{US}) + \varepsilon_t^{\hat{r}p^{Iron}} \cdot \sigma \quad (104)$$

$$\Delta \bar{r}p_t^{Iron} = \rho^{\Delta \bar{r}p^{Iron}} \cdot \Delta \bar{r}p_{t-1}^{Iron} + (1 - \rho^{\Delta \bar{r}p^{Iron}}) \cdot ss^{\Delta \bar{r}p^{Iron}} + \varepsilon_t^{\Delta \bar{r}p^{Iron}} \cdot \sigma \quad (105)$$

Deflators

$$\Delta p_t^c = \rho^{\Delta p^c} \cdot \Delta p_{t-1}^c + (1 - \rho^{\Delta p^c}) \cdot (\Delta cpi_t) + \varepsilon_t^{\Delta p^c} \cdot \sigma \quad (106)$$

$$\Delta p_t^{inv} = \rho^{\Delta p^{inv}} \cdot \Delta p_{t-1}^{inv} + (1 - \rho^{\Delta p^{inv}}) \cdot \Delta cpi_t + \varepsilon_t^{\Delta p^{inv}} \cdot \sigma \quad (107)$$

$$\Delta p_t^{gov} = \rho^{\Delta p^{gov}} \cdot \Delta p_{t-1}^{gov} + (1 - \rho^{\Delta p^{gov}}) \cdot \Delta cpi_t + \varepsilon_t^{\Delta p^{gov}} \cdot \sigma \quad (108)$$

$$\Delta p_t^{ex} = \rho^{\Delta p^{ex}} \cdot \Delta p_{t-1}^{ex} + (1 - \rho^{\Delta p^{ex}}) \cdot (v_1 \cdot ((1 - w^{Com}) \cdot \Delta p_t^{Iron} + w^{Com} \cdot \Delta p_t^{Copper}) + (1 - v_1) \cdot \Delta cpi_t^{F,USD} + \Delta s_t^{MNT/USD}) + \varepsilon_t^{\Delta p^{ex}} \cdot \sigma \quad (109)$$

$$\Delta p_t^{im} = v_1 \cdot (w^{Com} \cdot \Delta p_t^{Oil} + (1 - w^{Com}) \cdot \Delta p_t^{Food}) + (1 - v_1) \cdot \Delta cpi_t^{F,USD} + \Delta s_t^{MNT/USD} + \varepsilon_t^{\Delta p^{im}} \cdot \sigma \quad (110)$$

$$\Delta p_t^y = \rho^{\Delta p^y} \cdot \Delta p_{t-1}^y + (1 - \rho^{\Delta p^y}) \cdot (w^{y,c} \cdot \Delta p_t^c + w^{y,inv} \cdot \Delta p_t^{inv} + w^{y,gov} \cdot \Delta p_t^{gov} + w^{y,ex} \cdot \Delta p_t^{ex} - (w^{y,c} + w^{y,inv} + w^{y,gov} + w^{y,ex} - 1) \cdot \Delta p_t^{im}) + \varepsilon_t^{\Delta p^y} \cdot \sigma \quad (111)$$

$$\Delta p_t^{y,agr} = v_2 \cdot \Delta cpi_t + (1 - v_2) \cdot (\Delta p_t^{Food} + \Delta s_t^{MNT/USD}) + \varepsilon_t^{\Delta p^{y,agr}} \cdot \sigma \quad (112)$$

$$\Delta p_t^{y,min} = \Delta p_t^{Copper} + \Delta s_t^{MNT/USD} + \varepsilon_t^{\Delta p^{y,min}} \cdot \sigma \quad (113)$$

$$\Delta p_t^{y,core} = \rho^{\Delta p^{y,core}} \cdot \Delta p_{t-1}^{y,core} + (1 - \rho^{\Delta p^{y,core}}) \cdot ((\Delta p_t^y - w^{y,agr} \cdot \Delta p_t^{y,agr} - w^{y,mine} \cdot \Delta p_t^{y,mine}) / (1 - w^{y,agr} - w^{y,mine})) + \varepsilon_t^{\Delta p^{y,core}} \cdot \sigma \quad (114)$$

Definitions - expectations

$$\hat{c}_t^e = \hat{c}_{t+1} \quad (115)$$

$$\hat{inv}_t^e = \hat{inv}_{t+1} \quad (116)$$

$$Q_t^e = Q_{t+1} \quad (117)$$

$$ex^{non\hat{-}mine}_t^e = ex^{non\hat{-}mine}_{t+1} \quad (118)$$

$$\Delta cpi_t^e = \Delta cpi_{t+1} \quad (119)$$

$$\Delta_4 cpi_t^e = \Delta_4 cpi_{t+1} \quad (120)$$

$$tar_t^e = tar_{t+1} \quad (121)$$

$$s_t^{e,MNT/USD} = s_{t+1}^{MNT/USD} \quad (122)$$

$$s_t^{e,MNT/USD,float} = \theta_6 \cdot s_{t+1}^{MNT/USD,float} + (1 - \theta_6) \cdot (s_{t-1}^{MNT/USD} + 2/4 \cdot \Delta \bar{s}_t^{MNT/USD}) \quad (123)$$

$$s_t^{e,MNT/USD,fix} = s_{t+1}^{MNT/USD,fix} \quad (124)$$

$$\Delta s_t^{e,MNT/USD} = \Delta s_{t+1}^{MNT/USD} \quad (125)$$

$$\Delta \bar{s}_t^{e,MNT/USD} = \Delta \bar{s}_{t+1}^{MNT/USD} \quad (126)$$

Definitions - gaps and trends

$$y_t = \hat{y}_t + \bar{y}_t \quad (127)$$

$$y_t^{agr} = \hat{y}_t^{agr} + \bar{y}_t^{agr} \quad (128)$$

$$y_t^{mine} = \hat{y}_t^{mine} + \bar{y}_t^{mine} \quad (129)$$

$$y_t^{core} = \hat{y}_t^{core} + \bar{y}_t^{core} \quad (130)$$

$$d_t = \hat{d}_t + \bar{d}_t \quad (131)$$

$$c_t = \hat{c}_t + \bar{c}_t \quad (132)$$

$$inv_t = \hat{inv}_t + \bar{inv}_t \quad (133)$$

$$gov_t = \hat{gov}_t + \bar{gov}_t \quad (134)$$

$$ex_t = \hat{ex}_t + \bar{ex}_t \quad (135)$$

$$ex_t^{mine} = \hat{ex}_t^{mine} + \bar{ex}_t^{mine} \quad (136)$$

$$ex_t^{non-mine} = \hat{ex}_t^{non-mine} + \bar{ex}_t^{non-mine} \quad (137)$$

$$im_t = \hat{im}_t + \bar{im}_t \quad (138)$$

$$emp_t^{total} = \hat{emp}_t^{total} + \bar{emp}_t^{total} \quad (139)$$

$$emp_t^{core} = \hat{emp}_t^{core} + \bar{emp}_t^{core} \quad (140)$$

$$emp_t^{agr} = \hat{emp}_t^{agr} + \bar{emp}_t^{agr} \quad (141)$$

$$emp_t^{mine} = \hat{emp}_t^{mine} + \bar{emp}_t^{mine} \quad (142)$$

$$w_t^{total} = \hat{w}_t^{total} + \bar{w}_t^{total} \quad (143)$$

$$w_t^{core} = \hat{w}_t^{core} + \bar{w}_t^{core} \quad (144)$$

$$w_t^{agr} = \hat{w}_t^{agr} + \bar{w}_t^{agr} \quad (145)$$

$$w_t^{mine} = \hat{w}_t^{mine} + \bar{w}_t^{mine} \quad (146)$$

$$z_t = \bar{z}_t + \hat{z}_t \quad (147)$$

$$pby_t = p\hat{y}_t + p\bar{y}_t \quad (148)$$

$$y_t^{CN} = \bar{y}_t^{CN} + \hat{y}_t^{CN} \quad (149)$$

$$y_t^{EU} = \bar{y}_t^{EU} + \hat{y}_t^{EU} \quad (150)$$

$$y_t^{US} = \bar{y}_t^{US} + \hat{y}_t^{US} \quad (151)$$

$$y_t^{FD} = \bar{y}_t^{FD} + \hat{y}_t^{FD} \quad (152)$$

$$rp_t^{Food} = \hat{rp}_t^{Food} + \bar{rp}_t^{Food} \quad (153)$$

$$rp_t^{Oil} = \hat{rp}_t^{Oil} + \bar{rp}_t^{Oil} \quad (154)$$

$$rp_t^{Copper} = \hat{rp}_t^{Copper} + \bar{rp}_t^{Copper} \quad (155)$$

$$rp_t^{Iron} = \hat{rp}_t^{Iron} + \bar{rp}_t^{Iron} \quad (156)$$

Definitions - growth rates

$$\Delta \bar{y}_t = 4 \cdot (\bar{y}_t - \bar{y}_{t-1}) \quad (157)$$

$$\Delta \bar{y}_t^{agr} = 4 \cdot (\bar{y}_t^{agr} - \bar{y}_{t-1}^{agr}) \quad (158)$$

$$\Delta \bar{y}_t^{mine} = 4 \cdot (\bar{y}_t^{mine} - \bar{y}_{t-1}^{mine}) \quad (159)$$

$$\Delta \bar{y}_t^{core} = 4 \cdot (\bar{y}_t^{core} - \bar{y}_{t-1}^{core}) \quad (160)$$

$$\Delta \bar{d}_t = 4 \cdot (\bar{d}_t - \bar{d}_{t-1}) \quad (161)$$

$$\Delta \bar{c}_t = 4 \cdot (\bar{c}_t - \bar{c}_{t-1}) \quad (162)$$

$$\Delta \bar{inv}_t = 4 \cdot (\bar{inv}_t - \bar{inv}_{t-1}) \quad (163)$$

$$\Delta \bar{gov}_t = 4 \cdot (\bar{gov}_t - \bar{gov}_{t-1}) \quad (164)$$

$$\Delta \bar{ex^{mine}}_t = 4 \cdot (\bar{ex^{mine}}_t - \bar{ex^{mine}}_{t-1}) \quad (165)$$

$$\Delta \bar{ex^{non-mine}}_t = 4 \cdot (\bar{ex^{non-mine}}_t - \bar{ex^{non-mine}}_{t-1}) \quad (166)$$

$$\Delta \bar{ex}_t = 4 \cdot (\bar{ex}_t - \bar{ex}_{t-1}) \quad (167)$$

$$\Delta \bar{im}_t = 4 \cdot (\bar{im}_t - \bar{im}_{t-1}) \quad (168)$$

$$\Delta_4 y_t = y_t - y_{t-4} \quad (169)$$

$$\Delta_4 y_t^{agr} = y_t^{agr} - y_{t-4}^{agr} \quad (170)$$

$$\Delta_4 y_t^{mine} = y_t^{mine} - y_{t-4}^{mine} \quad (171)$$

$$\Delta_4 y_t^{core} = y_t^{core} - y_{t-4}^{core} \quad (172)$$

$$\Delta_4 \bar{y}_t^{mine} = \bar{y}_t^{mine} - \bar{y}_{t-4}^{mine} \quad (173)$$

$$\Delta_4 d_t = d_t - d_{t-4} \quad (174)$$

$$\Delta_4 c_t = c_t - c_{t-4} \quad (175)$$

$$\Delta_4 inv_t = inv_t - inv_{t-4} \quad (176)$$

$$\Delta_4 gov_t = gov_t - gov_{t-4} \quad (177)$$

$$\Delta_4 ex_t = ex_t - ex_{t-4} \quad (178)$$

$$\Delta_4 ex^{mine}_t = ex^{mine}_t - ex^{mine}_{t-4} \quad (179)$$

$$\Delta_4 ex^{non-mine}_t = ex^{non-mine}_t - ex^{non-mine}_{t-4} \quad (180)$$

$$\Delta_4 im_t = im_t - im_{t-4} \quad (181)$$

$$\Delta e\bar{m}p_t^{total} = 4 \cdot (e\bar{m}p_t^{total} - e\bar{m}p_{t-1}^{total}) \quad (182)$$

$$\Delta e\bar{m}p_t^{core} = 4 \cdot (e\bar{m}p_t^{core} - e\bar{m}p_{t-1}^{core}) \quad (183)$$

$$\Delta e\bar{m}p_t^{agr} = 4 \cdot (e\bar{m}p_t^{agr} - e\bar{m}p_{t-1}^{agr}) \quad (184)$$

$$\Delta e\bar{m}p_t^{mine} = 4 \cdot (e\bar{m}p_t^{mine} - e\bar{m}p_{t-1}^{mine}) \quad (185)$$

$$\Delta w_t^{total} = 4 \cdot (w_t^{total} - w_{t-1}^{total}) \quad (186)$$

$$\Delta w_t^{core} = 4 \cdot (w_t^{core} - w_{t-1}^{core}) \quad (187)$$

$$\Delta w_t^{agr} = 4 \cdot (w_t^{agr} - w_{t-1}^{agr}) \quad (188)$$

$$\Delta w_t^{mine} = 4 \cdot (w_t^{mine} - w_{t-1}^{mine}) \quad (189)$$

$$\Delta \bar{w}_t^{total} = 4 \cdot (\bar{w}_t^{total} - \bar{w}_{t-1}^{total}) \quad (190)$$

$$\Delta \bar{w}_t^{core} = 4 \cdot (\bar{w}_t^{core} - \bar{w}_{t-1}^{core}) \quad (191)$$

$$\Delta \bar{w}_t^{agr} = 4 \cdot (\bar{w}_t^{agr} - \bar{w}_{t-1}^{agr}) \quad (192)$$

$$\Delta \bar{w}_t^{mine} = 4 \cdot (\bar{w}_t^{mine} - \bar{w}_{t-1}^{mine}) \quad (193)$$

$$\Delta_4 emp_t^{total} = (emp_t^{total} - emp_{t-4}^{total}) \quad (194)$$

$$\Delta_4 emp_t^{core} = (emp_t^{core} - emp_{t-4}^{core}) \quad (195)$$

$$\Delta_4 emp_t^{agr} = (emp_t^{agr} - emp_{t-4}^{agr}) \quad (196)$$

$$\Delta_4 emp_t^{mine} = (emp_t^{mine} - emp_{t-4}^{mine}) \quad (197)$$

$$\Delta_4 w_t^{total} = (w_t^{total} - w_{t-4}^{total}) \quad (198)$$

$$\Delta_4 w_t^{core} = (w_t^{core} - w_{t-4}^{core}) \quad (199)$$

$$\Delta_4 w_t^{agr} = (w_t^{agr} - w_{t-4}^{agr}) \quad (200)$$

$$\Delta_4 w_t^{mine} = (w_t^{mine} - w_{t-4}^{mine}) \quad (201)$$

$$\Delta cpi_t = 4 \cdot (cpi_t - cpi_{t-1}) \quad (202)$$

$$\Delta_4 cpi_t = cpi_t - cpi_{t-4} \quad (203)$$

$$\Delta s_t^{MNT/USD} = 4 \cdot (s_t^{MNT/USD} - s_{t-1}^{MNT/USD}) \quad (204)$$

$$\Delta_4 s_t^{MNT/USD} = (s_t^{MNT/USD} - s_{t-4}^{MNT/USD}) \quad (205)$$

$$\Delta cpi_t^{F,USD} = 4 \cdot (cpi_t^{F,USD} - cpi_{t-1}^{F,USD}) \quad (206)$$

$$\Delta_4 cpi_t^{F,USD} = cpi_t^{F,USD} - cpi_{t-4}^{F,USD} \quad (207)$$

$$\Delta z_t = 4 \cdot (z_t - z_{t-1}) \quad (208)$$

$$\Delta \bar{z}_t = 4 \cdot (\bar{z}_t - \bar{z}_{t-1}) \quad (209)$$

$$\Delta p_t^{Food} = 4 \cdot (p_t^{Food} - p_{t-1}^{Food}) \quad (210)$$

$$\Delta p_t^{Oil} = 4 \cdot (p_t^{Oil} - p_{t-1}^{Oil}) \quad (211)$$

$$\Delta p_t^{Copper} = 4 \cdot (p_t^{Copper} - p_{t-1}^{Copper}) \quad (212)$$

$$\Delta p_t^{Iron} = 4 \cdot (p_t^{Iron} - p_{t-1}^{Iron}) \quad (213)$$

$$\Delta rp_t^{Food} = 4 \cdot (rp_t^{Food} - rp_{t-1}^{Food}) \quad (214)$$

$$\Delta rp_t^{Oil} = 4 \cdot (rp_t^{Oil} - rp_{t-1}^{Oil}) \quad (215)$$

$$\Delta rp_t^{Copper} = 4 \cdot (rp_t^{Copper} - rp_{t-1}^{Copper}) \quad (216)$$

$$\Delta rp_t^{Iron} = 4 \cdot (rp_t^{Iron} - rp_{t-1}^{Iron}) \quad (217)$$

$$\Delta \bar{r}p_t^{Food} = 4 \cdot (\bar{r}p_t^{Food} - \bar{r}p_{t-1}^{Food}) \quad (218)$$

$$\Delta \bar{r}p_t^{Oil} = 4 \cdot (\bar{r}p_t^{Oil} - \bar{r}p_{t-1}^{Oil}) \quad (219)$$

$$\Delta \bar{r}p_t^{Copper} = 4 \cdot (\bar{r}p_t^{Copper} - \bar{r}p_{t-1}^{Copper}) \quad (220)$$

$$\Delta \bar{r}p_t^{Iron} = 4 \cdot (\bar{r}p_t^{Iron} - \bar{r}p_{t-1}^{Iron}) \quad (221)$$

$$\Delta y_t^{CN} = 4 \cdot (y_t^{CN} - y_{t-1}^{CN}) \quad (222)$$

$$\Delta y_t^{EU} = 4 \cdot (y_t^{EU} - y_{t-1}^{EU}) \quad (223)$$

$$\Delta y_t^{US} = 4 \cdot (y_t^{US} - y_{t-1}^{US}) \quad (224)$$

$$\Delta y_t^{FD} = 4 \cdot (y_t^{FD} - y_{t-1}^{FD}) \quad (225)$$

$$\Delta \bar{y}_t^{CN} = 4 \cdot (\bar{y}_t^{CN} - \bar{y}_{t-1}^{CN}) \quad (226)$$

$$\Delta \bar{y}_t^{EU} = 4 \cdot (\bar{y}_t^{EU} - \bar{y}_{t-1}^{EU}) \quad (227)$$

$$\Delta \bar{y}_t^{US} = 4 \cdot (\bar{y}_t^{US} - \bar{y}_{t-1}^{US}) \quad (228)$$

$$\Delta \bar{y}_t^{FD} = 4 \cdot (\bar{y}_t^{FD} - \bar{y}_{t-1}^{FD}) \quad (229)$$

$$\tilde{\Delta}_4 y_t^{mine} = (\Delta_4 y_t^{mine} + \Delta_4 y_{t-1}^{mine} + \Delta_4 y_{t-2}^{mine} + \Delta_4 y_{t-3}^{mine})/4 \quad (230)$$

$$\tilde{\Delta}_4 \bar{y}_t^{mine} = (\Delta_4 \bar{y}_t^{mine} + \Delta_4 \bar{y}_{t-1}^{mine} + \Delta_4 \bar{y}_{t-2}^{mine} + \Delta_4 \bar{y}_{t-3}^{mine})/4 \quad (231)$$

$$\Delta_4 y_t^{CN,yearly} = (\Delta_4 y_t^{CN} + \Delta_4 y_{t-1}^{CN} + \Delta_4 y_{t-2}^{CN} + \Delta_4 y_{t-3}^{CN})/4 \quad (232)$$

$$\Delta_4 y_t^{CN} = y_t^{CN} - y_{t-4}^{CN} \quad (233)$$

$$\Delta_4 y_t^{EU} = y_t^{EU} - y_{t-4}^{EU} \quad (234)$$

$$\Delta_4 y_t^{US} = y_t^{US} - y_{t-4}^{US} \quad (235)$$

$$\Delta_4 y_t^{FD} = y_t^{FD} - y_{t-4}^{FD} \quad (236)$$

$$\Delta p_t^c = 4 \cdot (p_t^c - p_{t-1}^c) \quad (237)$$

$$\Delta p_t^{inv} = 4 \cdot (p_t^{inv} - p_{t-1}^{inv}) \quad (238)$$

$$\Delta p_t^{gov} = 4 \cdot (p_t^{gov} - p_{t-1}^{gov}) \quad (239)$$

$$\Delta p_t^{ex} = 4 \cdot (p_t^{ex} - p_{t-1}^{ex}) \quad (240)$$

$$\Delta p_t^{im} = 4 \cdot (p_t^{im} - p_{t-1}^{im}) \quad (241)$$

$$\Delta p_t^y = 4 \cdot (p_t^y - p_{t-1}^y) \quad (242)$$

$$\Delta p_t^{y,agr} = 4 \cdot (p_t^{y,agr} - p_{t-1}^{y,agr}) \quad (243)$$

$$\Delta p_t^{y,mine} = 4 \cdot (p_t^{y,mine} - p_{t-1}^{y,mine}) \quad (244)$$

$$\Delta p_t^{y,core} = 4 \cdot (p_t^{y,core} - p_{t-1}^{y,core}) \quad (245)$$

$$\Delta_4 p_t^c = p_t^c - p_{t-4}^c \quad (246)$$

$$\Delta_4 p_t^{inv} = p_t^{inv} - p_{t-4}^{inv} \quad (247)$$

$$\Delta_4 p_t^{gov} = p_t^{gov} - p_{t-4}^{gov} \quad (248)$$

$$\Delta_4 p_t^{ex} = p_t^{ex} - p_{t-4}^{ex} \quad (249)$$

$$\Delta_4 p_t^{im} = p_t^{im} - p_{t-4}^{im} \quad (250)$$

$$\Delta_4 p_t^y = p_t^y - p_{t-4}^y \quad (251)$$

$$\Delta_4 p_t^{y,agr} = p_t^{y,agr} - p_{t-4}^{y,agr} \quad (252)$$

$$\Delta_4 p_t^{y,min} = p_t^{y,min} - p_{t-4}^{y,min} \quad (253)$$

$$\Delta_4 p_t^{y,core} = p_t^{y,core} - p_{t-4}^{y,core} \quad (254)$$

$$\Delta_4 cpi_t^{CN} = (\Delta cpi_t^{CN} + \Delta cpi_{t-1}^{CN} + \Delta cpi_{t-2}^{CN} + \Delta cpi_{t-3}^{CN})/4 \quad (255)$$

$$\Delta_4 cpi_t^{EU} = (\Delta cpi_t^{EU} + \Delta cpi_{t-1}^{EU} + \Delta cpi_{t-2}^{EU} + \Delta cpi_{t-3}^{EU})/4 \quad (256)$$

$$\Delta_4 cpi_t^{US} = (\Delta cpi_t^{US} + \Delta cpi_{t-1}^{US} + \Delta cpi_{t-2}^{US} + \Delta cpi_{t-3}^{US})/4 \quad (257)$$

$$\Delta_4 p_t^{Food} = (p_t^{Food} - p_{t-4}^{Food}) \quad (258)$$

$$\Delta_4 p_t^{Oil} = (p_t^{Oil} - p_{t-4}^{Oil}) \quad (259)$$

$$\Delta_4 p_t^{Copper} = (p_t^{Copper} - p_{t-4}^{Copper}) \quad (260)$$

$$\Delta_4 p_t^{Iron} = (p_t^{Iron} - p_{t-4}^{Iron}) \quad (261)$$

Variables of the model

Variable	Model name	Description
y	y	Real GDP: Total (100*log)
\hat{y}	y_gap	Real GDP: Total, gap (%)
\bar{y}	y_trend	Real GDP: Total, trend (100*log)
$\Delta\bar{y}$	dl_y_trend	Real GDP: Total, trend (%, QoQ)
Δ_4y	d4l_y	Real GDP: Total (%, YoY)
y^{agr}	y_agr	Real GDP: Agricultural (100*log)
\hat{y}^{agr}	y_agr_gap	Real GDP: Agricultural, gap (%)
\bar{y}^{agr}	y_agr_trend	Real GDP: Agricultural, trend (100*log)
$\Delta\bar{y}^{agr}$	dl_y_agr_trend	Real GDP: Agricultural, trend (%, QoQ)
Δ_4y^{agr}	d4l_y_agr	Real GDP: Agricultural (%, YoY)
y^{mine}	y_mine	Real GDP: Mining (100*log)
\hat{y}^{mine}	y_mine_gap	Real GDP: Mining, gap (%)
\bar{y}^{mine}	y_mine_trend	Real GDP: Mining, trend (100*log)
$\Delta\bar{y}^{mine}$	dl_y_mine_trend	Real GDP: Mining, trend (%, QoQ)
$\Delta_4\bar{y}^{mine}$	d4l_y_mine_trend	Real GDP: Mining, trend (%, YoY)
Δ_4y^{mine}	d4l_y_mine	Real GDP: Mining (%, YoY)
$\tilde{\Delta}_4y^{mine}$	d4l_y_mine_avg	Real GDP: Mining (%, YoY, yearly avg)
$\tilde{\Delta}_4\bar{y}^{mine}$	d4l_y_mine_trend_avg	Real GDP: Mining, trend (%, YoY, yearly avg)
y^{core}	y_base	Real GDP: Core (100*log)
\hat{y}^{core}	y_base_gap	Real GDP: Core, gap (%)
\bar{y}^{core}	y_base_trend	Real GDP: Core, trend (100*log)
$\Delta\bar{y}^{core}$	dl_y_base_trend	Real GDP: Core, trend (%, QoQ)
Δ_4y^{core}	d4l_y_base	Real GDP: Core (%, YoY)
d	dd	Real Domestic Demand (100*log)
\hat{d}	dd_gap	Real Domestic Demand, gap (%)
\bar{d}	dd_trend	Real Domestic Demand, trend (100*log)
$\Delta\bar{d}$	dl_dd_trend	Real Domestic Demand, trend (%, QoQ)
Δ_4d	d4l_dd	Real Domestic Demand (%, YoY)
c	c	Real Consumption (100*log)
\hat{c}	c_gap	Real Consumption, gap (%)

go to the next page

Variable	Model name	Description
\hat{c}	ups_c_gap	Real Consumption, gap shock (%)
\hat{c}^e	e_c_gap	Real Consumption, gap expected value (%)
\bar{c}	c_trend	Real Consumption, trend (100*log)
$\Delta \bar{c}$	dl_c_trend	Real Consumption, trend (%), QoQ
$\Delta_4 c$	d4l_c	Real Consumption (%), YoY
inv	inv	Real Investment (100*log)
\hat{inv}	inv_gap	Real Investment, gap (%)
\hat{inv}^e	ups_inv_gap	Real Investment, gap shock (%)
\hat{inv}^e	e_inv_gap	Real Investment, expected value gap (%)
\bar{inv}	inv_trend	Real Investment, trend (100*log)
$\Delta \bar{inv}$	dl_inv_trend	Real Investment, trend (%), QoQ
$\Delta_4 inv$	d4l_inv	Real Investment (%), YoY
Q	tob	Tobin-Q (%)
Q^e	e_tob	Tobin-Q, expected value (%)
gov	gov	Real Government Consumption (100*log)
\hat{gov}	gov_gap	Real Government Consumption, gap (%)
\bar{gov}	gov_trend	Real Government Consumption, trend (100*log)
$\Delta \bar{gov}$	dl_gov_trend	Real Government Consumption, trend (%), QoQ
$\Delta_4 gov$	d4l_gov	Real Government Consumption (%), YoY
ex	ex	Real Export (100*log)
\hat{ex}	ex_gap	Real Export, gap (%)
\bar{ex}	ex_trend	Real Export, trend (100*log)
$\Delta \bar{ex}$	dl_ex_trend	Real Export, trend (%), QoQ
$\Delta_4 ex$	d4l_ex	Real Export (%), YoY
$ex^{non-mine}$	ex_non_mine	Real Export: Non-Mining (100*log)
$\hat{ex}^{non-mine}$	ex_non_mine_gap	Real Export: Non-Mining, gap (%)
$\hat{ex}^{non-mine}^e$	e_ex_non_mine_gap	Real Export: Non-Mining, gap expected value (%)
$\bar{ex}^{non-mine}$	ex_non_mine_trend	Real Export: Non-Mining, trend (100*log)
$\Delta \bar{ex}^{non-mine}$	dl_ex_non_mine_trend	Real Export: Non-Mining, trend (%), QoQ
$\Delta_4 ex^{non-mine}$	d4l_ex_non_mine	Real Export: Non-Mining (%), YoY
ex^{mine}	ex_mine	Real Export: Mining (100*log)
\hat{ex}^{mine}	ex_mine_gap	Real Export: Mining, gap (%)
\bar{ex}^{mine}	ex_mine_trend	Real Export: Mining, trend (100*log)

go to the next page

Variable	Model name	Description
Δ_{ex}^{mine}	dl_ex_mine_trend	Real Export: Mining, trend (%), QoQ
$\Delta_4 ex^{mine}$	d4l_ex_mine	Real Export: Mining (%), YoY
im	im	Real Import (100*log)
\hat{im}	im_gap	Real Import, gap (%)
\bar{im}	im_trend	Real Import, trend (100*log)
$\Delta \bar{im}$	dl_im_trend	Real Import, trend (%), QoQ
$\Delta_4 im$	d4l_im	Real Import (%), YoY
$\hat{im^c}$	im_c_gap	Consumed Real Import, gap (%)
$\hat{im^{inv}}$	im_inv_gap	Invested Real Import, gap (%)
$\hat{im^{ex}}$	im_ex_gap	Exported Real Import, gap (%)
$\Delta \bar{im^{ex}}$	dl_im_ex_trend	Exported Real Import, trend (%), QoQ
cpi	cpi	CPI (100*log)
Δcpi	dl_cpi	CPI (%), QoQ
\hat{cpi}	dl_cpi_gap	CPI: Deviation from implicit target (%), QoQ
$\Delta_4 cpi$	d4l_cpi	CPI (%), YoY
Δcpi^e	e_dl_cpi	CPI (%), QoQ
$\Delta_4 cpi^e$	e_d4l_cpi	CPI (%), YoY
tar	target	Implicit Inflation Target (%), YoY
tar^e	e_target	Implicit Inflation Target, expectation (%), YoY
\hat{rp}^{Fuel}	rp_fuel_gap	Fuel price: gap (%)
p^c	p_c	Deflator: Consumption (100*log)
Δp^c	dl_p_c	Deflator: Consumption (%), QoQ
$\Delta_4 p^c$	d4l_p_c	Deflator: Consumption (%), YoY
p^{inv}	p_inv	Deflator: Investment (100*log)
Δp^{inv}	dl_p_inv	Deflator: Investment (%), QoQ
$\Delta_4 p^{inv}$	d4l_p_inv	Deflator: Investment (%), YoY
p^{gov}	p_gov	Deflator: Government Consumption (100*log)
Δp^{gov}	dl_p_gov	Deflator: Government Consumption (%), QoQ
$\Delta_4 p^{gov}$	d4l_p_gov	Deflator: Government Consumption (%), YoY
p^{ex}	p_ex	Deflator: Export (100*log)
Δp^{ex}	dl_p_ex	Deflator: Export (%), QoQ
$\Delta_4 p^{ex}$	d4l_p_ex	Deflator: Export (%), YoY
p^{im}	p_im	Deflator: Import (100*log)

go to the next page

Variable	Model name	Description
Δp^{im}	dl_p_im	Deflator: Import (%), QoQ
$\Delta_4 p^{im}$	d4l_p_im	Deflator: Import (%), YoY
p^y	p_y	Deflator: Total GDP (100*log)
Δp^y	dl_p_y	Deflator: Total GDP (%), QoQ
$\Delta_4 p^y$	d4l_p_y	Deflator: Total GDP (%), YoY
$p^{y,agr}$	p_y_agr	Deflator: Agricultural GDP (100*log)
$\Delta p^{y,agr}$	dl_p_y_agr	Deflator: Agricultural GDP (%), QoQ
$\Delta_4 p^{y,agr}$	d4l_p_y_agr	Deflator: Agricultural GDP (%), YoY
$p^{y,mine}$	p_y_mine	Deflator: Mining GDP (100*log)
$\Delta p^{y,mine}$	dl_p_y_mine	Deflator: Mining GDP (%), QoQ
$\Delta_4 p^{y,mine}$	d4l_p_y_mine	Deflator: Mining GDP (%), YoY
$p^{y,core}$	p_y_base	Deflator: Core GDP (100*log)
$\Delta p^{y,core}$	dl_p_y_base	Deflator: Core GDP (%), QoQ
$\Delta_4 p^{y,core}$	d4l_p_y_base	Deflator: Core GDP (%), YoY
i_{pol}	rate	Mongolbank rate (%)
i_{uip}	rate_uip	Implied UIP-based Rate (%)
i_{eff}	rate_eff	Effective Money Market Rate (%)
\bar{r}	r_trend	Domestic Neutral Real Rate (%)
\hat{r}	r_gap	Real Rate gap (%)
$i_{pol}^{\hat{}}$	rate_gap	Policy Rate deviation from neutral nominal rate (%)
$Prem$	prem	Country Risk Premium (%)
$s^{MNT/USD}$	mnt_usd	Nominal Exchange Rate: MNT/USD (100*log)
$s^{MNT/USD,fix}$	mnt_usd_fix	Nominal Exchange Rate: MNT/USD, fixed regime (100*log)
$\tilde{\Delta}s^{MNT/USD,fix}$	dl_mnt_usd_fix	Nominal Exchange Rate: MNT/USD, fixed regime (100*log)
$s^{MNT/USD,floor}$	mnt_usd_float	Nominal Exchange Rate: MNT/USD, floating regime (100*log)
$\tilde{\Delta}s^{MNT/USD,floor}$	dl_mnt_usd_float	Nominal Exchange Rate: MNT/USD, fixed regime (100*log)
$\Delta s^{MNT/USD}$	dl_mnt_usd	Nominal Exchange Rate: MNT/USD (%), QoQ
$\Delta s^{e,MNT/USD}$	e_dl_mnt_usd	Nominal Exchange Rate: MNT/USD, expected value (%), QoQ
$\Delta_4 s^{MNT/USD}$	d4l_mnt_usd	Nominal Exchange Rate: MNT/USD (%), YoY
$s^{e,MNT/USD}$	e_mnt_usd	Nominal Exchange Rate: MNT/USD, expected value (100*log)
$\Delta \bar{s}^{MNT/USD}$	dl_mnt_usd_trend	Implied Nominal Exchange Rate trend (%), QoQ
$\Delta \bar{s}^{e,MNT/USD}$	e_dl_mnt_usd_trend	Implied Nominal Exchange Rate trend, expected value (%), QoQ
$s^{e,MNT/USD,fix}$	e_mnt_usd_fix	Nominal Exchange Rate: MNT/USD, expected value, fixed regime (100*log)

go to the next page

Variable	Model name	Description
$s_{e,MNT/USD,float}$	e_mnt_usd_float	Nominal Exchange Rate: MNT/USD, expected value, floating regime (100*log)
z	z	Real Effective Exchange Rate (100*log)
\hat{z}	z_gap	Real Effective Exchange Rate, gap (%)
\bar{z}	z_trend	Real Effective Exchange Rate, trend (100*log)
$\Delta\bar{z}$	dl_z_trend	Real Effective Exchange Rate, trend (%, QoQ)
Δz	dl_z	Real Effective Exchange Rate (%, QoQ)
pby	prim_bal_rate	Primary balance to GDP (%)
pby^{yearly}	prim_bal_rate_avg	Primary balance to GDP yearly average (%)
\hat{pby}	prim_bal_rate_gap	Primary balance to GDP, gap (%)
\bar{pby}	prim_bal_rate_trend	Primary balance to GDP, trend (%)
\hat{inc}	income_gap	Real Labor Income Rate, gap (%)
emp^{total}	emp_total	Employment: Total (100*log)
\hat{emp}^{total}	emp_total_gap	Employment: Total, gap (%)
\bar{emp}^{total}	emp_total_trend	Employment: Total, trend (100*log)
$\Delta e\bar{mp}^{total}$	dl_emp_total_trend	Employment: Total, trend (%, QoQ)
$\Delta_4 emp^{total}$	d4l_emp_total	Employment: Total (%, YoY)
$emp^{total,yearly}$	emp_total_avg	Employment: Total, yearly average (100*log)
w^{total}	wage_total	Real Wage: Total (100*log)
\hat{w}^{total}	wage_total_gap	Real Wage: Total, gap (%)
\bar{w}^{total}	wage_total_trend	Real Wage: Total, trend (100*log)
Δw^{total}	dl_wage_total	Real Wage: Total (%, QoQ)
$\Delta_4 w^{total}$	d4l_wage_total	Real Wage: Total (%, YoY)
$\Delta \bar{w}^{total}$	dl_wage_total_trend	Real Wage: Total, trend (%, QoQ)
emp^{core}	emp_core	Employment: Core (100*log)
\hat{emp}^{core}	emp_core_gap	Employment: Core, gap (%)
\bar{emp}^{core}	emp_core_trend	Employment: Core, trend (100*log)
$\Delta e\bar{mp}^{core}$	dl_emp_core_trend	Employment: Core, trend (%, QoQ)
$\Delta_4 emp^{core}$	d4l_emp_core	Employment: Core (%, YoY)
$emp^{core,yearly}$	emp_core_avg	Employment: Core, yearly average (100*log)
w^{core}	wage_core	Real Wage: Core (100*log)
\hat{w}^{core}	wage_core_gap	Real Wage: Core, gap (%)
\bar{w}^{core}	wage_core_trend	Real Wage: Core, trend (100*log)
Δw^{core}	dl_wage_core	Real Wage: Core (%, QoQ)

go to the next page

Variable	Model name	Description
$\Delta_4 w^{core}$	d4l_wage_core	Real Wage: Core (%), YoY
$\Delta \bar{w}^{core}$	dl_wage_core_trend	Real Wage: Core, trend (%), QoQ
emp^{agr}	emp_agr	Employment: Agricultural (100*log)
\hat{emp}^{agr}	emp_agr_gap	Employment: Agricultural, gap (%)
\bar{emp}^{agr}	emp_agr_trend	Employment: Agricultural, trend (100*log)
Δemp^{agr}	dl_emp_agr_trend	Employment: Agricultural, trend (%), QoQ
$\Delta_4 emp^{agr}$	d4l_emp_agr	Employment: Agricultural (%), YoY
$emp^{agr,yearly}$	emp_agr_avg	Employment: Agricultural, yearly average (100*log)
w^{agr}	wage_agr	Real Wage: Agricultural (100*log)
\hat{w}^{agr}	wage_agr_gap	Real Wage: Agricultural, gap (%)
\bar{w}^{agr}	wage_agr_trend	Real Wage: Agricultural, trend (100*log)
Δw^{agr}	dl_wage_agr	Real Wage: Agricultural (%), QoQ
$\Delta_4 w^{agr}$	d4l_wage_agr	Real Wage: Agricultural (%), YoY
$\Delta \bar{w}^{agr}$	dl_wage_agr_trend	Real Wage: Agricultural, trend (%), QoQ
emp^{mine}	emp_mine	Employment: Mining (100*log)
\hat{emp}^{mine}	emp_mine_gap	Employment: Mining, gap (%)
\bar{emp}^{mine}	emp_mine_trend	Employment: Mining, trend (100*log)
Δemp^{mine}	dl_emp_mine_trend	Employment: Mining, trend (%), QoQ
$\Delta_4 emp^{mine}$	d4l_emp_mine	Employment: Mining (%), YoY
$emp^{mine,yearly}$	emp_mine_avg	Employment: Mining, yearly average (100*log)
w^{mine}	wage_mine	Real Wage: Mining (100*log)
\hat{w}^{mine}	wage_mine_gap	Real Wage: Mining, gap (%)
\bar{w}^{mine}	wage_mine_trend	Real Wage: Mining, trend (100*log)
Δw^{mine}	dl_wage_mine	Real Wage: Mining (%), QoQ
$\Delta_4 w^{mine}$	d4l_wage_mine	Real Wage: Mining (%), YoY
$\Delta \bar{w}^{mine}$	dl_wage_mine_trend	Real Wage: Mining, trend (%), QoQ
y^{FD}	yw	Foreign Demand (100*log)
\hat{y}^{FD}	yw_gap	Foreign Demand, gap (%)
\bar{y}^{FD}	yw_trend	Foreign Demand, trend (100*log)
$\Delta \bar{y}^{FD}$	dl_yw_trend	Foreign Demand, trend (%), QoQ
Δy^{FD}	dl_yw	Foreign Demand (%), QoQ
$\Delta_4 y^{FD}$	d4l_yw	Foreign Demand (%), YoY
$cpi^{F,USD}$	cpi_imp_usd	Foreign effective CPI in USD (100*log)

go to the next page

Variable	Model name	Description
$\Delta cpi^{F,USD}$	dl_cpi_imp_usd	Foreign effective CPI in USD (%, QoQ)
$\Delta_4 cpi^{F,USD}$	d4l_cpi_imp_usd	Foreign effective CPI in USD (%, YoY)
Δcpi^F	dl_cpi_imp	Foreign effective CPI in MNT (%, QoQ)
y^{CN}	y_cn	Real GDP: China (100*log)
\dot{y}^{CN}	y_cn_gap	Real GDP: China, gap (%)
\bar{y}^{CN}	y_cn_trend	Real GDP: China, trend (100*log)
$\Delta \bar{y}^{CN}$	dl_y_cn_trend	Real GDP: China, trend (%, QoQ)
Δy^{CN}	dl_y_cn	Real GDP: China (%, QoQ)
$\Delta_4 y^{CN}$	d4l_y_cn	Real GDP: China (%, YoY)
$\Delta_4 y^{CN,yearly}$	d4l_y_cn_avg	Real GDP: China yearly average growth (%, YoY)
Δcpi^{CN}	dl_cpi_cn	CPI: China (%, QoQ)
$\Delta_4 cpi^{CN}$	d4l_cpi_cn	CPI: CN (%, YoY)
$\Delta s^{CNY/USD}$	dl_cny_usd	Nominal Exchange Rate: CNY/USD (%, QoQ)
y^{US}	y_us	Real GDP: US (100*log)
\dot{y}^{US}	y_us_gap	Real GDP: US, gap (%)
\bar{y}^{US}	y_us_trend	Real GDP: US, trend (100*log)
$\Delta \bar{y}^{US}$	dl_y_us_trend	Real GDP: US, trend (%, QoQ)
Δy^{US}	dl_y_us	Real GDP: US (%, QoQ)
$\Delta_4 y^{US}$	d4l_y_us	Real GDP: US (%, YoY)
Δcpi^{US}	dl_cpi_us	CPI: US (%, QoQ)
$\Delta_4 cpi^{US}$	d4l_cpi_us	CPI: US (%, YoY)
i^{US}	rate_us	Interest rate: FED Funds rate (%)
\bar{r}^{US}	r_us_trend	Real Interest rate trend: US (%)
y^{EU}	y_eu	Real GDP: EU (100*log)
\dot{y}^{EU}	y_eu_gap	Real GDP: EU, gap (%)
\bar{y}^{EU}	y_eu_trend	Real GDP: EU, trend (100*log)
$\Delta \bar{y}^{EU}$	dl_y_eu_trend	Real GDP: EU, trend (%, QoQ)
Δy^{EU}	dl_y_eu	Real GDP: EU (%, QoQ)
$\Delta_4 y^{EU}$	d4l_y_eu	Real GDP: EU (%, YoY)
Δcpi^{EU}	dl_cpi_eu	CPI: EU (%, QoQ)
$\Delta_4 cpi^{EU}$	d4l_cpi_eu	CPI: EU (%, YoY)
$\Delta s^{EUR/USD}$	dl_eur_usd	Nominal Exchange Rate: EUR/USD (%, QoQ)
$\hat{r}_p^{Commodity}$	qcommodity_gap	Weighted average of exported commodity price, gap (%)

go to the next page

Variable	Model name	Description
$\Delta \bar{p}^{Commodity}$	dl_qcommodity_trend	Weighted average of exported commodity price, trend (%), QoQ
p^{Copper}	copper	Copper price in USD (%), 100*log)
Δp^{Copper}	dl_copper	Copper price in USD (%), QoQ)
$\Delta_4 p^{Copper}$	d4l_copper	Copper price in USD (%), YoY)
rp^{Copper}	qcopper	Copper real price (100*log)
$\hat{r}p^{Copper}$	qcopper_gap	Copper real price, gap (%)
$\bar{r}p^{Copper}$	qcopper_trend	Copper real price, trend (100*log)
$\Delta r p^{Copper}$	dl_qcopper	Copper real price (%), QoQ)
$\Delta \bar{r}p^{Copper}$	dl_qcopper_trend	Copper real price, trend (%), QoQ)
p^{Iron}	iron	Iron price in USD (%), 100*log)
Δp^{Iron}	dl_iron	Iron price in USD (%), QoQ)
$\Delta_4 p^{Iron}$	d4l_iron	Iron price in USD (%), YoY)
rp^{Iron}	qiron	Iron real price (100*log)
$\hat{r}p^{Iron}$	qiron_gap	Iron real price, gap (%)
$\bar{r}p^{Iron}$	qiron_trend	Iron real price, trend (100*log)
$\Delta r p^{Iron}$	dl_qiron	Iron real price (%), QoQ)
$\Delta \bar{r}p^{Iron}$	dl_qiron_trend	Iron real price, trend (%), QoQ)
p^{Food}	food	Food price in USD (%), 100*log)
Δp^{Food}	dl_food	Food price in USD (%), QoQ)
$\Delta_4 p^{Food}$	d4l_food	Food price in USD (%), YoY)
rp^{Food}	qfood	Food real price (100*log)
$\hat{r}p^{Food}$	qfood_gap	Food real price, gap (%)
$\bar{r}p^{Food}$	qfood_trend	Food real price, trend (100*log)
$\Delta r p^{Food}$	dl_qfood	Food real price (%), QoQ)
$\Delta \bar{r}p^{Food}$	dl_qfood_trend	Food real price, trend (%), QoQ)
p^{Oil}	oil	Oil price in USD (%), 100*log)
Δp^{Oil}	dl_oil	Oil price in USD (%), QoQ)
$\Delta_4 p^{Oil}$	d4l_oil	Oil price in USD (%), YoY)
rp^{Oil}	qoil	Oil real price (100*log)
$\hat{r}p^{Oil}$	qoil_gap	Oil real price, gap (%)
$\bar{r}p^{Oil}$	qoil_trend	Oil real price, trend (100*log)
$\Delta r p^{Oil}$	dl_qoil	Oil real price (%), QoQ)
$\Delta \bar{r}p^{Oil}$	dl_qoil_trend	Oil real price, trend (%), QoQ)

Parameters of the model

Parameter	Model name	Description	Value
σ	factor	Scale parameter for standard errors	88.59
$w^{y,agr}$	w_agr	Weights in GDP identity: Agricultural	0.07
$w^{y,mine}$	w_mine	Weights in GDP identity: Mining	0.15
$w^{y,c}$	w_c	Weights in GDP identity: Consumption	0.55
$w^{y,inv}$	w_inv	Weights in GDP identity: Investment	0.30
$w^{y,gov}$	w_gov	Weights in GDP identity: Government Consumption	0.14
$w^{y,ex}$	w_ex	Weights in GDP identity: Export	0.60
$w^{y,im}$	w_im	Weights in GDP identity: Import	0.59
$w^{ex,mine}$	w_ex_mine	Weights in Export: Mining	0.60
$w^{im,c}$	w_im_c	Weights in Import: Consumption	0.15
$w^{im,inv}$	w_im_inv	Weights in Import: Investment	0.25
$w^{emp,agr}$	w_emp_agr	Weights in Labor market: Agricultural	0.10
$w^{emp,mine}$	w_emp_mine	Weights in Labor market: Mining	0.10
w^{CN}	w_yw_cn	Weights in Foreign Demand: China	0.70
w^{EU}	w_yw_eu	Weights in Foreign Demand: EU	0.15
$w^{CN,CPI}$	w_cpi_imp_cn	Weights in Foreign CPI: China	0.40
$w^{EU,CPI}$	w_cpi_imp_eu	Weights in Foreign CPI: EU	0.30
w^{FX}	w_neer	Weights of Fixed Exchange rate regime	0.37
w^{Com}	w_commodity	Weights of copper in exported commodities	0.75
$w^{Commodity,CN}$	w_comm_cn	Weights of China in commodity basket	0.40
$w^{Commodity,EU}$	w_comm_eu	Weights of EU in commodity basket	0.20
$ss^{\Delta\bar{y}^{agr}}$	ss_dl_y_agr_trend	Steady-state: Agricultural growth (%), QoQ)	1.00
$ss^{\Delta\bar{y}^{mine}}$	ss_dl_y_mine_trend	Steady-state: Mining growth (%), QoQ)	1.80
$ss^{\Delta\bar{c}}$	ss_dl_c_trend	Steady-state: Consumption growth (%), QoQ)	4.50
$ss^{\Delta\bar{inv}}$	ss_dl_inv_trend	Steady-state: Investment growth (%), QoQ)	5.00
$ss^{\Delta\bar{g}ov}$	ss_dl_gov_trend	Steady-state: Government consumption growth (%), QoQ)	4.50
$ss^{\Delta\bar{ex}^{mine}}$	ss_dl_ex_mine_trend	Steady-state: Mining Export growth (%), QoQ)	1.80
$ss^{\Delta\bar{ex}^{n,mine}}$	ss_dl_ex_non_mine_trend	Steady-state: Non-Mining Export growth (%), QoQ)	8.00
$ss^{\Delta\bar{y}}$	ss_dl_y_trend	Steady-state: GDP growth (%), QoQ)	4.52
$ss^{\Delta\bar{im}}$	ss_dl_im_trend	Steady-state: Import growth (%), QoQ)	4.49

go to the next page

Parameter	Model name	Description	Value
$ss^{\Delta\bar{y}^{core}}$	ss_dl_y_base_trend	Steady-state: GDP Core growth (%), QoQ	5.39
ss^{tar}	ss_target	Steady-state: CPI (%), YoY	4.88
$ss^{\bar{b}y}$	ss_prim_bal_rate_trend	Steady-state: Primary balance to GDP ratio (%)	0.00
ss^{prem}	ss_prem	Steady-state: Risk premium (%)	3.50
$ss^{\Delta\bar{z}}$	ss_dl_z_trend	Steady-state: Real Exchange Rate trend (%), QoQ	-1.50
$ss^{\bar{r}}$	ss_r_trend	Steady-state: Real Interest Rate trend (%)	4.00
$ss^{\Delta\bar{w}^{core}}$	ss_dl_wage_core_trend	Steady-state: Real Wage, Core growth (%), QoQ	3.35
$ss^{\Delta\bar{w}^{agr}}$	ss_dl_wage_agr_trend	Steady-state: Real Wage, Agricultural growth (%), QoQ	1.00
$ss^{\Delta\bar{w}^{mine}}$	ss_dl_wage_mine_trend	Steady-state: Real Wage, Mining growth (%), QoQ	1.00
$ss^{\Delta\bar{w}^{total}}$	ss_dl_wage_total_trend	Steady-state: Real Wage, Total (%), QoQ	2.88
$ss^{\Delta\bar{e}mp^{total}}$	ss_dl_emp_total_trend	Steady-state: Employment Wage, Total (%), QoQ	1.94
$ss^{\Delta\bar{y}^{FD}}$	ss_dl_yw_trend	Steady-state: Effective foreign demand (%), QoQ	5.42
$ss^{\Delta\bar{y}^{CN}}$	ss_dl_y_cn_trend	Steady-state: China GDP growth (%), QoQ	7.00
$ss^{\Delta cpi^{CN}}$	ss_dl_cpi_cn	Steady-state: China CPI (%), YoY	2.00
$ss^{\Delta s^{CNY/USD}}$	ss_dl_cny_usd	Steady-state: CNY/USD (%), QoQ	0.00
$ss^{\Delta\bar{y}^{US}}$	ss_dl_y_us_trend	Steady-state: China GDP growth (%), QoQ	2.00
$ss^{\Delta cpi^{US}}$	ss_dl_cpi_us	Steady-state: China CPI (%), YoY	2.00
$ss^{\bar{r}^{US}}$	ss_r_us_trend	Steady-state: US Real Interest Rate (%)	2.00
$ss^{\Delta\bar{y}^{EU}}$	ss_dl_y_eu_trend	Steady-state: EU GDP growth (%), QoQ	1.50
$ss^{\Delta cpi^{EU}}$	ss_dl_cpi_eu	Steady-state: EU CPI (%), YoY	2.00
$ss^{\Delta s^{EUR/USD}}$	ss_dl_eur_usd	Steady-state: EUR/USD (%), QoQ	0.00
$ss^{\Delta\bar{r}p^{Food}}$	ss_dl_qfood_trend	Steady-state: Real price of Food growth (%), QoQ	1.00
$ss^{\Delta\bar{r}p^{Oil}}$	ss_dl_qoil_trend	Steady-state: Real price of Oil growth (%), QoQ	1.00
$ss^{\Delta\bar{r}p^{Copper}}$	ss_dl_qcopper_trend	Steady-state: Real price of Copper growth (%), QoQ	1.00
$ss^{\Delta\bar{r}p^{Iron}}$	ss_dl_qiron_trend	Steady-state: Real price of Iron growth (%), QoQ	1.00
$\rho^{\hat{y}^{agr}}$	rho_y_agr_gap	Autoregressive coefficient: Agricultural GDP gap	0.26
$\rho^{\Delta\bar{y}^{agr}}$	rho_dl_y_agr_trend	Autoregressive coefficient: Agricultural GDP trend	0.80
$\rho^{\hat{y}^{mine}}$	rho_y_mine_gap	Autoregressive coefficient: Mining GDP gap	0.21
$\rho^{\Delta\bar{y}^{mine}}$	rho_dl_y_mine_trend	Autoregressive coefficient: Mining GDP trend	0.50
$\rho^{\hat{e}x^{mine}}$	rho_ex_mine_gap	Autoregressive coefficient: Mining Export gap	0.10
$\rho^{g\delta v}$	rho_gov_gap	Autoregressive coefficient: Government Consumption gap	0.36
$\rho^{\Delta\bar{c}}$	rho_dl_c_trend	Autoregressive coefficient: Consumption trend	0.80
$\rho^{\Delta i\bar{n}v}$	rho_dl_inv_trend	Autoregressive coefficient: Investment trend	0.75

go to the next page

Parameter	Model name	Description	Value
$\rho^{\Delta g_{\text{ov}}}$	rho_dl_gov_trend	Autoregressive coefficient: Government Consumption trend	0.85
$\rho^{\Delta ex_{\text{mine}}}$	rho_dl_ex_mine_trend	Autoregressive coefficient: Mining Export trend	0.70
$\rho^{\Delta ex_{\text{non-mine}}}$	rho_dl_ex_non_mine_trend	Autoregressive coefficient: Non-Mining Export trend	0.90
$\rho^{\Delta i_{\bar{m}}}$	rho_dl_im_trend	Autoregressive coefficient: Import trend	0.60
$\rho^{\Delta im_{\text{ex}}}$	rho_dl_im_ex_trend	Autoregressive coefficient: Exported Import trend	0.30
ρ^{pb_y}	rho_prim_bal_rate_gap	Autoregressive coefficient: Primary Balance to GDP ratio gap	0.25
$\rho^{\bar{pb}_y}$	rho_prim_bal_rate_trend	Autoregressive coefficient: Primary Balance to GDP ratio trend	0.60
ρ^{tar}	rho_target	Autoregressive coefficient: CPI Target	0.95
$\rho^{i_{\text{pol}}}$	rho_rate	Autoregressive coefficient: Policy rate smoothing	0.74
ρ^{prem}	rho_prem	Autoregressive coefficient: Risk premium	0.70
$\rho^{\Delta \bar{z}}$	rho_dl_z_trend	Autoregressive coefficient: Real Exchange Rate	0.90
$\rho^{\Delta p^c}$	rho_dl_p_c	Autoregressive coefficient: Consumption deflator	0.00
$\rho^{\Delta p^{inv}}$	rho_dl_p_inv	Autoregressive coefficient: Investment deflator	0.00
$\rho^{\Delta p^{gov}}$	rho_dl_p_gov	Autoregressive coefficient: Government Consumption deflator	0.00
$\rho^{\Delta p^{ex}}$	rho_dl_p_ex	Autoregressive coefficient: Export deflator	0.25
$\rho^{\Delta p^y}$	rho_dl_p_y	Autoregressive coefficient: GDP deflator	0.25
$\rho^{\Delta p^{y, \text{mine}}}$	rho_dl_p_y_mine	Autoregressive coefficient: Mining GDP deflator	0.25
$\rho^{\Delta p^{y, \text{core}}}$	rho_dl_p_y_base	Autoregressive coefficient: Core GDP deflator	0.25
$\rho^{\hat{e}mp^{\text{core}}}$	rho_emp_core_gap	Autoregressive coefficient: Core Employment, gap	0.50
$\rho^{\Delta \hat{e}mp^{\text{core}}}$	rho_dl_emp_core_trend	Autoregressive coefficient: Core Employment, trend growth	0.90
$\rho^{\hat{w}^{\text{core}}}$	rho_wage_core_gap	Autoregressive coefficient: Core Real Wage, gap	0.50
$\rho^{\Delta \hat{w}^{\text{core}}}$	rho_dl_wage_core_trend	Autoregressive coefficient: Core Real Wage, trend growth	0.90
$\rho^{\hat{e}mp^{\text{agr}}}$	rho_emp_agr_gap	Autoregressive coefficient: Agricultural Employment, gap	0.50
$\rho^{\Delta \hat{e}mp^{\text{agr}}}$	rho_dl_emp_agr_trend	Autoregressive coefficient: Agricultural Employment, trend growth	0.70
$\rho^{\hat{w}^{\text{agr}}}$	rho_wage_agr_gap	Autoregressive coefficient: Agricultural Real Wage, gap	0.40
$\rho^{\Delta \hat{w}^{\text{agr}}}$	rho_dl_wage_agr_trend	Autoregressive coefficient: Agricultural Real Wage, trend growth	0.70
$\rho^{\hat{e}mp^{\text{mine}}}$	rho_emp_mine_gap	Autoregressive coefficient: Mining Employment, gap	0.50
$\rho^{\Delta \hat{e}mp^{\text{mine}}}$	rho_dl_emp_mine_trend	Autoregressive coefficient: Mining Employment, trend growth	0.70
$\rho^{\hat{w}^{\text{mine}}}$	rho_wage_mine_gap	Autoregressive coefficient: Mining Real Wage, gap	0.40
$\rho^{\Delta \hat{w}^{\text{mine}}}$	rho_dl_wage_mine_trend	Autoregressive coefficient: Mining Real Wage, trend growth	0.70
$\rho^{\hat{y}^{CN}}$	rho_y_cn_gap	Autoregressive coefficient: China GDP, gap	0.70
$\rho^{\Delta \hat{y}^{CN}}$	rho_dl_y_cn_trend	Autoregressive coefficient: China GDP, trend growth	0.80
$\rho^{\Delta cpi^{CN}}$	rho_dl_cpi_cn	Autoregressive coefficient: China CPI	0.70

go to the next page

Parameter	Model name	Description	Value
$\rho^{\Delta s^{CNY/USD}}$	rho_dl_cny_usd	Autoregressive coefficient: CNY/USD	0.70
$\rho^{\hat{y}^{EU}}$	rho_y_eu_gap	Autoregressive coefficient: EU GDP, gap	0.70
$\rho^{\Delta \bar{y}^{EU}}$	rho_dl_y_eu_trend	Autoregressive coefficient: EU GDP, trend growth	0.80
$\rho^{\Delta cpi^{EU}}$	rho_dl_cpi_eu	Autoregressive coefficient: EU CPI	0.60
$\rho^{\Delta s^{EUR/USD}}$	rho_dl_eur_usd	Autoregressive coefficient: EUR/USD	0.70
$\rho^{\hat{y}^{US}}$	rho_y_us_gap	Autoregressive coefficient: US GDP, gap	0.60
$\rho^{\Delta \bar{y}^{US}}$	rho_dl_y_us_trend	Autoregressive coefficient: US GDP, trend growth	0.80
$\rho^{\Delta cpi^{US}}$	rho_dl_cpi_us	Autoregressive coefficient: US CPI	0.70
ρ^i^{US}	rho_rate_us	Autoregressive coefficient: FED Funds Rate	0.90
$\rho^{\bar{r}^{US}}$	rho_r_us_trend	Autoregressive coefficient: US Real Interest Rate	0.90
$\rho^{\hat{r}p^{Food}}$	rho_qfood_gap	Autoregressive coefficient: Real Price of Food, gap	0.50
$\rho^{\Delta \bar{r}p^{Food}}$	rho_dl_qfood_trend	Autoregressive coefficient: Real Price of Food, trend growth	0.80
$\rho^{\hat{r}p^{Oil}}$	rho_qoil_gap	Autoregressive coefficient: Real Price of Oil, gap	0.30
$\rho^{\Delta \bar{r}p^{Oil}}$	rho_dl_qoil_trend	Autoregressive coefficient: Real Price of Oil, trend growth	0.80
$\rho^{\hat{r}p^{Copper}}$	rho qcopper_gap	Autoregressive coefficient: Real Price of Copper, gap	0.50
$\rho^{\Delta \bar{r}p^{Copper}}$	rho_dl_qcopper_trend	Autoregressive coefficient: Real Price of Copper, trend growth	0.80
$\rho^{\hat{r}p^{Iron}}$	rho_qiron_gap	Autoregressive coefficient: Real Price of Iron, gap	0.50
$\rho^{\Delta \bar{r}p^{Iron}}$	rho_dl_qiron_trend	Autoregressive coefficient: Real Price of Iron, trend growth	0.80
ψ_1	c1_y_mine_gap	Mining GDP gap: Foreign Demand coefficient	0.19
ψ_2	c2_y_mine_gap	Mining GDP gap: commodity real price gap coefficient	0.10
α_1	c1_c_gap	Consumption gap: backward-looking coefficient	0.13
α_2	c2_c_gap	Consumption gap: real interest rate gap coefficient	0.12
α_3	c3_c_gap	Consumption gap: income gap coefficient	0.05
α_4	c4_c_gap	Consumption gap: agricultural gap coefficient	0.10
β_1	c1_inv_gap	Investment gap: backward-looking coefficient	0.23
β_2	c2_inv_gap	Investment gap: Tobin-Q coefficient	0.30
β_3	c1_tob	Tobin-Q: forward-looking coefficient	0.50
β_4	c2_tob	Tobin-Q: GDP gap coefficient	0.10
β_5	c3_tob	Tobin-Q: commodity real price gap coefficient	0.10
β_6	c4_tob	Tobin-Q: real interest rate gap coefficient	0.40
γ_1	c1_ex_non_mine_gap	Non-mining Export gap: backward-looking coefficient	0.21
γ_2	c2_ex_non_mine_gap	Non-mining Export gap: forward-looking coefficient	0.00
γ_3	c3_ex_non_mine_gap	Non-mining Export gap: real exchange rate gap coefficient	0.10

go to the next page

Parameter	Model name	Description	Value
γ_4	c4_ex_non_mine_gap	Non-mining Export gap: Mining GDP gap coefficient	0.10
γ_5	c5_ex_non_mine_gap	Non-mining Export gap: foreign demand gap coefficient	0.81
γ_6	c6_ex_non_mine_gap	Non-mining Export gap: mining export gap coefficient	0.30
γ_7	c1_ex_mine_gap	Mining Export: real exchange rate gap coefficient	0.10
γ_8	c2_ex_mine_gap	Mining Export: Mining GDP gap coefficient	0.64
γ_9	c3_ex_mine_gap	Mining Export: commodity real price gap coefficient	0.10
γ_{10}	c1_im_c_gap	Consumed Import: backward-looking coefficient	0.40
γ_{11}	c2_im_c_gap	Consumed Import: forward-looking coefficient	0.20
γ_{12}	c3_im_c_gap	Consumed Import: consumption elasticity coefficient	0.50
γ_{13}	c4_im_c_gap	Consumed Import: real exchange rate gap coefficient	0.10
γ_{14}	c1_im_inv_gap	Invested Import: backward-looking coefficient	0.40
γ_{15}	c2_im_inv_gap	Invested Import: forward-looking coefficient	0.20
γ_{16}	c3_im_inv_gap	Invested Import: investment elasticity coefficient	0.50
γ_{17}	c1_im_ex_gap	Exported Import: backward-looking coefficient	0.65
γ_{18}	c2_im_ex_gap	Exported Import: forward-looking coefficient	0.20
γ_{19}	c3_im_ex_gap	Exported Import: export elasticity coefficient	0.10
ν_1	c1_dl_cpi	CPI: backward-looking coefficient	0.11
ν_2	c2_dl_cpi	CPI: imported inflation coefficient	0.02
ν_3	c3_dl_cpi	CPI: real marginal cost coefficient	0.24
ν_4	c4_dl_cpi	CPI: share of domestic demand in real marginal cost	0.50
ν_5	c5_dl_cpi	CPI: real price of food gap coefficient	0.08
ν_6	c6_dl_cpi	CPI: real price of oil gap coefficient	0.01
ν_7	c7_dl_cpi	Domestic fuel real price: backward-looking coefficient	0.50
ν_8	c8_dl_cpi	Domestic fuel real price: cost coefficient	0.10
ν_9	c9_dl_cpi	Domestic fuel real price: oil price weight	0.25
θ_1	c1_rate	Policy rate: reaction to expected CPI	1.13
θ_2	c2_rate	Policy rate: reaction to core GDP gap	0.30
θ_3	c3_rate	Policy rate: reaction to nominal exchange rate changes	0.10
θ_4	c1_mnt_usd	Nominal exchange rate: previous depreciation coefficient	0.70
θ_5	c2_mnt_usd	Nominal exchange rate: real exchange rate gap coefficient	0.40
θ_6	c1_e_mnt_usd	Nominal exchange rate: forward-looking coefficient	0.60
θ_7	c1_prem	Risk premium: Primary Balance to GDP gap coefficient	0.60
θ_8	c2_prem	Risk premium: GDP growth coefficient	0.20

go to the next page

Parameter	Model name	Description	Value
θ_9	c1_dl_z_trend	Real exchange rate trend: commodity price trend coefficient	0.10
v_1	c1_dl_p_ex	Export Deflator: Commodity price gap coefficient	0.70
v_2	c1_dl_p_y_agr	Agricultural Deflator: CPI coefficient	0.10
μ_1	c1_prim_bal_rate_gap	Primary Balance gap: consumption gap coefficient	0.08
μ_2	c2_prim_bal_rate_gap	Primary Balance gap: income gap coefficient	0.10
μ_3	c3_prim_bal_rate_gap	Primary Balance gap: mining gap coefficient	0.05
μ_4	c4_prim_bal_rate_gap	Primary Balance gap: government consumption gap coefficient	0.13
μ_5	c1_prim_bal_rate_trend	Primary Balance to GDP trend: commodity price trend coefficient	0.03
ζ_1	c1_emp_core_gap	Core Employment gap: core GDP gap coefficient	0.40
ζ_2	c1_dl_emp_core_trend	Core Employment trend: core GDP trend coefficient	0.45
ζ_3	c1_emp_agr_gap	Agricultural Employment gap: agricultural GDP gap coefficient	0.60
ζ_4	c1_emp_mine_gap	Mining Employment gap: mining GDP gap coefficient	0.80
ζ_5	c1_wage_core_gap	Core Real Wage gap: core GDP gap coefficient	0.30
ζ_6	c1_wage_agr_gap	Agricultural Real Wage gap: agricultural GDP gap coefficient	0.40
ζ_7	c1_wage_mine_gap	Mining Real Wage gap: mining GDP gap coefficient	0.25
ζ_8	c1_dl_wage_core_trend	Core Real wage trend: core GDP trend coefficient	0.40
ω_1	c1_dl_c_trend	Consumption trend: real interest rate trend coefficient	0.05
ω_2	c2_dl_c_trend	Consumption trend: mining GDP trend coefficient	0.10
ω_3	c1_dl_inv_trend	Investment trend: commodity price trend coefficient	0.10
ω_4	c2_dl_inv_trend	Investment trend: GDP growth trend coefficient	0.05
ω_5	c1_dl_ex_mine_trend	Mining Export trend: mining GDP trend coefficient	0.75
ω_6	c2_dl_ex_mine_trend	Mining Export trend: commodity price trend coefficient	0.90
ω_7	c1_dl_ex_non_mine_trend	Non-Mining Export trend: real exchange rate trend coefficient	0.40
ω_8	c2_dl_ex_non_mine_trend	Non-Mining Export trend: foreign demand trend coefficient	0.10
ω_9	c3_dl_ex_non_mine_trend	Non-Mining Export trend: mining export trend demand coefficient	0.80
ω_{10}	c1_dl_y_mine_trend	Mining GDP trend: Mining Export coefficient	0.50
κ_1	c1_dl_cpi_cn	China CPI: Demand coefficient	0.10
κ_2	c2_dl_cpi_cn	China CPI: Food coefficient	0.04
κ_3	c3_dl_cpi_cn	China CPI: Oil coefficient	0.01
κ_4	c1_dl_cpi_eu	EU CPI: Demand coefficient	0.25
κ_5	c2_dl_cpi_eu	EU CPI: Food coefficient	0.02
κ_6	c3_dl_cpi_eu	EU CPI: Oil coefficient	0.01
κ_7	c1_dl_cpi_us	US CPI: Demand coefficient	0.20

go to the next page

Parameter	Model name	Description	Value
κ_8	c2_dl_cpi_us	US CPI: Food coefficient	0.03
κ_9	c3_dl_cpi_us	US CPI: Oil coefficient	0.01
κ_{10}	c1_qoil_gap	Oil real price gap: Demand coefficient	0.10
κ_{11}	c1_qcopper_gap	Copper real price gap: Demand coefficient	0.20
κ_{12}	c1_qiron_gap	Iron real price gap: Demand coefficient	0.20

Shocks of the model

Shock	Model name	Description	Std
$\varepsilon^{\hat{y}}$	eps_y_gap	Shocks to Real GDP: Total, gap (%)	0.01
$\varepsilon^{y^{agr}}$	eps_y_agr_gap	Shocks to Real GDP: Agricultural, gap (%)	0.20
$\varepsilon^{y^{mine}}$	eps_y_mine_gap	Shocks to Real GDP: Mining, gap (%)	0.30
$\varepsilon^{y^{core}}$	eps_y_base_gap	Shocks to Real GDP: Core, gap (%)	0.01
$\varepsilon^{\hat{d}}$	eps_dd_gap	Shocks to Real Domestic Demand, gap (%)	0.01
$\varepsilon^{\hat{c}}$	eps_c_gap	Shocks to Real Consumption, gap (%)	0.15
$\varepsilon^{i\bar{n}v}$	eps_inv_gap	Shocks to Real Investment, gap (%)	0.30
$\varepsilon^{g\bar{o}v}$	eps_gov_gap	Shocks to Real Government Consumption, gap (%)	0.50
$\varepsilon^{ex^{non-mine}}$	eps_ex_non_mine_gap	Shocks to Real Non-mining Export, gap (%)	0.20
$\varepsilon^{ex^{mine}}$	eps_ex_mine_gap	Shocks to Real Mining Export, gap (%)	0.30
$\varepsilon^{\bar{i}m}$	eps_im_gap	Shocks to Real Import, gap (%)	0.25
$\varepsilon^{\Delta\bar{y}}$	eps_dl_y_trend	Shocks to Real GDP: Total, trend (%), QoQ	0.01
$\varepsilon^{\Delta y^{agr}}$	eps_dl_y_agr_trend	Shocks to Real GDP: Agricultural, trend (%), QoQ	0.10
$\varepsilon^{\Delta y^{mine}}$	eps_dl_y_mine_trend	Shocks to Real GDP: Mining, trend (%), QoQ	0.20
$\varepsilon^{\Delta y^{core}}$	eps_dl_y_base_trend	Shocks to Real GDP: Core, trend (%), QoQ	0.01
$\varepsilon^{\Delta\bar{d}}$	eps_dl_dd_trend	Shocks to Real Domestic Demand, trend (%), QoQ	0.01
$\varepsilon^{\Delta\bar{c}}$	eps_dl_c_trend	Shocks to Real Consumption, trend (%), QoQ	0.10
$\varepsilon^{\Delta i\bar{n}v}$	eps_dl_inv_trend	Shocks to Real Investment, trend (%), QoQ	0.20
$\varepsilon^{\Delta g\bar{o}v}$	eps_dl_gov_trend	Shocks to Real Government Consumption, trend (%), QoQ	0.20
$\varepsilon^{\Delta ex^{non-mine}}$	eps_dl_ex_non_mine_trend	Shocks to Real Non-mining Export, trend (%), QoQ	0.10
$\varepsilon^{\Delta ex^{mine}}$	eps_dl_ex_mine_trend	Shocks to Real Mining Export, trend (%), QoQ	0.25
$\varepsilon^{\Delta \bar{i}m}$	eps_dl_im_trend	Shocks to Real Import, trend (%), QoQ	0.10
$\varepsilon^{\Delta cpi}$	eps_dl_cpi	Shocks to CPI (%), QoQ	0.50
ε^{tar}	eps_target	Shocks to Implicit Inflation Target (%), QoQ	0.05
$\varepsilon^{\Delta p^y}$	eps_dl_p_y	Shocks to Deflators: Total GDP (%), QoQ	10.00
$\varepsilon^{\Delta p^{y,agr}}$	eps_dl_p_y_agr	Shocks to Deflators: Agricultural GDP (%), QoQ	10.00
$\varepsilon^{\Delta p^{y,mine}}$	eps_dl_p_y_mine	Shocks to Deflators: Mining GDP (%), QoQ	10.00
$\varepsilon^{\Delta p^{y,core}}$	eps_dl_p_y_base	Shocks to Deflators: Core GDP (%), QoQ	10.00
$\varepsilon^{\Delta p^c}$	eps_dl_p_c	Shocks to Deflators: Consumption (%), QoQ	10.00

go to the next page

Shock	Model name	Description	Std
$\varepsilon^{\Delta p^{inv}}$	eps_dl_p_inv	Shocks to Deflators: Investment (%), QoQ)	10.00
$\varepsilon^{\Delta p^{gov}}$	eps_dl_p_gov	Shocks to Deflators: Government Consumption (%), QoQ)	10.00
$\varepsilon^{\Delta p^{ex}}$	eps_dl_p_ex	Shocks to Deflators: Export (%), QoQ)	10.00
$\varepsilon^{\Delta p^{im}}$	eps_dl_p_im	Shocks to Deflators: Import (%), QoQ)	10.00
$\varepsilon^{i^{pol}}$	eps_rate	Shocks to Policy Rate (%)	0.10
$\varepsilon^{\Delta \bar{z}}$	eps_dl_z_trend	Shocks to Real Exchange Rate, trend (%), QoQ)	0.07
$\varepsilon^{\Delta s^{MNT/USD}}$	eps_mnt_usd	Shocks to Nominal Exchange Rate (%), QoQ)	1.00
ε^{prem}	eps_prem	Shocks to Risk Premium (%)	0.20
$\varepsilon^{\hat{p}^b}$	eps_prim_bal_rate_gap	Shocks to Primary Balance, gap (%)	1.00
$\varepsilon^{p\bar{b}y}$	eps_prim_bal_rate_trend	Shocks to Primary Balance to GDP, trend (%)	0.10
$\varepsilon^{\hat{e}^{mp^{total}}}$	eps_emp_total_gap	Shocks to Employment: Total, gap (%)	0.01
$\varepsilon^{\Delta \hat{e}^{mp^{total}}}$	eps_dl_emp_total_trend	Shocks to Employment: Total, trend (%), QoQ)	0.01
$\varepsilon^{\hat{e}^{mp^{agr}}}$	eps_emp_agr_gap	Shocks to Employment: Agricultural, gap (%)	0.30
$\varepsilon^{\Delta \hat{e}^{mp^{agr}}}$	eps_dl_emp_agr_trend	Shocks to Employment: Agricultural, trend (%), QoQ)	0.10
$\varepsilon^{\hat{w}^{agr}}$	eps_wage_agr_gap	Shocks to Real Wage: Agricultural, gap (%)	0.15
$\varepsilon^{\Delta \hat{w}^{agr}}$	eps_dl_wage_agr_trend	Shocks to Real Wage: Agricultural, trend (%), QoQ)	0.15
$\varepsilon^{\hat{e}^{mp^{mine}}}$	eps_emp_mine_gap	Shocks to Employment: Agricultural, gap (%)	0.30
$\varepsilon^{\Delta \hat{e}^{mp^{mine}}}$	eps_dl_emp_mine_trend	Shocks to Employment: Agricultural, trend (%), QoQ)	0.10
$\varepsilon^{\hat{w}^{mine}}$	eps_wage_mine_gap	Shocks to Real Wage: Agricultural, gap (%)	0.15
$\varepsilon^{\Delta \hat{w}^{mine}}$	eps_dl_wage_mine_trend	Shocks to Real Wage: Agricultural, trend (%), QoQ)	0.10
$\varepsilon^{\hat{e}^{mp^{core}}}$	eps_emp_core_gap	Shocks to Employment: Core, gap (%)	0.15
$\varepsilon^{\Delta \hat{e}^{mp^{core}}}$	eps_dl_emp_core_trend	Shocks to Employment: Core, trend (%), QoQ)	0.10
$\varepsilon^{\hat{w}^{core}}$	eps_wage_core_gap	Shocks to Real Wage: Core, gap (%)	0.30
$\varepsilon^{\Delta \hat{w}^{core}}$	eps_dl_wage_core_trend	Shocks to Real Wage: Core, trend (%), QoQ)	0.10
$\varepsilon^{\hat{y}^{CN}}$	eps_y_cn_gap	Shocks to Real GDP: China, gap (%)	0.50
$\varepsilon^{\Delta \hat{y}^{CN}}$	eps_dl_y_cn_trend	Shocks to Real GDP: China, trend (%), QoQ)	0.10
$\varepsilon^{\Delta cpi^{CN}}$	eps_dl_cpi_cn	Shocks to CPI: China (%), QoQ)	1.00
$\varepsilon^{\hat{s}^{CNY/USD}}$	eps_dl_cny_usd	Shocks to Nominal Exchange Rate: CNY/USD (%), QoQ)	1.00
$\varepsilon^{\hat{y}^{EU}}$	eps_y_eu_gap	Shocks to Real GDP: EU, gap (%)	0.50
$\varepsilon^{\Delta \hat{y}^{EU}}$	eps_dl_y_eu_trend	Shocks to Real GDP: EU, trend (%), QoQ)	0.10
$\varepsilon^{\Delta cpi^{EU}}$	eps_dl_cpi_eu	Shocks to CPI: EU (%), QoQ)	1.00
$\varepsilon^{\hat{s}^{EUR/USD}}$	eps_dl_eur_usd	Shocks to Nominal Exchange Rate: EUR/USD (%), QoQ)	1.00
$\varepsilon^{\hat{y}^{US}}$	eps_y_us_gap	Shocks to Real GDP: US, gap (%)	0.50

go to the next page

Shock	Model name	Description	Std
$\varepsilon^{\Delta \bar{y}^{US}}$	eps_dl_y_us_trend	Shocks to Real GDP: US, trend (%, QoQ)	0.10
$\varepsilon^{\Delta cpi^{US}}$	eps_dl_cpi_us	Shocks to CPI: US (%, QoQ)	1.00
$\varepsilon^{i^{US}}$	eps_rate_us	Shocks to FED Funds Rate (%)	0.04
$\varepsilon^{\bar{r}^{US}}$	eps_r_us_trend	Shocks to Real Intererst Rate, trend (%)	0.01
$\varepsilon^{\hat{r}p^{Copper}}$	eps_qcopper_gap	Shocks to Real Price of Copper, gap (%)	0.50
$\varepsilon^{\Delta \hat{r}p^{Copper}}$	eps_dl_qcopper_trend	Shocks to Real Price of Copper, trend (%, QoQ)	0.75
$\varepsilon^{\hat{r}p^{Iron}}$	eps_qiron_gap	Shocks to Real Price of Iron, gap (%)	1.00
$\varepsilon^{\Delta \hat{r}p^{Iron}}$	eps_dl_qiron_trend	Shocks to Real Price of Iron, trend (%, QoQ)	0.75
$\varepsilon^{\hat{r}p^{Food}}$	eps_qfood_gap	Shocks to Real Price of Food, gap (%)	0.75
$\varepsilon^{\Delta \hat{r}p^{Food}}$	eps_dl_qfood_trend	Shocks to Real Price of Food, trend (%, QoQ)	0.50
$\varepsilon^{\hat{r}p^{Oil}}$	eps_qoil_gap	Shocks to Real Price of Oil, gap (%)	0.75
$\varepsilon^{\Delta \hat{r}p^{Oil}}$	eps_dl_qoil_trend	Shocks to Real Price of Oil, trend (%, QoQ)	0.50

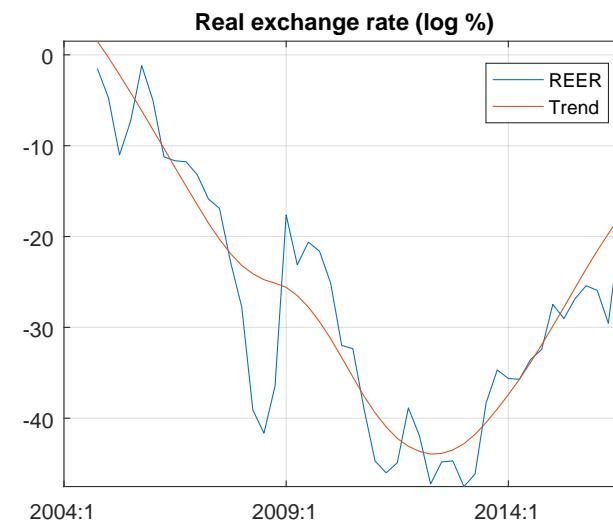
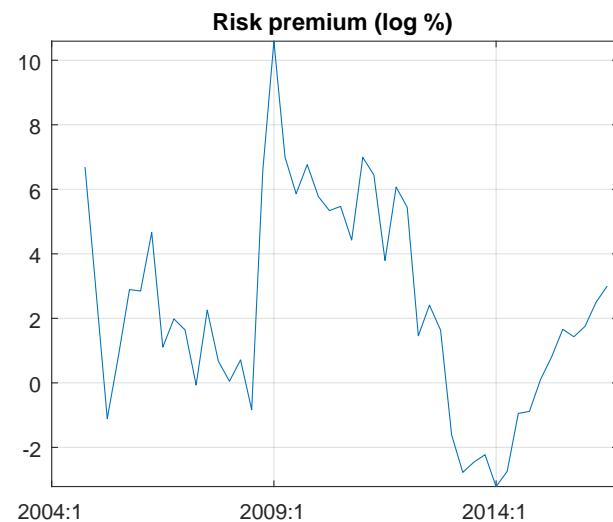
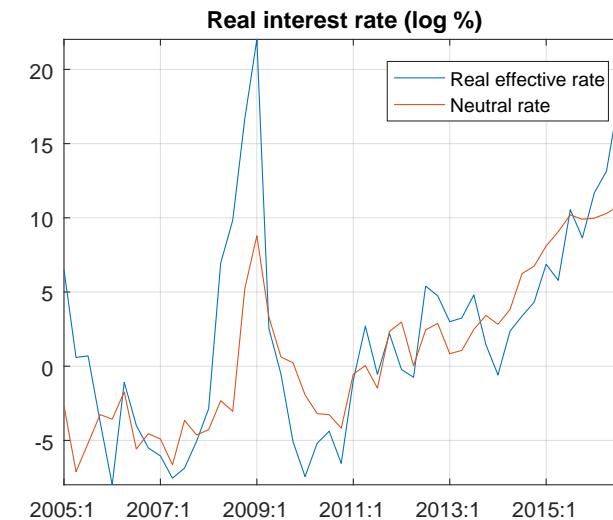
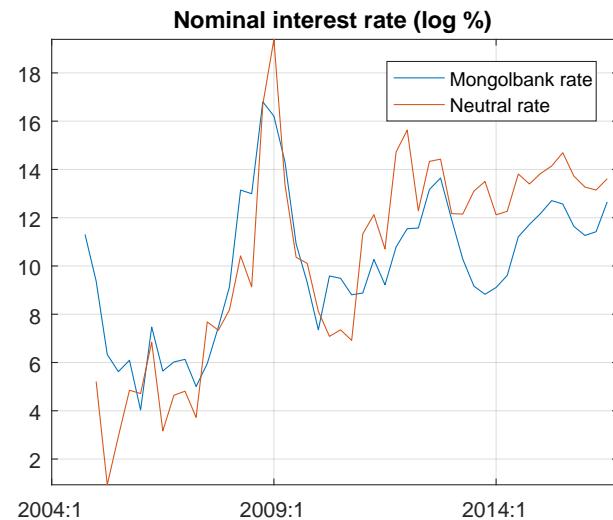
Filter and forecast report

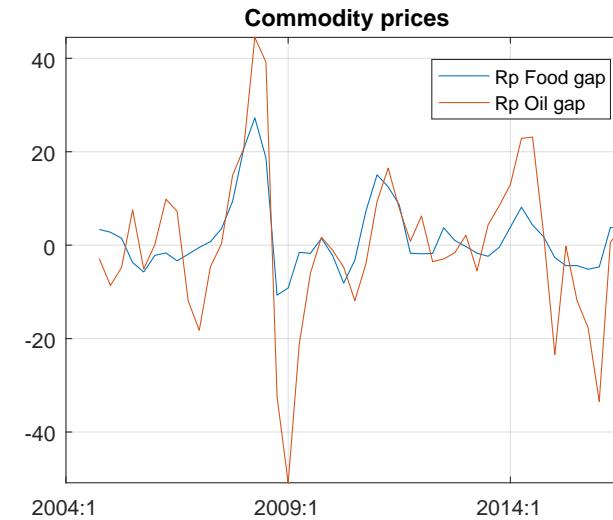
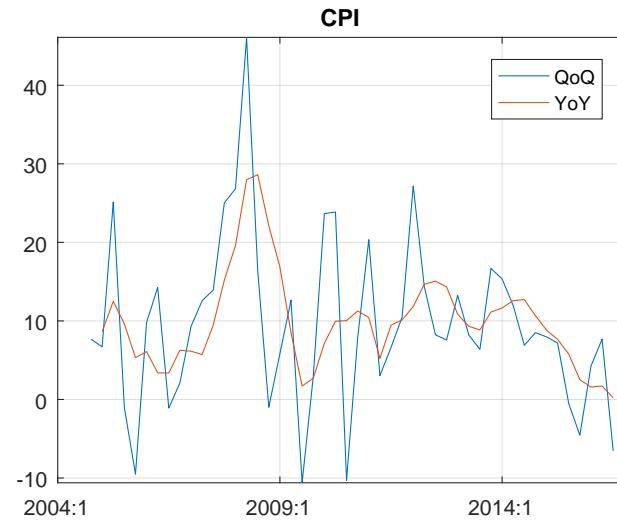
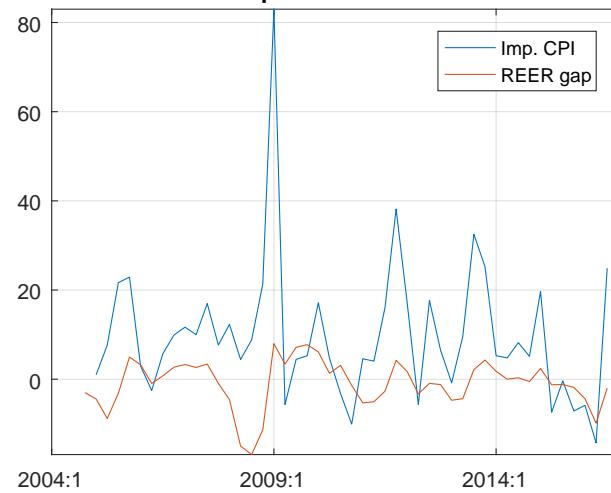
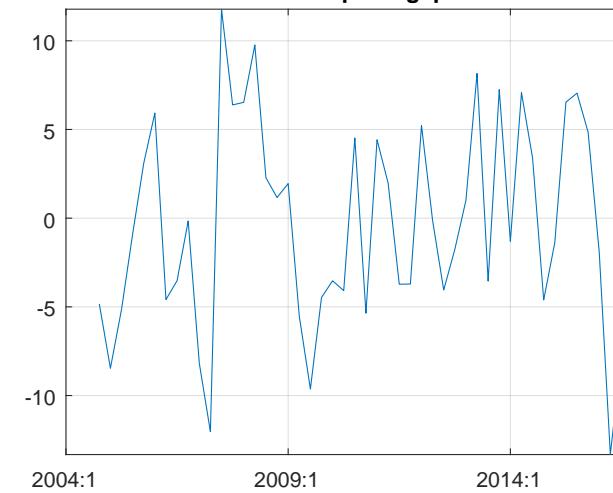
Daniel Baksa

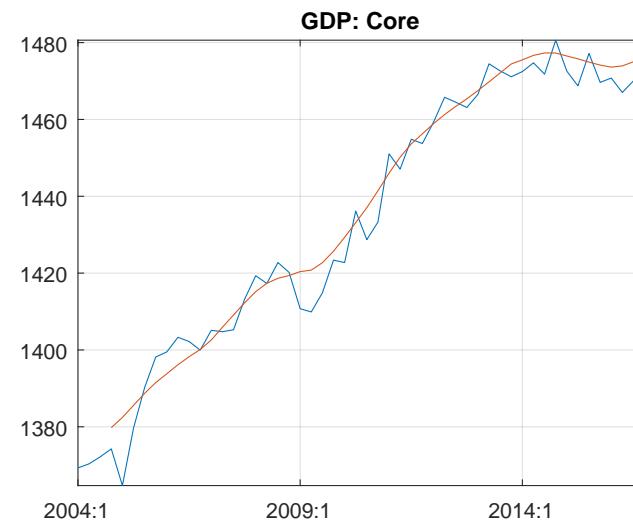
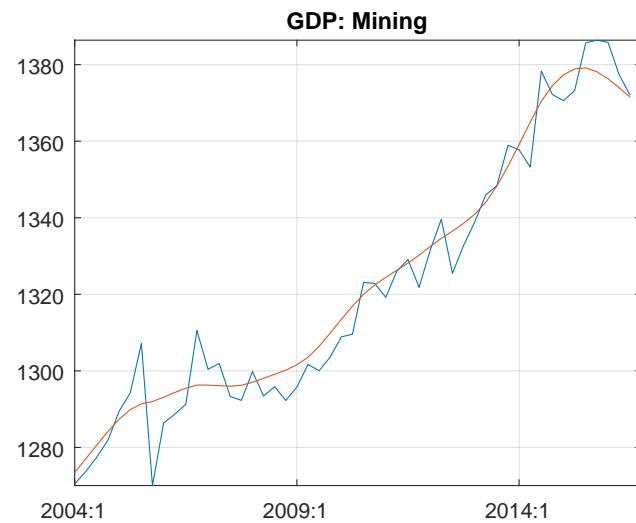
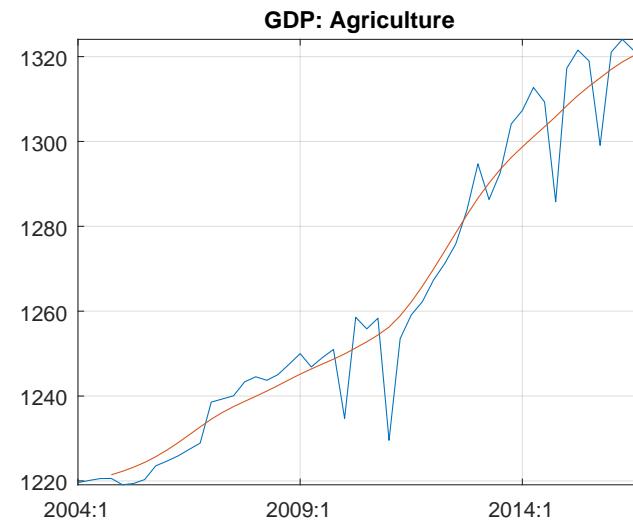
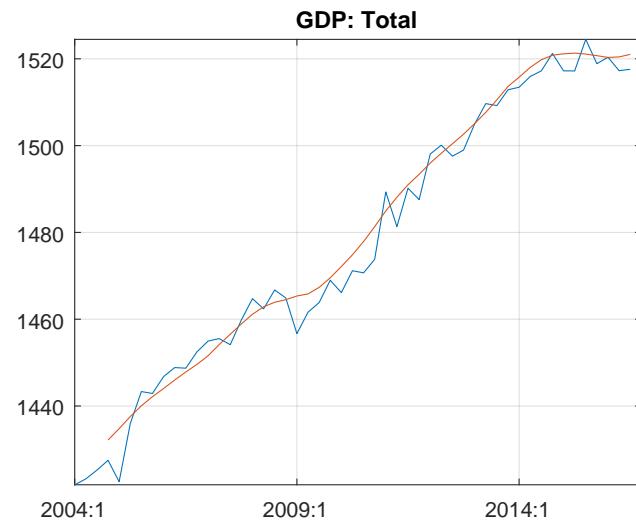
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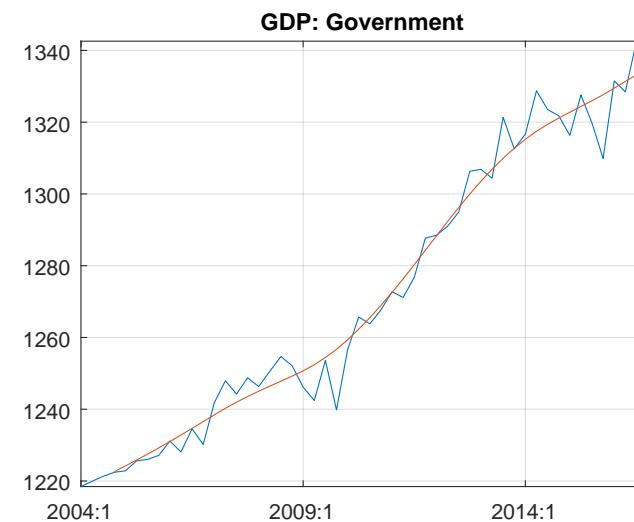
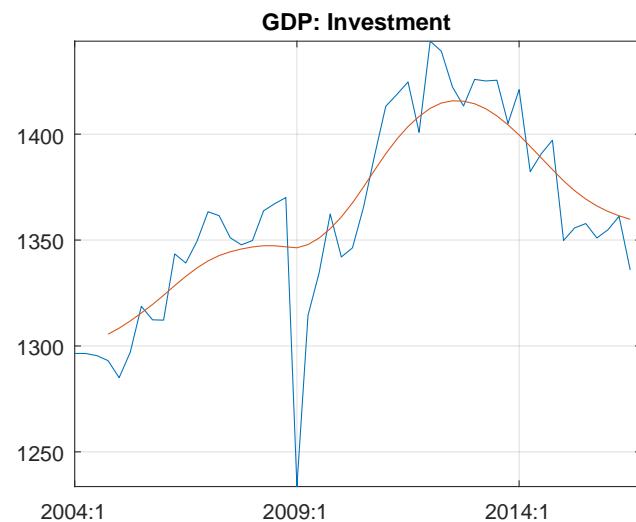
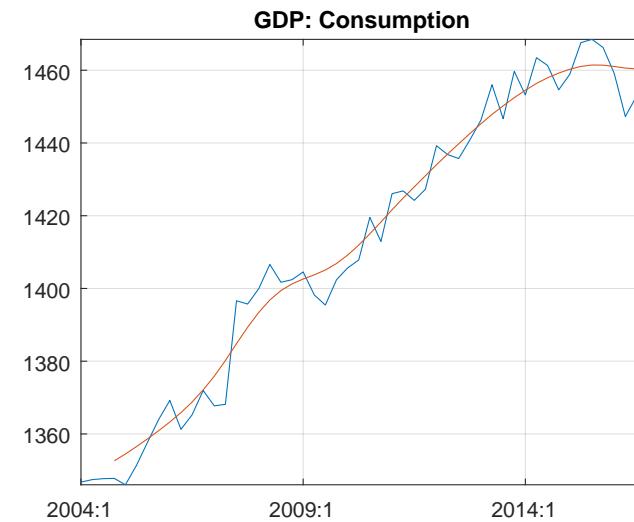
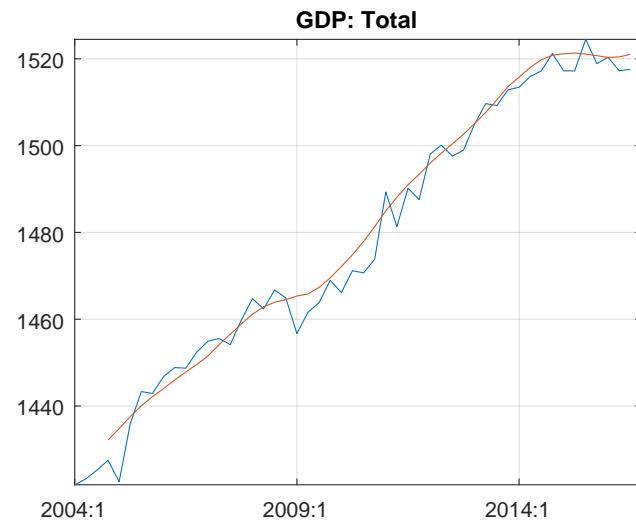
Trends, gaps

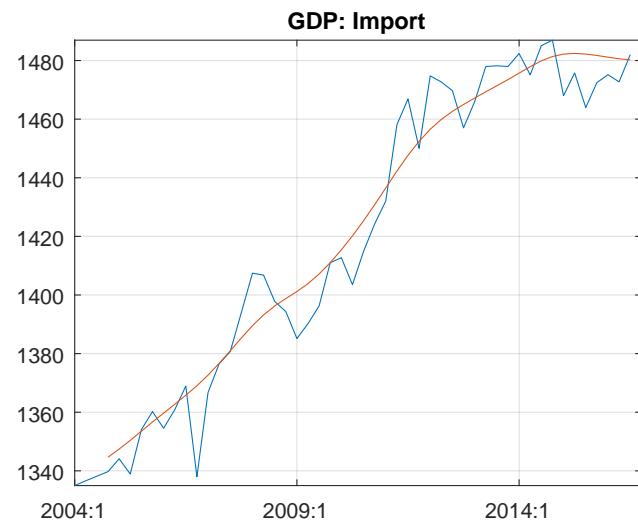
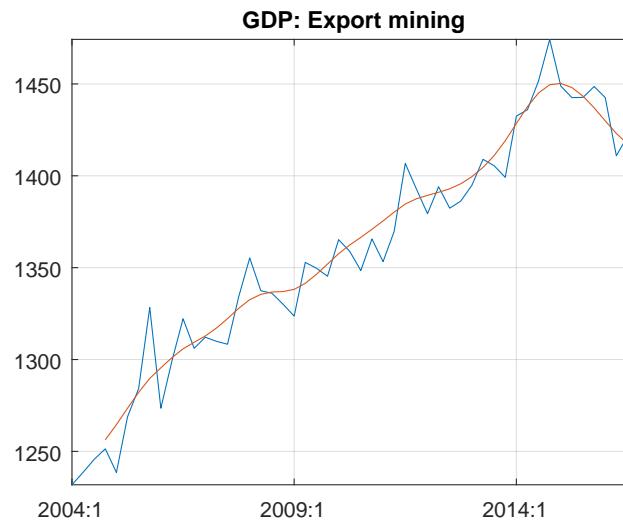
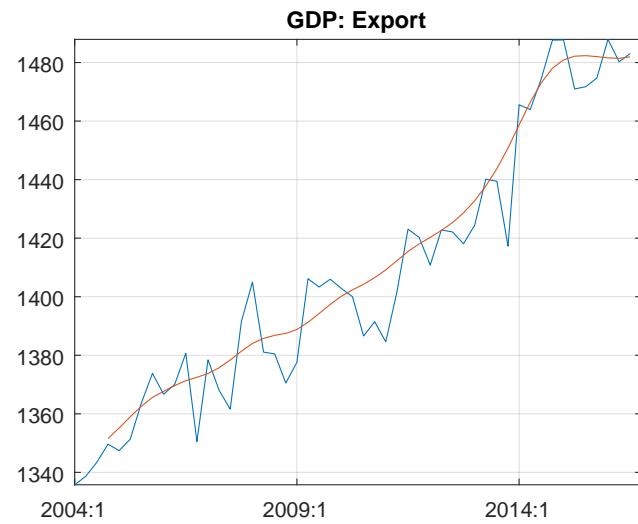
Monetary policy



Inflation**Imported inflation****Consumption gap**

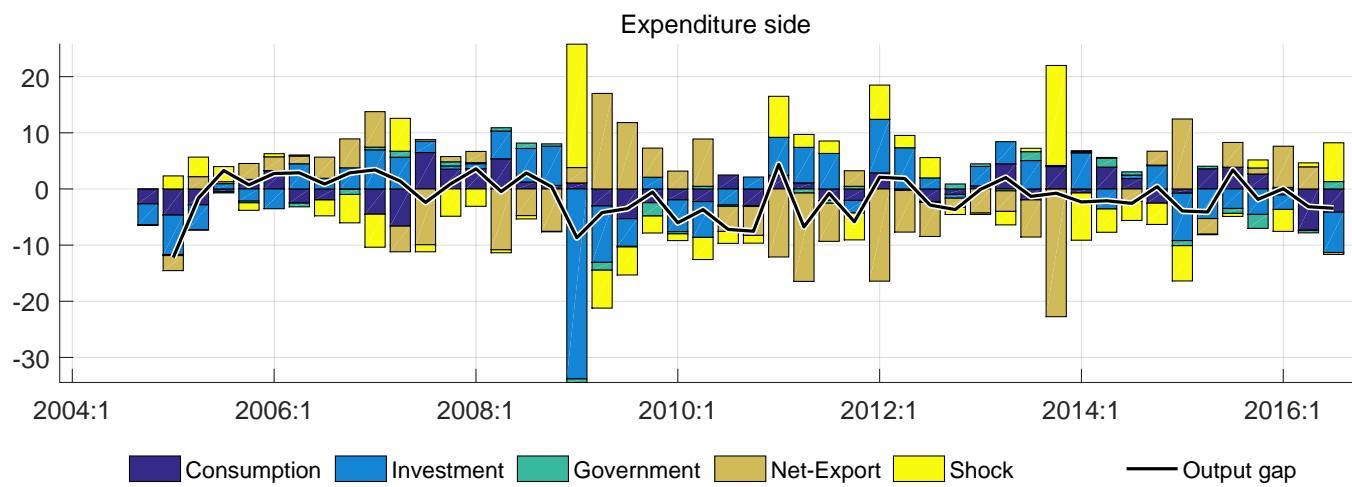
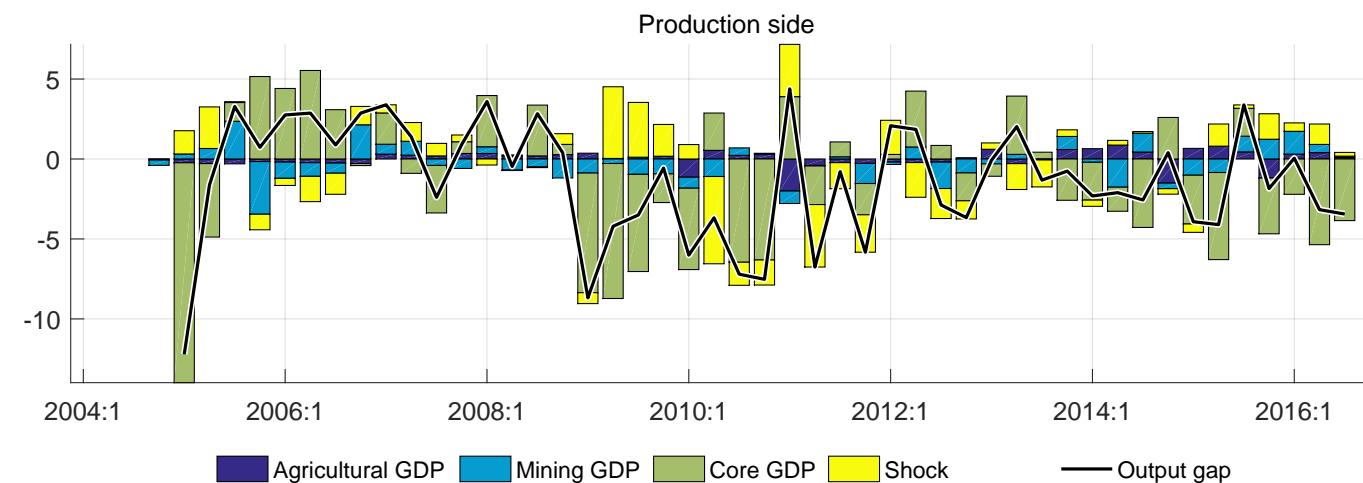
Production side

Expenditure side

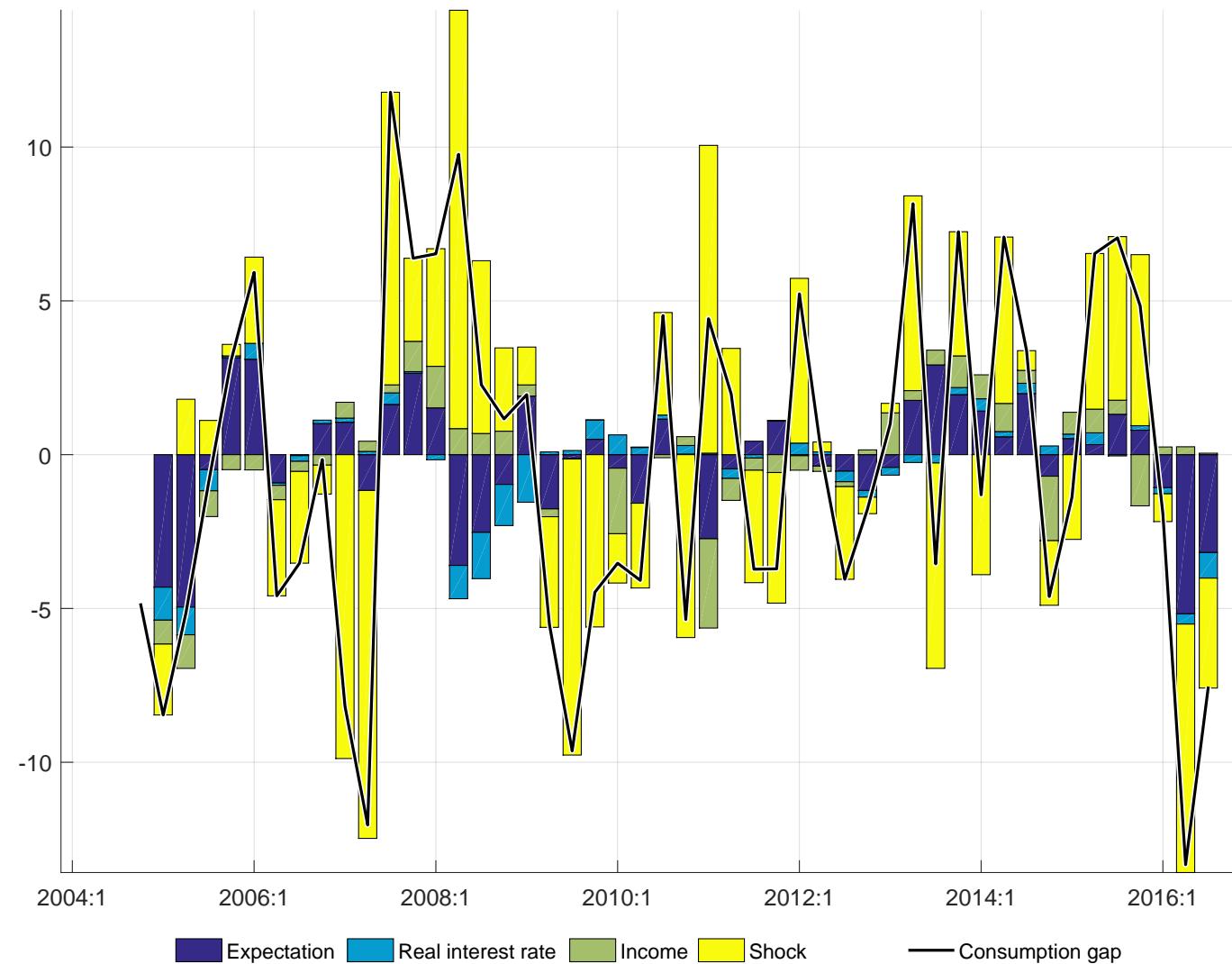
Expenditure side

Equations decomposition for selected variables

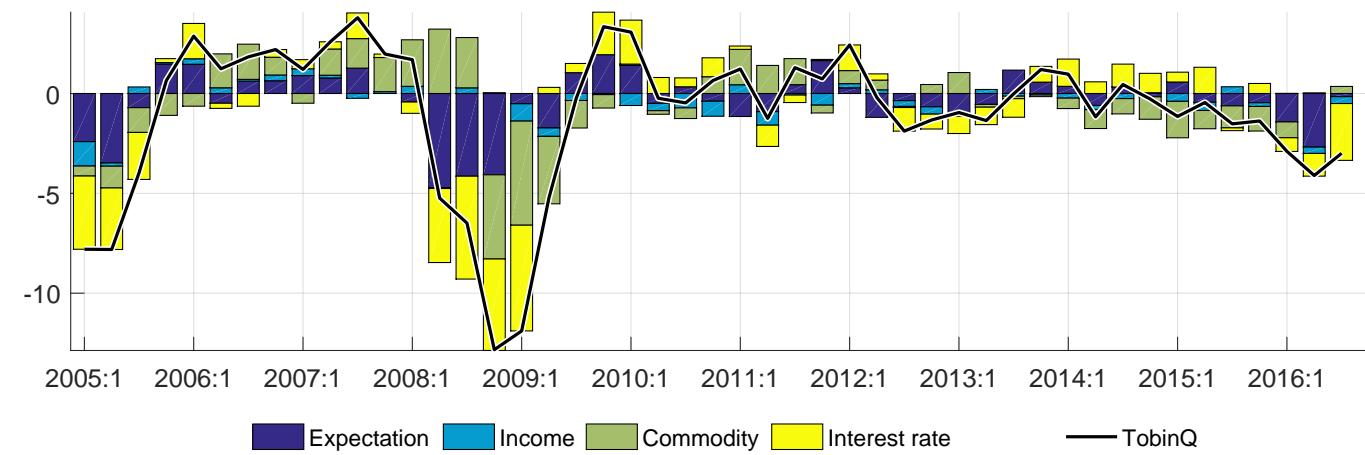
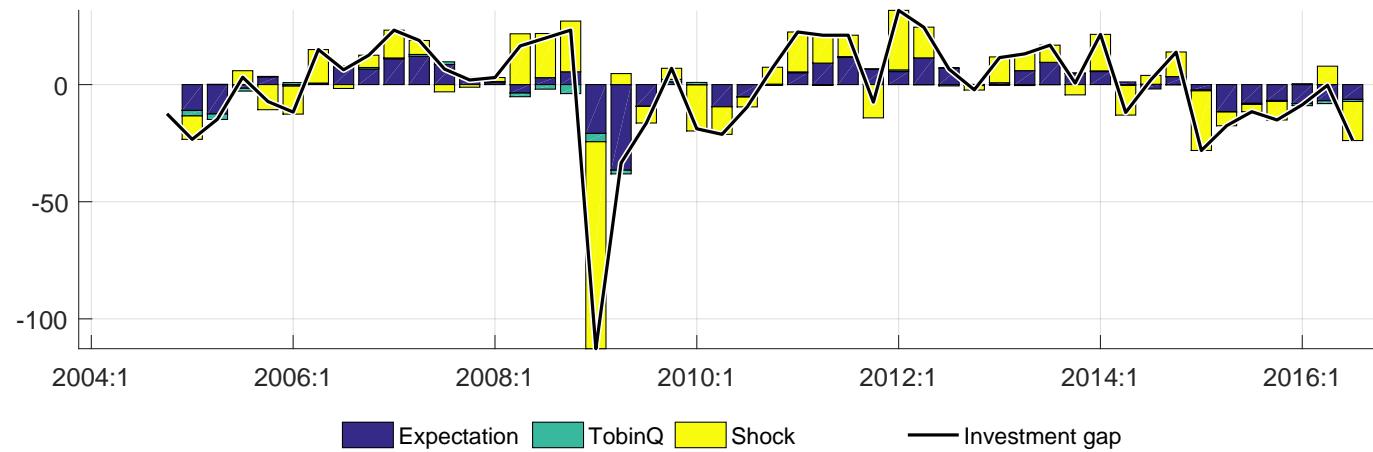
Contributions to Output gap



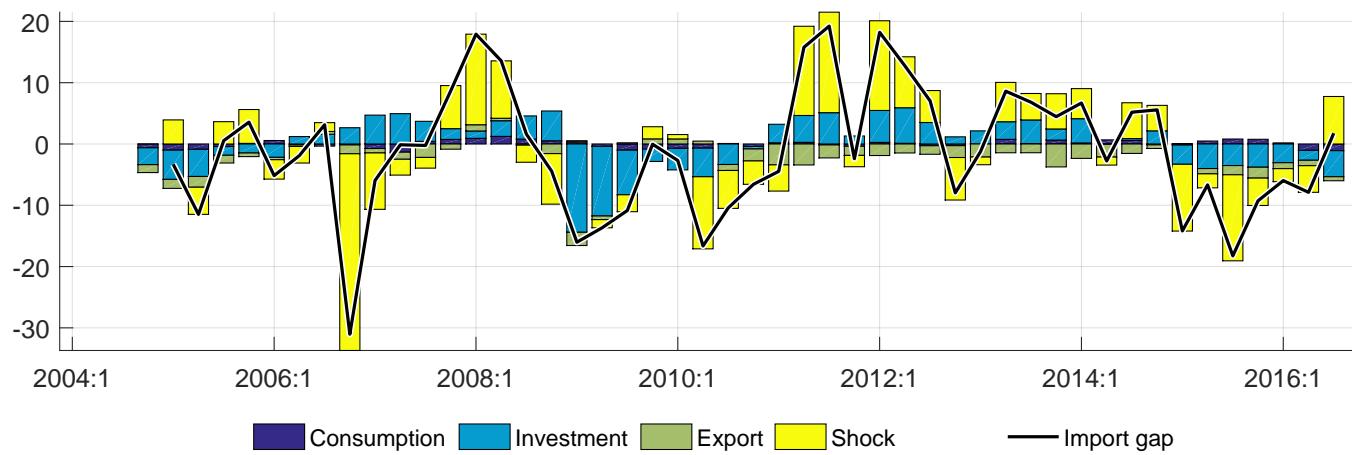
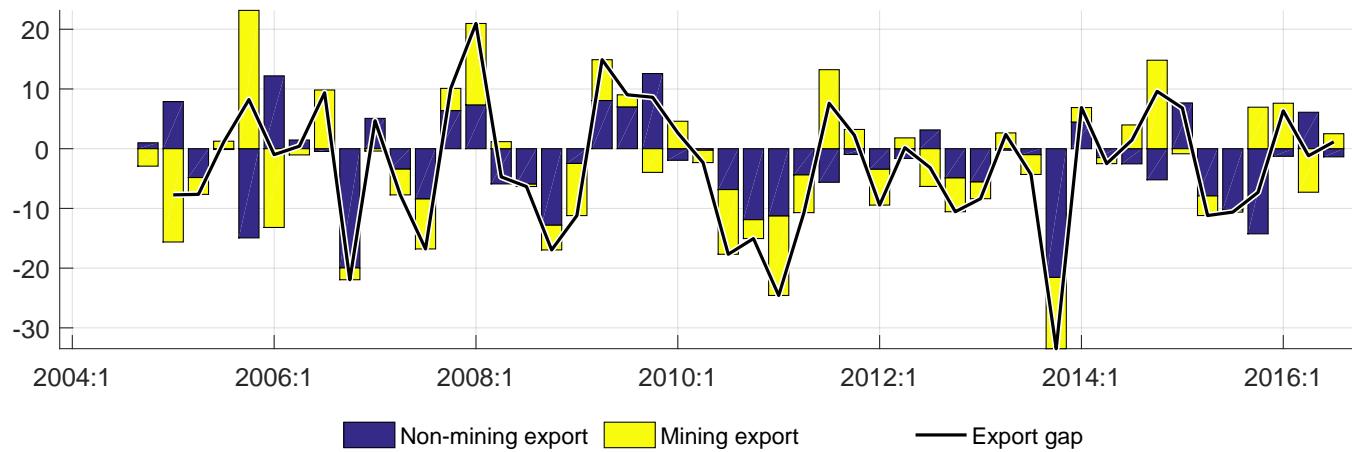
Contributions to Consumption gap



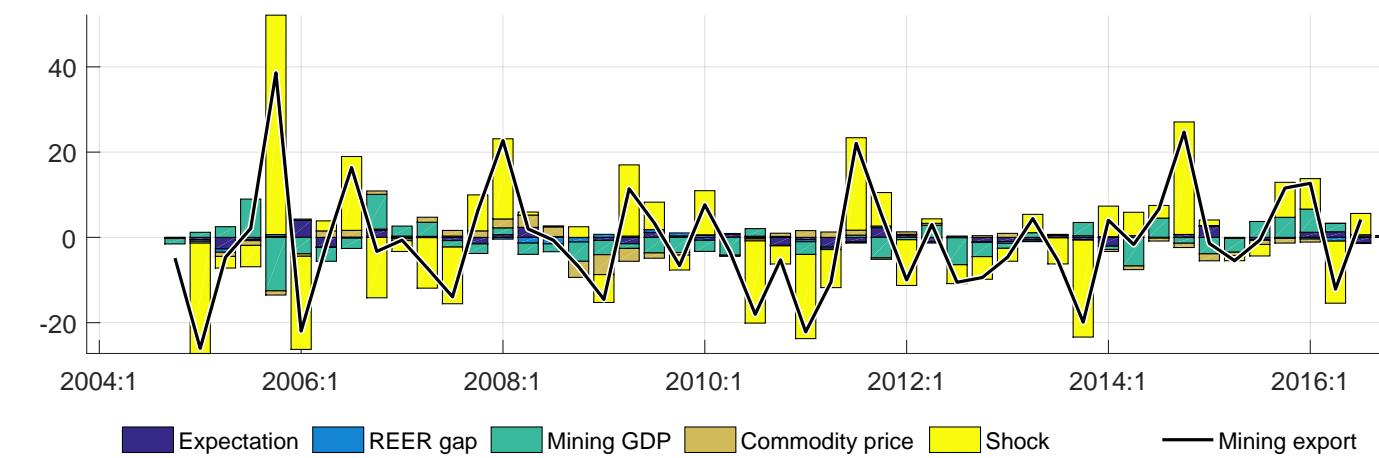
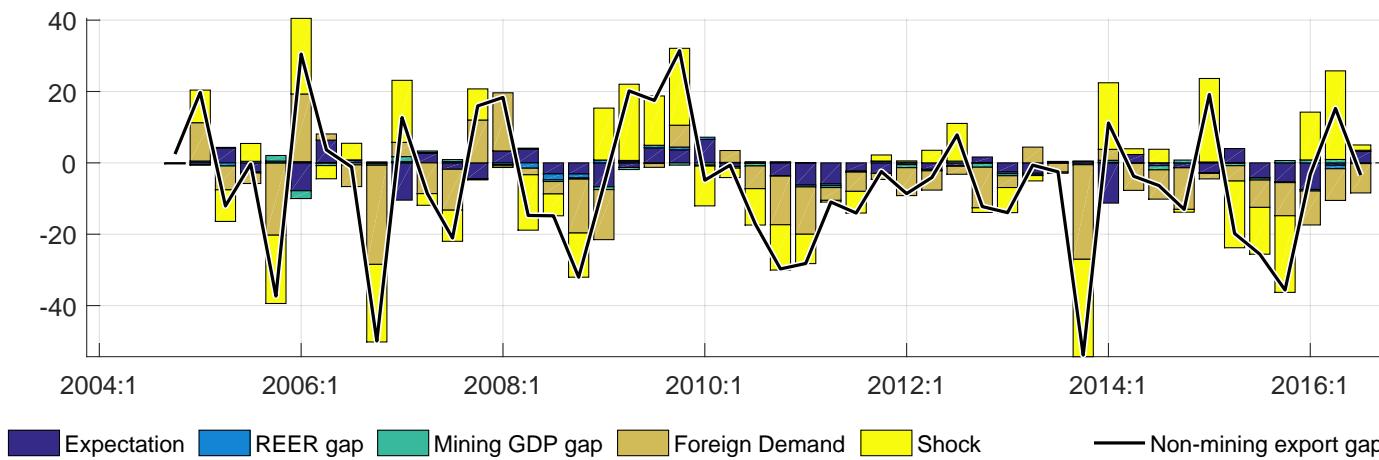
Contributions to Investment gap



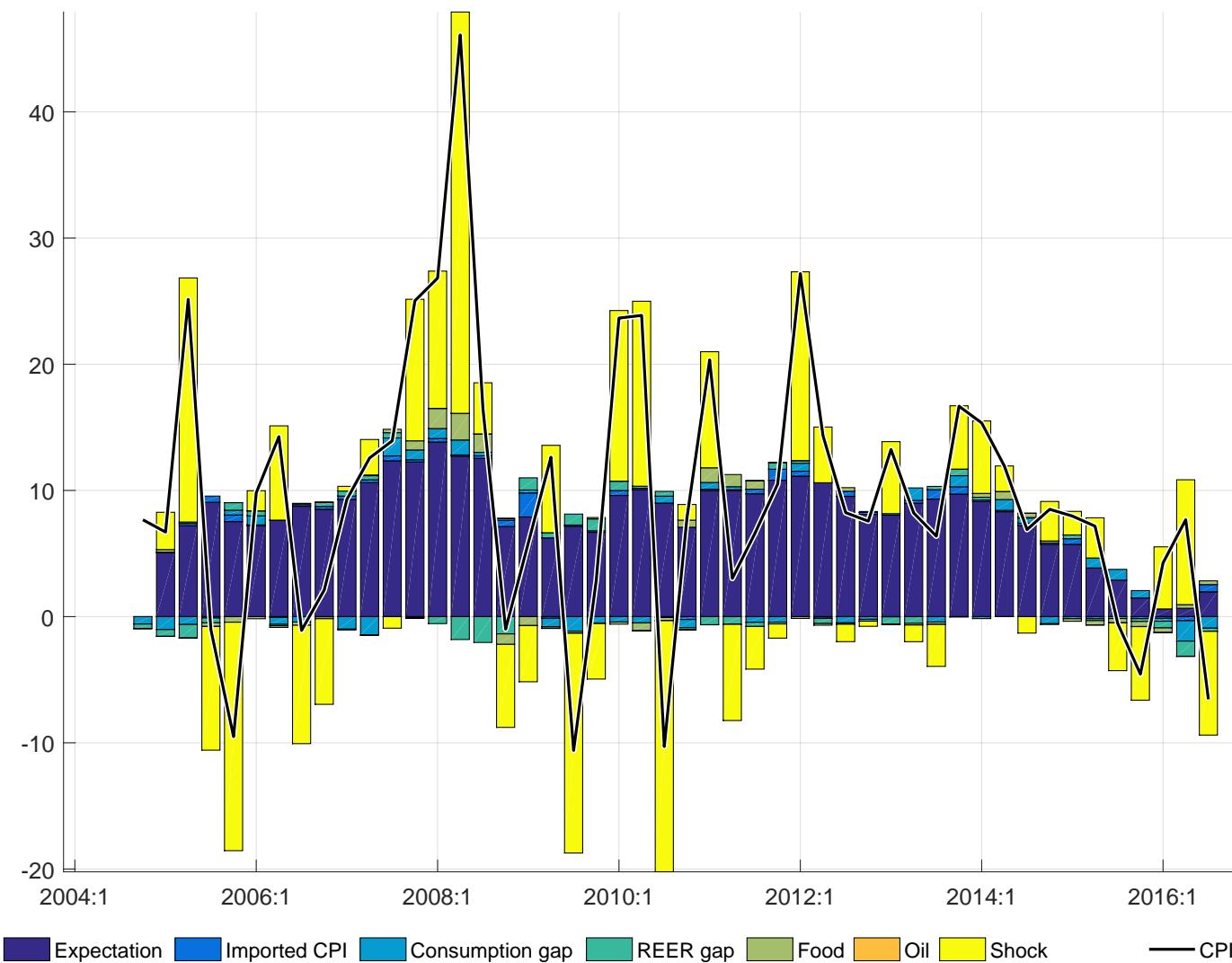
Contributions to Net-Export gap



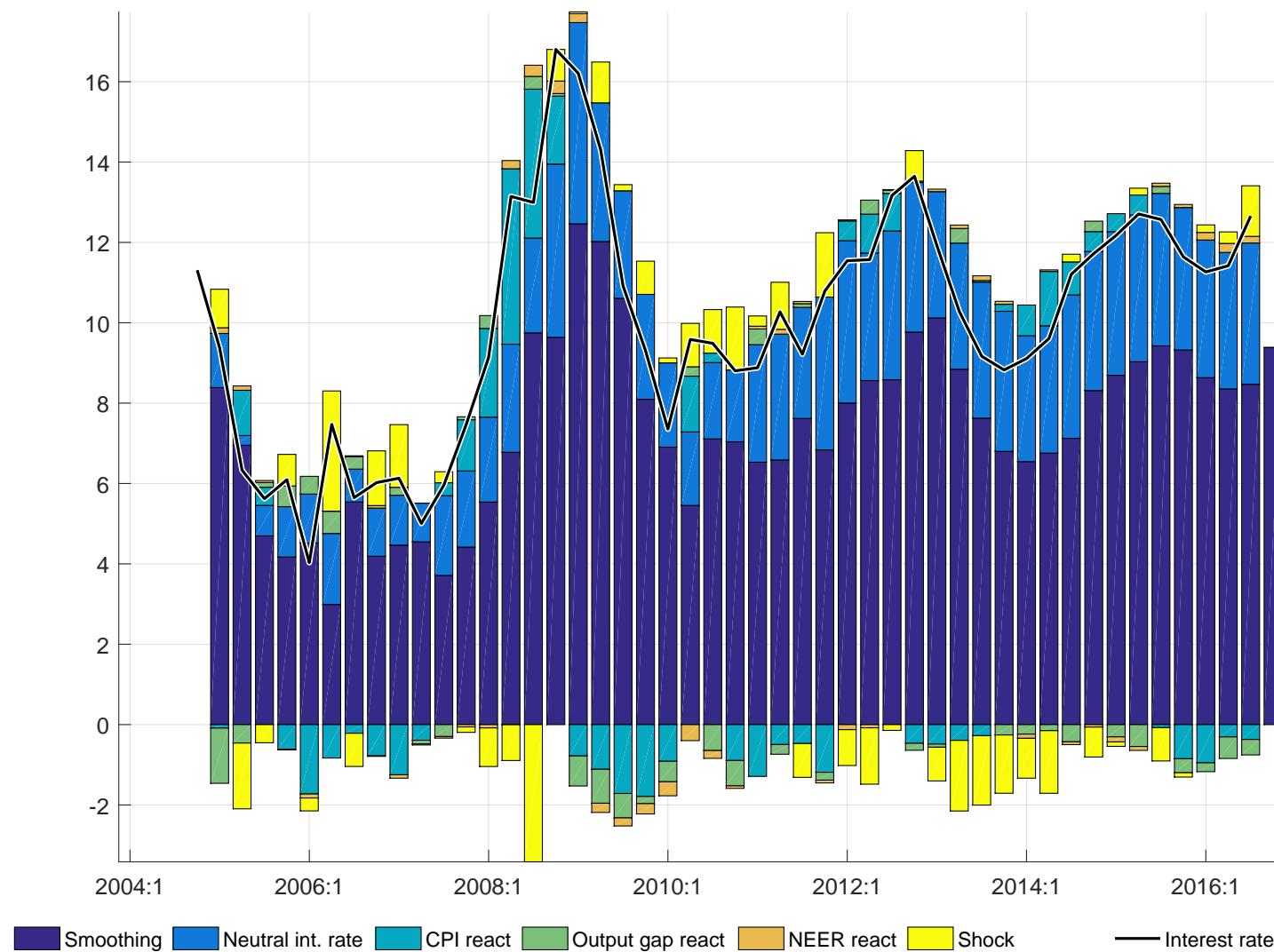
Contributions to Export gap



Contributions to CPI



Contributions to Mongolbank rate

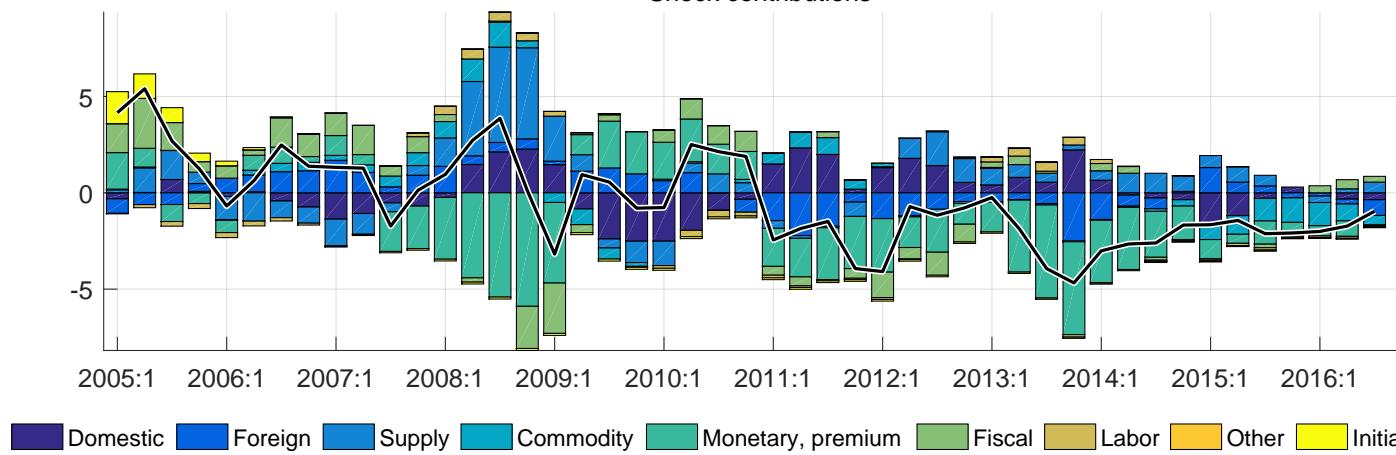


Shock decomposition for selected variables

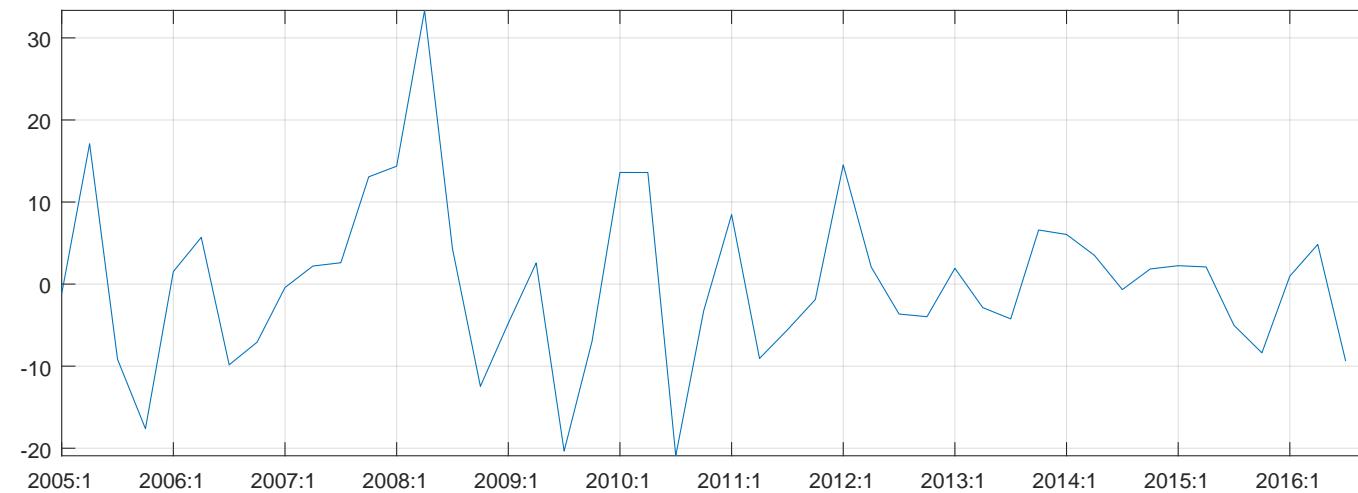
Mongolbank rate gap (%)



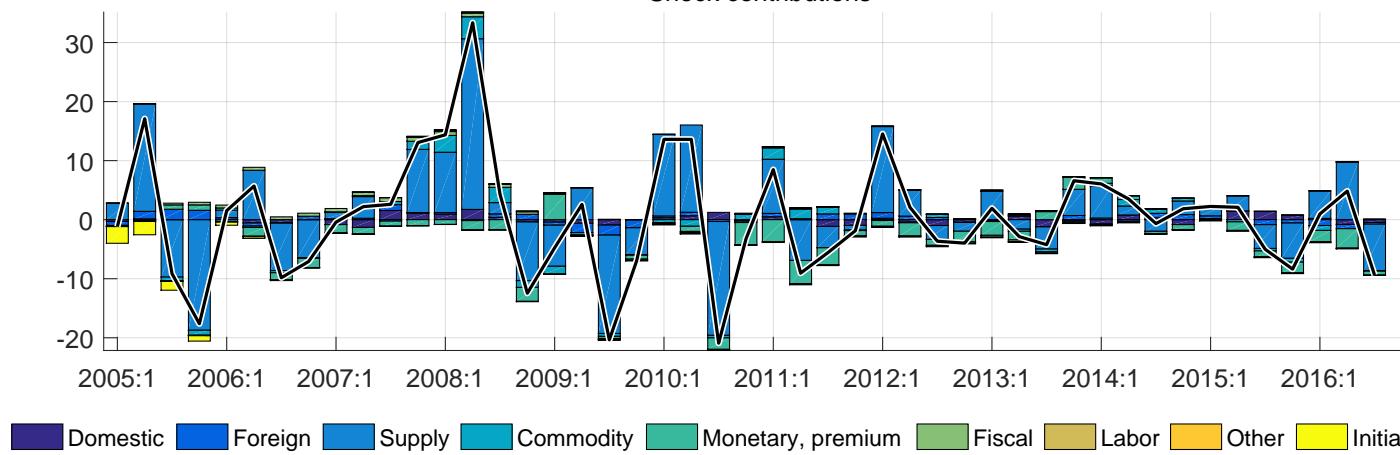
Shock contributions



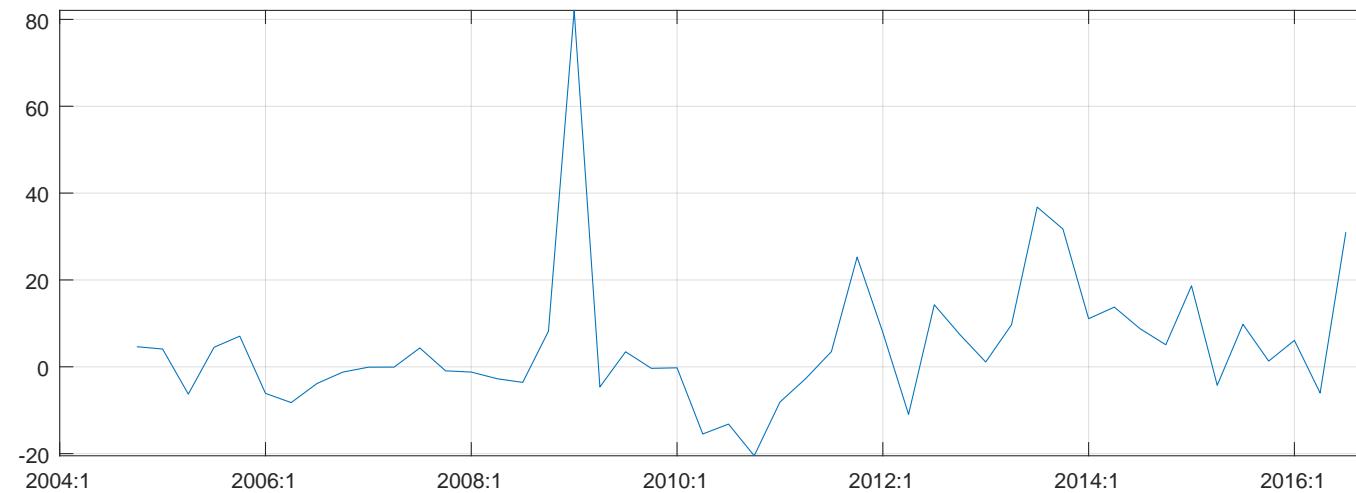
Consumer Price Index gap (%, QoQ)



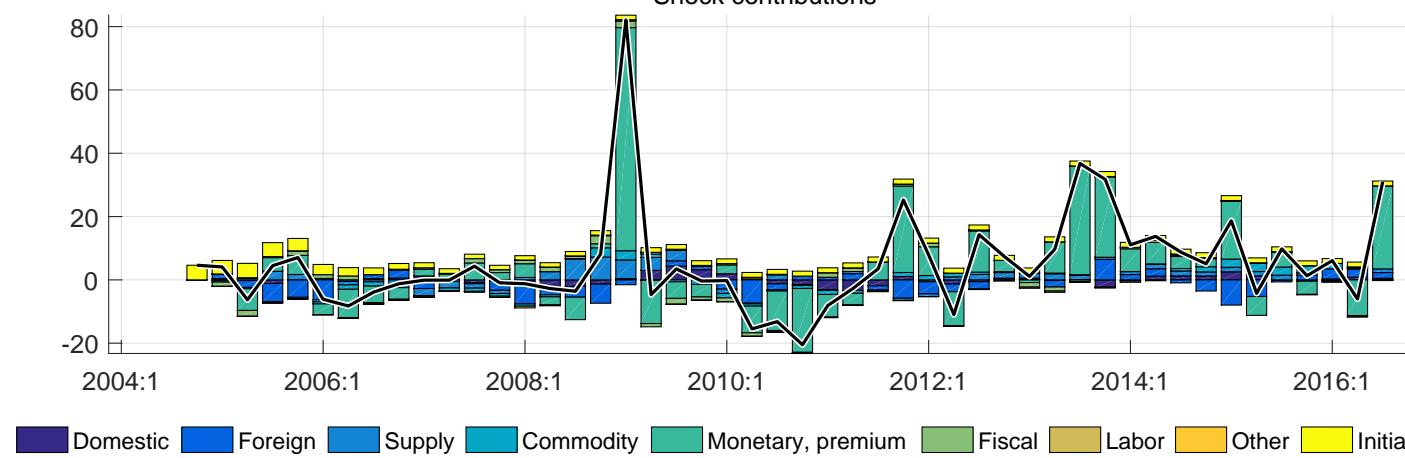
Shock contributions



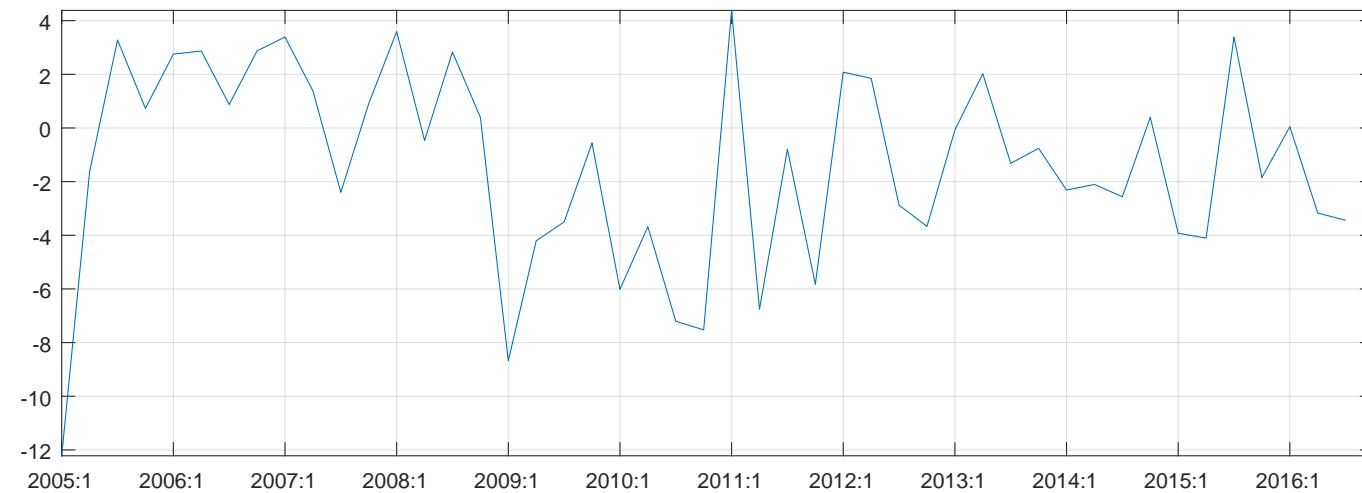
Nominal Exchange rate (100*log,QoQ, MNT/USD)



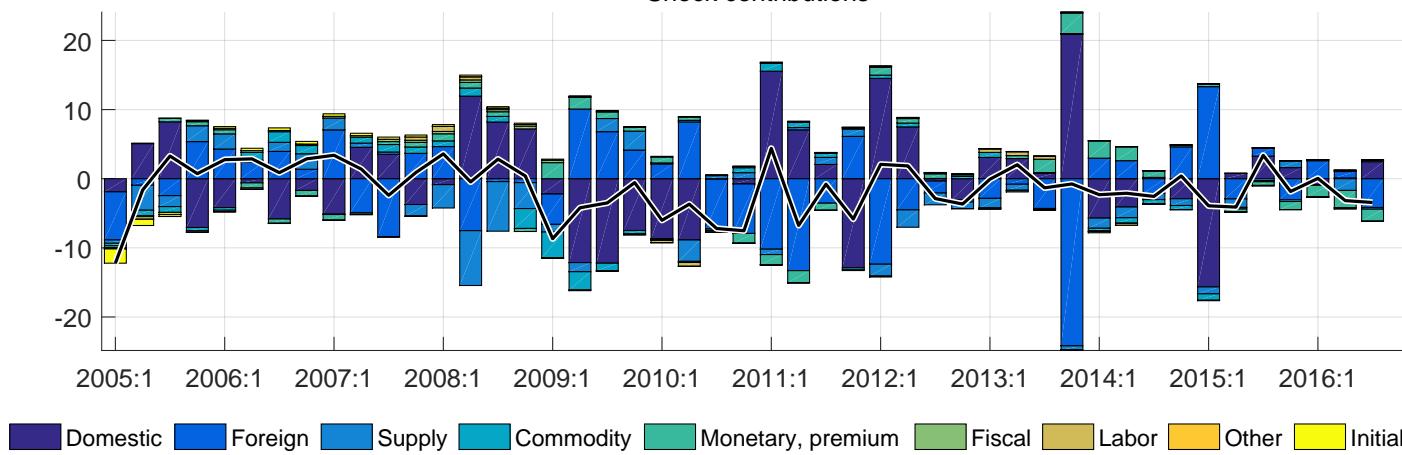
Shock contributions



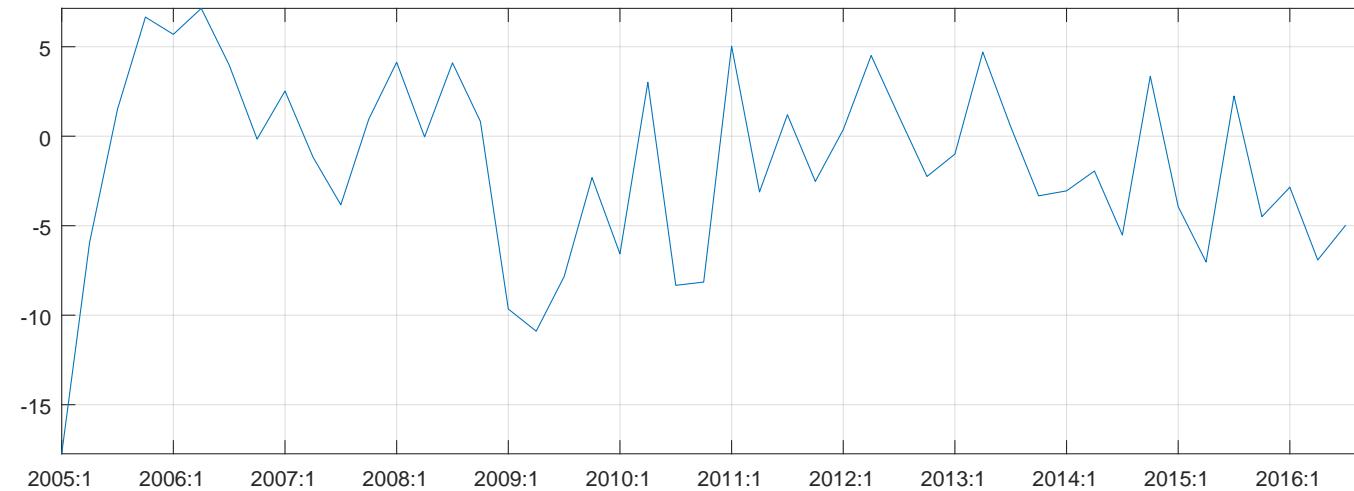
Output gap (%)



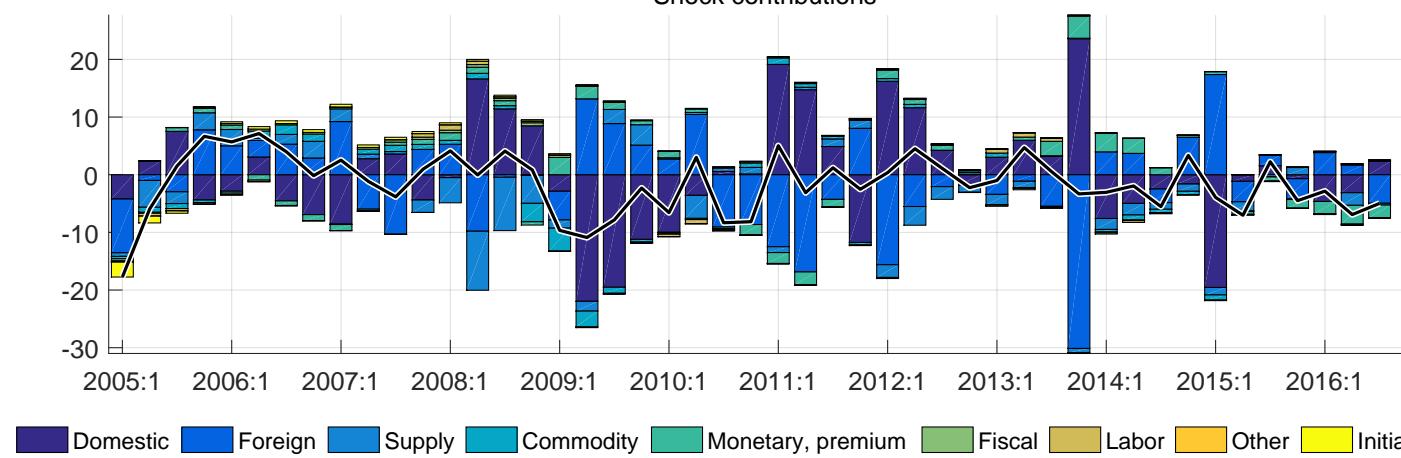
Shock contributions



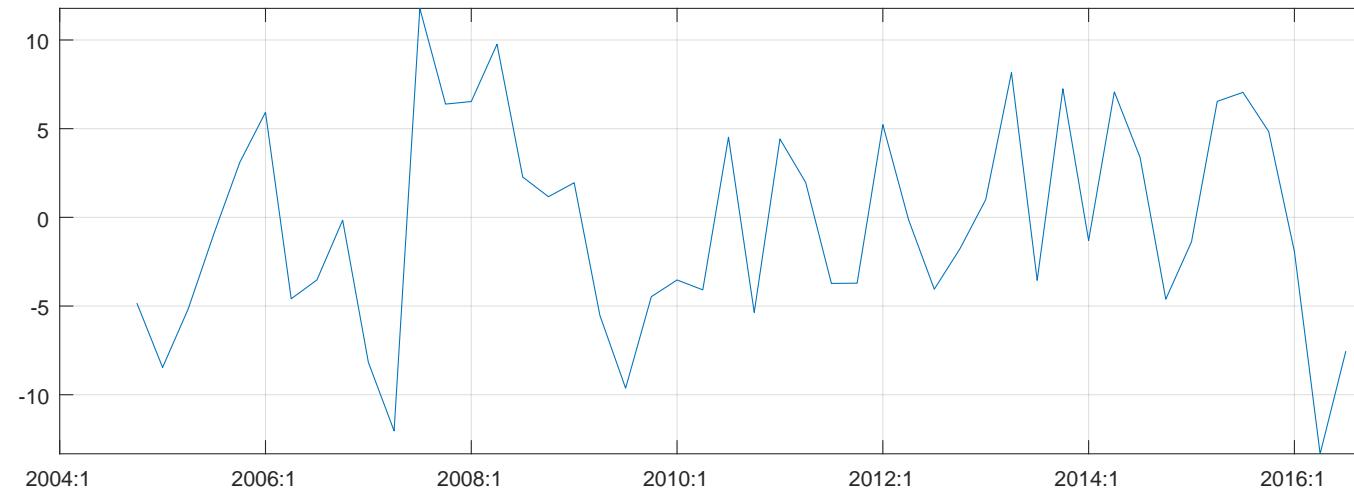
GDP core gap (%)



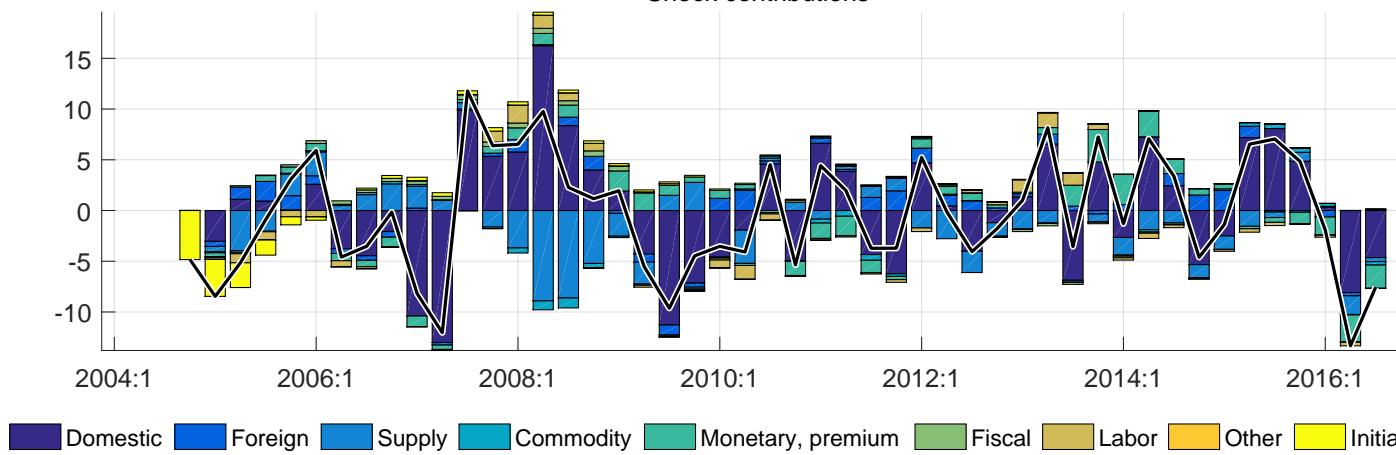
Shock contributions



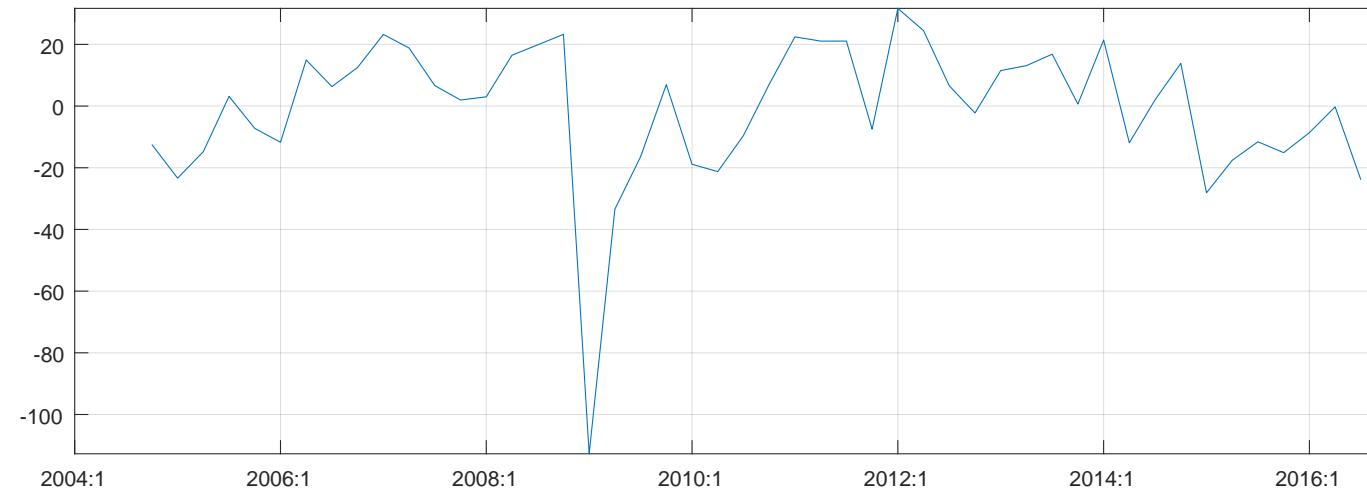
Consumption gap (%)



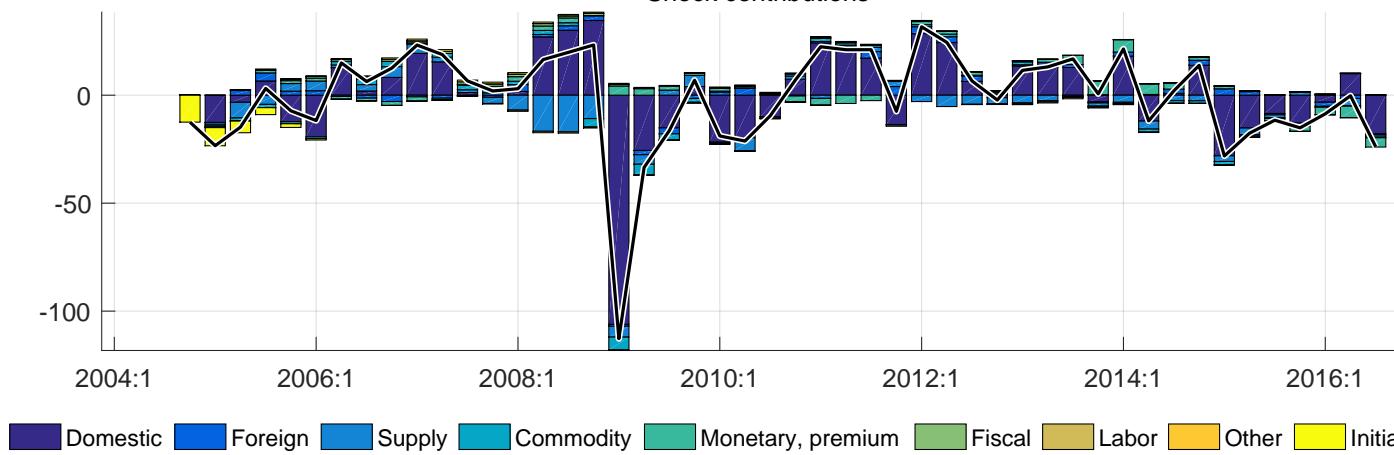
Shock contributions



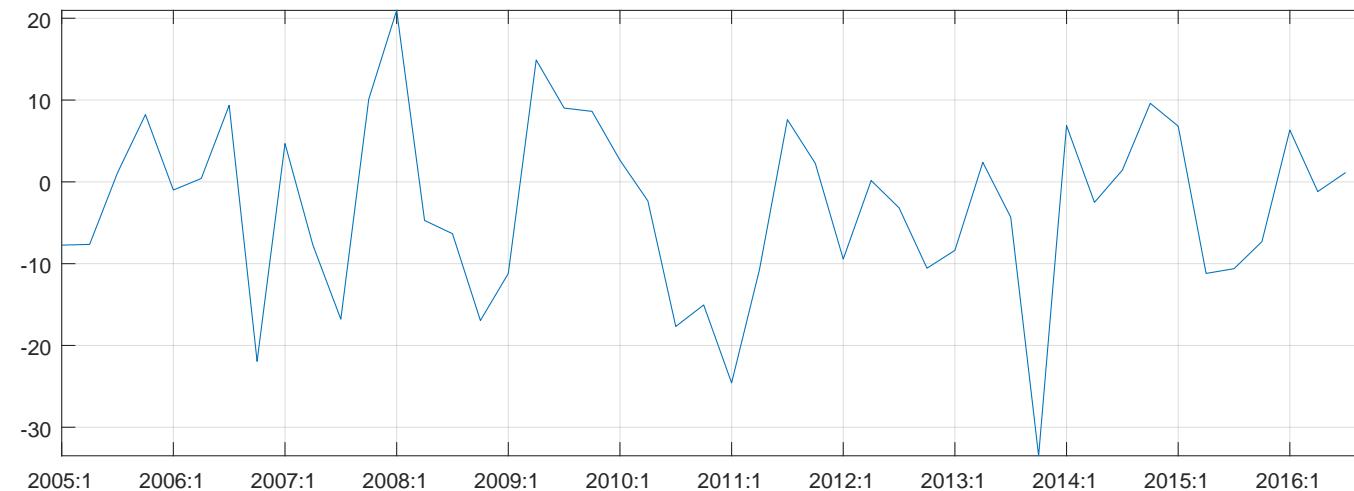
Investment gap (%)



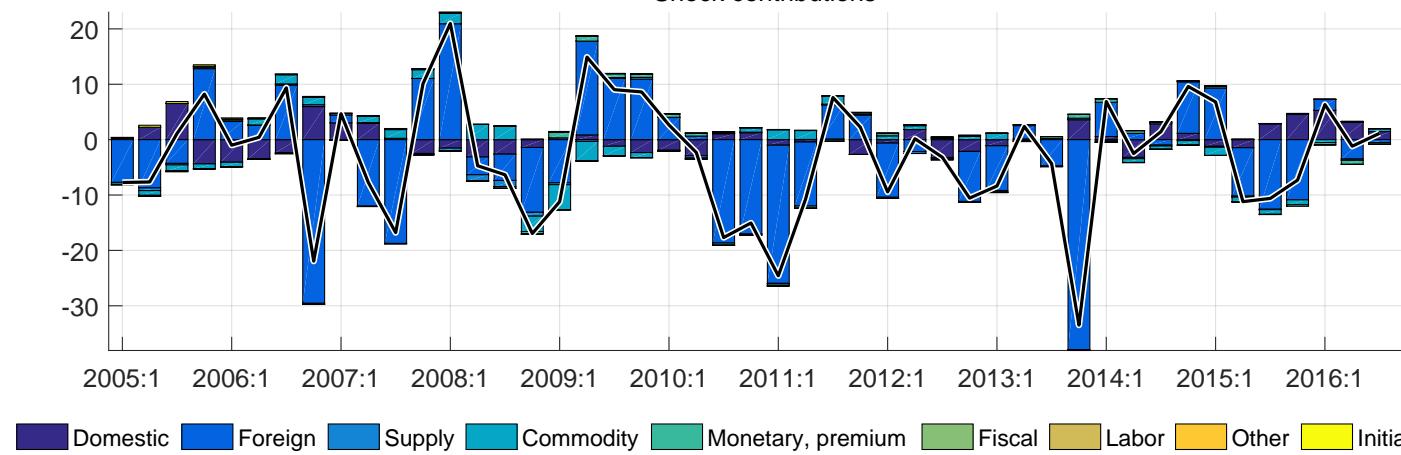
Shock contributions



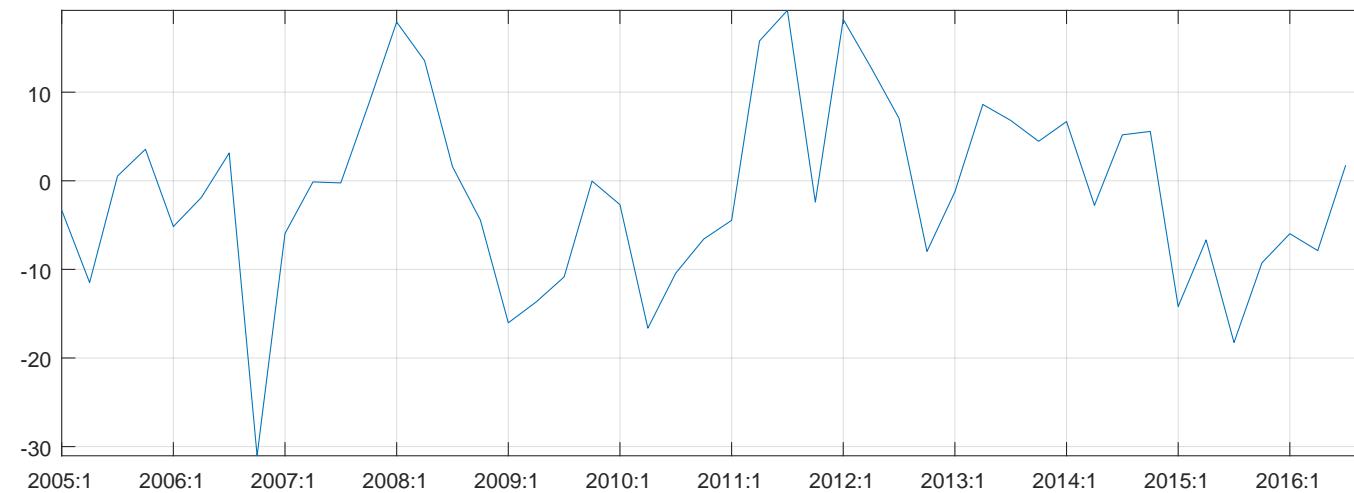
Export gap (%)



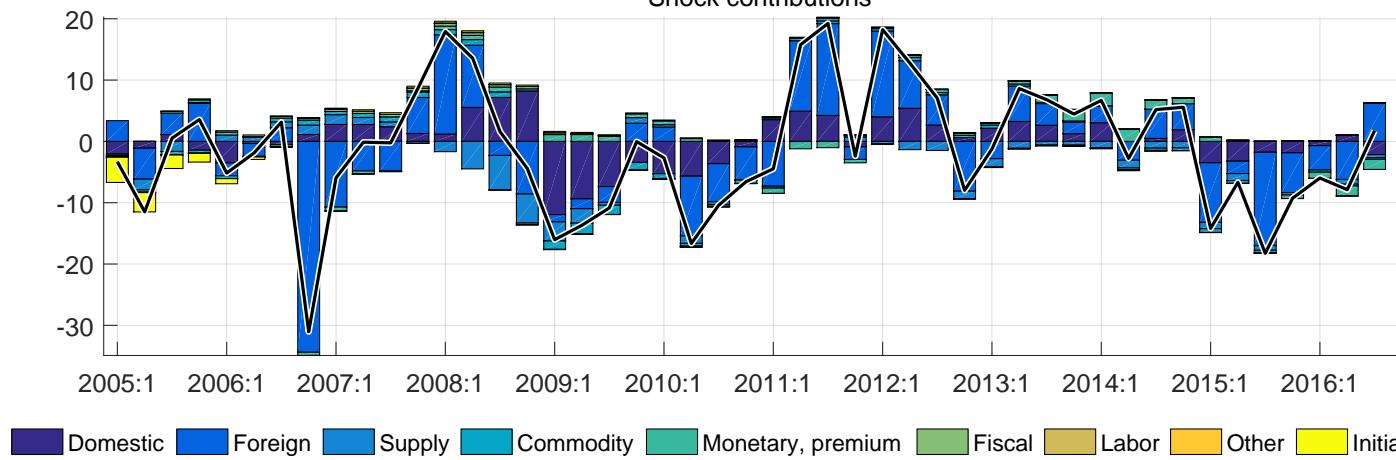
Shock contributions



Import gap (%)



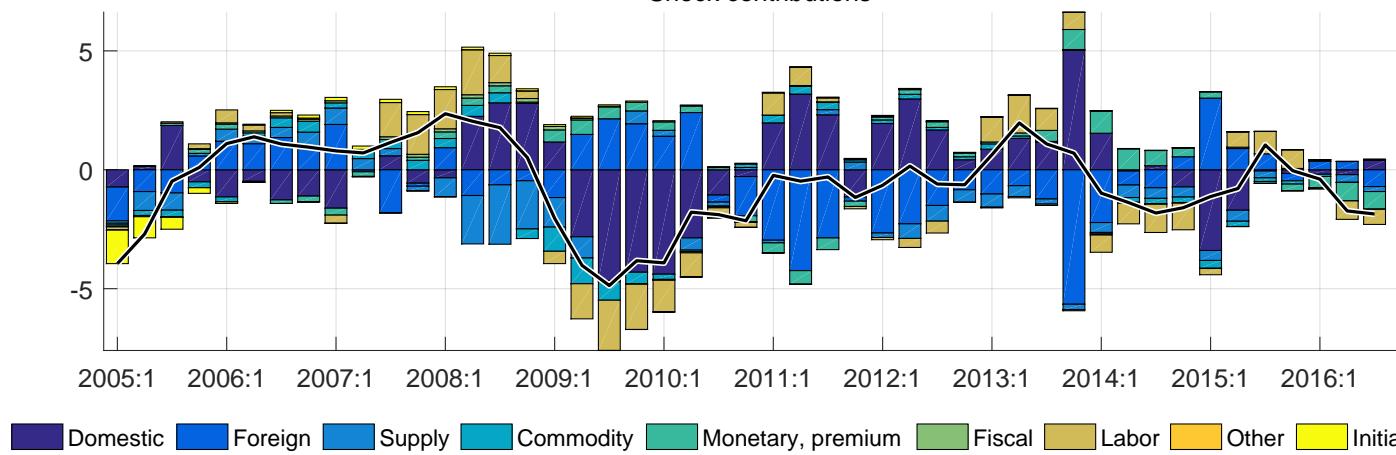
Shock contributions



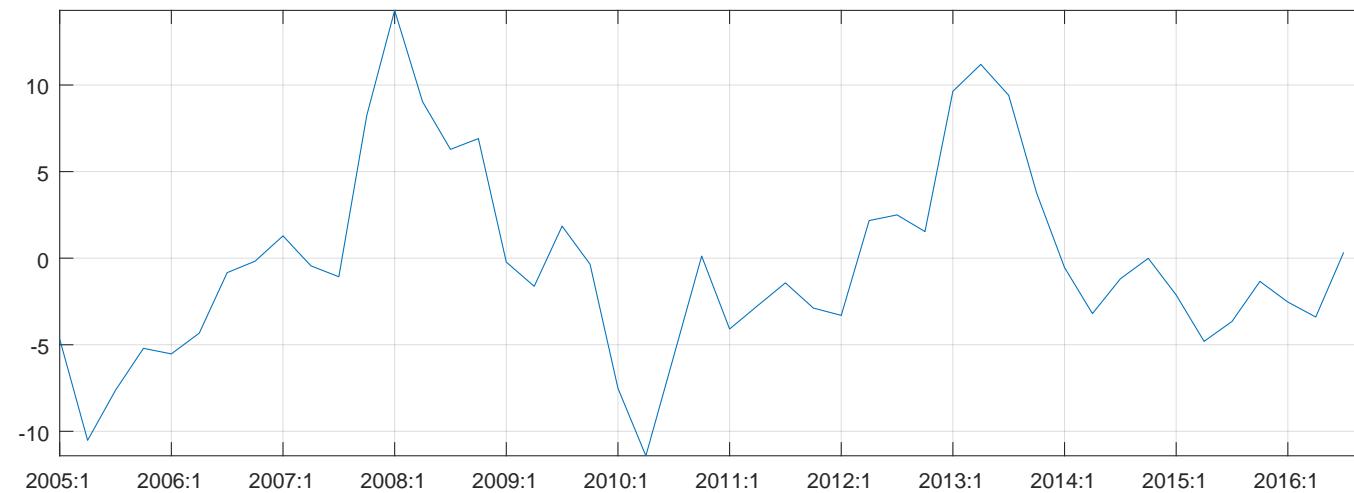
Employment gap (%)



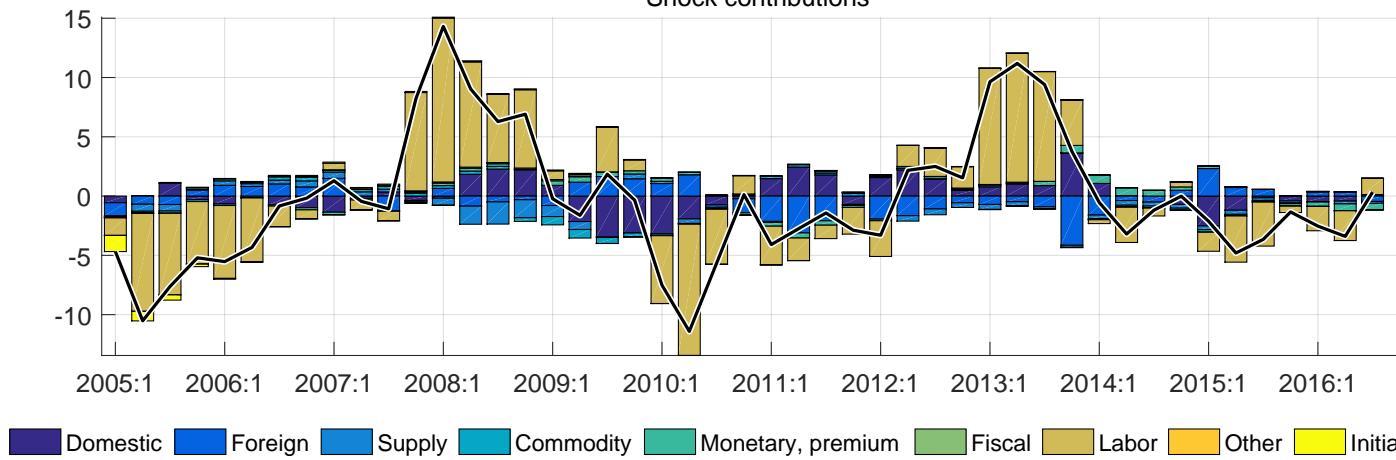
Shock contributions



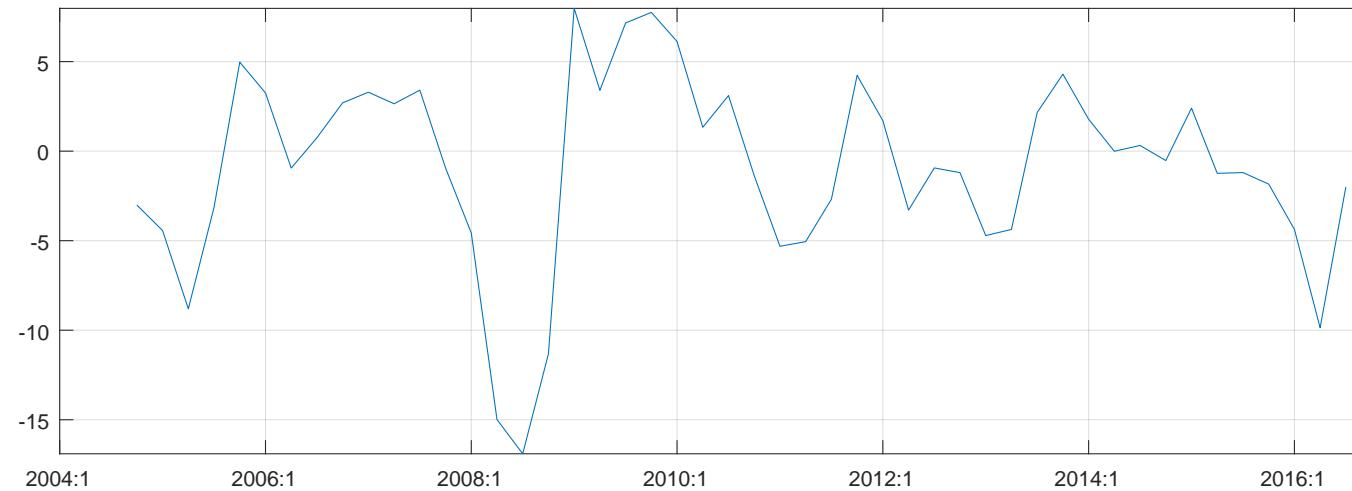
Real wage gap (%)



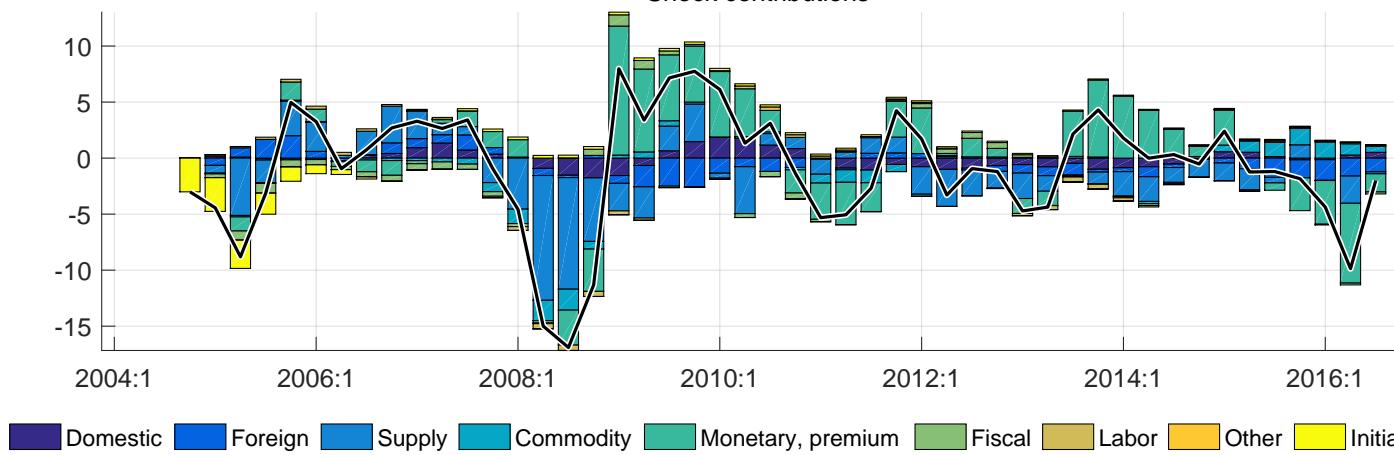
Shock contributions



Real Exchange rate gap (%)

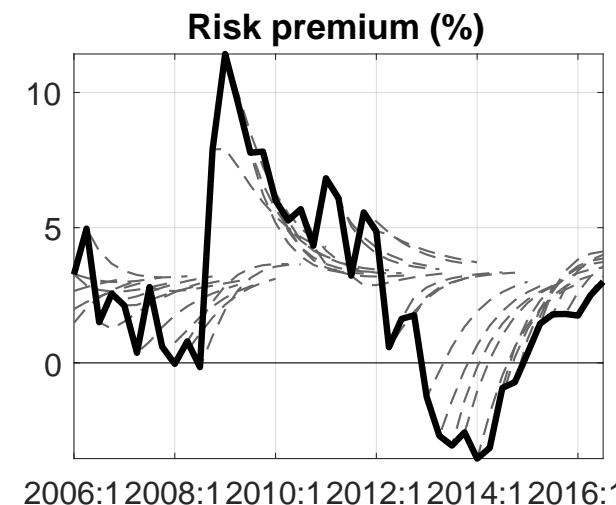
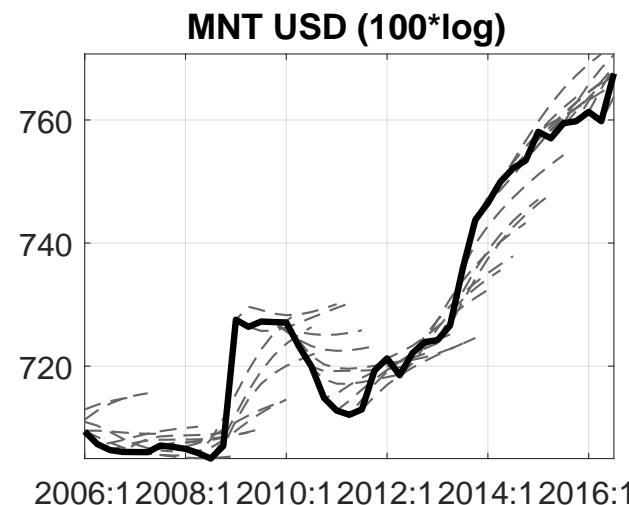
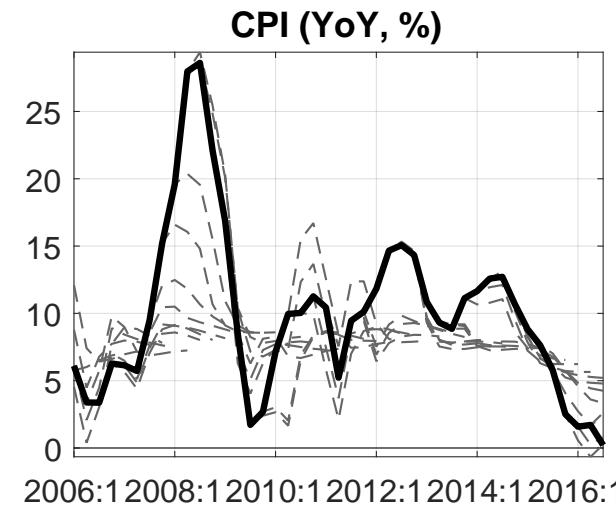
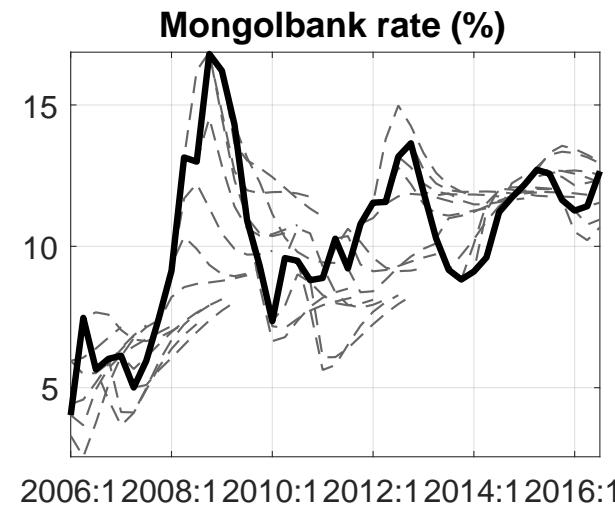


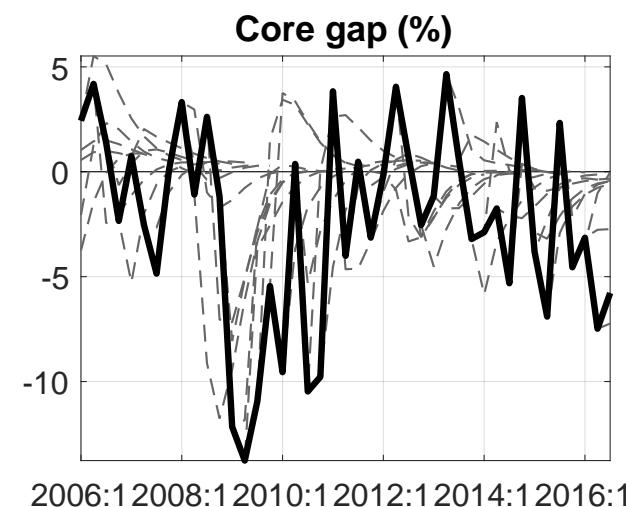
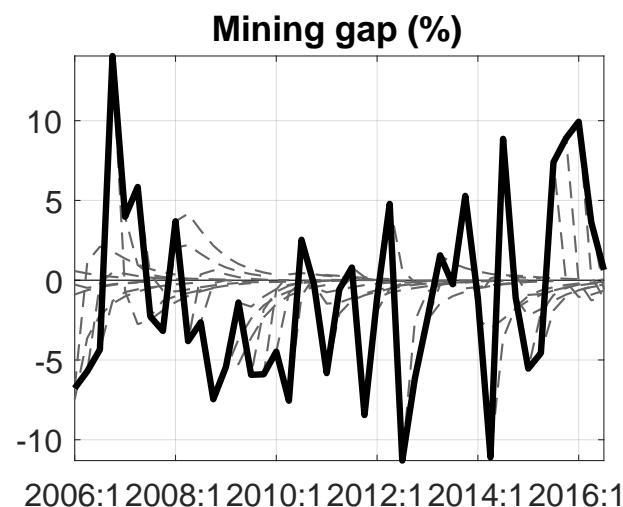
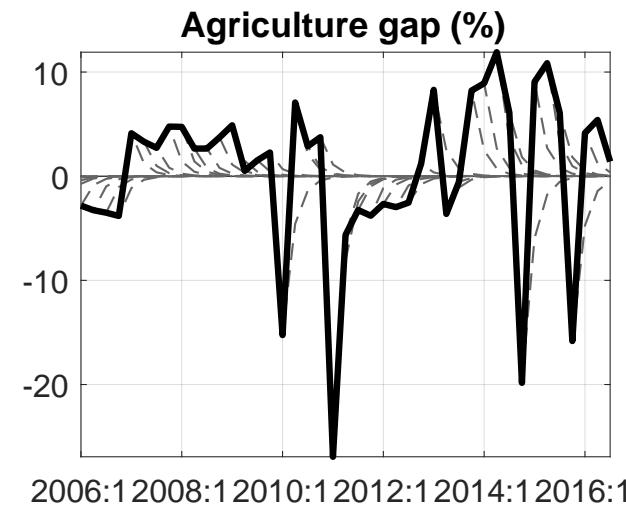
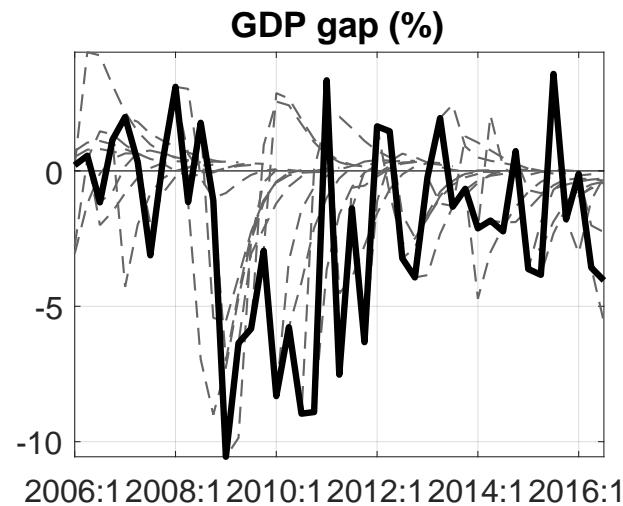
Shock contributions

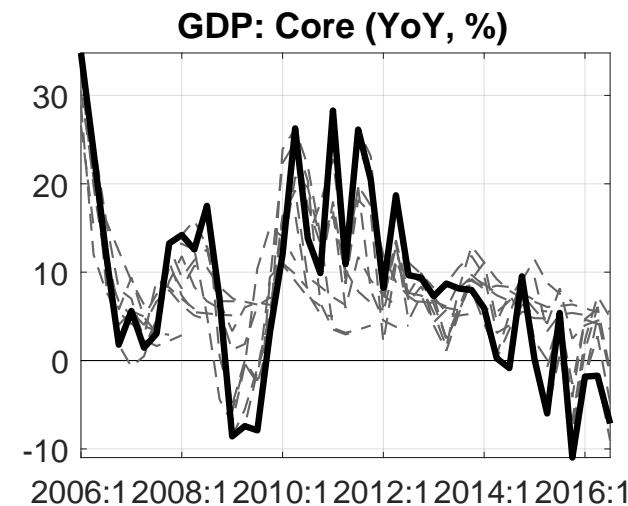
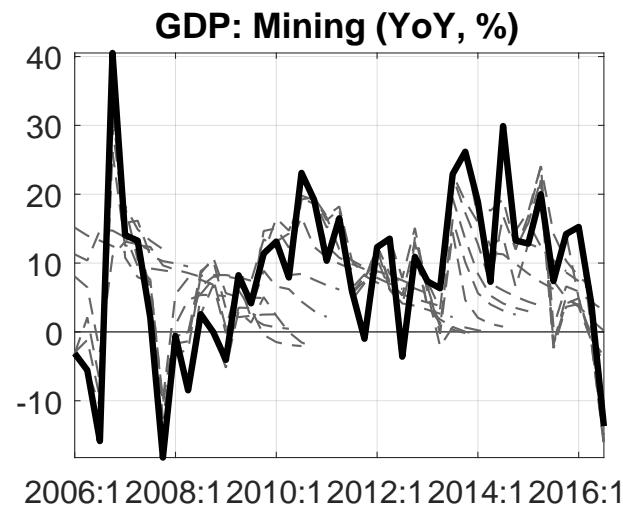
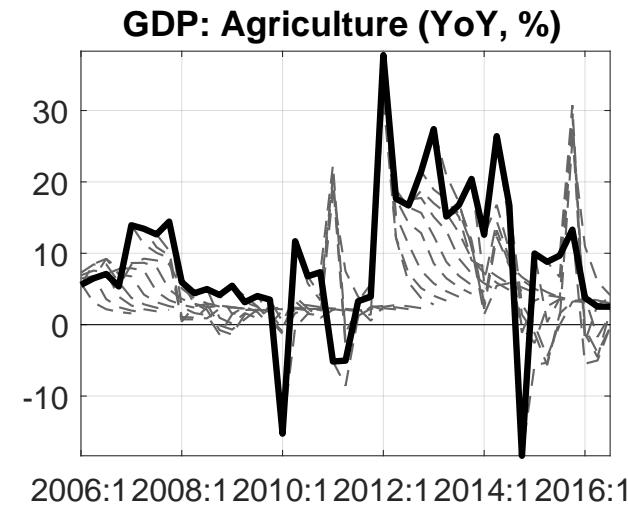
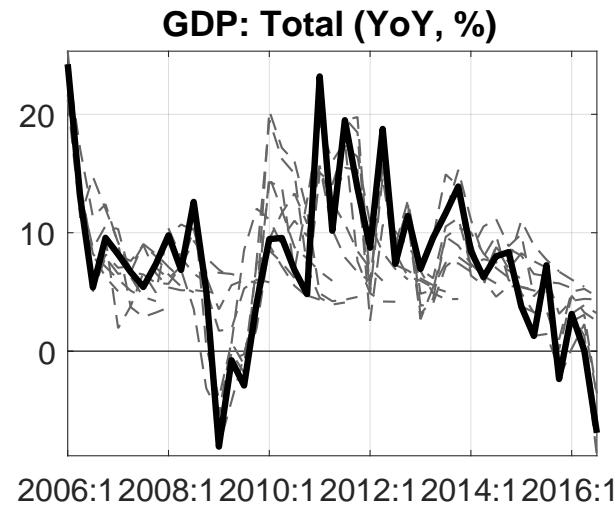


Historical forecast exercises: without any exogenous assumptions, calibrated model

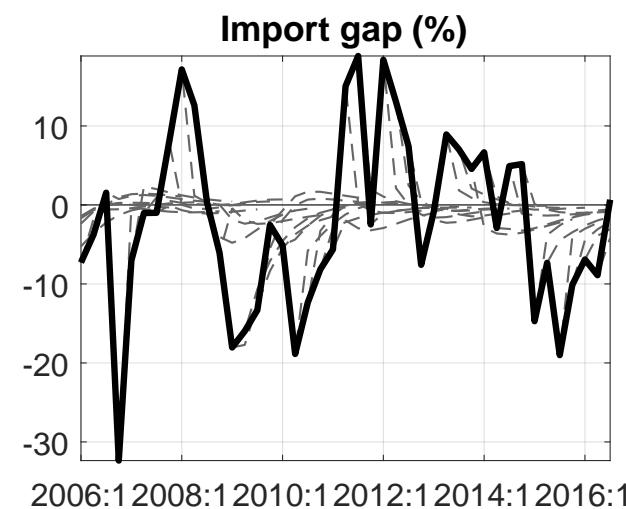
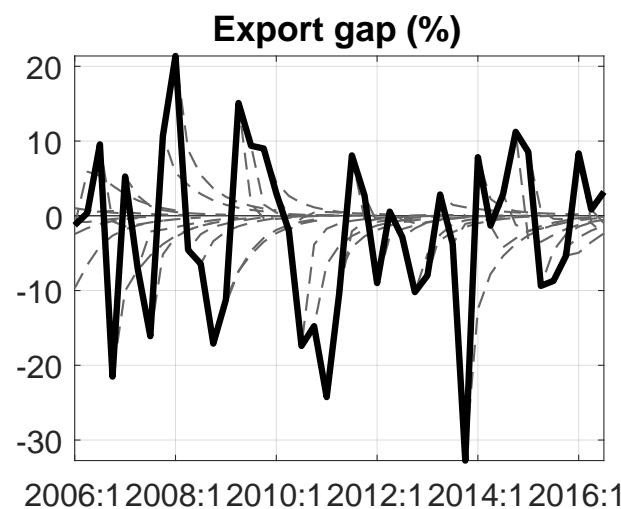
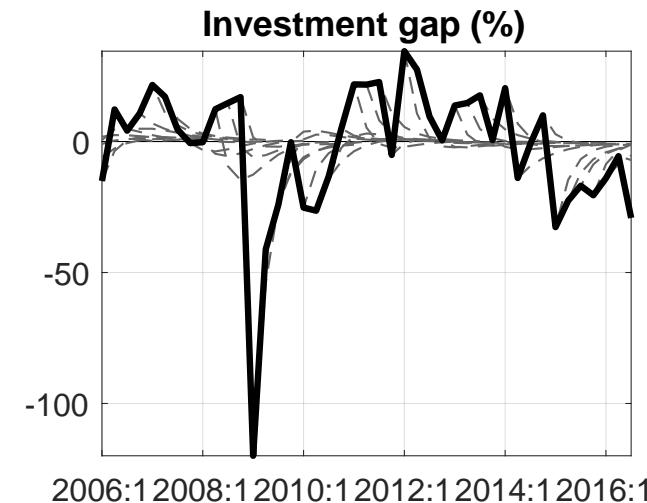
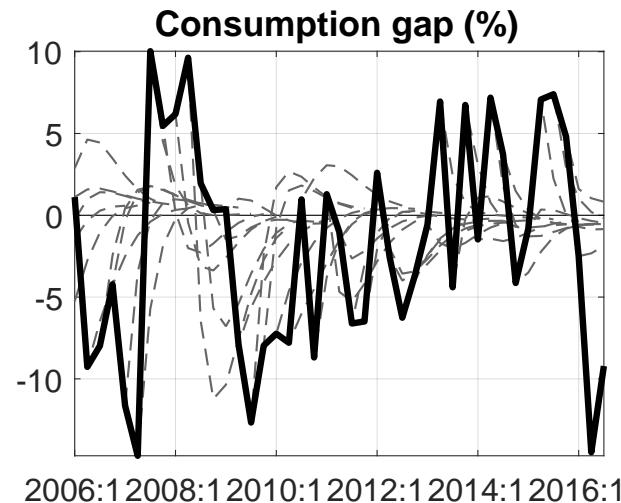
Monetary policy, and financial variables

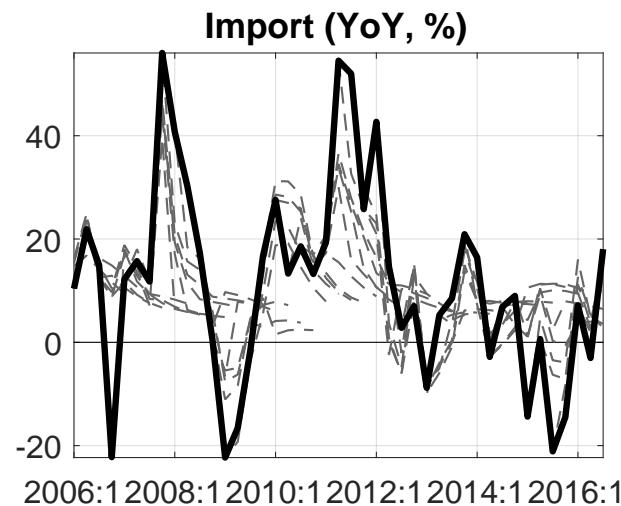
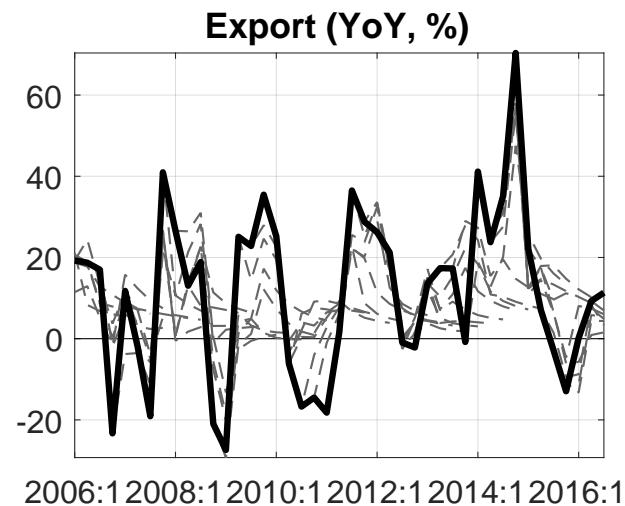
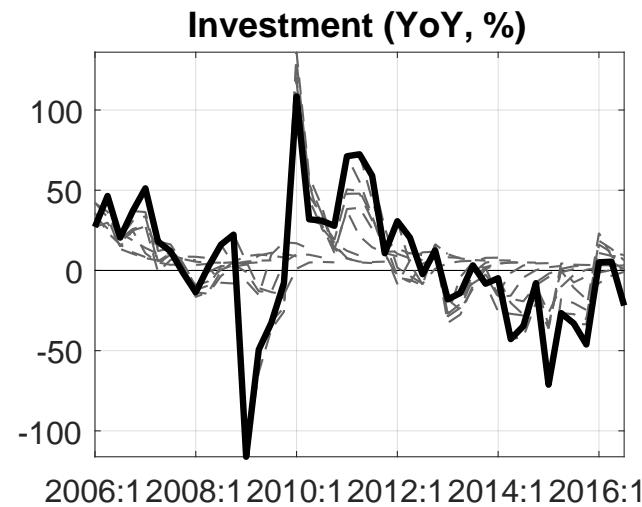
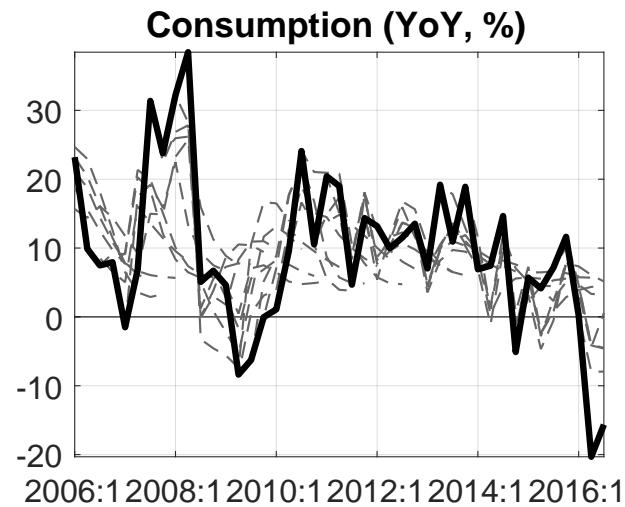


Production side

Production side

Expenditure side



Expenditure side

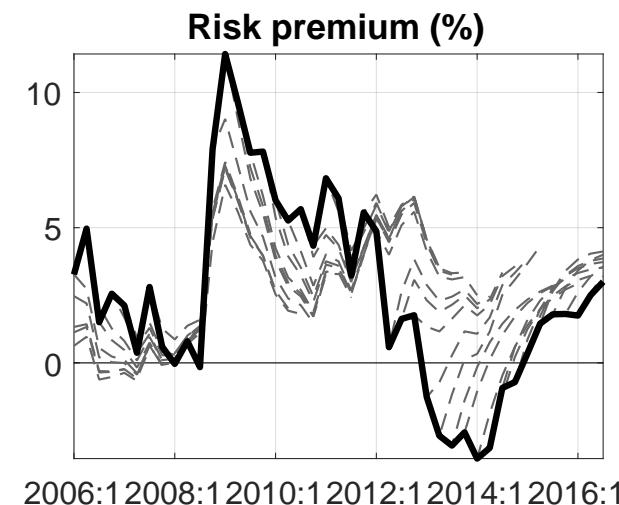
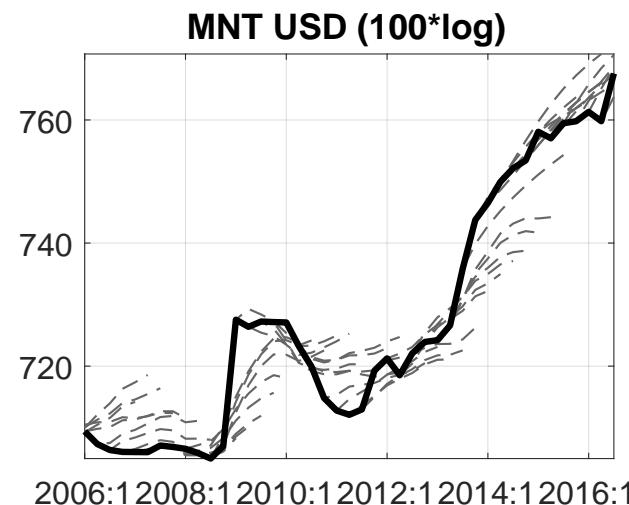
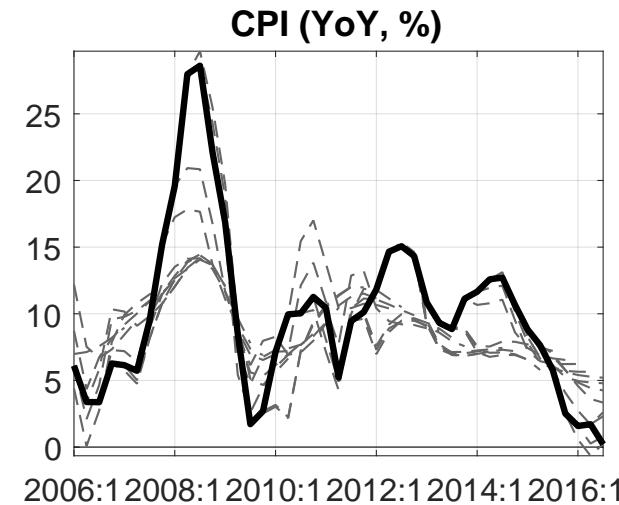
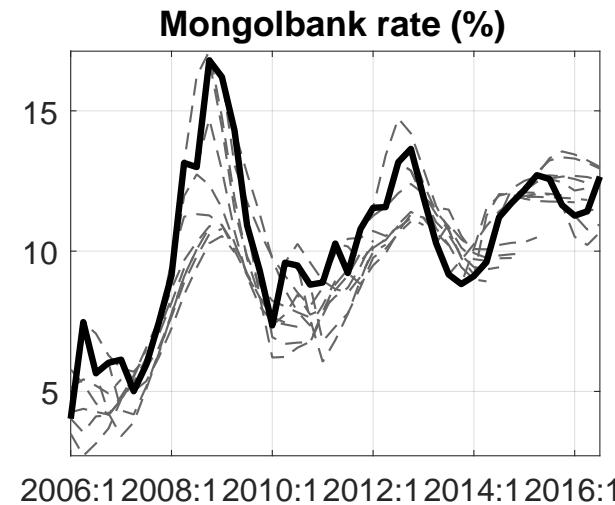
RMSE ratios

RMSE ratios: without any assumptions, calibrated model

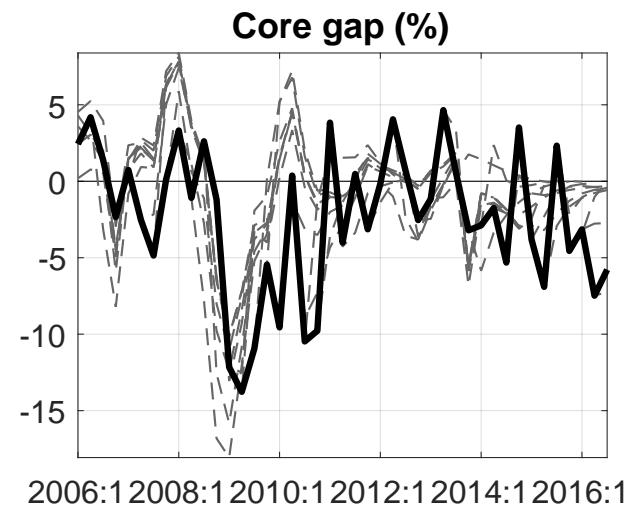
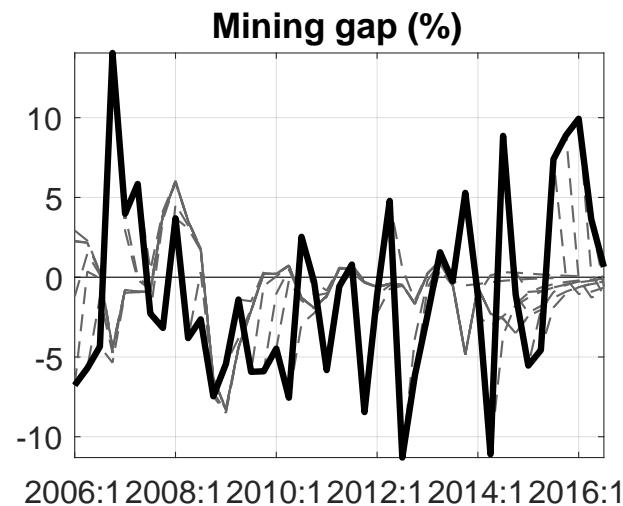
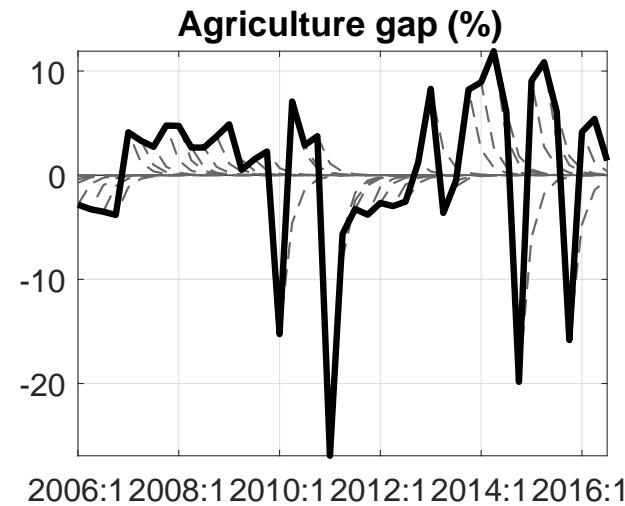
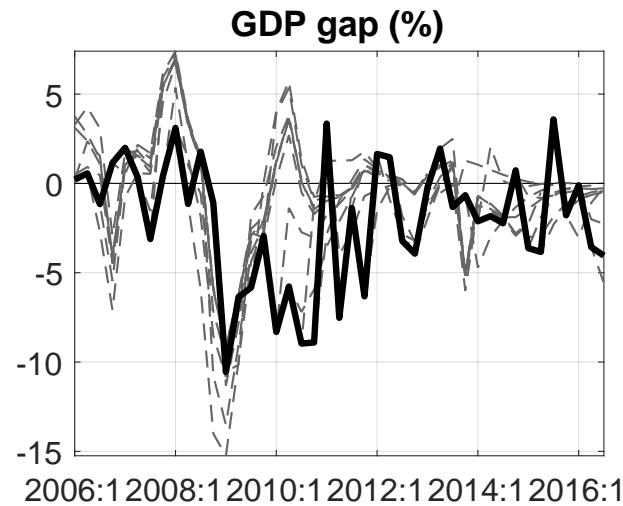
Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Mongolbank rate (%)	0.94	0.79	0.73	0.74	0.74	0.74	0.73	0.74
CPI (YoY, %)	0.70	0.68	0.64	0.64	0.63	0.65	0.69	0.72
MNT/USD (100*log)	0.79	0.64	0.51	0.49	0.49	0.52	0.56	0.60
GDP: Total (YoY, %)	0.63	0.57	0.49	0.48	0.71	0.72	0.76	0.72
Consumption (YoY, %)	0.67	0.57	0.51	0.41	0.61	0.74	0.70	0.73
Investment (YoY, %)	0.65	0.57	0.51	0.52	0.76	0.72	0.66	0.62
Export (YoY, %)	0.57	0.49	0.48	0.44	0.70	0.92	0.94	0.94
Import (YoY, %)	0.60	0.50	0.48	0.42	0.64	0.69	0.73	0.73

Historical forecast exercises: with exogenous assumptions, calibrated model

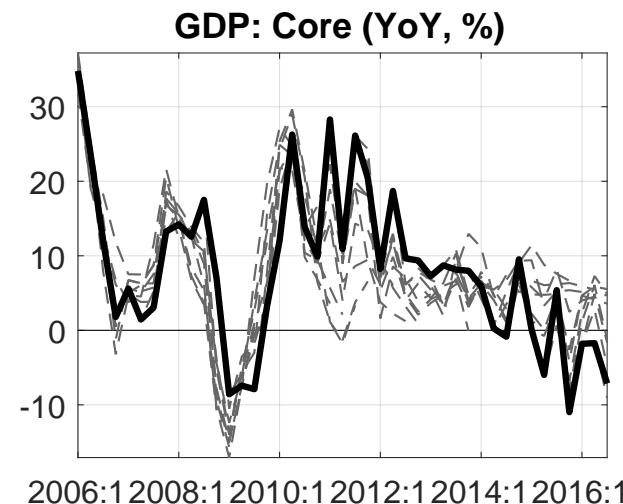
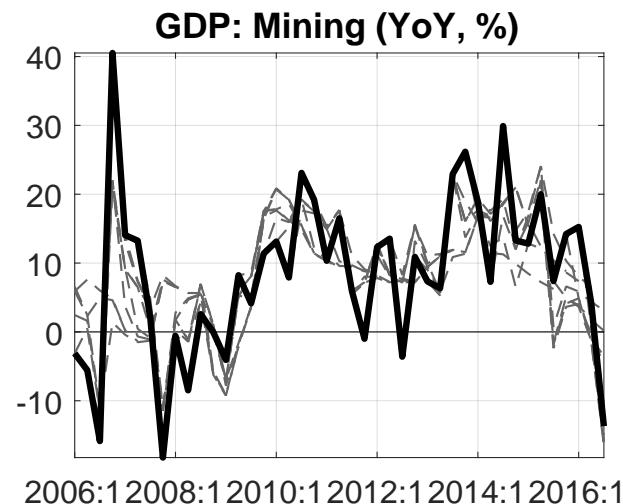
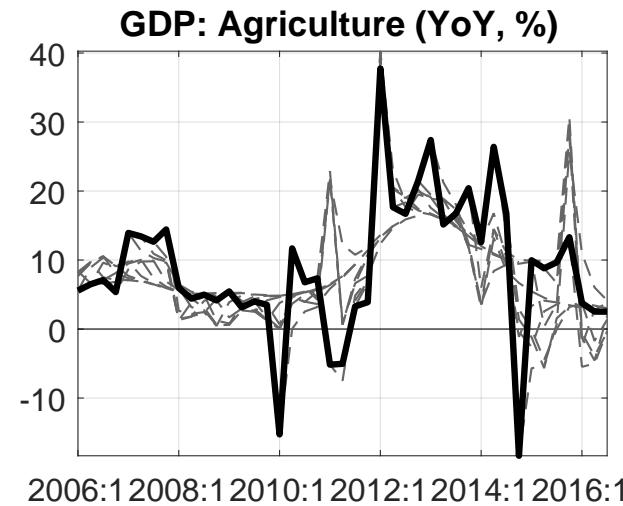
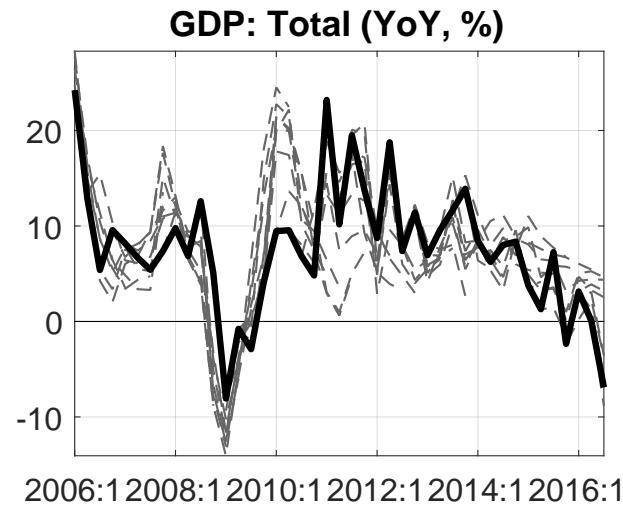
Monetary policy, and financial variables



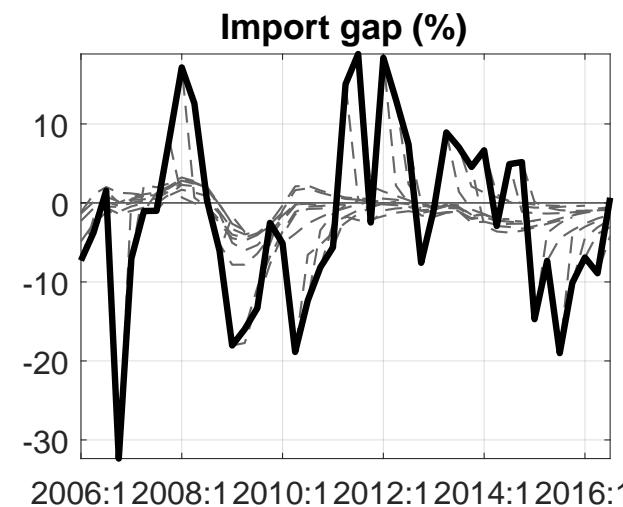
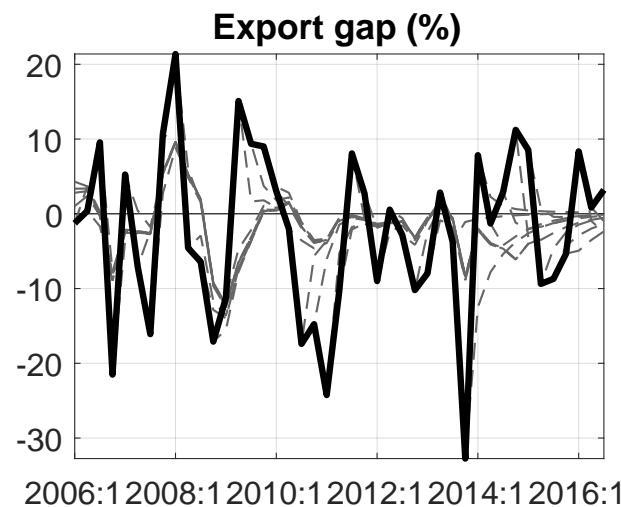
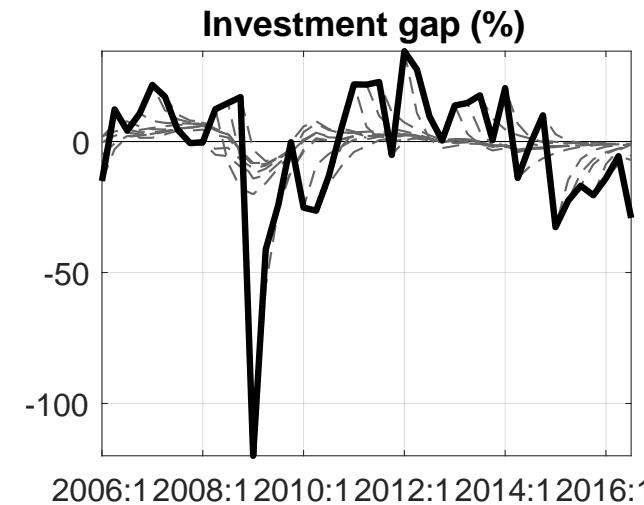
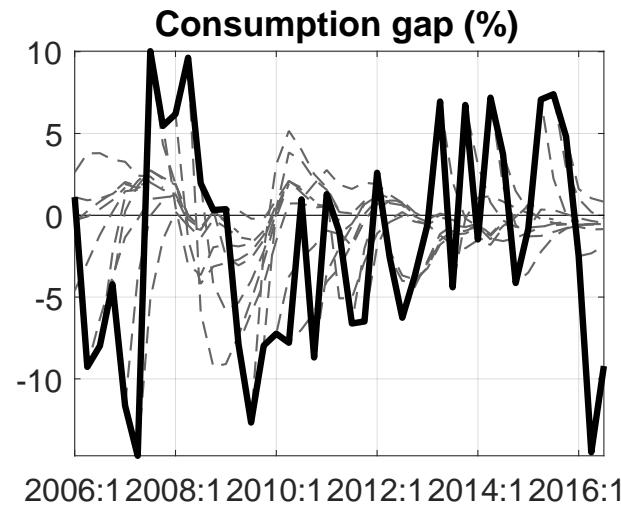
Production side

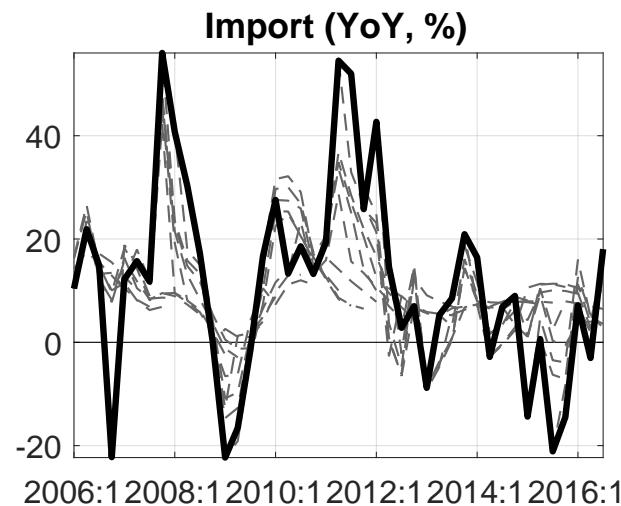
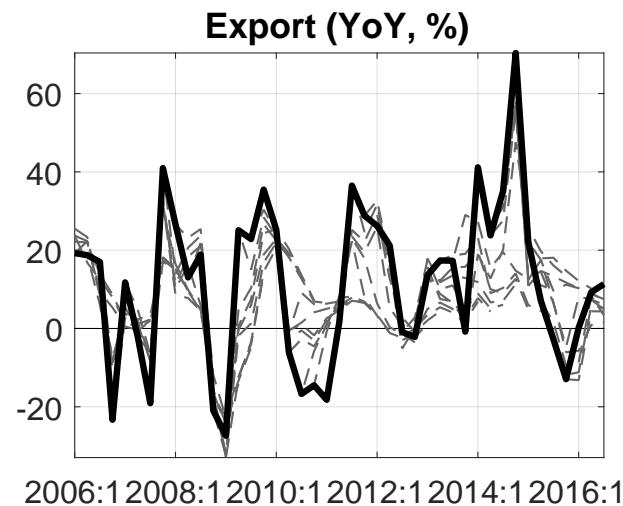
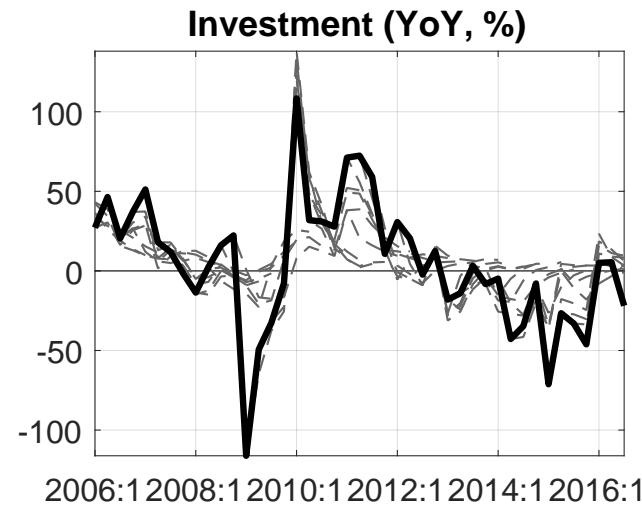
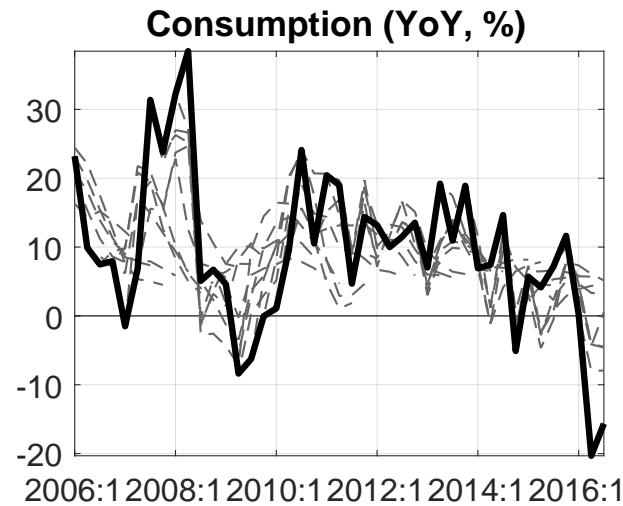


Production side



Expenditure side



Expenditure side

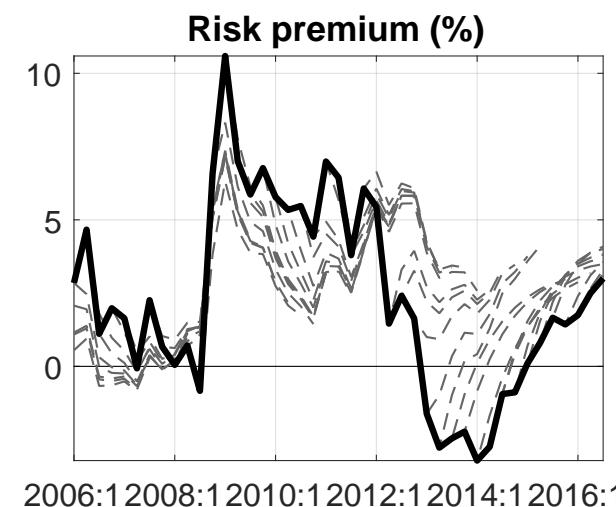
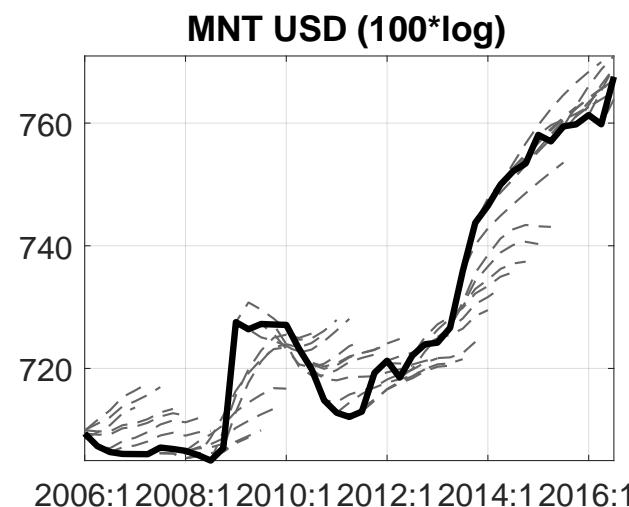
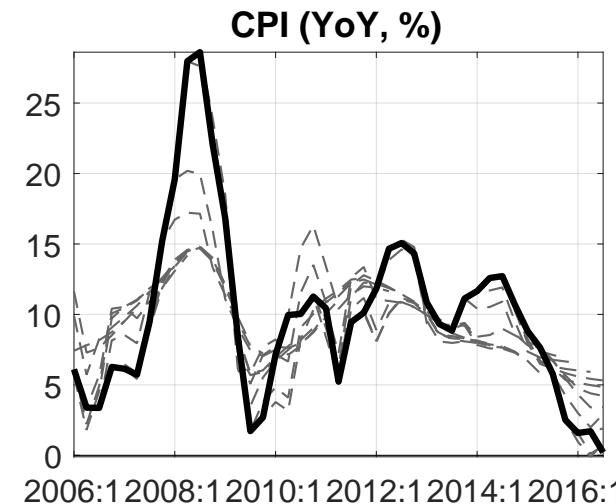
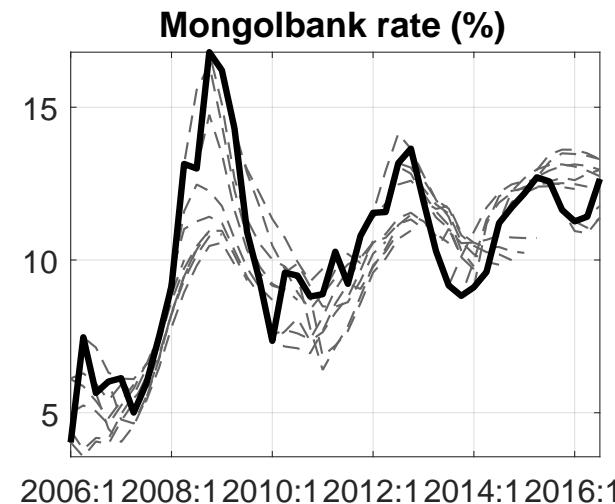
RMSE ratios

RMSE ratios: with exogenous assumptions, calibrated model

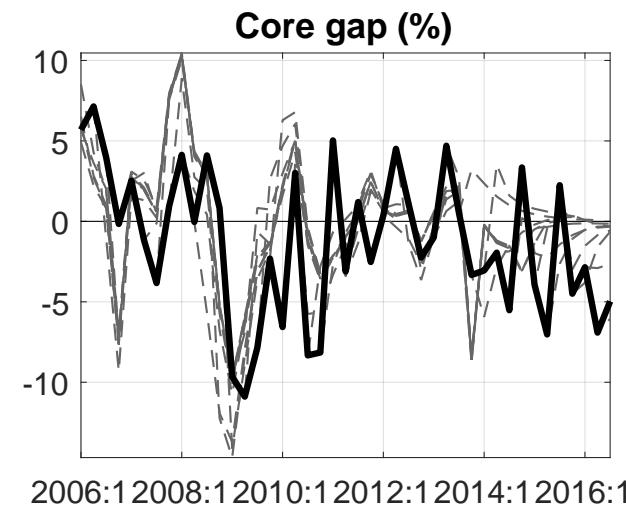
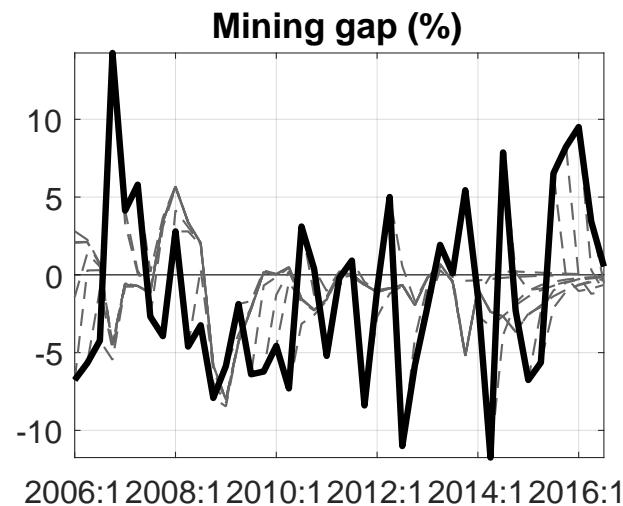
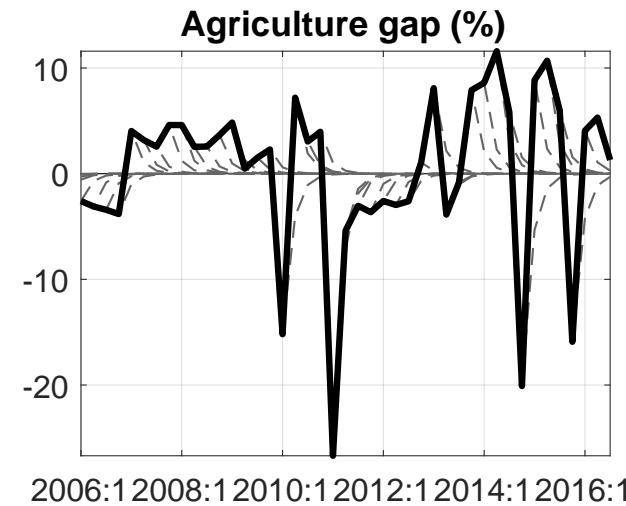
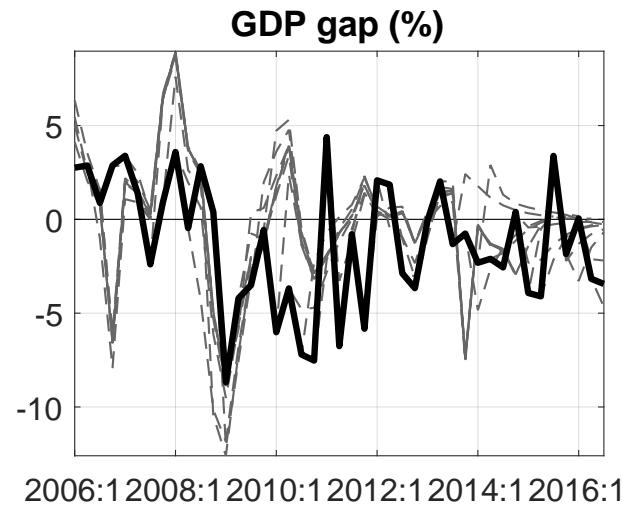
Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Mongolbank rate (%)	0.89	0.68	0.58	0.53	0.50	0.48	0.47	0.47
CPI (YoY, %)	0.67	0.63	0.56	0.53	0.50	0.50	0.52	0.53
MNT/USD (100*log)	0.76	0.61	0.51	0.46	0.46	0.48	0.52	0.57
GDP: Total (YoY, %)	0.66	0.69	0.62	0.54	0.86	0.83	0.86	0.77
Consumption (YoY, %)	0.66	0.57	0.52	0.42	0.60	0.73	0.70	0.74
Investment (YoY, %)	0.63	0.55	0.49	0.49	0.73	0.68	0.62	0.58
Export (YoY, %)	0.50	0.38	0.38	0.37	0.63	0.83	0.88	0.92
Import (YoY, %)	0.59	0.48	0.46	0.40	0.61	0.66	0.69	0.68

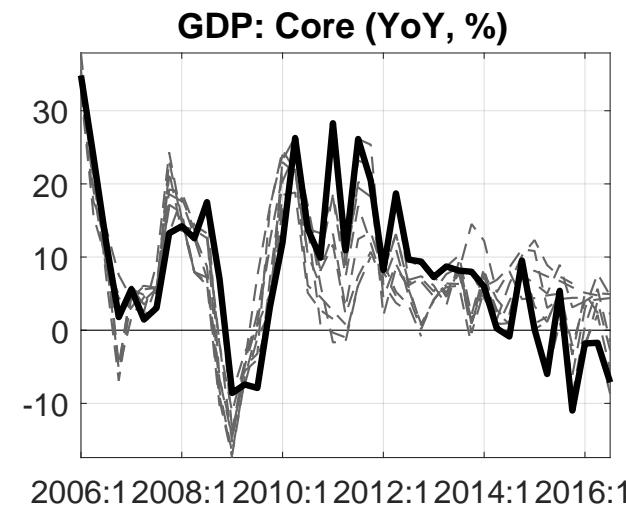
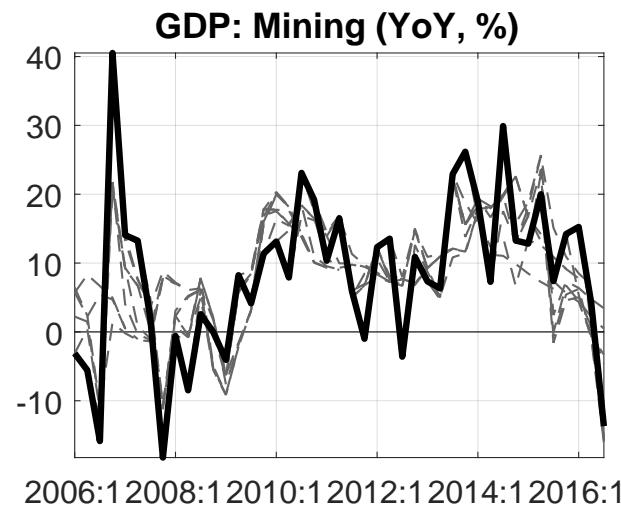
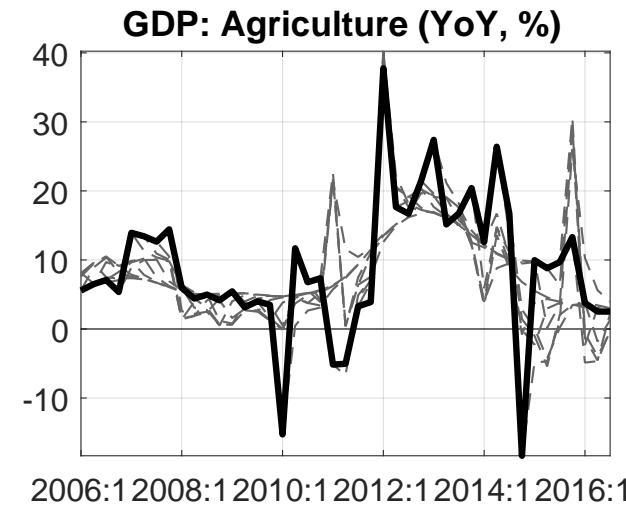
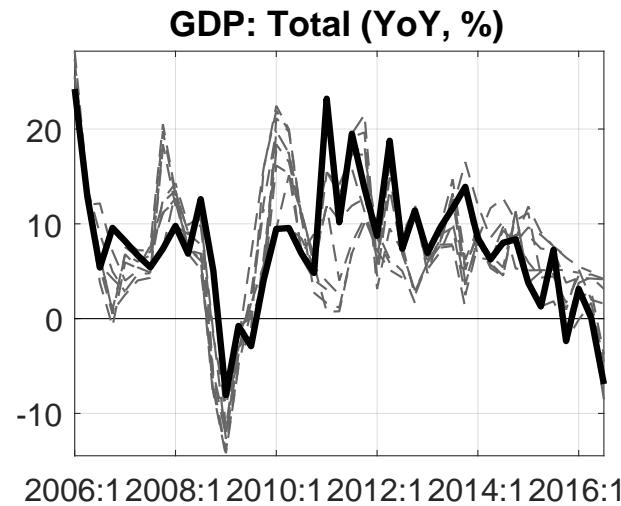
Historical forecast exercises: with exogenous assumptions, estimated model

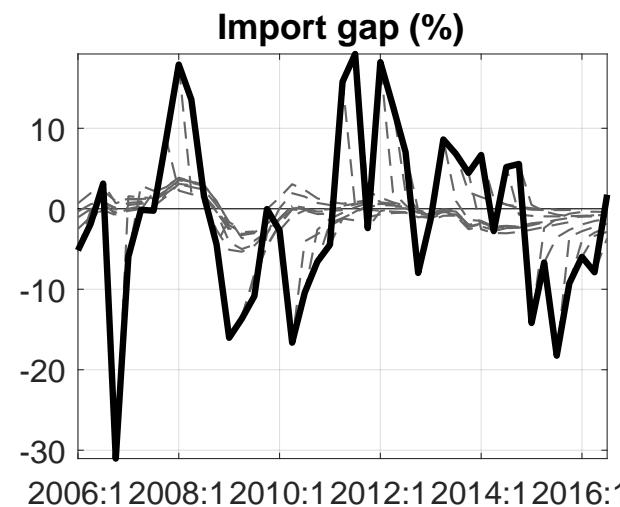
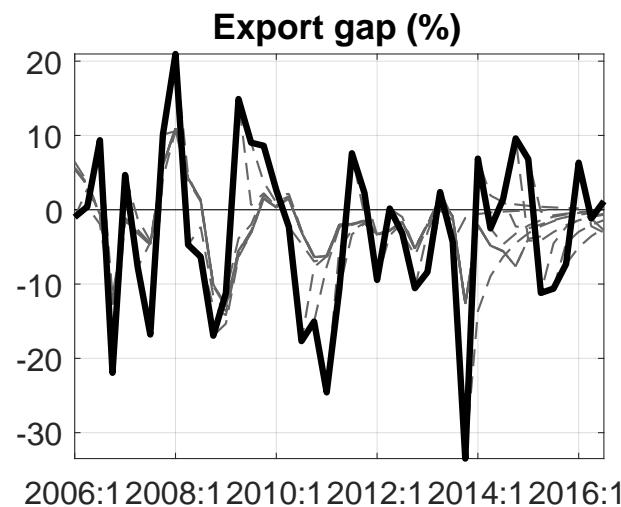
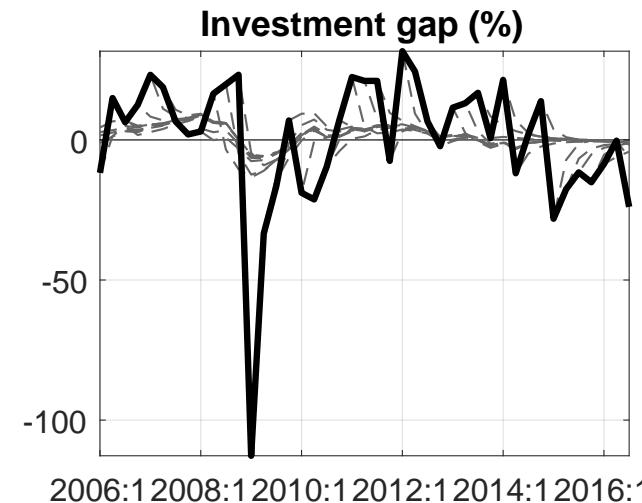
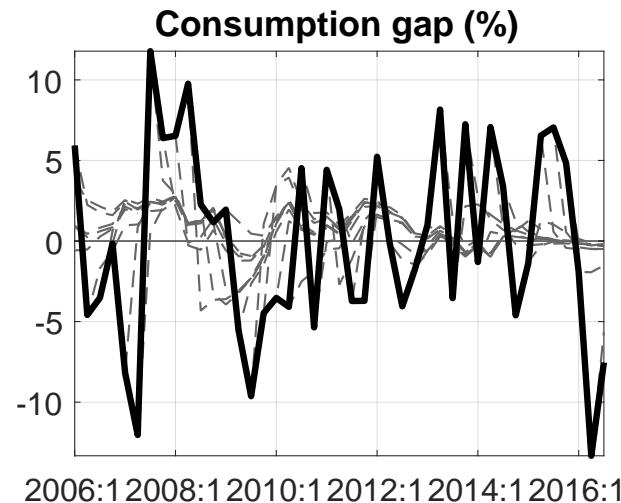
Monetary policy, and financial variables

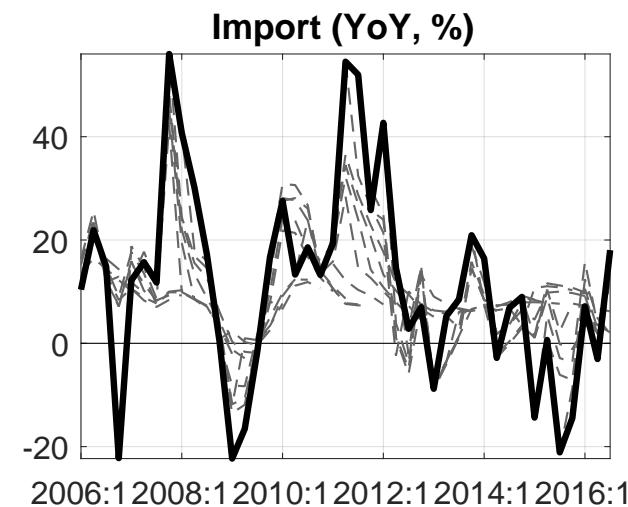
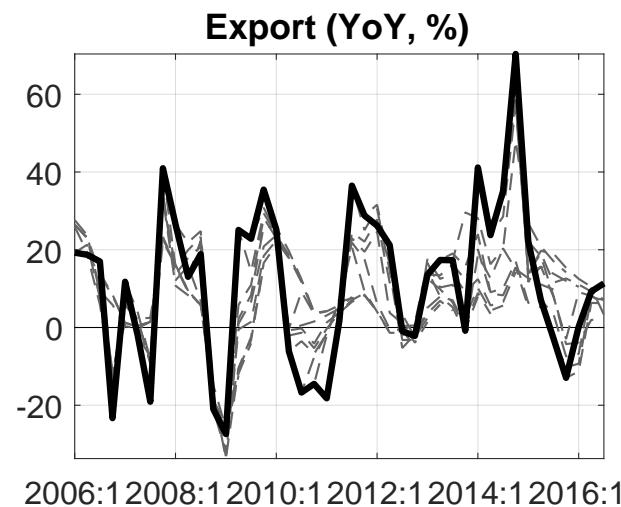
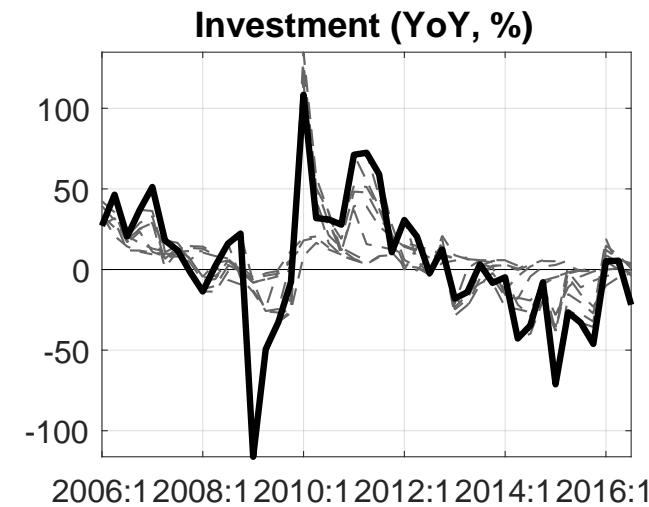
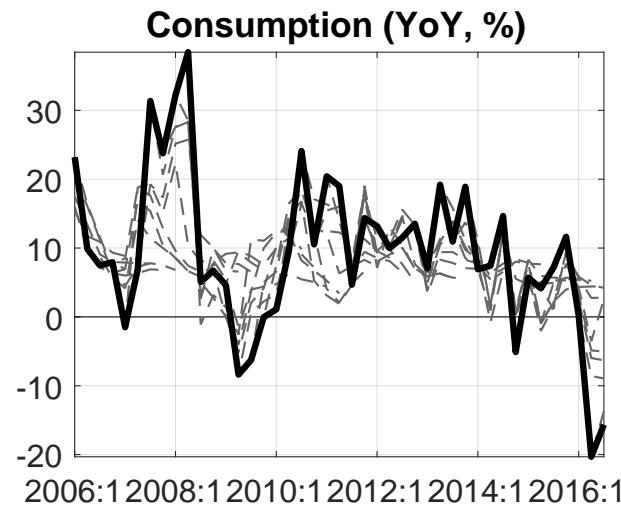


Production side



Production side

Expenditure side

Expenditure side

RMSE ratios

RMSE ratios: with exogenous assumptions, estimated model

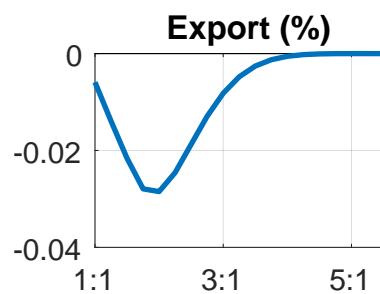
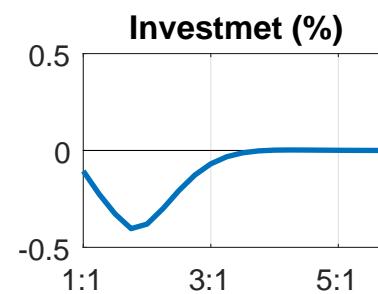
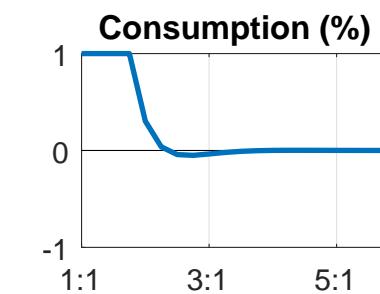
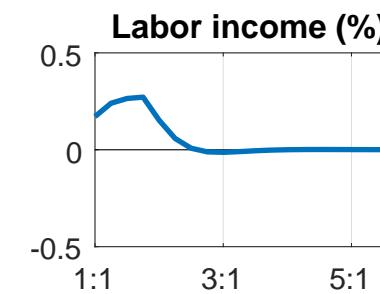
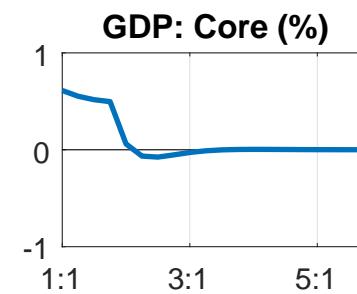
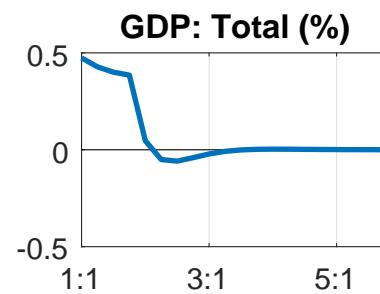
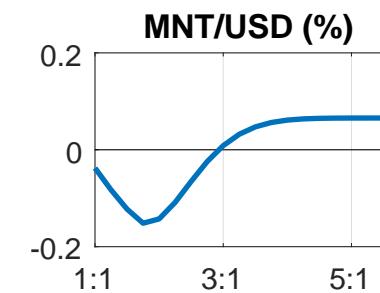
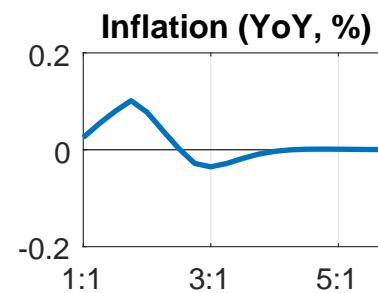
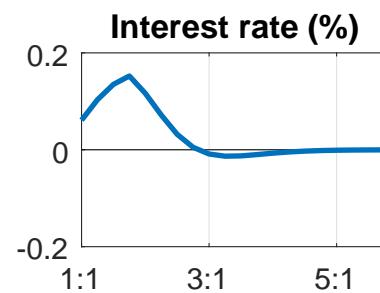
Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Mongolbank rate (%)	0.83	0.64	0.58	0.53	0.49	0.46	0.44	0.44
CPI (YoY, %)	0.65	0.59	0.52	0.49	0.46	0.47	0.49	0.50
MNT/USD (100*log)	0.76	0.59	0.49	0.47	0.49	0.54	0.59	0.64
GDP: Total (YoY, %)	0.67	0.66	0.57	0.50	0.90	0.85	0.85	0.76
Consumption (YoY, %)	0.59	0.47	0.46	0.42	0.65	0.73	0.69	0.73
Investment (YoY, %)	0.59	0.51	0.47	0.47	0.72	0.67	0.62	0.59
Export (YoY, %)	0.48	0.35	0.36	0.35	0.62	0.80	0.84	0.89
Import (YoY, %)	0.58	0.47	0.45	0.40	0.61	0.66	0.69	0.69

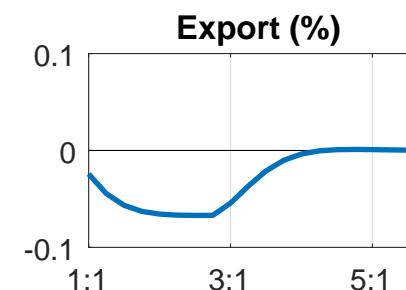
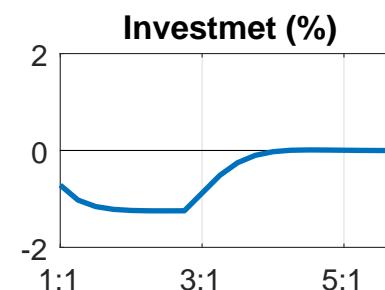
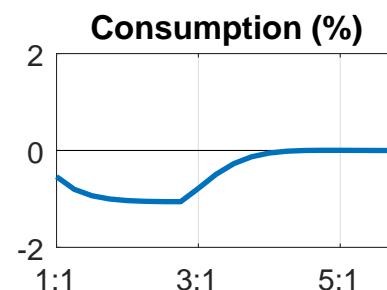
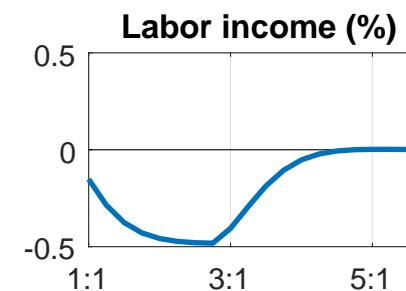
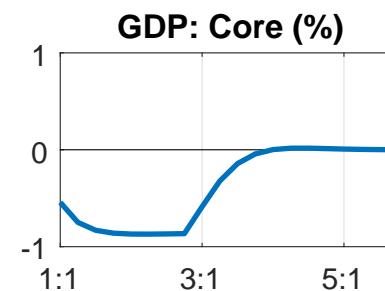
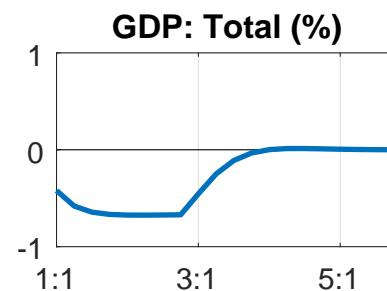
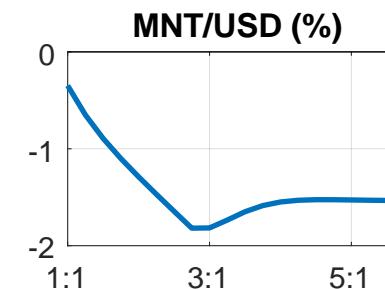
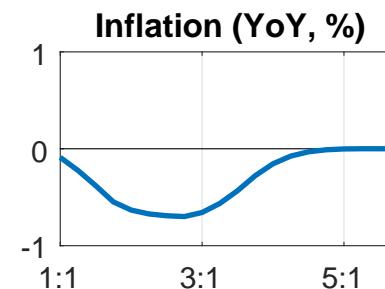
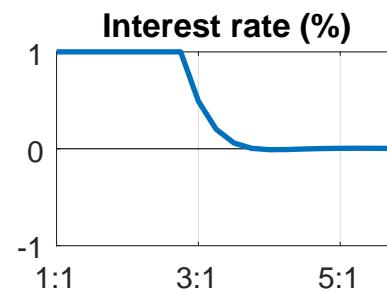
Dynamic properties of the model: impulse respons functions and variance decomposition on quarterly frequency

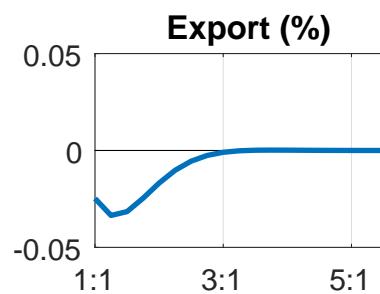
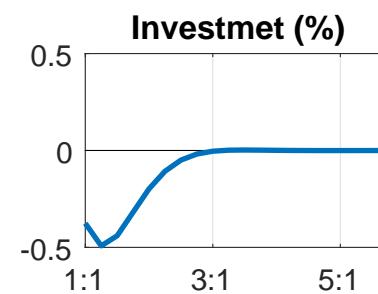
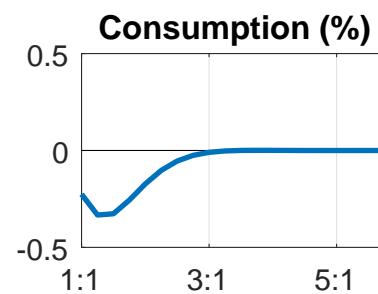
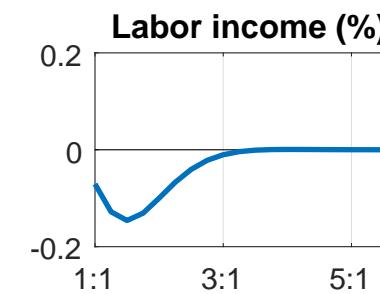
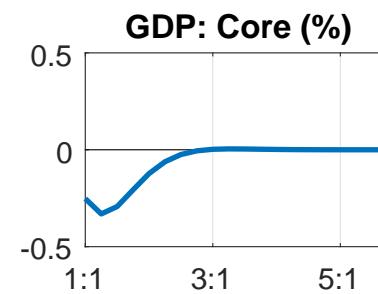
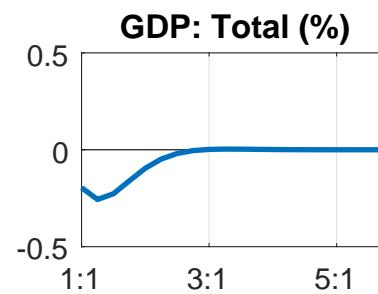
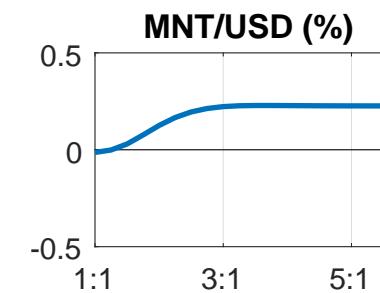
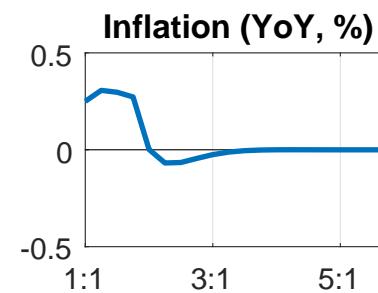
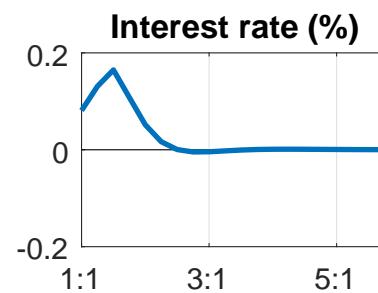
Daniel Baksa

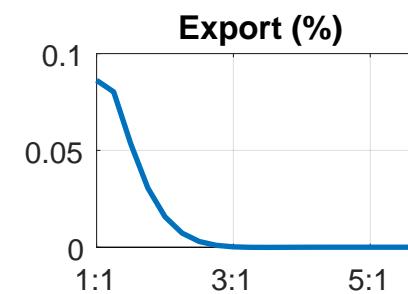
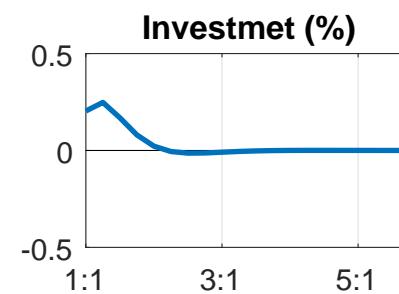
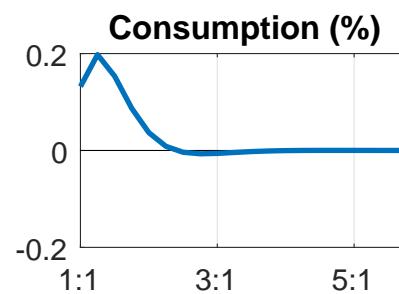
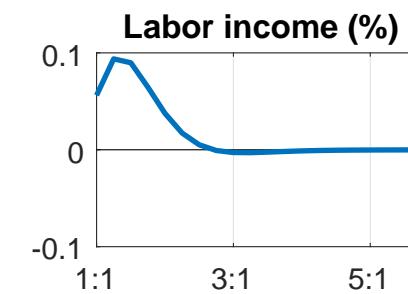
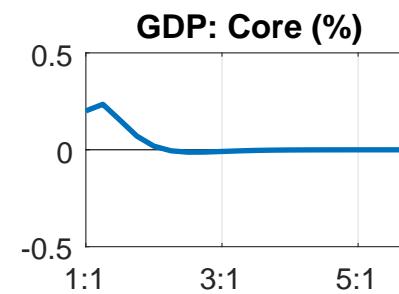
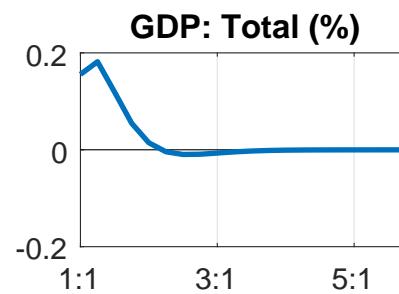
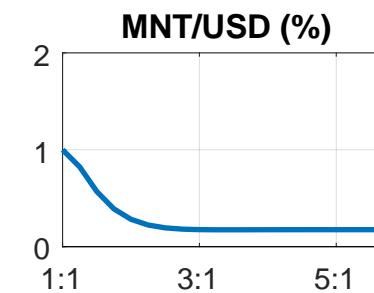
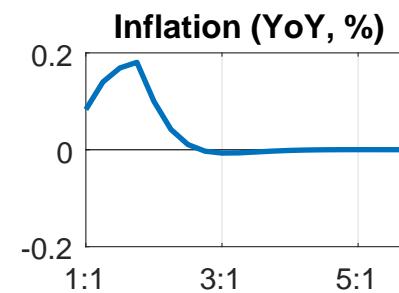
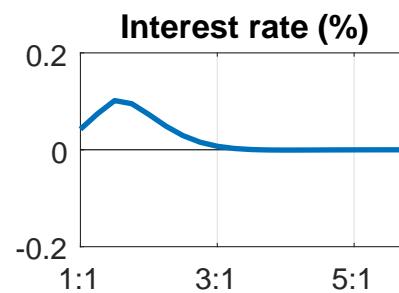
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Impulse respons functions

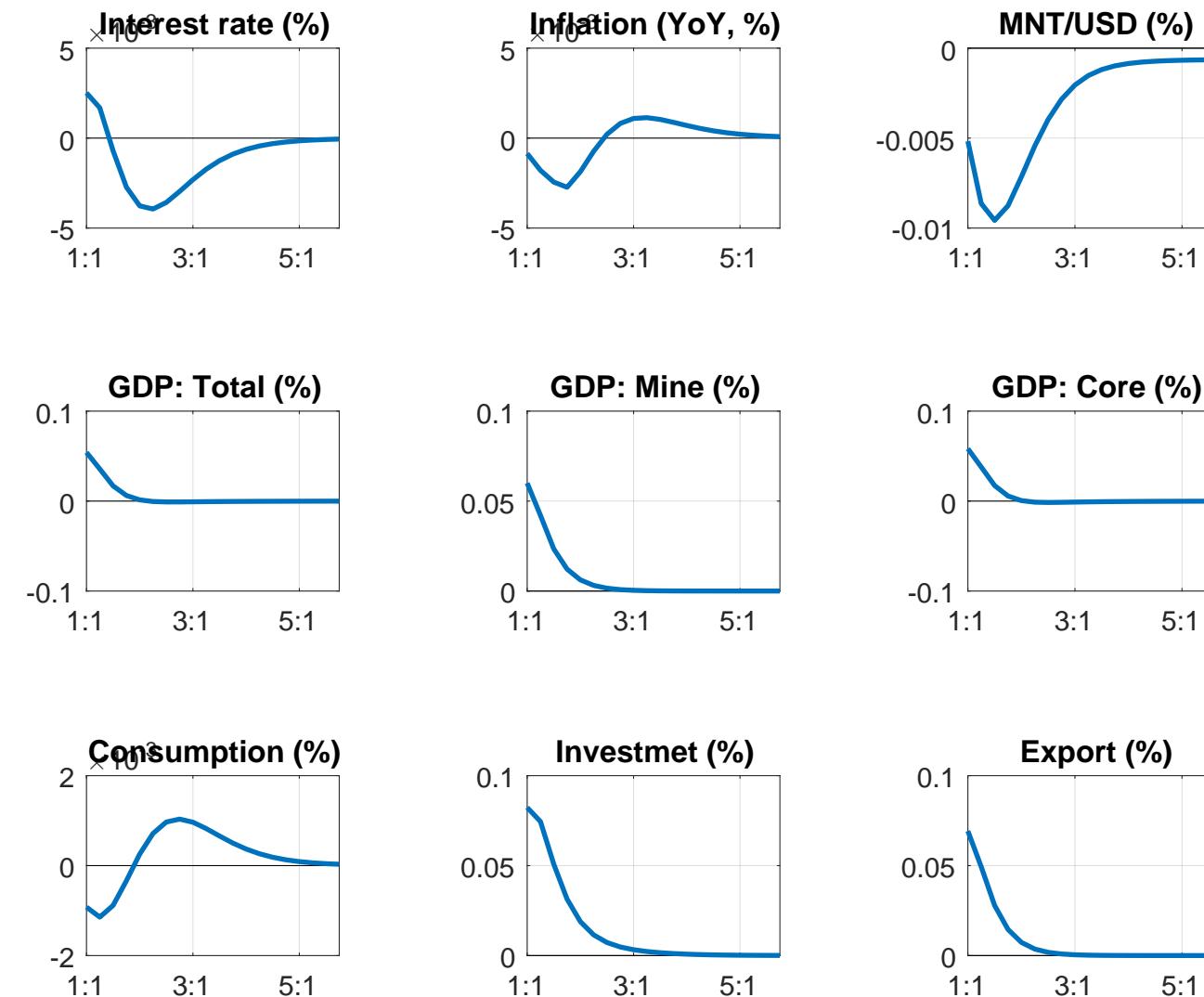
Consumption shock

Monetary policy shock

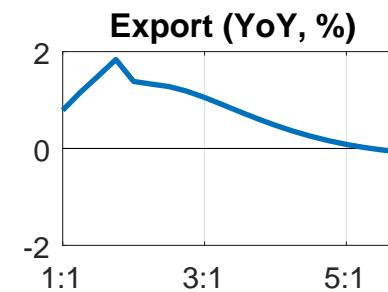
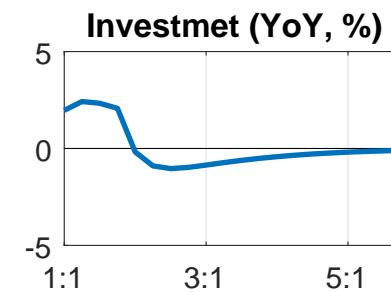
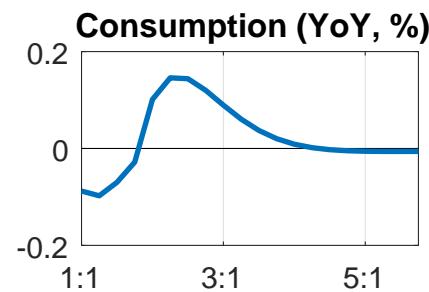
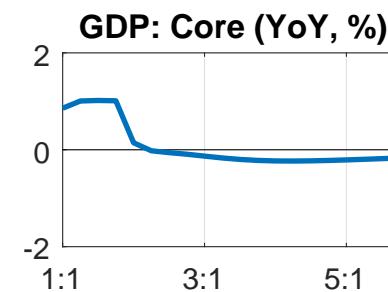
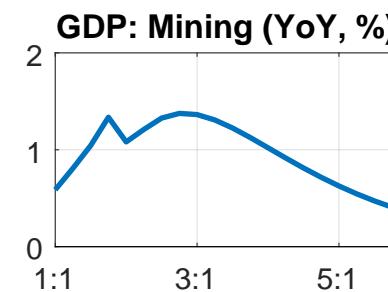
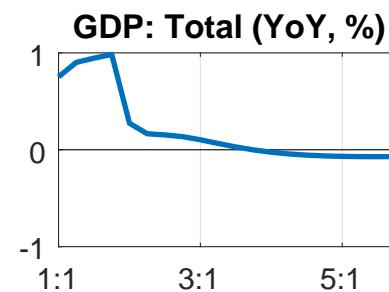
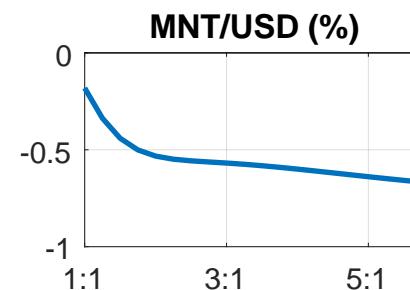
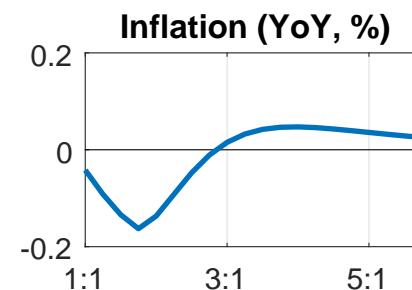
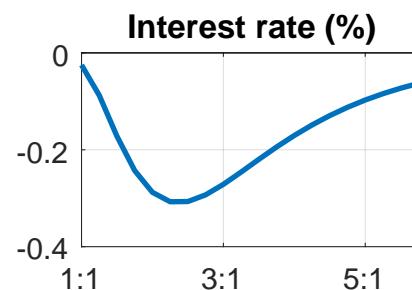
CPI shock

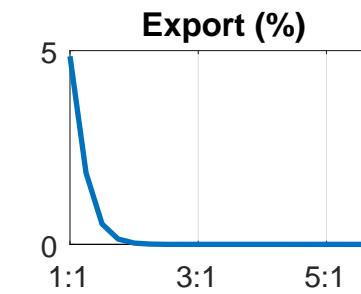
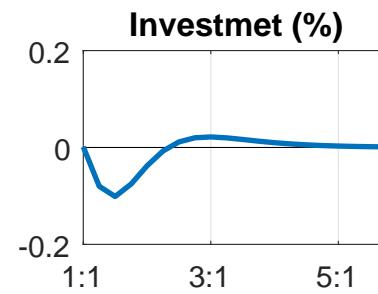
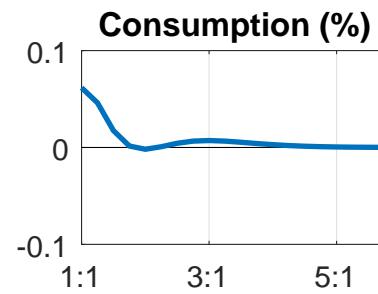
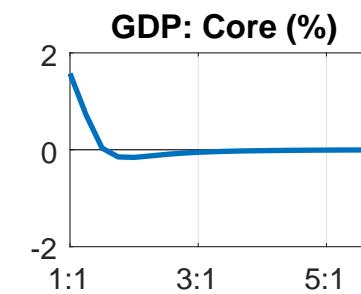
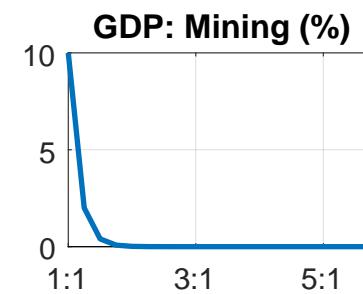
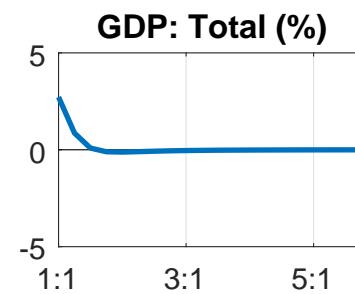
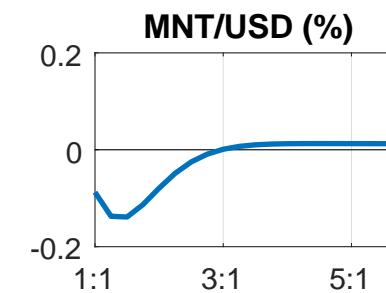
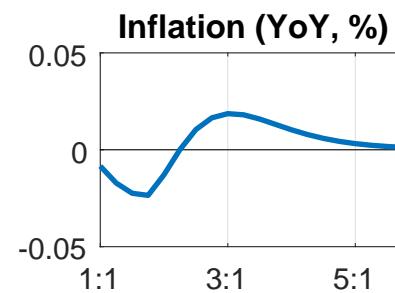
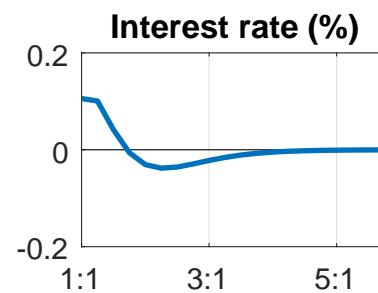
Nominal exchange rate shock

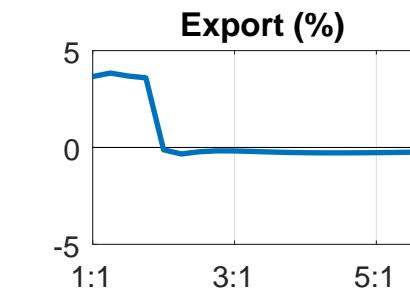
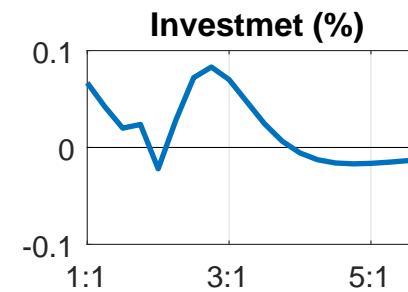
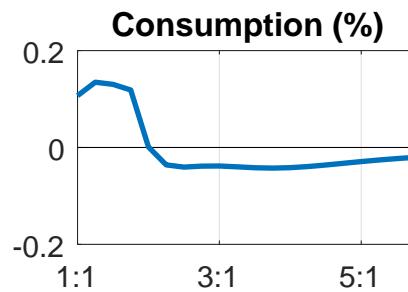
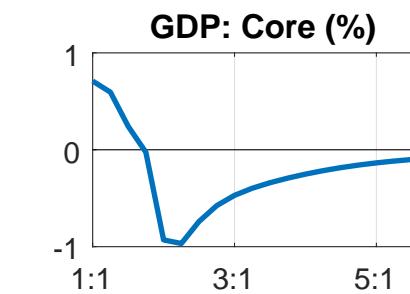
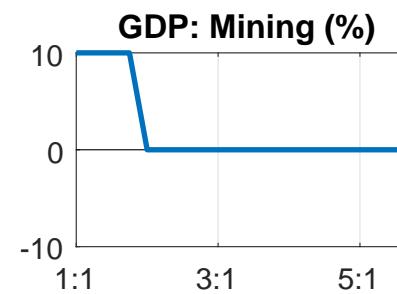
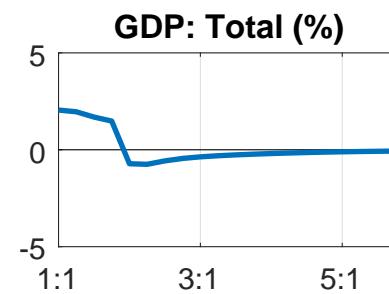
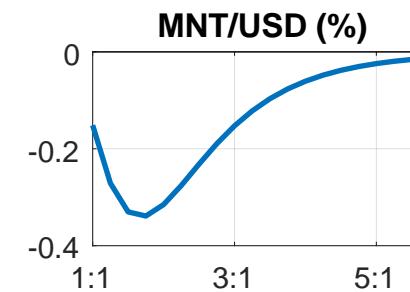
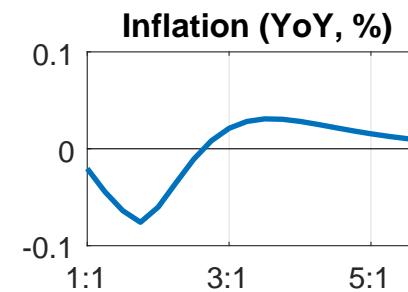
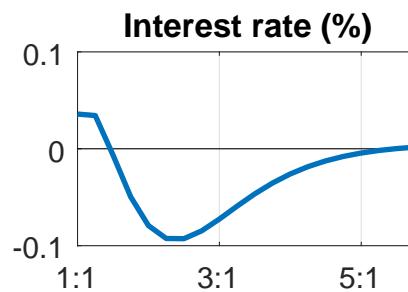
Temporary copper price shock



Permanent copper price shock



Temporary mining shock

Permanent mining shock

Variance decomposition

