Managing Monetary Tradeoffs in Vulnerable Open Economies

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Motivation and Objectives

- Policy dilemmas resulting from volatile capital flows cited as a predominant concern in EMEs but not AEs (Ghosh et al, 2017; Carstens, 2019)

- Inflation targeting EMEs more reliant on foreign exchange intervention (FXI) and capital flow management tools (CFMs) (Hoffman et al., 2019)

This paper:

- Develops a quantitative framework which speaks to these asymmetries and policymakers' concerns
- Quantifies benefits and tradeoffs associated with FXI and CFMs

Contributions

- Propose a framework sufficiently rich to account for empirically relevant frictions in EMEs, yet simple enough to parse out the key mechanisms
  - *Shallow FX markets resulting in UIP risk premia* (Gabaix and Maggiori, 2015)
  - *Occasionally binding external debt limit generating sudden stops* (Arellano and Mendoza, 2002; Chari et al., 2005; Mendoza, 2010; Bianchi, 2011; Chang, 2019)
  - *Weakly anchored inflation expectations leading to strong exchange rate pass-through and possibly contractionary depreciation* (Brandao-Marques, 2021)
  - *FX mismatches amplifying sudden stop risk* (Basu et al., 2020)
- Complement theoretical literature on the benefits of FXI and CFM (Jeanne & Korinek, 2010; Farhi and Werning, 2014; Cavallino, 2019; Basu et al., 2020)

Preview of Findings

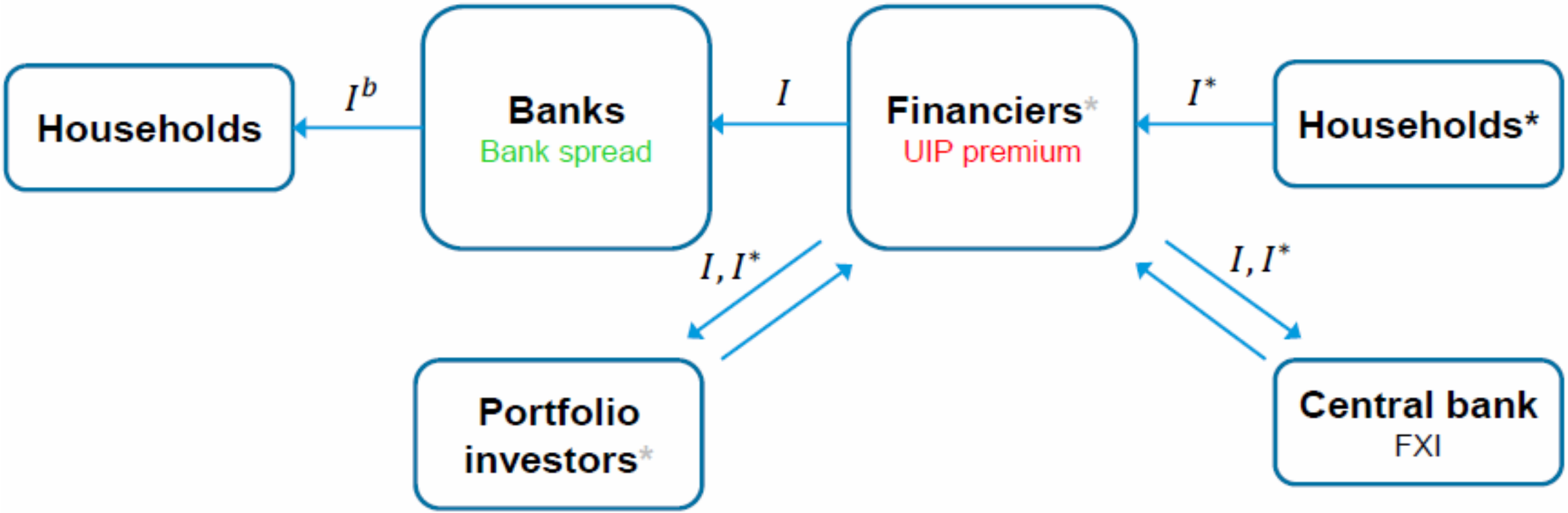
- Benefits of using FXI and CFMs to lean against large waves of capital flows driven by risk appetite shocks and buildup of external debt
  - Large welfare gains
  - Reduced probability and severity of *sudden stops*
  - Improved monetary tradeoffs
- Not necessarily “free lunch”
  - When used only reactively, FXI and CFMs may forestall needed adjustments, leaving economy more vulnerable to future crises

Outline

- **Model Overview**
  - **Key Features**
  - **Model Calibration and Fit**
  - **Unpleasant Monetary Dilemma in Vulnerable EMEs**
- **FXI and CFMs**
  - **“Flight to Safety” Episode**
  - **CFM and FXI Policy Rules**

Model Overview

Financial Market Structure



Financial Block: Key equilibrium conditions

- Retail rate-based UIP

smooth *occasionally binding*

$$(1-\tau_{F,t})\ \underbrace{I_t^b = \mathbb{E}_t\left\{I_t^* \frac{\varepsilon_{t+1}}{\varepsilon_t}\right\}}_{\text{Standard UIP Condition}} + \underbrace{\Gamma_t I_t \frac{B_{F,t}}{YP_{D,t}}}_{\text{Gabaix and Maggiori (2015) wedge}} + \underbrace{(1-\tau_{F,t})\Theta_t.}_{\text{“sudden stop” wedge}}$$

- Market clearing for bonds

$$B_{F,t} = -B_t - B_{P,t} + B_{M,t}$$

- NFA accumulation

$$B_t = NX_t + \left[(1-\omega_F)I_{t-1} + \omega_F I_{t-1}^* \frac{\varepsilon_t}{\varepsilon_{t-1}}\right] B_{t-1}$$
$$+ (1-\omega_B)\left(I_{t-1}^b - I_{t-1}\right) B_{t-1}$$
$$+ (1-\omega_F)\left(I_{t-1}^* \frac{\varepsilon_t}{\varepsilon_{t-1}} - I_{t-1}\right) B_{M,t-1}$$
$$+ (1-\omega_F)\,\tau_{F,t-1} I_{t-1}\left(B_{F,t-1} + B_{P,t-1}\right)$$

- ➢ Net exports + NFA revaluation
- ➢ Bank spread
- ➢ Carry cost of FX reserves
- ➢ Tax on capital flows

Rest of the model

- Sticky prices and wages
  - Indexation to proxy for less well-anchored inflation expectations
  - Kimball agregator to generate skewed inflation responses
- Standard trade linkages
- Taylor rule-based monetary policy

Model Calibration: Inflation Expectations

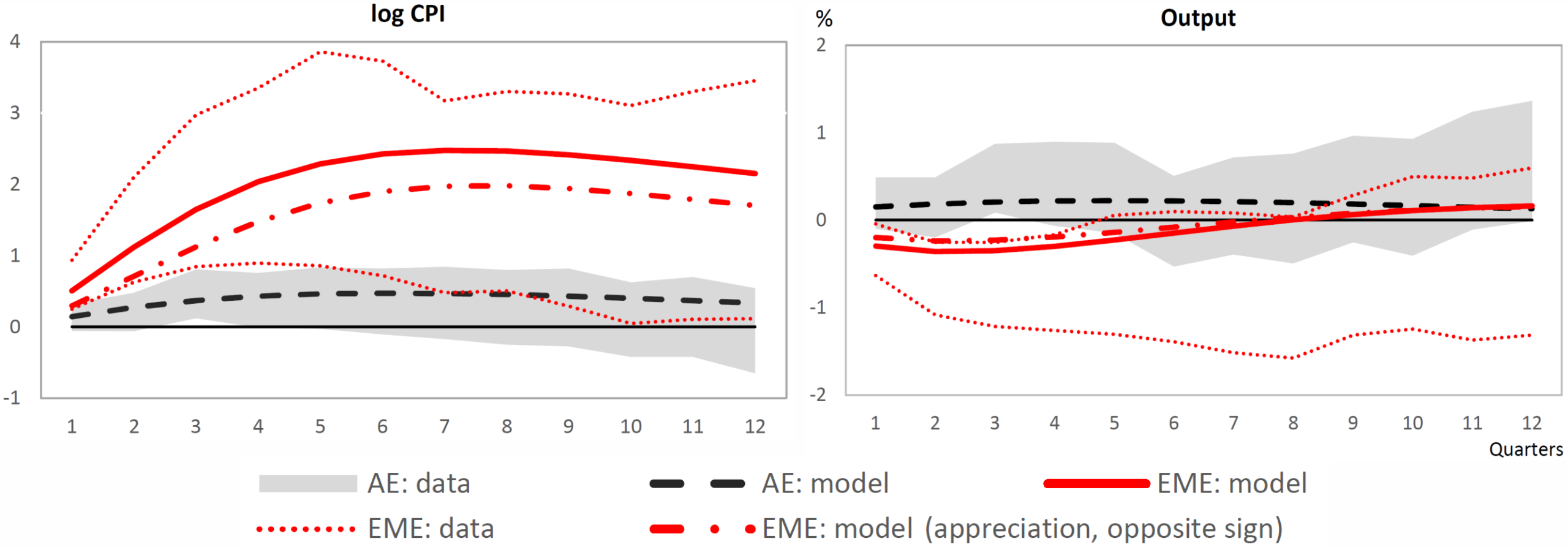
- Less well-anchored inflation expectations in EMEs

Parameter	Foreign	AE	EME	Description
ι	0.23	0.23	0.75	Price indexation
ι_w	0.5	0.5	0.75	Wage indexation
κ	0.007	0.007	0.014	Phillips curve slope (domestic production)
κ_w	0.007	0.007	0.011	Phillips curve slope (wages)
κ_m	-	0.012	0.006	Phillips curve slope (exports)
κ_m^*	-	0.012	0.06	Phillips curve slope (imports)

Model Calibration: Financial Intermediation

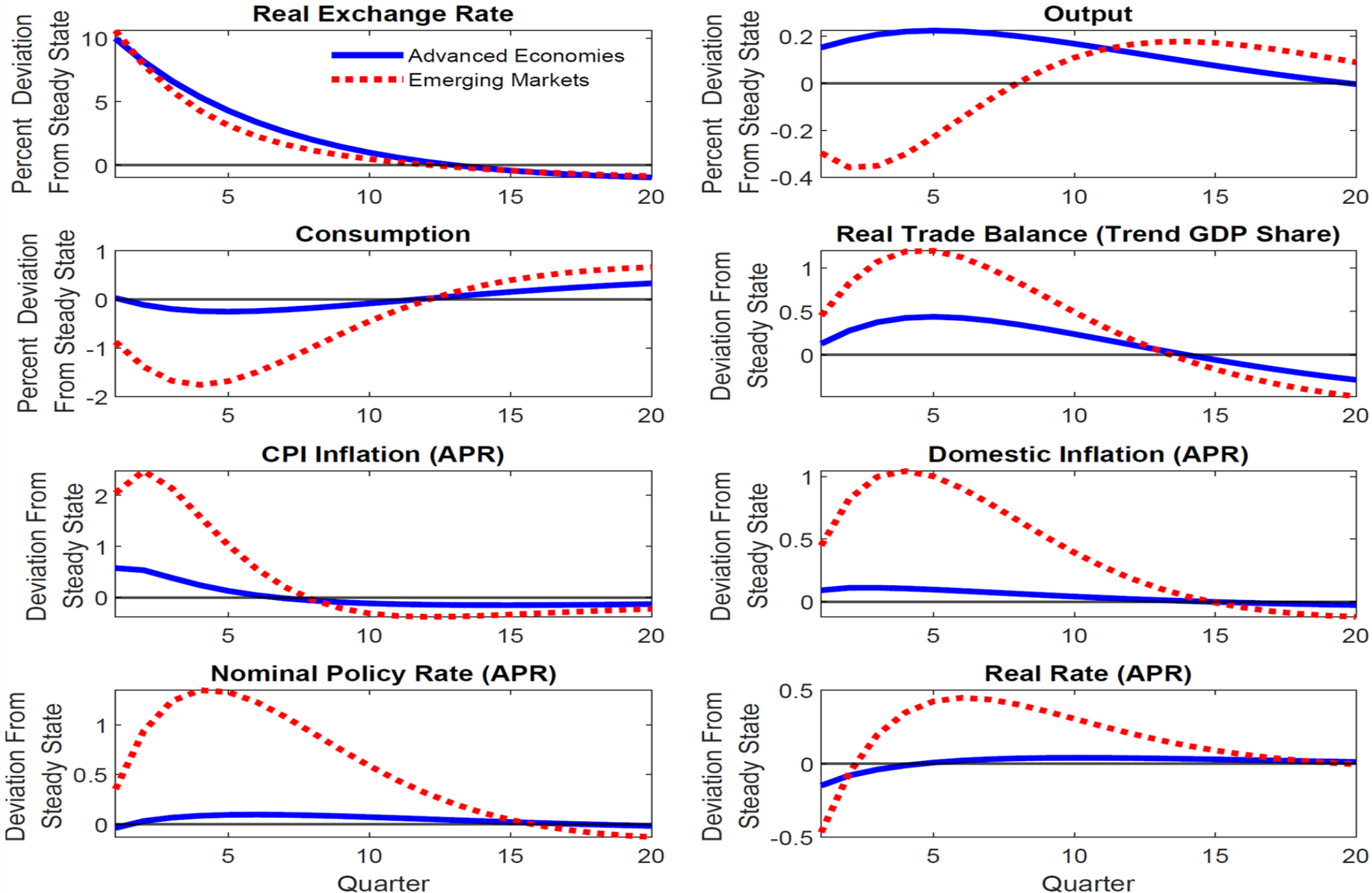
- FX purchases worth 10% of GDP => 15% depreciation (Adler et al. (2019)
- Ownership shares imply an unhedged FX exposure of around 16% (IMF, 2021)
- Banks are fully domestically owned
- Crisis frequency in EMEs around 3% (Bianchi and Mendoza, 2020)

Transmission of Exchange Rate Shocks



- Model IRFs well within 90% confidence bands from Brandao-Marques et al. (2021)

Transmission of Risk Appetite Shocks in AEs and EMEs



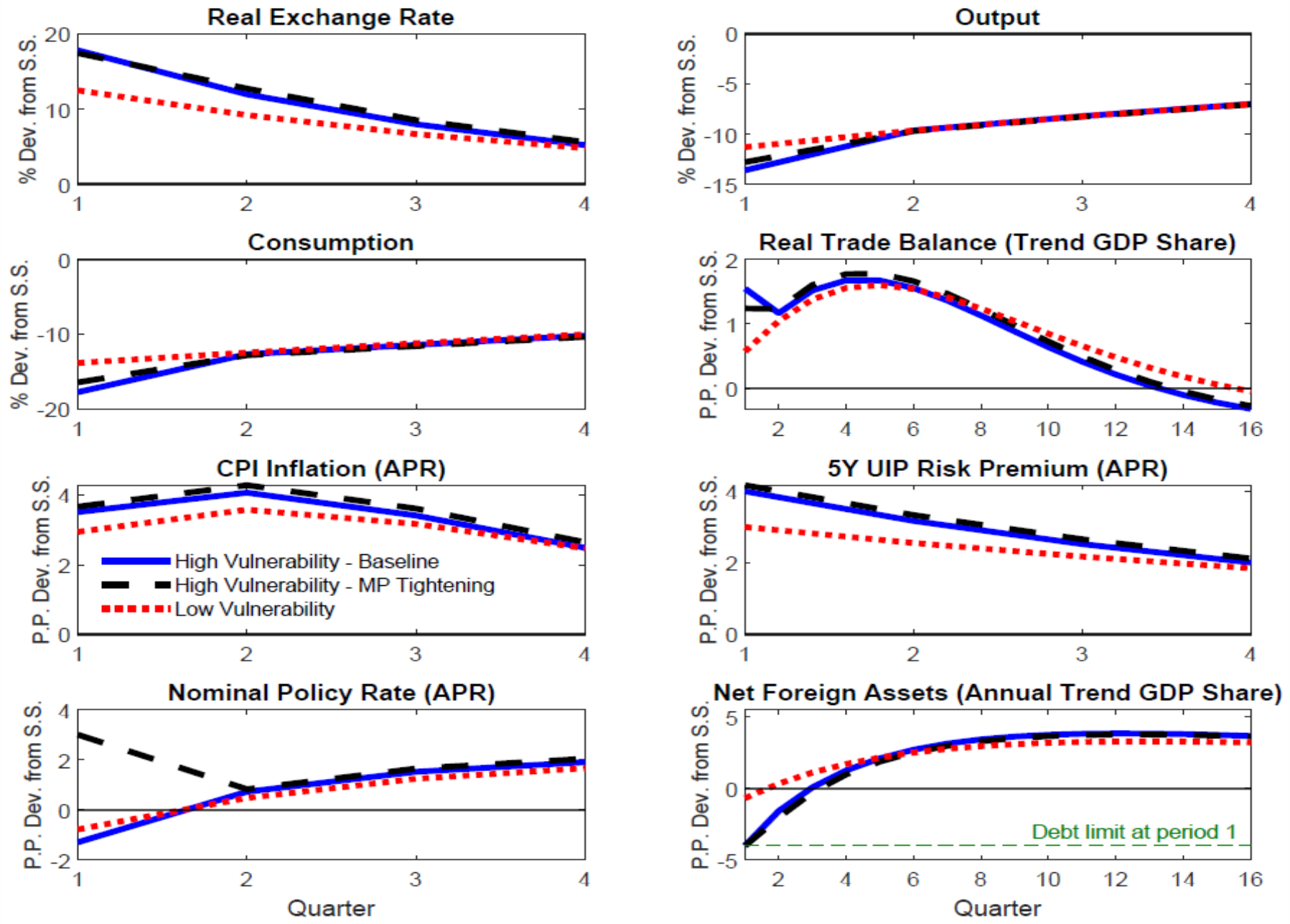
FXI and CFMs

“Flight to Safety” Episode

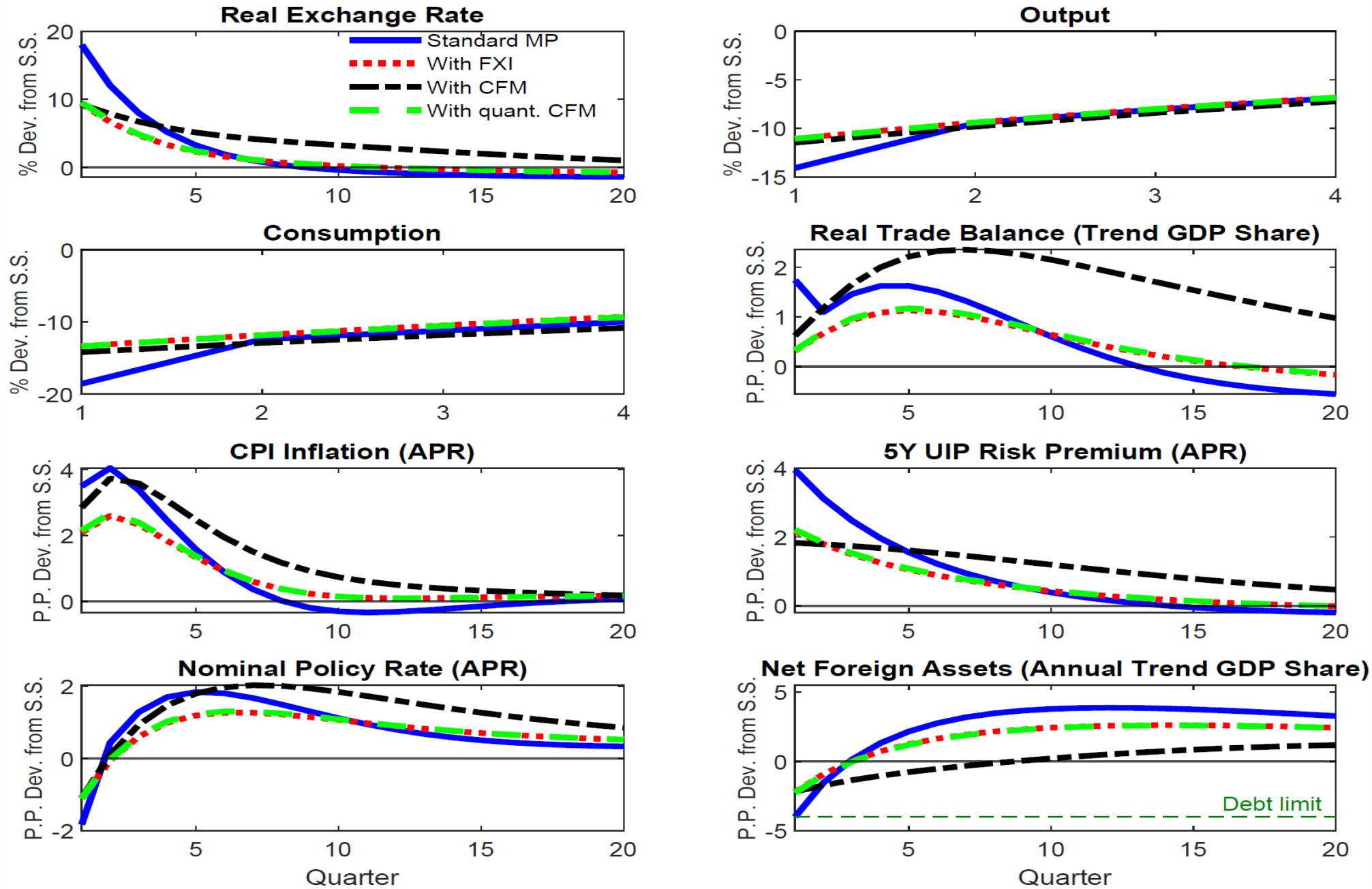
Use of FXIs and CFMs in Stress Scenario

- COVID-style stress scenario with heightened global risk aversion
- Compare economies with different initial conditions:
  - Low vulnerability (20% NFL, baseline FX market depth)
  - High vulnerability (45% NFL, shallower FX markets)
- Examine how outcomes in the vulnerable EME can be improved with FXI or CFMs

Vulnerabilities and Monetary Autonomy



Effects of FXI and CFM in a Vulnerable Economy



FXI and CFM Policy Rules

FXI and CFM rules

- **FXI rule**

$$\tilde{B}_{M,t} = \psi_{m,1}\tilde{B}_{P,t} - \psi_{m,2}\Theta_t$$

  - Two major motives for intervening in FX markets
    - Inefficient fluctuations in UIP premium
    - "Sudden stops" resulting in borrowing spreads

- **CFM rule**

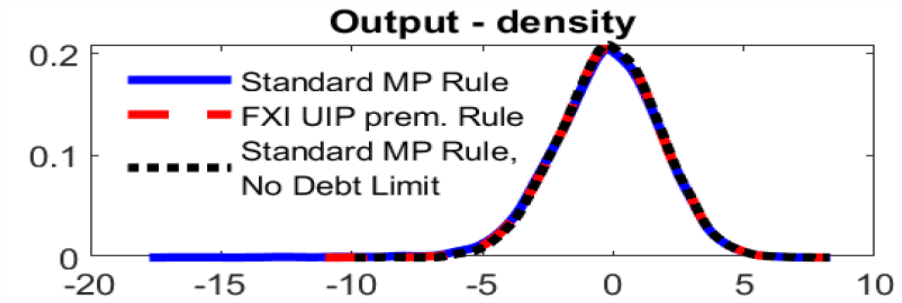
$$\tau_{F,t} = \max(0, -\psi_f \tilde{B}_t)$$

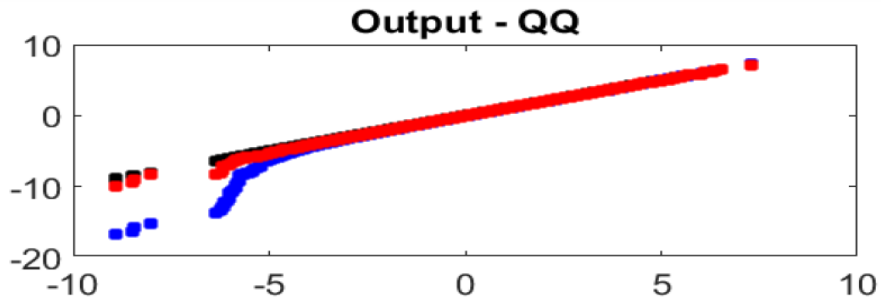
  - Leans against the buildup of NFL, keeping the economy away from the debt limit

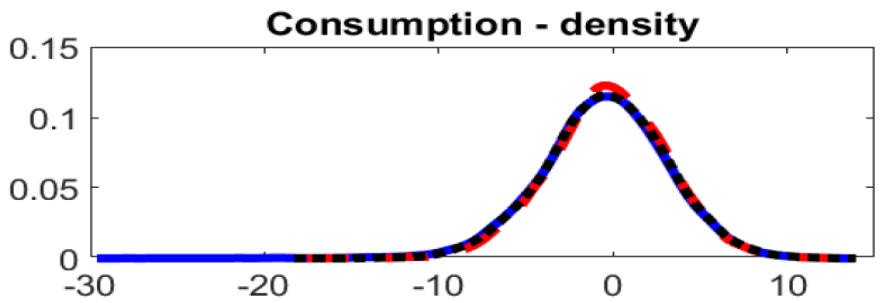
Unconditional Moments for Alternative Policy Rules

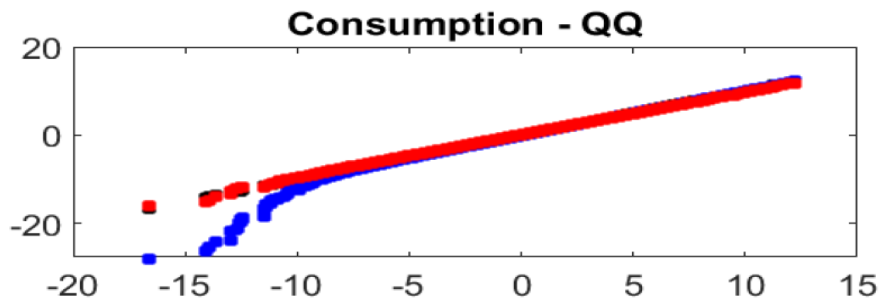
No debt limit	Occasionally binding debt limit				
Standard MP Rule	Standard MP Rule	FXI UIP Prem. Rule	CFM Rule	FXI UIP & CFM Rules	FXI Spread Rule
Financial Stress Probability					
0.00	2.98	0.00	1.52	0.00	3.04
Welfare Gain Relative to Standard MP Rule					
0.03	0.00	0.27	0.16	0.34	-0.01
Loss Decrease Relative to Standard MP Rule					
5.24	0.00	35.67	6.59	36.25	-0.92

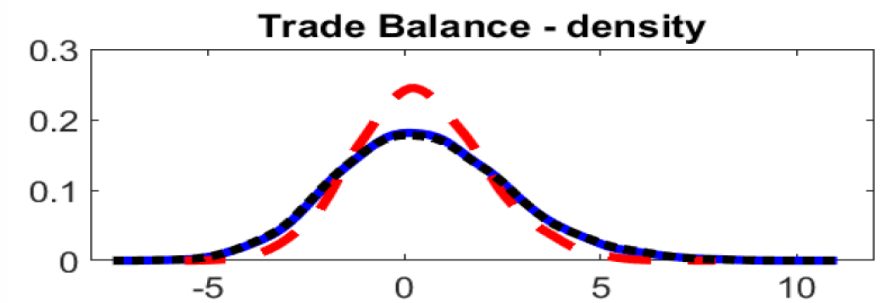
Unconditional Distributions w/wo FXI Rule

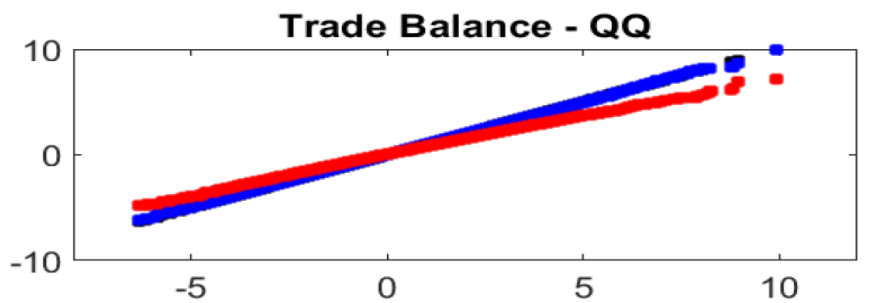


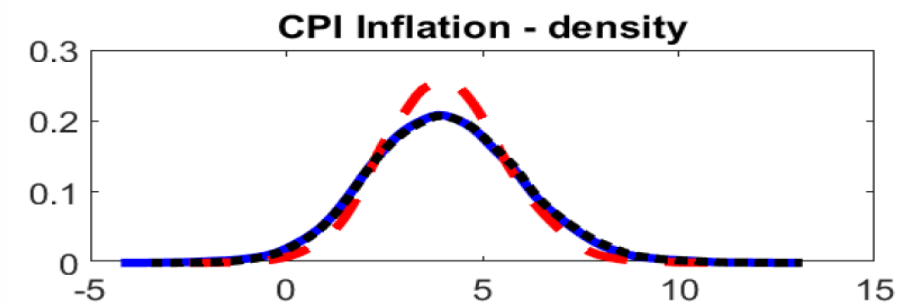


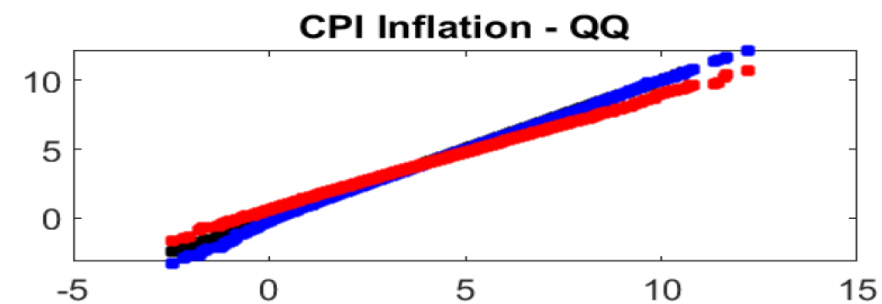












Summary and Conclusions

Result Summary

- FXI and CFMs can bring about substantial welfare benefits and increase monetary autonomy in vulnerable EMEs
- For FXI or CFMs to be effective, they need to have a precautionary flavor
- Additional considerations must also be accounted for when deciding whether to utilize FXI and CFMs in practice

Thank you!