Appendix A. Key Derivations

In this Appendix we present the key steps necessary to derive the linearized equilibrium conditions of a small open economy version of our model. Unless indicated otherwise, we use the variable transformations defined in Section 3.

A.1. Household Budget Constraint and Optimality Conditions

Linearizing the budget constraint (3) yields

$$\hat{B}_t^{*,h} + \hat{B}_t^h = \beta^{-1}\left(\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h + \mu^{-1}(\hat{W}_t + \hat{N}_t^h) + \hat{D}_t - \hat{C}_t^h\right), \tag{A.1}$$

where $\hat{D}_t \equiv (D_t - D)/Y$, and where we used the assumption of zero steady state assets ($B^* = B = 0$), as well as the result that the steady state labor share is the inverse of the (gross) product markup μ.

Given the household's utility function (1) and budget constraint (3), the optimization problem yields the following linearized Euler equations associated with Home and Foreign bond holdings

$$\hat{C}_t^h = \hat{\mathbb{E}}_t\hat{C}_{t+1}^h - \frac{1}{\sigma}\hat{\mathbb{E}}_t\left\{\hat{i}_t - \hat{\pi}_{t+1}\right\}, \tag{A.2}$$

$$\hat{C}_t^h = \hat{\mathbb{E}}_t\hat{C}_{t+1}^h - \frac{1}{\sigma}\hat{\mathbb{E}}_t\left\{\hat{i}_t^* - \hat{\pi}_{t+1}^* + \hat{Q}_{t+1} - \hat{Q}_t - \phi\hat{B}_t^* + \varrho_t\right\}, \tag{A.3}$$

where $\phi = \Phi'(0,0)$, and the intratemporal labor supply condition is

$$\hat{W}_t = \sigma\hat{C}_t^h + \varphi\hat{N}_t^h. \tag{A.4}$$

Combining equations (A.2) and (A.3) results in

$$\hat{\mathbb{E}}_t\left\{\hat{i}_t - \hat{\pi}_{t+1}\right\} = \hat{\mathbb{E}}_t\left\{\hat{i}_t^* - \hat{\pi}_{t+1}^* + \hat{Q}_{t+1} - \hat{Q}_t - \phi\hat{B}_t^* + \varrho_t\right\}. \tag{A.5}$$

Since this equation features expectations in aggregate variables that are beyond the control of an individual agent, and which are expressed as deviations from their respective steady state values, we can use the behavioral discounting formula (11) for $k = 0, 1$ to write

$$\hat{i}_t - m\mathbb{E}_t\left\{\hat{\pi}_{t+1}\right\} = \hat{i}_t^* - m\mathbb{E}_t\left\{\hat{\pi}_{t+1}^* - \hat{Q}_{t+1}\right\} - \hat{Q}_t - \phi\hat{B}_t^* + \varrho_t, \tag{A.6}$$

which is the UIP condition (13) in the main text.

A.2. Deriving the Individual Consumption Function

Let us iterate the linearized budget constraint forward and use the standard transversality condition to write

$$\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h = \hat{\mathbb{E}}_t\sum_{T=t}^{\infty}\beta^{T-t}\left(\hat{C}_T^h - \mu^{-1}(\hat{W}_T + \hat{N}_T^h) + \hat{D}_T\right). \tag{A.7}$$

Note that by multiplying the Euler equation (A.2) by β and iterating forward we obtain

$$\hat{C}_t^h = (1-\beta)\hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \hat{C}_T^h - \frac{\beta}{\sigma} \hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \left(\hat{i}_T - \hat{\pi}_{T+1} \right). \tag{A.8}$$

Combining the two and rearranging yields

$$\begin{aligned} \hat{C}_t^h &= (1-\beta) \left(\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h \right) \\ &\quad + \hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \left[(1-\beta) \left(\frac{1}{\mu} (\hat{W}_T + \hat{N}_T^h) + \hat{D}_T \right) - \frac{\beta}{\sigma} \left(\hat{i}_T - \hat{\pi}_{T+1} \right) \right]. \end{aligned} \tag{A.9}$$

We can now use the equilibrium condition (A.4) to eliminate individual labor supply

$$\begin{aligned} \hat{C}_t^h &= (1-\beta) \left(\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h \right) \\ &\quad + \hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \left[(1-\beta) \left(\frac{\varphi+1}{\mu\varphi} \hat{W}_T - \frac{\sigma}{\mu\varphi} \hat{C}_T^h + \hat{D}_T \right) - \frac{\beta}{\sigma} \left(\hat{i}_T - \hat{\pi}_{T+1} \right) \right], \end{aligned} \tag{A.10}$$

and again exploit Equation (A.8) to finally obtain

$$\begin{aligned} \left(1 + \frac{\sigma}{\mu\varphi}\right) \hat{C}_t^h &= (1-\beta) \left(\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h \right) \\ &\quad + \hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \left[(1-\beta) \left(\frac{\varphi+1}{\mu\varphi} \hat{W}_T + \hat{D}_T \right) - \frac{\beta}{\sigma} \left(1 + \frac{\sigma}{\mu\varphi}\right) \left(\hat{i}_T - \hat{\pi}_{T+1} \right) \right]. \end{aligned} \tag{A.11}$$

The equation above is the individual consumption function that incorporates labor supply choice.

A.3. Deriving the IS Curve

Since Equation (A.11) features expectations only about aggregate variables, we can apply to it the behavioral discounting formula (11) for $k = 0, 1, 2, ...$

$$\begin{aligned} \left(1 + \frac{\sigma}{\mu\varphi}\right) \hat{C}_t^h &= (1-\beta) \left(\hat{B}_{t-1}^{*,h} + \hat{B}_{t-1}^h \right) \\ &\quad + \mathbb{E}_t \sum_{T=t}^{\infty} (\beta m)^{T-t} \left[(1-\beta) \left(\frac{\varphi+1}{\mu\varphi} \hat{W}_T + \hat{D}_T \right) - \frac{\beta}{\sigma} \left(1 + \frac{\sigma}{\mu\varphi}\right) \left(\hat{i}_T - m\hat{\pi}_{T+1} \right) \right], \end{aligned} \tag{A.12}$$

so that it now uses the rational expectations operator rather than the subjective one. Since we no longer need to make a distinction between macroeconomic aggregates and individual choices, we can drop indexing consumption and assets by h and use the Home bond market clearing condition $B_t = 0$. After some algebra, we can write Equation (A.12) recursively

$$\left(1+\frac{\sigma}{\mu\varphi}\right)\hat{C}_t = (1-\beta)\left(\hat{B}^*_{t-1}+\hat{B}_{t-1}-m\beta\hat{B}^*_t-m\beta\hat{B}_t\right)+(1-\beta)\left(\frac{\varphi+1}{\mu\varphi}\hat{W}_t+\hat{D}_t\right)$$
$$-\frac{\beta}{\sigma}\left(1+\frac{\sigma}{\mu\varphi}\right)\left(\hat{i}_t-m\mathbb{E}_t\hat{\pi}_{t+1}\right)+m\beta\left(1+\frac{\sigma}{\mu\varphi}\right)\mathbb{E}_{t+1}\hat{C}_{t+1}. \quad \text{(A.13)}$$

Now we can use the budget constraint (A.1) and the Home currency bond market clearing condition $B_t = 0$ to obtain

$$\left(\beta+\frac{\sigma}{\mu\varphi}\right)\hat{C}_t = (1-\beta)(1-m)\beta\hat{B}^*_t+\frac{1-\beta}{\mu}\left(\frac{1}{\varphi}\hat{W}_t-\hat{N}_t\right)$$
$$-\frac{\beta}{\sigma}\left(1+\frac{\sigma}{\mu\varphi}\right)\left(\hat{i}_t-m\mathbb{E}_t\hat{\pi}_{t+1}\right)+m\beta\left(1+\frac{\sigma}{\mu\varphi}\right)\mathbb{E}_{t+1}\hat{C}_{t+1}. \quad \text{(A.14)}$$

Finally, using the optimal labor supply condition (A.4) results in

$$\hat{C}_t = m\mathbb{E}_t\hat{C}_{t+1}-\frac{1}{\sigma}\left(\hat{i}_t-m\mathbb{E}_t\hat{\pi}_{t+1}\right)+(1-m)\frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}}\hat{B}^*_t, \quad \text{(A.15)}$$

which is the aggregate IS curve (12) in the main text.

A.4. Deriving the Phillips Curve

Aggregation of intermediate inputs into final goods according to Dixit-Stiglitz formulas (4) yields the following isoelastic demand condition

$$Y^f_{H,t}+Y^{*,f}_{H,t} = \left(\frac{P^f_{H,t}}{P_{H,t}}\right)^{\frac{\mu}{1-\mu}}\left[Y_{H,t}+Y^*_{H,t}\right], \quad \text{(A.16)}$$

where the aggregate price indices are

$$P_{H,t} = \left[\int_0^1 \left(P^f_{H,t}\right)^{\frac{1}{1-\mu}} \mathrm{d}f\right]^{1-\mu}, \qquad \text{and} \qquad P^*_{H,t} = \left[\int_0^1 \left(P^{*,f}_{H,t}\right)^{\frac{1}{1-\mu}} \mathrm{d}f\right]^{1-\mu}, \quad \text{(A.17)}$$

and where we used the law of one price $P^f_{H,t} = \varepsilon_t P^{*,f}_{H,t}$, which also implies $P_{H,t} = \varepsilon_t P^*_{H,t}$.

Using the demand conditions (A.16) and production technology (5) allows us to rewrite the firm problem consistent with maximization of (6) as

$$\max_{P^f_{H,t}} \hat{\mathbb{E}}_t \sum_{T=t}^{\infty}\theta^{T-t}\Lambda_{t,T}\left[P^f_{H,t}-P_T\frac{W_T}{z_t}\right]\left(\frac{P^f_{H,t}}{P_{H,T}}\right)^{\frac{\mu}{1-\mu}}\left[Y_{H,T}+Y^*_{H,T}\right]. \quad \text{(A.18)}$$

The first order condition is

$$\hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \theta^{T-t} \Lambda_{t,T} \left[P^f_{H,t} - \mu P_T MC_T \right] \left(\frac{P^f_{H,t}}{P_{H,T}} \right)^{\frac{\mu}{1-\mu}} \left[Y_{H,T} + Y^*_{H,T} \right] = 0, \tag{A.19}$$

where $MC_t \equiv (W_t P_t)/(P_{H,t} z_t)$ is the real marginal cost deflated by the producer price index.

As in a textbook closed economy case (see e.g. Galí, 2015), linearizing around the zero inflation steady state yields

$$\hat{P}^{\diamond}_{H,t} = (1-\beta\theta) \sum_{T=t}^{\infty} (\beta\theta)^{T-t} \hat{\mathbb{E}}_t \left\{ \hat{\pi}_{H,t+1} + ... + \hat{\pi}_{H,T} + \hat{MC}_T \right\}, \tag{A.20}$$

where $\hat{P}^{\diamond}_{H,t} \equiv \log(P^f_{H,t}/P_{H,t})$, $\hat{MC}_t \equiv \log(MC_t/MC)$, $\hat{\pi}_{H,t} \equiv \log(P_{H,t}/P_{H,t-1})$ and where we used the result that all reoptimizing firms choose the same price to drop the f superscript. Since the subjective expectation operator now concerns only variables beyond individual firm control and all of them are expressed as deviations from steady state, we can apply the discounting formula (11) to obtain

$$\hat{P}^{\diamond}_{H,t} = (1-\beta\theta) \sum_{T=t}^{\infty} (\beta\theta)^{T-t} \mathbb{E}_t \left\{ m\hat{\pi}_{H,t+1} + ... + m^{T-t}\hat{\pi}_{H,T} + m^{T-t}\hat{MC}_T \right\}. \tag{A.21}$$

After some algebra, this can be written recursively as

$$\hat{P}^{\diamond}_{H,t} - \beta\theta m \mathbb{E}_t \hat{P}^{\diamond}_{H,t+1} = (1-\beta\theta)\hat{MC}_t + \beta\theta m \mathbb{E}_t \left\{ \hat{\pi}_{H,t+1} \right\}. \tag{A.22}$$

Note that the definition of the price index (A.17) implies

$$\hat{\pi}_{H,t} = (1-\theta)(\hat{P}^{\diamond}_{H,t} + \hat{\pi}_{H,t}) = \frac{1-\theta}{\theta} \hat{P}^{\diamond}_{H,t}. \tag{A.23}$$

Combining this with Equation (A.22) and rearranging yields

$$\hat{\pi}_{H,t} = m\beta \mathbb{E}_t \left\{ \hat{\pi}_{H,t+1} \right\} + \frac{(1-\beta\theta)(1-\theta)}{\theta} \hat{MC}_t, \tag{A.24}$$

which is Equation (14) in the main text.

A.5. Deriving the Marginal Cost Equation

The optimal composition of the consumption basket (2) implies the following formula for the aggregate price index P_t

$$P_t = \left[(1-\alpha) \left(P_{H,t} \right)^{1-\eta} + \alpha \left(P_{F,t} \right)^{1-\eta} \right]^{\frac{1}{1-\eta}}, \tag{A.25}$$

which leads to

$$\hat{P}_{H,t} = -\frac{\alpha}{1-\alpha}\hat{P}_{F,t} = -\frac{\alpha}{1-\alpha}\hat{Q}_t, \tag{A.26}$$

where $\hat{P}_{H,t} = \log(P_{H,t}/P_t)$, $\hat{P}_{F,t} = \log(P_{F,t}/P_t)$, and where the last equality follows from the definition of the real exchange rate $Q_t = \varepsilon_t P_t^*$ and the small open economy version of producer currency pricing $P_{F,t} = \varepsilon_t P_t^*$.

Combining labor market clearing condition (9), with the firm-level production function (5), and the firm's demand conditions (A.16) yields

$$N_t = \frac{Y_{H,t} + Y_{H,t}^*}{z_t}\Delta_t, \tag{A.27}$$

where

$$\Delta_t \equiv \int_0^1 \left(\frac{P_{H,t}^f}{P_{H,t}}\right)^{\frac{\mu}{1-\mu}} \mathrm{d}f \tag{A.28}$$

is a measure of price dispersion. Defining aggregate output as the sum of domestic production and exports results in the following aggregate production function

$$Y_t \equiv Y_{H,t} + Y_{H,t}^* = \frac{z_t}{\Delta_t}N_t, \tag{A.29}$$

the linearized version of which is

$$\hat{Y}_t = \hat{z}_t + \hat{N}_t - \hat{\Delta}_t. \tag{A.30}$$

Given the problem of firms, their marginal cost deflated by producer prices is

$$\hat{MC}_t = \hat{W}_t - \hat{P}_{H,t} - \hat{z}_t, \tag{A.31}$$

where $\hat{P}_{H,t} = \log(P_{H,t}/P_t)$. Using Equation (A.26) to substitute in for $\hat{P}_{H,t}$, labor supply condition (A.4) to eliminate $\hat{W}_t$, Equation (A.30) to eliminate $\hat{N}_t$, and the well-known result that price dispersion is of second order (see, e.g., Woodford, 2003) yields

$$\hat{MC}_t = \sigma\hat{C}_t + \varphi\hat{Y}_t + \frac{\alpha}{1-\alpha}\hat{Q}_t - (1+\varphi)\hat{z}_t, \tag{A.32}$$

which is Equation (15) in the main text.

A.6. Deriving the Goods Market Clearing Condition

Our definition of aggregate output (A.29) together with market clearing conditions (10) imply

$$Y_t = C_{H,t} + \frac{1-\zeta}{\zeta}C_{H,t}^*. \tag{A.33}$$

Plugging in for the optimal composition of the consumption basket then results in

$$Y_t = (1-\alpha)\left(\frac{P_{H,t}}{P_t}\right)^{-\eta} C_t + \frac{1-\zeta}{\zeta}\alpha^* \left(\frac{P^*_{H,t}}{P^*_t}\right)^{-\eta} C^*_t. \tag{A.34}$$

The small open economy assumption and producer currency pricing imply $C^*_t = Y^*_t$ and $P^*_{H,t} = P_{H,t}/\varepsilon_t$. This allows us to write

$$Y_t = (1-\alpha)\left(\frac{P_{H,t}}{P_t}\right)^{-\eta} C_t + \frac{1-\zeta}{\zeta}\alpha^* \left(\frac{P_{H,t}}{P_t Q_t}\right)^{-\eta} Y^*_t. \tag{A.35}$$

Linearization then yields

$$\hat{Y}_t = (1-\alpha)\hat{C}_t - (1-\alpha)\eta\hat{P}_{H,t} + \alpha\hat{Y}^*_t - \alpha\eta(\hat{P}_{H,t} - \hat{Q}_t). \tag{A.36}$$

Using Equation (A.26) to eliminate $\hat{P}_{H,t}$ and rearranging terms results in

$$\hat{Y}_t = (1-\alpha)\hat{C}_t + \alpha\hat{Y}^*_t + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\hat{Q}_t, \tag{A.37}$$

which is equation (17) in the main text.

Appendix B. Additional Derivations

B.1. Deriving Equation (34)

Eliminating consumption from Equation (12) using the resource constraint (17) results in

$$\hat{Y}_t = m\mathbb{E}_t\hat{Y}_{t+1} + \alpha\left(\hat{Y}^*_t - m\mathbb{E}_t\hat{Y}^*_{t+1}\right) + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\left(\hat{Q}_t - m\mathbb{E}_t\hat{Q}_{t+1}\right) - \frac{1-\alpha}{\sigma}\left(\hat{i}_t - m\mathbb{E}_t\hat{\pi}_{t+1}\right) + (1-m)(1-\alpha)\frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}}\hat{B}^*_t, \tag{B.1}$$

and exploiting the UIP condition (13) then yields

$$\hat{Y}_t = m\mathbb{E}_t\hat{Y}_{t+1} + \alpha\left(\hat{Y}^*_t - m\mathbb{E}_t\hat{Y}^*_{t+1}\right) + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\left(\hat{i}^*_t - \phi\hat{B}^*_t + \varrho_t - m\mathbb{E}_t\left\{\hat{\pi}^*_{t+1}\right\} - \hat{i}_t + m\mathbb{E}_t\left\{\hat{\pi}_{t+1}\right\}\right) - \frac{1-\alpha}{\sigma}\left(\hat{i}_t - m\mathbb{E}_t\hat{\pi}_{t+1}\right) + (1-m)(1-\alpha)\frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}}\hat{B}^*_t. \tag{B.2}$$

When considering the effects of Home monetary policy, we can drop the exogenous risk premium and foreign variables (also exogenous on account of the small open economy assumption). By rearranging and using the definition of the ex ante real interest rate

$\hat{r}_t \equiv \hat{i}_t - m\mathbb{E}_t\hat{\pi}_{t+1}$ we then arrive at

$$\hat{Y}_t = m\mathbb{E}_t\hat{Y}_{t+1} - \left(\frac{1-\alpha}{\sigma} + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\right)\hat{r}_t - \left[\eta\frac{\alpha(2-\alpha)}{1-\alpha}\phi - (1-m)(1-\alpha)\frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}}\right]\hat{B}^*_t, \tag{B.3}$$

which is Equation (34) in the main text.

B.2. Deriving Equations (36) *and* (37)

By combining equations (14) and (15), and iterating forward on the outcome, we obtain

$$\hat{\pi}_{H,t} = \kappa\mathbb{E}_t\sum_{T=t}^{\infty}(\beta m)^{T-t}\left(\sigma\hat{C}_T + \varphi\hat{Y}_T + \frac{\alpha}{1-\alpha}\hat{Q}_T - \hat{z}_t\right), \tag{B.4}$$

Note that each of the three endogenous variables defining real marginal cost (last bracket above) can be expressed as a function of the current and expected future real interest rates, see in particular equations (30), (35) and (29). Ignoring terms associated with the net foreign asset position (as they are small), omitting productivity shocks (as we focus on the effects of domestic monetary policy), and consistently dropping foreign variables (on account of the the small open economy assumption) allows us to write

$$\sigma\hat{C}_t + \varphi\hat{Y}_t + \frac{\alpha}{1-\alpha}\hat{Q}_t \approx -a\mathbb{E}_t\sum_{T=t}^{\infty}m^{T-t}\hat{r}_T, \tag{B.5}$$

where $a \equiv \varphi\left(\frac{1-\alpha}{\sigma} + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\right) + \frac{1}{1-\alpha}$. Plugging this into Equation (B.4) yields

$$\begin{aligned}\hat{\pi}_{H,t} &\approx -\kappa a\mathbb{E}_t\left[\hat{r}_t + m(1+\beta)\hat{r}_{t+1} + ... + m^n(1+\beta+...+\beta^n)\hat{r}_{t+n} + ...\right]\\ &= -\kappa a\mathbb{E}_t\sum_{T=t}^{\infty}\frac{m^{T-t+1} - (\beta m)^{T-t+1}}{m(1-\beta)}\hat{r}_T.\end{aligned} \tag{B.6}$$

Recall that CPI inflation is given by Equation (16). Exploiting relationships (B.6) and (29), and again ignoring terms related to net foreign assets, yields

$$\hat{\pi}_t \approx -\frac{\kappa a}{m(1-\beta)}\mathbb{E}_t\sum_{T=t}^{\infty}\left[m^{T-t+1} - (\beta m)^{T-t+1}\right]\hat{r}_T - \frac{\alpha}{1-\alpha}\mathbb{E}_t\sum_{T=t}^{\infty}m^{T-t}\hat{r}_T - \frac{\alpha}{1-\alpha}\hat{Q}_{t-1}, \tag{B.7}$$

which is Equation (36) in the main text.

In the limit $\beta \to 1$ we also have $M \to m$, and Equation (B.6) becomes

$$\hat{\pi}_{H,t} = -\kappa a\mathbb{E}_t\left[\hat{r}_t + 2m\hat{r}_{t+1} + ... + (n+1)m^n\hat{r}_{t+n} + \ldots\right], \tag{B.8}$$

which plugged into the definition of CPI (16) results in

$$\hat{\pi}_t = -\kappa a \mathbb{E}_t \sum_{T=t}^{\infty} (T-t+1)\, m^{T-t} \hat{r}_T - \frac{\alpha}{1-\alpha} \mathbb{E}_t \sum_{T=t}^{\infty} m^{T-t} \hat{r}_T - \frac{\alpha}{1-\alpha} \hat{Q}_{t-1}, \tag{B.9}$$

which is Equation (37) in the text.

Finally, the relative weight of the penultimate component in the formula above is

$$\frac{\frac{\alpha}{1-\alpha}}{\varphi\left(\frac{1-\alpha}{\sigma} + \eta\frac{\alpha(2-\alpha)}{1-\alpha}\right) + \frac{1}{1-\alpha}} = \frac{1}{\varphi(\eta - \sigma^{-1})\,(2-\alpha) + \left(\frac{\varphi}{\sigma} + 1\right)\alpha^{-1}},$$

and so it is clearly increasing in the economy's openness α.

B.3. Deriving Equation (38) *and* (39)

Let us rearrange the output IS curve (B.1) as follows

$$\hat{Y}_t - \alpha \hat{Y}_t^* - \eta \frac{\alpha(2-\alpha)}{1-\alpha} \hat{Q}_t = m \mathbb{E}_t \left\{ \hat{Y}_{t+1} + \alpha \hat{Y}_{t+1}^* + \eta \frac{\alpha(2-\alpha)}{1-\alpha} \hat{Q}_{t+1} \right\}$$

$$- \frac{1-\alpha}{\sigma} \mathbb{E}_t \sum_{T=t}^{\infty} m^{T-t} \hat{r}_T + (1-m)(1-\alpha) \frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}} \hat{B}_t^*. \tag{B.10}$$

Iterating this forward yields

$$\hat{Y}_t = \alpha \hat{Y}_t^* + \eta \frac{\alpha(2-\alpha)}{1-\alpha} \hat{Q}_t - \frac{1-\alpha}{\sigma} \mathbb{E}_t \sum_{T=t}^{\infty} m^{T-t} \hat{r}_T + (1-m)(1-\alpha) \mathbb{E}_t \sum_{T=t}^{\infty} m^{T-t} \hat{B}_T^*, \tag{B.11}$$

which is Equation (38) in the main text.

To derive Equation (39), we iterate forward on the foreign IS curve (20) while allowing the degree of myopia abroad m^* to be possibly different from that in the home economy m, use the outcome to substitute for $\hat{Y}_t^*$ above, and further exploit Equation 29 to substitute for $\hat{Q}_t$. After omitting the terms associated with net foreign assets and the exogenous component of the risk premium, assuming a constant real interest rate in the Home economy $\hat{r}_t = 0$, and rearranging we arrive at

$$\hat{Y}_t \approx -\frac{\alpha}{\sigma} \mathbb{E}_t \sum_{T=t}^{\infty} m^{*T-t} \hat{r}_T^* + \eta \frac{\alpha(2-\alpha)}{1-\alpha} \mathbb{E}_t \sum_{T=t}^{\infty} m^{T-t} \hat{r}_T^*, \tag{B.12}$$

which is Equation (39) in the main text.

Appendix C. Complete Markets Case

When markets are complete, the budget constraint (3) can be rewritten as

$$C_t^h + \hat{\mathbb{E}}_t q_{t,t+1} A_{t+1}^h = A_t^h + W_t N_t^h + D_t, \tag{C.1}$$

where A_t^h is the real stochastic payoff of a portfolio of Arrow-Debreu securities purchased by household h at time $t-1$ and $q_{t,t+1}$ is the pricing kernel so that $\hat{\mathbb{E}}_t q_{t,t+1} A_{t+1}^h$ is the period-t price of a random payment A_{t+1}^h that occurs in period $t+1$ (see e.g. Woodford (2003) for a discussion). In a behavioral model like ours, $q_{t,t+1}$ can be interpreted as the price of a contingent claim that pays one unit of good in some state at time $t+1$, divided by the *subjective* probability of occurrence of that state given information at time t.

It then immediately follows that in the steady state we have $q = (1+r)^{-1} = \beta$. Linearizing around the zero asset holdings equilibrium yields

$$\hat{\mathbb{E}}_t \hat{A}_{t+1}^h = \beta^{-1} \left(\hat{A}_t^h + \mu^{-1}(\hat{W}_t + \hat{N}_t^h) + \hat{D}_t - \hat{C}_t^h \right). \tag{C.2}$$

Optimization by households still implies the same household-level Euler equation (A.2) and intratemporal optimality condition (A.4). This allows us to proceed exactly as in A.2 to obtain an individual consumption function that is similar to equation (A.11), and which features expectations about aggregate variables only

$$\left(1 + \frac{\sigma}{\mu\varphi}\right) \hat{C}_t^h = (1-\beta)\hat{A}_t^h + \hat{\mathbb{E}}_t \sum_{T=t}^{\infty} \beta^{T-t} \left[(1-\beta) \left(\frac{\varphi+1}{\mu\varphi} \hat{W}_T + \hat{D}_T \right) - \frac{\beta}{\sigma} \left(1 + \frac{\sigma}{\mu\varphi}\right) \left(\hat{i}_T - \hat{\pi}_{T+1} \right) \right]. \tag{C.3}$$

The remaining derivations follows those presented in A.3, except that we now need to apply behavioral discounting to the expected payoff of the aggregate portfolio of Arrow-Debreu securities $\hat{\mathbb{E}}_t \hat{A}_{t+1} = m\mathbb{E}_t \hat{A}_{t+1}$. This is the key step that makes a difference compared to the incomplete markets case, in which only risk-free bonds exist and so there is no uncertainty on the one-period asset return. As a result, we finally arrive at

$$\hat{C}_t = m\mathbb{E}_t \hat{C}_{t+1} - \frac{1}{\sigma} \left(\hat{i}_t - m\mathbb{E}_t \hat{\pi}_{t+1} \right), \tag{C.4}$$

which is equation (32) in the main text and which, unlike its incomplete markets version (12), does not feature the country's net foreign assets position.

Appendix D. Bayesian Estimation Results

E.1. Data

The domestic block of our model is represented by Canada and the foreign block, which is essentially a closed economy, is represented by the US. For these two countries, the estimation uses quarterly data on output, inflation and interest rates, as well as the bilateral exchange rate. All time series are taken from the Federal Reserve Economic Data (FRED) and transformed as follows:

1. Per-Capita Real Output Growth (y_t^{obs}): We use the real GDP series labeled as NGDPRSAXD-CCAQ and quarterly population estimates 17-10-0009-01 (formerly CANSIM 051-0005)

$$y_t^{obs} = 100 \left[\ln \left(\frac{\text{GDP}_t}{\text{Pop}_t} \right) - \ln \left(\frac{\text{GDP}_{t-1}}{\text{Pop}_{t-1}} \right) \right] \tag{E.1}$$

2. Inflation (π_t^{obs}): GDP deflator CANGDPDEFQISMEI

$$\pi_t^{obs} = 100 \ln \left[\frac{\text{Def}_t}{\text{Def}_{t-1}} \right] \tag{E.2}$$

3. Interest Rate (i_t^{obs}): 3-Month rate IR3TIB01CAM156N

$$i_t^{obs} = \frac{R_t}{4} \tag{E.3}$$

4. Foreign Per-Capita Real Output Growth ($y_t^{obs,*}$): We take real GDP GDPC1 and population level CNP16OV

$$y_t^{obs,*} = 100 \left[\ln \left(\frac{\text{GDP}_t^*}{\text{Pop}_t^*} \right) - \ln \left(\frac{\text{GDP}_{t-1}^*}{\text{Pop}_{t-1}^*} \right) \right] \tag{E.4}$$

5. Foreign Inflation ($\pi_t^{obs,*}$): Implicit price deflator GDPDEF

$$\pi_t^{obs,*} = 100 \ln \left[\frac{\text{Def}_t^*}{\text{Def}_{t-1}^*} \right] \tag{E.5}$$

6. Foreign Interest Rate ($r_t^{obs,*}$): Effective federal fund rate FEDFUNDS

$$r_t^{obs,*} = \frac{R_t^*}{4} \tag{E.6}$$

7. Exchange Rate (e_t^{obs}): Canadian Dollar to US Dollar Exchange Rate CCUSMA02CAQ618N

$$\Delta e_t^{obs} = 100 \ln \left[\frac{\text{RER}_t}{\text{RER}_{t-1}} \right] \tag{E.7}$$

The measurement equations linking the data to the model variables are

$$y_t^{obs,*} = \hat{Y}_t^* - \hat{Y}_{t-1}^* + y^* \tag{E.8}$$

$$\pi_t^{obs,*} = \hat{\pi}_t^* + \pi^* \tag{E.9}$$

$$i_t^{obs,*} = \hat{i}_t^* + \pi^* + r^* \tag{E.10}$$

$$y_t^{obs} = \hat{Y}_t - \hat{Y}_{t-1} + y \tag{E.11}$$

$$\pi_t^{obs} = \hat{\pi}_{H,t} + \pi \tag{E.12}$$

$$i_t^{obs} = \hat{i}_t + \pi + r \tag{E.13}$$

$$e_t^{obs} = Q_t - Q_{t-1} + \hat{\pi}_t + \pi - \hat{\pi}_t^* - \pi^* \tag{E.14}$$

so that, rather than demeaning data prior to estimation, we use intercepts y, π, r, y^*, π^*, r^* to capture the trend growth rate of output, average inflation, and the average real interest rate.

Our baseline sample runs from 1972:Q1 to 2007:Q4. However, for robustness, we also estimate the model over the periods 1982:Q2–2007:Q4 and 1972:Q1–2019:Q4. In the latter case, which captures the period when the US policy rate was constrained by the zero lower bound and asset purchase programs were conducted, we replace the interest rate with the shadow rate estimated by Wu and Xia (2016).

E.2. Shocks

To estimate a model with seven observable variables using full information methods, we need to allow for at least seven stochastic shocks. Three of them are already included in the model equations and they affect domestic and foreign monetary policy (ν_t and ν_t^*) and international risk premium (ϱ_t). Following the DSGE literature, for each country we additionally include shocks to household intertemporal preferences (g_t and g_t^*) and to firm cost (ξ_t and ξ_t^*). Preference shocks are introduced as shifters in the subjective discount factor β, resulting in the following modification of the IS curve (12)

$$\hat{C}_t = m\mathbb{E}_t\hat{C}_{t+1} - \frac{1}{\sigma}\left(\hat{i}_t - m\mathbb{E}_t\hat{\pi}_{t+1}\right) + (1-m)\frac{1-\beta}{1+\frac{\sigma}{\mu\varphi}}\hat{B}_t^* + g_t - m\mathbb{E}_t\hat{g}_{t+1}. \tag{E.15}$$

The cost shocks are modelled as exogenous shifts in firms' market power μ and modify the Phillips curve (14) as follows

$$\hat{\pi}_{H,t} = m\beta\mathbb{E}_t\{\hat{\pi}_{H,t+1}\} + \kappa\hat{MC}_t + \xi_t. \tag{E.16}$$

All shocks are defined as independent AR(1) processes, except for the monetary policy shocks that we assume to be white noise.

E.3. Estimation Results

Table E.1 presents the characteristics of the prior and posterior distributions for structural parameters and constants in the measurement equations while estimated shock properties are presented in Table E.2. The Markov Chain Monte Carlo (MCMC) jump size in the Metropolis-Hastings algorithm is scaled to ensure a target acceptance rate of around 30 percent. We use 250,000 draws and burn the initial 150,000, with convergence of the MCMC chains verified using diagnostic tests based on trace plots and potential scale reduction factors. Estimation is conducted using Dynare 4.6.4 (Adjemian et al., 2021). We report the estimates obtained for the baseline sample 1972:Q2–2007:Q4. The results for the other two samples (1982:Q2–2007:Q4 and 1972:Q1–2019:Q4) are similar and available upon request.

Table E.1: **Estimation: Structural Parameters**

Parameter	Description	Prior			Poster.: Rational		Poster.: Baseline	
		Dist.	Mean	SD	Mean	[5, 95]	Mean	[5, 95]
m	Cognitive Discounting	B	0.80	0.070			0.68	[0.54, 0.83]
ϕ_π	H Taylor Rule, Inflation	N	1.50	0.50	2.58	[2.06, 3.14]	1.26	[0.83, 1.67]
ϕ_π^*	F Taylor Rule, Inflation	N	1.50	0.50	2.16	[1.82, 2.52]	1.50	[1.02, 1.94]
ϕ_y	H Taylor Rule, Output	N	0.125	0.13	0.33	[0.21, 0.44]	0.37	[0.25, 0.49]
ϕ_y^*	F Taylor Rule, Output	N	0.125	0.13	0.14	[0.07, 0.22]	0.18	[0.06, 0.28]
ρ	H Interest Rate Smooth	B	0.90	0.05	0.87	[0.84, 0.89]	0.86	[0.82, 0.89]
ρ^*	F Interest Rate Smooth	B	0.90	0.05	0.74	[0.70, 0.79]	0.81	[0.74, 0.88]
θ	Calvo Probability	B	0.875	0.05	0.88	[0.85, 0.92]	0.95	[0.93, 0.97]
φ	Inverse Frisch Elasticity	G	3.00	0.25	2.97	[2.60, 3.33]	2.97	[2.56, 3.37]
σ	Intertemp. El. of Subst.	N	1.00	0.20	1.74	[1.52, 1.95]	1.64	[1.39, 1.89]
η	Trade Elasticity	G	1.00	0.05	0.84	[0.78, 0.90]	0.80	[0.73, 0.86]
r	SS H Real Rate	N	0.50	0.25	0.18	[-0.18, 0.54]	0.29	[-0.08, 0.67]
r^*	SS F Real Rate	N	0.50	0.25	0.65	[0.44, 0.85]	0.68	[0.42, 0.92]
π	SS H Inflation	N	1.00	0.25	1.02	[0.71, 1.32]	1.05	[0.83, 1.27]
π^*	SS F Inflation	N	1.00	0.25	0.97	[0.72, 1.24]	0.94	[0.70, 1.18]
y	SS H Output Growth	N	0.50	0.25	0.36	[0.33, 0.39]	0.40	[0.38, 0.42]
y^*	SS F Output Growth	N	0.50	0.25	0.41	[0.38, 0.44]	0.44	[0.42, 0.46]

Note: B stands for Beta, G stands for Gamma and N stands for Normal distribution. H and F indicates Home and Foreign, respectively. SS denotes the steady state and SD the standard deviation.

E.4. Robustness Check: Less Informative Priors

Tables E.3 and E.4 present the estimation results of the behavioral model, in which we assume that the standard deviations of the prior distributions are 50% bigger than in the baseline variant.

Table E.2: **Estimation: Shocks**

Parameter	Description	Prior			Poster.: Rational		Poster.: Baseline	
		Dist.	Mean	SD	Mean	[5, 95]	Mean	[5, 95]
ρ_g	AR H Preference	B	0.70	0.10	0.95	[0.93, 0.97]	0.96	[0.95, 0.98]
ρ_g^*	AR F Preference	B	0.70	0.10	0.83	[0.78, 0.87]	0.90	[0.86, 0.94]
ρ_ξ	AR H Cost-Push	B	0.70	0.10	0.87	[0.74, 0.98]	0.65	[0.55, 0.70]
ρ_ξ^*	AR F Cost-Push	B	0.70	0.10	0.94	[0.89, 0.98]	0.89	[0.84, 0.93]
ρ_ϱ	AR Risk Premium	B	0.70	0.10	0.98	[0.97, 0.99]	0.96	[0.94, 0.98]
σ_ν	SD H Monetary Policy	IG	0.25	Inf	0.39	[0.33, 0.44]	0.31	[0.27, 0.34]
$\sigma_{\nu*}$	SD F Monetary Policy	IG	0.25	Inf	0.41	[0.36, 0.45]	0.37	[0.33, 0.40]
σ_g	SD H Preference	IG	0.25	Inf	11.08	[7.90, 13.9]	3.99	[3.19, 4.76]
σ_{g*}	SD F Preference	IG	0.25	Inf	2.70	[2.07, 3.22]	1.82	[1.48, 2.20]
σ_ξ	SD H Cost-Push	IG	0.25	Inf	0.21	[0.16, 0.26]	0.37	[0.29, 0.44]
$\sigma_{\xi*}$	SD F Cost-Push	IG	0.25	Inf	0.08	[0.05, 0.11]	0.10	[0.07, 0.14]
σ_ϱ	SD Risk Premium	IG	0.25	Inf	0.29	[0.26, 0.33]	0.65	[0.45, 0.83]

Note: B stands for Beta and IG stands for Inverted Gamma distribution. AR indicates AR(1) coefficient and SD the standard deviation of innovation. H and F denote Home and Foreign, respectively.

Table E.3: **Estimation with Inflated Priors: Structural Parameters**

Parameter	Description	Prior			Posterior	
		Dist.	Mean	SD	Mean	[5, 95]
m	Cognitive Discounting	B	0.80	0.10	0.62	[0.37, 0.81]
ϕ_π	H Taylor Rule, Inflation	N	1.50	0.75	1.24	[0.75, 1.71]
ϕ_π^*	F Taylor Rule, Inflation	N	1.50	0.75	1.44	[0.92, 1.96]
ϕ_y	H Taylor Rule, Output	N	0.125	0.195	0.34	[0.20, 0.46]
ϕ_y^*	F Taylor Rule, Output	N	0.125	0.195	0.15	[0.02, 0.28]
ρ	H Interest Rate Smooth	B	0.90	0.075	0.86	[0.81, 0.90]
ρ^*	F Interest Rate Smooth	B	0.90	0.075	0.82	[0.73, 0.91]
θ	Calvo Probability	B	0.875	0.075	0.96	[0.93, 0.98]
φ	Inverse Frisch Elasticity	G	3.00	0.375	2.87	[2.28, 3.44]
σ	Intertemp. El. of Subst.	G	1.00	0.30	2.04	[1.66, 2.41]
η	Trade Elasticity	G	1.00	0.075	0.64	[0.59, 0.69]
r	SS H Real Rate	N	0.50	0.325	0.17	[-0.31, 0.66]
r^*	SS F Real Rate	N	0.50	0.325	0.74	[0.35, 1.12]
π	SS H Inflation	N	1.00	0.325	1.09	[0.84, 1.35]
π^*	SS F Inflation	N	1.00	0.325	0.92	[0.59, 1.26]
y	SS H Output Growth	N	0.50	0.325	0.40	[0.37, 0.43]
y^*	SS F Output Growth	N	0.50	0.325	0.43	[0.40, 0.46]

Note: B stands for Beta, G stands for Gamma and N stands for Normal distribution. H and F indicates Home and Foreign, respectively. SS denotes the steady state and SD the standard deviation.

Table E.4: **Estimation with Inflated Priors: Shocks**

Parameter	Description	Prior			Posterior	
		Dist.	Mean	SD	Mean	[5, 95]
ρ_g	AR H Preference	B	0.70	0.15	0.98	[0.96, 0.99]
ρ_g^*	AR F Preference	B	0.70	0.15	0.94	[0.90, 0.98]
ρ_ξ	AR H Cost-Push	B	0.70	0.15	0.67	[0.56, 0.78]
ρ_ξ^*	AR F Cost-Push	B	0.70	0.15	0.91	[0.86, 0.96]
ρ_ϱ	AR Risk Premium	B	0.70	0.15	0.97	[0.95, 0.99]
σ_ν	SD H Monetary Policy	IG	0.25	Inf	0.30	[0.27, 0.34]
$\sigma_{\nu*}$	SD F Monetary Policy	IG	0.25	Inf	0.36	[0.32, 0.40]
σ_g	SD H Preference	IG	0.25	Inf	4.20	[3.21, 5.12]
σ_{g*}	SD F Preference	IG	0.25	Inf	2.04	[1.60, 2.49]
σ_ξ	SD H Cost-Push	IG	0.25	Inf	0.39	[0.29, 0.49]
$\sigma_{\xi*}$	SD F Cost-Push	IG	0.25	Inf	0.11	[0.07, 0.16]
σ_ϱ	SD Risk Premium	IG	0.25	Inf	0.69	[0.43, 0.96]

Note: B stands for Beta and IG stands for Inverted Gamma distribution. AR indicates AR(1) coefficient and SD the standard deviation of innovation. H and F denote Home and Foreign, respectively.