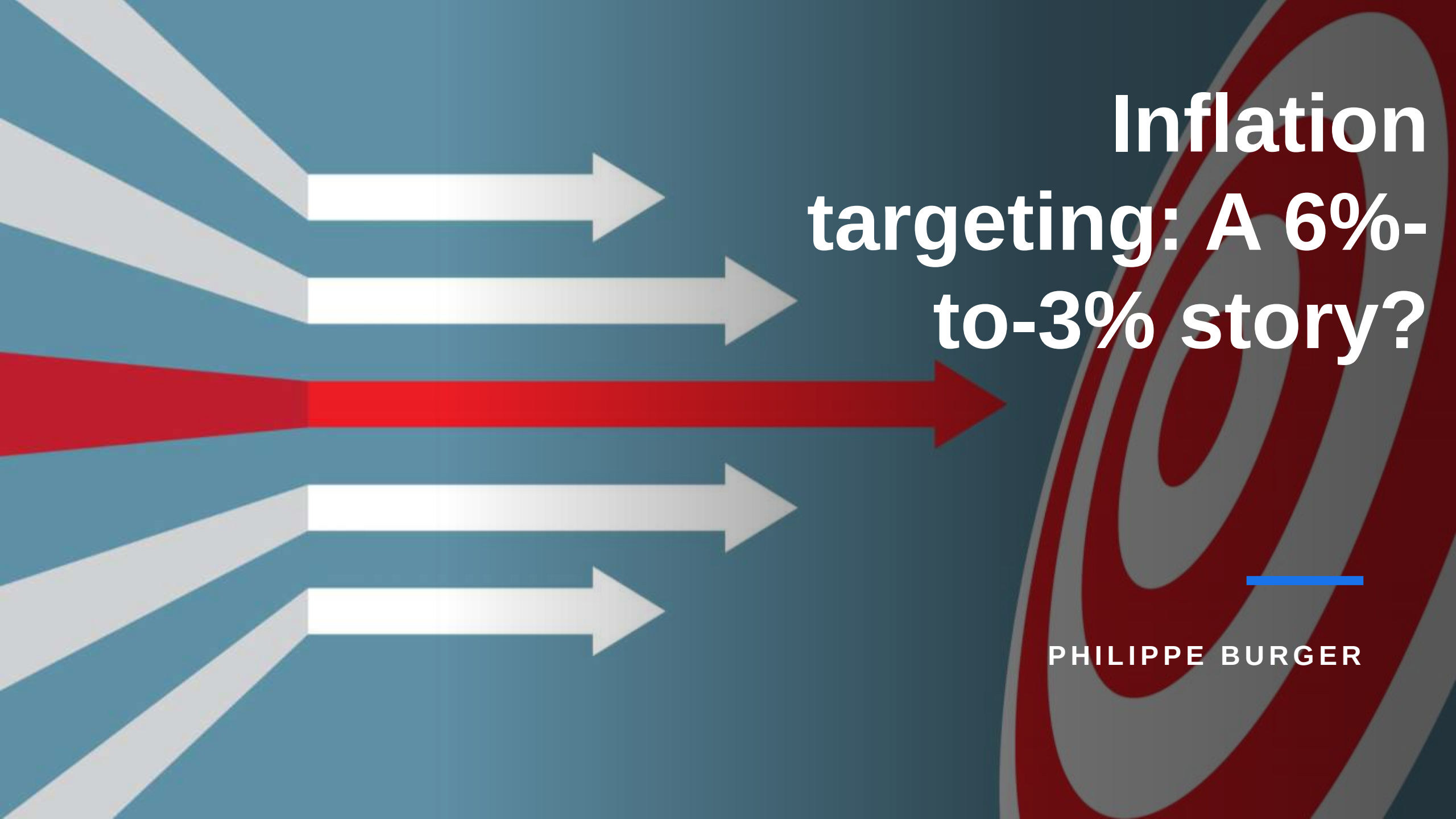


Inflation targeting: A 6%-to-3% story?

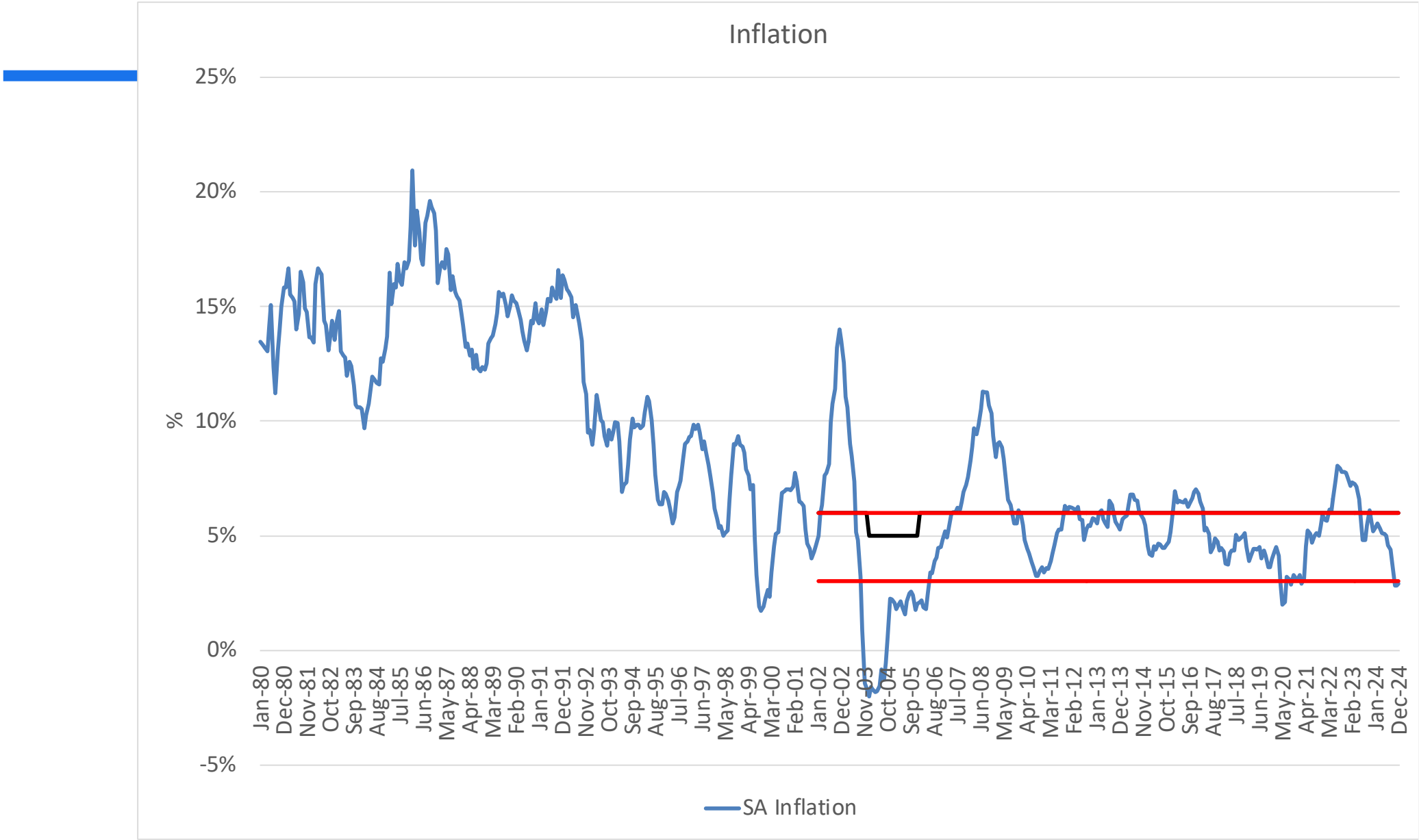
PHILIPPE BURGER

Inflation targeting – an overview

- It should be 6% to 3%, not 3% to 6%
- In the beginning... and then....?
- Administered prices...
- Should it be a 6%-to-3% story?

In the beginning... and then....?

- Is it a 3%-to-6%, or 6%-to-3% story?
- Introduced 23 February 2000 with a target range of 3%-6%.
- In 2001 set at 3%-5% for 2004 and 2005, but in 2002 Minister Manuel revised the 2004 target back to 6% (and stated that it will remain there unless otherwise announced)
- Before 12 November 2003 Escape Clause, from 12 November 2003 Explanation Clause
- Since 2017, the MPC targets the 4.5% midpoint of the 3–6% target range.



Source: FRED St Louis 2025, SARB 2025, National Treasury 2002 and author's calculations

How do we assess success?

- Are inflation expectations anchored? How do we assess that?
- Lower average inflation

	2000-2024	
Average (monthly y-o-y)	5.3%	
	2000-2009	**2010-2024**
Average (monthly y-o-y)	5.5%	5.1%

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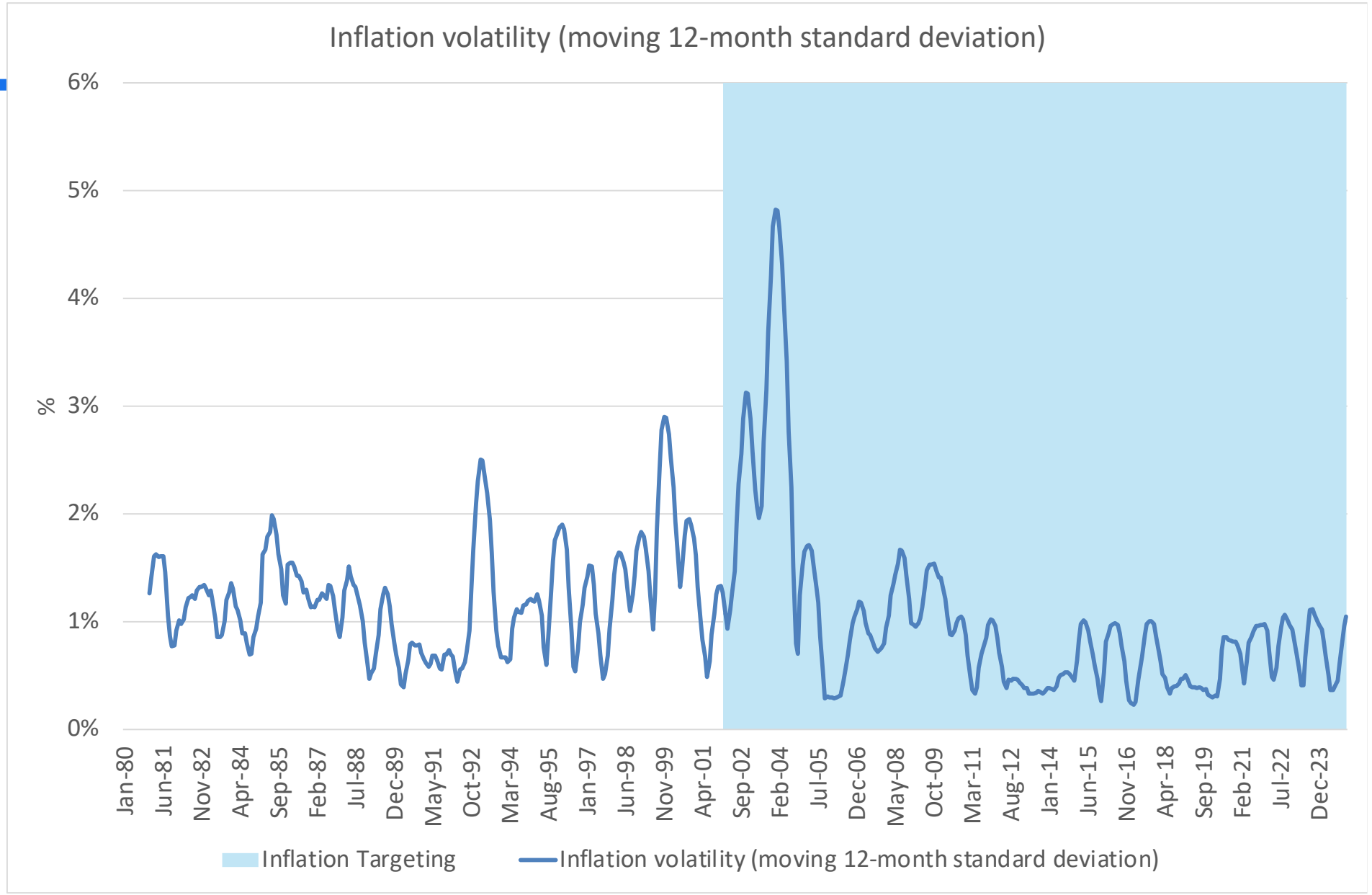
  - The standard deviation of inflation fell

	2000-2024	
Average (monthly y-o-y)	5.3%	
Standard Deviation (monthly y-o-y)	2.5%	
	2000-2009	**2010-2024**
Average (monthly y-o-y)	5.5%	5.1%
Standard Deviation (monthly y-o-y)	3.7%	1.2%



Source: FRED St Louis 2025 and author's calculations

How do we assess success?

- Are inflation expectations anchored? How do we assess that?
- Lower average inflation
  - It is lower, but not at the 2%-to-3% level often seen as the norm in most of SA’s largest trading partners
- Lower variation in inflation
  - The standard deviation of inflation fell
- Lower inertia of inflation, lower pass-through effects from trade (exchange rates and foreign inflation), and less sensitivity to business cycle movements
  - In general, yes,
  - But there are inflationary factors present that makes combatting inflation somewhat more difficult

- Start with a version of Robert Gordon's basic Triangle Model that augments the traditional Phillips Curve model with supply-shock variables (Gordon 1984; 2013), But also add a variable capturing expected inflationary pressure (though not necessarily expected inflation itself). (For the various alternative Phillips Curve specifications for SA, see also Botha, Kuhn and Steenkamp 2020)
- The basic thus includes (1) price inertia, *p*, (2) demand-side variables, *D*, and (3) supply-shock variables, *z*:

$$p_t = \phi_{1R} + \phi_{2R}(L)p_{t-1} + \phi_{2R}(L)D_t + \phi_{3R}(L)z_t + \varepsilon_{Rt}$$

In the typical Triangle Model for the US supply-shock variables are (Gordon 2013):

- Changes in the relative price of food and energy,
- Change in the relative price of non-food, non-oil imports,
- Eight-quarter change in the trend rate of productivity growth

$$p_t = \phi_{1R} + \phi_{2R}(L)p_{t-1} + \phi_{2R}(L)D_t + \phi_{3R}(L)z_t + \phi_{3R}(L)G_t + \theta_1(L)S_t + \varepsilon_{Rt}$$

- Monthly inflation
- In the SA model, in addition to lagged Inflation and real GDP growth, the latter as demand-side variable, the model includes:
- Expected inflation and inflation correlated: SA inflation expectations backward-looking (Horn, Martin, Pretorius and Steenkamp 2025). Include a variable to capture expected inflationary pressure:
  - US Inflation (in a quarterly GETS model estimated with 4 lags of 1-year Exp Inflation, US Inflation, SA Inflation, Admin Inflation, and seasonal dummies for 2004(q1)-2024(q3), only the first lags of 1-year Exp Inflation and US Inflation, and 3 impulse dummies remain)
- Supply-shock variables:
  - % Chance in the Nominal Effective Exchange Rate
  - % Change in Electric Current Generated
- The Budget Balance/GDP as an additional demand-side variable
- Seasonal dummies and a Covid dummy
- Markov-switching model with all variables (except dummies) set as regime-switching variables
  - Sample period: 2002M1 to 2024M8 (i.e., for inflation targeting period – first target was set in 2000 for 2002)
  - Estimated for monthly inflation
  - Used interpolation to generate monthly GDP growth values from quarterly GDP

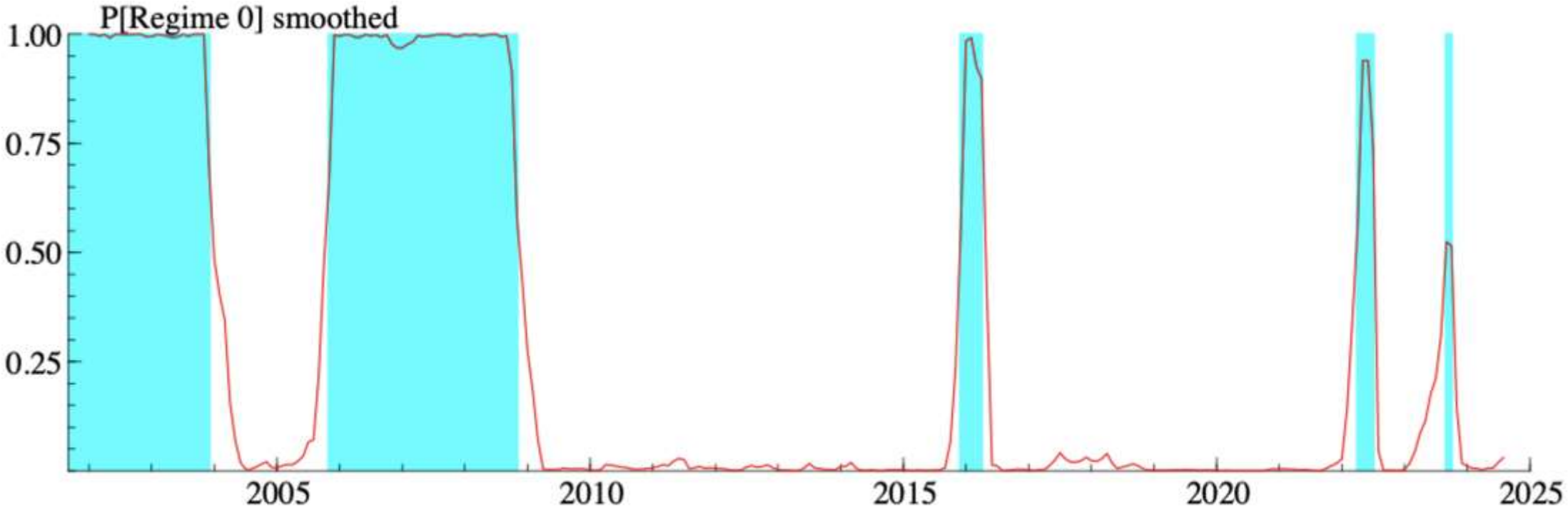
Regime Switching	Regime 0 (Volatile inflation)			Regime 1 (Stable inflation)		
	Coefficient	t-prob	Long-term Coeff	Coefficient	t-prob	Long-term coeff
Constant	0.0036***	0.0090	*0.0051*	0.0006	0.1280	*0.0009*
Inflation $_{t-1}$	0.2741***	0.0050		0.0982**	0.0450	
Inflation $_{t-2}$	0.3017***	0.0020		0.0892*	0.0910	
Inflation $_{t-12}$	-0.2858**	0.0130		0.1747***	0.0000	
US Inflation $_{t-1}$	0.1173	0.2380	*0.1653*	0.3754***	0.0000	*0.5885*
US Inflation $_{t-3}$	-0.0615	0.5340	*-0.0867*	-0.3281***	0.0000	*-0.5143*
Electr Gen (%) $_{t-2}$	-0.0376	0.2580	*-0.0530*	-0.0213***	0.0040	*-0.0334*
Electr Gen (%) $_{t-3}$	-0.1071***	0.0050	*-0.1509*	-0.0335***	0.0000	*-0.0526*
Real GDP (%) $_{t-3}$	-0.2004	0.2480	*-0.2823*	0.0400***	0.0060	*0.0627*
Budget Balance/GDP $_{t-7}$	0.0410	0.6370	*0.0577*	-0.1060***	0.0010	*-0.1662*
Budget Balance/GDP $_{t-11}$	-0.2128**	0.0120	*-0.2997*	-0.1037***	0.0000	*-0.1625*
Ex Rate Nom Effective $_{t-7}$	-0.0279**	0.0300	*-0.0392*	0.0060	0.2770	*0.0094*
Non-Regime Switching	**Coefficient**	**t-prob**	**Long-term coeff**			
Covid Dummy $_{t-1}$	-0.0030***	0.0170	*-0.0042*			
Seasonal $_{t}$	0.0031***	0.0000	*0.0044*			
Seasonal $_{t-2}$	0.0019***	0.0040	*0.0026*			
Seasonal $_{t-6}$	0.0046***	0.0000	*0.0065*			

	Coefficient	Std.Error
sigma(0)	0.0034	0.0003
sigma(1)	0.0021	0.0001
p_{0|0}	0.9332	0.0329
p_{1|1}	0.9789	0.0128

Normality test:	Chi^2(2) =	1.426	[0.4903]
ARCH 1-1 test:	F(1,238) =	0.014	[0.9046]
Portmanteau(36):	Chi^2(36) =	37.831	[0.3857]
Linearity LR-test:	Chi^2(15) =	96.877	[0.0000]

Sample: 2002M1 to 2024M8

	Regime 0	Regime 1
Average (monthly m-o-m)	0.6%	0.4%
Average (monthly m-o-m, annualised)	7.3%	4.4%
Average (monthly y-o-y)	6.7%	4.7%
Standard Deviation (monthly m-o-m)	0.6%	0.4%
Standard Deviation (monthly y-o-y)	3.4%	2.0%
Residual standard error (sigma (monthly m-o-m)	0.3%	0.2%



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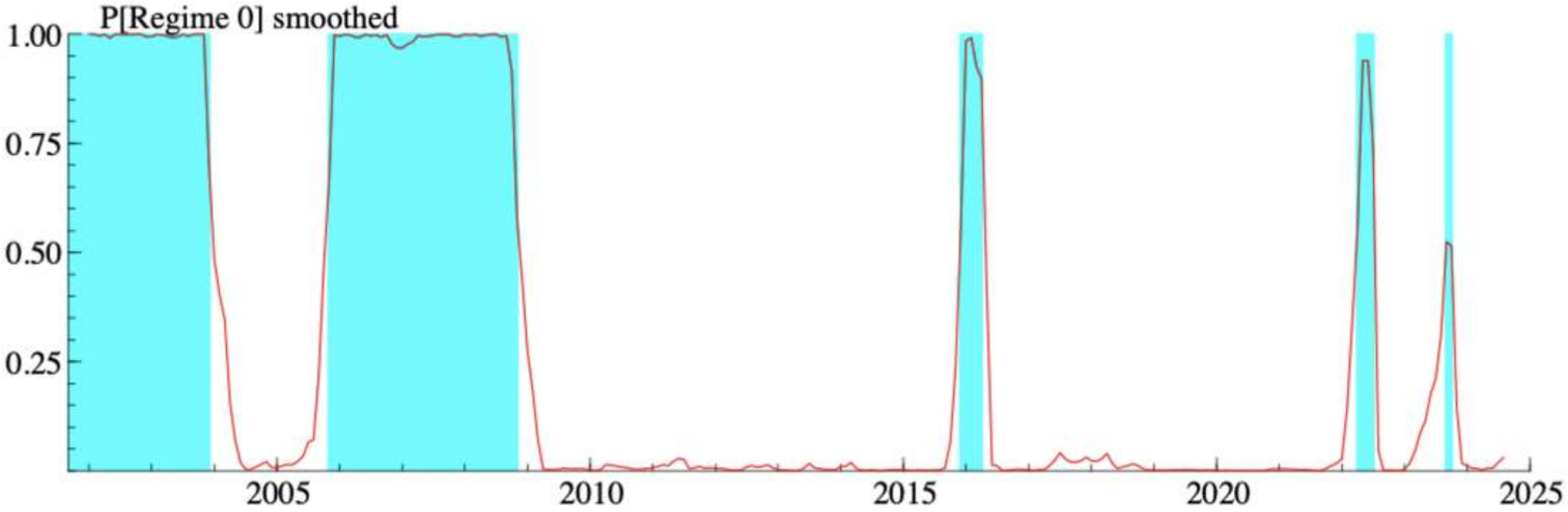
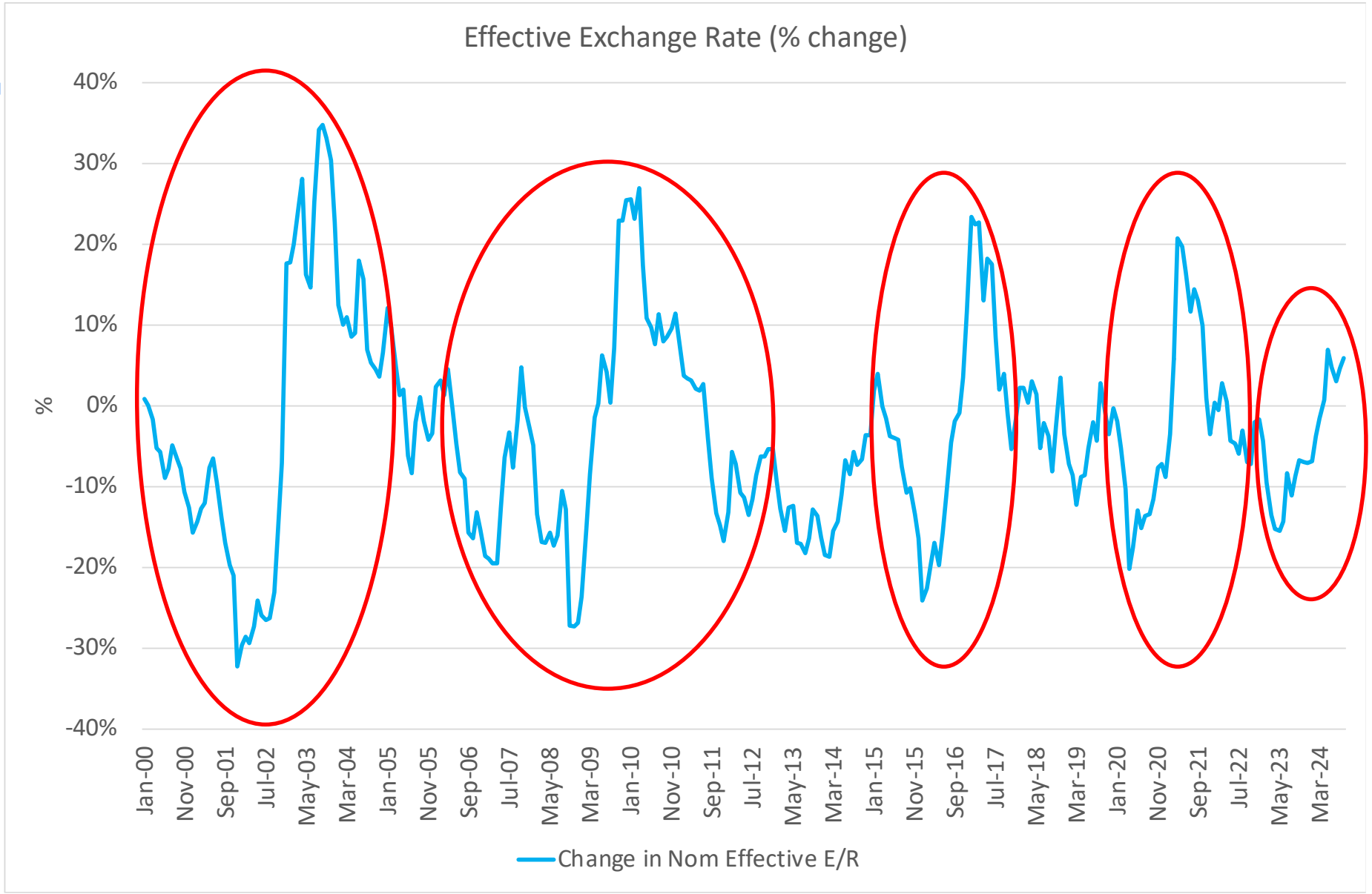


	Regime 0 (Volatile inflation) Regime 1 (Stable inflation)
Inflation	Inertia: sum of parameters is 0.29 in Regime 0 and 0.36 in Regime 1, or 0.27 if calculated with parameters statistically significant at 5%
Real GDP Growth	Insignificant in Regime 0. Long-run parameters a modest 0.06 in Regime 1
Nominal Effective Exchange Rate (%)	A long-run parameter of -0.04 in Regime 0 and statistically insignificant in Regime 1



Source: SARB 2025 and author's calculations

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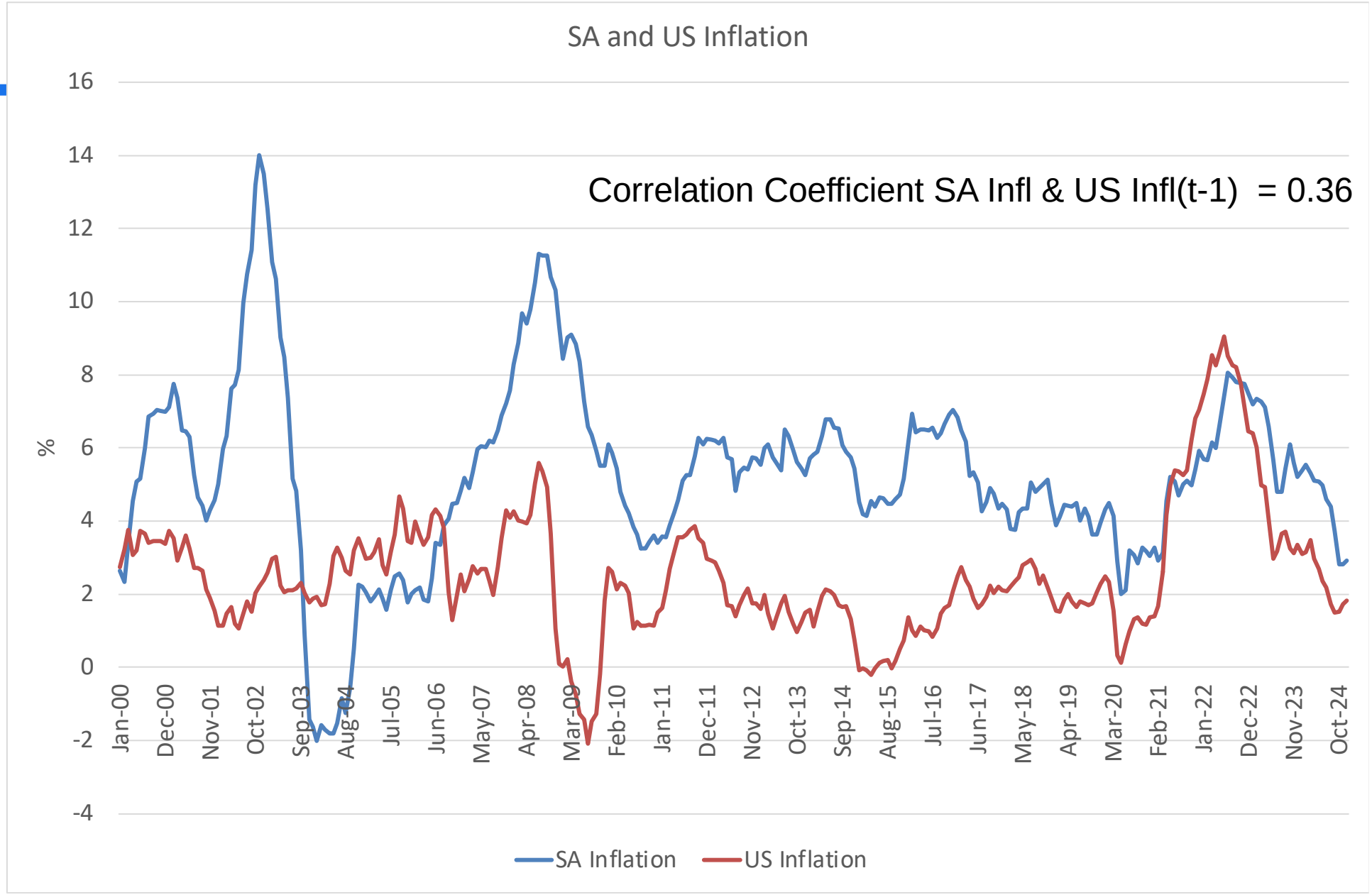
US Inflation	Sum of long-run parameters statistically insignificant in Regime 0 and 0.07 In Regime 1 (but the temporary effect is 0.59 at lag 1 and -0.51 at lag 3)



Source: FRED St Louis 2025 and author's calculations

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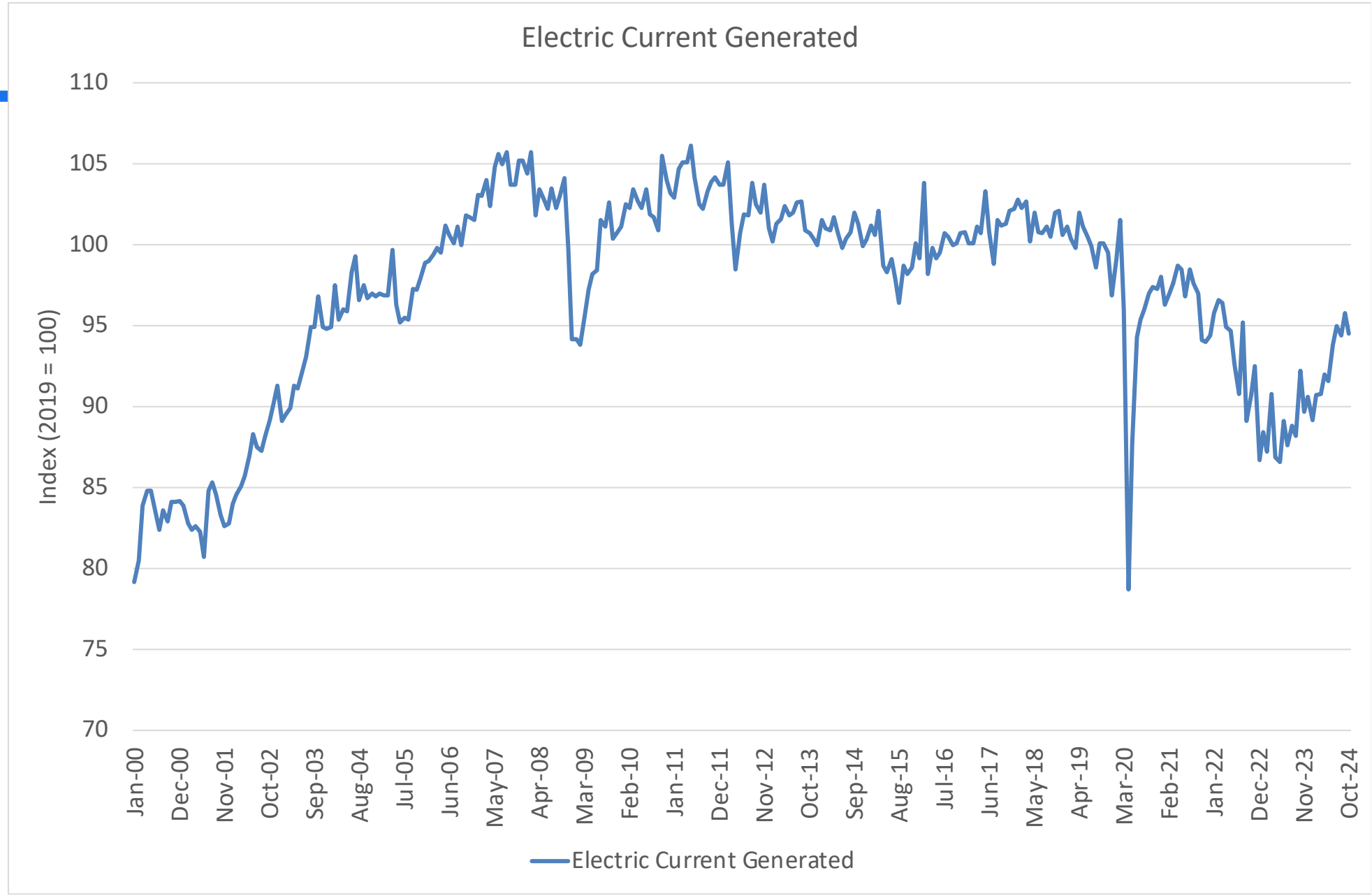
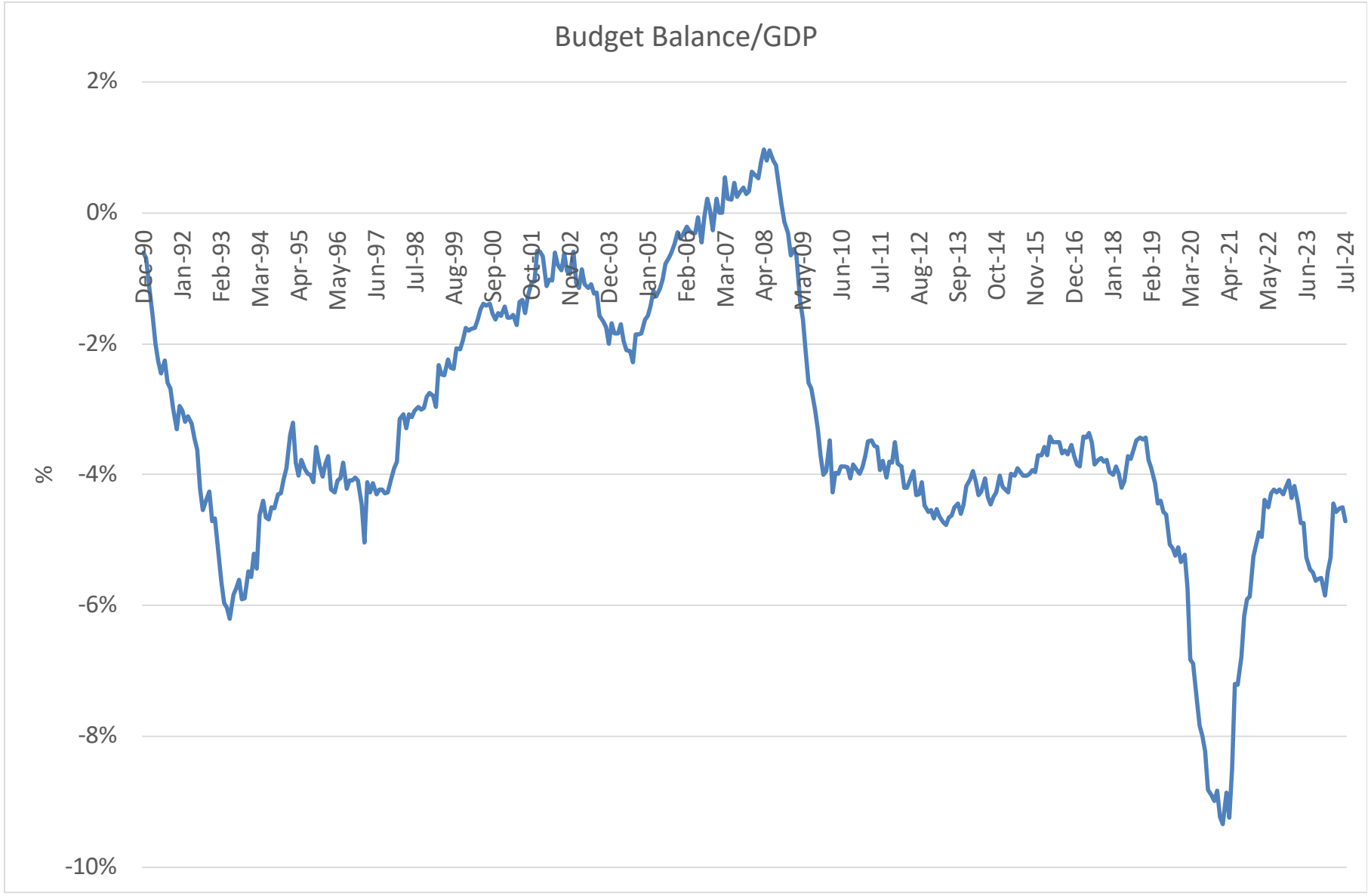
US Inflation	Sum of long-run parameters statistically insignificant in Regime 0 and 0.07 In Regime 1 (but the temporary effect is 0.59 at lag 1 and -0.51 at lag 3)
Electricity Current Generated (%)	Remains inflationary with long-run parameter at lag 3 in Regime 0 at -0.15 and the sum of long-run parameters (lags 2 and 3) in Regime 1 at -0.09
Budget Balance/GDP	Remains inflationary with long-run parameter at lag 11 in Regime 0 at -0.30 and the sum of long-run parameters (lags 7 and 11) in Regime 1 at -0.33



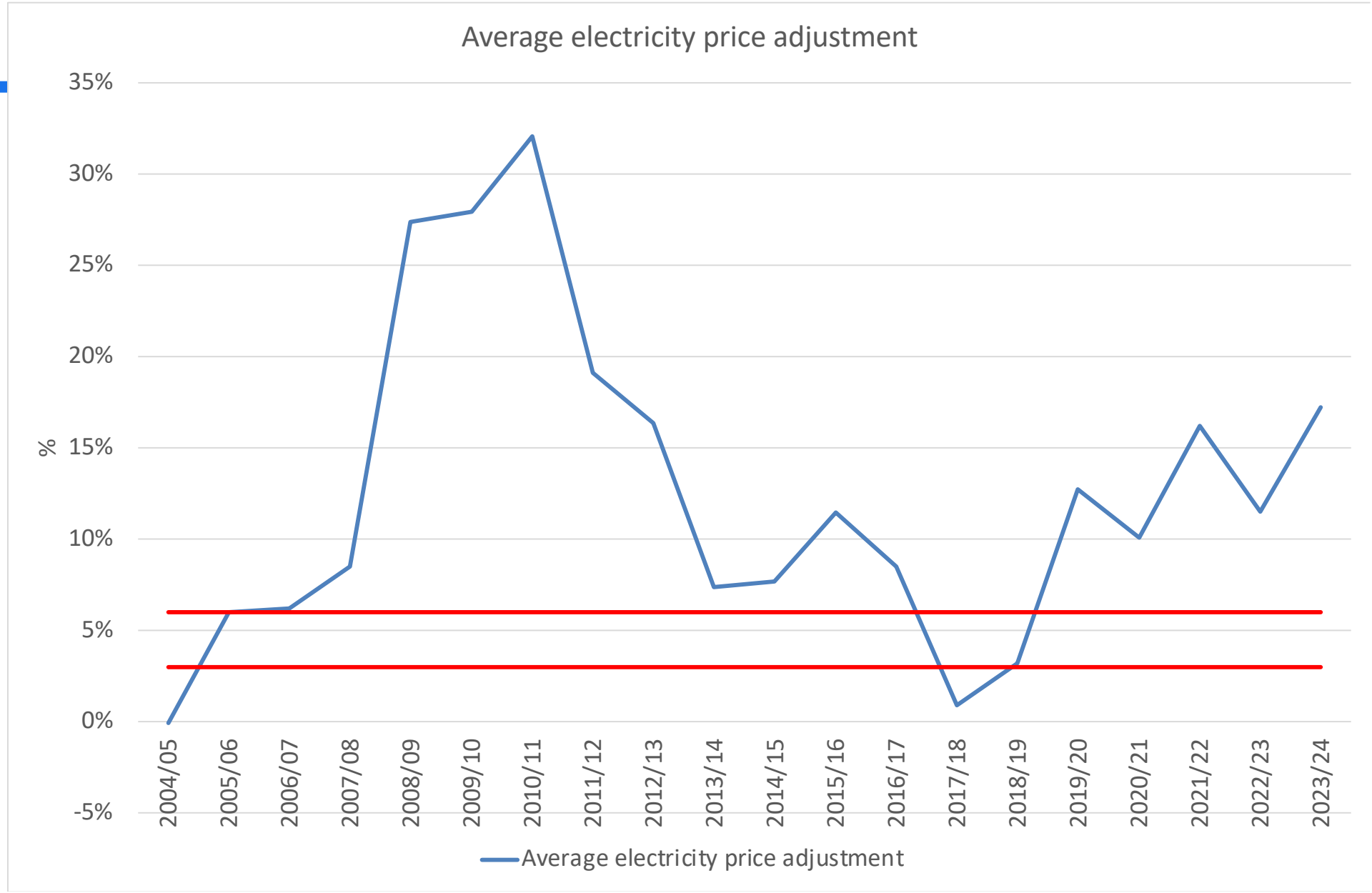
Source: SARB 2025



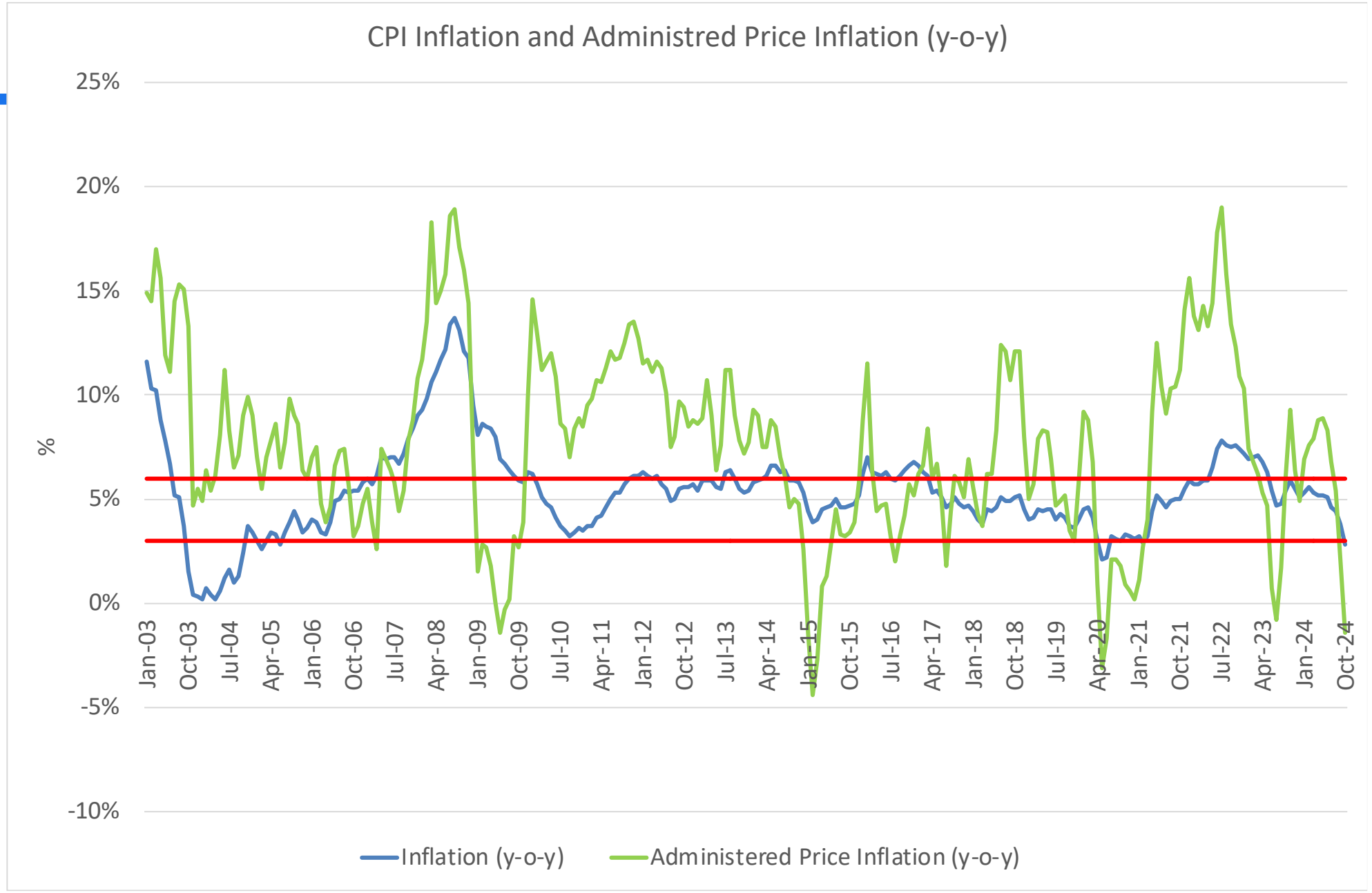
Source: SARB 2025 and author's calculations

Administered prices...

- Much higher than overall CPI inflation
- Renders the achievement of the inflation target more difficult
- Loewald, Makrelov and Pirozhkova (2022): Granger causality test showing bi-directional causation
- Long-standing issue: Schaling and Schussler (2001) and Du Plessis (2005)



Source: Eskom

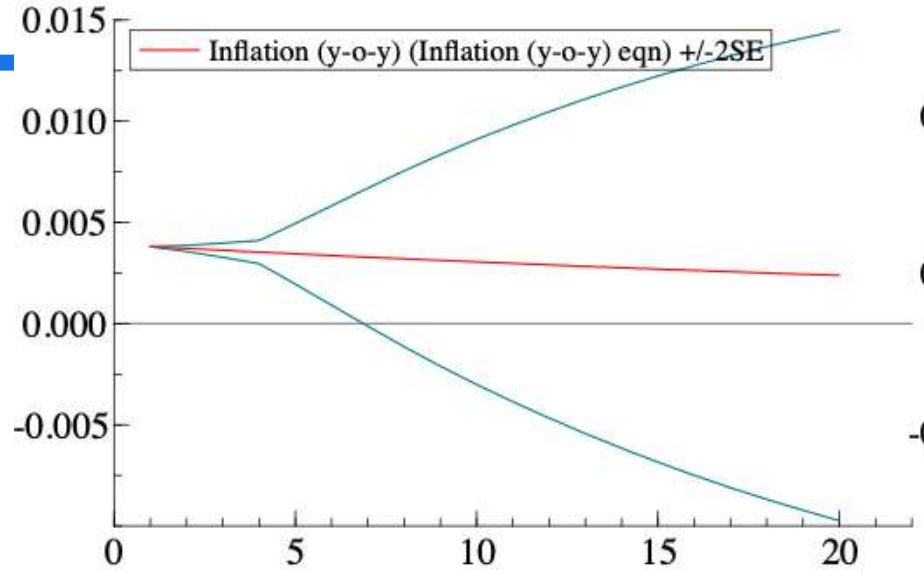


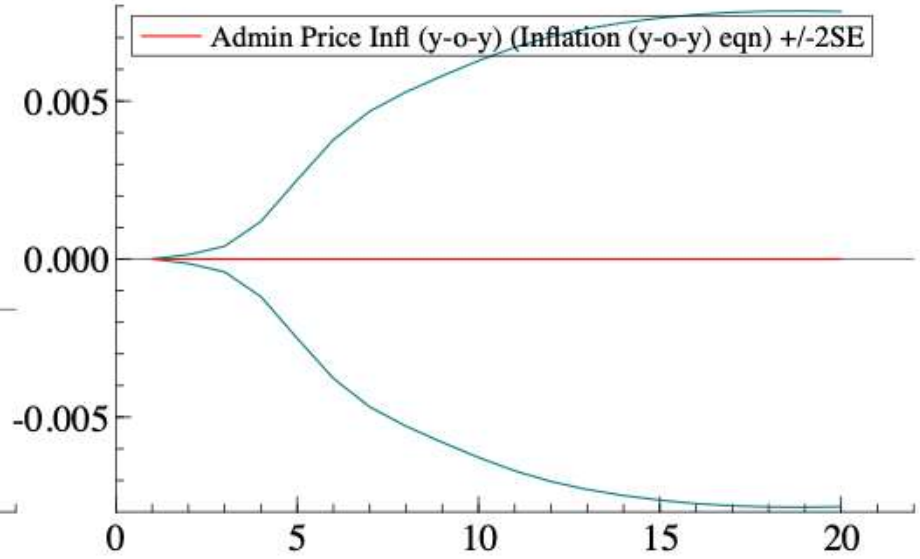
Source: FRED St Louis 2025 & SARB 2025

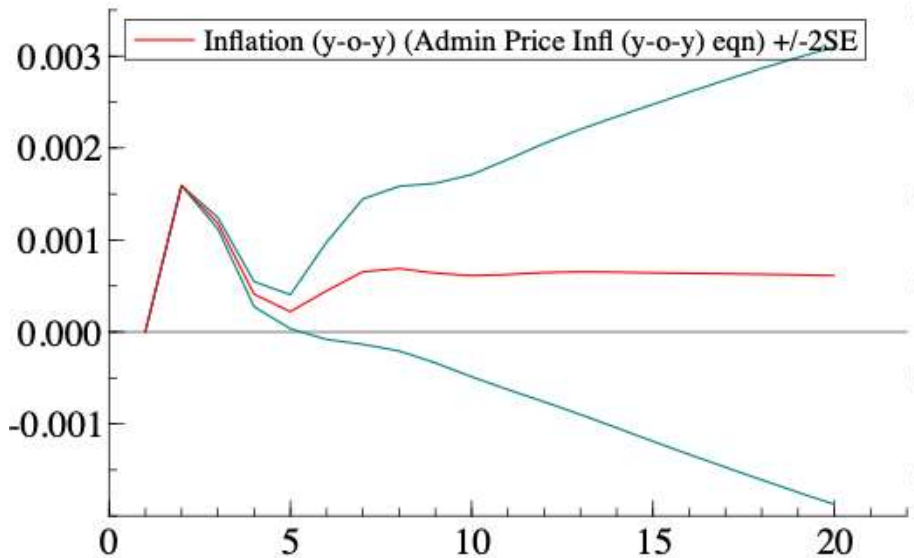
$$p_t = \theta_{p1} + \theta_{p2}(L)p_{t-1} + +\theta_{p3}(L)ap_{t-1} + \varepsilon_t^p$$
$$ap_t = \theta_{ap1} + \theta_{ap2}(L)p_{t-1} + +\theta_{ap3}(L)ap_{t-1} + \varepsilon_t^{ap}$$

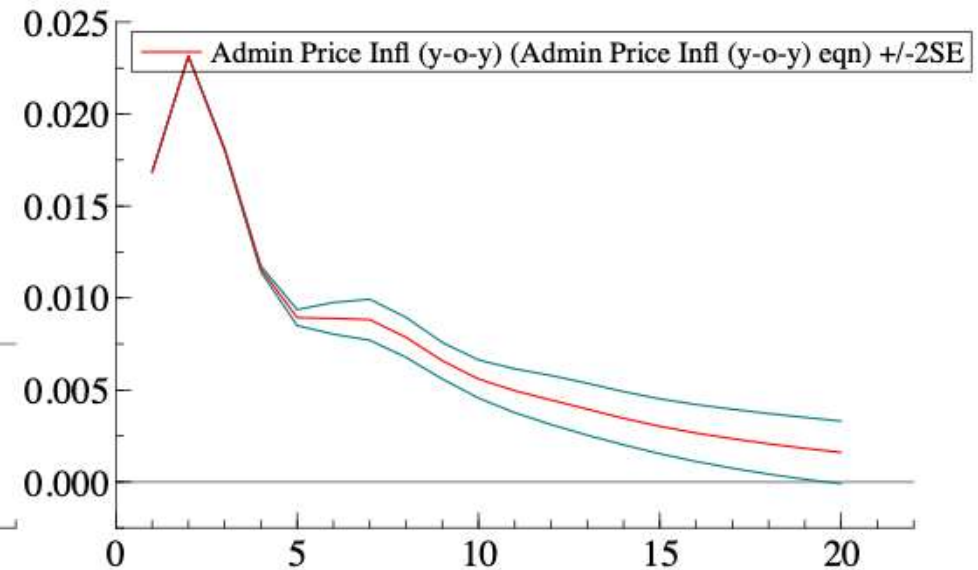
- System Model of Inflation and Administered Price Inflation estimated with Full Information Maximum Likelihood (FIML) and General-to-Specific (GETS) Methodology, the latter to ensure a parsimonious model containing only statistically significant lags.
- Shows that Administrative Price Inflation impacts Inflation, though the effect dissipates after about half a year (as captured in the impulse-response functions).

Equation for: Inflation (y-o-y)	Coefficient	t-prob	
Inflation (y-o-y) $_{t-1}$	0.9756***	0.0000	
Admin Price Infl (y-o-y) $_{t-1}$	0.0945***	0.0000	
Admin Price Infl (y-o-y) $_{t-2}$	-0.1520***	0.0000	
Admin Price Infl (y-o-y) $_{t-3}$	0.0635***	0.0007	
Constant (Unconstrained)	0.0008	0.4430	
Sigma	0.0038		
Equation for: Admin Price (y-o-y) Infl	**Coefficient**	**t-prob**	
Admin Price Infl (y-o-y) $_{t-1}$	1.3753***	0.0000	
Admin Price Infl (y-o-y) $_{t-2}$	-0.8180***	0.0000	
Admin Price Infl (y-o-y) $_{t-3}$	0.3364***	0.0001	
Constant (Unconstrained)	0.0069**	0.0179	
sigma	0.0168		
AR 1-7 test for Inflation (y-o-y):	AR 1-7 =	1.59	[0.1434]
AR 1-7 test for Admin Price Infl (y-o-y):	AR 1-7 =	1.66	[0.1253]
Vector SEM-AR 1-7 test:	F(28,242) =	1.1525	[0.2792]
Vector ARCH 1-7 test:	F(28,236) =	0.6634	[0.9027]
Vector Normality test:	Chi^2(4) =	5.8817	[0.2082]
Vector Hetero test:	F(72,338) =	1.0812	[0.3199]
LR test of over-identifying restrictions:	Chi^2(17) =	24.315	[0.1111]
Sample: 2013M1 – 2024M8			


Inflation (y-o-y) (Inflation (y-o-y) eqn) +/-2SE
0.015
0.010
0.005
0.000
-0.005
0
5
10
15
20

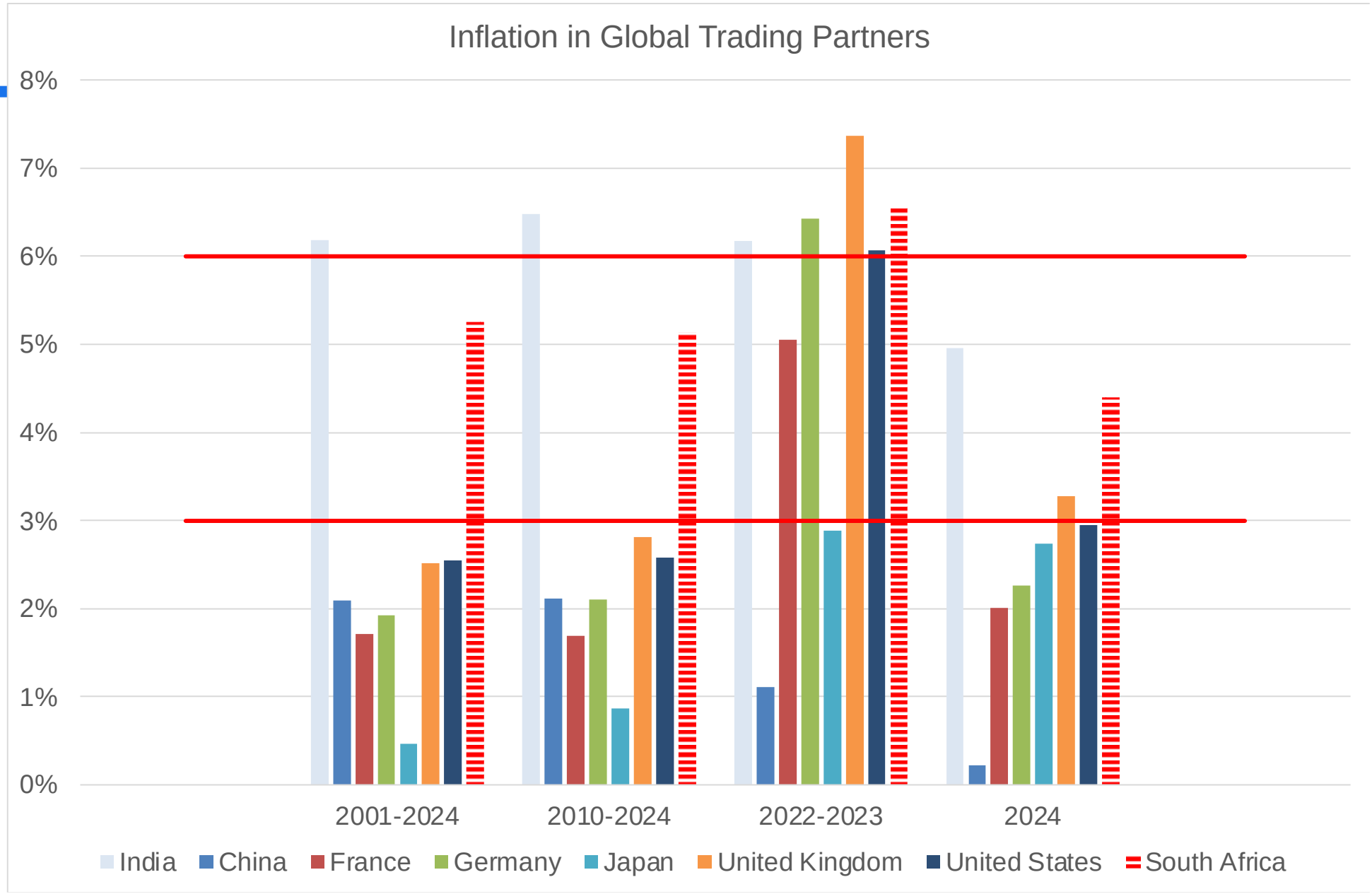

Admin Price Infl (y-o-y) (Inflation (y-o-y) eqn) +/-2SE
0.005
0.000
-0.005
0
5
10
15
20


Inflation (y-o-y) (Admin Price Infl (y-o-y) eqn) +/-2SE
0.003
0.002
0.001
0.000
-0.001
0
5
10
15
20


Admin Price Infl (y-o-y) (Admin Price Infl (y-o-y) eqn) +/-2SE
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20

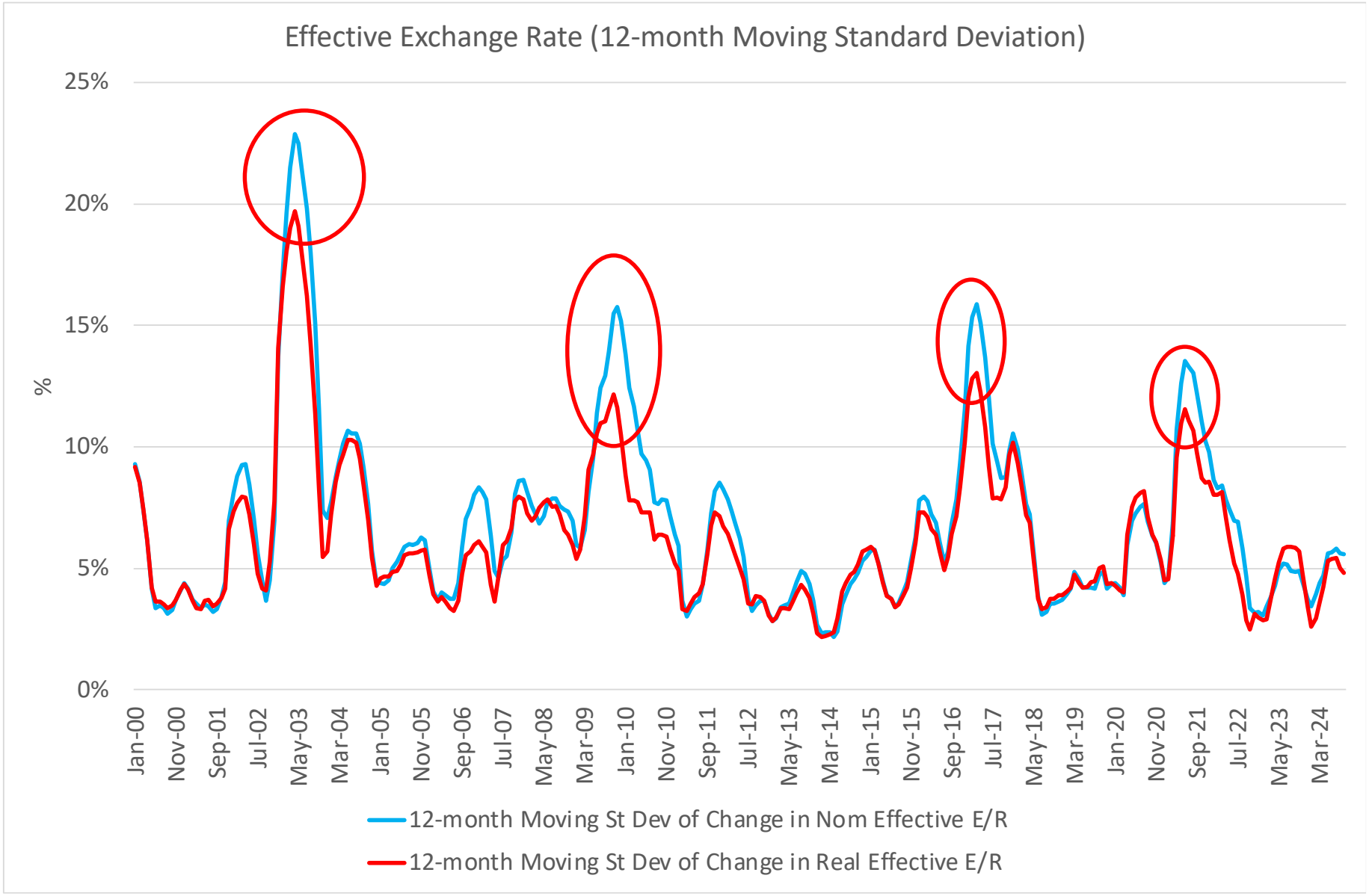
Should it be a 6%-to-3% story?

- Should we go from 4.5% mid-point target in a range of 3% to 6%, to a 3% target and a narrower range?
- Align closer to our trading partners
- SA and US inflation already relatively highly correlated – so the movement of the rates are to some extent aligned. Can now align averages



Source: IMF 2025

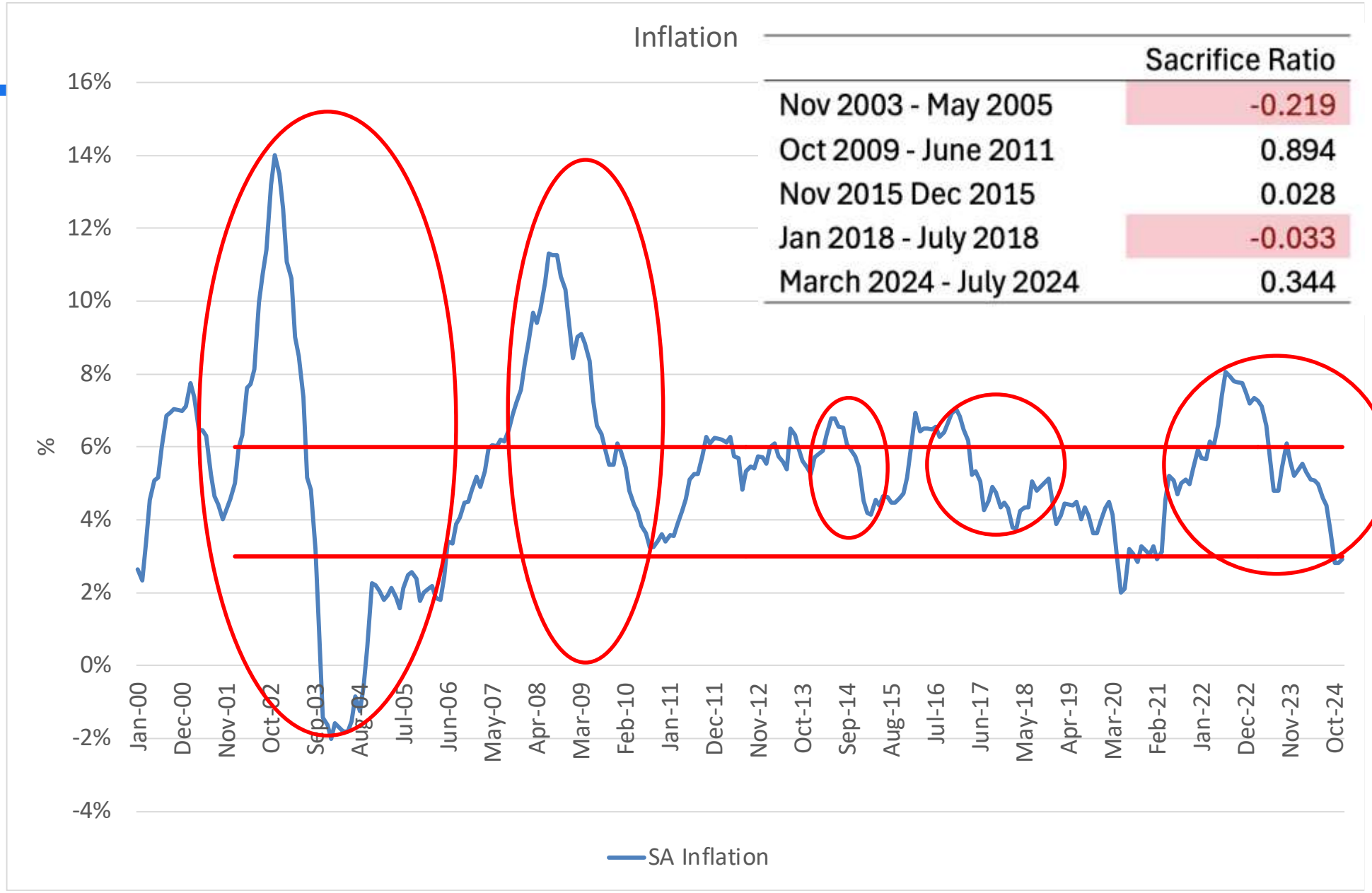
- A lower inflation rate translates into lower nominal exchange rate volatility
- Reduces exchange rate risk
- Lower risk improves investment and trade climate
- Reduces variability of inflation during more volatile exchange rate fluctuations (Regime 0)



Source: SARB 2025 and author's calculations

- Lowering average inflation might require higher unemployment and lower real GDP growth if the inflation anchor is not strong enough
- Implies a sacrifice of output to reduce inflation – sacrifice ratio
- Loewald, Makrelov and Pirozhkova (2022) argue sacrifice ratio fell because:
  - SARB's credibility improved,
  - Inflation expectations have become more forward-looking.
  - Lower exchange rate pass-through
- Agree, during stable-inflation periods (Regime 1):
  - Inflation less volatile
  - Exchange rate pass-through not significant
  - Though inertia still significant
- Stable-inflation periods also much longer in duration in the period after the GFC
- Thus, overall, the SARB's credibility is much much improved

- But did the sacrifice ratio fall?
- Various ways to calculate the sacrifice ratio (trend analysis (Ball 1994); SVAR (Cecchetti and Rich (2001), Loewald, Makrelov and Pirozhkova (2022) for SA)
- Calculate a crude sacrifice ratio (inspired by Ball (1994)) as follows for episodes that fulfil the following:
  - *Inflation reduction*: Average inflation (inflation calculated year-on-year) for a period of two years falls by 1.5 percentage points year-on-year
  - *Sacrificed output*: Average GDP growth (growth calculated year-on-year) for a year minus Average GDP growth (growth calculated year-on-year) for seven years, lagged by a quarter
- Relationship between real GDP growth and Inflation not constant.



	Sacrifice Ratio
Nov 2003 - May 2005	-0.219
Oct 2009 - June 2011	0.894
Nov 2015 Dec 2015	0.028
Jan 2018 - July 2018	-0.033
March 2024 - July 2024	0.344

- But the sacrifice ratio does seem to have increased since Covid (concurs with International Monetary Fund (2024).
  - As Horn, Martin, Pretorius and Steenkamp (2025) and Du Rand, Hollander and van Lill (2023) argue, this will render the achievement of a lower inflation target more difficult.
- However, reducing the inflation target is not only the responsibility of the SARB
- Argue for an approach that is not only dependent on the sacrifice ratio.
- The inflation target is set by government, in consultation with the SARB
- Government needs to play a significant role (coordinating fiscal and monetary policy and relieving supply constraint imposed by limited electricity supply)
- Lower budget balance/GDP ratio (with sum of long-term parameters on budget balance/GDP equals to -0.329 (-(0.166 + 0.163)), improving budget balance with 1 percentage point, reduces inflation by 0.33%)
- Improved electricity supply (with sum of long-term parameters on electricity current generated equals to -0.09 (-(0.034 + 0.053)), improving electricity supply with 10%, reduces inflation by 0.9%)

Conclusion

- High-inflation volatility regime associated with a higher average inflation.
- High-inflation volatility regime also associated with the exchange rate volatility.
- However, since the the GFC, periods of higher inflation volatility are much shorter
- Thus, inflation is relatively well-anchored since the GFC – but there are shocks that coincide with periods of exchange rate volatility
- Administered prices have an impact and given their volatility, also contributes to inflation volatility
- Government should support its own inflation target by reducing both the average and volatility of administered price inflation

- Should the CPI Inflation target of 3%–6% be reduced, i.e. should we write a 6%-to-3% story?
  - Lower inflation volatility (relative to SA's trading partners) will also translate into a less volatile nominal exchange rate, reducing exchange rate risk for investment and trade
- Yes, manage expectations by announcing a lowering of the target range to 1.5-4.5%, with a 3% mid-point target. Phase this in over two to three years – for instance, 0.5 percentage points per year
- That mid-point would align the average inflation in SA with its trading partners, while allowing the target range to accommodate a 1 standard deviation variability in inflation

Inflation (annual)	Average	Standard Deviation
2000-2024	5.27%	2.54%
2010-2024	5.13%	1.24%
2000-2009	5.47%	3.72%
	Upper bound	**Lower bound**
Policy target range	6.00%	3.00%
2000-2024 avarege +/- st dev	7.81%	2.73%
2010-2024 avarege +/- st dev	6.38%	3.89%
2000-2009 avarege +/- st dev	9.19%	1.75%
4.5% mid-point +/- '10-'24 st dev	5.74%	3.26%
3% mid-point +/- '10-'24 st dev	4.24%	1.76%
Target range with 3% mid-point	4.50%	1.50%

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Inflation (annual)	Average	Standard Deviation
2000-2024	5.27%	2.54%
2010-2024	5.13%	1.24%
2000-2009	5.47%	3.72%
	Upper bound	**Lower bound**
Policy target range	6.00%	3.00%
2000-2024 avarege +/- st dev	7.81%	2.73%
2010-2024 avarege +/- st dev	6.38%	3.89%
2000-2009 avarege +/- st dev	9.19%	1.75%
4.5% mid-point +/- '10-'24 st dev	5.74%	3.26%
3% mid-point +/- '10-'24 st dev	4.24%	1.76%
Target range with 3% mid-point	4.50%	1.50%

- But (and this is a big ‘but’), the SARB is not the only author of this 6%-to-3% story. There is also a fiscal side to the story:
  - Lowering of the level and volatility of administered price inflation
  - Reducing the budget deficit
  - Improving electricity supply