Supplementary Material

Appendix A. Theoretical DSGE Model

A.1. Households

A.1.1. Ricardian households

The first order conditions for the representative Ricardian household:

$$UC_t^{RC} = (1-\varrho)\left(C_t^{Rc} - \chi C_{t-1}^{Rc}\right)^{(1-\varrho)(1-\sigma_c)-1}\left(1-H_t^{Rc}\right)^{\varrho(1-\sigma_c)} \quad \text{(A1)}$$

$$UC_t^{RC} = \beta R_{n,t} E_t\left[UC_{t+1}^{RC}\frac{Z_{t+1}}{Z_t}\frac{1}{\pi_{t+1}}\right] \quad \text{(A2)}$$

$$UC_t^{RC} = \beta R_{n,t}^{*}\phi_t(.)E_t\left[UC_{t+1}^{RC}\frac{Z_{t+1}}{Z_t}\frac{1}{\pi_{t+1}}\frac{NER_{t+1}}{NER_t}\right] \quad \text{(A3)}$$

$$\frac{UH_t^{RC}}{UC_t^{RC}} = \frac{\varrho}{(1-\varrho)}\frac{\left(C_t^{Rc} - \chi C_{t-1}^{RC}\right)}{1-H_t^{Rc}} = w_t(1-\tau_t^{w}) \quad \text{(A4)}$$

Equation (A1) is the marginal utility of consumption. Equations (A2) and (A3) are the domestic and foreign Euler equations determining the optimal choice between consumption of goods and holdings of domestic-currency, and consumption and foreign-currency denominated financial savings, respectively. Equations (A4) is the intra-temporal optimal labour supply condition. It states that the marginal rate of substitution between consumption and leisure should equal the real wage.

The money demand function is specified as in standard literature, with the stock of nominal money balances M_t expressed as a function of consumption C_t and the nominal interest rate $R_{n,t}$ as follows:

$$\frac{M_t}{P_t} = \frac{C_t}{R_{n,t}^{\eta}} \quad \text{(A5)}$$

where P_t is the aggregate price index while η is the interest rate elasticity of money demand. According to equation (A5), households' holdings of real money balances increases when their consumption demand grows but declines when the short-term interest rate rises.

The stock of money evolves as follows:

$$M_t = \left(\frac{1 + g_t^m}{1 + \pi_t}\right) M_{t-1} \tag{A6}$$

where g_t^m is the money supply growth rate which is assumed to be equal to the rate of inflation in steady state.

Drawing on the frameworks of Adolfson et al. (2008) and Uribe and Schmitt-Grohé (2017), the country-specific debt risk premium function $\phi\left(\frac{D_t}{Y_t}, NER_t, \varepsilon_{\phi,t}\right)$ is modelled as a function of the domestic economy's net foreign debt exposure defined as $D_t = \left(B^*_{GF,t} - B^*_{F,t}\right)$, the nominal effective exchange rate, and an i.i.d risk premium shock $\varepsilon_{\phi,t}$. [1]By combining equations (A2) and (A3), this formulation leads to a modified uncovered interest parity (UIP) condition expressed as:

$$R_{n,t} E_t \left[\frac{\Lambda_{t,t+1}}{\pi_{t,t+1}}\right] = \left(1 + r_{d,t-1}\right) E_t \left[\frac{\Lambda_{t,t+1}}{\pi_{t,t+1}} \Delta\, ner_{t+1}\right] \tag{A7}$$

where, $\Delta\, neer_t \equiv \frac{NER_{t+1}}{NER_t}$ is the nominal currency depreciation, $\Lambda_{t,t+1} = \beta \frac{UC^{RC}_{t+1}}{UC^{RC}_t}$. Following Lindé et al. (2009), the risk premium function $\phi(.)$ is assumed to be strictly decreasing in the value of net foreign debt and $\phi(0) = 1$ and $\phi'(.) < 1$. This implies that when the domestic economy is a net lender, its economic units receive a lower return on their international investments, but are charged a premium over the world interest rate when the domestic economy is a net borrower (Benigno, 2009).

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1 $B^*_{GF,t}$ is a country's total foreign liabilities, as reflected in the central government's current budget constraint.

The functional form of the external-debt interest rate risk premium is specified as follows:

$$\phi\left(\frac{D_t}{Y_t}, NER_t, \varepsilon_{\phi,t}\right) = exp\left[-2\phi_B NER_t\left(\left(1-w_g\right)B^*_{GF,t} - w_g B^*_{F,t}\right) + \varepsilon^{\phi}_t\right] \quad \text{(A8)}$$

where w_g represents the relative weight of risk associated with private sector borrowing while ϕ_B denotes the parameter that determines how sensitive the country-specific interest rate risk premium is to fluctuations in the stock of net foreign debt.

A.1.2. Rule-of-thumb Households

The only one first order condition is:

$$\frac{\varrho}{(1-\varrho)}\frac{\left(C_t^{RT} - \chi C_{t-1}^{RT}\right)}{1-H_t^{RT}} = w_t\left(1-\tau_t{}^w\right) \quad \text{(A9)}$$

A.1.2.1. Consumption Demand

In order to account for the interaction between domestic and foreign households in the goods sector, the consumption bundle of households is split into domestically-produced and imported goods as in Galí (2015). Consumption preferences are aggregated using a CES Dixit-Stiglitz (1977) aggregator and yields the following aggregate consumption:

$$C_t = \left(w_c^{\frac{1}{\mu c}} C_{H,t}{}^{\frac{\mu c-1}{\mu c}} + (1-w_c)^{\frac{1}{\mu c}} C_{F,t}{}^{\frac{\mu c-1}{\mu c}}\right)^{\frac{\mu c}{\mu c-1}}$$

(A10)

where $w_c \in [0,1]$ stands for the share of domestically-produced goods in the consumer basket, while parameter $\mu c > 0$ is the intertemporal elasticity of substitution between domestically-produced goods ($C_{H,t}$) and foreign-produced goods ($C_{F,t}$). The aggregate price index corresponding to (A10) is given by:

$$P_t = \left[w_c P_{H,t}{}^{1-\mu c} + (1-w_c) P_{F,t}{}^{1-\mu c}\right]^{\frac{1}{1-\mu c}} \quad \text{(A11)}$$

where $P_{H,t}$ and $P_{F,t}$ denote the aggregate price indices for domestically produced and imported goods, respectively. Deriving the optimal allocation between these two categories yields the following demand functions:

$$C_{H,t} = w_c\left(\frac{P_{H,t}}{P_t}\right)^{-\mu c} C_t \tag{A12}$$

$$C_{F,t} = (1 - w_c)\left(\frac{P_{F,t}}{P_t}\right)^{-\mu c} C_t \tag{A13}$$

A.1.2.2. The real exchange rate and terms of trade

Given the relatively small size of the domestic economy, all foreign aggregates are taken as given to domestic economic units. Foreign variables are denoted with an asterisk (*), so that C_t^* represents aggregate foreign consumption. In line with traditional literature, the real exchange rate (RER_t) is defined as the nominal exchange rate multiplied by the aggregate price of foreign goods P_t^*relative to the aggregate price of domestic goods:

$$RER_t \equiv \frac{P_t^* NER_t}{P_t} \tag{A14}$$

The law of one price implies $P_t^* = P_{F,t}^*$ and $NER_t P_t^* = P_{F,t}$ in steady state, and hence

$$RER_{C,t} = \frac{P_{F,t}}{P_t} = \frac{1}{\left[(1 - w_c) + w_c(tot_t)^{\mu c - 1}\right]^{\frac{1}{1-\mu c}}} \tag{A15}$$

In the domestic economy, the law of one price is assumed to apply exclusively to exports. Accordingly, the foreign equivalent of equation (17), which captures foreign demand for domestically produced consumption goods, is given by:

$$C_{H,t}^* = (1 - w_c^*)\left(\frac{P_{H,t}^*}{P_t^*}\right)^{-\mu c^*} C_t^*$$

where $P_{H,t}^{\ *}$ and $P_t^{\ *}$ are, respectively, the price of domestic consumption goods and of foreign consumption goods in foreign currency. However, since only formal sector domestic goods are exportable, the domestic currency units used for foreign demand of domestic consumption goods becomes:

$$C_{H,t}^{\ *} = (1 - w_c^{\ *})\left(\frac{P_{H,t}}{P_t RER_{C,t}}\right)^{-\mu c^*} C_t^{\ *} \quad \text{(A16)}$$

Following traditional literature, the domestic economy's terms of trade (tot) is defined as the relative price of imported goods to exports:

$$tot \equiv \frac{P_{F,t}}{P_{H,t}} \equiv \frac{P_t RER_{C,t}}{P_{H,t}} \quad \text{(A17)}$$

Thus, using (A15), the consumption export demand function in (A16) can be rewritten as:

$$C_{H,t}^{\ *} = (1 - w_c^{\ *})\left(\frac{1}{tot}\right)^{-\mu c^*} C_t^{\ *} \quad \text{(A18)}$$

Applying similar derivations to investment goods demand functions for domestic and imported investment goods are given as:

$$I_{H,t} = w_{Inv}\left(\frac{P_{H,t}}{P_t^{\ I}}\right)^{-\mu Inv} I_t \quad \text{(A19)}$$

$$I_{F,t} = \left(1 - w_{Inv}\right)\left(\frac{P_{F,t}}{P_t^{\ I}}\right)^{-\mu Inv} I_t \quad \text{(A20)}$$

$$P_t^{\ I} = \left[w_{Inv} P_{H,t}^{\ 1-\mu Inv} + \left(1 - w_{Inv}\right) P_{F,t}^{\ 1-\mu Inv}\right]^{\frac{1}{1-\mu Inv}} \quad \text{(A21)}$$

$$I_{H,t}^{\ *} = (1 - w_{Inv}^{\ *})\left(\frac{1}{tot}\right)^{-\mu Inv^*} I_t^{\ *} \quad \text{(A22)}$$

where w_{inv} and μ_{inv} are, respectively, the home bias for investment goods and intertemporal elasticity of substitution between domestically-produced goods ($I_{H,t}$) and foreign-produced goods ($I_{F,t}$). Equation (A19) is the demand for domestically-produced investment goods, (A20) is demand for foreign-produced investment goods, (A21) is the aggregate price index for investment goods which is assumed to be different from the aggregate CPI index as in Basu and Thoenissen (2009) while (A22) is the foreign demand for domestic investment exports.

A.2. Firms

The input demand functions are:

$$\frac{W_t}{P_t} = \varphi \frac{Y_t^W}{H_t} \frac{MC_{H,t}}{P_t} \tag{A23}$$

$$\frac{R_t^k}{P_t} = r_t^k = \left(1 - \tau_t{}^k\right)\left(1 - \varphi\right)\frac{Y_t^W}{K_{t-1}} \frac{MC_{H,t}}{P_t} \tag{A24}$$

where $MC_{H,t} = P_{H,t}^W$ denotes the real marginal cost of production, reflecting the assumption of perfect competition where market prices equal nominal marginal costs. The term $\tau_t{}^k$ is the tax on corporate profits applicable to the formal sector only.

Equation (A23) describes the labour demand function, where the wage rate corresponds to the marginal product of labour. Similarly, the capital demand function in equation (A24) implies that the real interest rate must equal the marginal product of physical capital.

A.2.1. Capital-producing firms

The first order condition with respect to aggregate investment for period $k = 1$, yields:

$$Q_t\left(1 - S\left(\frac{I_t}{I_{t-1}}\right) - S^{'\left(\frac{I_t}{I_{t-1}}\right)}\frac{I_t}{I_{t-1}}\right) + E_t\left[\Lambda_{tt+1}Q_{t+1}S^{'\left(\frac{I_{t+1}}{I_t}\right)}\left(\frac{I_{t+1}}{I_t}\right)^2\right] = \frac{P_t^I}{P_t} \tag{A25}$$

where, for simplicity, the investment adjustment costs are defined using a quadratic functional form:

$$S(X_{i,t}) \equiv \frac{\phi_I}{2}\left(\frac{I_{i,t}}{I_{i,t-1}} - 1\right)^2$$

Demand for capital by formal and informal wholesale firms must satisfy:

$$R_{K,t} \equiv \frac{Q_{t+1}(1-\delta) + r_{t+1}^k}{Q_t} \equiv \frac{(1-\varphi)\frac{Y_t^W}{K_{t-1}} mc_{H,t}(1-\tau_t{}^k) + Q_{t+1}(1-\delta)}{Q_t} \tag{A26}$$

Arbitrage between returns in the capital and bond markets is then given by:

$$E_t[\Lambda_{tt+1} R_{K,t+1}] \equiv E_t[\Lambda_{tt+1} R_{t+1}] \tag{A27}$$

where R_t is the real interest rate given by:

$$R_t = R_{n,t}/\pi_{t+1} \tag{A28}$$

A.2.2. Retail Firms

The demand function for the m^{th} intermediate good is:

$$Y_{H,t}(m) = \left(\frac{P_{Ht}(m)}{P_t}\right)^{-\zeta} Y_{H,t} \tag{A29}$$

A.2.2.1. Pricing Decisions

Pricing decisions for final goods are made within the retail sector, where firms face price rigidity. According to Calvo (1983), each firm has a probability of $(1-\xi)$ of resetting its prices in any given period. Following Doojav (2016), firms that do not re-optimize their prices, occurring with probability ξ, adjust them partially through indexation based on the following rule:

$$P_{H,t}(m) = P_{H,t-1}(m)\left(\frac{P_{H,t-1}}{P_{H,t-2}}\right)^{\gamma} \tag{A30}$$

where $\gamma \in [0,1]$ is the degree of indexation to past inflation.

Based on equation (A30) and the prevailing aggregate wholesale price of domestic goods ${P_{H,t}}^{W}$ and under the assumption that all firms encounter a uniform optimization challenge, retailers aiming to maximize profits will determine the optimal price $P^{o}_{H,t}(m)$. This decision accounts for the possibility that firms may be unable to re-optimize prices in future periods, and is solved through the following expression:

$$\max_{P^{o}_{H,t}(m)} \left\{ E_t \sum_{k=0}^{\infty} {\xi_H}^{k} N_{t,t+k} \left(\frac{P^{o}_{H,t}(m)}{P_{H,t}} \right)^{-\zeta_i} Y_{H,t+k} \left[P^{o}_{H,t}(m) \left(\frac{P_{H,t+k-1}}{P_{H,t-1}} \right)^{\gamma^p} - P^{w}_{H,t+k} \right] \right\} \tag{A31}$$

where $N_{t,t+k} = \beta \frac{\Lambda_{t,t+1}/P_{t+k}}{\Lambda_t/P_t}$ is the nominal discount factor.

The first order condition with respect to the new price is:

$$E_t \sum_{k=0}^{\infty} {\xi_H}^{k} N_{t,t+k} Y_{t,t+k}(m) \left[P^{o}_{H,t} \left(\frac{P_{H,t+k-1}}{P_{t-1}} \right)^{\gamma^p} - \left(\frac{\zeta}{\zeta-1} \right) mc_{H,t} P_{H,t} \right] = 0.$$

Rearranging terms:

$$P^{o}_{H,t} = \frac{\zeta}{\zeta-1} \frac{E_t \sum_{k=0}^{\infty} {\xi_H}^{k} N_{t,t+k} \left(P_{H,t+k}\right)^{\zeta_i} Y_{H,t+k} mc_{H,t} P_{H,t}}{E_t \sum_{k=0}^{\infty} {\xi_H}^{k} N_{t,t+k} \left(P_{i,t+k}\right)^{\zeta} \left(P_{H,t+k}\right)^{-1} Y_{H,t+1} \left(\frac{P_{H,t+k-1}}{P_{H,t-1}} \right)^{\gamma^p}} \tag{A32}$$

Given the aggregate domestic price index $P_{H,t}$ and noting that all firms resetting prices select an identical value, the Law of Large Numbers implies that the aggregate price index evolves as follows:

$${P_{H,t}}^{1-\zeta} = \xi \left(P_{H,t-1} \left(\frac{P_{H,t}}{P_{H,t-1}} \right)^{\gamma^p} \right)^{1-\zeta} + \left(1-\xi\right) {P^{o}_{H,t}}^{1-\zeta}$$

which can be rewritten as:

$$P_{H,t} = \left[\xi\left(P_{H,t-1}\pi_{H,t}{}^{\gamma^p}\right)^{1-\zeta} + \left(1-\xi\right)P^o_{H,t}{}^{1-\zeta}\right]^{\frac{1}{1-\zeta}} \quad \text{(A33)}$$

Using $\Pi_{t,t+k} = \frac{P_{H,t+k}}{P_{H,t}}$, the optimal relative price index becomes:

$$\frac{P^o_{H,t}}{P_{H,t}} = \frac{\zeta}{\zeta-1}\frac{E_t\sum_{k=0}^{\infty}\xi^k\Lambda_{t,t+k}\left(\Pi_{i,t+k}\right)^{\zeta}Y_{H,t+k}mc_{H,t+k}}{E_t\sum_{k=0}^{\infty}\xi^k\Lambda_{t,t+k}\left(\Pi_{i,t+k}\right)^{\zeta}\left(\pi_{H,t+k}\right)^{-1}Y_{H,t+k}\left(\frac{P_{H,t+k-1}}{P_{H,t-1}}\right)^{\gamma^p}} \quad \text{(A34)}$$

Denoting the numerator as J_t and denominator as JJ_t and recalling that $N_{t,t+k} = \beta\frac{\Lambda_{t,t+k}/P_{t+k}}{\Lambda_t/P_t}$, the inflation dynamics are given by:

$$\frac{P^o_{H,t}}{P_{H,t}} = \frac{J_t}{JJ_t} \quad \text{(A35)}$$

$$J_t - \beta\xi E_t\left(\tilde{\Pi}^{\zeta}_{t+1}J_{t+1}\right) = \frac{\zeta}{\zeta-1}Y_{H,t}\Lambda_t MC_{H,t}MS_{Ht} \quad \text{(A36)}$$

$$JJ_t - \beta\xi E_t\left(\tilde{\Pi}^{\zeta-1}_{t+1}JJ_{t+1}\right) = Y_{H,t}\Lambda_t \quad \text{(A37)}$$

$$\tilde{\Pi}_{H,t} = \frac{\Pi_{H,t}}{\Pi^{\gamma}_{H,t-1,t}} \quad \text{(A38)}$$

$$MC_{H,t} = \frac{P_{H,t}}{P_t}^{W} = \frac{\frac{P^W_{H,t}}{P_{H,t}}}{\frac{P_{H,t}}{P_t}} = \frac{\frac{W_tH_t}{P_t}}{Y_{H,t}\frac{P_{H,t}}{P_t}} \quad \text{(A39)}$$

$$1 = \xi\tilde{\Pi}^{\zeta-1}_{t-1,t} + \left(1-\xi\right)\left(\frac{J_t}{JJ_t}\right)^{1-\zeta} \quad \text{(A40)}$$

with price dispersion given by:

$$Dp_t = \xi \Pi_{t-1,t}^{\zeta} Disp_{t-1} + (1-\xi)\left(\frac{J_t}{JJ_t}\right)^{1-\zeta} \tag{A41}$$

where and MS_t is an exogenous AR (1) markup shock defined as:

$$log\left(MS_t\right) = \rho_{ms} log\left(MS_{t-1}\right) + (1-\rho_{ms}) log(MS) + \varepsilon_{ms,t} \tag{A42}$$

A.2.2.2. Incomplete exchange rate pass-through

Building on Monacelli (2005), the concept of incomplete exchange rate pass-through is modeled by permitting deviations from the law of one price for imported goods. Upon arrival at the dock, retailers pay the domestic currency equivalent of the current global market price. However, because the domestic demand for imports is price-sensitive and slopes downward, retailers must determine an optimal mark-up when setting retail prices in local currency. Consequently, the law of one price fails to hold in the short term, although it gradually reasserts itself over time.

The deviation from the law of one price in the domestic economy therefore implies $P_t^* \neq P_{F,t}^*$, such that $NER_t P_t^* \neq P_{F,t}$.

Following Monacelli the law of one price gap on imported goods is defined as:

$$\psi_t^f = \frac{NER_t P_t^*}{P_{F,t}} \tag{A43}$$

where ψ_t^f represent the deviation from the law of one price, $NER_t P_t^*$ corresponds to the aggregate global price index expressed in domestic currency, while $P_{F,t}$ denotes the domestic currency import price index. Similar to the pricing behavior of domestic producers, local import retailers adopt the Calvo pricing framework. Their optimization problem is defined as follows:

$$\max_{P_{F,t}^{o}(m)} \left\{ E_t \sum_{k=0}^{\infty} {\xi_F}^k \frac{\Lambda_{t,t+k}}{P_{t+k}} IM_t(m) \left[\widetilde{P}_{F,t}(m) - NER_{t+k} P_{t+1}^*\right] \right\} \tag{A44}$$

subject to an import demand function given by:

$$IM_t(m) = \left(\frac{P_{F,t}(m)}{P_{F,t}}\right)^{-\zeta_F} IM_t \tag{A45}$$

ξ_F is the sticky price parameter.

Using (A45) the counterpart to (A34) becomes:

$$P^o_{F,t} = \frac{\zeta_F}{\zeta_F - 1} \frac{E_t \sum_{k=0}^{\infty} {\xi_F}^k \Lambda_{t,t+k} \left(P_{F,t,t+k}\right)^{\zeta_F} \left(NER_{t+k} P^*_{t+k}\right) IM_{t,t+k}}{E_t \sum_{k=0}^{\infty} {\xi_F}^k \Lambda_{t,t+k} \left(P_{F,t,t+k}\right)^{\zeta_F - 1} IM_{t,t+k}} \tag{A46}$$

The corresponding Dixit-Stiglitz composite price index for imported goods is given by:

$$P_{F,t} = \left[\xi_F \left(P_{F,t-1}\right)^{1-\zeta_F} + \left(1 - \xi_F\right) {P^o_{F,t}}^{1-\zeta_F}\right]^{\frac{1}{1-\zeta_F}} \tag{A47}$$

ψ^f_t is defined as an exogenous AR (1) process for convenience of the form:

$$log\left(\psi^f_t\right) = \rho_\psi log\left(\psi^f_{t-1}\right) + \varepsilon_{\psi,t} \tag{A48}$$

Appendix B. Supplementary Tables

Variable	Description from source database	Source
Y	nominal GDP	IMF IFS database
C	households and NPISH final consumption expenditure	IMF IFS database
IM	merchandise imports	IMF IFS database
EX	merchandise exports	IMF IFS database
GC	government consumption expenditure	IMF IFS database
CPI	consumer price index	IMF IFS database
RN	discount rate/policy rate	RBM database
$REER$	real effective exchange rate	IMF IFS database
TOT	relative price of imported goods price index to export price index expressed as a %	IMF IFS database

Table B1. Data and sources

Parameter	Description	Value	Source
Parameters set to match average sample data			
g_y	government consumption spending-to-GDP ratio	0.2	average for 2007-2023
b_g	total government debt-to-GDP ratio	0.65	average for 2007-2023
f_x	share of domestic debt in total public debt	0.36	average for 2007-2023
w_C	domestic home bias in consumption	0.94	Derived from WDI trade data
w_{Inv}	domestic home bias in investment	0.37	Derived from WDI trade data
C_{exp}	consumption goods share in exports	0.8823	Derived from WDI trade data
Inv_{exp}	investment goods share in exports	0.1177	Derived from WDI trade data
$\overline{H}$	average labour hours	0.3333	Gabriel et al. (2016)
η	interest rate elasticity of money demand	1.016	estimated using OLS
τ^k	corporate tax rate	0.2415	WDI data
$\overline{\pi}$	steady state inflation rate	1.017059	set to match the upper bound of Malawi's inflation target band of $5\% \pm 2\%$
β	domestic discount factor	0.9942	set to be consistent the average central bank discount rate of 17.83% and inflation rate of 15.12% for the period 1964-2017
w_g	risk weight on private external debt	0.65	set to ensure that private debt is more risk than public debt
Parameters determined from literature			
δ^k	physical capital depreciation rate	0.025	Uribe and Schmitt-Grohé (2017)
σ_c	intertemporal elasticity of substitution	2.0	Uribe and Schmitt-Grohé (2017)
ϱ	intratemporal elasticity of substitution	0.36	Uribe and Schmitt-Grohé (2017)
ζ	elasticity of substitution intermediate goods	7.0	Gabriel et al. (2016)
μ_C	elasticity of substitution consumption goods	2.0	Banerjee and Basu (2015)
μ_{Inv}	elasticity of substitution investment goods	2.0	Banerjee and Basu (2015)
μ_{C*}	elasticity of substitution foreign consumption	1.5	set to be lower than elasticity for domestically-used consumption goods as in Steinbach (2014)
$\mu_{Inv}*$	elasticity of substitution foreign investment	1.5	set to be lower than elasticity for domestically-used investment goods as in Steinbach (2014)
w_{C*}	home bias for consumption goods to rest of the world economy	0	set to reflect the insignificance of exported consumption goods from domestic economy to rest of the world economy
$w_{Inv}*$	home bias for investment goods to the rest of the world economy	0	set to reflect the insignificance of exported investment goods from domestic economy to rest of the world economy

ϕ_{gy}	output response parameter in government spending rule	0.1	own calibration
ρ_{inv^*}	persistence parameter for foreign investment	0.7	set to be consistent with prior means for all estimated AR(1) parameters

Table B2. Calibrated parameters of the model

Parameter	Prior distributions			Posterior distributions	
				Posterior means	
	pdf	mean	std dev.	NoXrate	Xrate
Behavioural parameters					
Calvo prices ξ	beta	0.750	0.10	0.2781	0.6557
price indexation γ	beta	0.275	0.05	0.3211	0.2927
rule-of-thumb households λ	beta	0.500	0.10	0.1783	0.1178
consumption habits formationχ	beta	0.780	0.05	0.7711	0.7339
investment adj. costs ϕ_{inv}	normal	5.000	1.50	0.1787	2.0230
external risk premium ϕ_B	InvG	0.010	2.00	0.0041	0.1642
labour shareφ	beta	0.830	0.05	0.9017	0.8865
Unit root for shocks					
productivity ρ_a	beta	0.850	0.10	0.9891	0.9422
government spendingρ_{gov}	beta	0.850	0.10	0.8394	0.8721
domestic markup ρ_{ms}	beta	0.850	0.10	0.8765	0.8663
consumer preferences ρ_{pref}	beta	0.850	0.10	0.8207	0.9637
foreign demand ρ_{y*}	beta	0.850	0.10	0.9017	0.9320
foreign interest rate $\rho_{R_n^*}$	beta	0.850	0.10	0.8317	0.9279
foreign inflation rate $\rho_{\pi*}$	beta	0.850	0.10	0.9095	0.8684
law of one price gap ρ_{lopg}	beta	0.850	0.10	0.4937	0.9767
Standard deviation of shocks					
productivity σ_a	InvG	0.800	Inf	0.5920	4.7649
monetary policy σ_{mp}	InvG	0.150	Inf	0.3738	0.7871
government spending σ_{gov}	InvG	0.400	Inf	3.1238	3.0691
domestic markup σ_{ms}	InvG	0.300	Inf	0.1686	0.6379
law of one price gap σ_{lopg}	InvG	0.300	Inf	0.1915	0.7023
foreign demandσ_{y*}	InvG	0.400	Inf	5.7615	5.7151

foreign interest rate $\sigma_{R_n^*}$	InvG	0.400	Inf	0.1341	1.1179
foreign inflation σ_{π^*}	InvG	0.400	Inf	0.1194	0.4169
Consumer preferences σ_{pref}	InvG	0.400	Inf	0.4433	0.6379
mes. error output mes_y	InvG	0.055	Inf	1.1683	0.1056
mes. error output mes_c	InvG	0.055	Inf	1.1809	1.4831
Policy reaction parameters					
interest rate smoothing ρ_{Rn}	beta	0.800	0.05	0.7641	0.8808
inflation response θ_π	normal	1.700	0.15	1.0886	1.6548
output gap response θ_y	normal	0.100	0.05	-0.0953	0.0977
output growth response θ_{yd}	normal	0.100	0.05	0.1649	0.0978
Exchange rate gap response θ_{reer}	normal	0.003	0.15	-	0.1005
govt debt response θ_{bg}	normal	0.100	0.05	0.0865	0.1150
Log data density (Laplace approximation)				**-1049.8036**	**-1053.8250**

Table B3. Priors and posterior estimates

shock	${y_t}^{obs}$	${c_t}^{obs}$	${gc_t}^{obs}$	${im_t}^{obs}$	${ex_t}^{obs}$	${\pi_t}^{obs}$	${r_{n,t}}^{obs}$	${reer_t}^{obs}$	${tot_t}^{obs}$
				monetary policy shock					
Xrate	18.32	4.78	0.11	14.64	18.18	3.25	0.10	15.12	20.51
No Xrate	3.83	1.56	0.01	0.92	3.53	25.43	0.80	2.27	3.08
				productivity shock					
Xrate	39.58	30.55	3.30	1.35	8.60	36.66	27.30	17.54	9.70
No Xrate	0.60	0.44	0.00	0.17	0.62	5.07	4.28	0.09	0.54
				government spending shock					
Xrate	4.72	0.11	94.42	2.55	1.52	0.03	0.01	0.70	1.72
No Xrate	16.89	0.09	99,71	0.89	2.78	2.07	3.52	0.22	2.43
				foreign demand shock					
Xrate	1.84	0.22	0.03	4.86	17.17	0.06	0.04	1.33	3.07
No Xrate	1.65	0.01	0.00	0.93	40.08	0.09	0.16	0.40	2.48
				foreign interest rate shock					
Xrate	8.42	0.23	0.03	36.97	25.12	0.21	0.44	15.53	28.34
No Xrate	3.13	0.16	0.00	3.28	9.88	1.55	1.51	1.94	8.61
				foreign inflation shock					

Xrate	0.02	0.08	0.01	0.36	0.14	0.13	0.04	0.19	0.15
No Xrate	11.13	0.61	0.02	11.86	35.52	5.98	6.64	8.62	30.95
law of one price gap shock									
Xrate	0.47	2.95	0.18	22.62	0.95	31.94	22.81	15.96	4.55
No Xrate	4.33	0.10	0.07	79.24	0.13	2.77	0.96	28.04	45.41
terms of trade shock									
Xrate	19.16	5.29	0.52	14.34	18.20	2.14	0.12	22.75	20.53
No Xrate	0.06	0.09	0.17	0.05	0.12	1.43	0.65	57.00	0.11
consumer preferences shock									
Xrate	7.46	22.70	1.41	2.32	10.11	25.57	49.15	10.88	11.41
No Xrate	0.21	2.86	0.02	2.65	7.33	55.49	81.38	1.33	6.39
mes^y									
Xrate	0.01	0.00	0.00	0.00	0.00	0.00	0,00	0.00	0.00
No Xrate	58.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mes^c									
Xrate	0.00	33.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Xrate	0.00	94.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table B4. Forecast error variance decomposition of shocks

Appendix C. Supplementary Figures

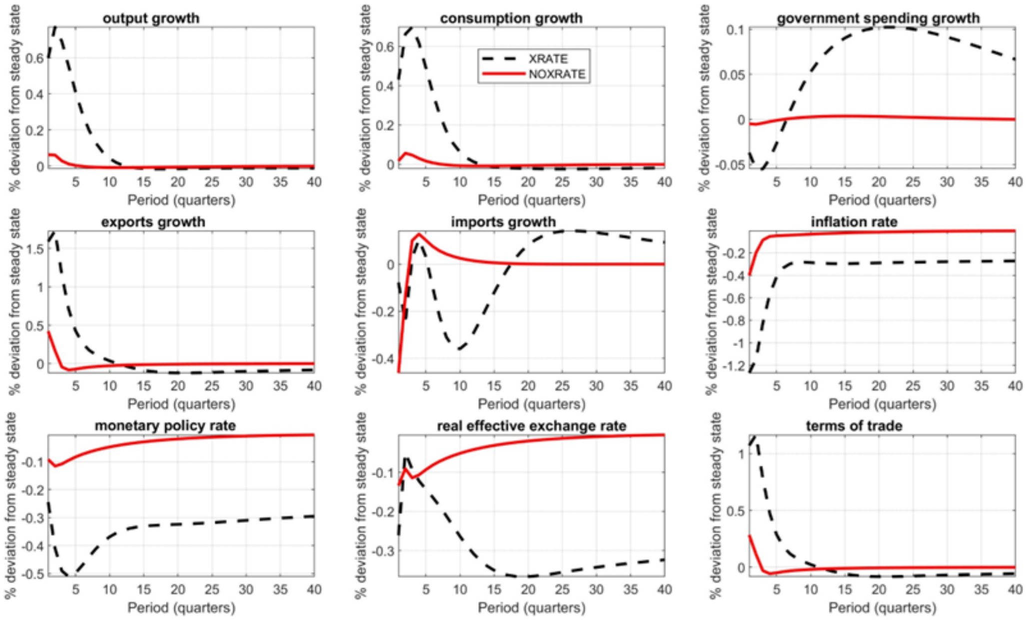

Figure C1. IRFs to productivity shock

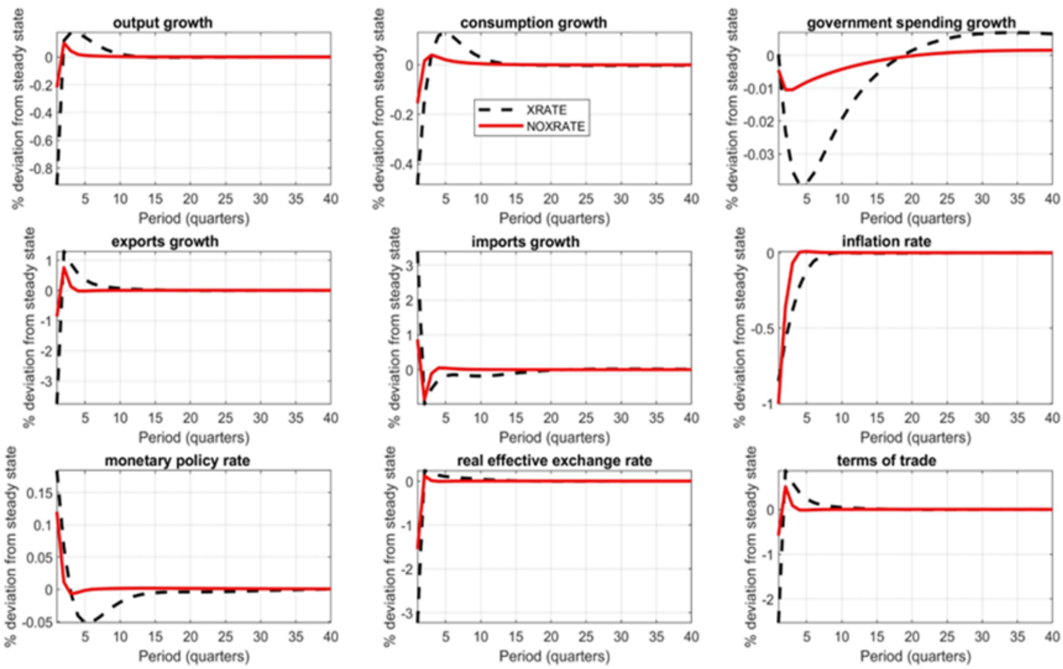

Figure C2. IRFs to monetary policy shock

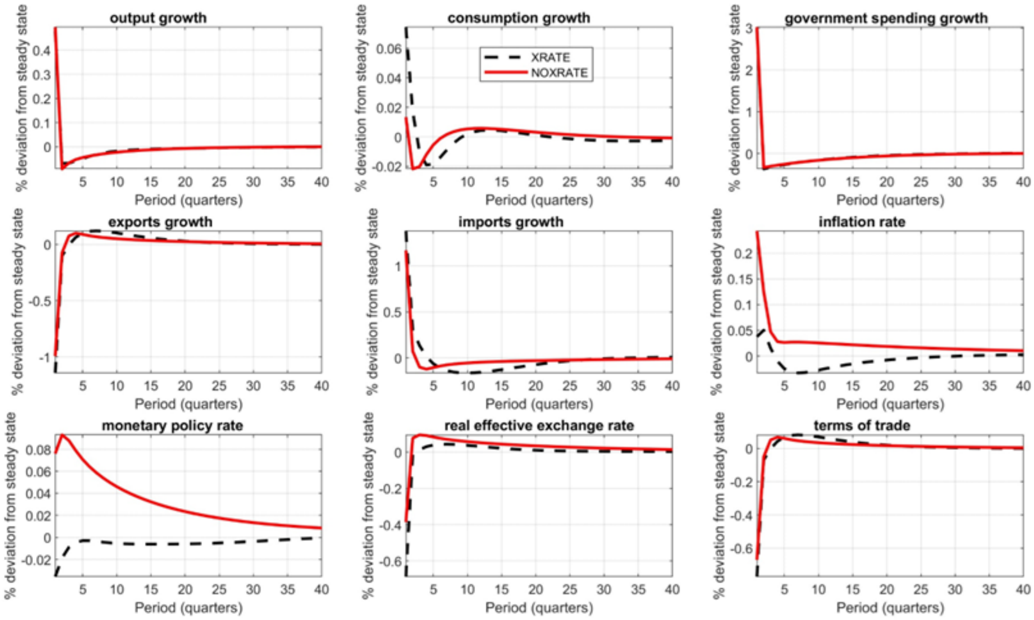

Figure C3. IRFs to government spending shock

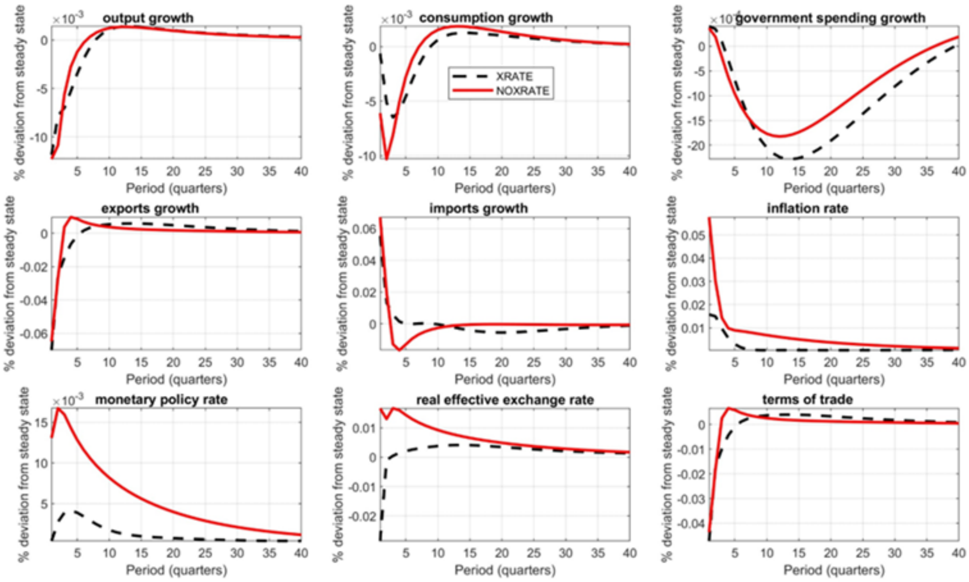

Figure C4. IRFs to domestic price markup shock

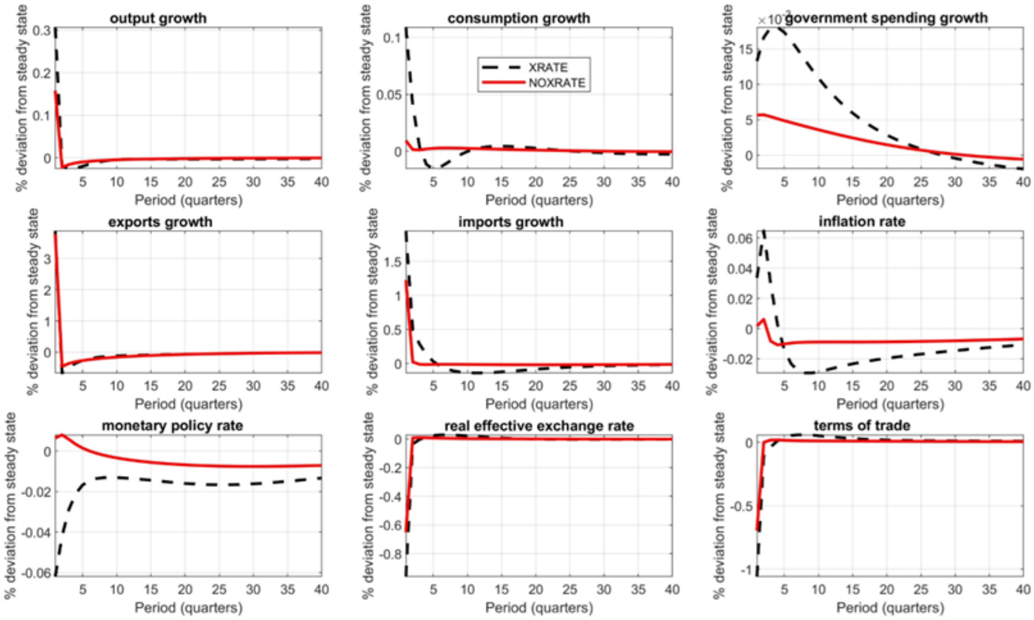

Figure C5. IRFs to foreign demand shock

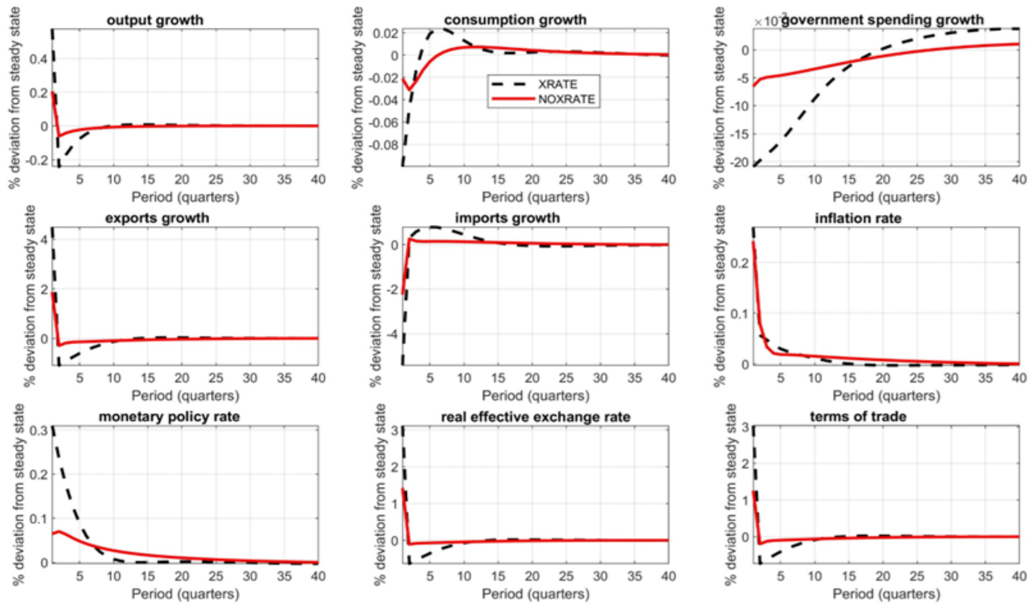

Figure C6. IRFs to foreign interest rate shock

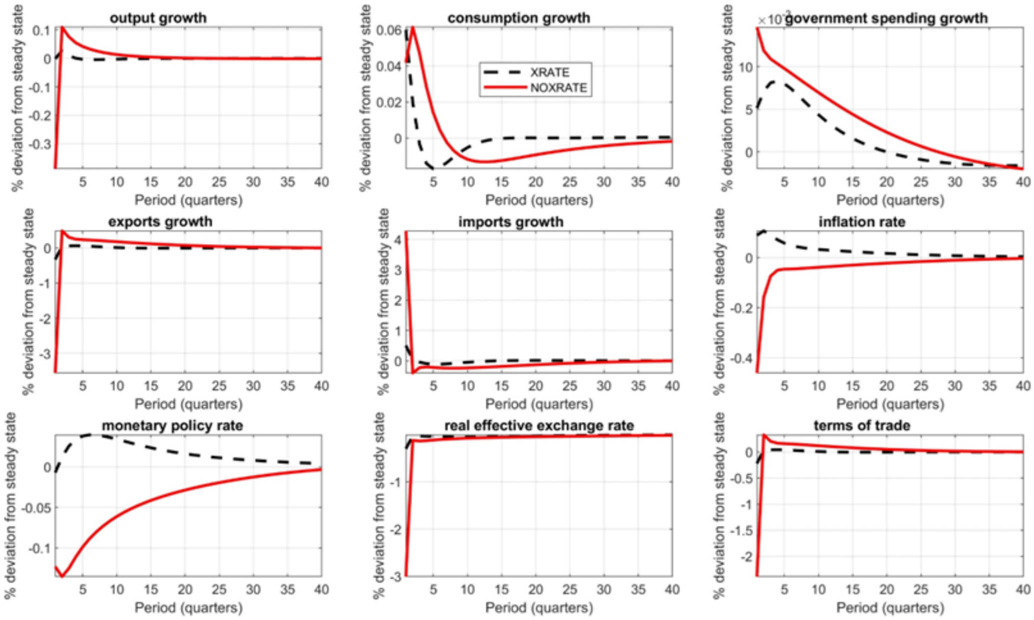

Figure C7. IRFs to foreign inflation shock

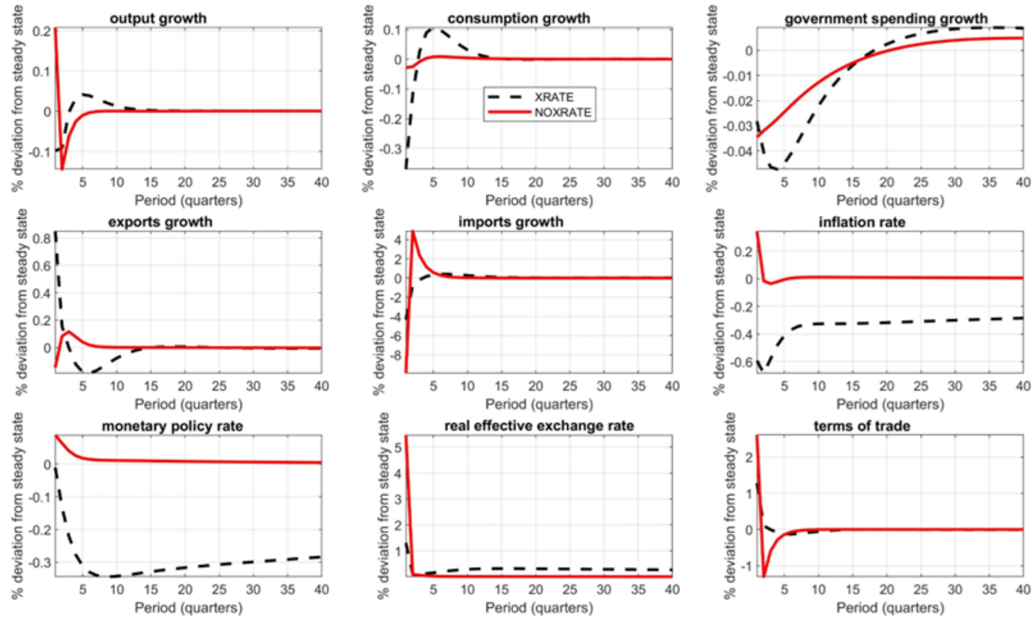

Figure C8. IRFs to law of one price gap

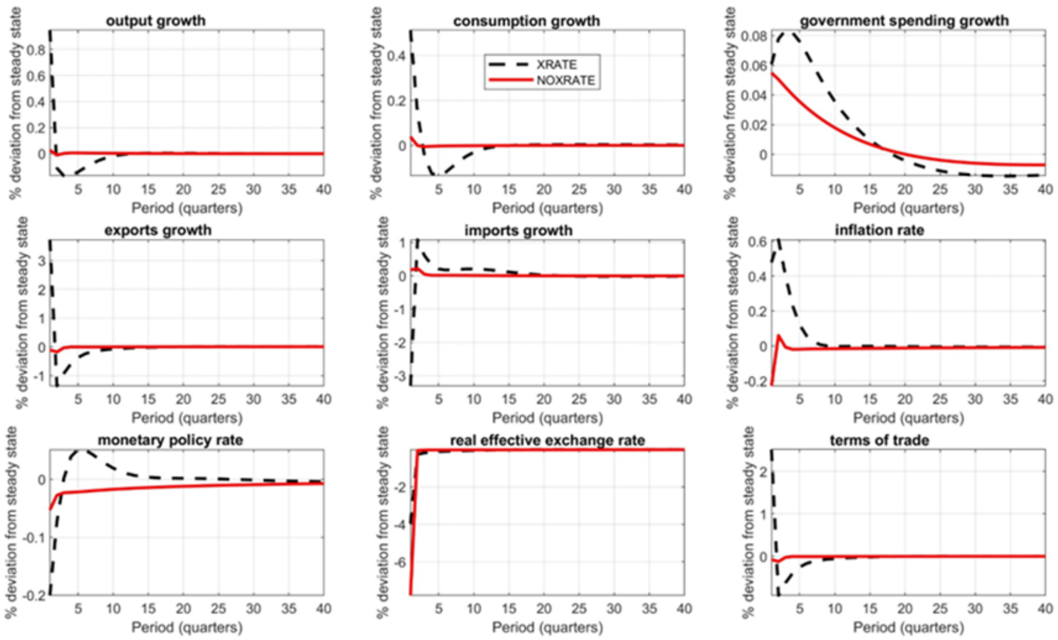

Figure C9. IRFs to terms of trade shock

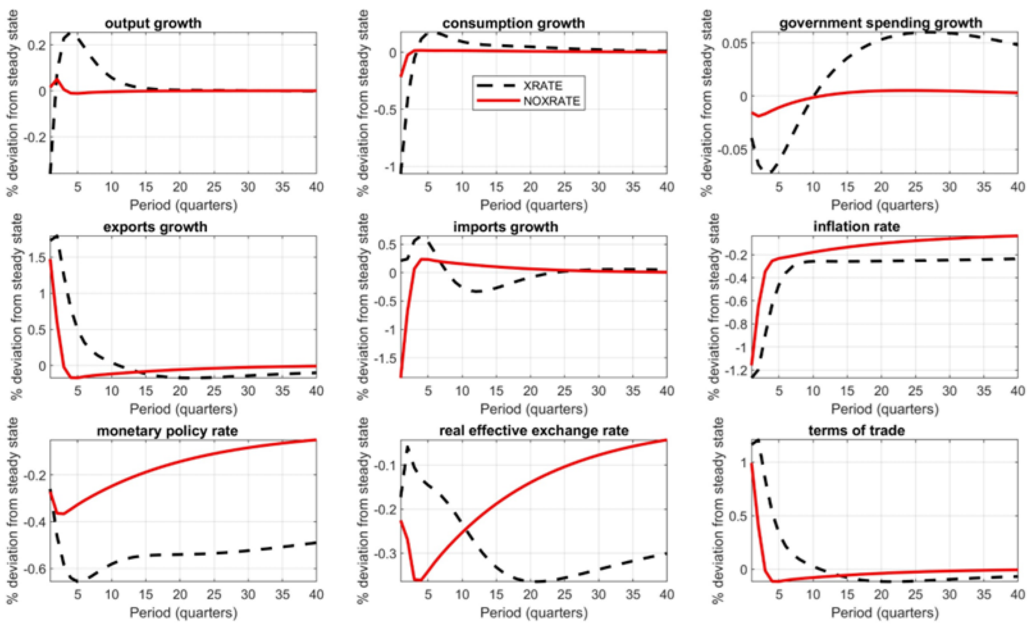

Figure C10. IRFs to consumer preferences shock