Fiscal backing, inflation and US business cycles

Frank Smets and Raf Wouters

European Central Bank/Ghent University and National Bank of Belgium

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Outline

Motivation

- Debate about the role of expansionary fiscal/monetary policy mix in the recent inflation surge.
- Canonical RANK models (Christiano, Eichenbaum and Evans (2005), Smets and Wouters (2007)) are not very well suited to shed light on this debate:
  - Assume either a *monetary-led regime* (Taylor principle, debt feedback)
    - ➡️ Fiscal policy (lump sum transfers) does not matter for the economy
  - or a *fiscal-led regime* (no Taylor principle, no debt feedback)
    - ➡️ Fiscal policy controls inflation, but monetary policy is counterproductive
- Need a realistic model of monetary and fiscal policy interaction that allows for an *intermediate regime* with partial fiscal backing (Cochrane (2022), Bianchi, Faccini and Melosi (2023)):
  - Fiscal policy generally commits to serve current debt by running future surpluses, but may not take the full burden of adjustment
  - Monetary policy is geared towards stabilizing inflation, but it may have to face the inflationary consequences of partially unfunded government debt.

Objectives of this paper

- Develop a model which allows for **intermediate** monetary/fiscal policy regimes with **partial fiscal backing**
  - The degree of fiscal backing is captured by a regime parameter, λ.
  - Assume λ is constant over time and across shocks, but in principle can be time and shock-dependent.
  - Move away from regime switching assumption in Chung et al (2007), Bianchi-Ilut (2017) and Bianchi-Melosi (2020).
- Estimate the Smets-Wouters (SW, 2007) model with partial fiscal backing for the US economy.
  - What is the average degree of fiscal backing?
  - Are the most important drivers of inflation monetary or fiscal?
  - How does it affect the propagation of various business cycle shocks?
- Interpret the post-pandemic inflation period through the lens of the SW model with partial fiscal backing

Outline

- Motivation and objectives
- Illustration
- Estimation results
- The post-pandemic inflation
- Conclusions and follow-up

A simple Fisherian model with partial fiscal backing

- An endowment economy with flexible prices and one-period nominal government debt:

  $R_t = E_t \pi_{t+1}$ (Fisher relation)

  $b_t = \beta^{-1} b_{t-1} + b(R_t - \beta^{-1}\pi_t) - \tau_t$ (Government budget constraint)

  $R_t = \psi(\pi_t - \pi_t^F)$ (Monetary policy reaction function)

  $\tau_t = \delta_b(b_{t-1} - b_{t-1}^F) - \varepsilon_t^\tau$ (Fiscal policy reaction function)

- Shadow economy determining unfunded debt and fiscal inflation:

  $E_t \pi_{t+1}^F = 0$

  $b_t^F = \beta^{-1} b_{t-1}^F - b(\beta^{-1})\pi_t^F + (1 - \lambda)\,\varepsilon_t^\tau$
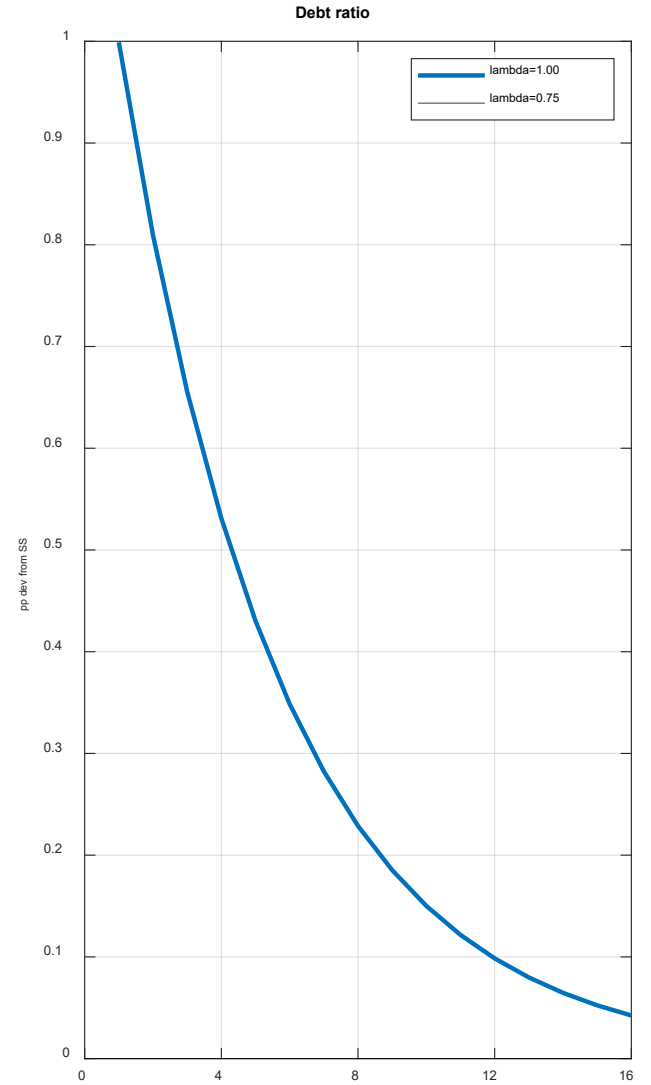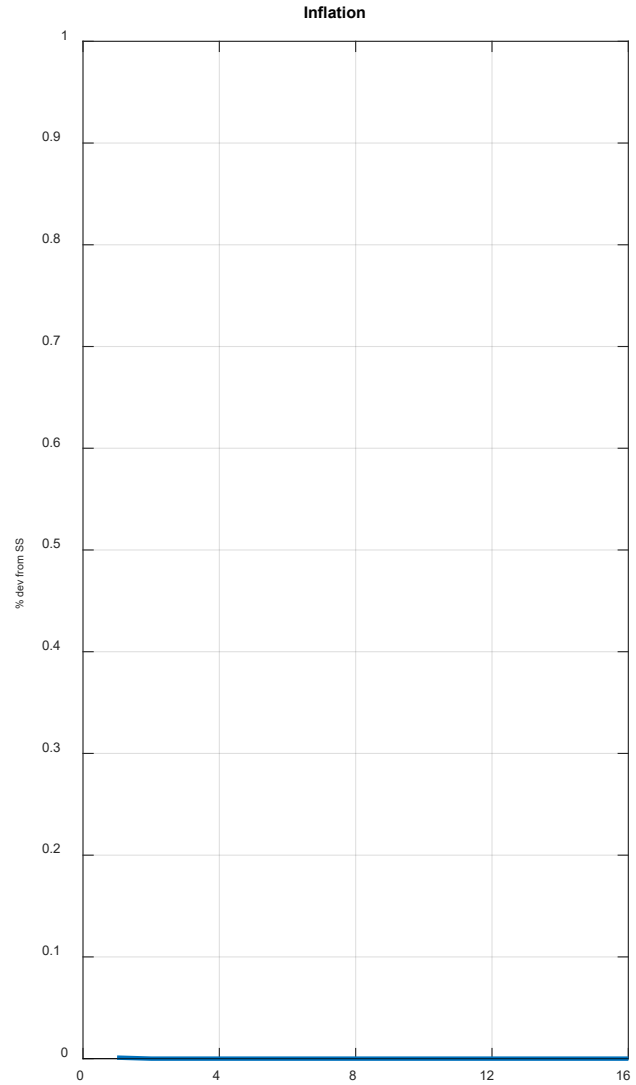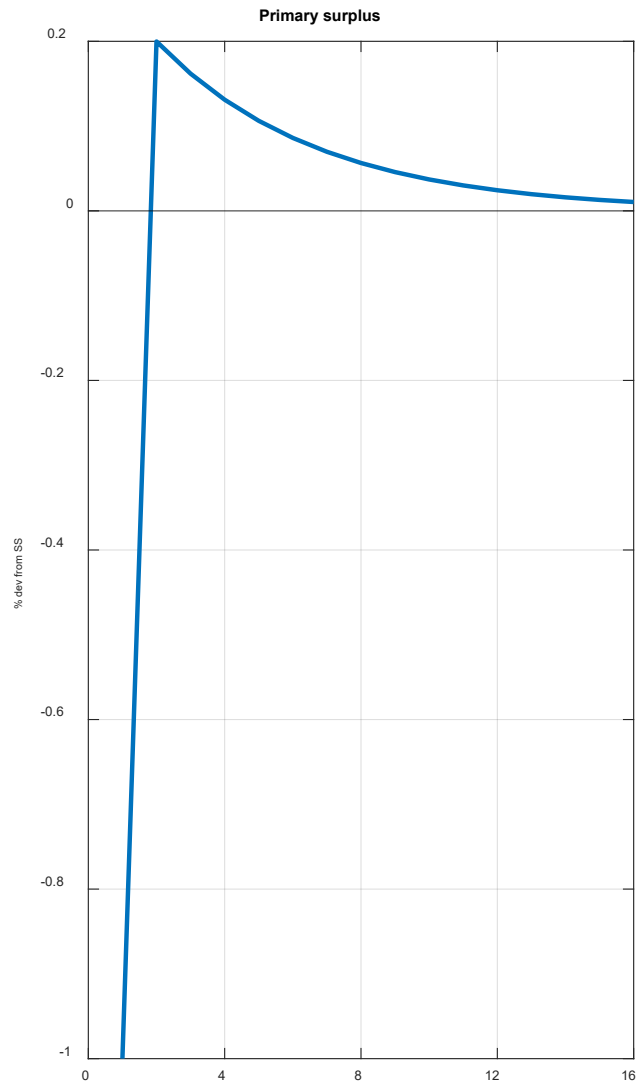
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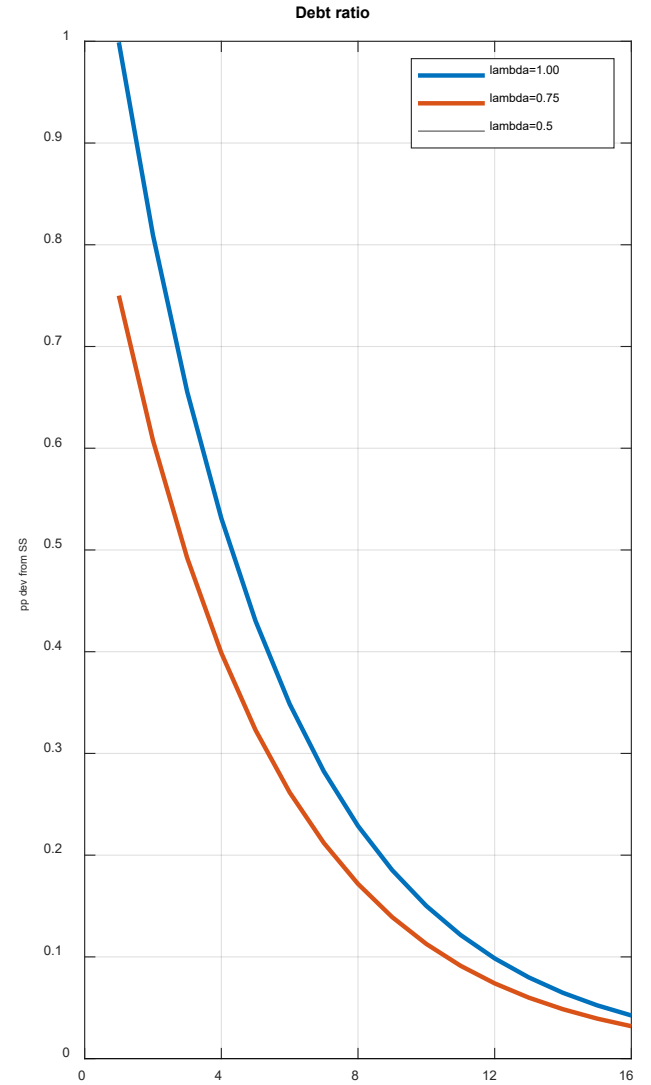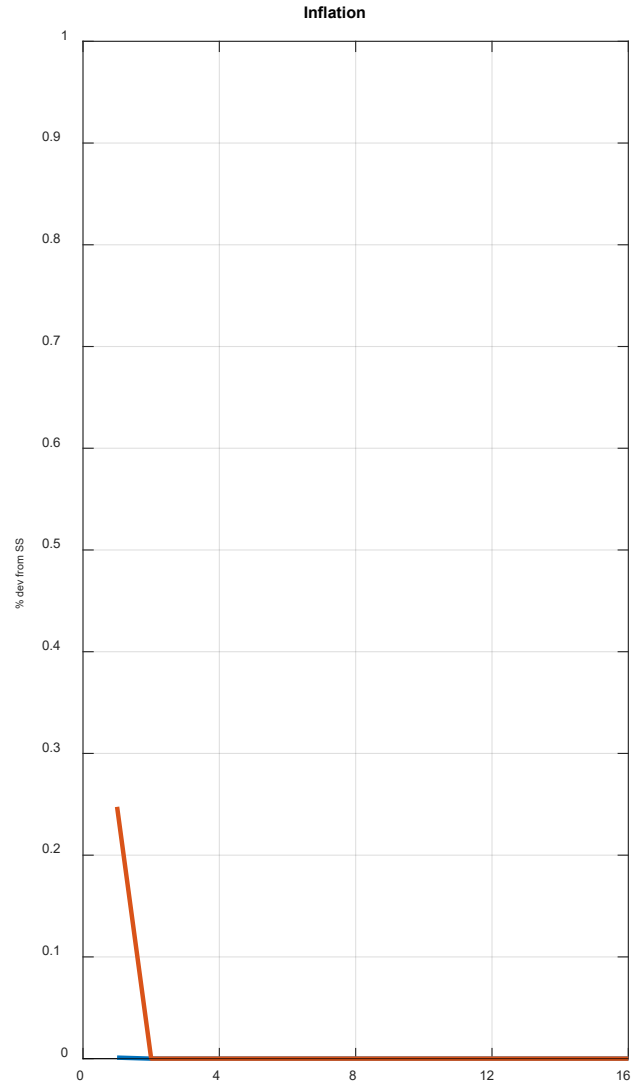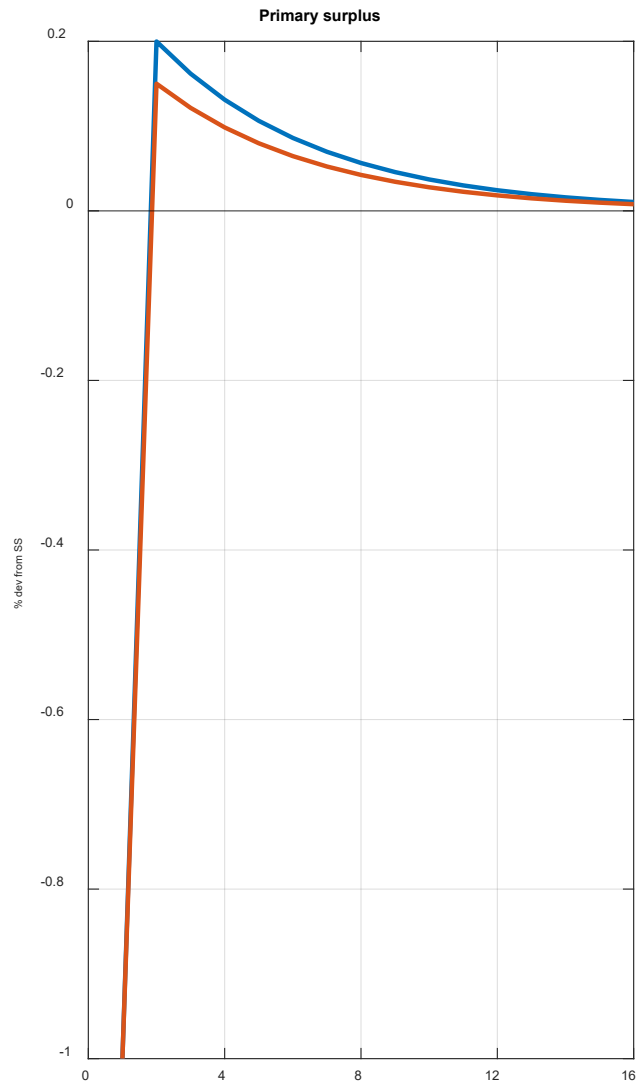
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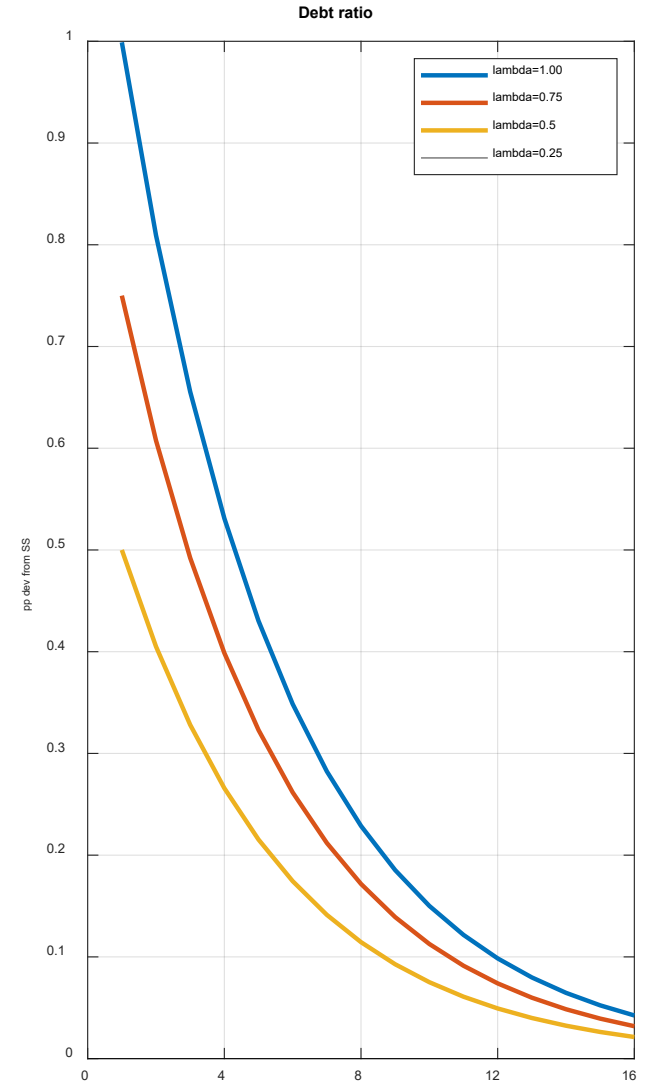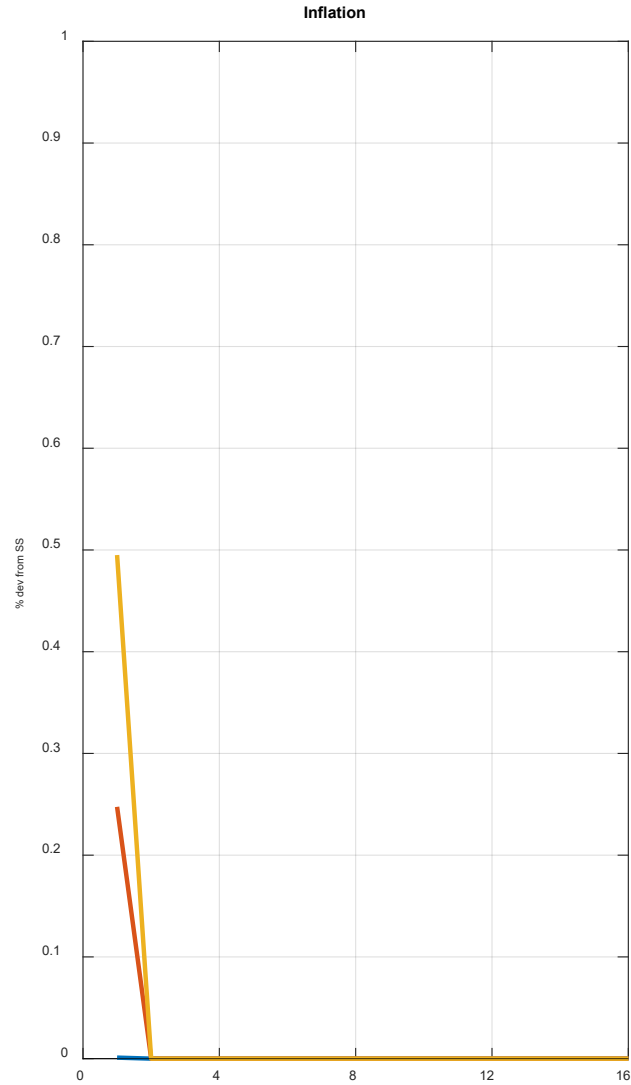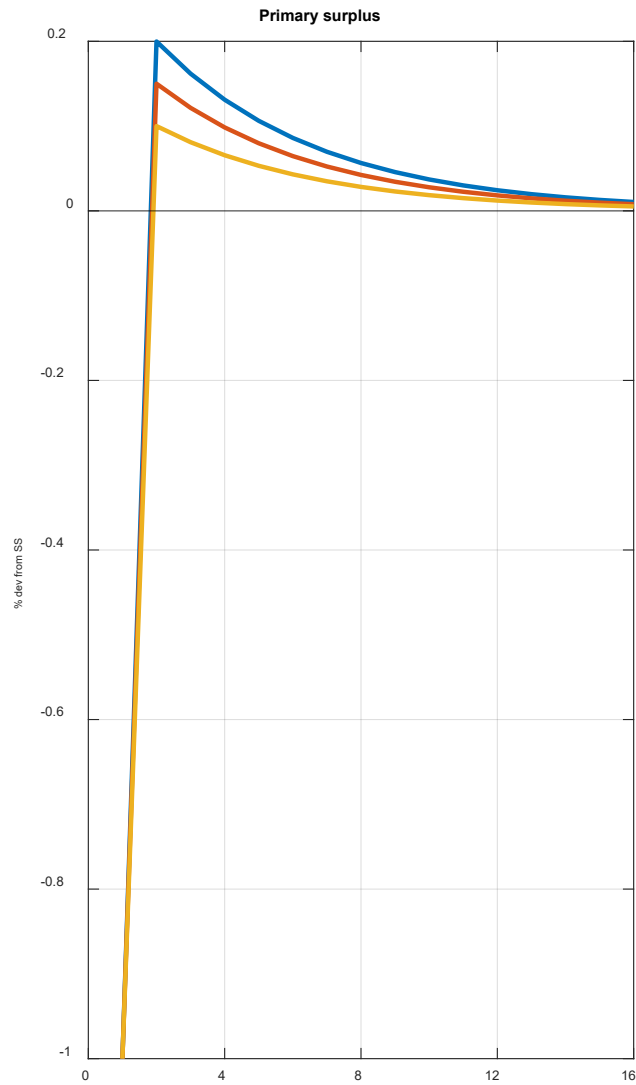
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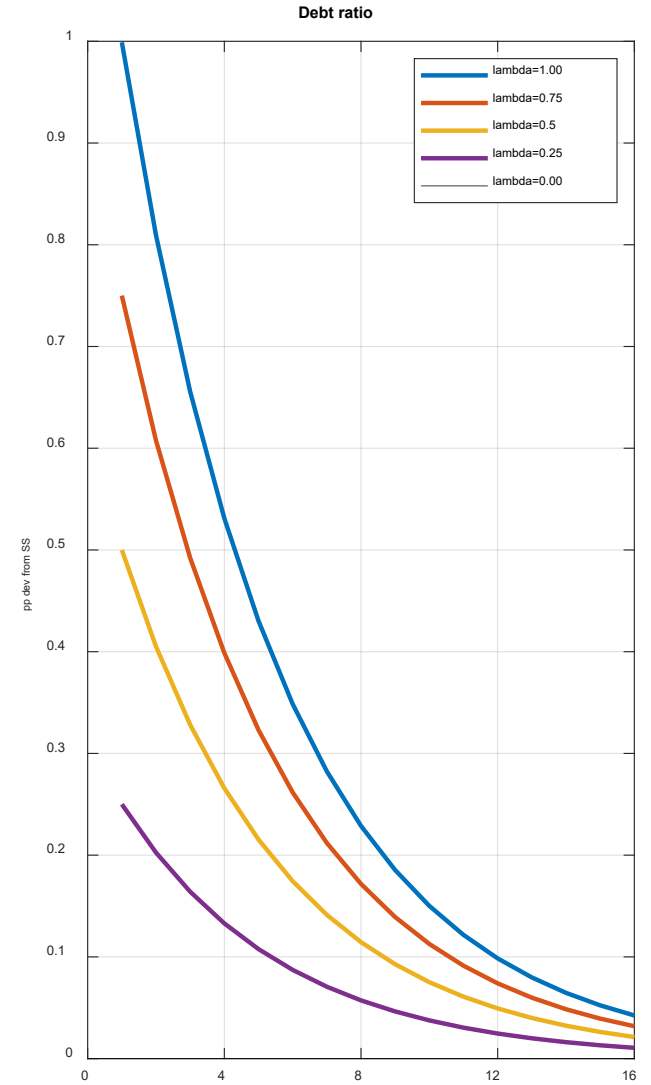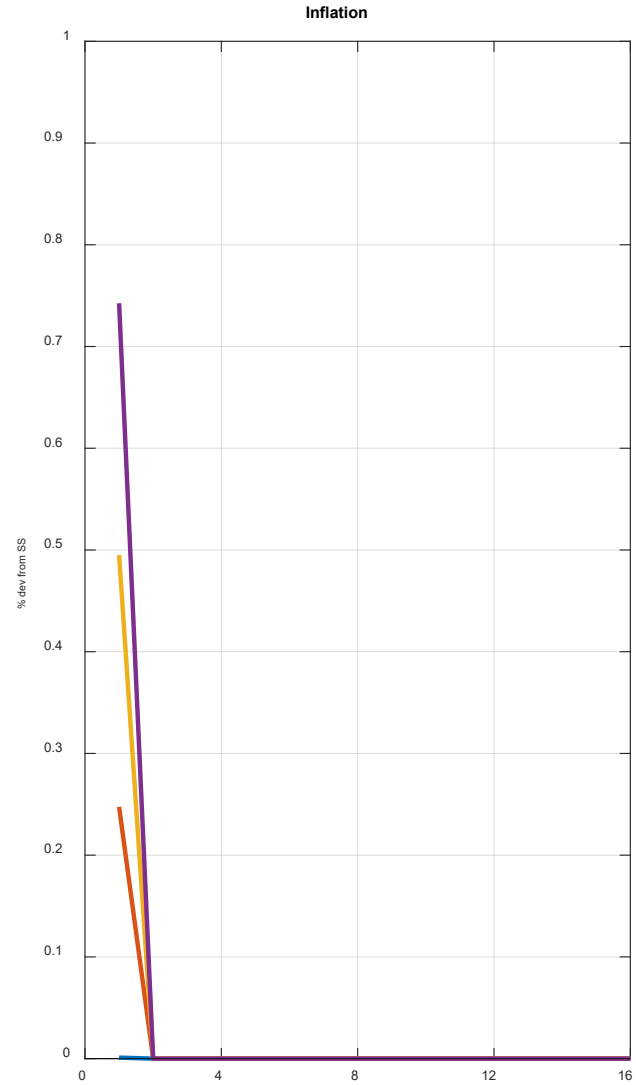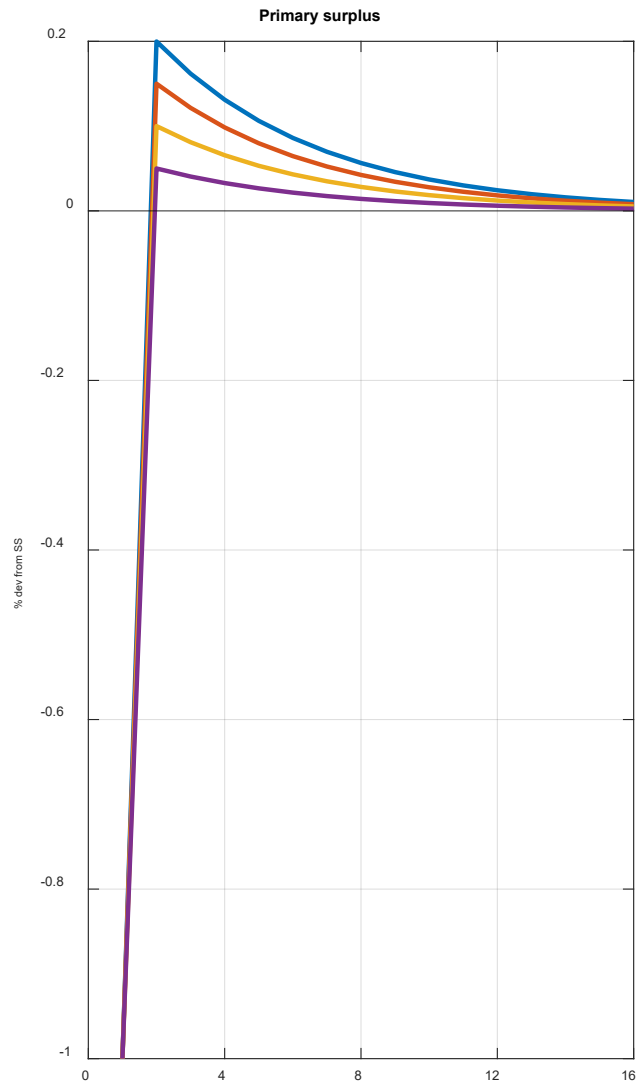
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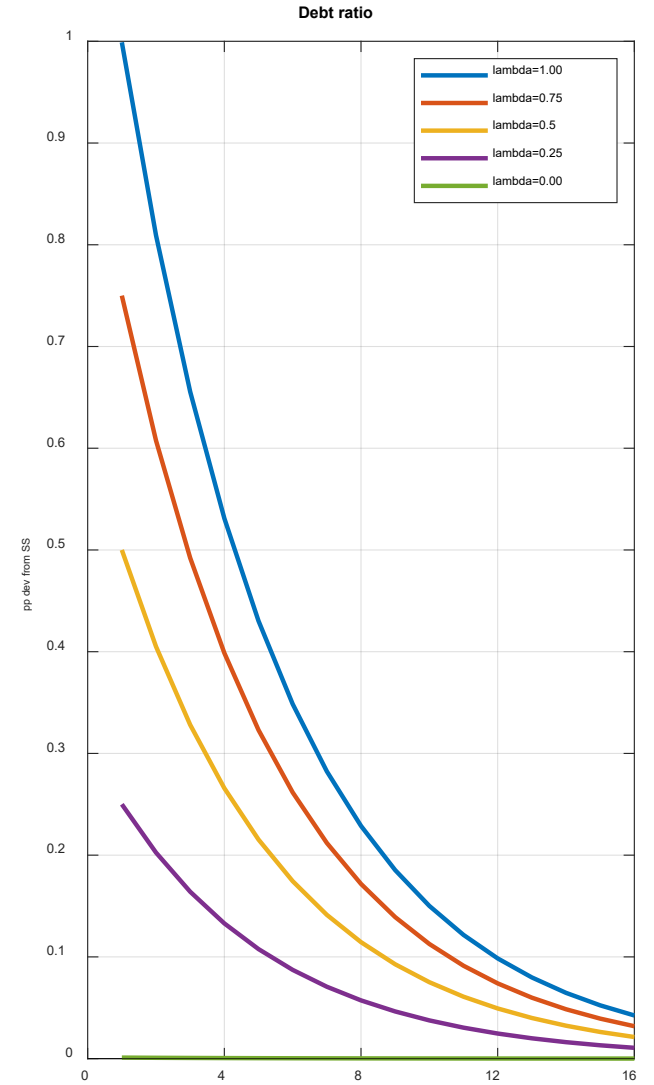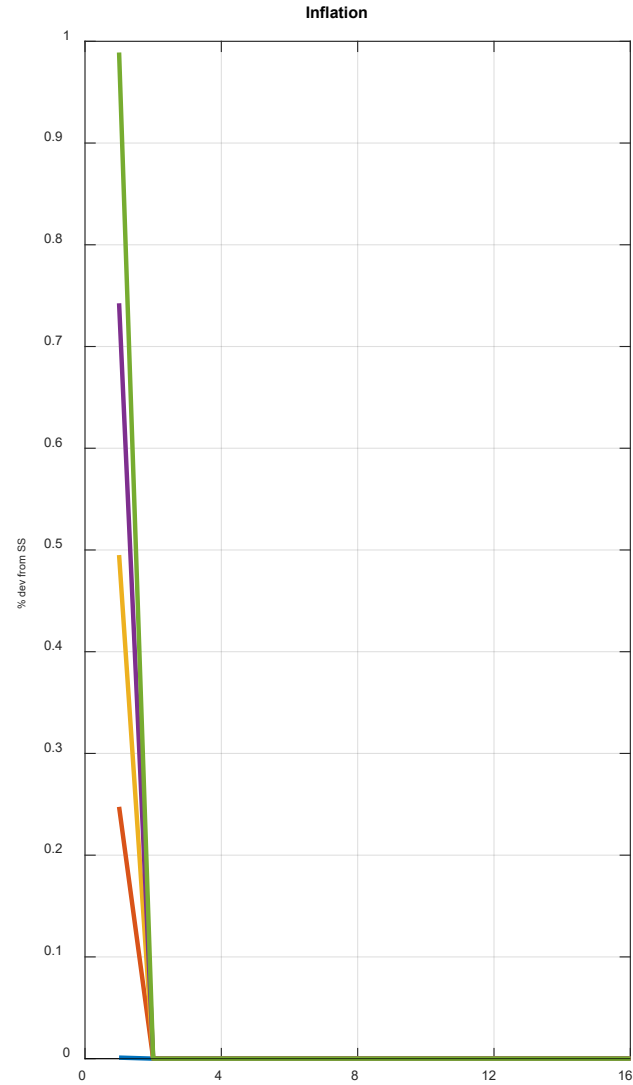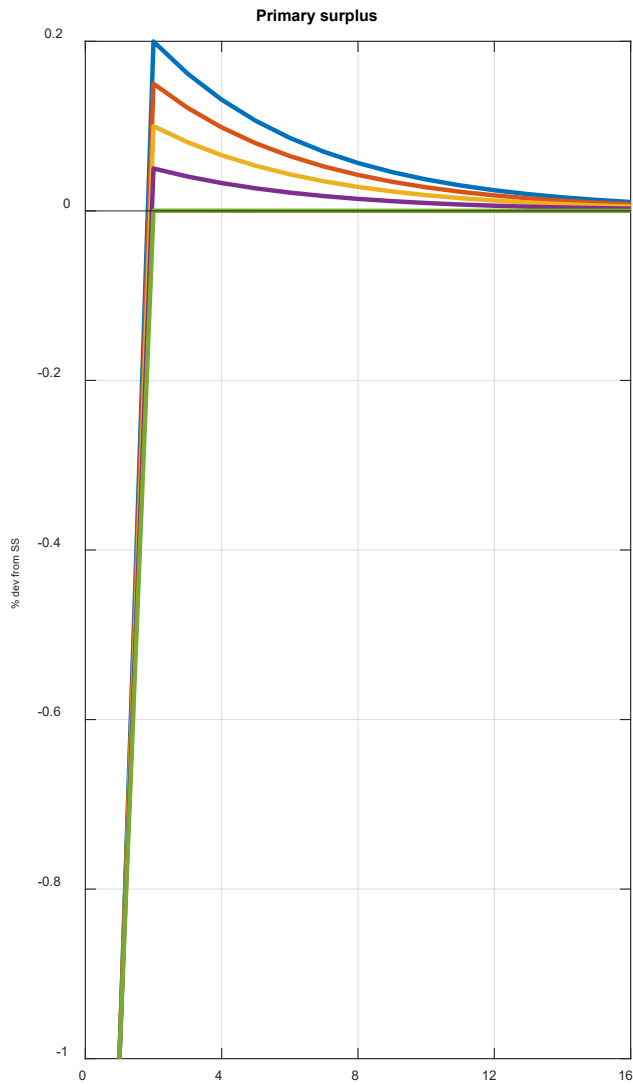
Fiscal easing in the Fisherian model with partial fiscal funding given by λ

RANK model with partial fiscal backing

$y_t = E_t y_{t+1} - [R_t - E_t \pi_{t+1}] + \varepsilon_t^d$ (Forward-looking IS curve)

$\pi_t = \kappa(y_t - y_t^*) + \beta E_t \pi_{t+1}$ (New Keynesian Phillips curve)

$y_t^* = \varepsilon_t^a$ (Potential output)

$R_t = E_t R_{t,t+1}^b$ (No arbitrage condition)

$R_{t-1,t}^b = \frac{\rho}{R} P_t^b - P_{t-1}^b$ (Return on long-term bond)

$b_t = \beta^{-1} b_{t-1} + b\beta^{-1}\left(R_{t-1,t}^b - y_t + y_{t-1} - \pi_t\right) - \tau_t$ (Govt budget constraint)

RANK Model with partial fiscal backing

Monetary policy rule:

$$R_t = \rho_R R_{t-1}$$
$$+ (1 - \rho_R)\left[\psi_\pi(\pi_t - \pi_t^F) + \psi_\pi^F \pi_t^F + \psi_y\left((y_t - y_t^*) - (y_t^F - y_t^{F*})\right) + \psi_y^F(y_t^F - y_t^{F*})\right]$$
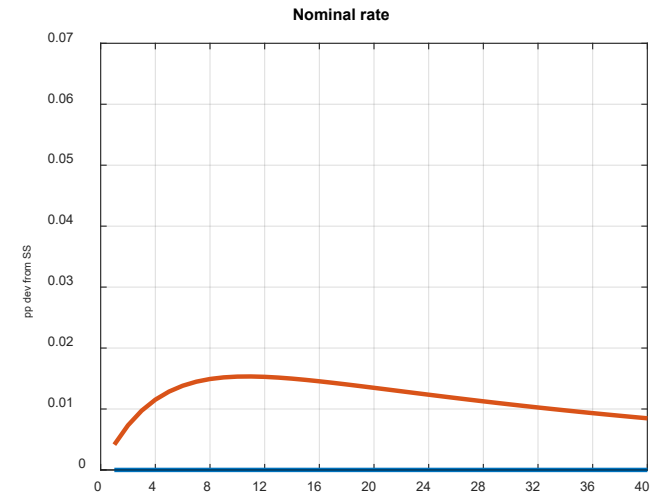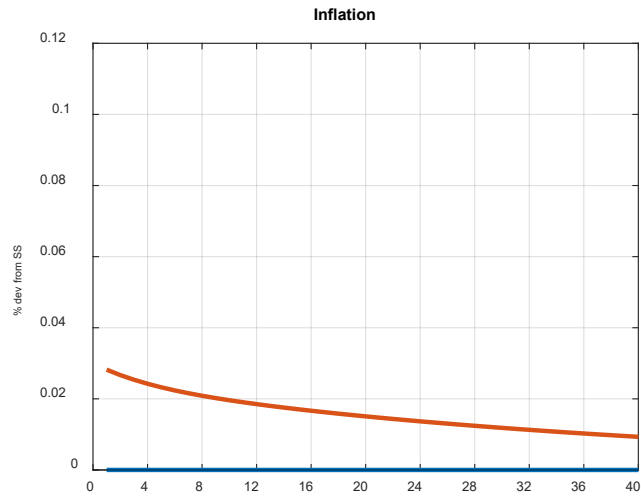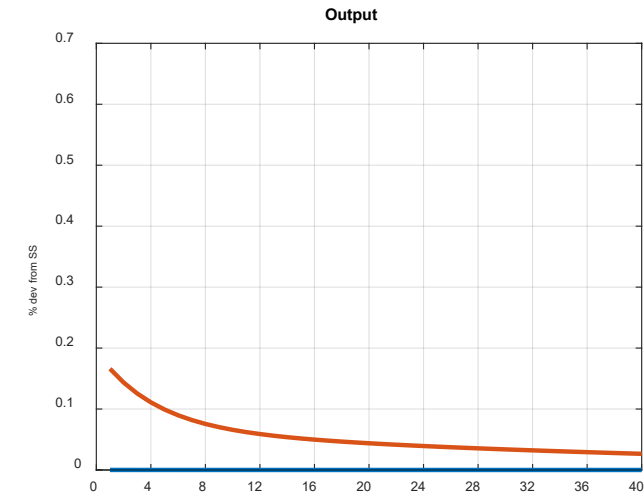$$+ \varepsilon_t^{mp}$$

Fiscal policy rule:

$$\tau_t = \rho_\tau \tau_{t-1} + (1 - \rho_\tau)\left[\delta_b(b_{t-1} - b_{t-1}^F) + \delta_b^F b_{t-1}^F + \delta_y(y_t - y_t^*)\right]$$
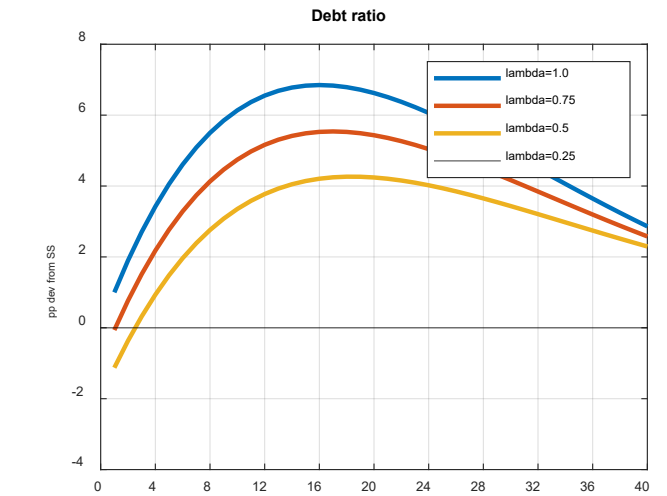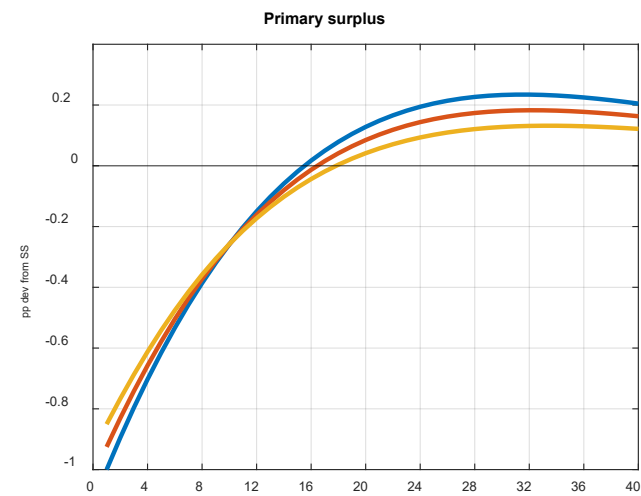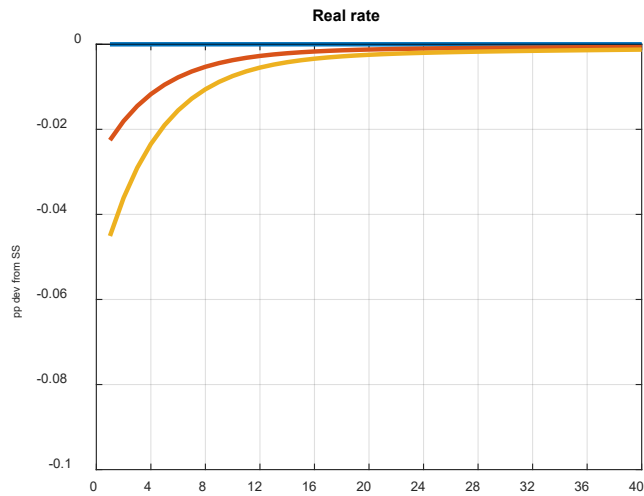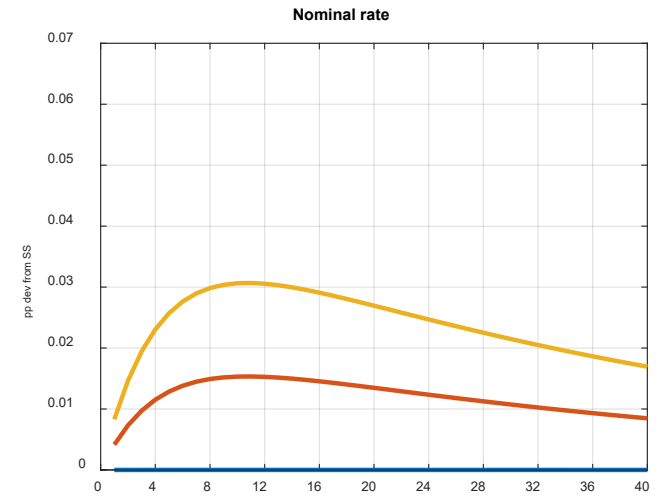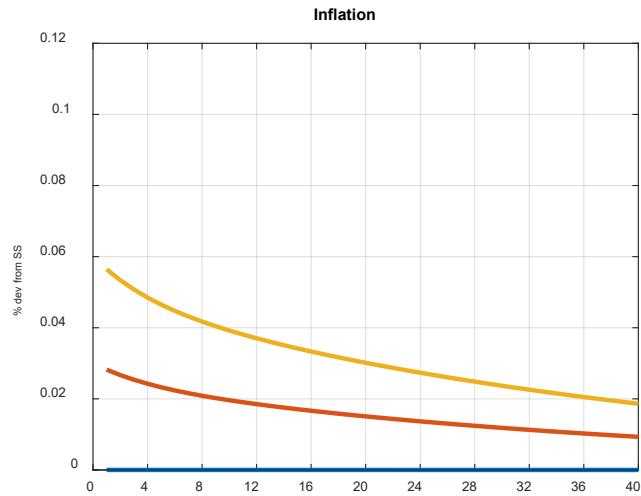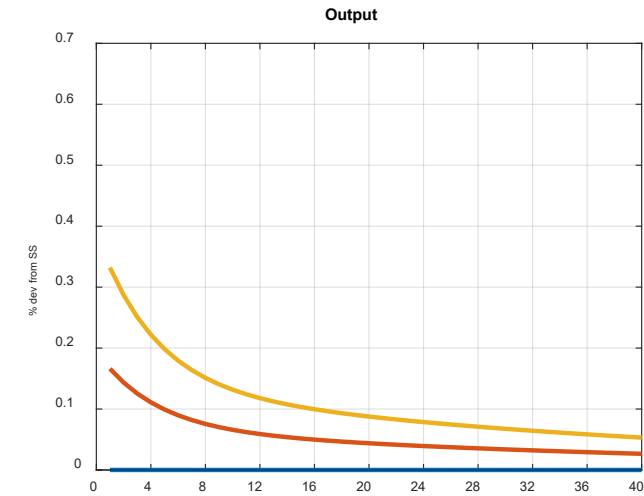$$+ \delta_{dy}(y_t - y_{t-1}) + \varepsilon_t^\tau$$

Unfunded debt, b_t^F, and fiscal inflation, π_t^F, are again determined in a fiscal-led shadow economy.

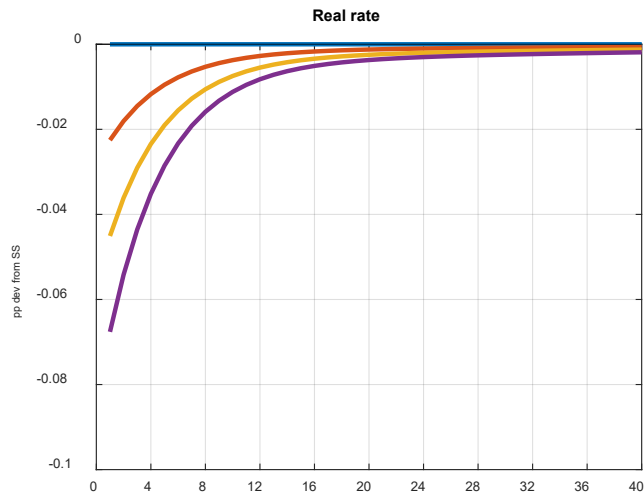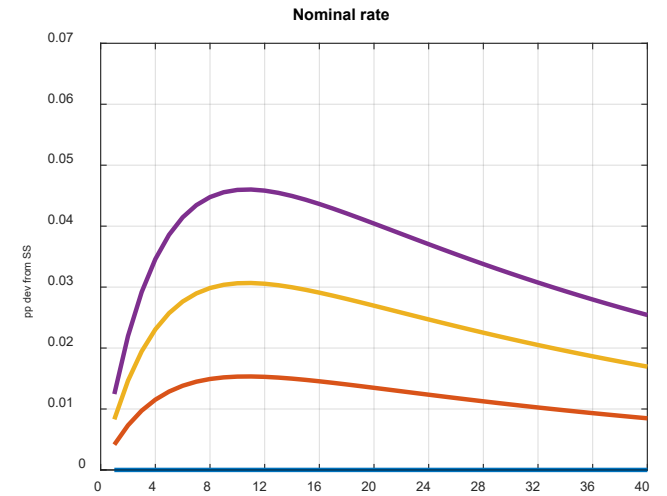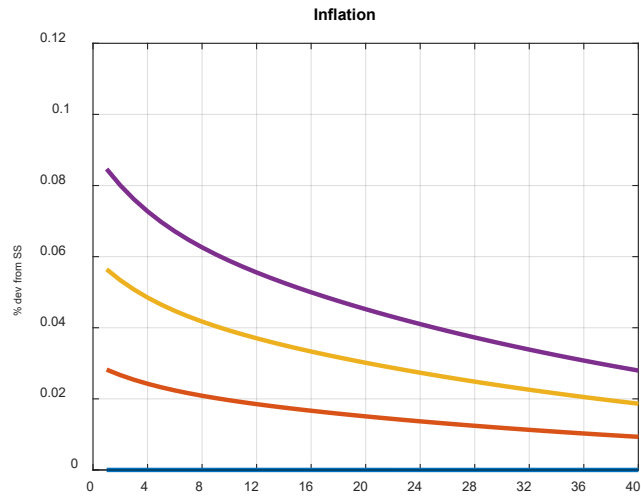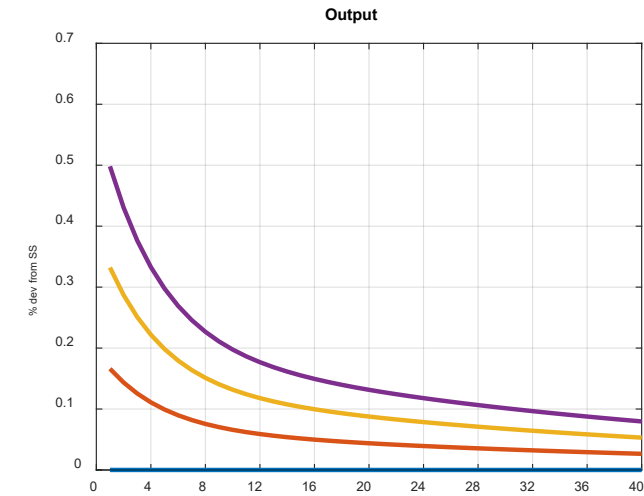Expansionary transfer shock in RANK model with partial fiscal funding given by λ

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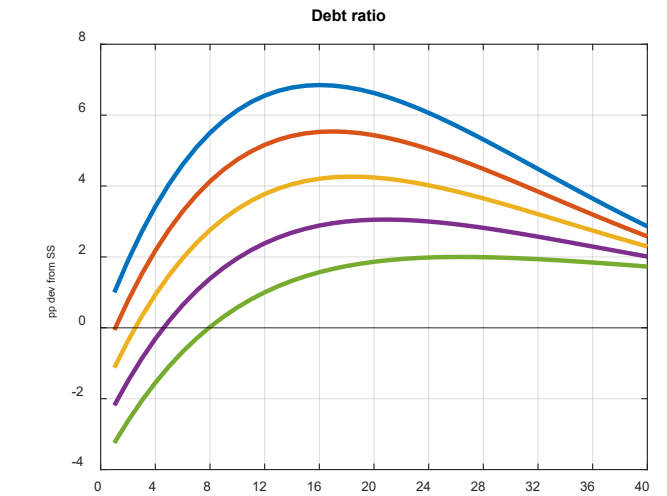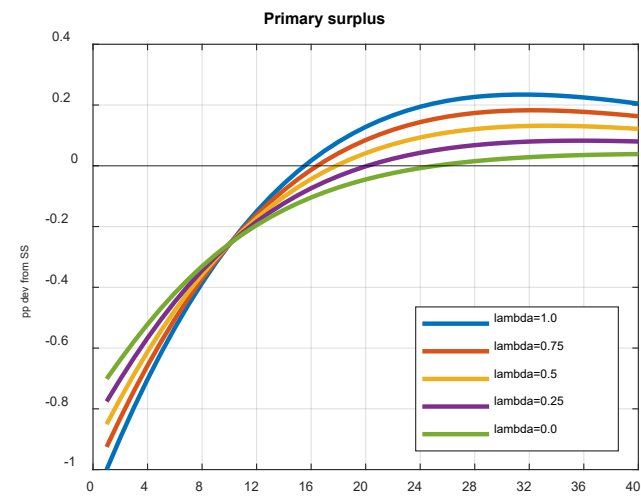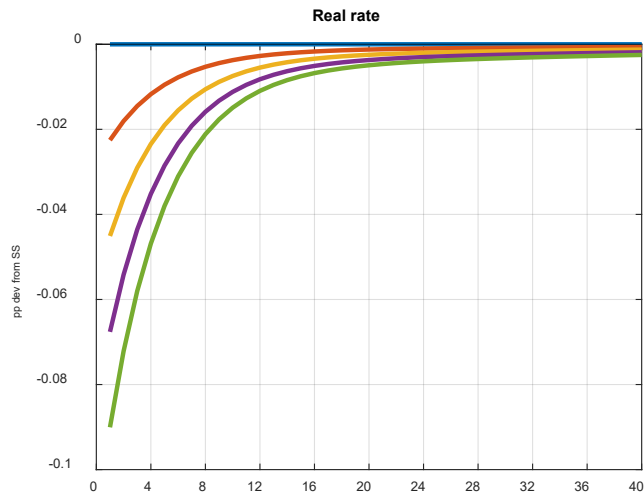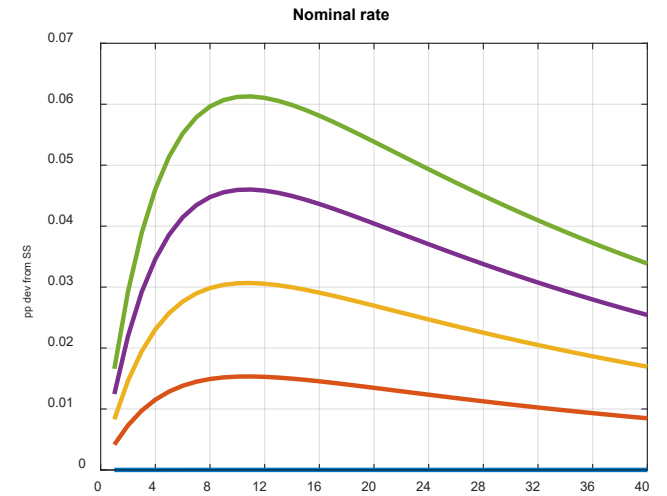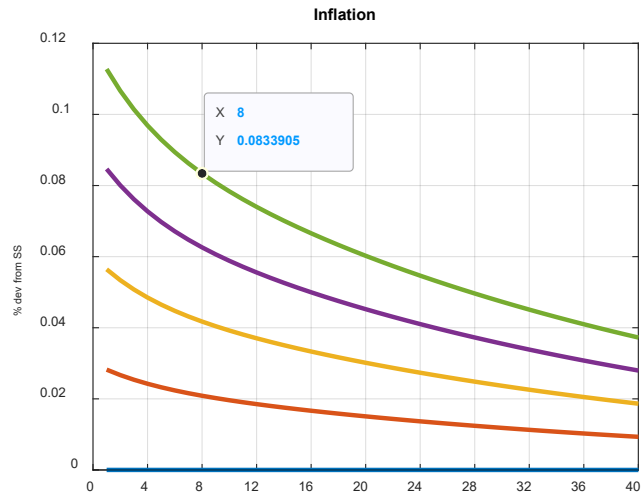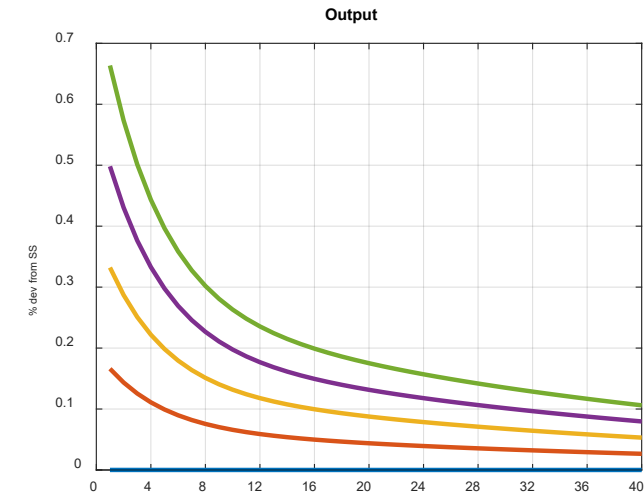
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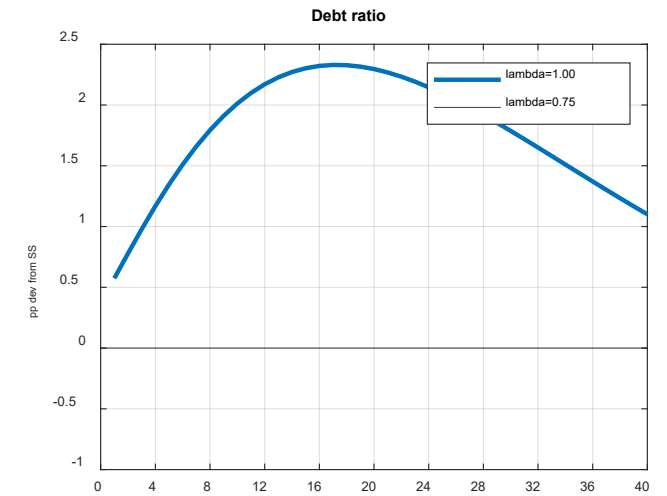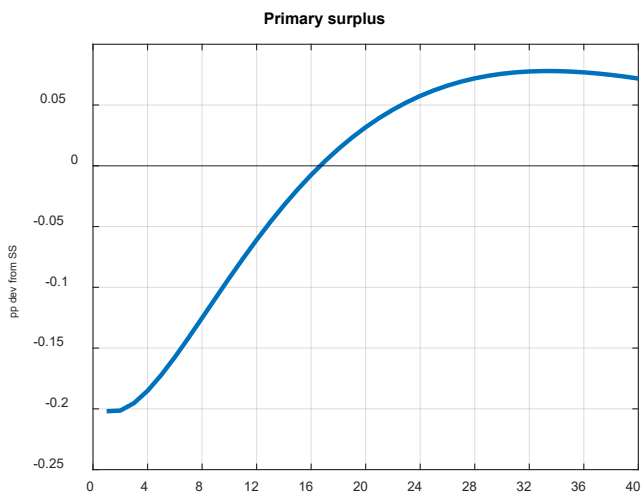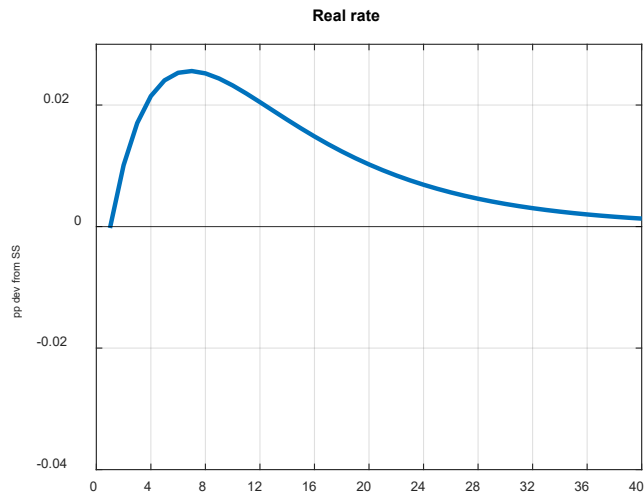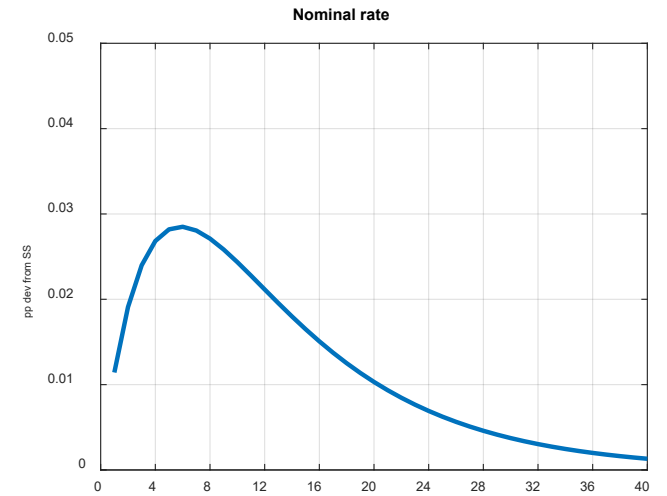
Negative productivity shock in RANK model with partial fiscal funding given by λ

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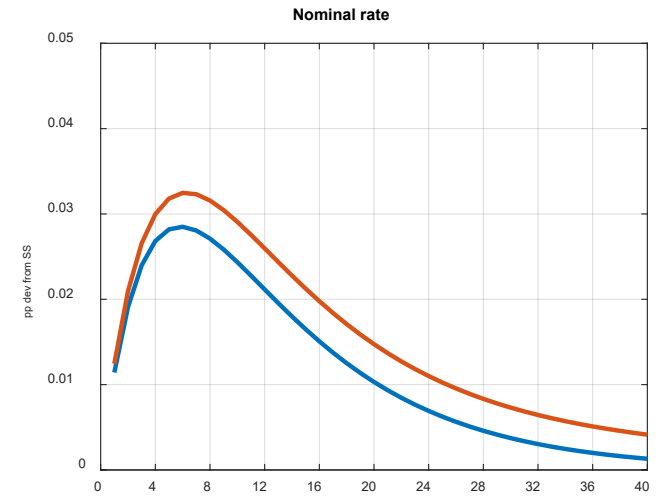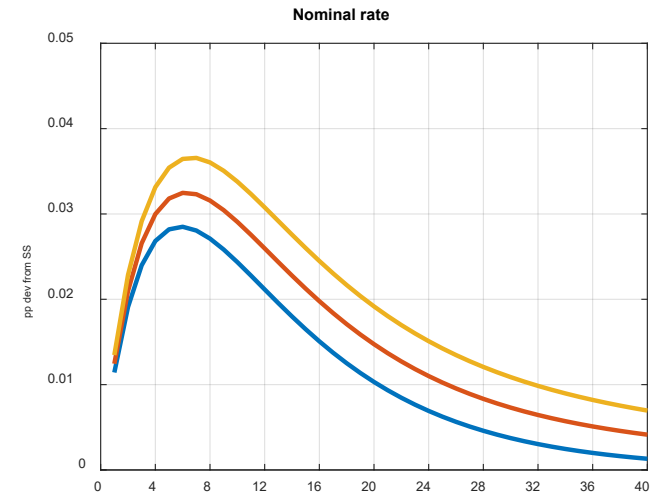- Motivation and objectives

- Illustration

- Estimation results

- Post-pandemic inflation

- Conclusions and follow-up

Smets-Wouters (2007) with partial backing

- Smets-Wouters (2007): usual seven observables and shocks
- Add fiscal block with equations for taxes, transfers, government spending and the intertemporal government budget constraint:
  - Observables: market value of government debt, growth rate of taxes, transfers, government spending.
  - Four additional fiscal shocks: lump sum tax, lump sum transfer, government spending and a residual debt shock. The latter can also be interpreted as measurement error.
- Extend the dataset with a 1-year short-term interest rate and a forward guidance shock to take into account the ELB periods after the Global Financial Crisis.
- Add fiscal-led shadow economy to keep track of unfunded debt and fiscal inflation: All shocks affect the shadow economy with a parameter $(1 - \lambda)$.

Selected estimation results (1965Q1-2019Q4)

Regime	Monetary-led	Intermediate	Fiscal-led
λ	1.00	0.83	0.00
Log likelihood	-2765	-2757	-2842
Calvo price stickiness	0.72	0.79	0.87
Calvo wage stickiness	0.53	0.63	0.73
Habit	0.64	0.62	0.81
Investment costs	3.96	3.83	7.23
Maturity parameter	0.86	0.90	0.84
Transfers: Debt feedback	0.05	0.07	-
Transfers: Persistence	0.99	0.99	0.99

Monetary and fiscal drivers of inflation and primary balance

Historical inflation decomposition (y-on-y in deviation from target)

- Funded - Monetary regime
- Unfunded - Fiscal regime
- Actual

Historical primary surplus decomposition

Public transfer shock in estimated SW model

Impulse Response of a public transfer shock
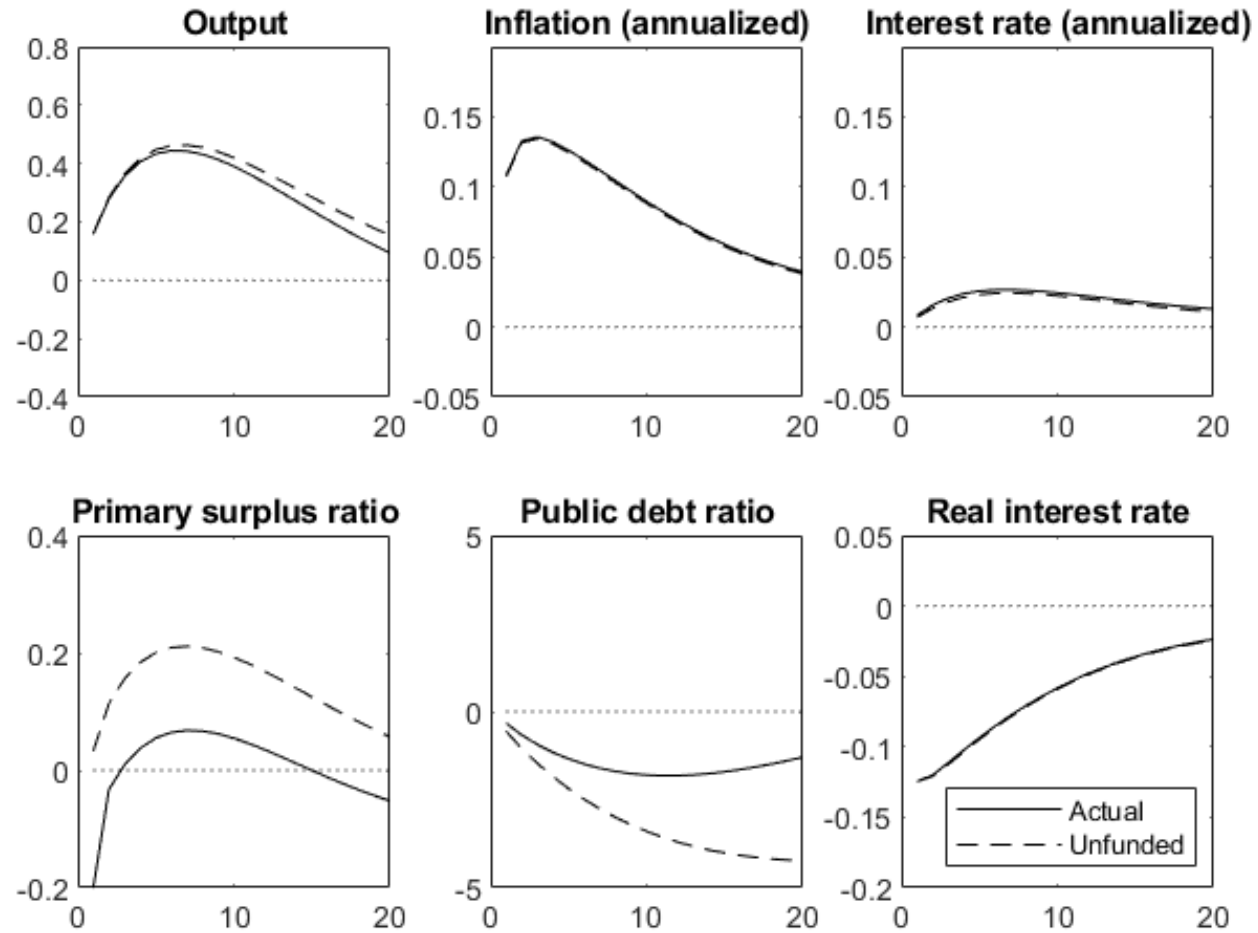
Mark-up shock in estimated SW model

Impulse Response of a price markup shock
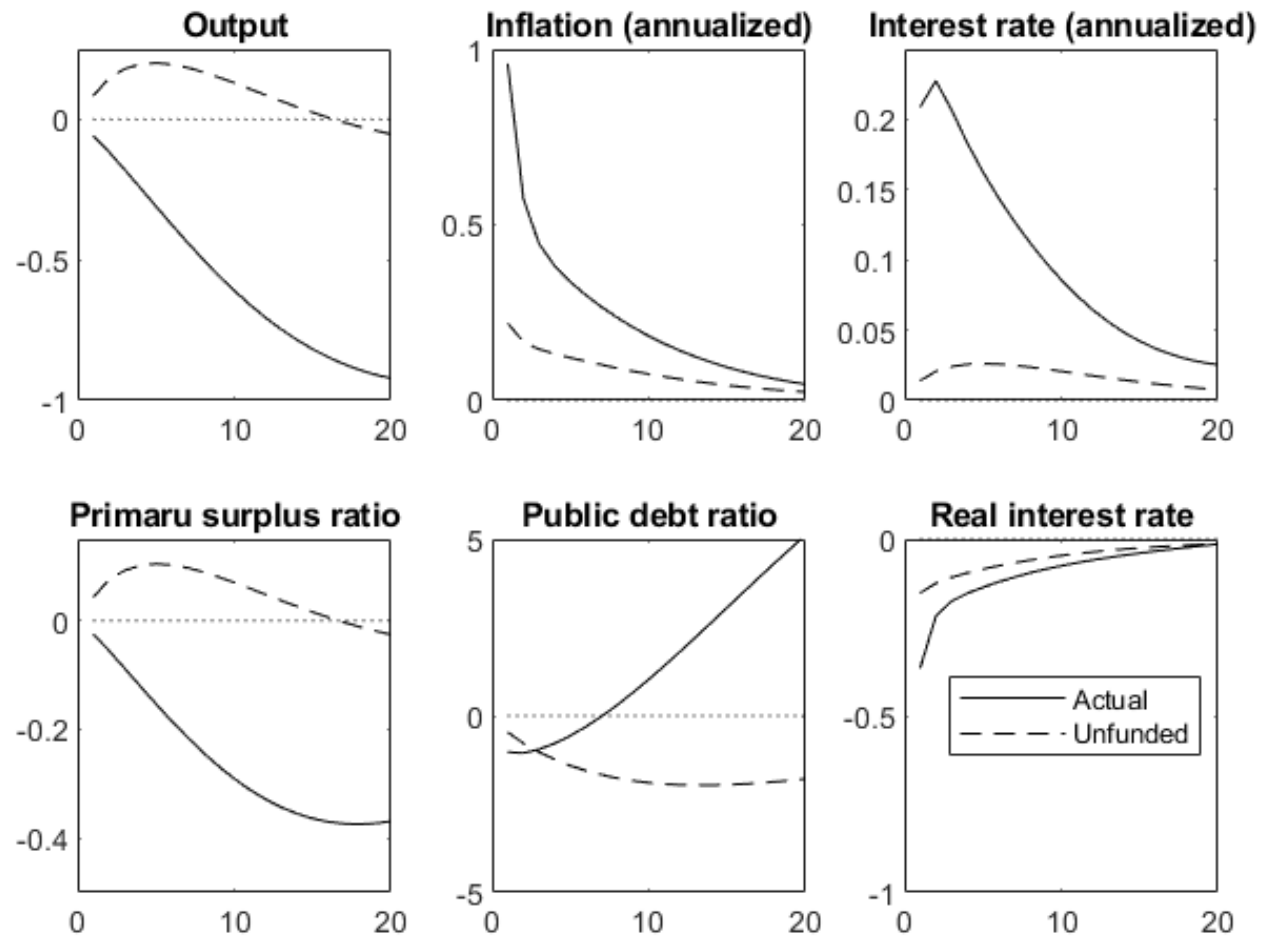
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Accounting for the post-pandemic inflation

Total Funded Unfunded

Inflation

Output

supply demand monpol fispol covid initial values

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Main findings
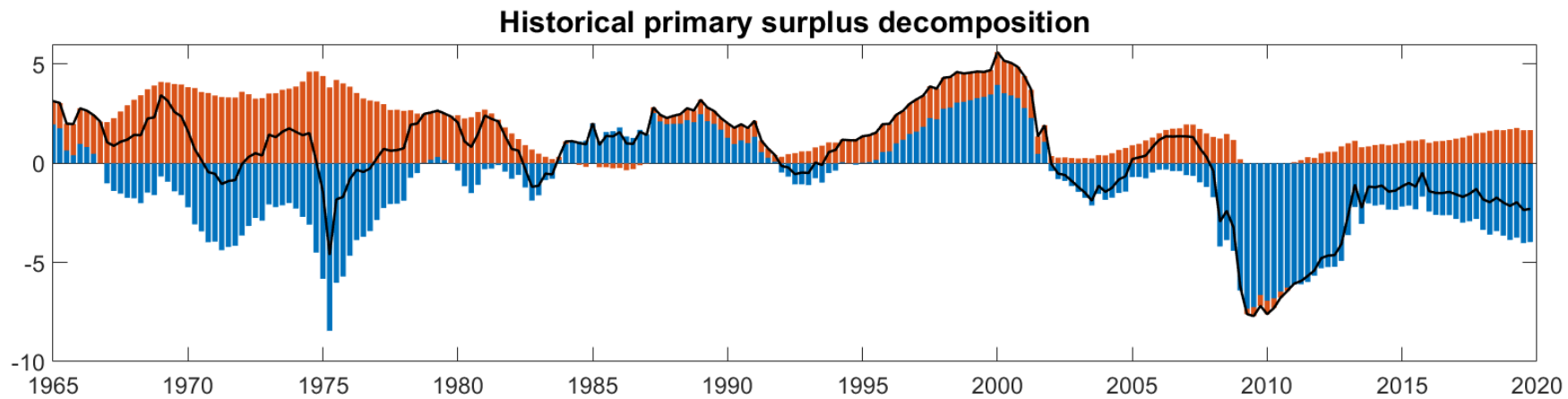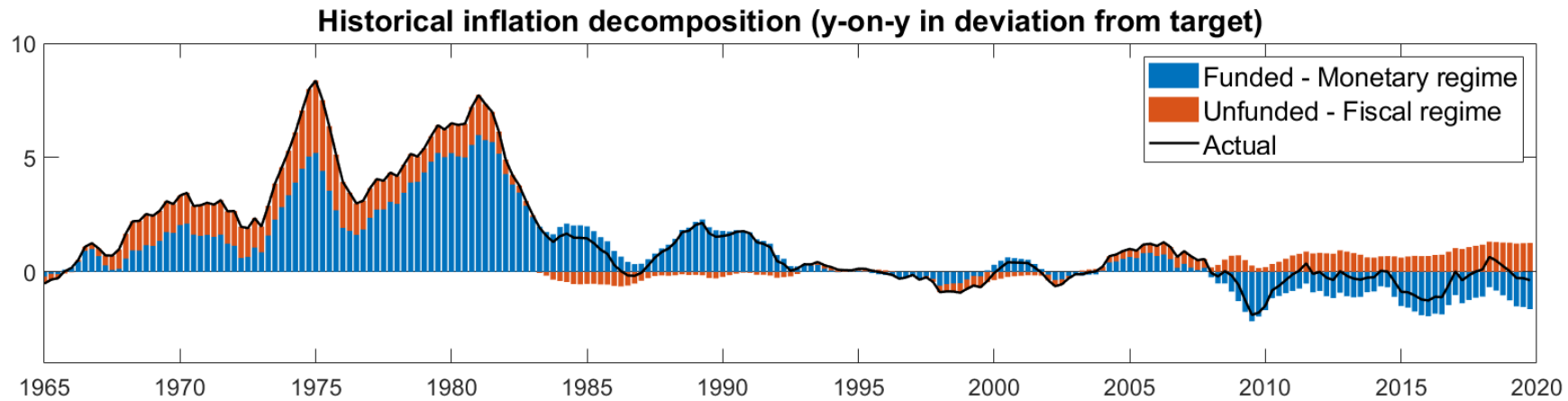
- What is the average degree of fiscal backing?
  - 0.83
- Are the most important drivers of inflation monetary or fiscal-led?
  - Monetary-led.
- How does lack of fiscal backing affect the propagation of various business cycle shocks?
  - Enhances the inflationary effects, stimulates output, and creates fiscal space following expansionary fiscal and negative supply shocks
  - Limited effect on propagation of demand shocks
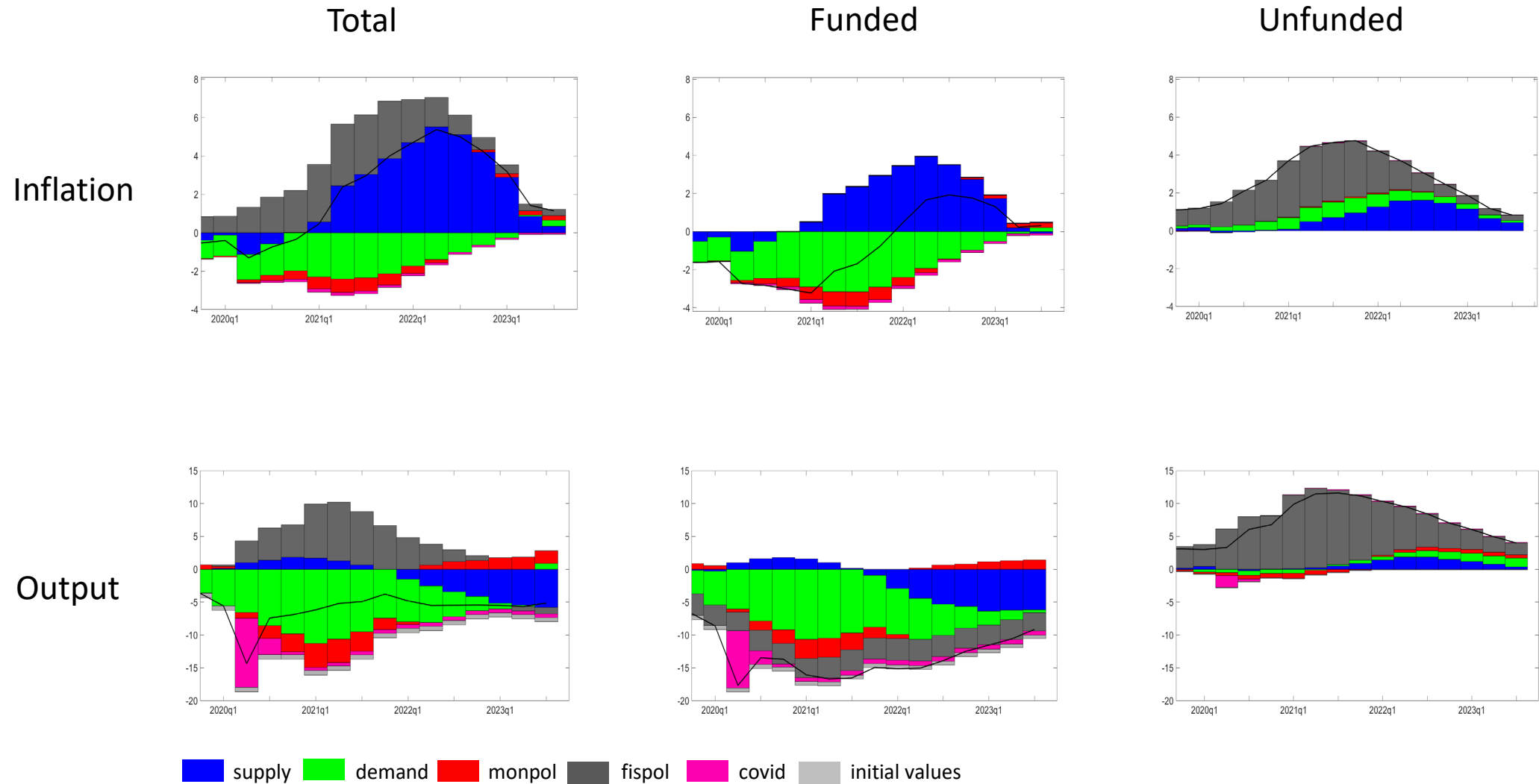- The post-pandemic inflation peak in 2022 is mostly driven by negative supply shocks, but fiscal policy (and fiscal inflation) did offset the impact of negative demand developments in 2021.

Robustness analysis and follow-up

- Is the degree of fiscal backing different in response to different shocks? Limited evidence of shock differentiation.

- Has the degree of fiscal backing changed over time? Weak evidence of time variation.

- How robust are the results with respect to TANK models? Robust with respect to TANK and complementarity between private and public consumption.

- Is the degree of fiscal backing asymmetric?

- What is the optimal degree of fiscal backing?