

Taylor Rule in Turkey (2002-2020)

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ECO 395M: Time Series Econometrics

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THE UNIVERSITY OF TEXAS AT AUSTIN

- 1 Motivation
- 2 Background
- 3 Model and Data Exploration
- 4 Estimation
- 5 Conclusions

- Changes in CPI has been above ten percent in Turkey since early 2017.
- How did the Central Bank respond to the rising inflation rates?
- What policies helped curbing it and what contributed to its rise?

Latest on Turkish economy

Turkey chase missing billions in foreign exchange reserves

US emissions reduction plan, Huarong debacle tests Beijing

Turkey bans crypto payments for goods and services

Turkish economy

+ Add to myFT

Turkish inflation accelerates for sixth consecutive month

Rising prices add to pressure on central bank to keep interest rates high

World Business Markets Breakingviews Video

MIDDLE EAST & AFRICA APRIL 5, 2021 / 2:17 AM / UPDATED 21 DAYS AGO

Turkey inflation above 16% in test for new cenbank chief

By Reuters Staff

3 MIN READ

ISTANBUL (Reuters) - Turkey's annual inflation climbed above 16% in March for the

THE PULSE OF THE MIDDLE EAST

NETIPY ISRAEL IRAN IRAQ ISRAEL JORDAN LEBANON NORTH AFRICA PALESTINE SYRIA TURKEY RUSSIA U.S.A

Turkish inflation rises, raising expectations of further rate hikes

Turkey's inflation rate rose to 15.61% in February, marking the fifth month consecutive increases and raising expectations for the central bank to intro further rate hikes.

Made for minds.

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EUROPE

Turkey's Erdogan fails to get d inflation under control

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Market Background

Central Bank of Republic of Turkey

- *Structural Changes after 2001 Crisis*
 - ▶ *Floating Exchange Rate*
 - ▶ *Amendment to the Central Bank Law*
- *Implicit Targeting after 2002*
 - ▶ *Measures to increase monetary policy effectiveness*
- *Inflation Targeting after 2006*
- *Wide Interest Rate Corridor after 2010*
 - ▶ *more than one interest rate is used as an instrument*
 - ▶ *new policy instruments : Reserve options mechanism and required reserve coefficient*
- *Not Wide Interest Rate Corridor after 2016*
 - ▶ *"makes it difficult to understand the monetary policy stance"*

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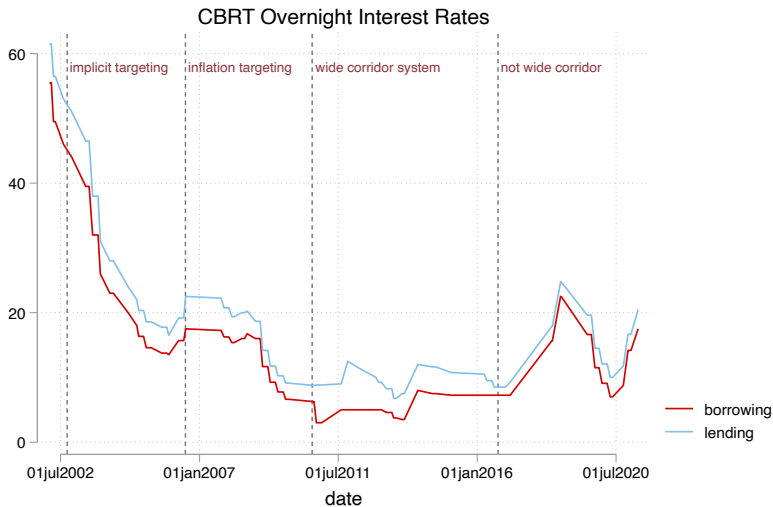
Taylor Rule

$$i_t = \pi_t + r_t^* + a_\pi (\pi_t - \pi_t^*) + a_y (y_t - \bar{y}_t)$$

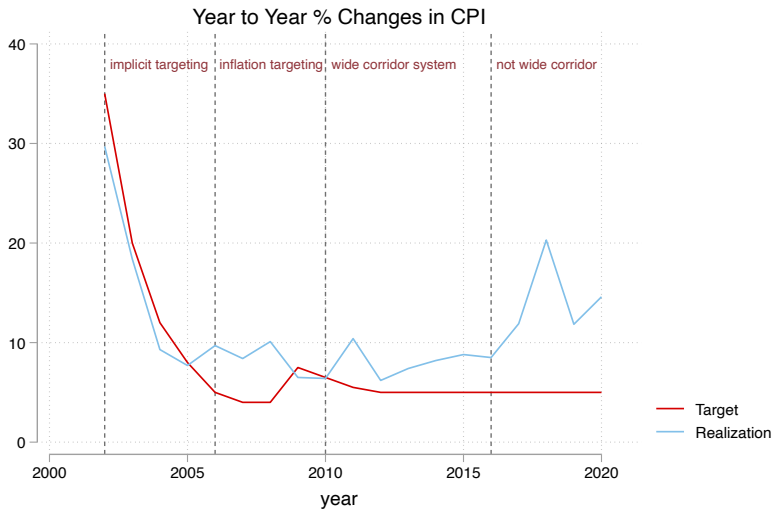
Variables

- *Policy Variable*
 - ▶ *CBRT's tools have changed over time.*
 - ▶ *I take Overnight Interest Rates to be the policy variable.*
- *Output Gap*
 - ▶ *detrended and deseasonalized log GDP*
 - ▶ *detrended composite leading indicator*
- *Inflation*
 - ▶ *Year to year percent change in CPI (2003=100)*
 - ▶ *Year to year change in Cost of Living for Wage Earners (1995=100)*
- *Data Sources*
 - ▶ <https://www.hmb.gov.tr/hmb-veri-dagitim-sistemi>
 - ▶ <https://www.tuik.gov.tr/Kurumsal/>
 - ▶ <https://www.tcmb.gov.tr/>

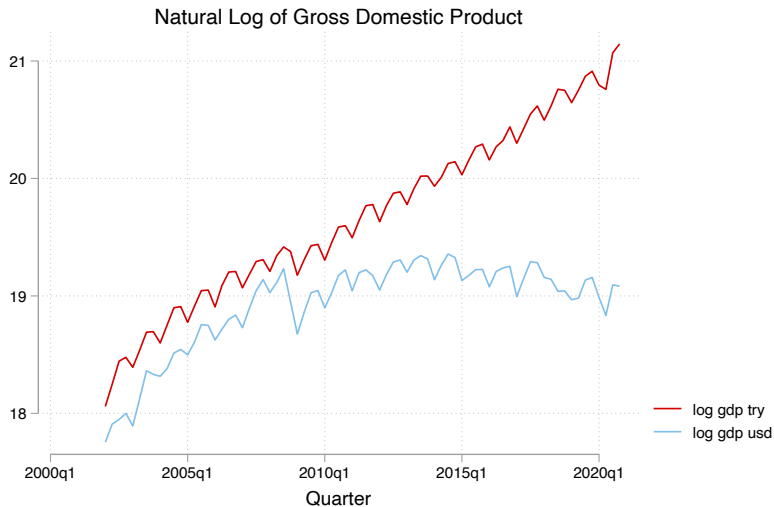
Policy



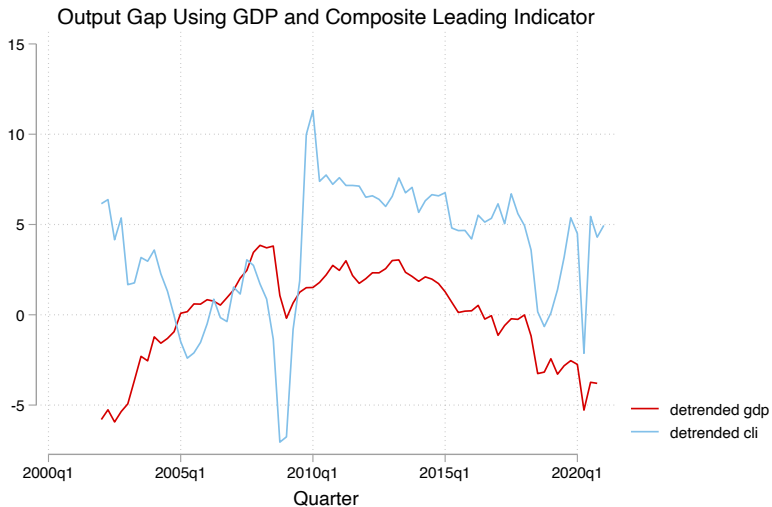
Inflation



Output Gap



Output Gap



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Short-Run SVAR

- I take Overnight Interest Rates to be the policy variable in this case.

$$\Delta \ln y_t = \alpha_1 + \beta_{12}\pi_t + \beta_{13}i_t + \gamma_{11}\Delta \ln y_{t-1} + \gamma_{12}\pi_{t-1} + \gamma_{13}i_{t-1} + \cdots + \varepsilon_{1t}$$

$$= \alpha_1 + \gamma_{11}\Delta \ln y_{t-1} + \gamma_{12}\pi_{t-1} + \gamma_{13}i_{t-1} + \cdots + \varepsilon_{1t}$$

$$\pi_t = \alpha_2 + \beta_{21}\Delta \ln y_t + \beta_{23}i_t + \gamma_{21}\Delta \ln y_{t-1} + \gamma_{22}\pi_{t-1} + \gamma_{23}i_{t-1} + \cdots + \varepsilon_{2t}$$

$$= \alpha_2 + \beta_{21}\Delta \ln y_t + \gamma_{21}\Delta \ln y_{t-1} + \gamma_{22}\pi_{t-1} + \gamma_{23}i_{t-1} + \cdots + \varepsilon_{2t}$$

$$i_t = \alpha_3 + \beta_{31}\Delta \ln y_t + \beta_{32}\pi_t + \gamma_{31}\Delta \ln y_{t-1} + \gamma_{32}\pi_{t-1} + \gamma_{33}i_{t-1} + \cdots + \varepsilon_{3t}$$

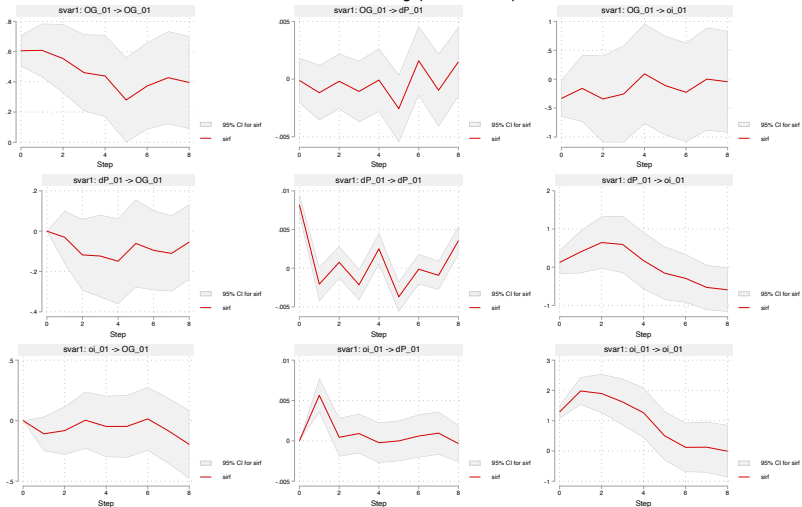
- In matrix notation,

$$\begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21} & 1 & 0 \\ -\beta_{31} & -\beta_{32} & 1 \end{bmatrix} \begin{pmatrix} \Delta \ln y_t \\ \pi_t \\ i_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{pmatrix} + \sum_{i=1}^8 A_i z_{t-i} + \varepsilon_t$$

$$Bz_t = \alpha + \sum_{i=1}^8 A_i z_{t-i} + \varepsilon_t$$

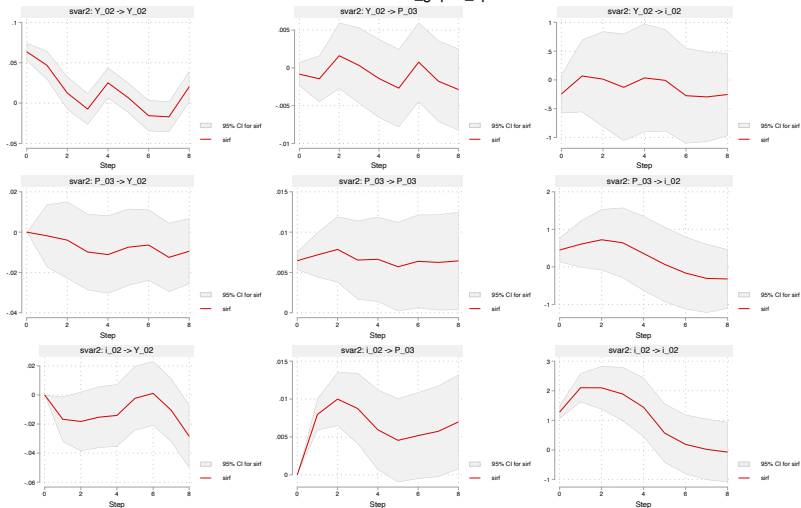
Short-Run SVAR Model 1 (First Difference)

Irfs of VAR Model: dtd_gdp_usd d_ln_cpi95 oni

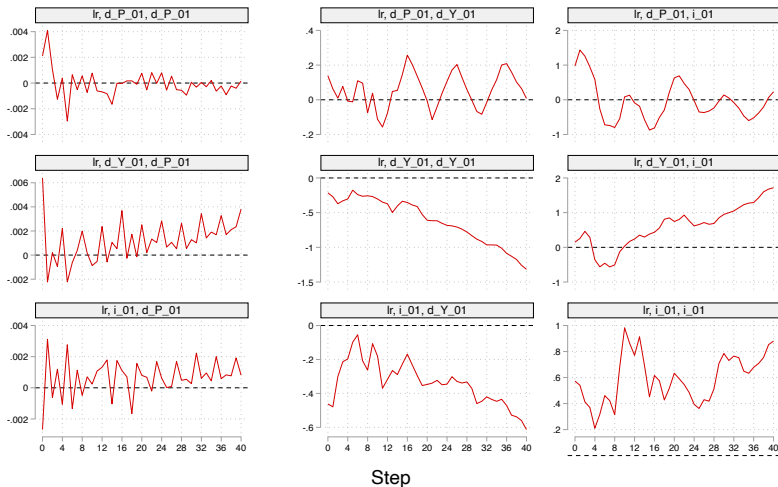


Short-Run SVAR Model 2 (Log)

Irfs of VAR Model: ln_gdp ln_cpi95 oni

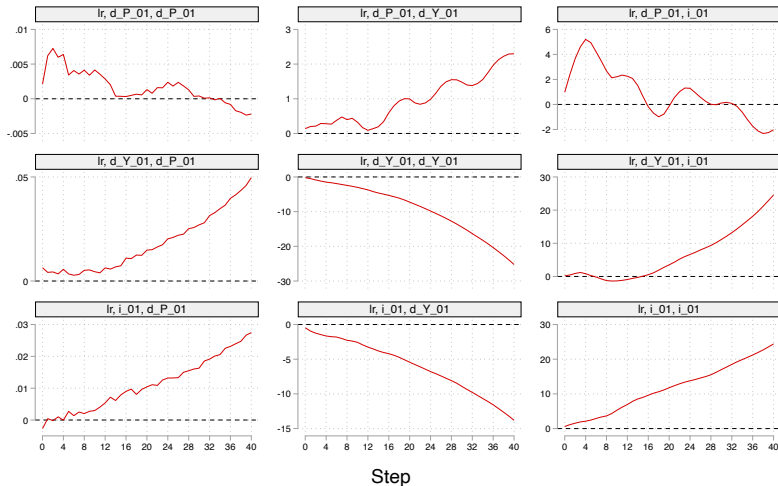


Long-Run SVAR



Graphs by irfname, impulse variable, and response variable

Long-Run SVAR



Graphs by irfname, impulse variable, and response variable

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Conclusions

- Shocks to Overnight Borrowing Rates lead to higher and persistent rises in inflation => hot political debate
- Shocks to output leads to higher prices and the effect is persistent => demand driven growth?
- CBRT responds to growing economy by reducing rates! (at least in the first few quarters) => what about contractionary policy during booms?

Thank Y'all !!

- Dr. Zervou and Zhenghao
- All our friends and colleagues here

References

- <https://www.tcmb.gov.tr/>
- Alkan, Buket. Journal of Economics and Political Economy ; Istanbul Vol. 6, Iss. 1, (Mar 2019) : 78-93. DOI :10.1453/jepe.v6i1.1851
- Kara, Hakan, Ogunc, Fethi and Sarikaya, Cagri, (2017), Inflation Dynamics in Turkey : A Historical Accounting, CBT Research Notes in Economics, Research and Monetary Policy Department, Central Bank of the Republic of Turkey.
- Khakimov, O.A. Erdogan, Levent Cağlarirmak, Necla. (2010). Assessing monetary policy rule in Turkey. International Journal of Economic Perspectives. 4. 319-330.
- More Literature Review is on the way