MCM
more than
50 years of
experience

Monetary Policy Challenges Facing Small Open Economies

NORGES BANK FRAMEWORK REVIEW CONFERENCE 2026
MARCH 2, 2026

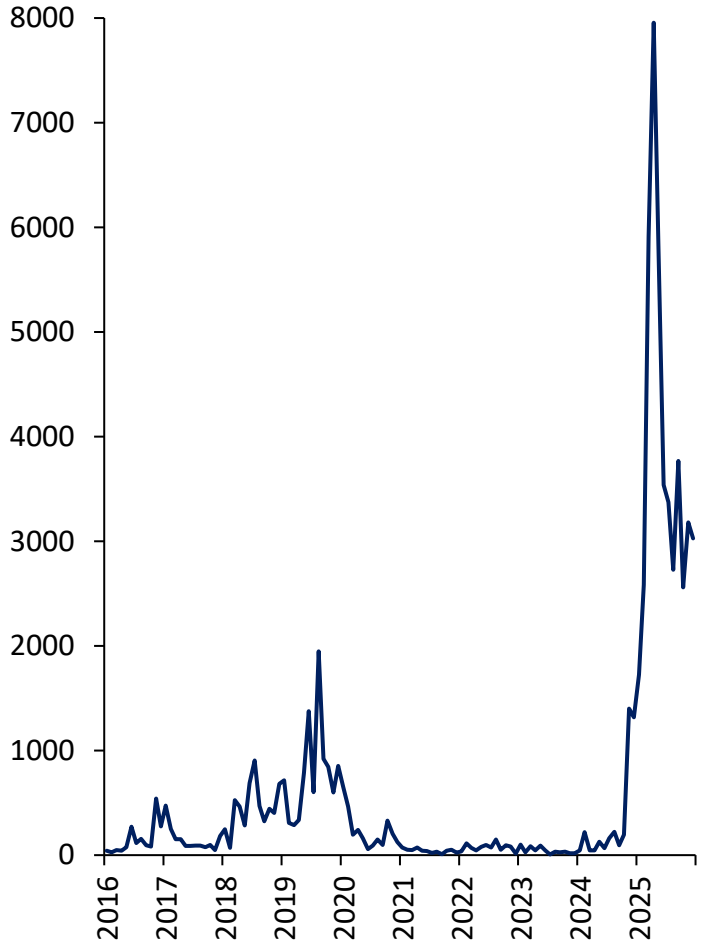
Christopher Erceg
International Monetary Fund

The views expressed here are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management

More shock prone environment

- Central banks face environment of larger shocks including on supply side:
  - Bigger trade shocks and re-routing of global supply chains; greater geopolitical risks; climate/food
  - Small open economies particularly exposed
- While more sources of upside inflation risk, a return to the ELB remains a significant possibility
  - R* low for many countries
  - Geopolitics/trade may operate as adverse demand shocks
  - May see bigger flight-to-safety flows to SOEs

Trade Policy Uncertainty



Sources: Baker, Scott R.; Bloom, Nick; Davis, Steven J. via FRED

Outline of discussion and key takeaways

- Central banks need a robust framework to address “two-sided” inflation risks
- Begin by **focusing on upside inflation risk**
  - How should CBs respond to large supply shocks, and when should they “look through”?
  - When does it make sense to use FXI to respond to capital flow pressures?
- I’ll argue that “looking through” is often reasonable, but a **more aggressive response may be needed in face of large shocks**, especially if:
  - Shock persistence uncertain, inflation has been running high, or in a hot economy
- **FXI may be useful** in some circumstances, but with a high bar
- Our analysis highlights the risk of putting too much weight on point forecasts of inflation (Gopinath, 2024; Schnabel, 2024)

Outline of discussion and key takeaways

- Then will turn to **tools for providing macro stimulus when the ELB becomes binding, focusing on QE and FXI**
    - The use of these tools has been criticized for fueling overheating and precipitating large CB losses (Orphanides 2024 and Eggertsson and Kohn 2024)
- I argue that these tools can play a useful role in a deep liquidity trap, especially if limited fiscal space.
- More reason for caution in a shallow liquidity trap, as they provide less stimulus with more risk of overheating and CB losses.

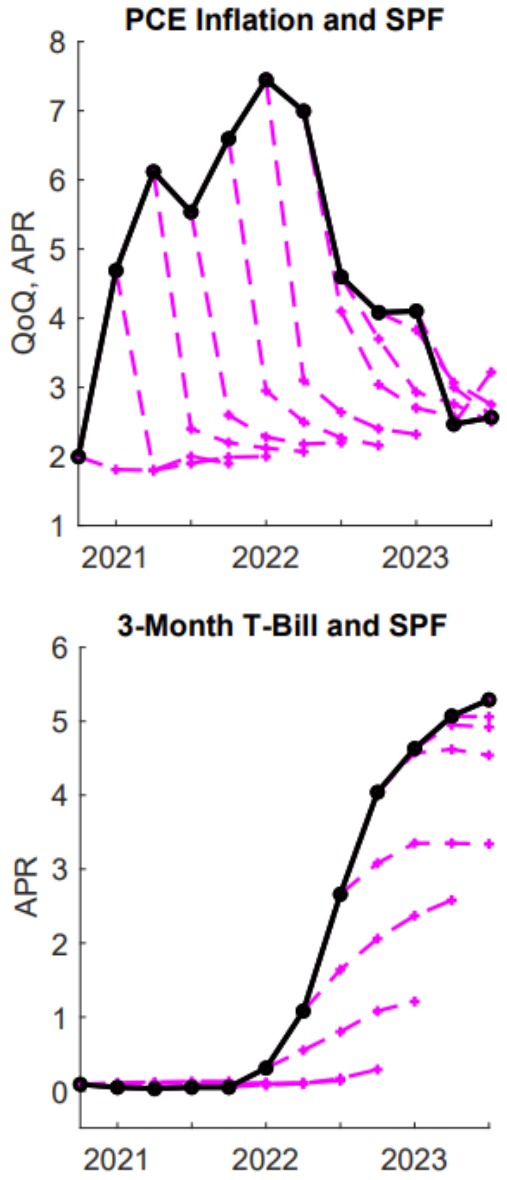
Supply shocks and upside inflation risks

Pre-Crisis view of transmission

- Pre-crisis view of transmission through Phillips Curve supported by voluminous empirical evidence
  - Phillips Curve linear with low slope
  - Little intrinsic inflation persistence, so shocks die out quickly
- **Provided strong rationale for "looking through" supply shocks**
  - Reduced the risk of costly recession
- Well captured by forecast-based rule responding to expected inflation

Lessons from inflation surge

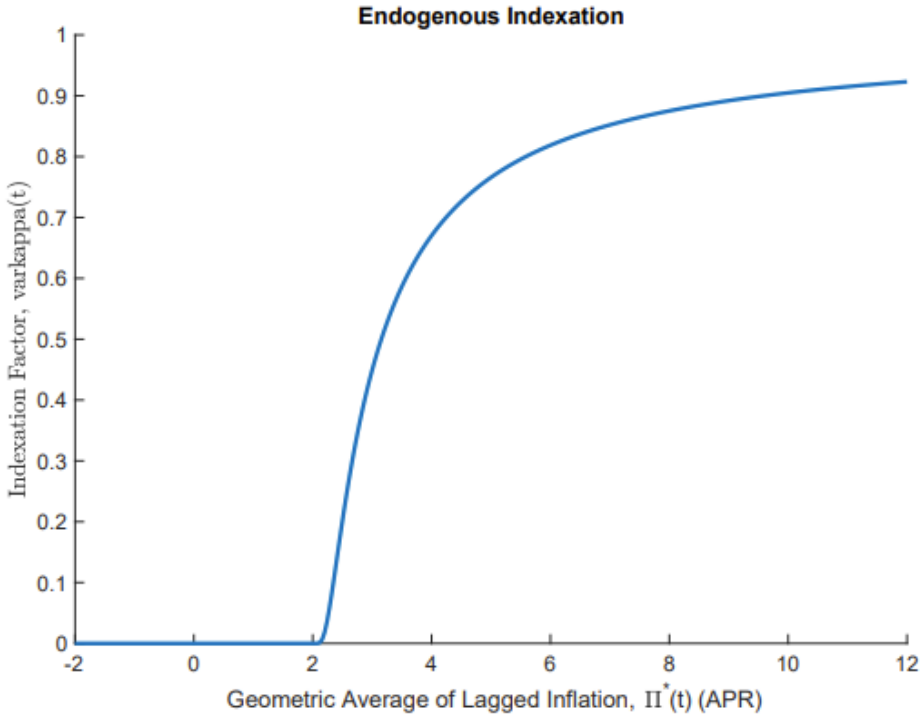
- Inflation surge was a surprise to policymakers and forecasters, and has forced a rethink of the Phillips Curve and standard policy prescriptions
- #1 Phillips Curve may have significant nonlinearities so large shocks have amplified effects (WEO, 2025)
- #2 Intrinsic persistence may rise in periods of high inflation/hot economy (BIS paper on two regimes for inflation by Borio et al, 2023))
- Problems can be amplified if there are misperceptions about shock persistence and policymaker follows a forecast-based rule.



Source: IMF Working Paper, Erceg and others (2024)

ELT model of surge

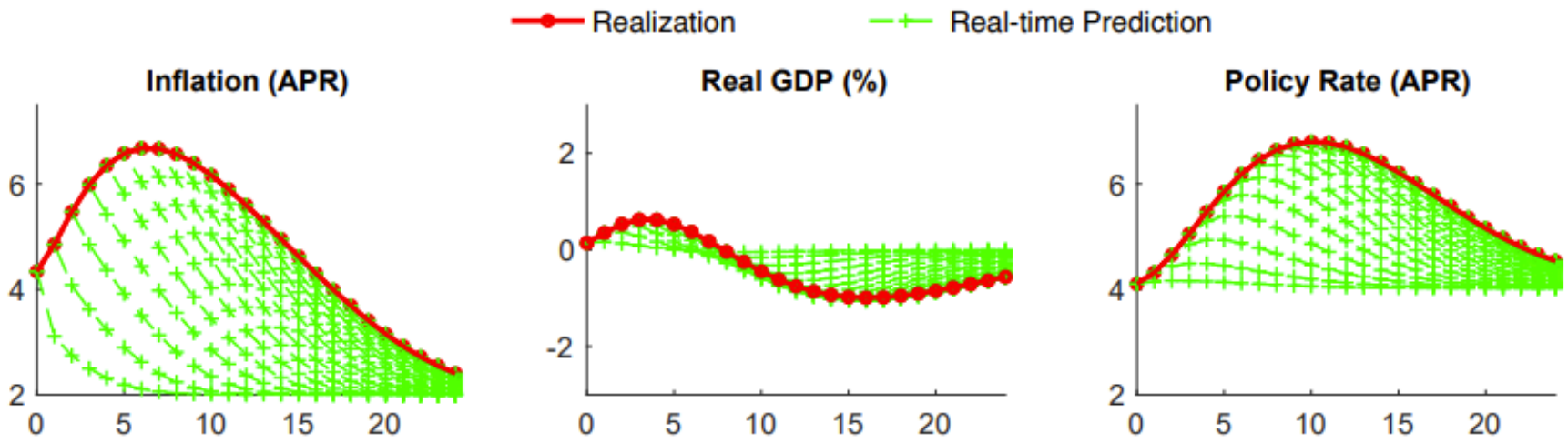
- In Erceg, Linde, Trabandt (2024), we build a DSGE model that accounts for key facets of inflation surge
- Model has several key features:
  - Allows for “misperceptions” about persistence of supply shocks
  - Central bank follows inflation forecast-based Taylor rule
  - Nonlinear Phillips Curve (Kimball 1995 and Harding, Linde, Trabandt 2023)
  - Endogenous price/wage indexation: rises if inflation persistently above target



Source: IMF Working Paper, Erceg and others (2024)

Transmission of large cost-push shocks

- Here we consider a highly persistent cost-push shock that is misperceived as transient
- Given misperceptions and the inflation forecast-based rule, **output actually rises in the near-term** and the inflation response is hump-shaped
  - Big differences from standard linear model with shocks correctly perceived

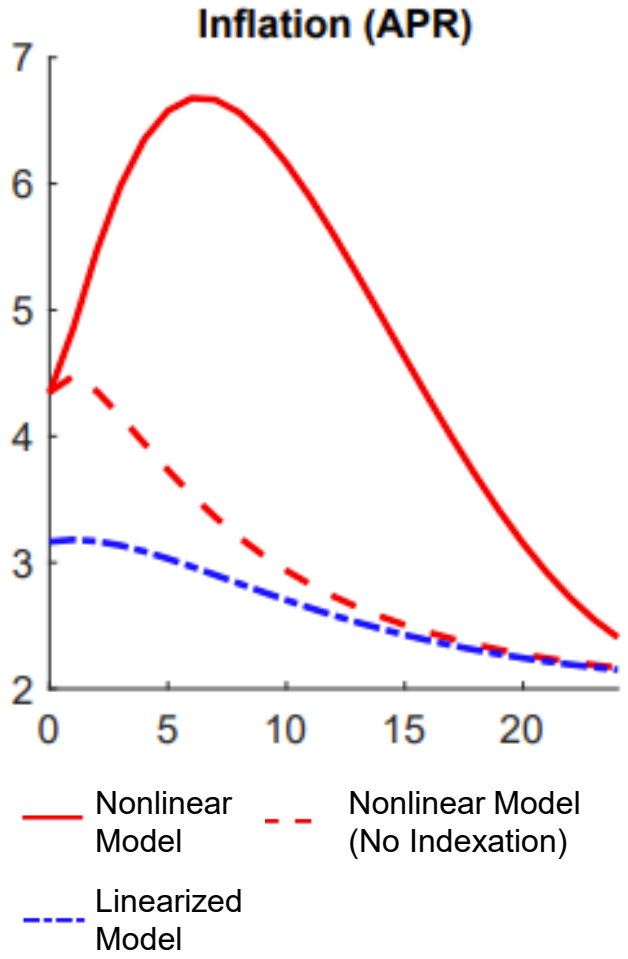


Source: IMF Working Paper, Erceg and others (2024)

Policy implications

- The humped-shaped response is much more likely if shocks are large, and/or under initial conditions of high inflation/hot economy
- Under these conditions, it may be desirable to react more forcefully to the supply shock(s) to keep these inflationary dynamics from taking hold
- Conversely, the standard prescription of "looking through" makes sense if shocks modest and size and initial conditions near steady state.

Markup shock perceived as transitory



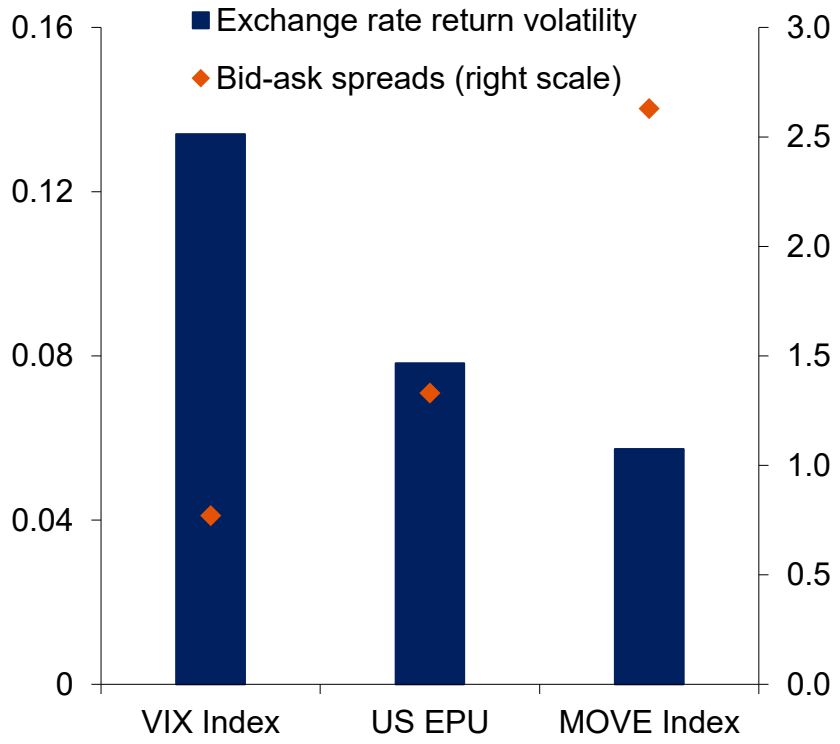
Source: IMF Working Paper, Erceg and others (2024)

Open economy shocks

- Similar logic applies to other open economy supply shocks, such as to oil/commodity prices or trade policy actions.
    - Caution about "looking through" if shock(s) large and initial conditions problematic
- Currency risk premium shocks (or "UIP shocks") are of particular interest, may become bigger in environment of greater policy uncertainty (GFSR, 2024)
- UIP shocks look like aggregate demand shocks if modest in size and economy near steady state, moving output and inflation in same direction; but more challenging if UIP shocks large.

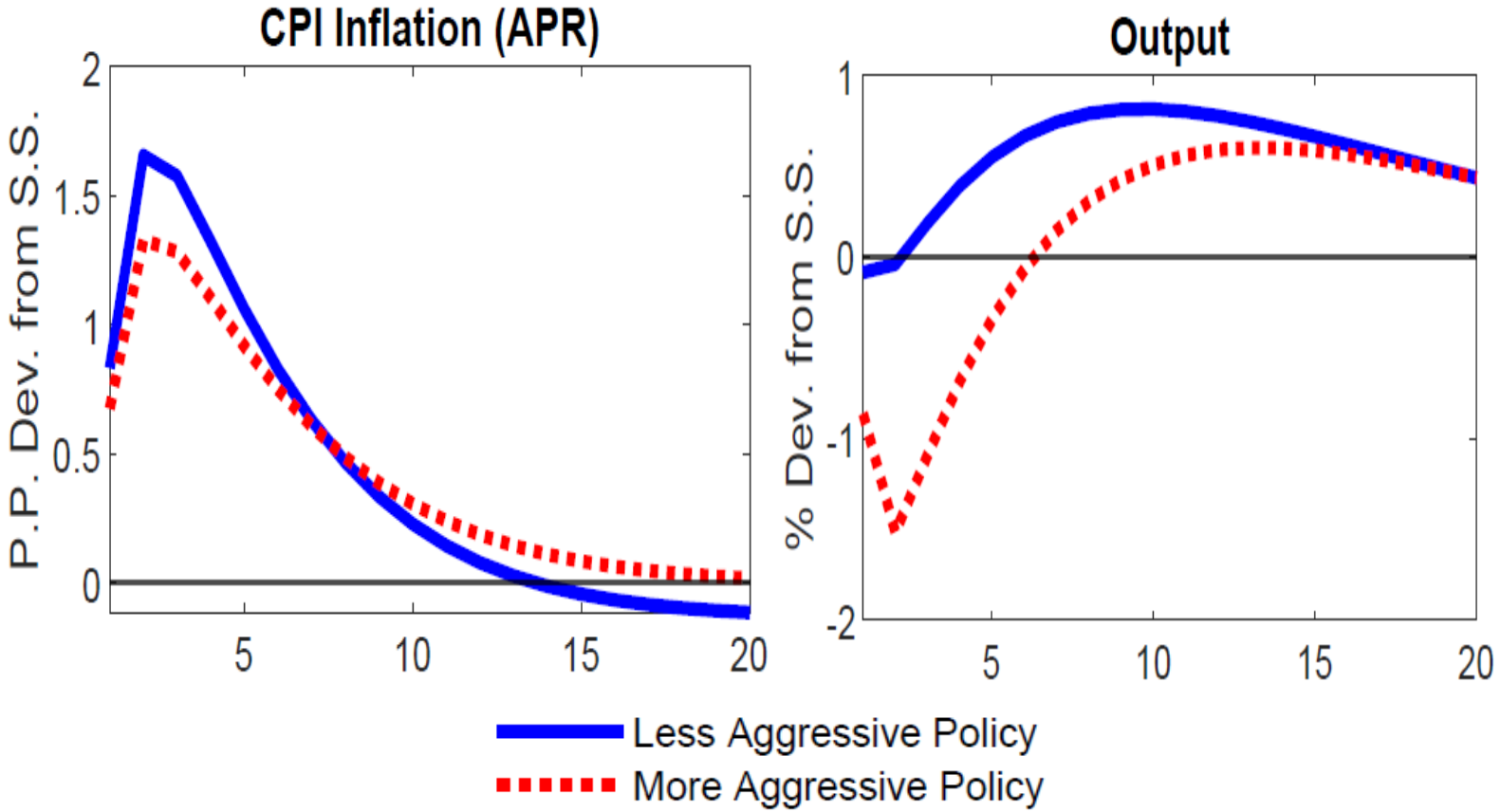
Effect of an Increase in Macrofinancial Uncertainty on Foreign Exchange Market Conditions

(percentage points, left scale; basis points, right scale)



Source: IMF GFSR October 2025

May need to change policy reaction function when large/persistent UIP shocks



- QIPF simulation: UIP shock under conditions of high intrinsic persistence
  - UIP shocks looks like adverse supply shocks
- Linderoth and Meuller(2024) find strong regime-dependence of passthrough
- **Even more aggressive response may be desirable in former case**

When to use FXI?

- While SoEs have typically relied on the policy rate to achieve stabilization goals, an important question is when it may be useful to also utilize FXI.
  - IMF staff have looked extensively into this question, producing a detailed policy note (December 2023).
  - Staff have applied the framework to many country cases in Article IVs.
- Note suggests three "uses cases" in which deploying FXI may be appropriate

CASE A	**To smooth destabilizing premia in shallow FX markets** (e.g., from investor flight that raises the UIP premium)
CASE B	**To counter risks from unhedged FX mismatch**
CASE C	**To mitigate price stability risks from a de-anchoring of inflation expectations**

When to use FXI (con't)?

- Develop a several principles for FXI use linked to the use cases:
  - Should ground the intervention in one or more of the use cases
  - Only deploy when shocks large and materially threaten attaining CB objectives
  - Don't use as substitute for warranted adjustments in fiscal or monetary policy (e.g., don't use FXI to make up for unsustainable fiscal policies)
  - Make sure that FXI is integrated into the overall policy response (e.g., complemented with policy rate adjustment)

When to use FXI (con't)?

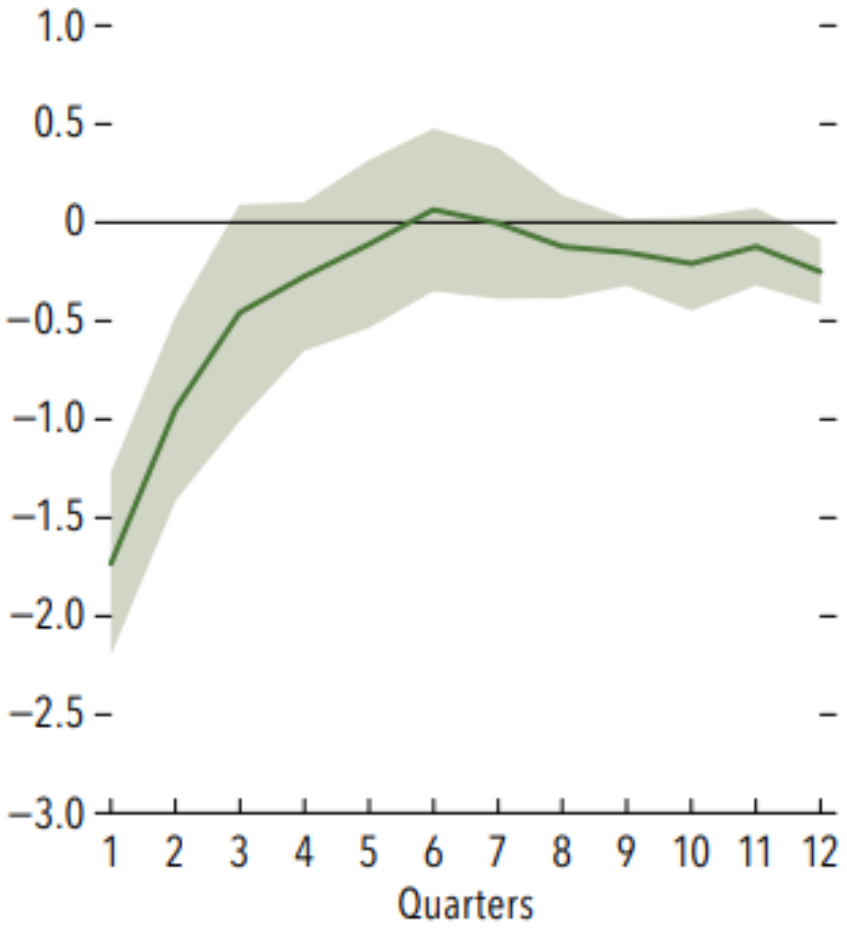
- An upshot is that allowing exchange rates to adjust flexibly and relying on the policy rate to achieve objectives is typically optimal in response to real shocks, such as to commodity prices, tariffs, etc.
- Given that FX markets are usually deep in SOEs and inflation expectations well anchored, **the use of FXI typically not desirable even for UIP shocks**
  - Recall it looks like an AD shock, so just use the policy rate
- However, FXI may be useful in shallow markets when UIP shocks are large and inflation expectations are at risk of de-anchoring
  - In case of adverse UIP shock, lessens need for costly policy tightening

Policy Options at ELB

Significant risk of hitting ELB in medium-term

- R* low for many SoEs, limiting policy space
- "New" sources of shocks from trade/geopolitics may have disproportionate effects on SOEs
- May see bigger flight-to-safety flows if investors turn move away from reserve currency issuers
- Inflation expectations could decline further reducing policy space

Effect of Higher Foreign Policy Uncertainty on Growth-at Risk



Source: IMF GFSR October 2024

UMP Tools can be helpful but..

- UMP tools -- including QE and negative interest rates -- were used by many CBs, including SOEs, to provide macroeconomic stimulus when the ELB became binding. The SNB and Czech National Bank also used FXI.
- However, in wake of inflation surge, balance sheet policies (QE and FXI) have come under significant criticism
    - May have contributed to overheating (Orphanides, 2023; Eggertsson and Kohn, 2023)
    - Exposed central banks to significant balance sheet losses that could weaken CB credibility
- Important to **reconsider the conditions when QE/FXI likely to be warranted** as well as implementation and communication
    - Only use QE in deep recessions? More escape clauses?

Model overview

- Use open economy DSGE model of Kolasa et al (2024) to assess effects of QE.
  Many NK features: sticky prices/wages, habit, and local currency pricing of imports

- **Incorporate bond market segmentation** to allow QE to have real effects
  (Andres et al., 2004; Chen et al., 2013):
  - "Financially Restricted" households: trade only in long-term bonds, which are perpetuities with geometrically decaying coupons (Woodford, 2001). LT bonds can be home or foreign.
  - "Financially Unrestricted" households HHs : trade in long-term bonds subject to portfolio frictions and also trade in short-term bonds.

- **Behavioral discounting** (Gabaix, 2020) to address FG puzzle and **nonlinear Phillips Curve** (Harding et al., 2023) to capture risks of overheating

- Fiscal block includes labor and consumption taxes.

Portfolio frictions (closed economy for intuition)

- All households maximize a utility functional given by:

$$U_t^j = \mathbb{E}_t^j \sum_{s=0}^{\infty} \beta_j^s \exp\{\varepsilon_{t+s}^d\} \left[\exp\{\varepsilon_{t+s}^c\} \log(c_{t+s}^j - \varkappa \bar{c}_{t-1+s}^j) - \frac{(n_{t+s}^j)^{1+\varphi}}{1+\varphi} \right]$$

- Unrestricted households face the budget constraint:

$$P_t \left(1+\tau_t^c\right) c_t^u + B_t^u + \left(1+\zeta_t\right) P_{L,t} B_{L,t}^u + T_t^u$$

$$= R_{t-1} B_{t-1}^u + \left(1+\kappa P_{L,t}\right) B_{L,t-1}^u + W_t \left(1-\tau_t^n\right) \bar{n}_t^u + D_t^u + \Xi_t^u$$

- The portfolio friction ("tax" on long-term bonds) facing unrestricted agents is given by:

$$\frac{1+\zeta_t}{1+\zeta} = \left(\frac{b_{L,t}^u}{b_L^u} \right)^{\xi}$$

- Restricted households face the same budget constraint except they face no portfolio frictions on long-term bonds and can't hold short-term bonds

How QE raises aggregate demand

- The foc for LT bonds for **unrestricted agents**:

$$1 = \beta E_t \frac{c_t^u}{c_{t+1}^u} \left\{ \frac{P_{L,t+1} R_{L,t+1}}{P_{Lt} \Pi_{t+1}} \right\} \frac{1}{\zeta_t}$$

- **For restricted agents**, the foc for LT bonds is:

$$1 = \beta E_t \frac{c_t^r}{c_{t+1}^r} \left\{ \frac{P_{L,t+1} R_{L,t+1}}{P_{Lt} \Pi_{t+1}} \right\}$$

- An asset purchase by the CB reduces the portfolio friction ζ_t ("tax") experienced by the unrestricted agents, reducing the term premium and long-term bond yield.

- The lower long-term bond yield in turn induces restricted agents to increase their consumption, which stimulates domestic demand.

QE in open economy

- Given that agents can invest in long-term bonds in either jurisdiction, the holding period return must be equalized when expressed in a common currency:

$$R_{L,t+1} = R^*_{L,t+1} + \Delta S_{t+1}$$

- **This "long-term UIP" equation implies that QE causes** an expected appreciation of the home currency (i.e., $\Delta S_{t+1} < 0$), since the foreign yield is fixed

- This translates into a **home currency depreciation today** which is a key component of the stimulus from QE

Policy rules and calibration

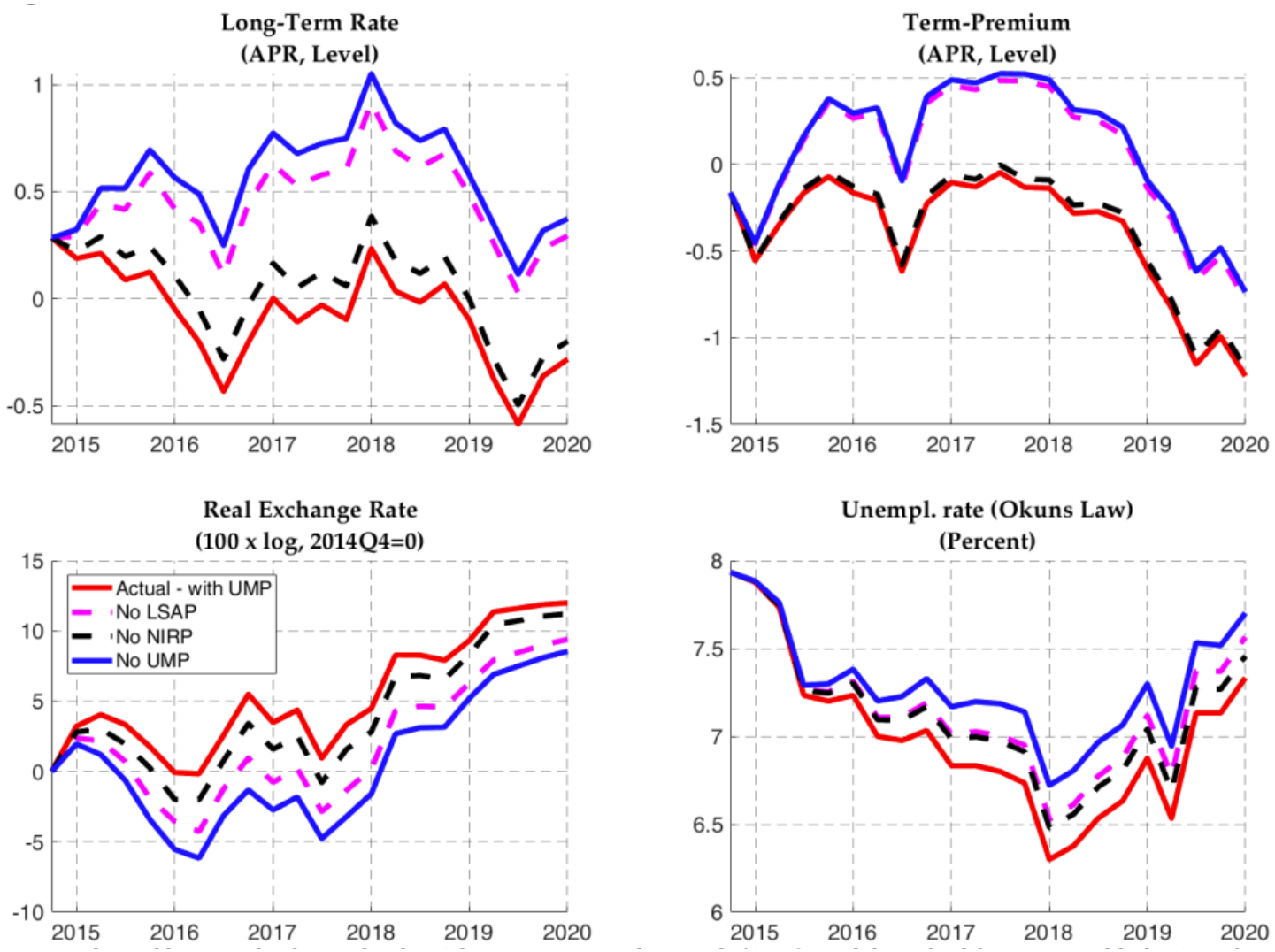
- Taylor-type simple instrument rule for short-term rate subject to an effective lower bound (here normalized to 0):

$$R_t = \max\left\{1, \tilde{R}_t\right\}, \qquad \frac{\tilde{R}_t}{R_t^*} = \left(\frac{\tilde{R}_{t-1}}{R_{t-1}^*}\right)^{\gamma} \left[\left(\frac{\pi_t^{yoy}}{\pi}\right)^{\gamma_\pi} \left(\frac{y_t}{y_{t-1}}\right)^{\gamma_y}\right]^{1-\gamma} \exp\{\varepsilon_t^r\}$$

- **QE follows an autoregressive process** with an exogenous shock
- Distortionary tax on labor income and consumption with very low adjustment of the labor tax in response to government debt
- QE: Bond market segmentation parameters calibrated so that **10 percent of GDP CB purchase reduces term premium about 80 basis points** (based on Swedish data)
  - Share of restricted households 20 percent and portfolio cost elasticity .02
- Steady state tax rates, debt/GDP, debt duration based on averages for Sweden

QE in a deep liquidity trap

QE in a Deep Liquidity Trap in Sweden

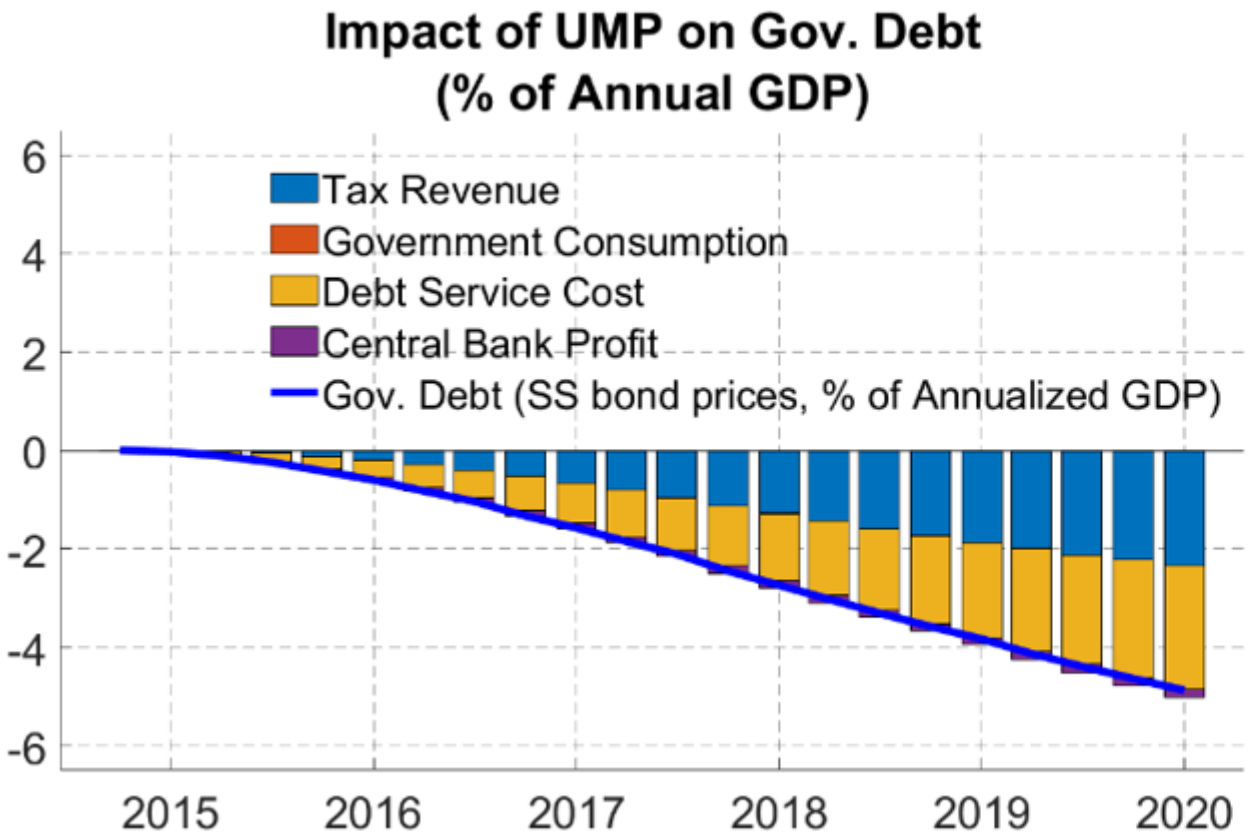


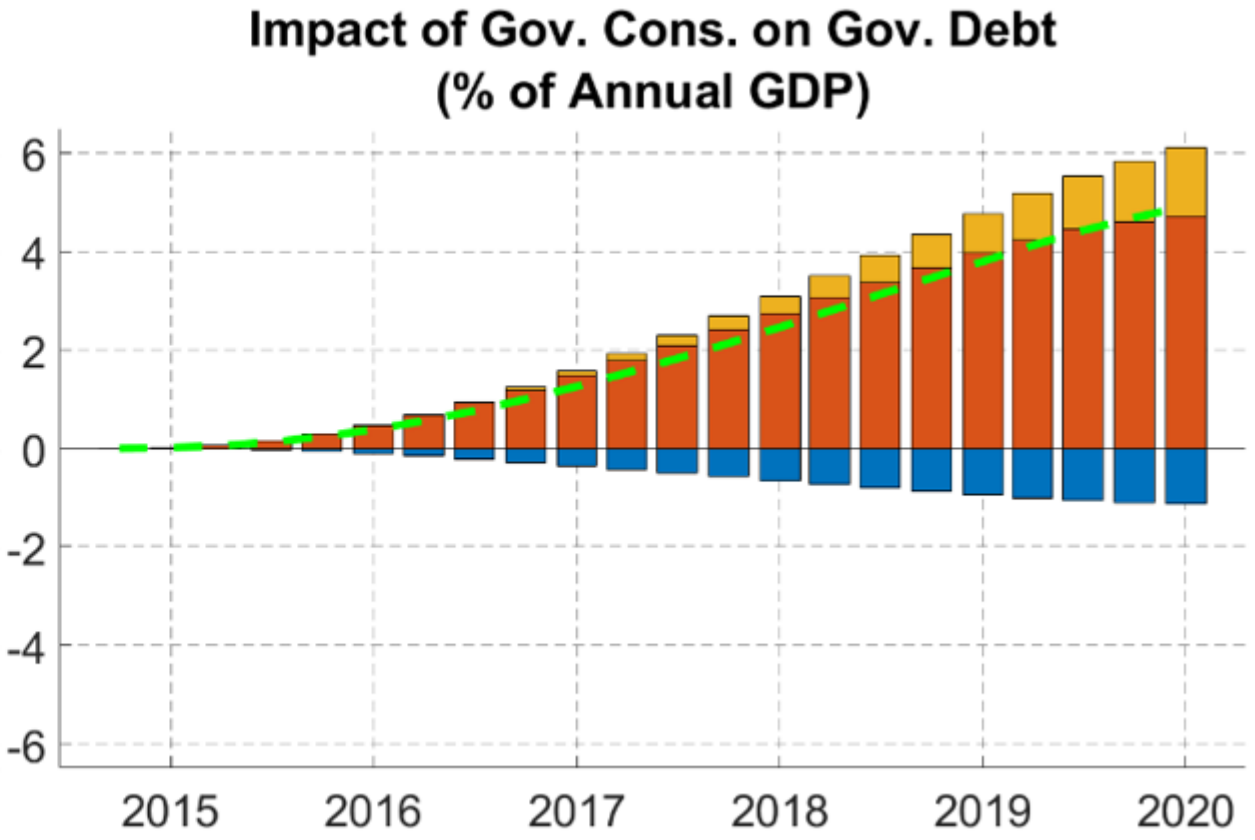
- Taken from Kolasa et al (2025): simulate implications of QE of about 8 percent of GDP
- Depresses term premium 60-70 basis points on long-term bonds, boosting output and lowering unemployment
- Real exchange rate depreciation a key transmission channel

Source: Sveriges Riksbank Working Paper, Kolasa and others (2025)

QE versus fiscal expansion

- Kolasa et al (2025). Compare effect on government debt of QE/NIRP and fiscal stimulus (same output boost). Central bank profits rise under the former, though effects small.



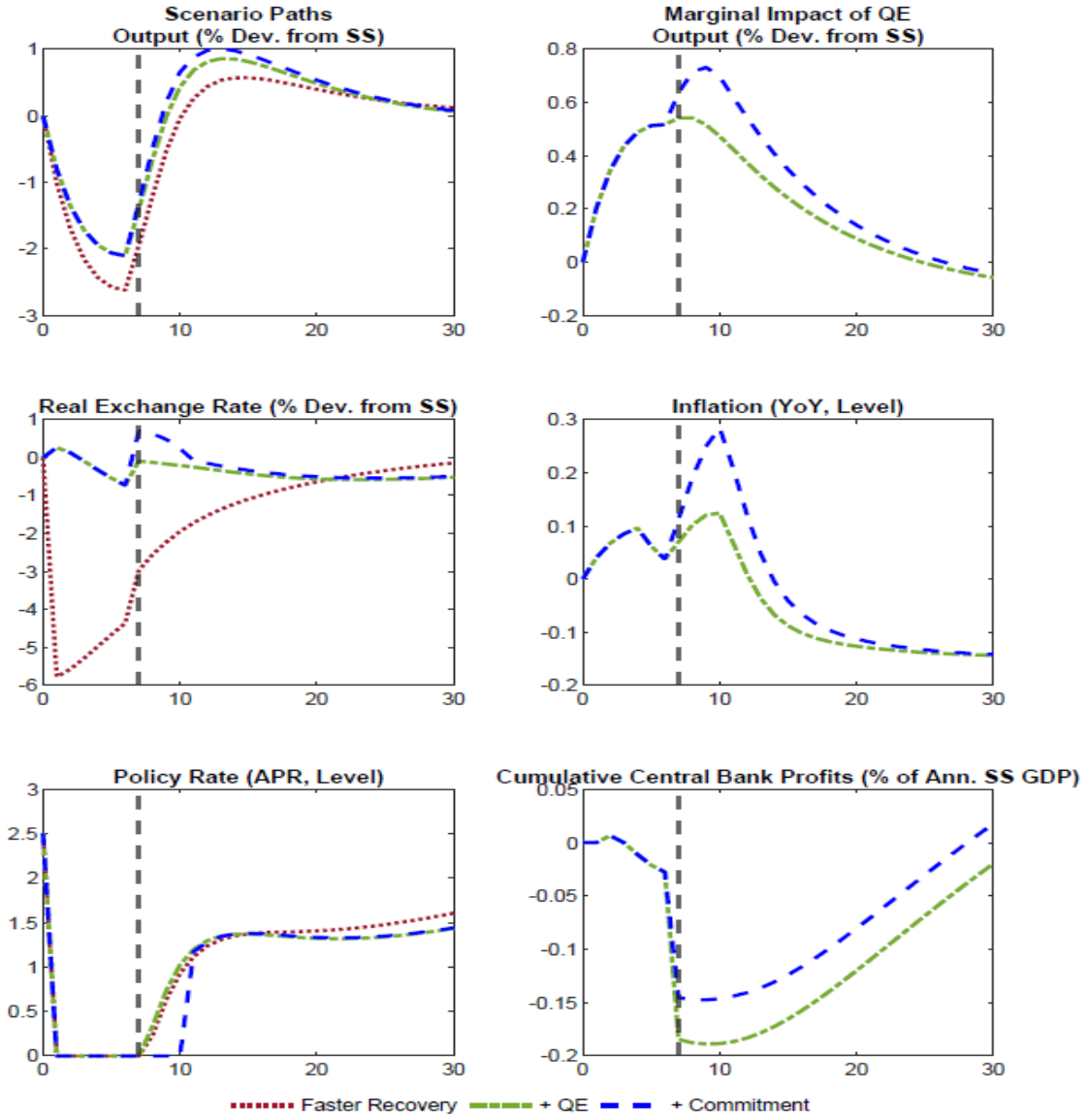


Source: Sveriges Riksbank Working Paper, Kolasa and others (2025)

Deep versus shallow liquidity trap (Adrian et al, 2025)

- In deep liquidity trap, the implications of QE are quite robust to alternative scenarios involving faster recoveries
  - Output converges to potential more quickly, but overheating unlikely
  - Strong improvement in consolidated fiscal position (that includes CB profits/losses), even if CB does experience some losses
- More reason for caution in “shallow” liquidity trap
  - Less macro stimulus
  - More risk that QE generates macro overheating
  - More risk of CB losses that may adversely affect CB credibility
- Must also take account of other QE costs (market function, financial stability risks when exiting as highlighted by e.g., Acharya and Rajan 2024)

FG Commitment can Exacerbate QE Overheating Risks



- QE often accompanied by forward guidance that rates will be unlikely to rise for some time after QE ends.
- If CB feels "locked into" keeping policy rates low even when it would otherwise raise them, this can trigger more overheating.
- This is shown in the figure, where QE "with commitment" exacerbates output overheating
- Escape clauses can be very helpful

Note: Simulation based on model in Sveriges Riksbank Working Paper, Kolasa and others (2025)

QE versus FX intervention at ELB

FXI when ELB binds

- Several central banks, including the SNB, CNB, and BoI, used FXI for macro stimulus when ELB was binding
- Did so against backdrop of concern about persistently low inflation and de-anchoring of inflation expectations
- Why FXI rather than QE?
  - Didn't see much scope to affect domestic demand via lower rates given small govt and corporate bond markets and low term/risk premiums

Swiss Franc per Euro

Source: Haver Analytics; Swiss National Bank

Transmission channels FXI vs. QE

- Consider the transmission channels to output/inflation:
  - Recall that QE stimulates output through raising domestic demand (from lower LT interest rates) and boosting net exports (as exchange rate depreciates). So similar to conventional policy.
  - FXI works by lowering the UIP premium, which stimulates net exports. In normal times, the induced rise in nominal rates would crowd out domestic demand.
  - **But in prolonged liquidity trap, FXI can look similar to QE.** With policy rates at ELB, real rates decline, so domestic demand rises; and the exchange rate channel is powerful under QE as noted earlier (Cwik and Winter, 2024; Kolasa, Laseen, Linde, 2024).

Using FXI for macro stimulus

- **May entail very large balance sheet expansions to have much effect** on exchange rate, output, and inflation, especially outside deep liquidity trap:
  - CW 2024 find that FXI purchases of 5 percent of GDP depress the exchange rate by 0.8 percent in 2 year trap.
  - More effective in deeper trap (since forward rates don't rise as much).
  - Considerable risk of balance sheet losses if purchased currency depreciates.
- Overall, probably makes sense to confine **mainly to deep liquidity trap and when FX markets are fairly shallow** so FXI purchases can move the exchange rate a lot.

Scenario Analysis

Scenario analysis

- Scenario analysis increasingly important in more shock-prone environment (Bernanke, 2024)
- Can use stochastic sims to consider the implications of different reaction functions for the distribution of outcomes
  - Important especially when initial conditions further from steady state and nonlinearities more likely to kick in
- Better assessment of risks of policy actions (especially UMP) facilitates transparency and accountability

4. Concluding Remarks

Conclusions

- “Looking through” supply shocks is often reasonable when inflation is close to target, and the shocks are modest in size and very likely transient.
- But a **more aggressive response may be warranted in the face of large shocks,** especially if persistence is uncertain, inflation has been running high, or in a hot economy.
- FXI may be useful in limited conditions, but with a high bar

- **On ELB:**
- Strong rationale for QE in a deep liquidity trap. Sizeable stimulus, even in faster recovery scenario, and depresses public debt.
- More caution is required in a shallow trap given increased risks of overheating and CB losses (as well as other costs). Escape clauses particularly important.