Exchange Rate and Inflation Under Weak Monetary Policy: Turkey Verifies Theory

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8. Introduce an Effective Upper Bound and show that inflation is not controlled when EUB is binding
9. Present event studies of financial market reactions to policy decisions in fall 2021

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$$i_t = r_t + E_t\{\pi_{t+1}\}$$

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- Can we lower inflation by lowering interest rates?

Neo-Fisherian Disinflation, Taylor Principle and the New Keynesian Model

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- What happens if $\phi_{\pi,t} < 1$?
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- Indeterminacy. Steady state is still there but we expect to hop around rather than getting to SS. Hence the Fisher effect is also irrelevant.
- What does indeterminacy mean in practice?
- Does the model have anything to say under weak policy rules?

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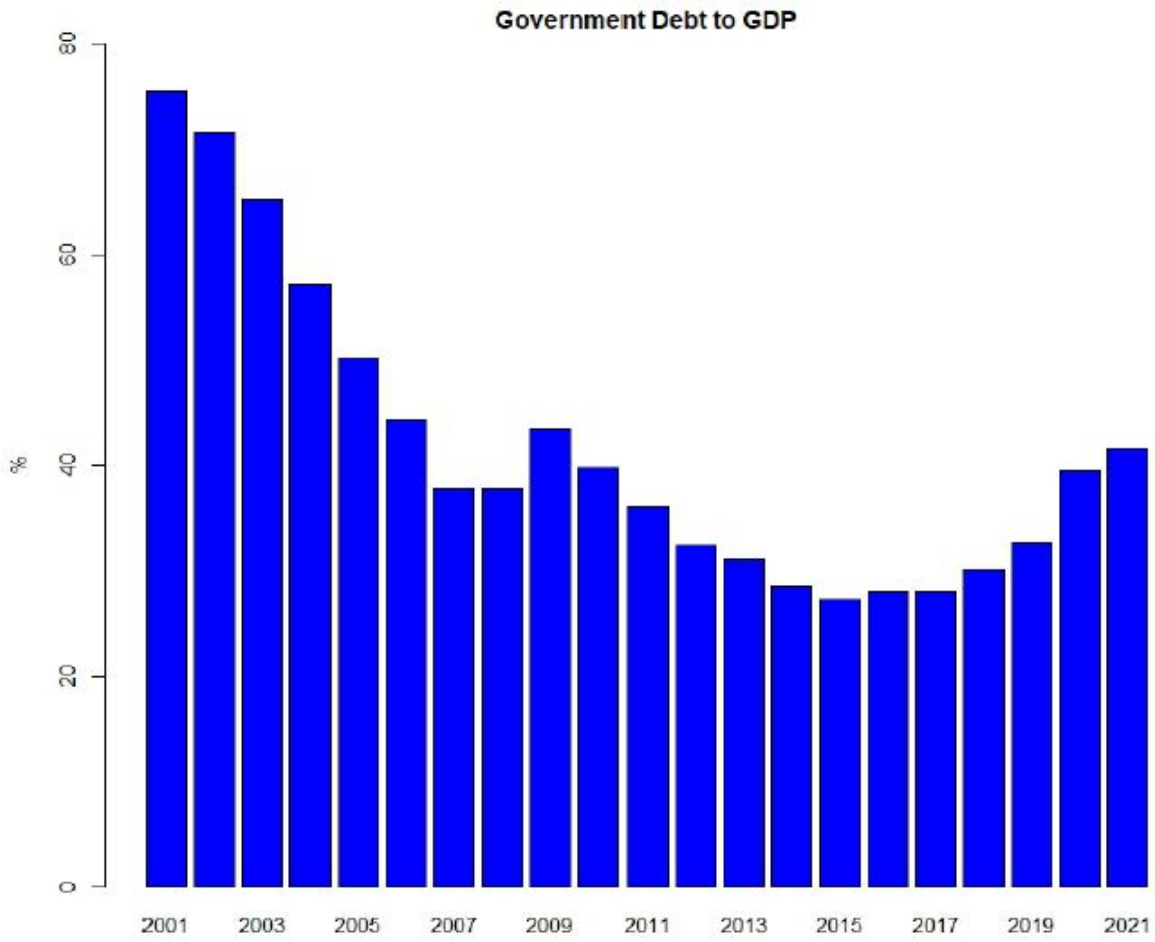
- Belief of government that correlation between inflation and interest rates is causal, from interest rates to inflation
- Political pressure on central bank for lower rates, going back at least a decade
- Exogenous to macroeconomic developments

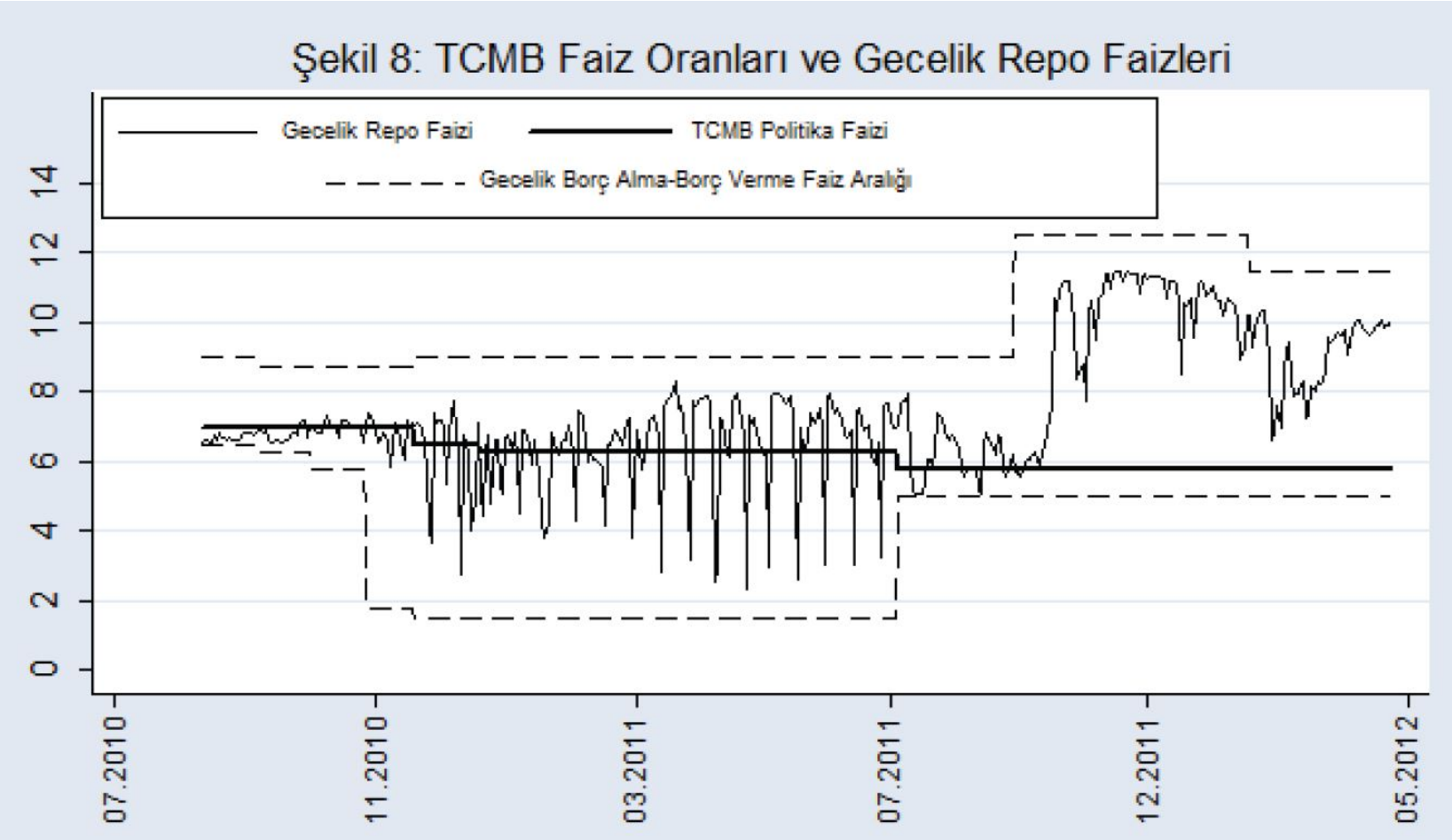
It was not fiscal dominance

Figure 1: Debt to GDP



And it began in 2010-11

Figure 2: Policy and O/N Rates, Going Haywire



Do we have a handle on exchange rates?

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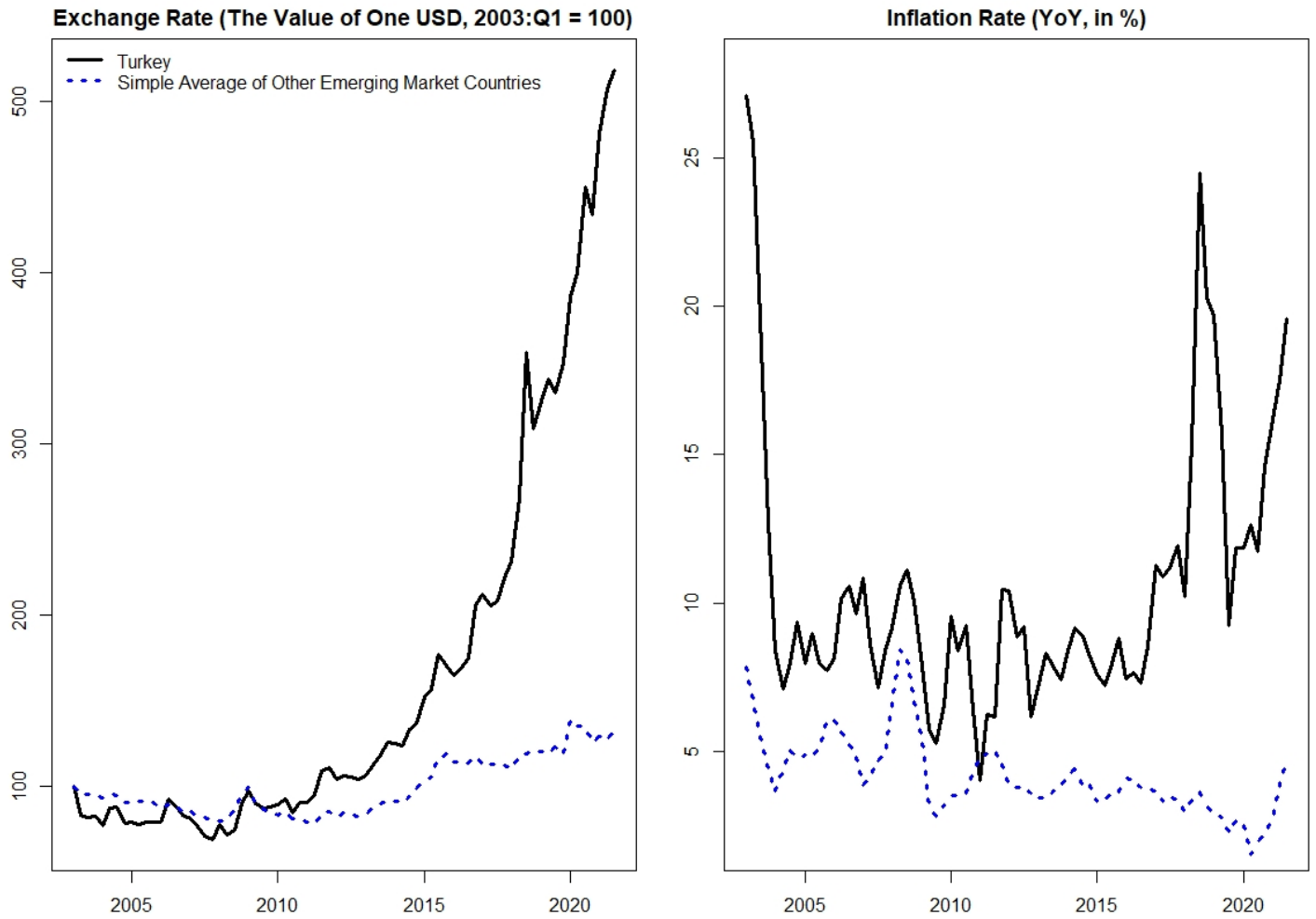
- What is the comovement between exchange rates and inflation?

Turkey is Different

Figure 3: Exchange rates and inflation rates in Turkey and other emerging market countries



Bivariate FX and Inflation Model

$$\begin{bmatrix} \triangle s_t \\ \pi_t \end{bmatrix} = \begin{bmatrix} \mu_t^{\triangle s} \\ \mu_t^{\pi} \end{bmatrix} + \begin{bmatrix} \epsilon_t^{\triangle s} \\ \epsilon_t^{\pi} \end{bmatrix}$$

$$\begin{bmatrix} \mu_t^{\triangle s} \\ \mu_t^{\pi} \end{bmatrix} = \begin{bmatrix} \mu_{t-1}^{\triangle s} \\ \mu_{t-1}^{\pi} \end{bmatrix} + \begin{bmatrix} \beta_{t-1}^{\triangle s} \\ \beta_{t-1}^{\pi} \end{bmatrix} + \begin{bmatrix} \eta_t^{\triangle s} \\ \eta_t^{\pi} \end{bmatrix}$$

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where

$$\begin{bmatrix} \epsilon_t^{\triangle s} \\ \epsilon_t^{\pi} \end{bmatrix} \overset{iid}{\sim} N(0, \Sigma_\epsilon), \quad \begin{bmatrix} \eta_t^{\triangle s} \\ \eta_t^{\pi} \end{bmatrix} \overset{iid}{\sim} N(0, \Sigma_\eta), \text{ and } \begin{bmatrix} \zeta_t^{\triangle s} \\ \zeta_t^{\pi} \end{bmatrix} \overset{iid}{\sim} N(0, \Sigma_\zeta)$$

and

$$\Sigma_\epsilon = \begin{bmatrix} \sigma^2_{\epsilon,\triangle s} & \sigma_{\epsilon,\triangle s\pi} \\ \sigma_{\epsilon,\pi\triangle s} & \sigma^2_{\epsilon,\pi} \end{bmatrix}, \; \Sigma_\eta = \begin{bmatrix} \sigma^2_{\eta,\triangle s} & \sigma_{\eta,\triangle s\pi} \\ \sigma_{\eta,\pi\triangle s} & \sigma^2_{\eta,\pi} \end{bmatrix}, \text{ and } \Sigma_\zeta = \begin{bmatrix} \sigma^2_{\zeta,\triangle s} & \sigma_{\zeta,\triangle s\pi} \\ \sigma_{\zeta,\pi\triangle s} & \sigma^2_{\zeta,\pi} \end{bmatrix}$$

Finding

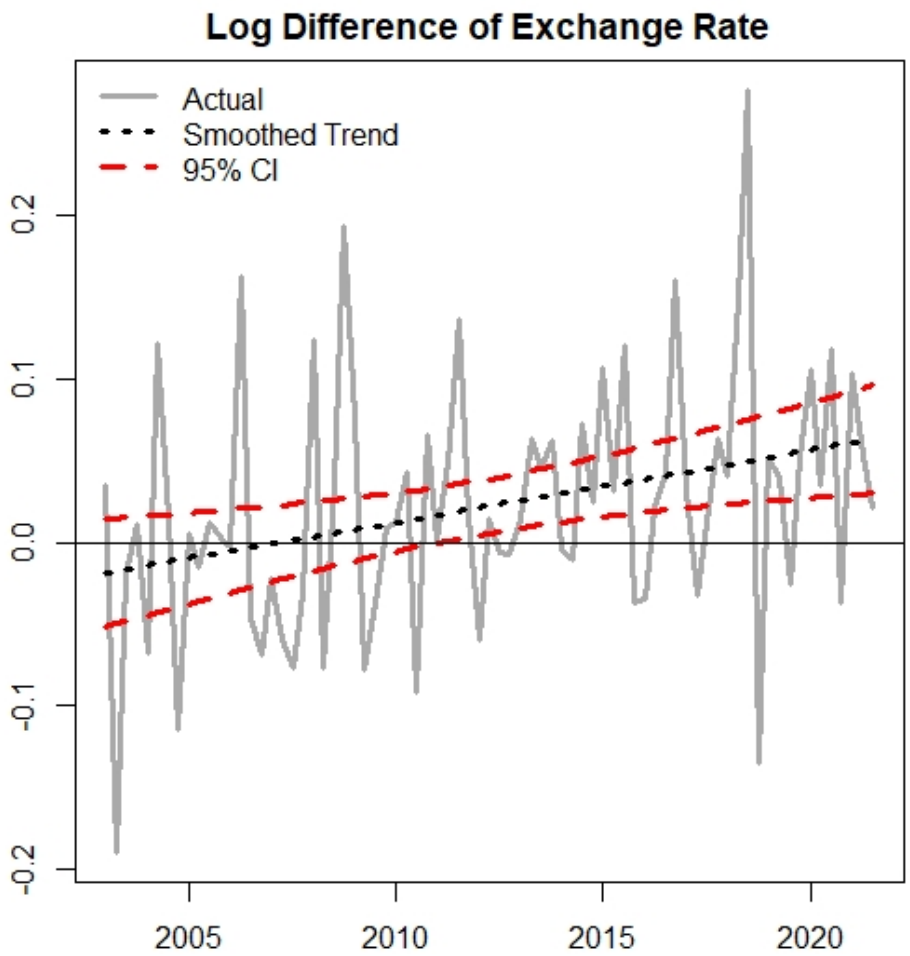
- Trend shocks are common, correlation is unity
- At high levels of inflation differentials, for trends, PPP applies

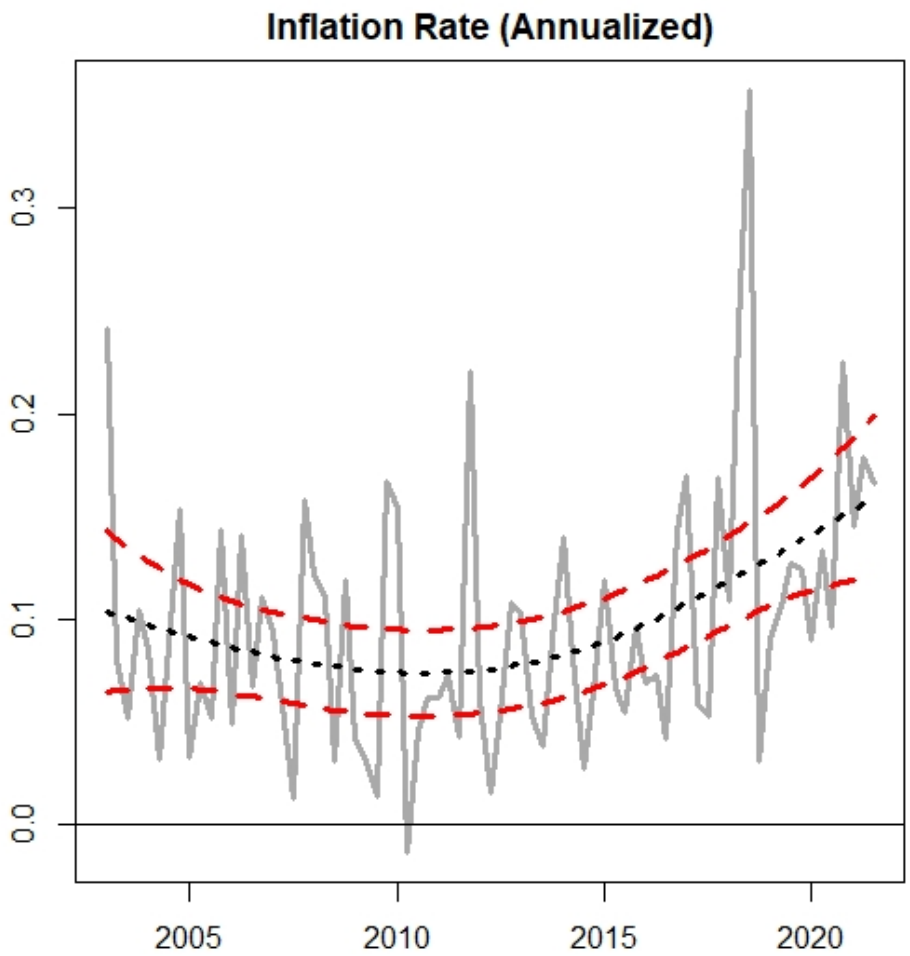
Finding

- Trend shocks are common, correlation is unity
- At high levels of inflation differentials, for trends, PPP applies
- Makes life easy in modeling, explaining broad behavior of inflation suffices in also explaining the exchange rate

FX and Inflation Trends

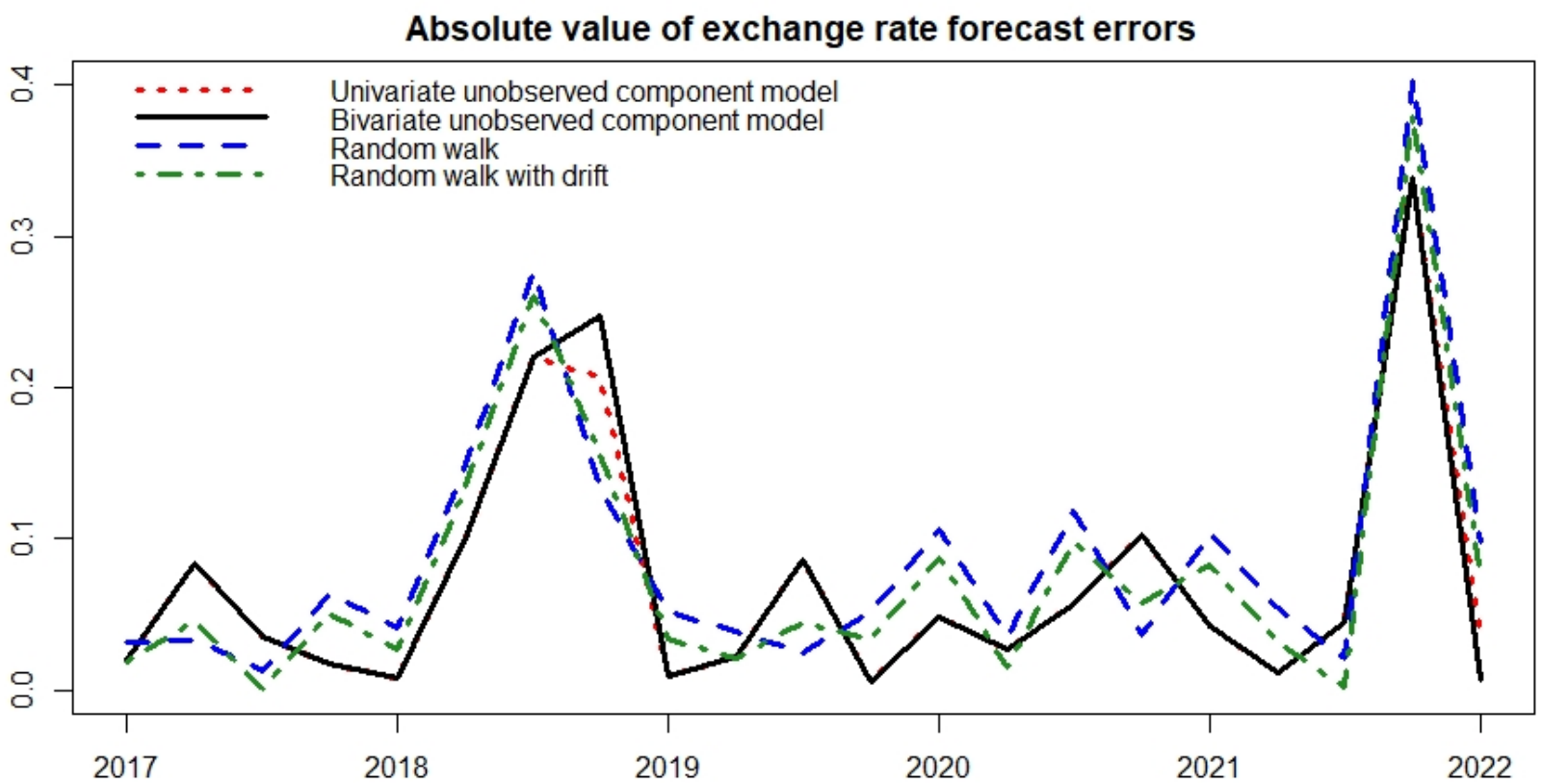
Figure 4: The Kalman smoothed estimates of $\mu_t^{\triangle s}$ and μ_t^{π}





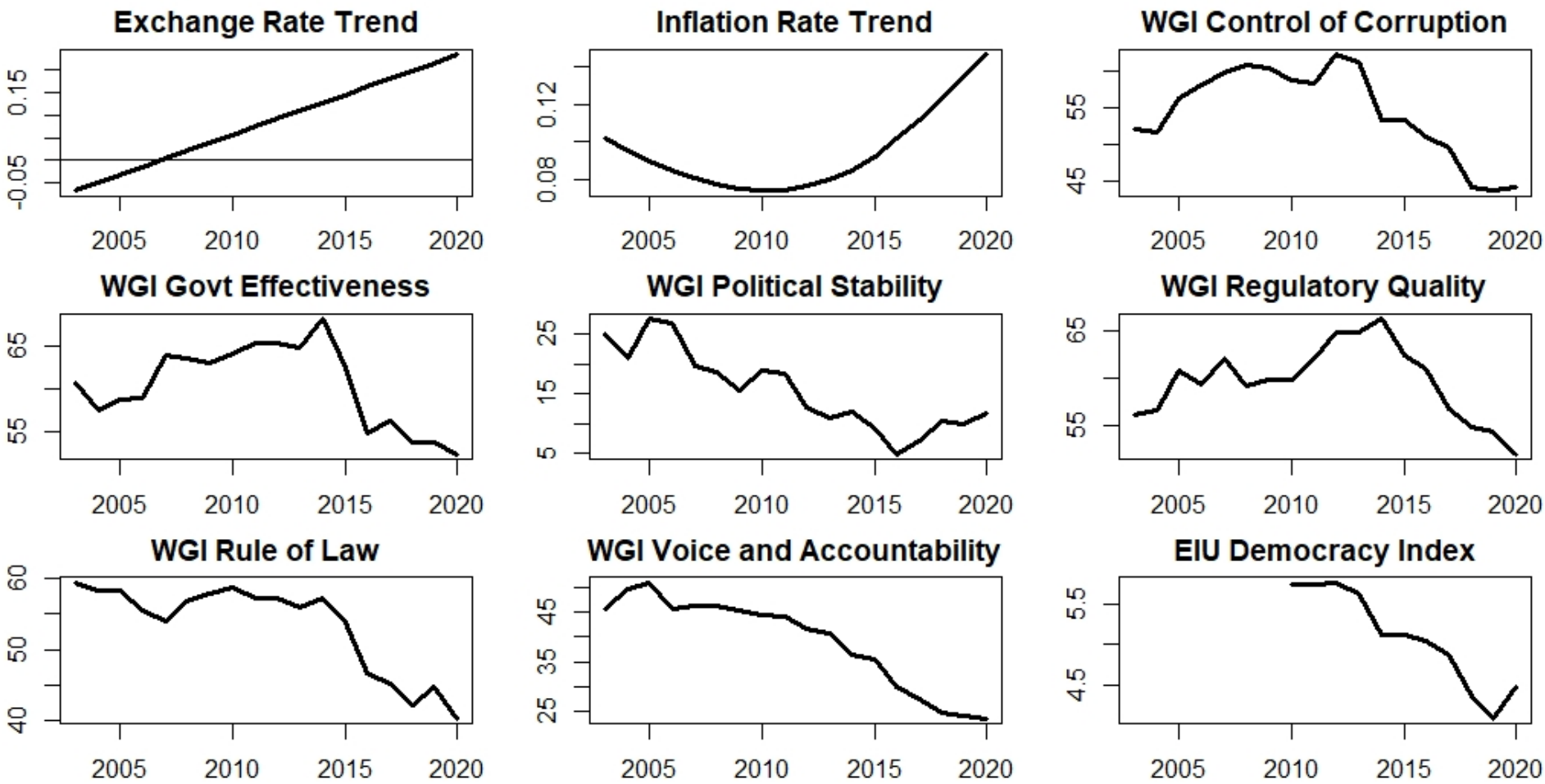
Modeling trends beats RW out of sample

Figure 5: Forecast errors



Why?

Figure 6: The estimated trends, the worldwide governance indicators, and the democracy index (annual)



Turkish Yield Spread as a Measure of Fundamentals

- Measures of governance are lagging and low frequency
- TR-US dollar debt yield spread good candidate to measure (perceived) fundamentals
- In the paper: Spread is not driven by US policy, relates to TR fundamentals
- Also in the paper: FX rate change Granger causes spread/fundamentals as predicted by Engel and West (2005)

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- Measure empirical rule
- Think of how such rule fits into theory
- Ask whether theory with such rule predicts behavior of inflation

Time Varying Taylor Rule

$$i_t = r_t + \bar{\pi}_t + \phi_{\pi,t}(\pi_t - \bar{\pi}_t) + \phi_{y,t} y_t + \vartheta_t$$

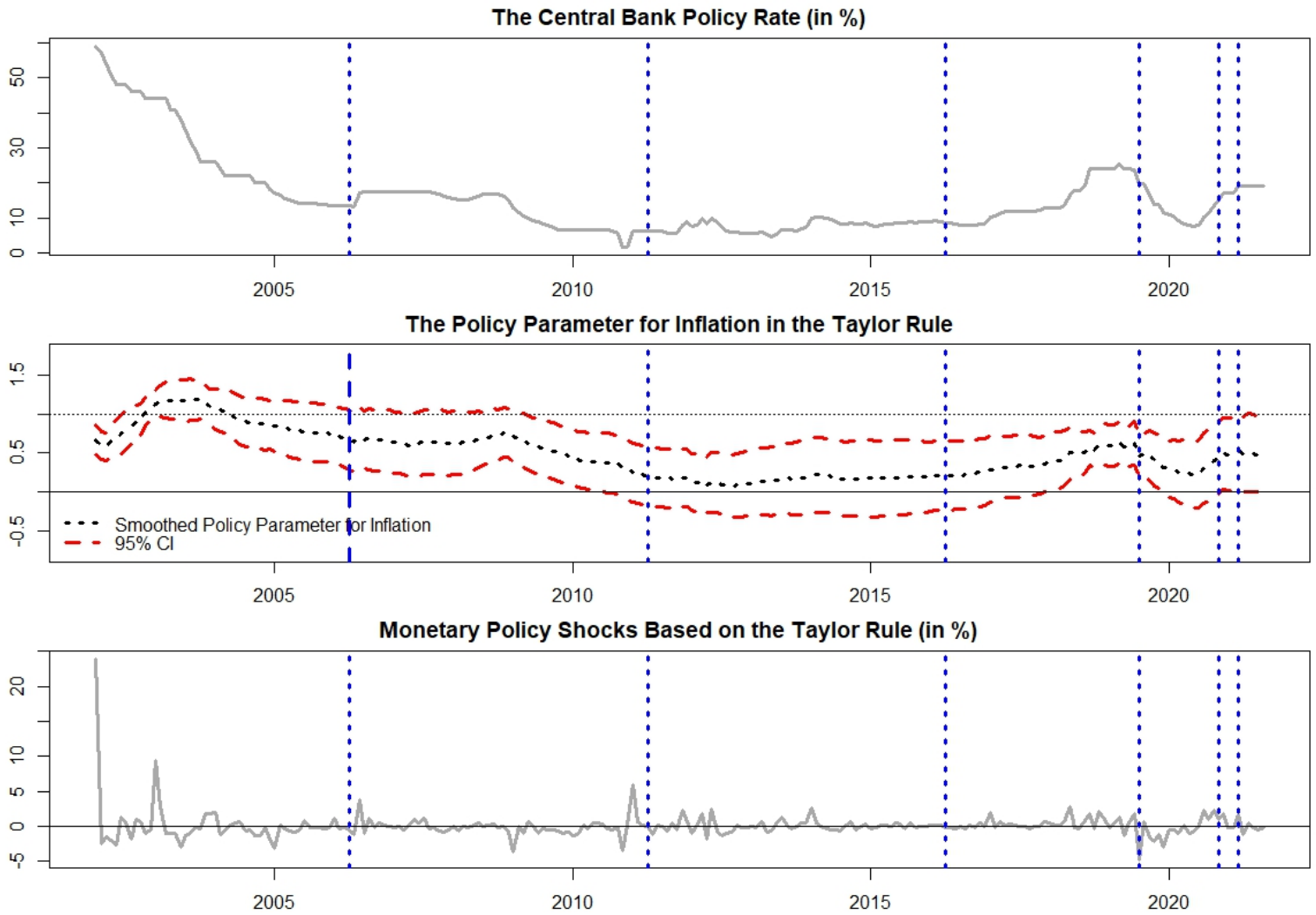
$$r_t = r_{t-1} + \xi_t$$

$$\phi_{\pi,t} = \phi_{\pi,t-1} + \varrho_t$$

$$\phi_{y,t} = \phi_{y,t-1} + \tau_t$$

What you were waiting for

Figure 7: The Taylor rule with time-varying parameters



New Keynesian Model...

$$x_t = E_t x_{t+1} - \frac{1}{\sigma}(i_t - E_t \pi_{t+1}) + u_t^{\pi}$$

$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t + u_t^{\pi}$$

$$i_t = (\phi_t^x - \psi^x \triangle_t) x_t + (\phi_t^{\pi} - \psi^{\pi} \triangle_t) \pi_t + u_t^i$$

$$\phi_t^x = (1 - \rho_{\phi^x})\phi^x + \rho_{\phi^x} \phi_{t-1}^x + e_t^{\phi^x}, \; e_t^{\phi^x} \overset{iid}{\sim} N(0, \sigma^2_{\phi^x})$$

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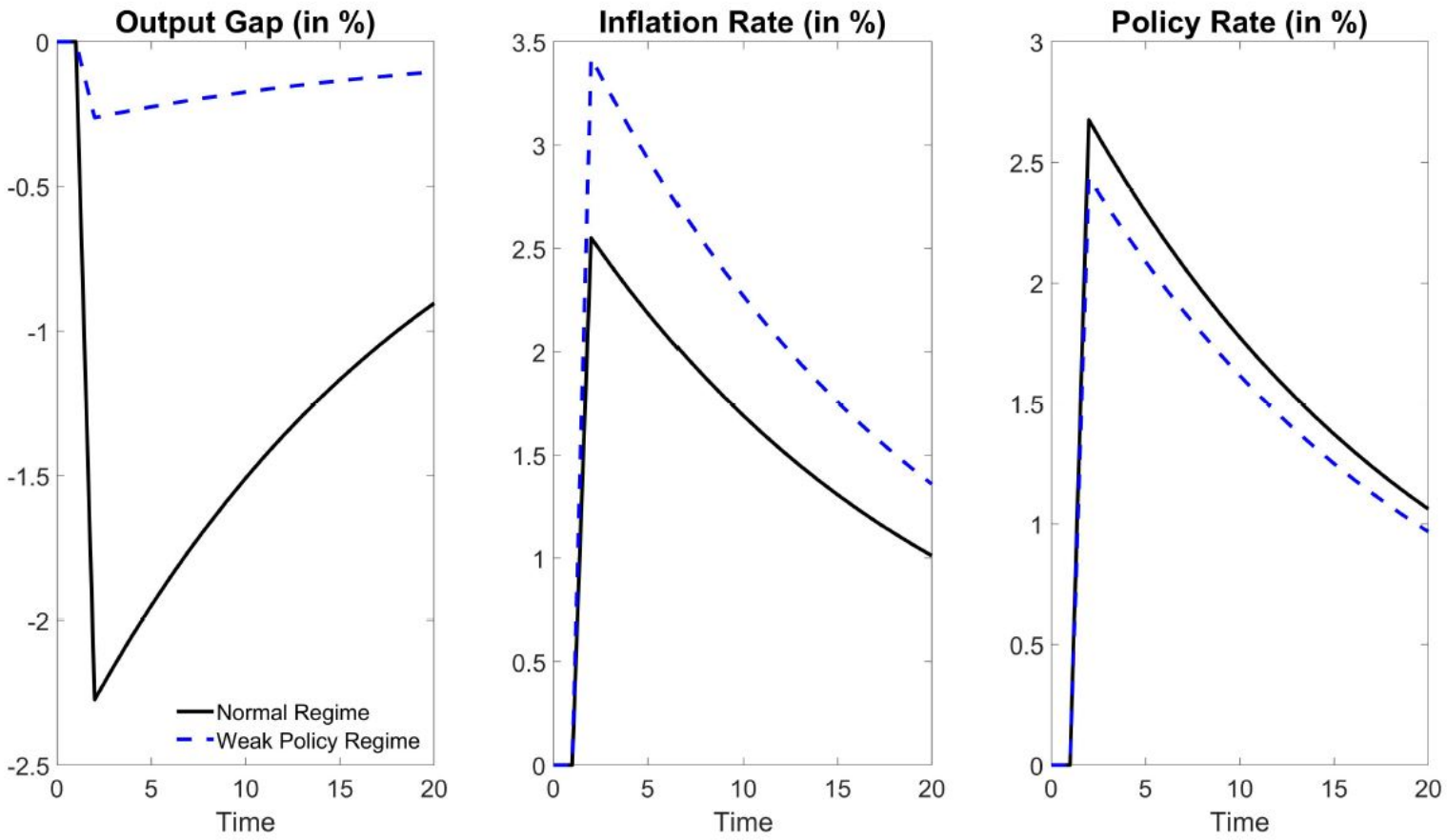
$$u_t^i = \rho_{u^i} u_{t-1}^i + e_t^{u^i}, \; e_t^{u^i} \overset{iid}{\sim} N(0, \sigma^2_{u^i}).$$

... with Regime Switches

$$\Pi = \begin{bmatrix} \pi_{00} & 1-\pi_{00} \\ 1-\pi_{11} & \pi_{11} \end{bmatrix}$$

Leads to

Figure 8: Impulse response functions based on a regime-switching New Keynesian model

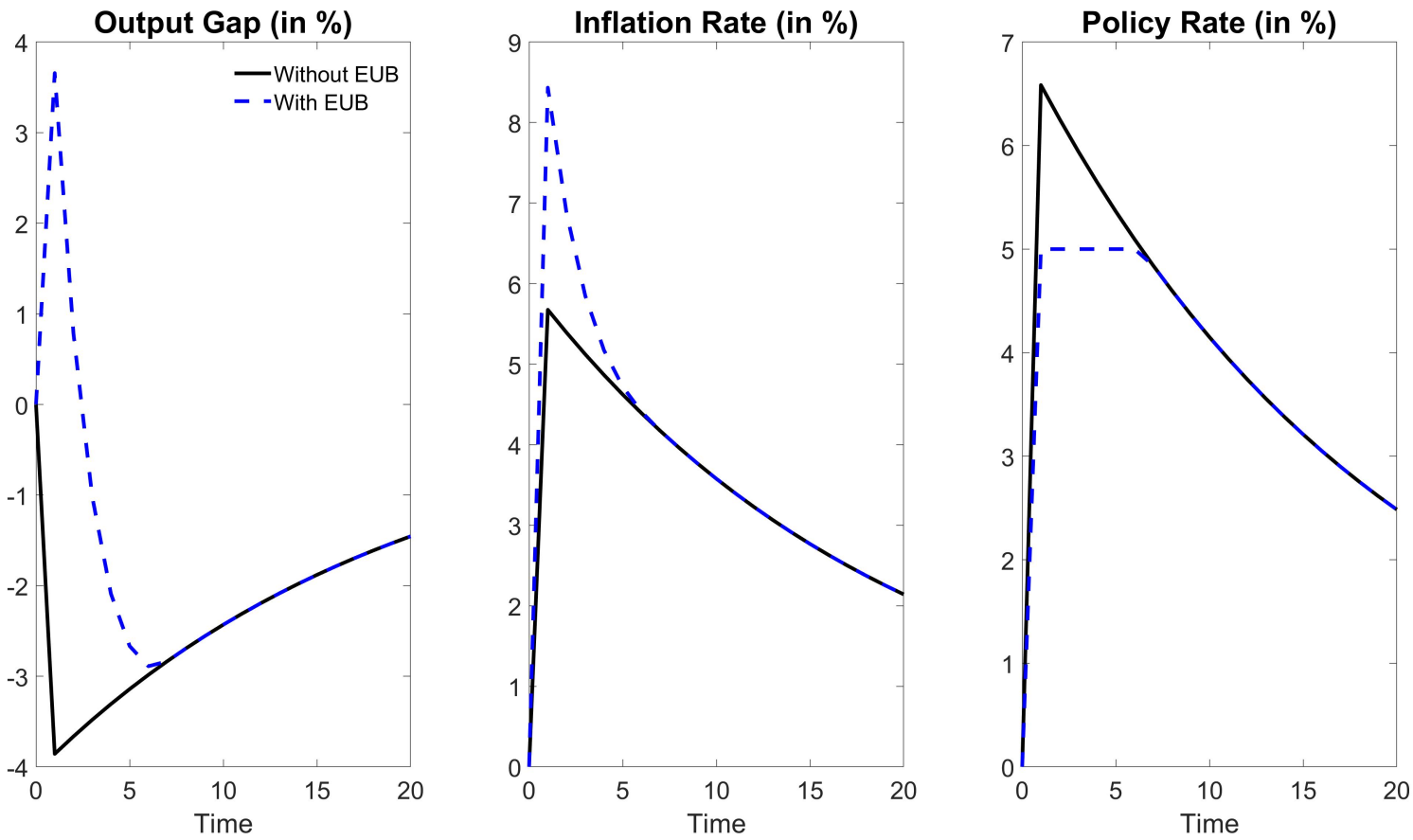


... or with Effective Upper Bound...

$$i_t = \min[i^{\text{EUB}}, \phi^x x_t + \phi^\pi \pi_t]$$

Leads to

Figure 9: Impulse response functions based on a New Keynesian model with the effective upper bound on the policy rate



This is lovely

- DNK model is excellent conceptual tool to make sense of inane policy as well as sane policy

Narrative for Fall 2021 - August 2021

" 'No more high interest-rates because high interest rates would bring us higher inflation,' Erdogan told ... ahead of the cental bank's Aug. 12 rate decision. His second call for a rate cut in as many months ... 'It is not possible for inflation to accelerate further from now on, because we're transiting to lower interest rates,' Erdogan said. 'I guess I am giving this signal to somewhere,' he added, without specifying." (Kozok and Hacaoğlu, 2021)

Narrative for Fall 2021 - August 2021

"Taking into account the high levels of inflation and inflation expectations, the current tight monetary policy stance will be maintained decisively until the significant fall in the Inflation Report's forecast path is achieved. Accordingly, the MPC has decided to keep the policy rate unchanged.

The CBRT will continue to use decisively all available instruments in pursuit of the primary objective of price stability. The policy rate will continue to be determined at a level above inflation to maintain a strong disinflationary effect until strong indicators point to a permanent fall in inflation and the medium-term 5 percent target is reached." (CBRT, 2021)

Narrative for Fall 2021 - September 2021

- Between August 2021 and September 2021 inflation increases

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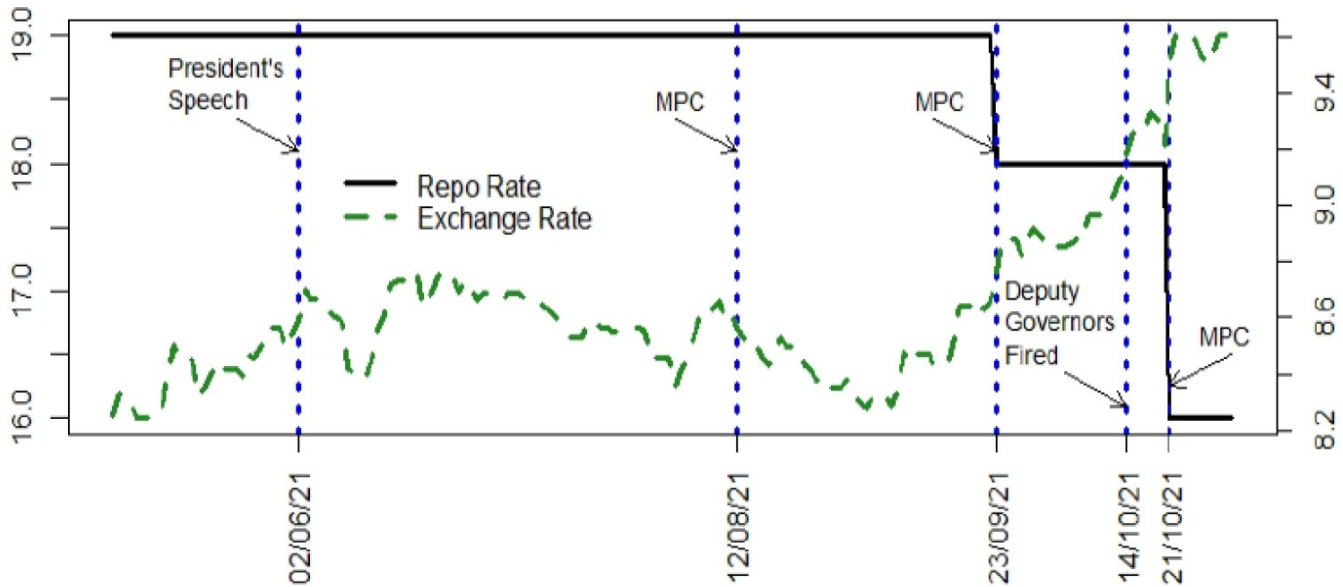
- Bloodbath in financial markets

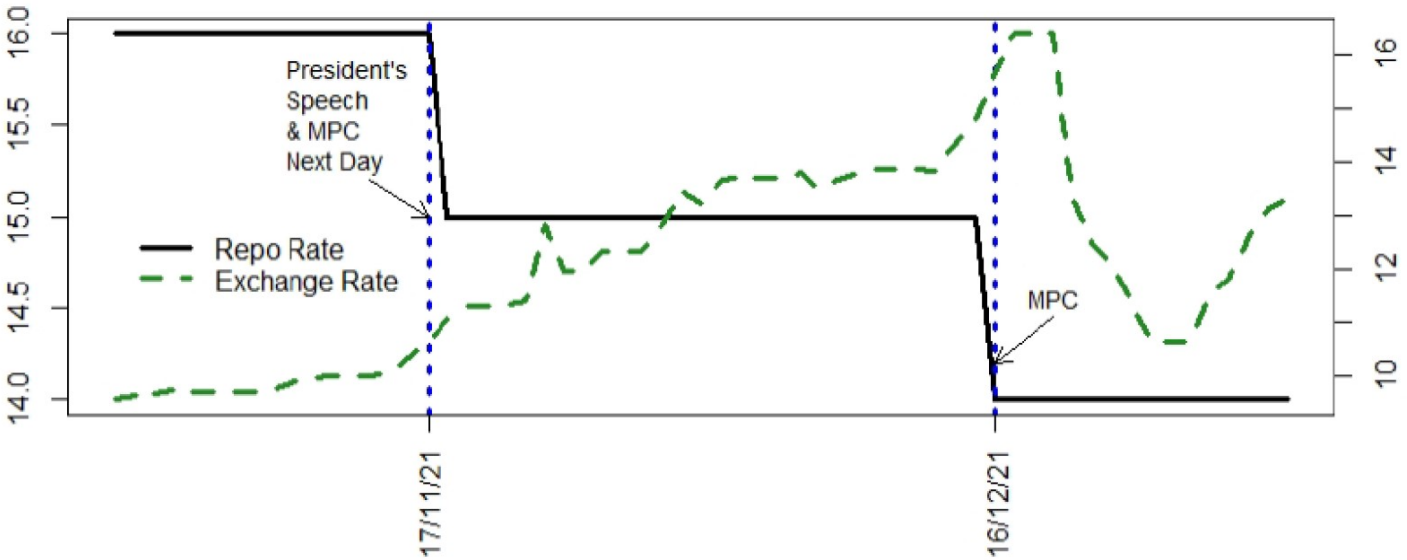
Fall of 2021 I

Figure 10: One Week Repo Rate (%; Left) and Exchange Rate (USD to TRY; Right), from May to Oct 2021



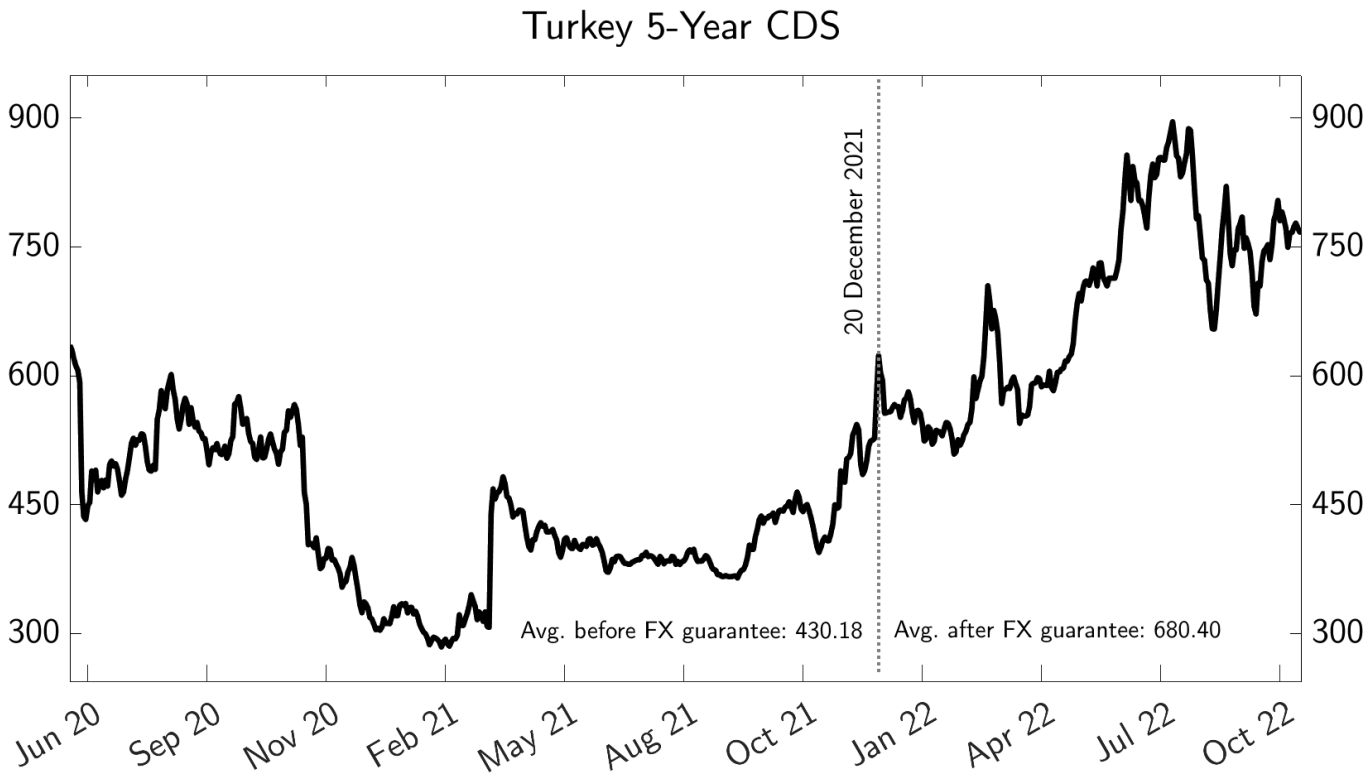
Fall of 2021 II

Figure 11: One Week Repo Rate (%; Left) and Exchange Rate (USD to TRY; Right), from Nov to Dec 2021



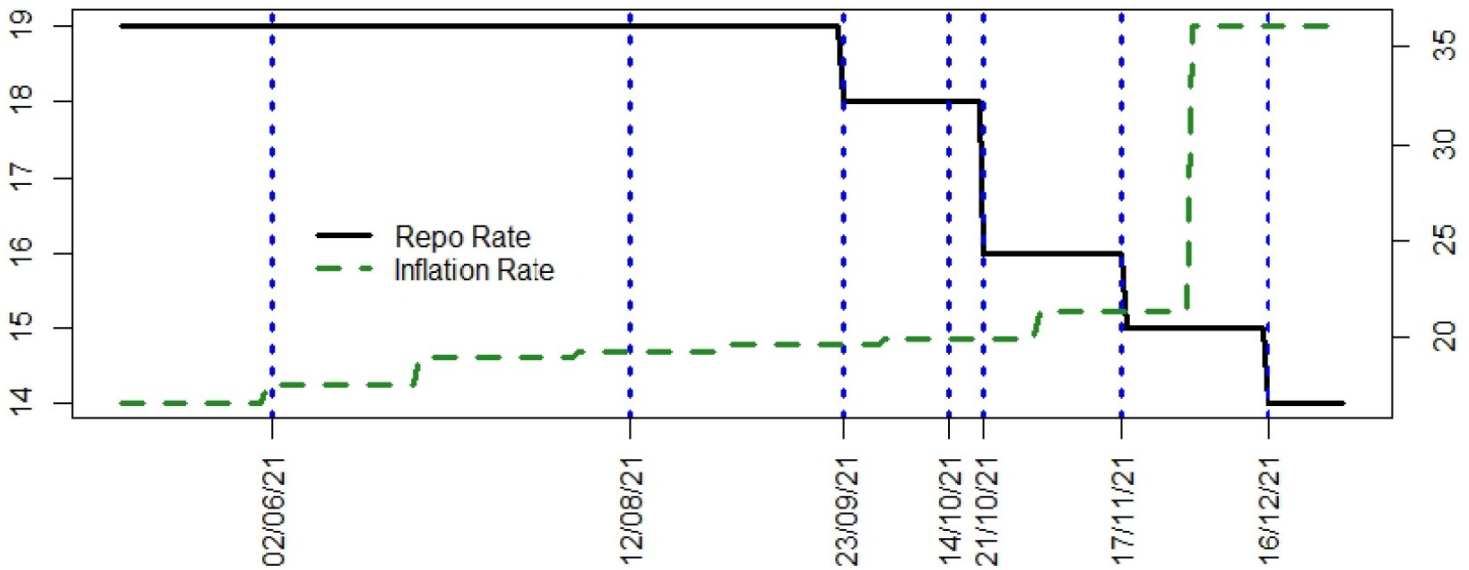
Aside: CDS

Figure 12: Five-year CDS Spreads



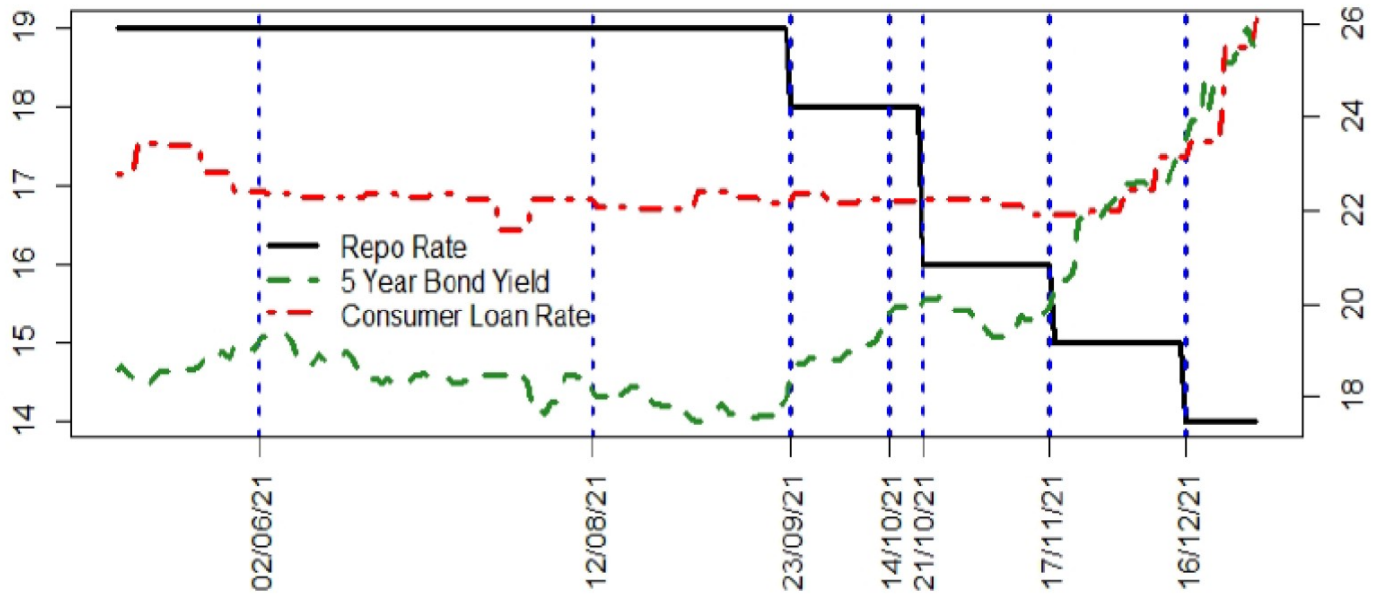
Fall of 2021 III

Figure 13: One Week Repo Rate (%; Left) and YoY CPI Inflation Rate



Fall of 2021 IV

Figure 14: One Week Repo Rate (%; Left) and 5 Year Govt Bond Yield and Consumer Loan Rate



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- Neo-Fisherianism is a very dangerous experiment to run, especially if policy is not credible.
- Lessons for emerging and advanced economies alike.