Fiscal policy in times of fiscal stress (or what to do when $r > g$)

Roy Havemann and Hylton Hollander

Western Cape Treasury and Stellenbosch University

roy.havemann@gmail.com hylton@sun.ac.za

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Motivation and contribution

$r > g$

- $pb < pb^{sus}$
- What is the least cost way of achieving a consolidation?
- How does one coordinate between fiscal and monetary policy?

Contribution

- Evaluate policy options by explicitly incorporating welfare loss
- Include coordination with monetary policy

Contribution to the literature

II. Optimal policy for fiscal sustainability

- There is a substantial literature on fiscal sustainability
- But not much on optimal policy in a DSGE model.

The new-Keynesian open-economy fiscal DSGE model based on Kemp and Hollander (2020) is well-suited to answer the above questions:

- Includes a non-trivial role for fiscal policy: consumption, investment, transfers, labour income tax, capital tax, consumption tax.
- Sticky prices for all goods: domestic, foreign, imports, exports
- Sticky wages for Ricardian and non-Ricardian households
- Rational, forward-looking, and optimizing households and firms
- Estimate with SA data and run counterfactual simulations.

Some stylised facts

What does the literature tell us?

1. South Africa is in fiscal stress ($r > g$)
   - $r > 6$
   - Growth will not save us ($g_{real} < 1.5, g_{nom} < 6$)
2. The current fiscal trajectory is not working
   - Debt has not increased employment
   - 'Austerity without consolidation' (Sachs, 2021)
   - Fiscal policy has been time inconsistent (Loewald et al., 2020)
   - Composition of spending is not growth enhancing
   - Borrowing strategy has increased r
3. Policy has been poorly coordinated
4. We are operating in a 'second-best' world

Stylised fact 1: $r > g$

Buiter et al. (1985), Blanchard et al. (1991),Fourie and Burger (2003), Blanchard (2019), Blanchard et al. (2021)

$$b_t = \frac{1 + r_t}{1 + g_t} b_{t-1} - s_t \tag{1}$$

Debt is stable when when $b = b_t = b_{t-1}$. It follows that this is when

$$s_t = \frac{r - g}{1 + g} b \tag{2}$$

First step is to estimate r_t^{adj}

- Follow Blanchard (2019) to calculate r_t^{adj}
- Adjust for maturity structure of debt
- Adjust for interest receipts on cash balances (net debt)
- Adjust for tax receipts (differential tax treatment between non-residents, banks and pension funds)

Stylised fact 1: $r > g$ past few years

Table: Calculation of r and r_t^{adj}

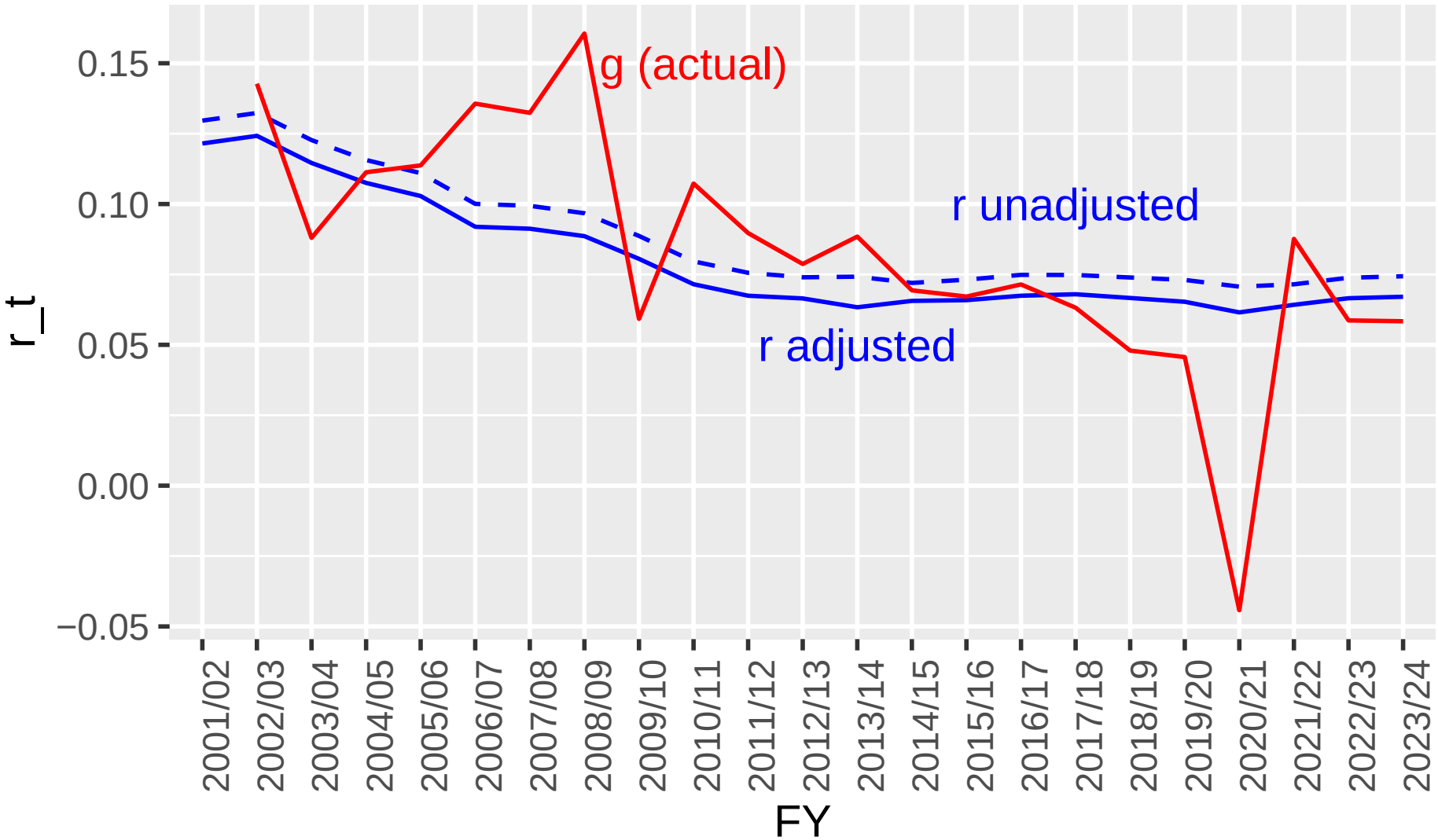
		2017/18	**2018/19**	**2019/20**
Debt service costs (NT Table 3)		162,644.6	181,849.1	204,769.4
Interest income (NT Table 3)		3,484.8	6,833.6	8,276.1
Net interest payments		**159,159.77**	**175,015.45**	**196,493.24**
Average debt (SARB QB S-57)		2,127,524	**2,367,589**	**2,689,706**
End of period debt (NT Table 10)		2,260,367	2,545,183	2,997,770
Average borrowing cost on government debt (nominal) debt at end of period		7.0%	6.9%	6.6%
Average borrowing cost on government debt (nominal) average debt over period	r_t	7.5%	7.4%	7.3%
Tax income on government debt (derived from STRATE holdings data)		14,550	17,234	20,835
Average borrowing cost on government debt (nominal, adjusted for tax income)	r_t^{adj}	6.8%	6.7%	6.5%
Nominal growth in output	g_t	6.3%	4.8%	4.6%
Net domestic debt stock as percentage of GDP	b_t	45.7%	48.3%	53.7%
Debt-stabilising primary balance	pb_t^{sus}	0.2%	0.8%	0.9%
National Treasury primary balance		-1.0%	-1.0%	-2.7%
r-g		0.7%	2.1%	2.0%
Fiscal adjustment required (%GDP)		-1.2%	-1.8%	-3.6%
Fiscal adjustment required (ZAR)		-55,054.62	-89,118.15	-185,710.17
Interest income (% of cash)		1.5%	2.8%	3.1%

Stylised fact 1: $r > g$ forecast

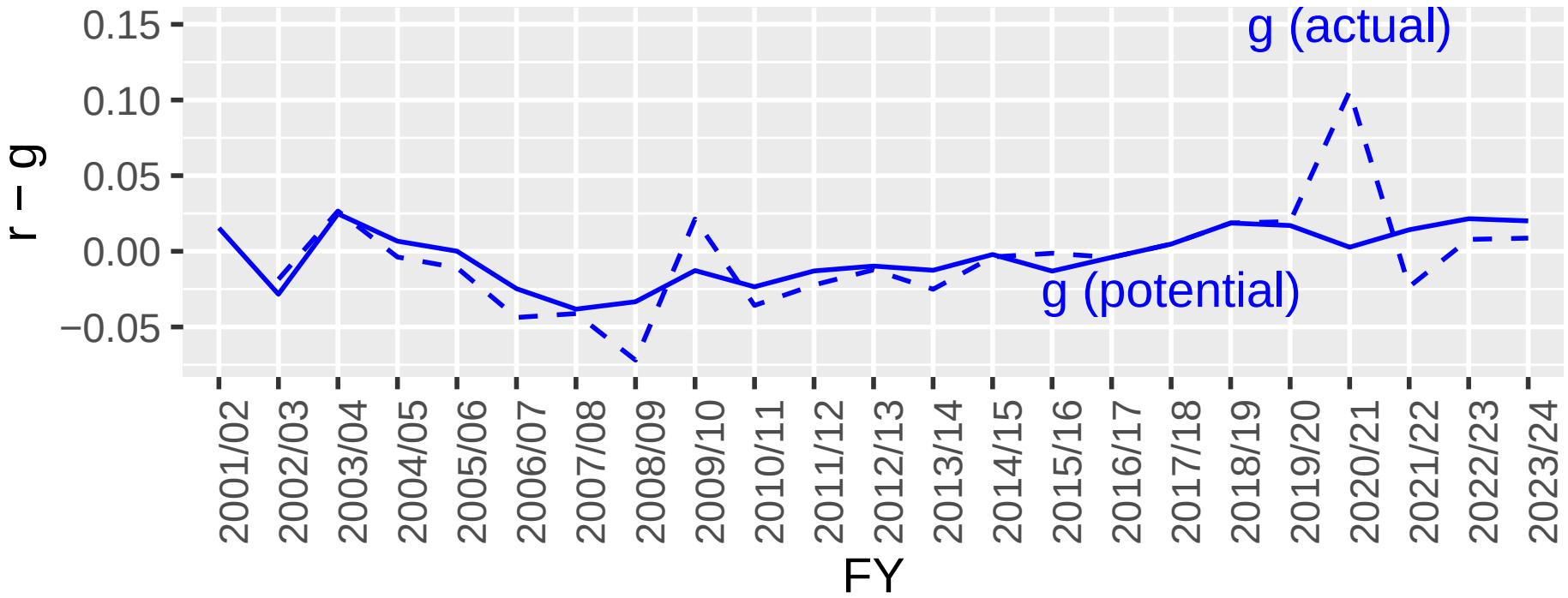
Table: Calculation of r_t^{adj} – forecast

Fiscal arithmetic		**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Average borrowing cost on government debt (nominal)	r_t	6.7%	6.5%	6.2%	6.4%	6.7%	6.7%
Nominal growth in output	g_t	4.8%	4.6%	-1.9%	8.8%	5.9%	5.8%
Net domestic debt stock as percentage of GDP	b_t	48.3%	53.7%	69.3%	72.5%	73.7%	73.8%
Debt-stabilising primary balance	pb_t^{sus}	0.8%	0.9%	4.4%	-1.5%	0.5%	0.6%
Projected primary balance	pb	-1.0%	-2.7%	-6.4%	-3.2%	-1.2%	-0.1%
Gap		2.1%	2.0%	-10.9%	-1.7%	-1.7%	-0.7%
Fiscal adjustment required		**-89,118**	**-185,710**	**-544,635**	**-91,659**	**-97,223**	**-45,060**

Stylised fact 1: South Africa is in fiscal stress ($r > g$)



Stylised fact 1: South Africa is in fiscal stress ($r - g > 0$)



$r^{adj})t - g$ using two different measures of g: actual g and potential g following Fedderke and Mengisteab (2017) and SARB

Stylised fact 1: South Africa is in fiscal stress ($r - g > pb$sus)

Two measures for fiscal sustainability

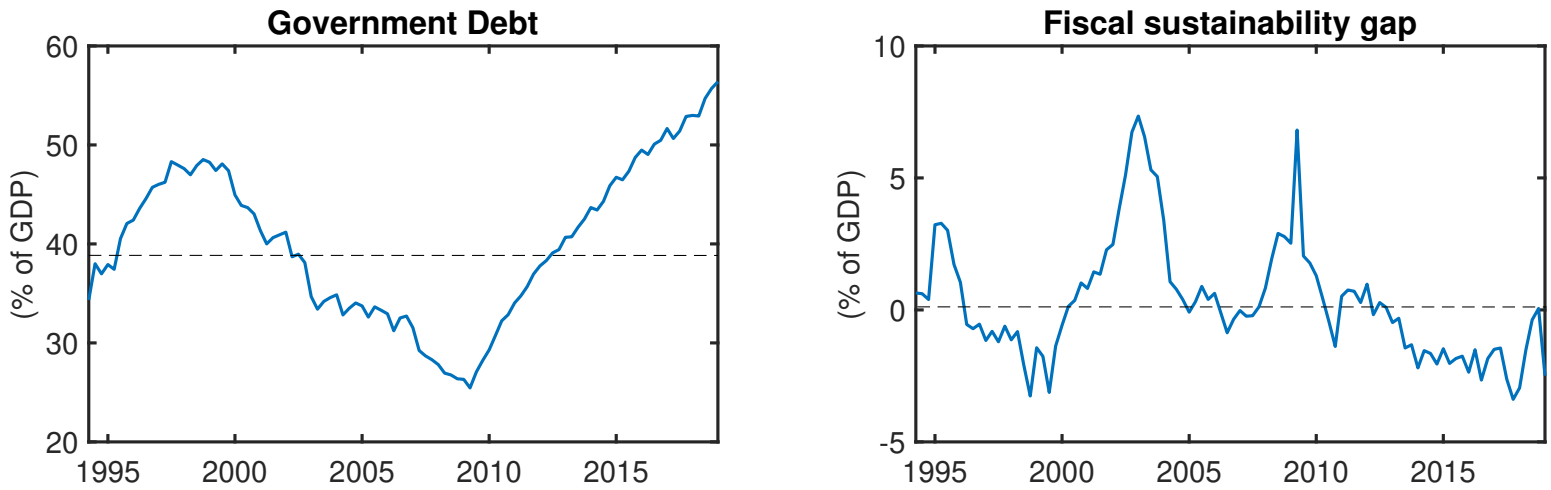
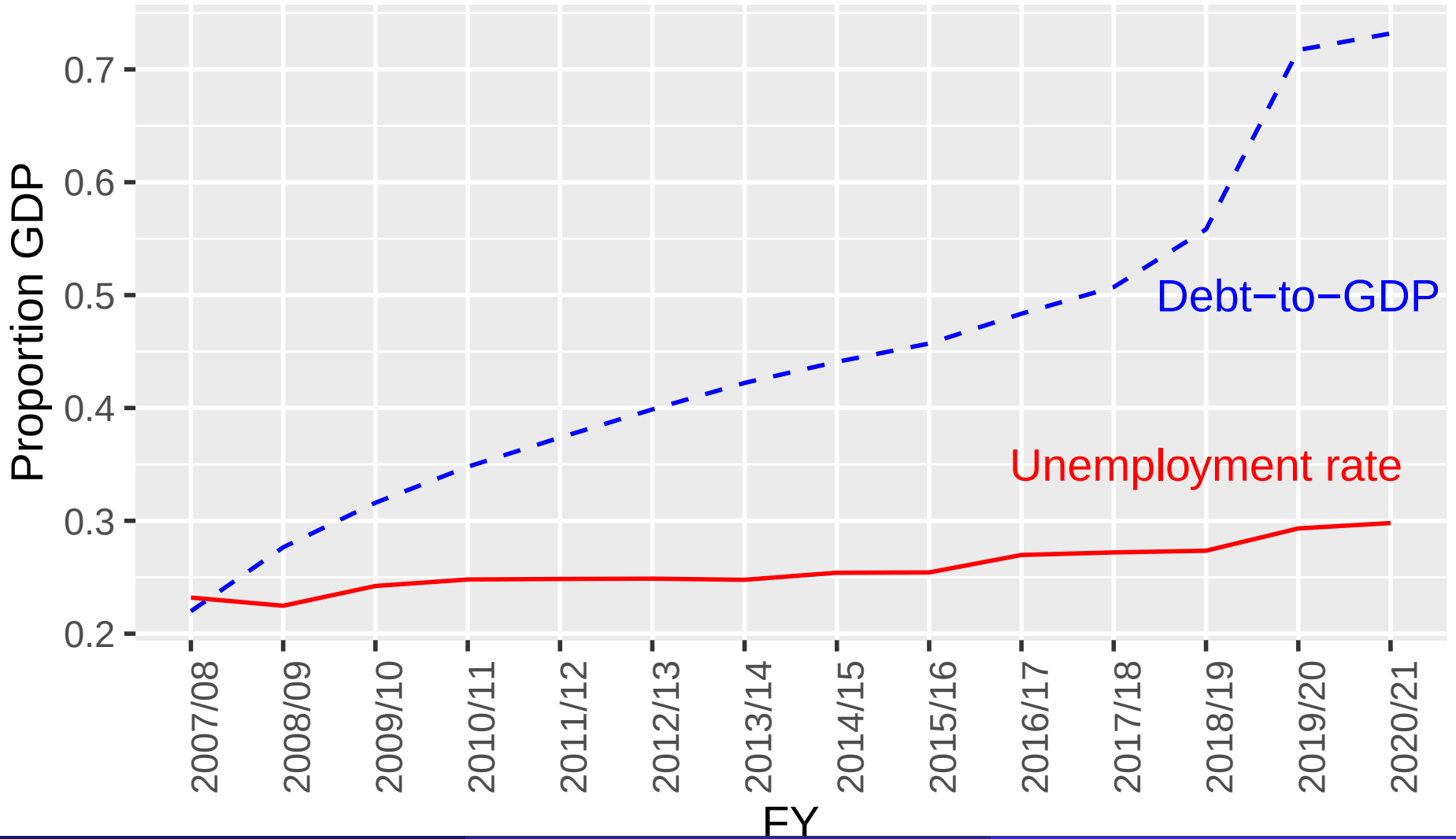


Figure: Debt-to-GDP stabilisation (left). Fiscal sustainability gap (right)

'Fiscal sustainability gap' (pb^{gap}) comes from the calculation of the fiscally sustainable fiscal balance

Stylised fact 2: The current fiscal trajectory is not working (1)



Stylised fact 2: The current fiscal trajectory is not working (2)

'Austerity without consolidation' Sachs (2021)

R million	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Health				
Total				
Budget 2019	238,837	255,486		
Budget 2020	229,707	243,970	257,559	
Budget 2021	247,009	248,839	245,893	245,019
Ex compensation				
Budget 2019	88,431	94,898		
Budget 2020	84,581	91,962	96,652	
Budget 2021	101,911	98,095	96,053	95,839

Table: Projected spending on health care, successive budgets

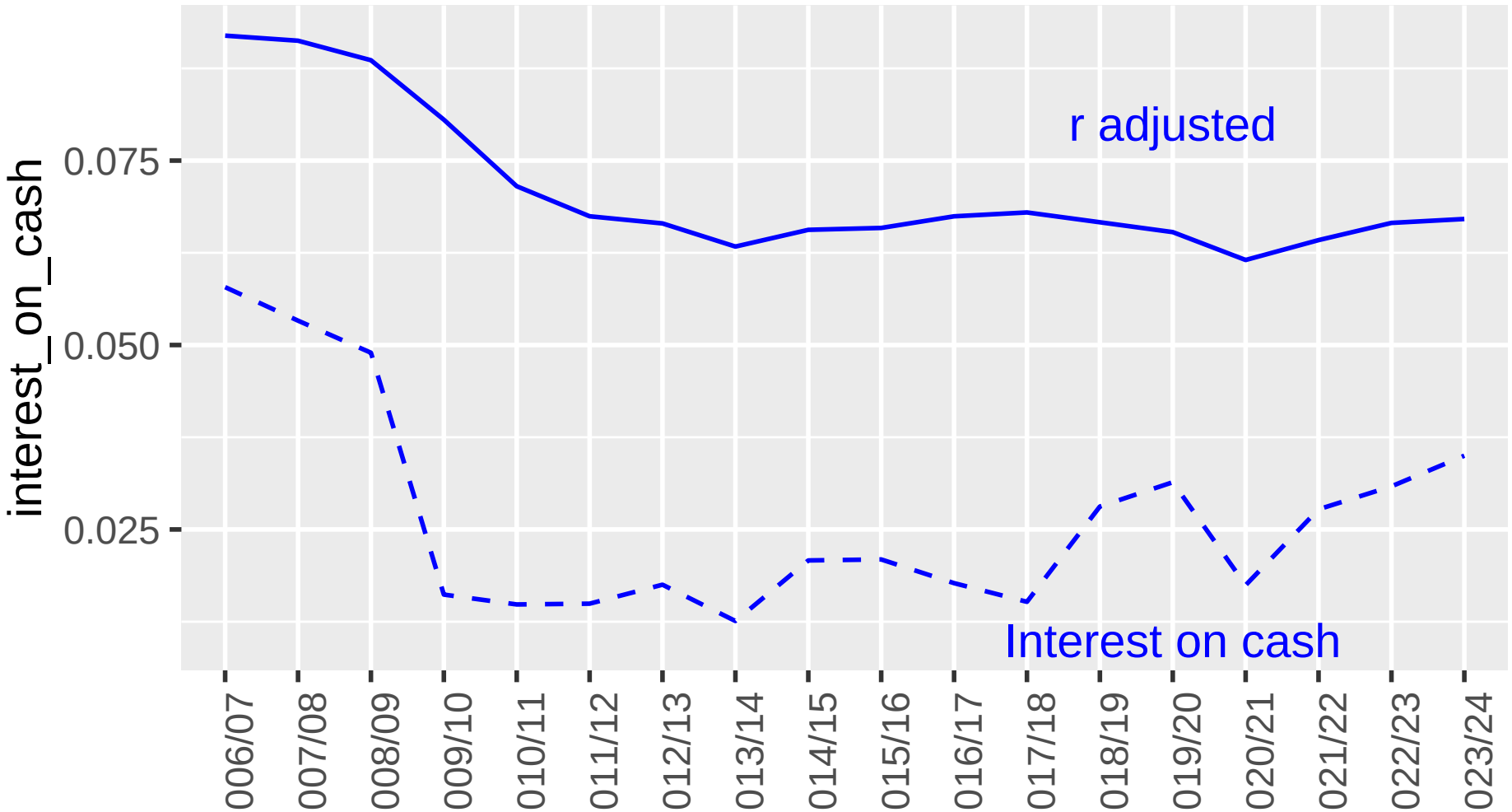
Stylised fact 2: The current fiscal trajectory is not working (3)

Fiscal policy has been time inconsistent

- Fiscal policy is highly politicised and naturally subject to time inconsistency and collective irrationality
- Projected fiscal path has not achieved time consistency, ergo lost credibility (Loewald et al., 2020)
- Fiscal rules solve time inconsistency (see, for example, Plessis and Boshoff (2007); Burger et al. (2012); Burger and Marinkov (2012)) but Treasury fiscal rule (the expenditure ceiling) has been consistently implemented but has not delivered a credible consolidation

Stylised fact 2: The current fiscal trajectory is not working (4)

Borrowing strategy is inefficient



Stylised fact 3: Fiscal, monetary and macroprudential policy have been poorly coordinated

- Coordination between fiscal and monetary policy – repeated game between two equally powerful players – the fiscal authority and the monetary authority (Blinder, 1982; Nordhaus et al., 1994; Davig and Leeper, 2011; Havemann and Hollander, 2021)
- A credible fiscal path
  will assist in solving the coordination problem Loewald et al. (2020) notes that:

  > *...to get more out of policy coordination, fiscal policy should move first, reducing risk premia and inflation expectations, dropping the neutral real rate, and allowing monetary policy to respond to weak growth.*

- Similarly, evidence that macroprudential and other policy were poorly coordinated after the financial crisis Loewald et al. (2020); Havemann and Hollander (2021).

Stylised fact 4: We are operating in a second-best world

Table: Policy differences between advanced and emerging market economies

Macro policy measure	Application Advanced economies	Emerging markets	South Africa
Objective of macro measures	Raise demand to meet supply	Raise supply	Raise supply
Output gap	Large	Small	Small (electricity shortages)
Fiscal policy	Close output gap	Sustainable in some cases	Not sustainable
Role of monetary policy	Tools largely exhausted	Limited	Can be used to offset demand effects of fiscal consolidation
Appropriate action	Fiscal / monetary stimulus	Depending on context	Reform to unlock growth

Adapted from Blanchard et al. (2021).

Without credible strategies to raise g, the only solution is to bring pb closer to the pb^{sus}

Methodology - Optimal policy and the loss function

The success of policy can be measured by its ability to minimise instability in the target variables—a loss function:

$$\min \mathcal{L}_t = y_t^2 + \Theta_{\mathbb{X}}.\mathbb{X}_t^2 \ ,$$

where the welfare loss ($\mathcal{L}$) is an increasing function of deviations to output (y_t) and one or more variables in the vector $\mathbb{X}$. $\Theta_{\mathbb{X}}$ is a vector of weights corresponding to the policy target variables.

- Fiscal policy: output and debt (b) or output and the fiscal sustainability gap (pb^{gap})
- Monetary policy: output and inflation (π)
- $\Theta_{\mathbb{X}}$ also controls for instability in the policy instrument.

Optimal policy: optimal simple rules

The fiscal instruments (government consumption and investment expenditure) follow simple feedback rules:

$$g_t = \phi_G g_{t-1} - \theta_{g,y} y_t - \theta_{g,b} b_t + \varepsilon_t^g$$
$$i_{g,t} = \phi_{i_g} i_{g,t-1} - \theta_{i_g,y} y_t - \theta_{i_g,b} b_t + \varepsilon_t^{i_g}$$

And monetary policy follows a Taylor-type reaction function:

$$r_t^s = \phi_r r_{t-1}^s + (1-\phi_r)\left(\pi_t^* + \phi_\pi\left(\pi_t - \pi_t^*\right) + \phi_{\Delta y}(y_t - y_{t-1})\right) + \varepsilon_t^r \quad (3)$$

Policymakers must choose θ's and ϕ's to minimize $\mathcal{L}_t \to 0$

Results – optimal fiscal policy

Weights on policy variables: $y, pb^{sus} = 1$

	Weights on policy instruments			
	$g, iG = 1$	$g, iG = 0.5$	$g, iG = 0$	
Parameters	*Optimal values*			*Estimated*
$\theta_{g,y}$	0.11	0.10	0.03	0.11
$\theta_{g,b}$	0.09	0.11	0.32	0.18
$\theta_{iG,y}$	0.45	0.44	0.19	0.20
$\theta_{iG,b}$	0.19	0.20	0.58	0.57
Obj.Func:	2.79	1.59	0.30	
$\theta_{iG,y}$	0.42	0.42	0.19	0.20
$\theta_{iG,b}$	0.20	0.20	1.00	0.57
Obj.Func:	2.53	1.44	0.32	

Results – Optimal monetary policy

Weights on policy variables: y, $\pi^C = 1$ (top); y, $pb^{sus} = 1$ (bottom)

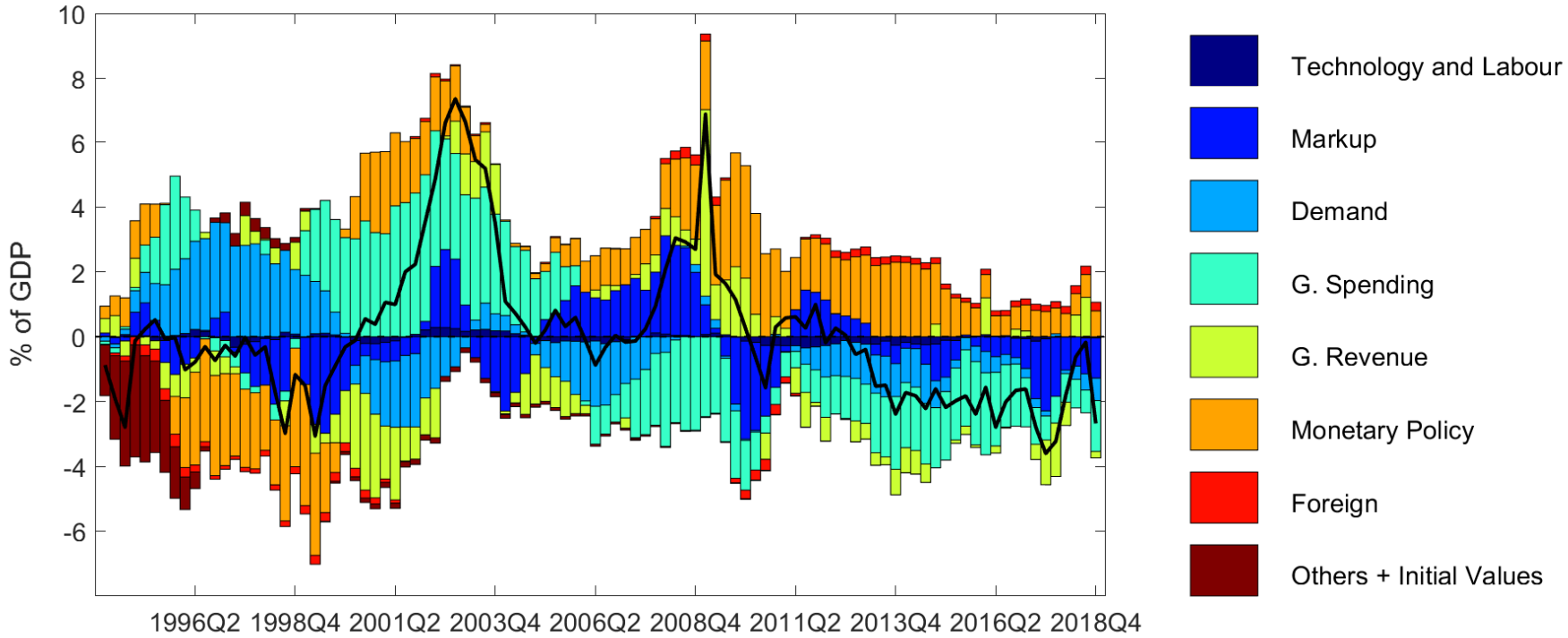
	Weights on policy instrument			
	$r = 1$	$r = 0.5$	$r = 0$	
Parameters	*Optimal values*			*Estimated*
ϕ_π	3.15	3.33	3.59	1.57
$\phi_{\Delta y}$	0.98	1.06	1.18	0.39
Obj.Func:	0.13	0.13	0.12	
	Weights on policy goal			
	$\pi^C = 1$	$\pi^C = 0.5$	$\pi^C = 0$	
ϕ_π	2.97	3.04	3.13	1.57
$\phi_{\Delta y}$	1.01	1.05	1.10	0.39
Obj.Func:	0.29	0.28	0.28	

Optimal policy coordination

Weights on policy variables: y, pb^{sus}, $\pi^C = 1$

	Weights on policy instrument(s)				
	$iG,\ r = 1$	$iG,\ r = 0.5$	$iG,\ r = 0$	$iG = 0$	
Parameters		*Optimal values*			*Est.*
$\theta_{iG,y}$	0.42	0.42	0.19	-0.41	0.20
$\theta_{iG,b}$	0.20	0.20	1.03	1.85	0.57
ϕ_π	1.62	1.63	3.35	-	1.57
$\phi_{\Delta y}$	0.42	0.43	1.21	-	0.39
Obj.Func:	2.54	1.44	0.27	0.76	

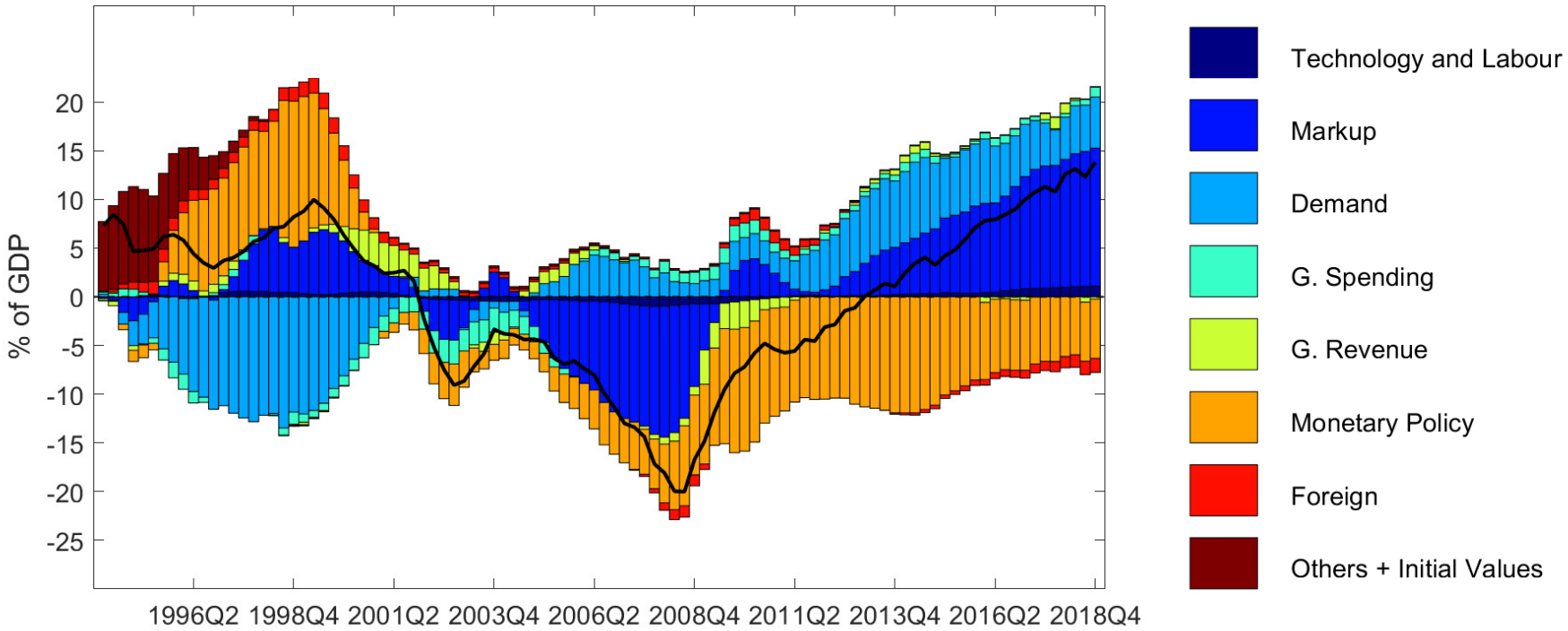
Fiscal sustainability and monetary policy



FEVD:

- Monetary policy shocks contribute 10%
- Risk premium shocks contribute 10%

Government debt-to-GDP and monetary policy



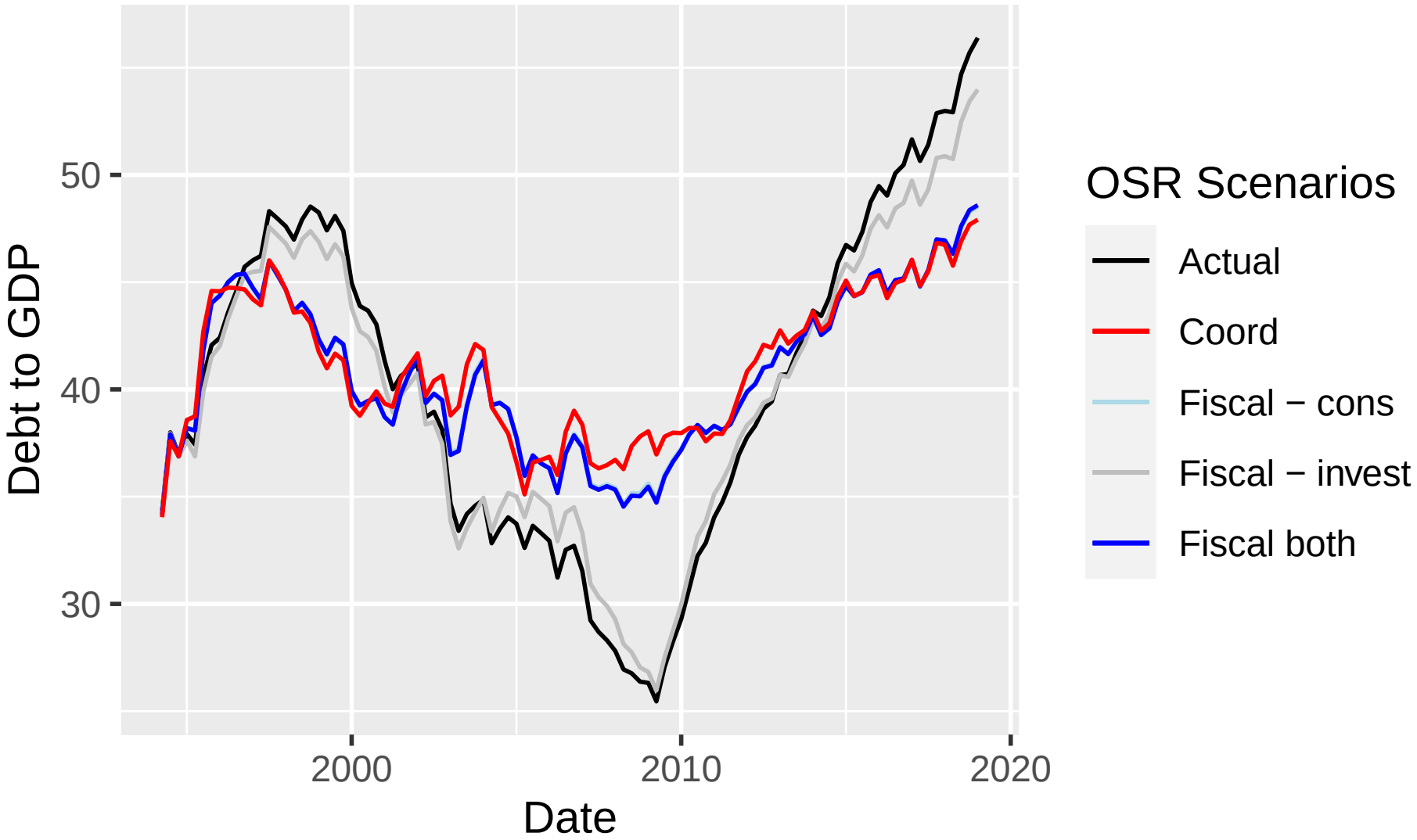
FEVD:

- Monetary policy shocks contribute 13%
- Risk premium shocks contribute 10%

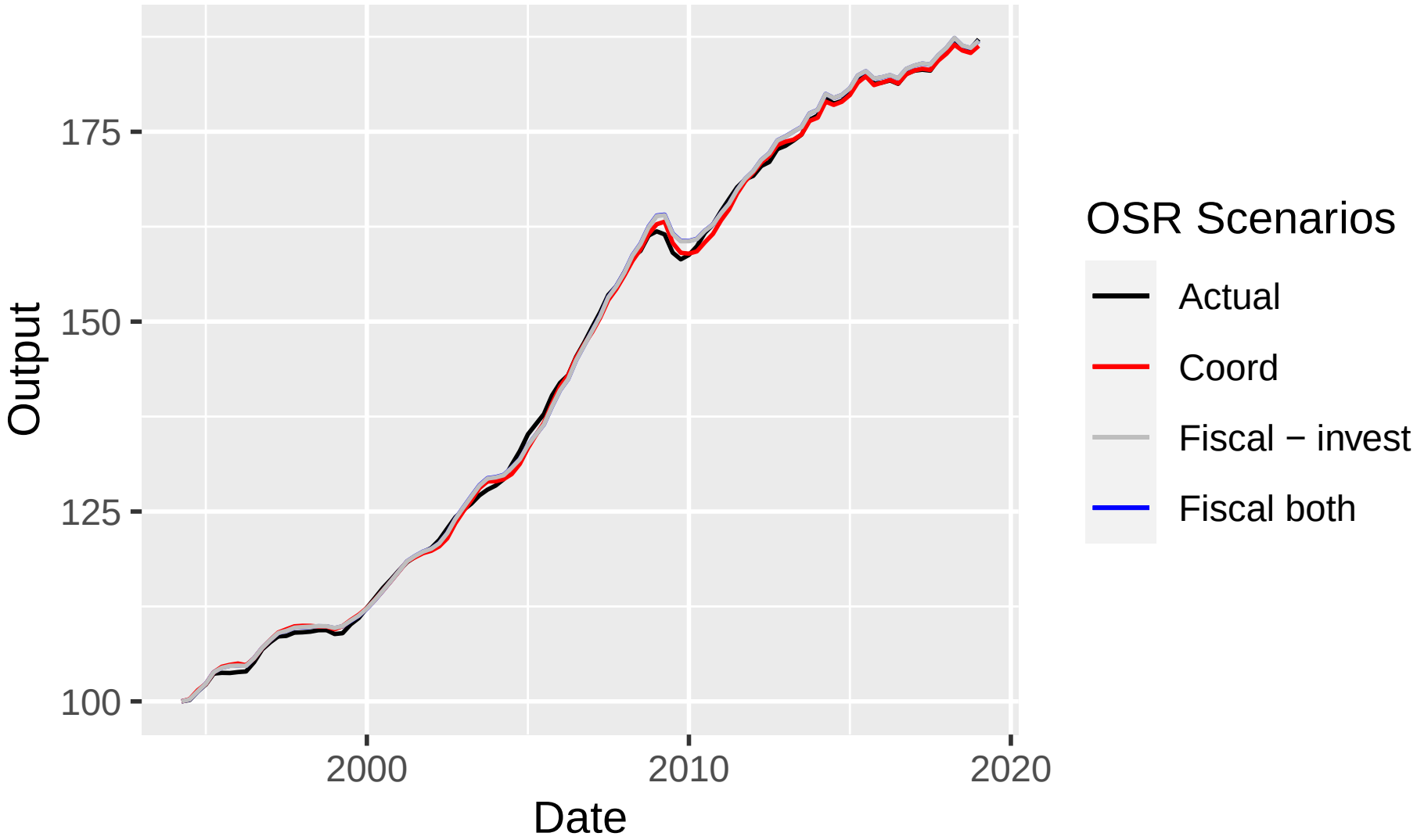
Counterfactuals

- 'Actual'
- 'Fiscal - invest' main fiscal policy instrument is government investment
- 'Fiscal - cons' main fiscal policy instrument is government consumption
- 'Fiscal both' both tools
- 'Coord' fiscal policy moves first, monetary policy responds

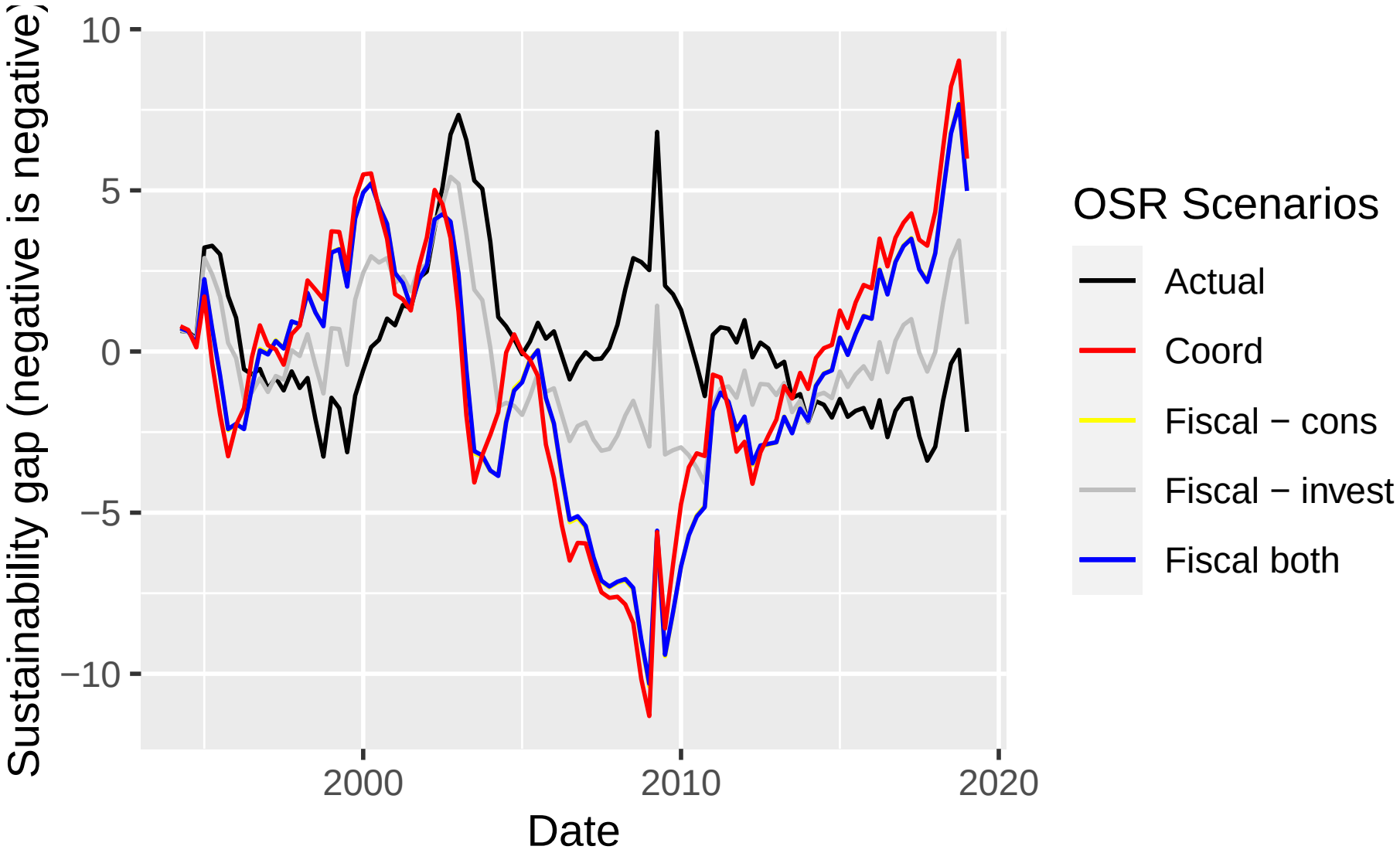
Counterfactual - Debt stabilisation



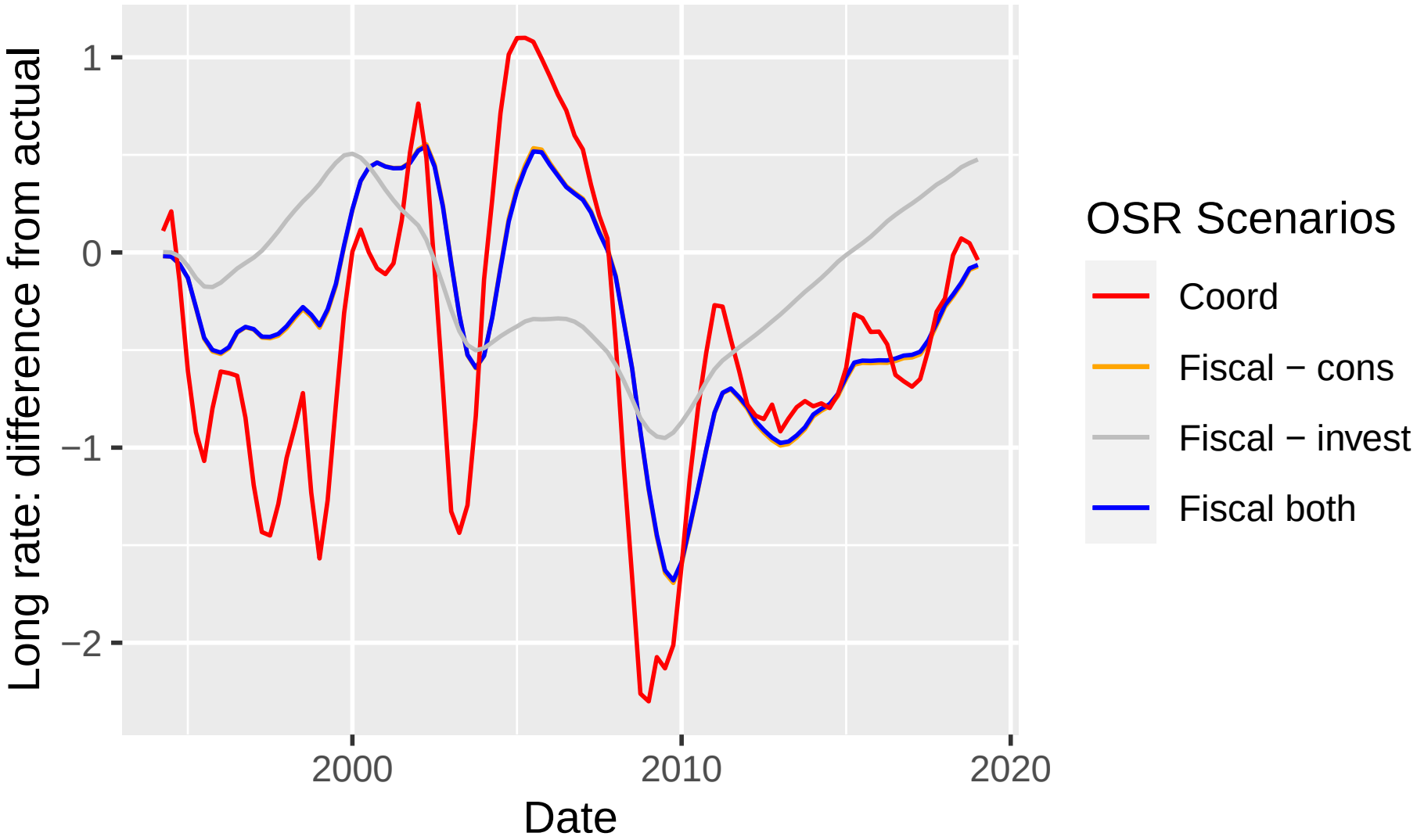
Impact on output of the scenarios



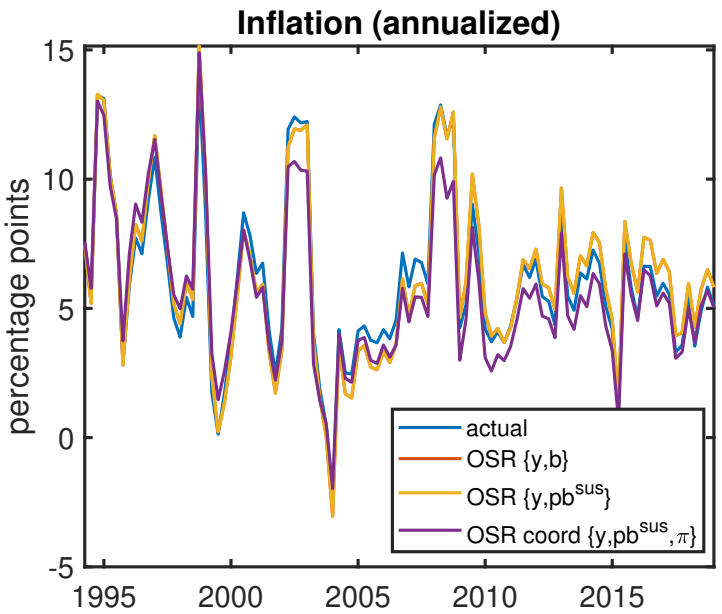
Sustainability gap

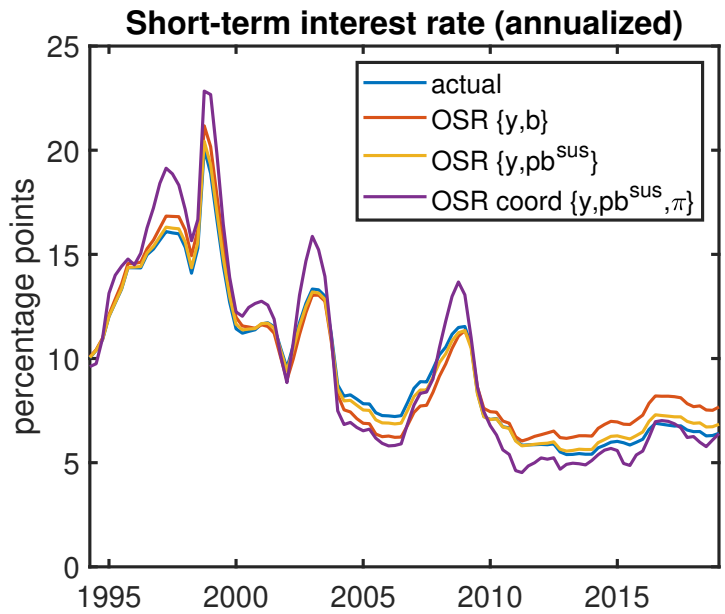


Impact on long-rates (estimate of r)

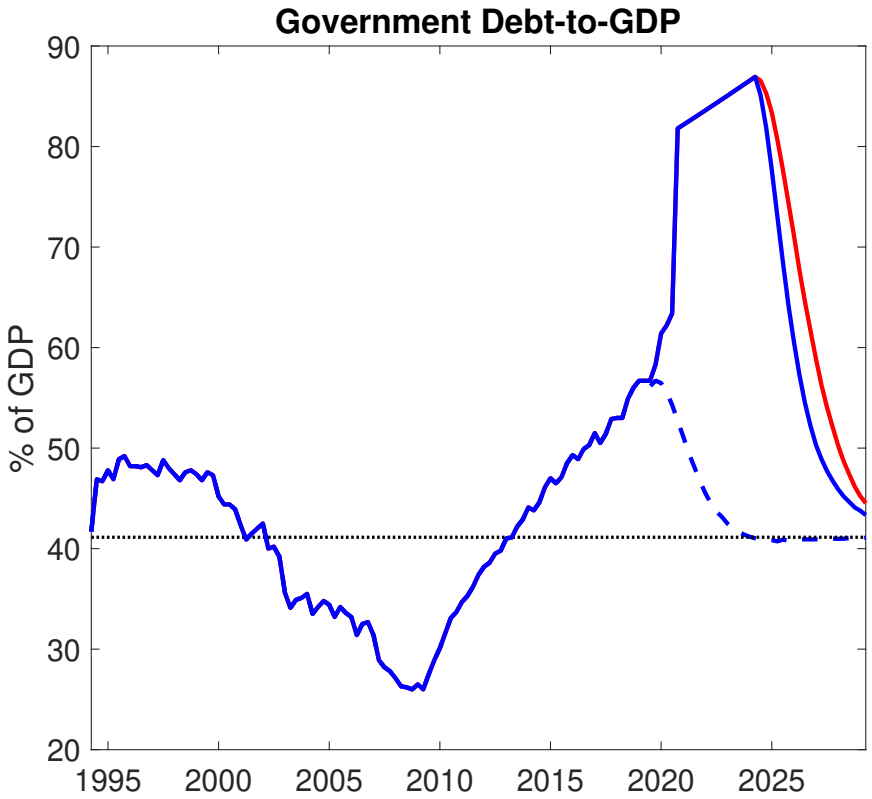


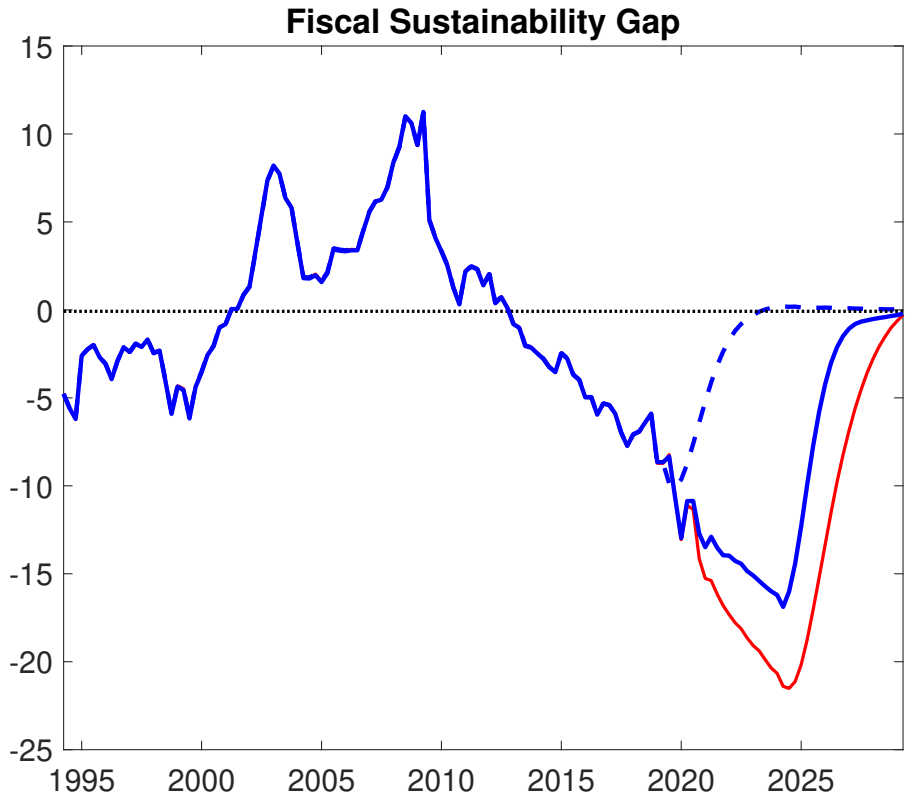
Inflation and the short-term (policy) rate





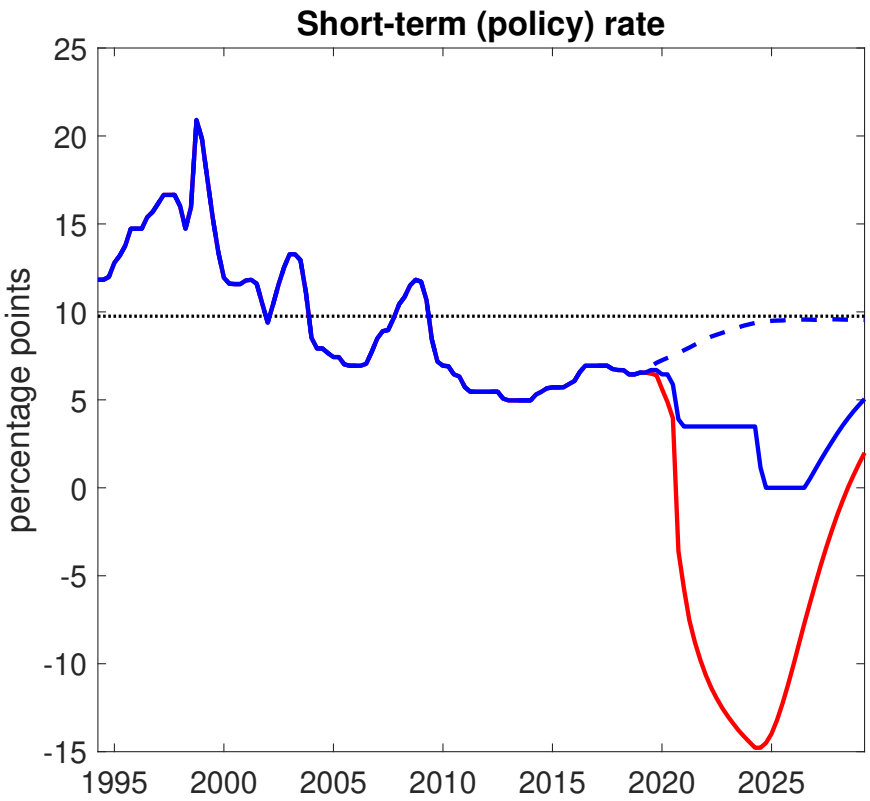
COVID-19, monetary policy, and debt stabilisation

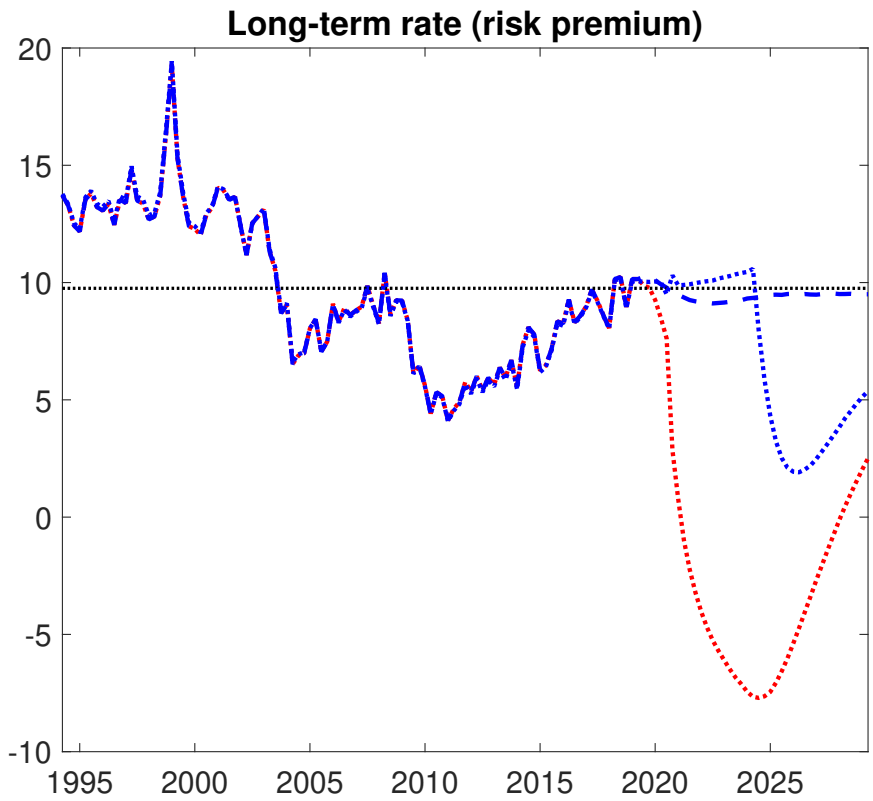




- Conditional forecast paths (observables): G.debt-to-GDP, output growth, employment, and policy rate.
- Controlled exogenous variables (shocks): G.consumption, preference, employment, MP
- Red line excludes policy rate control.

COVID-19, monetary policy, and debt stabilisation





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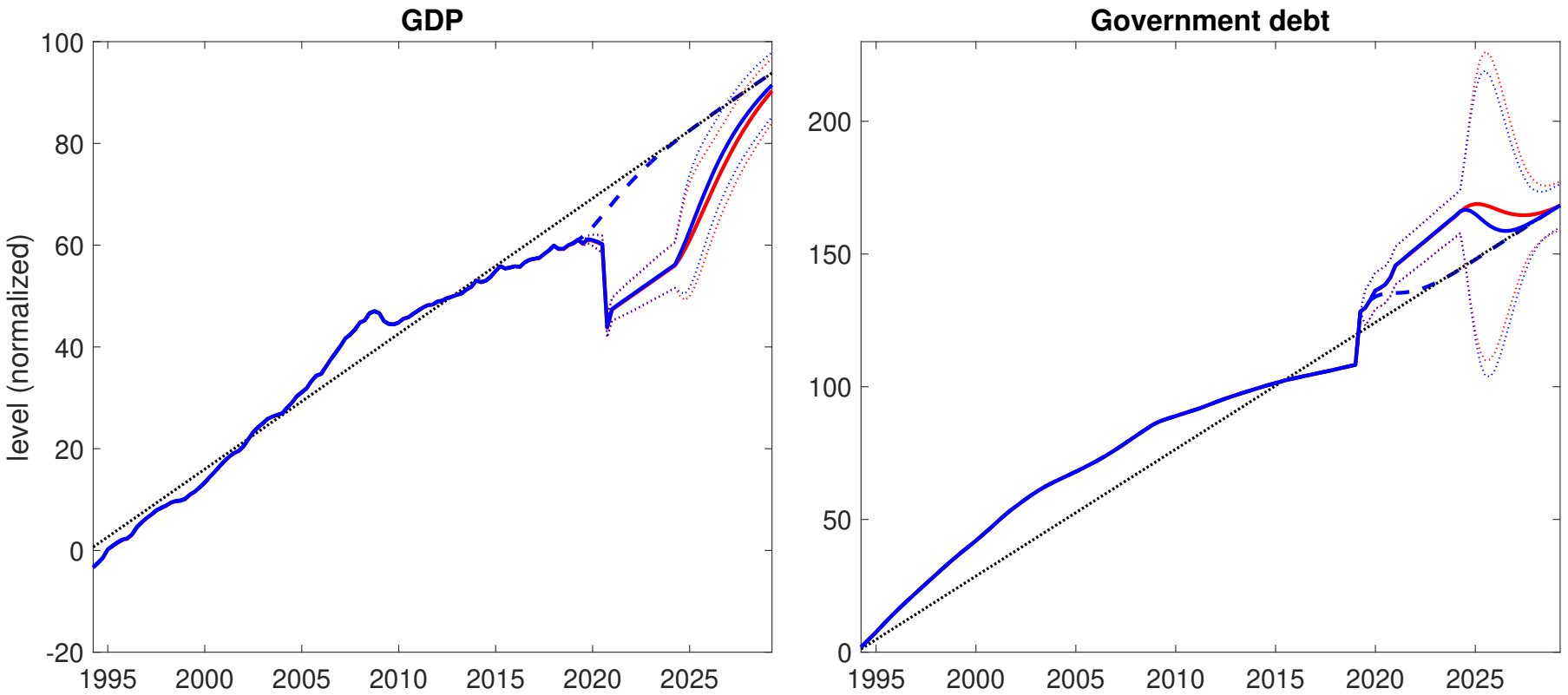

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- Controlled exogenous variables (shocks): G.consumption, preference, employment, MP
- Red line excludes policy rate control.

Conclusion – what to do when $r > g$?

1. Optimal policy response is to raise g. But without that, fiscal consolidation is necessary and will have ST welfare consequences
2. Welfare losses are minimised when:
   - Consolidation is gradual
   - Achieved through reductions to government consumption
   - Is coordinated with monetary policy
3. Worst option is a 'hard consolidation' – if 'easy consolidation' is put off for too long, a hard consolidation becomes inevitable
4. Welfare costs of consolidation can be mitigated through:
   - Simple changes to system of intergovernmental transfers – spending-neutral conditional grants will protect frontline services
   - Increasing interest income from cash / alternatively reducing cash / reviewing borrowing strategy

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