Macroeconomic effect of government debt maturity structure

{Can the National Treasury do contractionary monetary policy?}

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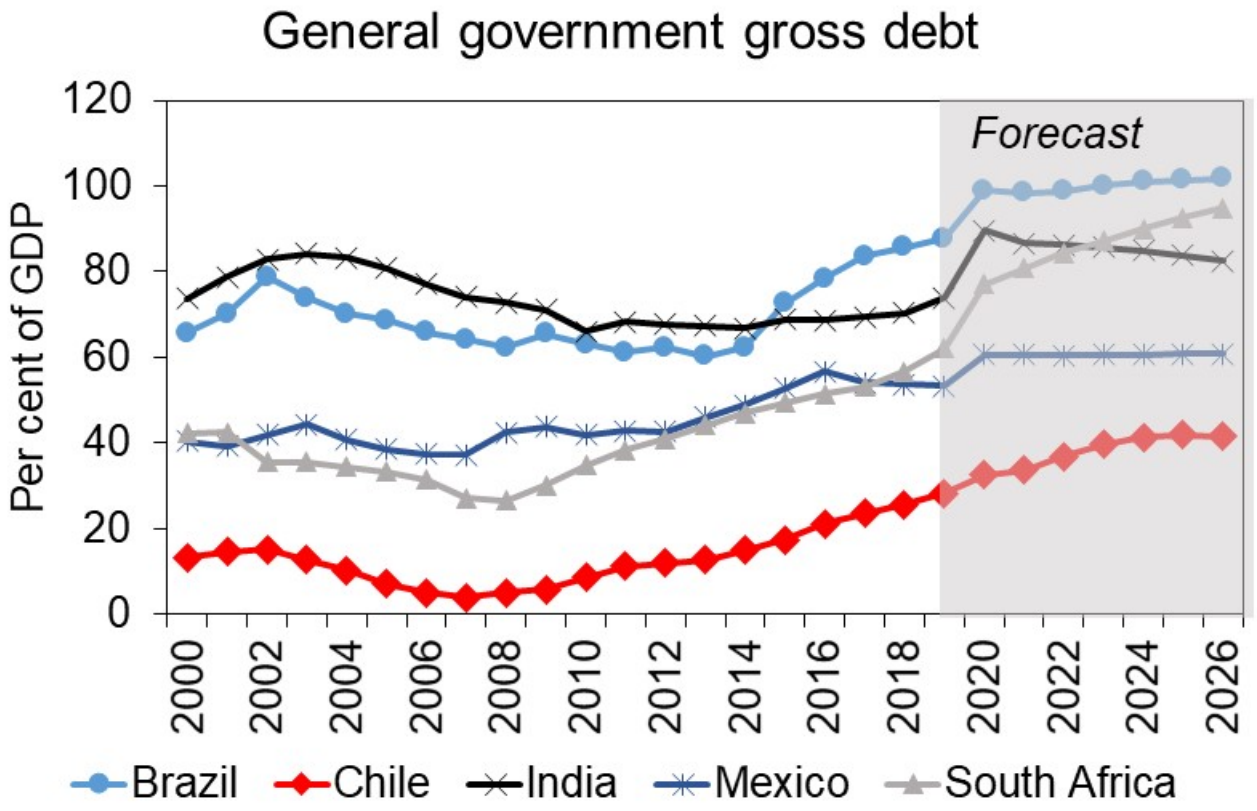
South African Reserve Bank

Outline

1. Introduction: Debt maturity structure
2. National Treasury's bond switch auction programme
3. The cost of the switch auction
4. Macroeconomic effect of the switch auction/maturity structure
5. Conclusion

Introduction

- Debt levels have been rising
- A return to a new “normal”, still elevated debt.
- As a result, debt issuance has increased and is concentrated at the long end of the sovereign yield.



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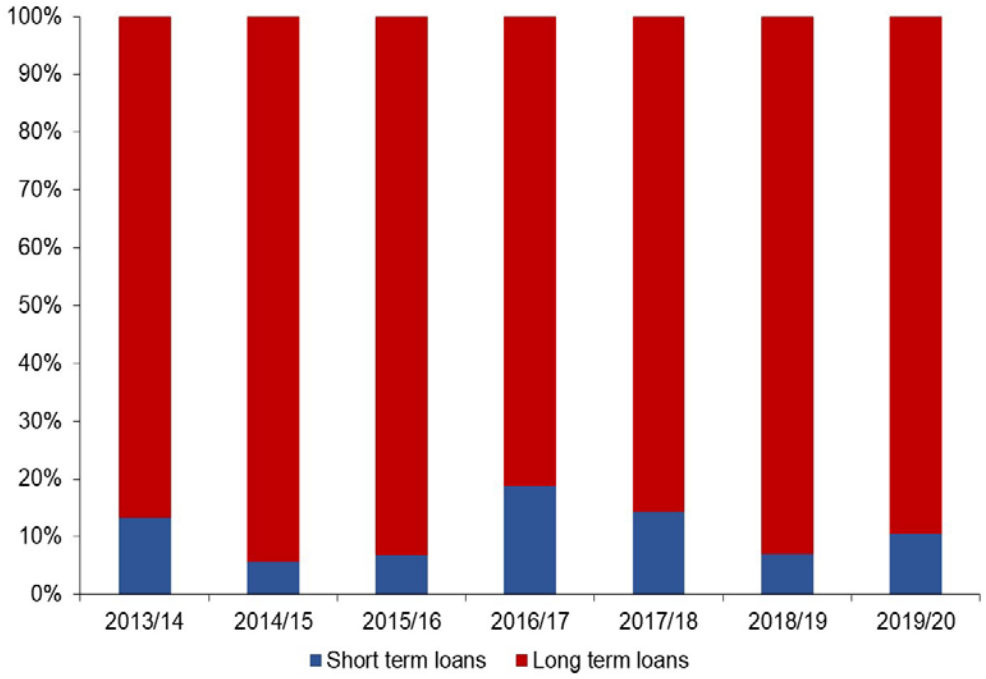
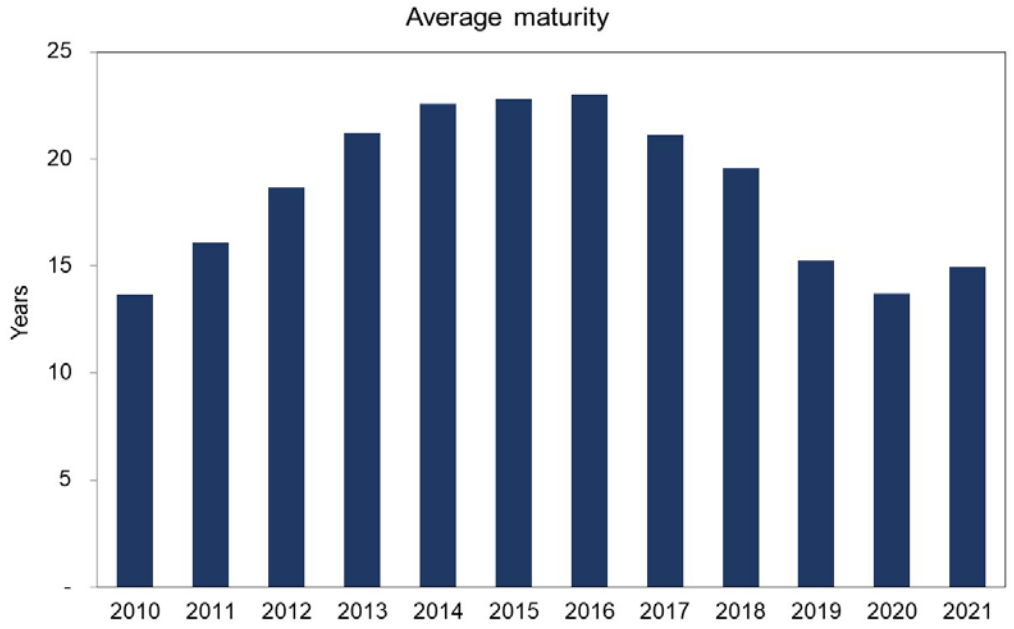
Introduction

- 10% of the funding requirement is financed by issuance of short-term loans
- Long-term loan issuance account for almost 90%.
- As a result, average maturity of weekly bond auctions increased to over 20 years in 2017.





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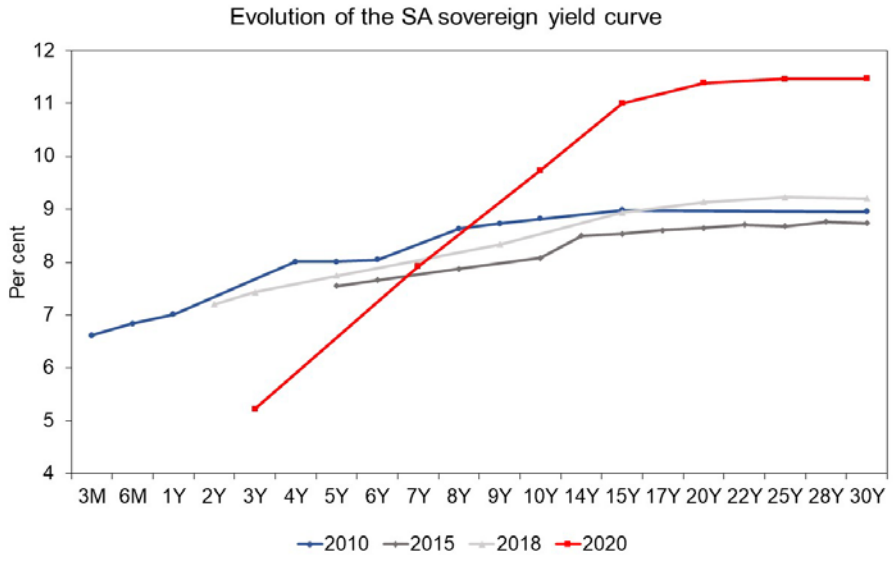
Introduction

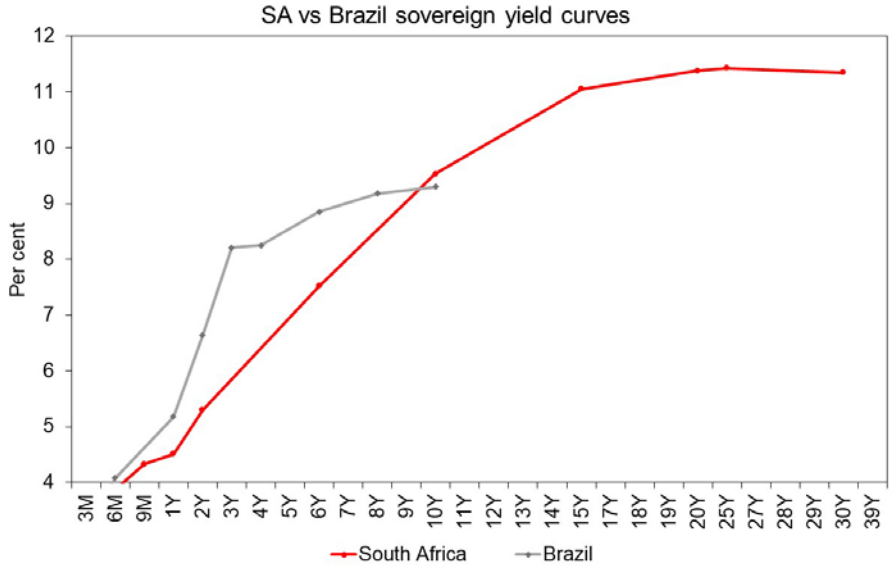
- Composition of debt skewed towards the ultra-long end of the yield curve.
- Share of short-term bonds outstanding decreased from around 10% to 7%, whereas ultra-long-term bonds increased from 49% to 59% since 2015 to 2019.

Bond Maturity	As at 31 March 2015		As at 31 March 2019	
	%	Amount (R'm)	%	Amount (R'm)
Short term (1-3 yrs)	10.44	133.97	7.37	142.87
Medium term (3 - 7 yrs)	20.29	260.4	18.48	358.05
Long term (7 - 12 yrs)	20.73	265.96	15.08	292.26
Ultra-long term (12 yrs +)	48.54	622.93	59.07	1144.76
Total	*100*	*1283.28*	*100*	*1937.94*

Steepening of the sovereign yield curve

- The long-end of the South African yield curve has remained sticky and high.
- Long yields have increased by 250 BPS over the last decade.
- South Africa's longest dated bond is a 30-year vs Brazil's 10 year.





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Introduction

- With these high debt levels comes an increase in refinancing risk
- NT manages this through bond buybacks or bond switches
- Policy intention is optimise the maturity structure but what is the external effect of this lengthened maturity structure?
- We analyse the effect of the switch auction in lengthening the maturity profile and assess macroeconomic effects using the event of the switch auctions.

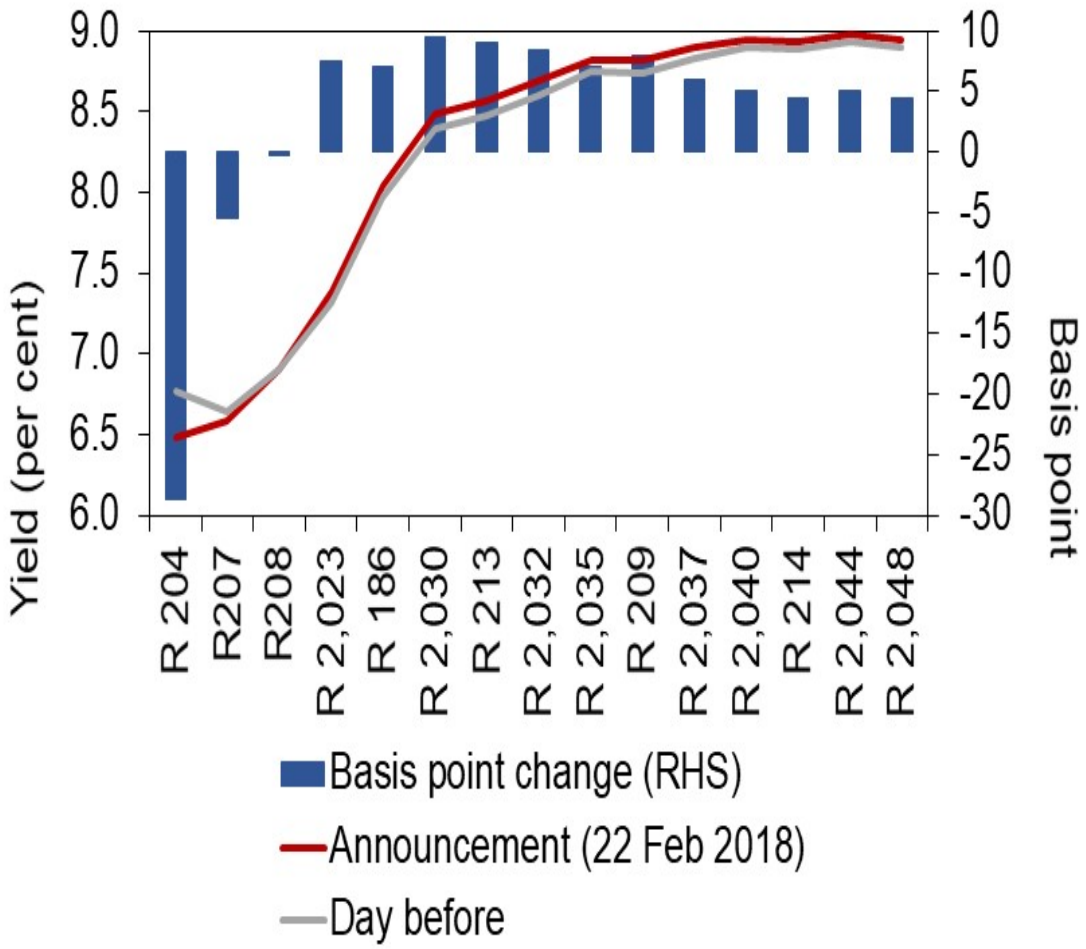
The National Treasury bond switch auction programme

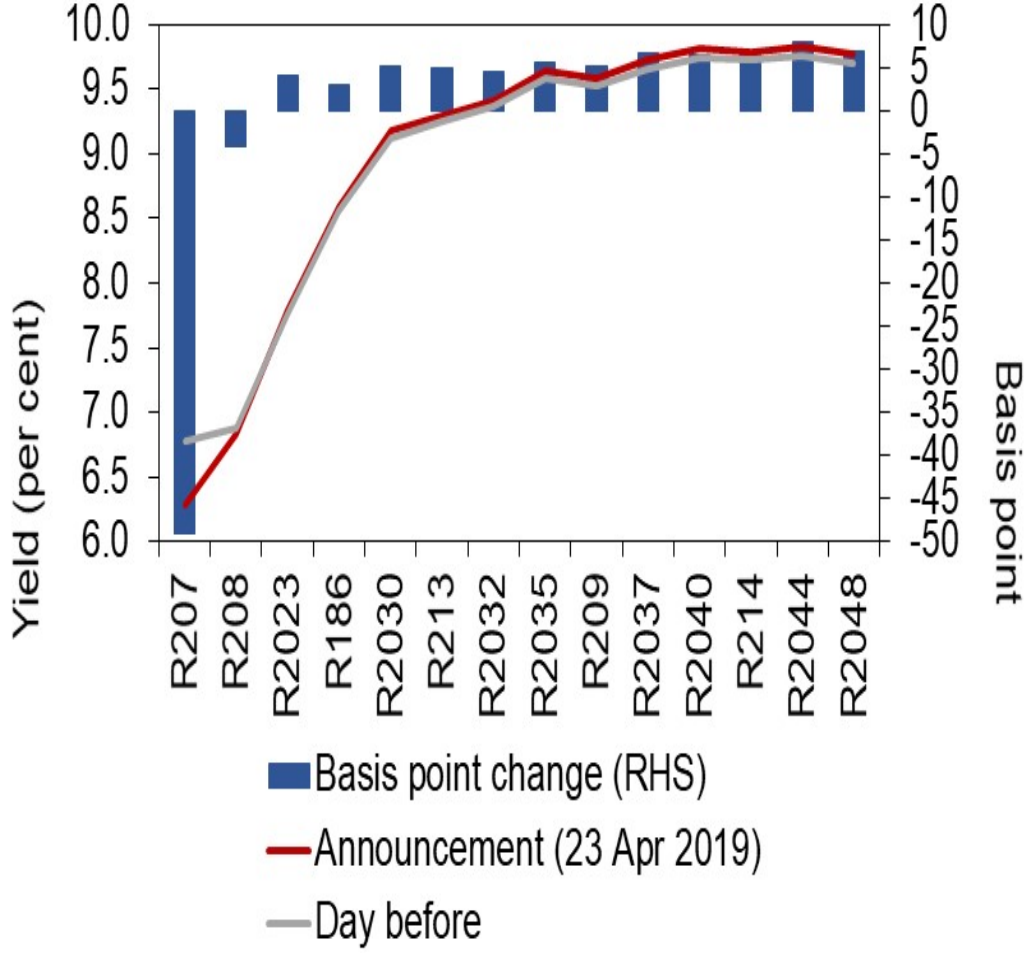
- Consequence of the rising budget deficit is an increase in rollover risk of debt maturing in the near term.
- Measure undertaken by the National Treasury (NT) is the government bond switch auction programme.
- NT first introduced this to consolidate debt, then to build benchmark bonds, and more recently to manage refinancing risk.
- Switch auction involves exchanging short-dated debt (source bond) for longer-dated bonds (destination bonds) on voluntary basis at prevailing market prices.

The National Treasury bond switch auction programme

- We consider the two most recent programmes, from 2011 to 2013 and 2015 to 2019.
- 2011 – 2013: set calendar, fixed amount on offer, source & destination bonds announced week in advance, with only one source and one destination bond.
- 2015: 2019: Calendar eliminated, and switches conducted on ad-hoc basis (announcement made 24 hours before the auction).
- In both programmes source bonds with very short maturities were switched for long bonds and therefore contributed to lengthening the maturity structure.

Change in yields around switch announcement





Impact of switch announcements on yields of bonds at different tenors

- Following Nakamura and Steinsson (2018), we apply OLS with high frequency identification to the following specification:

$$\Delta i_t = \beta + \gamma(\Delta shock_t) + \varepsilon_t$$

- $shock_t$ is the "policy shock" estimated as the first PC of the change in FRAs at different horizons on the day of the switch announcement from the day before

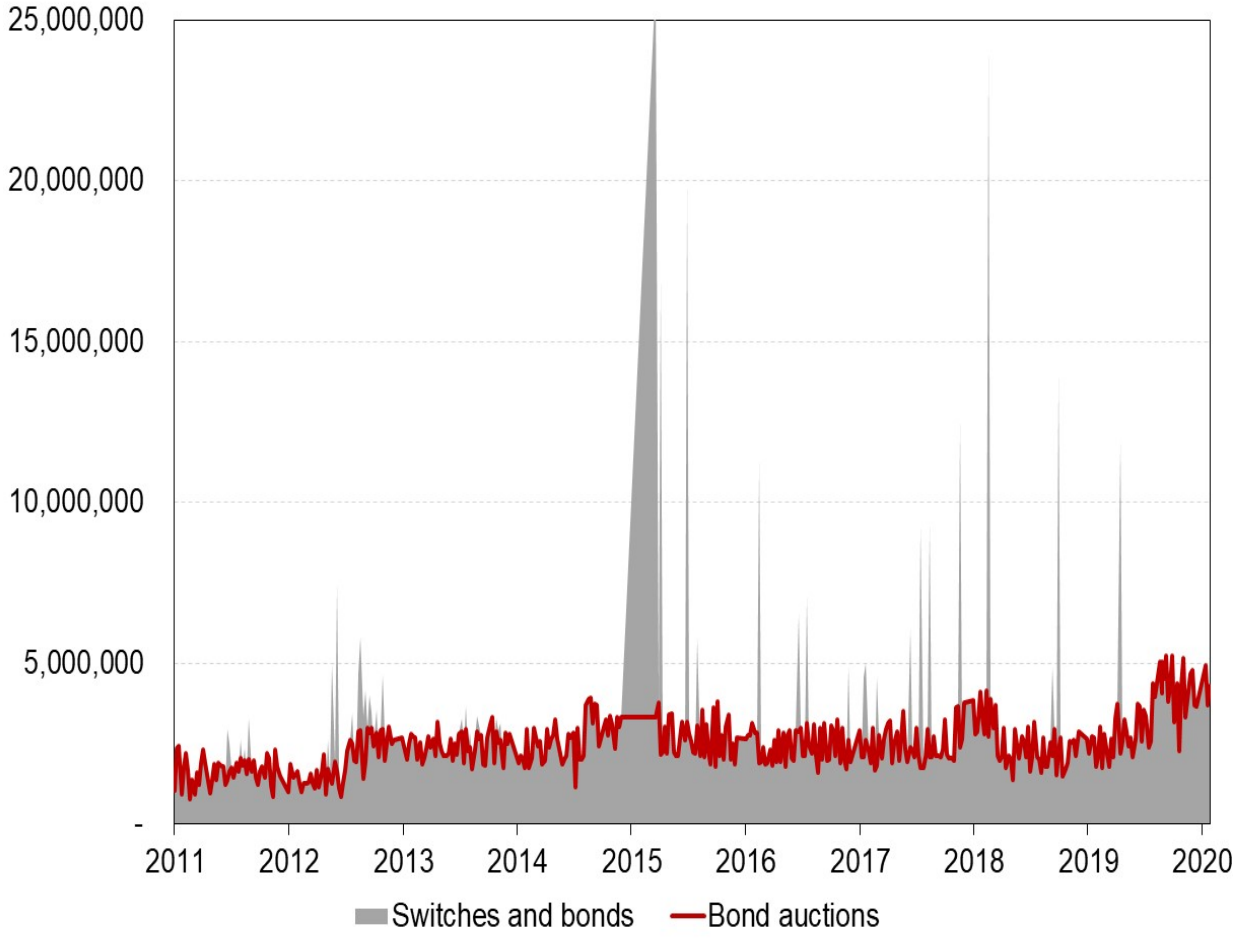
Response of Interest Rates and Inflation to the Policy Shock

	Nominal	Real	Inflation
1yr bond yield	2.335605***		0.396728
	(0.279806)		(0.269088)
2yr bond yield	2.685728***		
	(0.386334)		
5yr bond yield	2.393674***	0.433697	2.05631***
	(0.309039)	(0.279223)	(0.525943)
10yr bond yield	2.329995***	0.620695*	1.889873**
	(0.348089)	(0.332699)	(0.578029)
15yr bond yield	2.34877***	0.514475**	1.944194**
	(0.351475)	(0.250791)	(0.620069)
20r bond yield	2.302687***	0.769997**	1.644874***
	(0.361012)	(0.350085)	(0.426584)
25yr bond yield	3.561296***	0.507329	
	(0.923154)	(0.344410)	
30yr bond yield	2.568925***	0.485862	
	(0.461842)	(0.348385)	

, **, and * indicate 10, 5, and 1 per cent level of significance. Standard errors in parentheses.*

Cost of the switch auction

- Dollar value per basis point (DVBP): measure of price sensitivity; price change per change in yield
- Take dollar value (DV01) from Bloomberg and aggregate across bonds at each switch announcement/auction to get a “shock” series
- For a 1BP change in yields, bond prices could fluctuate by as much as R25m.



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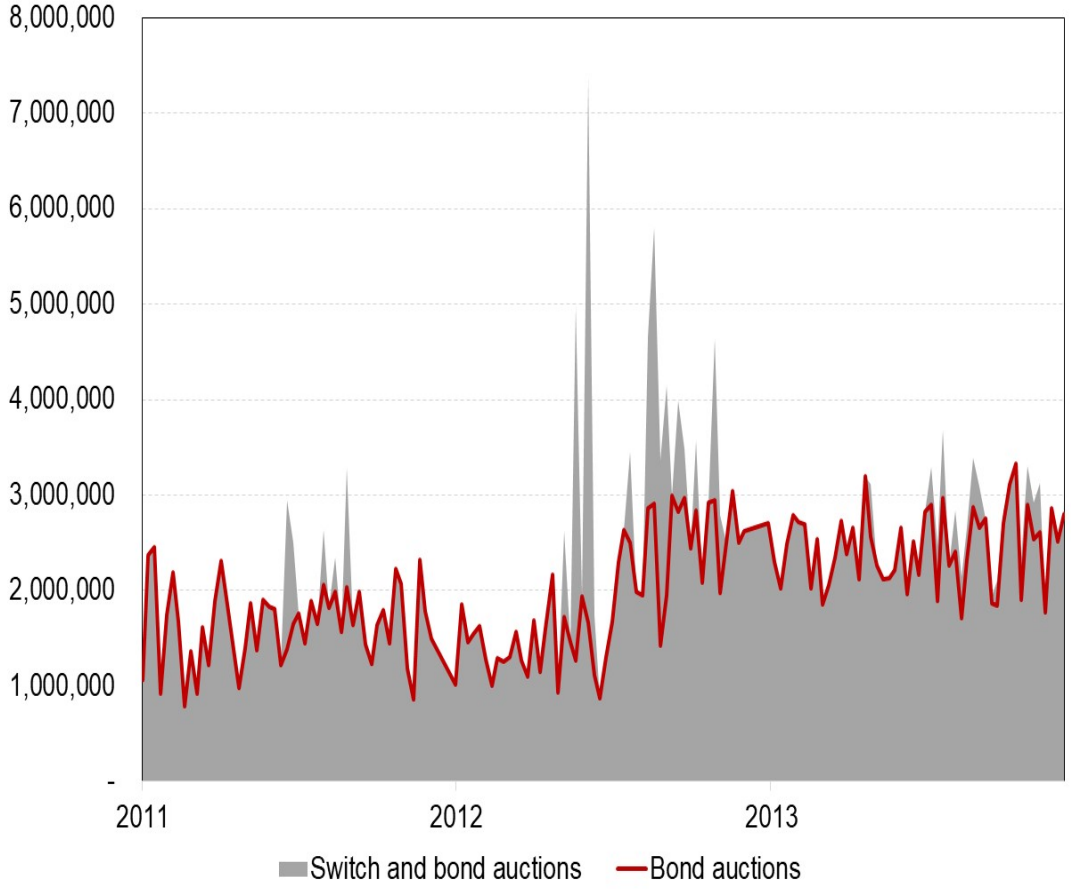
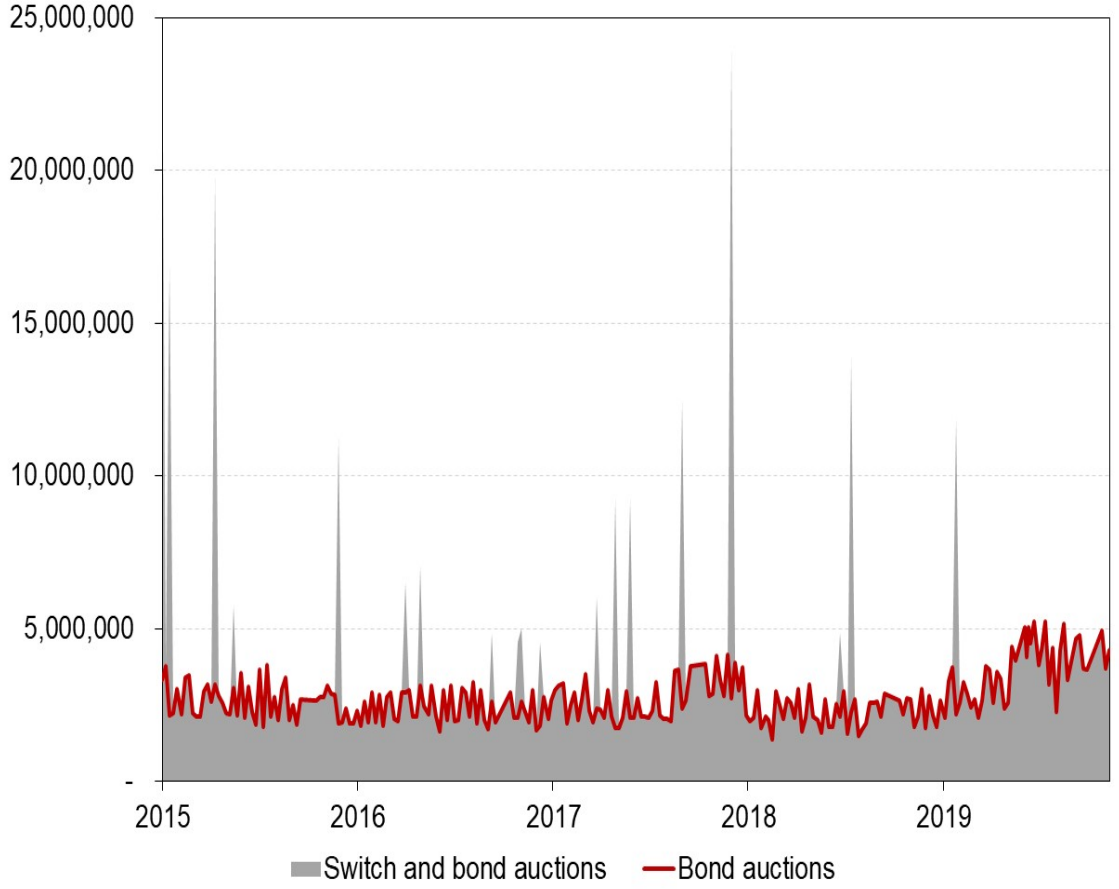
Cost of the switch auction





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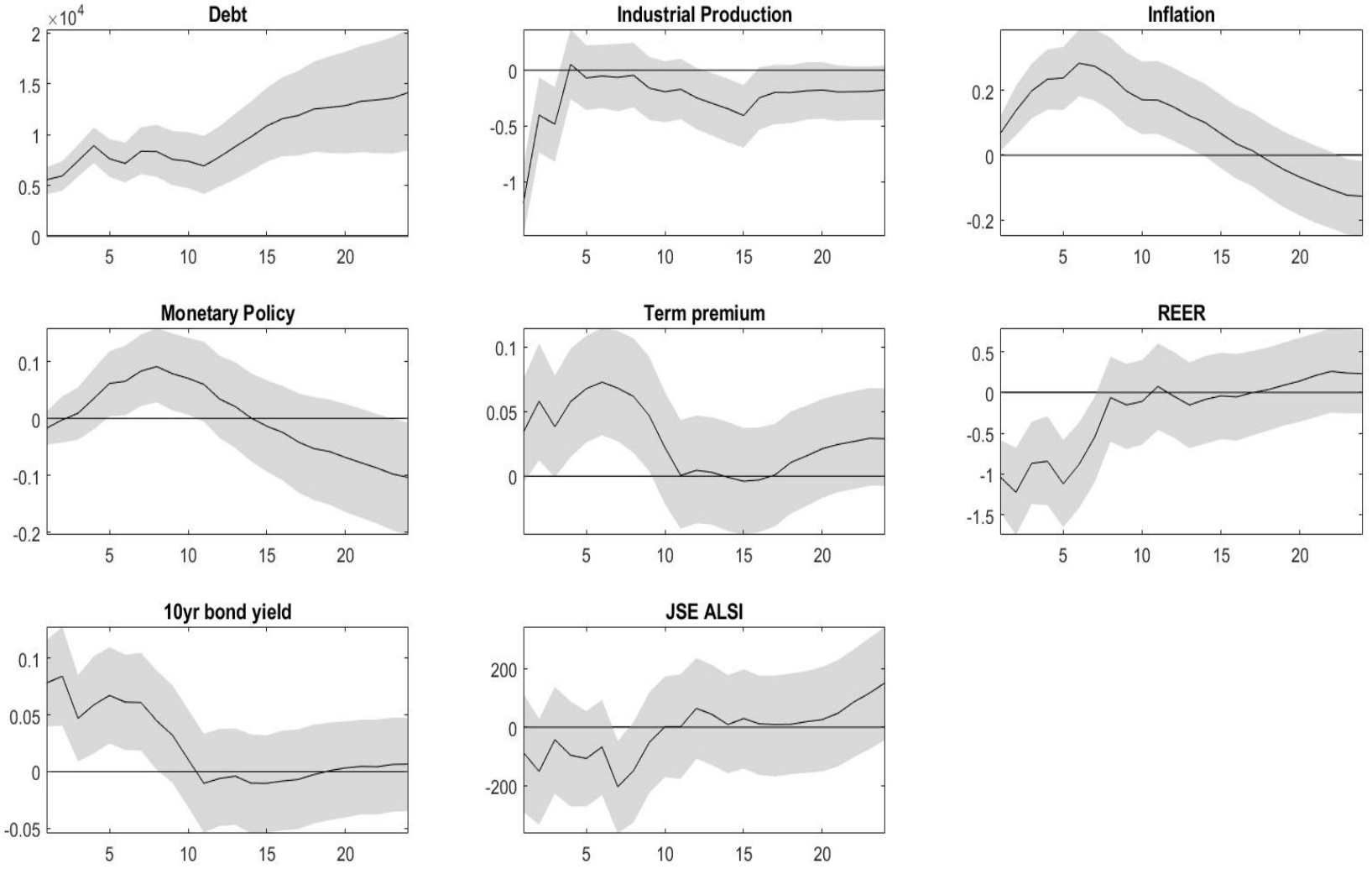
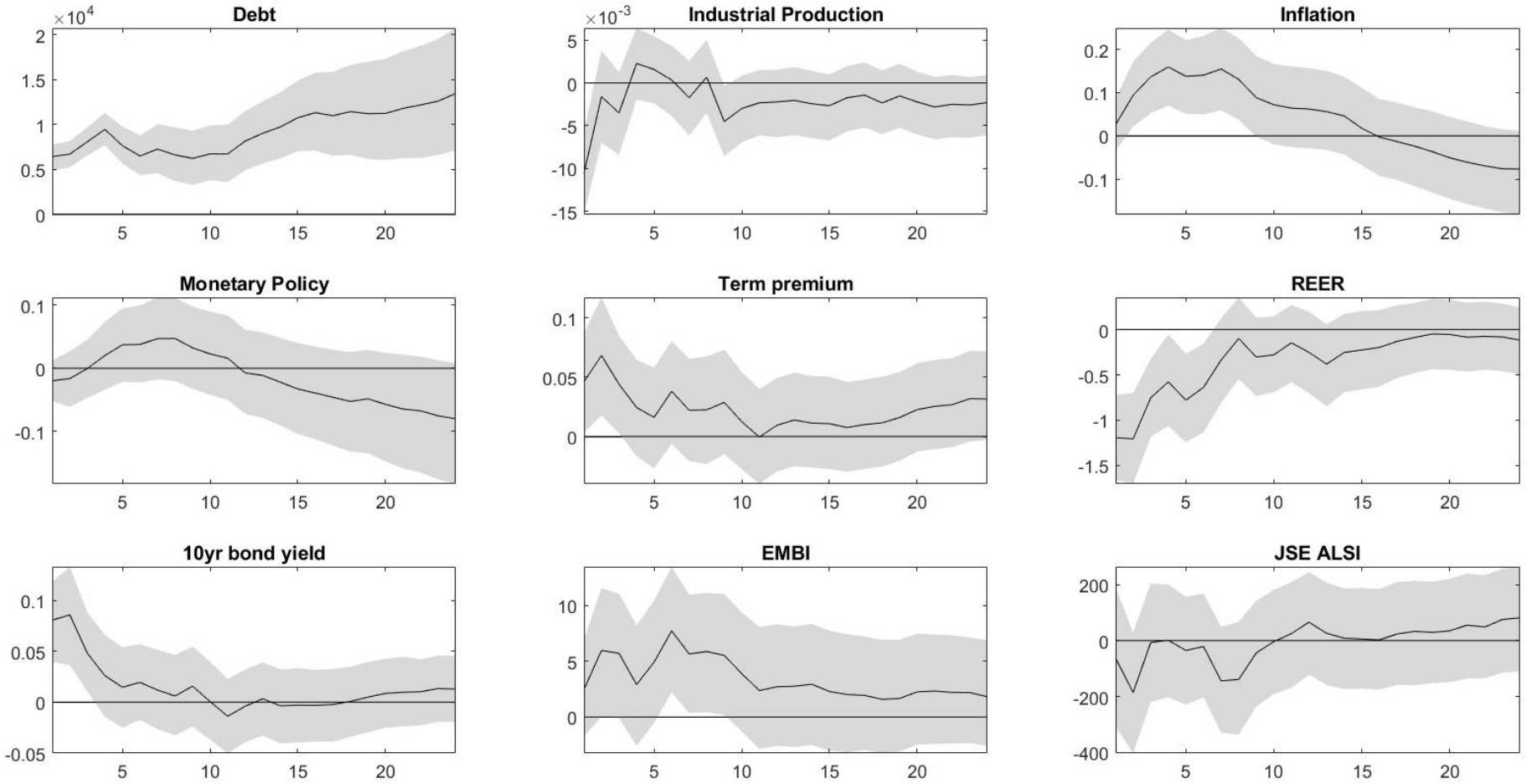
Macroeconomic effect of the switch auction

- Difficult to identify exogenous policy shock and most fiscal or monetary VARs fail to account for the anticipation effect (Ramey, 2011).
- Recent literature has focused on narrative approaches (McLaren, Banerjee and Latto, 2014) or expectation VARs (Ricco, 2017).
- Use shock to bond prices from switch announcement as the IV for debt.
- Follow the approach by Gertler and Karadi (2015), and Agrippino and Ricco (2019), by using high frequency surprises as exogenous fiscal shocks to estimate the effects on economic activity and monetary policy.
- Monthly data from 2000 to 2020: Debt stock; Industrial production, inflation, 3month jibar, long bond yield, term premium, real effective exchange rate (REER), JSE ALSI Index

BVAR with IV


Debt
×10^4
Industrial Production
Inflation
Monetary Policy
Term premium
REER
10yr bond yield
JSE ALSI

BVAR with IV



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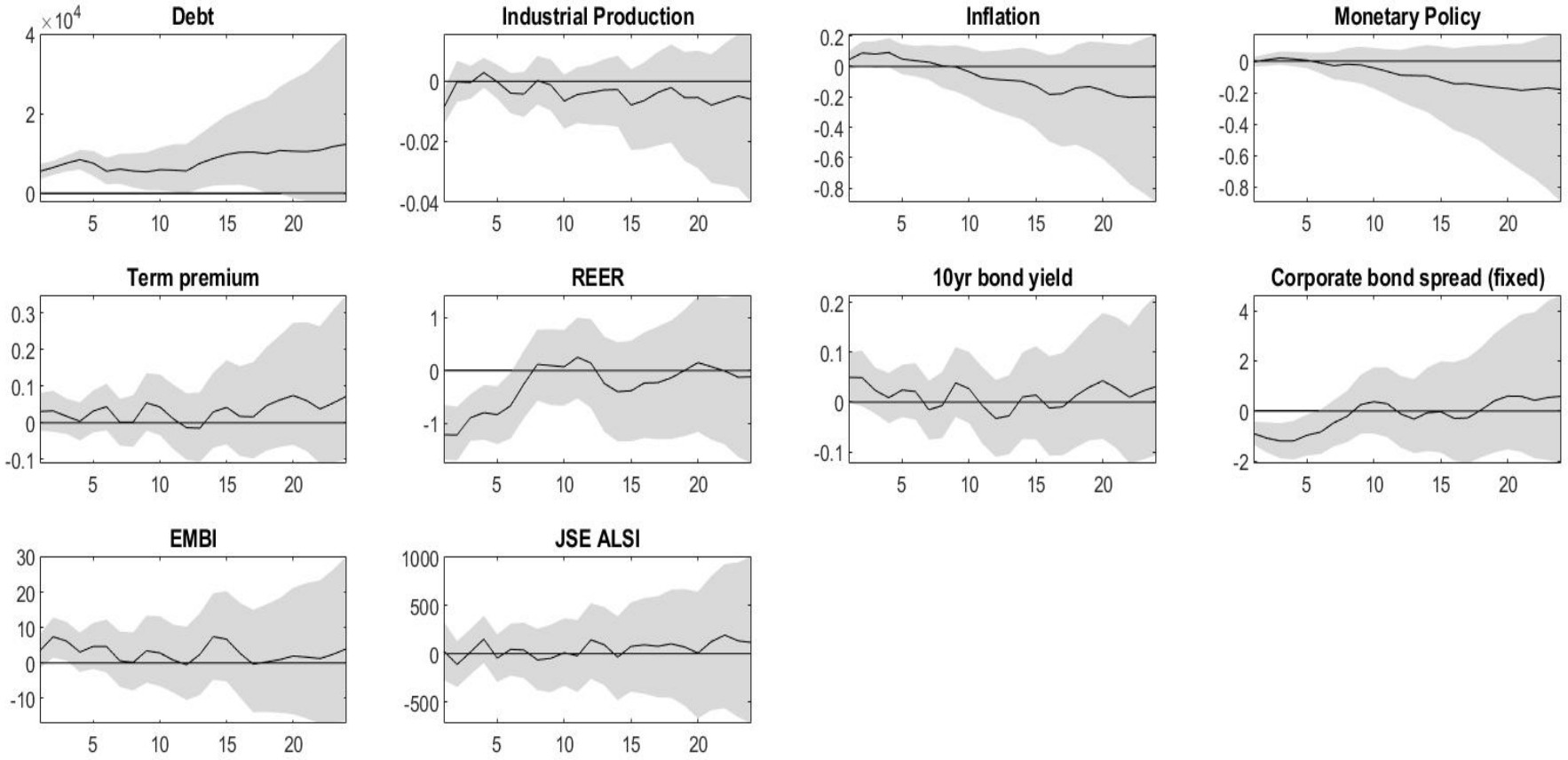
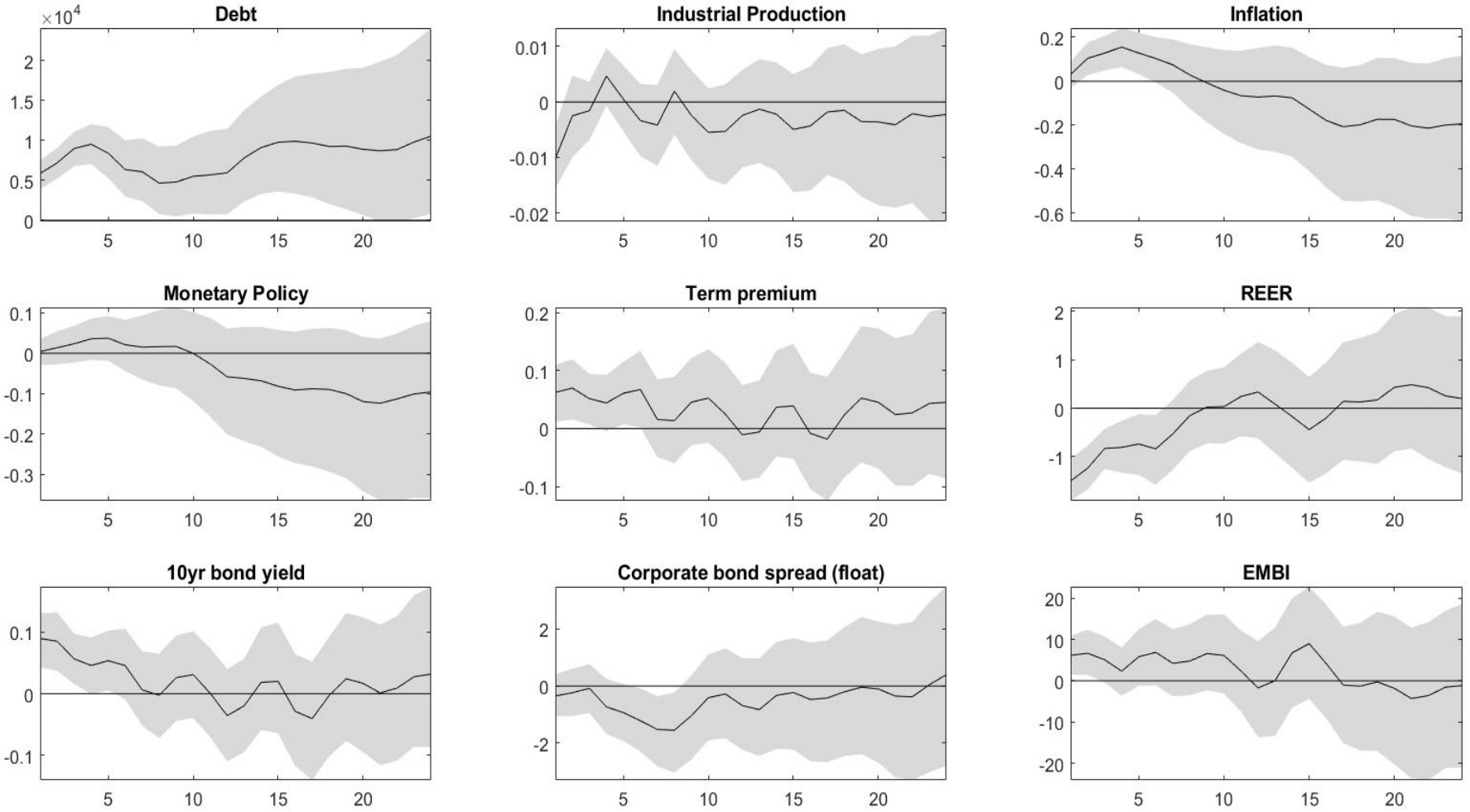
BVAR with IV


Debt
×10^4
Industrial Production
Inflation
Monetary Policy
Term premium
REER
10yr bond yield
Corporate bond spread (fixed)
EMBI
JSE ALSI

BVAR with IV


Debt
×10^4
Industrial Production
Inflation
Monetary Policy
Term premium
REER
10yr bond yield
Corporate bond spread (float)
EMBI

Conclusion

- Debt has been rising and as a result, government debt issuance has shifted to ultra-long-dated bonds.
- The NT switch auction has managed the refinancing risk effectively through lengthening the maturity structure.
- The potential costs of this maturity structure is an increase in yields and price sensitivity of bonds.
- By using the event of the switch auctions, we find that a shock to fiscal policy results in a "monetary contraction" through its effect on the long end of the yield curve.

THANK YOU

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