The slope of the consumer-price Phillips Curve

Replication Results

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In a N multi-sector economy with a general input-output network, following the methodology described in Rubbo (2023), the Phillips' curve at time t as a function of the underlying production primitives is given by:

$$\bar{\pi}_t^{\phi} = \rho\phi^T (I - \mathcal{V})\, \mathbb{E}\pi_{t+1} + \kappa^{\phi} (\gamma + \varphi)\, \tilde{y}_t + u_t^{\phi} \tag{1}$$

where $\bar{\pi}t^{\phi}$ denotes the aggregate price index, computed as a weighted average of sectoral inflation rates with weights given by $\phi^T = (\phi_1, \ldots, \phi_N)$; $\tilde{y}t$ is the current output gap; $\mathbb{E}\pi_{t+1}$ represents expected future inflation; γ captures the wealth effect on labor supply; and φ is the inverse Frisch elasticity. The matrix $\mathcal{V}$ satisfies the conditions $\sum_j \mathcal{V}_{ij} = 0$ and $(I - \mathcal{V})_{ij} \in [0, 1]\ \forall i, j \in N$.

In particular, the slope κ^{ϕ} is also an average of the sectoral ones, and it is given by[1]:

$$\kappa^{\phi} = \frac{\delta^{\phi}\alpha}{1 - \delta^{\beta}\alpha} \tag{2}$$

where the aggregation operator δ^{ϕ} is equal to $\phi^T\Delta(I - \Omega\Delta)^{-1}$[2].

In the case of the consumer-price Phillips Curve, the slope depends only on the pass-

[1] Where β is the $N \times 1$ vector of sectoral expenditure shares in total consumption, and α is the $N \times 1$ vector of sectoral labor shares in total sales.

[2] Where Δ in the diagonal matrix containing the sector-level price adjustment probabilities (see Pasten et al. (2017)) and $\Omega \in \mathbb{R}^N \times \mathbb{R}^N$ is the input-output matrix, where its elements $\Omega_{i,j}$ represents the expenditure share on input j in i's total sales.

through of wages into consumer prices, and it is given by:

$$\kappa^C = \frac{\delta^\beta \alpha}{1 - \delta^\beta \alpha} (\gamma + \varphi) \tag{3}$$

In Figure 1 below, the blue line shows the slope of the consumer-price Phillips Curve implied by equation 3, computed annually from 1997 to 2017 using input-output tables provided by the BEA. The calibrated slope is consistently close to zero, aligning with the established literature on the flattening of the Phillips curve (e.g., Coibion et al., 2013; Coibion, Olivier and Gorodnichenko, Yuriy, 2015; Blanchard, 2016; Hooper et al., 2020).

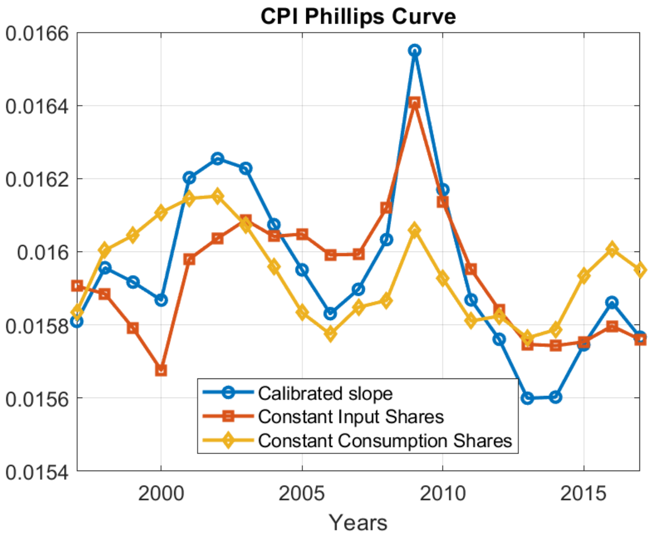

Figure 1: Evolution over time of the slope of the consumer-price Phillips Curve

Figure 1 also plots the slopes under constant input shares (red line) and constant consumption shares (yellow line)[3], enabling us to assess whether the input–output structure meaningfully shaped the Phillips curve from 1997 to 2017. Although the three lines exhibit a similar overall pattern – and differ only marginally – changes in consumption shares appear to have played a more significant role than shifts in intermediate input flows, as evidenced by the near one-to-one correspondence between the blue and red lines. This largely reflects the higher share of services (compared to manufactured goods) in consumers' expenditure.

[3] Yearly values are replaced by their mean over the entire period. In constant input shares case, the aggregation operator is $\beta_t^T \Delta \left(I - \Omega_{mean} \Delta\right) \alpha_{mean}$. In constant consumption shares case, the aggregation operator is $\beta_{mean}^T \Delta \left(I - \Omega_t \Delta\right) \alpha_t$.

References

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