Optimal Inflation Target in Ukraine: A Model-Based Perspective

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Inflation Targeting in Emerging Economies – National Bank of Ukraine
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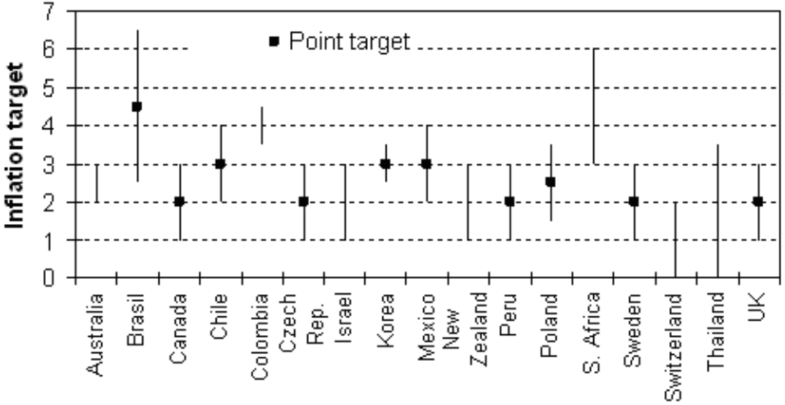
Inflation Targeting across Countries



Source: Horváth and Mateju (2011).

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- Many developed countries target inflation (just below) 2% – is this consistent with the trade-off?
- For the US, models say yes! *(Coibion, Gorodnichenko and Wieland, 2012)*

What about optimal target for Ukraine?

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- What about Ukraine? Given the high degree of openness, foreign shocks are likely to be important

A Small Open Economy NK Model

Households

- Maximize $\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[\ln C_t - \frac{N_t^{1+\varphi}}{1+\varphi} \right]$ subject to the budget constraint:

$$P_t C_t + D_t + \varepsilon_t D_t^* \leq W_t N_t + D_{t-1}(1+i_{t-1}) q_{t-1} + \varepsilon_t D_{t-1}^* (1+i_{t-1}^*) + \Pi_t - T_t, \quad \forall t$$

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

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  - If importers monopolistically competitive, face a Calvo lottery, which can be calibrated to match the empirical degree of exchange rate pass-through

Government: central bank and fiscal authority

- Interest rate rule:

$$\tilde{i}_t = \rho_{i1}\tilde{i}_{t-1} + \rho_{i2}\tilde{i}_{t-2} + (1 - \rho_{i1} - \rho_{i2})(\bar{\tilde{i}} + \phi_\pi(\pi_t - \overline{\pi}) + \phi_y(y_t - \overline{y})) + \epsilon_t^i$$

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Calibration strategy

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- Direct OLS estimation (can also use 2SLS):

$$\ln \frac{P_{F,t} C_{F,t}}{P_t C_t} = \textbf{-0.33}^{***} + \textbf{0.50}^{***} \times \ln \left(\frac{P_{F,t}}{P_t} \right)$$

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- Implies $\eta = 0.50$

Calibration strategy: foreign output and inflation

- Approximate Foreign country by the EU
- Use cyclical component of total EU GDP to estimate foreign output AR(1) process:
$$\hat{Y}_t^* = \mathbf{0.89}^{***}\hat{Y}_t^*, \quad \sigma_{Y^*} = 0.003$$
- Similarly, estimate a process for foreign inflation:
$$\hat{\pi}_t^* = \mathbf{0.51}^{***}\hat{\pi}_t^*, \quad \sigma_{\pi^*} = 0.007$$

Calibration strategy: interest rate rule

- Use Ukrainian quarterly macro data (2016Q1-2020Q4) to directly estimate the interest rate rule for Ukraine

$$\tilde{i}_t = \mathbf{1.16} \times \tilde{i}_{t-1} - \mathbf{0.32} \times \tilde{i}_{t-2} + \mathbf{0.23} \times (\pi_t - \overline{\pi}_t) + \mathbf{0.02} \times (y_t - \overline{y})$$

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- Implies $\phi_\pi = 1.45, \phi_y = 0.14$ and $\sigma_{e^i} = 0.002$

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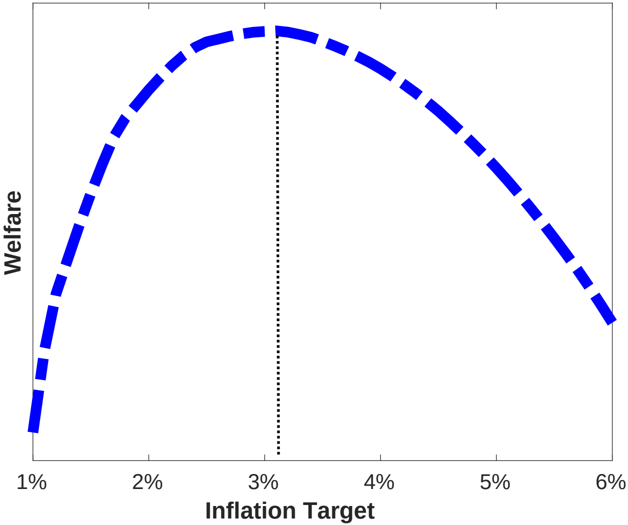
- Technology and cost-push processes calibrated to match observed persistence and variances of output and inflation

Calibration strategy: the rest

- Import share: $\alpha = 0.35$ (NBU calculations)
- Frisch elasticity: $\frac{1}{\varphi} = 1$
- Calvo parameter: $\theta = 0.55$ (Coibion et al. 2012)
- Within-sector elasticity: $\epsilon = 10$ (Coibion et al. 2012)
- Discount factor: $\beta = 0.995$ (steady-state real rate of 2%) (Grui, Lepushynskyi and Nikolaychuk, 2018)

Initial results

Optimal Inflation Target for Ukraine



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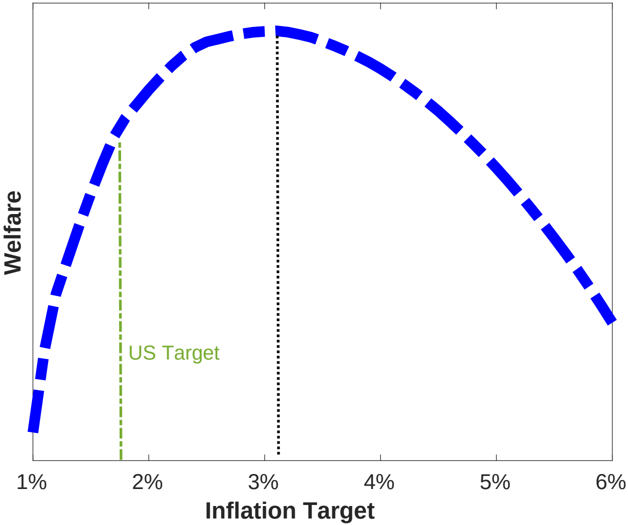
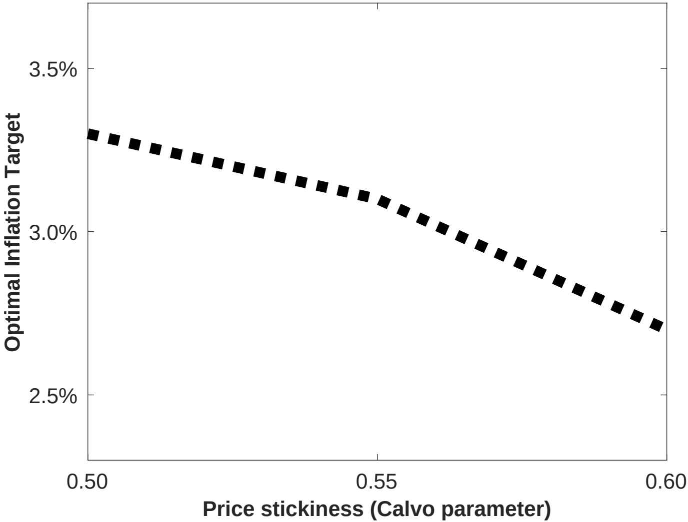
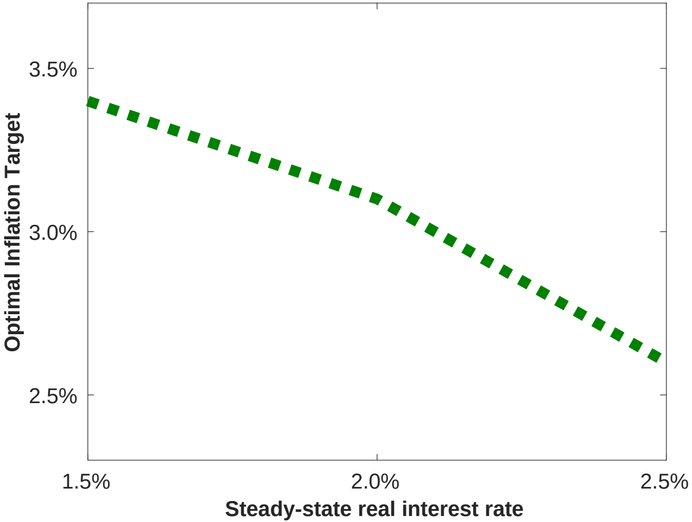


Varying the frequency of price adjustment



Varying the steady-state real rate



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    - Need better micro understanding of Ukrainian labor market(s) and their mobility to make advanced

Conclusion

- Optimal inflation target is pinned down by the trade-off between:
  - The productive distortions caused by sticky prices and their dispersion ($\uparrow$ with π)
  - The probability of the nominal interest rate reaching the lower bound ($\downarrow$ with π)
- Initial results to quantify the optimal inflation target for Ukraine, in the context of a small open economy New Keynesian model
- Need more work with Ukrainian **micro** data to make quantitative advances
- Comments welcome!