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Authorised for publication by:

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Making sense of neutral real interest rates[1] - July 2017

Chris Loewald, Head: Policy Development and Research

Abstract

Model-based estimations of neutral real interest rates are useful but have various limitations. Sifting through domestic and external variable drivers of neutral real rates remains a critical complement to those estimates. Assuming a decline in the growth rate of capital stock to account for negative productivity shocks or lower global growth, I arrive at a NRIR close to 2%. This lies somewhat above the central projection of model-based estimates. Even with a potential growth assumption of 0.5%, the real policy rate lies well below the neutral level. The negative rate gaps in each of the estimates should be placing upward pressure on economic growth and inflation.

Introduction

This short paper reviews estimations of neutral real interest rates for South Africa based on a range of methods established in the literature. I provide some perspective on the relevance of varying estimations and a rough estimate of where the neutral real rate currently lies.

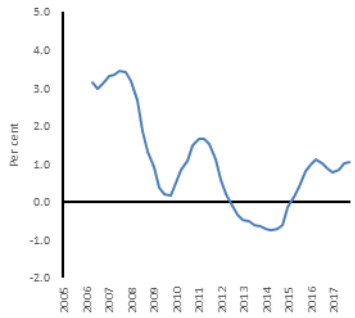
The neutral real interest rate

A neutral real interest rate (NRIR) is the level at which real interest rates will settle once the output gap is closed and inflation is stable around the central bank's target. Actual economic growth rates should be near potential. The NRIR has an operational significance as a benchmark for assessing the policy stance. When real policy rates are above the NRIR, a positive output gap should be closing as economic growth slows, and vice versa.

There are two basic methods for estimating NRIRs. One is to take the prevailing global interest rate level and add to it the set of reasons for why the local rate should differ, expressed as a real risk premium. The other starts from the potential growth rate of the economy and then adds all the other factors that may matter.[2] This is done, most notably by Laubach and Williams, with the use of a catch-all 'z' factor.

Prior to the global financial crisis, South Africa's potential growth rate was estimated at about 3.5%. Currently, short term estimates of potential sit at about 1.3%, suggesting that shorter-term factors outweigh longer- term ones that should pull it up. Among the latter are demographic factors, saving and consumption behaviour, inflation and exchange rate trends, and distance from technological frontiers. Among the shorter term factors is the growth effects of fiscal policy and the impact of policy uncertainty. These are not clearly identified in the models, but should explain movements in country risk premia or the 'z' factor in the neutral rate.

Figure 1: The real interest rate



1 Many thanks to SARB staff for comments on multiple drafts.

2 See Knut Wicksell, Interest and Prices, 1898.

Figure 2: The basic NRIR and SI gap

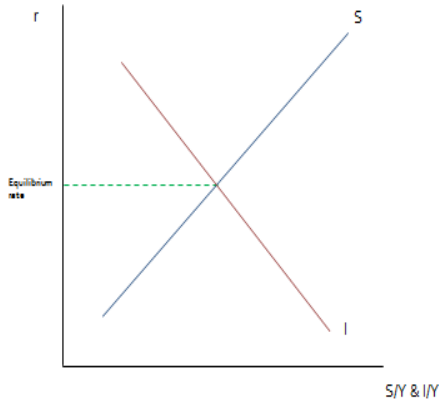


Figure 3: Real policy rates and gaps

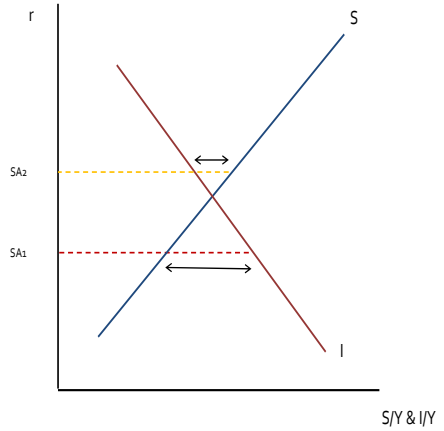
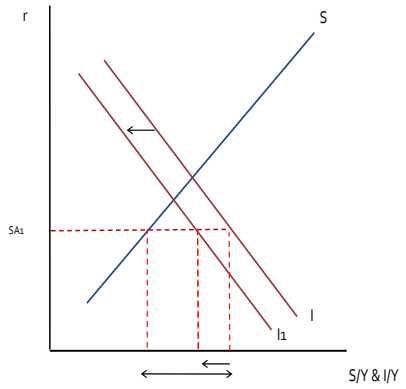


Figure 4: Global lower marginal product of capital, stable saving



My general proposition is that for emerging-market economies in this post-crisis period, surplus global savings push down NRIRs, while structurally weak domestic savings and higher returns to capital pushes them back up.[3] Therefore, in the near term, NRIRs should be below long-term averages (of about 3.5%), but well above the levels applying in advanced economies (ranging from -0.5 to 0.5%).

Where investment-saving imbalances are sticky, where there is a higher inflation trend or weakening policy frameworks, a risk-based approach to real returns suggests neutral rates should be higher than otherwise. For instance, based on an average real US rate of 0,41 per cent and an average SA risk premium of 164 bps over the 2005 to 2016 period, the neutral rate for SA can be estimated at 2,05 per cent (Table 3 below).[4] Higher US real rates and larger country risk premiums would raise that estimate.[5]

Neutral rate estimates can vary widely. Hassan and Redford (H&R) establish a range with a low of -1.45 to a high of 1.7%. Ruch and Steinbach (R&S) separately identify a range of -0.3 to 2.9% for 2015. From an operational perspective, these ranges are too wide to tell us whether current policy is loose, tight or neutral. For example, if the real rate sits at 0.5% and the range allows for the NRIR to be anything from -1.0 to 1.5%, then the policy stance could be contractionary or expansionary. Some kind of narrow range or point is needed to make sense of the policy stance. An implicit averaging of differing estimates works against a clear use of the NRIR for communication and policy purposes.

Before discussion of the staff estimations, I look separately at how a basic investment-saving framework can be used to think about South Africa's neutral real rate level and how some constraints to growth affect potential.

The impact of saving and investment (SI)

The 'NRIR and SI gap' charts (Figures 2-7) show the relationship between the two most important determinants of the cost of capital, and will serve as a simple framework for looking at a couple of alternative scenarios. These relationships should be seen as medium-term determinants of the NRIR, rather than very long term.[6]

3 This is more relevant for emerging market capital importers. Not all of them are, e.g. China.

4 As Fedderke and Pillay neatly show, risk moves and matters for the yield curve, while a purely expectations-hypothesis based approach that does not include risk, does not explain it well. See Fedderke and Pillay, "A theoretically defensible measure of risk: using financial market data from a middle income context", *ERSA Working Paper Number 64*, November 2007.

5 A risk-based approach is set out by Walter de Wet et al, "The balance between US real rates, South African country risk, and the real repo rate," Standard Bank, 24 January 2017

6 For a succinct overview of alternative short, medium and long run models see Vitorio Constancio, "The challenge of low real interest rates for monetary policy," Lecture at the Macroeconomics Symposium at Utrecht School of Economics, 15 June 2016. See also, Rhys R. Mendes, The Neutral Rate of Interest in Canada, Bank of Canada Discussion Paper 2014-5. September 2014, and also Joanne Archibald and Leni Hunter, What is the neutral real interest rate, and how can we use it, Reserve Bank of New Zealand, Bulletin, volume 64 No. 3 for applications of the investment-saving approach.

The basic idea is that investment to GDP (I/Y) and saving to GDP (S/Y) ratios are equilibrated by the real interest rate (Figure 2). If the real rate is above the equilibrium level, then a gap opens up between higher saving and lower investment or a negative gap closes.

In Figure 3, South Africa starts off with a real policy rate at level 'SA_1', below equilibrium.[7] Consequently, the economy exhibits a saving-investment imbalance (a current account deficit), shown by the red dotted line and displaying a gap measured on the horizontal axis between the saving to GDP and investment to GDP schedules. Raising the real policy rate above neutral (to SA_2) would create a current account surplus.

Global saving and investment conditions might affect South Africa as follows. With weaker potential growth, caused by a reduction in the marginal productivity of capital, I shifts to I_1. In the short run this lowers the warranted real level of interest (see Figure 4). The decline in productivity also reduces the pre-existing gap between saving and investment. At SA_1, the gap at the new investment schedule, I_1, is smaller than it would otherwise be. If South Africa's potential growth falls, but the real policy rate does not and the real interest rate gap (between the real rate and the neutral rate) becomes less negative, then the saving-investment gap closes faster (than would occur endogenously).

A rise in world saving has similar effects. Graphically, this shifts the domestic saving schedule to the right (Figure 5). Like a shift leftward in the investment schedule, a rise in saving lowers neutral real rates as more saving is available (NR old reduces to NR new). Also like a fall in investment, this reduces the size of a pre-existing negative saving-investment gap.

Combining a rise in saving with a fall in investment is the advanced economy diagnosis that motivates the argument for easing both fiscal and monetary policies. It is often supplemented with an argument for structural reform, on the grounds that fiscal policy either will not be enough to boost the productivity of capital or that many economies do not have fiscal space to expand deficits. Or that transmission channels for monetary policy are weakened and ineffective in boosting growth.[8]

How do global conditions improve our understanding of the current neutral rate in South Africa?

The following chart (Figure 6) represents current emerging-market conditions. The (representative) economy is subject to the decline in the global marginal product of capital, but also caught between a falling domestic saving rate and excess global saving. The net result of the opposing forces on available saving (negative domestic saving balanced by an offsetting net capital inflow) may be a net lower neutral real rate. At a

Figure 5: Global higher saving

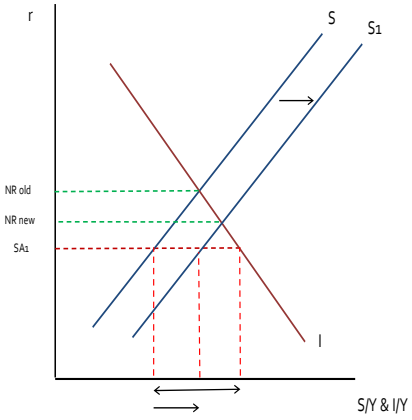


Figure 6: Global lower marginal product of capital, net stable saving

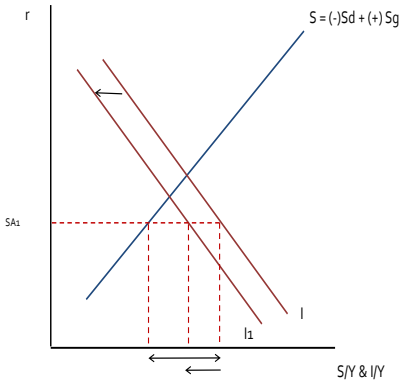
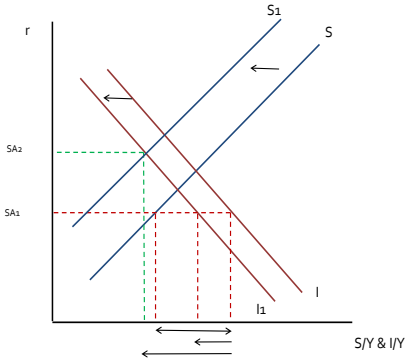


Figure 7: Lower potential, lower global and domestic saving



7 In what follows I assume an open economy setting.

8 Proposals for more rapid real appreciation in China or more expansionary fiscal policy in Germany target the main sources of excess saving in the global economy. A counter view is that the neutral real rate will eventually rise again as innovation eventually raises productivity. In this view, too much stimulus incorrectly discounts innovation and raises long-run inflation risks. Another well-known argument, alternatively, is that weak technological innovation is permanent, with the implication that the neutral rate has fallen permanently. See Gordon, Robert J., *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*, The Princeton Economic History of the Western World, Princeton University Press, January 12, 2016.

Figure 8: Saving and investment imbalance in South Africa

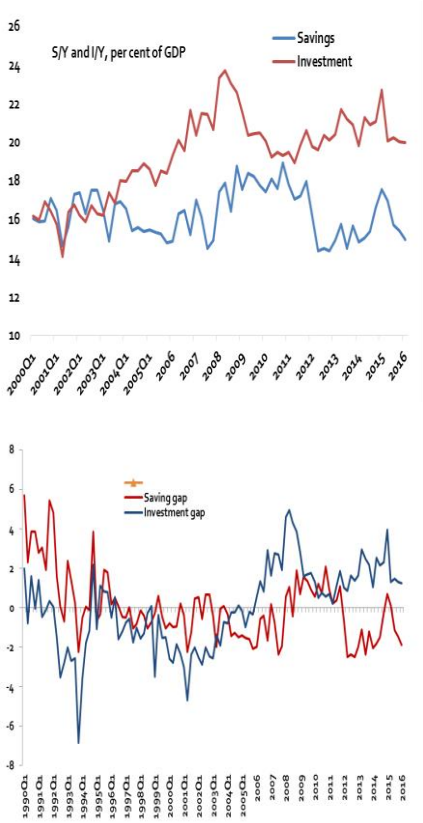
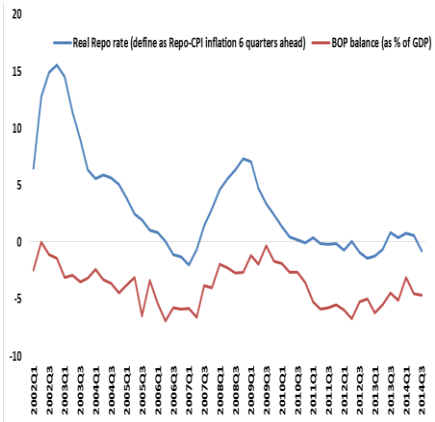


Figure 9: Real interest rates and current account



given real policy rate this results in a decline in the size of the pre-existing current account deficit (shown by the arrows below the horizontal axis).

Finally, I show in Figure 7 what happens when global saving dries up, allowing the negative domestic saving to shift the saving schedule to the left. In this case, getting to equilibrium would require a sharp rise in the real policy rate to reflect a new higher neutral rate (at SA_2), offset somewhat by a lower productivity of capital, but generating a collapse in the IS gap (and closure of the current account deficit). The larger the pre-existing IS gap, the larger the economic adjustment needed to close it if global savings turns negative.

Moving away from our charts, a more difficult part of the story involves the local productivity of capital. Current literature suggests that declining advanced economy potential pulls down emerging potential, as global GDP decelerates and via supply chains. But these forces will impact some economies more than others, raising the question of what the effects are for any particular country. More broadly, over the longer term, potential growth in emerging markets might be higher for other reasons, such as demographic change and distance from production possibility frontiers (which should encourage investment).[9]

In a similar way, we shouldn't expect the propensity to save in emerging and developing economies to be very similar to that in advanced economies. In emerging markets (Figure 7), the saving schedule will be more elastic, and should have moved in the opposite direction from global saving (shifting left to show less available saving). South Africa's overall propensity to consume has arguably increased over the past 20 years and fiscal policy has clearly been set to run large deficits. These should lead to a higher interest rate to either induce the required level of saving (say from corporates or households domestically) and/or to attract foreign saving. Reflecting this idea, the consumption preference-based estimate of Hassan & Redford, discussed below, reflects a considerably higher estimate than other methods. Additionally, this gap between investment and saving needs to induce a rise in potential growth, without which it becomes unsustainable, with risk premia rising, pushing up financing costs even as growth slows.

Figure 8 shows saving and investment ratios to GDP and their trajectory since 2000, with the imbalance being the gap between them. The second chart calculates saving and investment ratios as the difference to a long run average saving and investment to GDP. This shows quite clearly that overall investment has remained well above long term averages, while saving swung sharply positive in the immediate wake of the global financial crisis before turning quite negative from 2011. Both suggest a higher NRIR over the medium term. Figure 9 shows a high co-movement between *ex-ante* real interest rates and the deficit on the current account, suggesting that real policy rates have been well below neutral rates.[10]

A fall in potential growth normally pulls down the neutral real rate. However, lower real rates may have little effect on potential growth – the investment response to policy stimulus could be low. This could be for temporary or permanent reasons, or a more fundamental sense of

9 Michael D. Bauer and Glenn D. Rudebusch, Why are long term interest rates so low?, FRBSF Economic Letters, 2016-36, December 5, 2016.

10 Figure 9 shows only up to 2014 due to a 6 quarter lag.

uncertainty. Here, lower real rates or large fiscal deficits may offset the initial decline in demand for investment but eventually contribute to more long-term uncertainty, as seen in rising risk premiums. Fiscal policy impacts on the neutral real rate in contradictory ways. More spending on investment, research, and human capital development raises the potential growth rate of the economy and therefore the neutral real rate. With large fiscal deficits since 2008, fiscal policy has pushed up the neutral real rate by using available saving. But since much of the spending has been directed into public wages, this has likely pulled down the neutral real rate somewhat as the contribution to potential growth from such spending is probably not significant.

Estimates of the NRIR

As Hassan and Redford (H&R) show, different estimation methods generate a wide range of NRIR outcomes. The key differences between the outcomes rest on the role of unobserved factors, rather than potential growth. Their Laubach-Williams estimation regresses on potential growth and then other factors captured as 'z.' Potential economic growth, reflected in the 'g' factor in Figure 10, is a relatively stable contributor to the NRIR, declining from about 3.8% in 2000 to 2.0% in 2015. The change in the H&R Laubach-Williams estimate is driven by the 'z' factor, rather than potential growth, and comes out strongly negative.

Alternatively, using an estimation that focuses on time preferences for consumption relative to saving, the results show a quite positive level of NRIR (1.67%). Table 1 shows the various H&R estimates. The moving average and Hodrick-Prescott estimates are based on calculated historical real policy rates.

Figure 10: Laubach-Williams NRIR estimates for SA

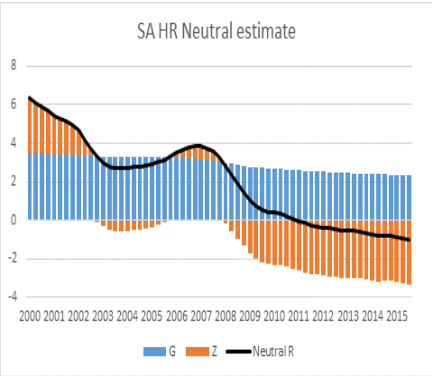
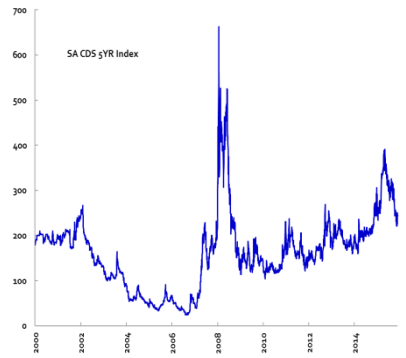


Table 1: Neutral rate estimates (Hassan and Redford)

Moving average	0.77
Hodrick Prescott	0.13
Consumption	1.67
Taylor Rule	-0.31
Laubach-Williams	-1.45

* Estimates are for 2015

Figure 11: Measures of risk



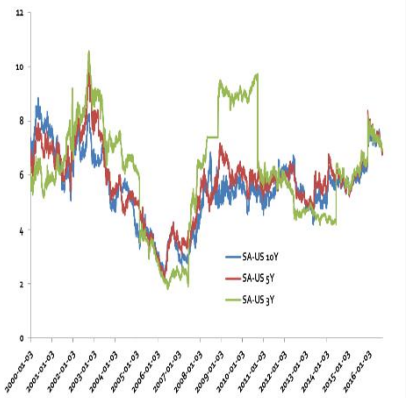
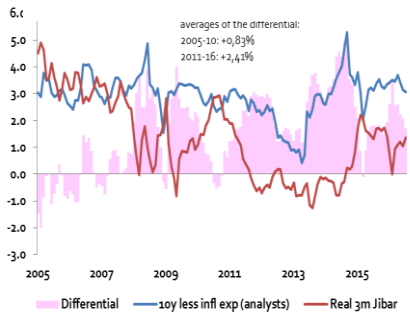


Figure 12: inflation and real risk



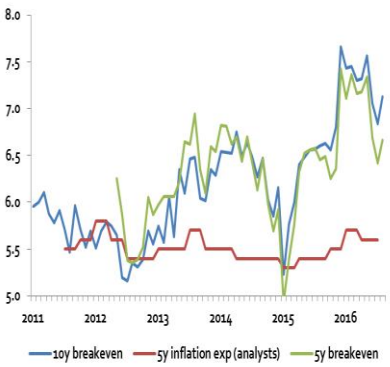


Table 2: Ex-ante real interest rates and the neutral rates (Quarterly Projection Model)

		2000-08	2013	2014	2015
Ex-ante real interest rate		3.2	-0.1	0.25	0.5
Neutral rate	Range*	[1.8 – 5.0]	[-0.7 – 2.5]	[-0.5 – 2.7]	[-0.3 – 2.9]
	Central projection	3.4	0.9	1.1	1.3

*based on one standard deviation estimates from the quarterly projection model

To more explicitly account for the impact of external factors, Ruch and Steinbach (R&S) estimate the NRIR using a model that adds global factors explicitly via an uncovered interest rate parity condition (UIP). This relates the differential between real interest rates at home and abroad to expected currency movements.[11]

Domestic real interest rate = Expected change in REER + foreign real interest rate + risk premium

where an increase in the real effective exchange rate (REER) signifies a depreciation. In the long-run equilibrium, this becomes the following specification:

Neutral real rate = expected change in equilibrium REER + foreign neutral real rate + equilibrium risk premium

With a foreign NRIR of 0.5% and a risk premium of 1.5%, a medium term domestic real neutral rate comes out at 2%.

Why does such a risk-based way of looking at the neutral rate matter?

Abstracting away from short-run nominal movements, are there reasons to think that the real equilibrium levels adjust over time or are effected by shorter-term shocks? One hypothesis is that the markets price-in all significant potential shocks and their effects on real risk. The other hypothesis is that they don't and that additional real risks only come to be priced in over time, resulting in a rising neutral real interest rate over the medium term. I abstract away from questions about market distortion.

Figure 11 shows the post-crisis rise in credit insurance costs (USD-based) and the difference between South African and US bond yields, suggesting that risk spreads can vary significantly over time. These are, however, nominal movements reacting to transitory shocks. Figure 12 shows a set of perspectives on the extent to which a real premium (over and above an inflation risk premium) has opened up on South African financial assets. In each instance, the real yield expected by the markets has increased well above the implied inflation differentials, suggesting a rise in a real premium.

11 UIP rarely stands up to sustained empirical scrutiny, however, due to the difficulty of forecasting exchange rate movements resulting from a wide range of factors including political risk, capital controls, taxes, and market complexity and structure. Similarly testing whether UIP holds requires the assumption of rational expectations.

The first chart shows the gap that opened up between the yield on 10 year bonds and 2-year-ahead BER inflation expectations, compared to the real 3 month JIBAR. As the repo rate was lowered, so the real JIBAR fell, but the falling real policy rate increased the inflation premium priced into the 10 year bonds relative to shorter term inflation expectations, as can be seen in the growing differential from 2011. Over the period, 2011 to 2016, this gap widened to average around +2.4%. The gap closed somewhat in 2015 as declining oil prices compressed expectations of future inflation.

The second chart shows a risk premium reflecting time preference, where risk rises that in the long-term inflation is expected to be higher than in the medium run. The gap between 5 and 10 year breakeven inflation rates of about 1.0 percentage points in mid-2014 falls and then rises again to over 1.5 percentage points. Figure 13 shows the real yields on 5-year and 10-year linked bonds compared to the real 3m JIBAR. This shows how the real yield has doubled since 2013.[12]

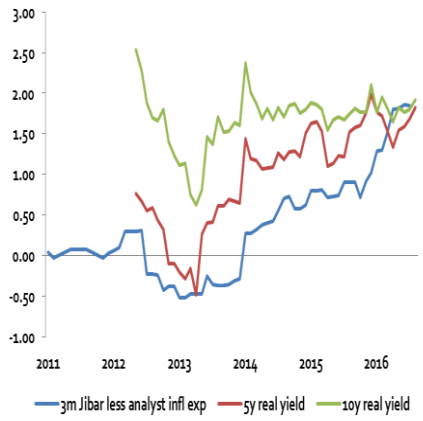
In summary, the estimates provide useful but incomplete perspectives, raising the question of which to use as a guide to policy. Conceptually, a backward-looking average can provide only so much guidance when short, medium, or long term conditions are changing. Some of those changing conditions involve inflation and inflation risk premiums, but these don't reflect all of the risk in asset prices. Additional real risk is likely to become more important where policy frameworks or institutions are perceived to be unsustainable or have weakened.

Conclusion

Much of the debate about the level of neutral real rate in advanced economies rests on decreasing potential growth and the level of real interest rates in increasing the demand for investment.[13] These coincide with large and negative output gaps. However, in South Africa output gaps are prone to real-time measurement problems and falling potential growth can be hard to explain.

The availability of global saving lowers neutral real rates for the economy, but sustained domestic dissaving suggests that they may be too low or that risks are building for sharp movements in yield curves and exchange rates. This implies that from a modelling and policy perspective, the interplay between domestic and global saving-investment factors and risk seem important and useful. Real risk levels are variable, but also display trends, giving guidance to how they affect neutral real rates. Likewise, for longer term estimates demographics (young population) and distance to production possibility frontiers (technological gaps) should put a floor under potential growth estimates.

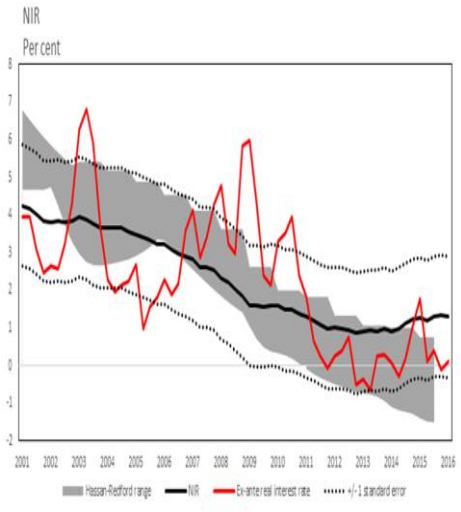
Figure 13: Real yields since 2011



12 It also shows that this short-term real yield has caught up to the longer-dated linked bonds, suggesting a mismatch in expectations, but also a turning point for either the short or long-term views. The rise in the yield also reflects an over-bought position in rand assets in the run up to 2013.

13 See Stanley Fischer, "Remarks on the US economy," Aspen Institute, 21 August 2016.

Figure 14: The QPM and H&R estimates compared to ex-ante real rates



In conclusion, sifting through domestic and external variables and understanding their idiosyncratic drivers remains a critical complement to model-based perspectives on neutral rates. South Africa's neutral rate should have fallen somewhat, alongside lower neutral rates globally. But policy has worked against this through two channels. The sharp fall in real policy rates and aggressive fiscal dissaving dating from 2009/10, all else equal, slowed the movement of the balance of payments toward a more sustainable position by keeping domestic consumption and investment higher and saving lower than they would have otherwise been with a less robust counter-cyclical policy.[14] The impact of policy on potential growth has been weak at best however, and real risk has increased. This suggests that while South Africa's neutral real rate has fallen in the global financial crisis, policy ineffectiveness has increased risk and raised the neutral rate to two per cent.

Table 3: NRIR estimate & Fed hike scenario, (+34 basis points & +36 on risk)

	Estimate	Scenario
Real US Rate	0.41	0.75
SA Risk premium (+)	1.64	2.00
NRIR (= a)	2.05	2.75
Nominal policy rate (+)	7.0	7.0
Expected CPI (-) (2017)	5.9	5.9
Real policy rate (= b)	1.1	1.1
RIR gap (= b-a)	-0.95	-1.65

[14] The sensitivity of saving to the interest rate is arguably also lower in South Africa, which would be seen in a steepening of the saving to GDP schedule in the IS framework.

Has the South African economy run out of fiscal space?

October 2017

Alain Kabundi and Luchelle Soobyah

Abstract

This note provides an empirical estimation of the primary balance sustainability gap for South Africa for the period 2000 to 2018. The results show that the South African primary balance sustainability gap has remained under severe strain since the global financial crisis. We estimate a negative sustainability gap at -1% of gross domestic product for 2016, which suggests little space for fiscal policy. The contributing factors are low growth and rising fiscal debt as a result of expansionary fiscal policy, a decline in commodity prices, and a decrease in revenue growth.

1. Introduction

Prior to the global financial crisis (GFC), many emerging market and developing economies (EMDEs) experienced strong and sound fiscal positions, mainly due to rising commodity prices. This, in turn, helped to abate the magnitude or impact of the crisis on these economies. Like most other EMDEs, especially commodity exporters, South Africa used countercyclical fiscal policy as a tool to curtail the negative effects of the financial crisis. Consequently, the fiscal positions in numerous EMDEs have deteriorated considerably since the GFC. Kose, Ohnsorge, and Sugawara (2017) find that both pre-crisis improvements and post-crisis deteriorations have been particularly noticeable among commodity-exporting EMDEs in line with the pre-crisis run-up and post-crisis slide in commodity prices. Contrary, the fiscal positions in the advanced economies (AEs) have improved significantly, back to mid-2000 levels.

In his 2014 speech at the Jackson Hole, Mario Draghi emphasised the importance of having room to manoeuvre in fiscal policy. In addition, he argued that it was economically desirable to be able to steer the overall fiscal policy stance.

This note estimates the primary balance sustainability gap using the method recently proposed by Kose et al. (2017) in order to determine whether South Africa currently has fiscal space.

The sustainability gap measures the evolution of debt dynamics or fiscal solvency risk. It estimates the fiscal space in an economy, which is important to ensure debt sustainability and government's continued ability to implement countercyclical fiscal policy.

2. Measuring the sustainability gap

The primary balance sustainability gap is the difference between the primary balance and the debt-stabilising primary balance. The debt-stabilising primary balance captures the long-term cumulative impact of sustained fiscal deficits on debt stocks under assumed macroeconomic and financial conditions.[1] We calculate the overall primary balance sustainability gap as follows:

$$pbgap_t = p_t - \left(\frac{i-\gamma}{1+\gamma}\right) d^* \quad (1)$$

where p represents the primary balance (on the main budget) as a percentage of gross domestic product (GDP), γ represents nominal GDP, d^* is the targeted debt ratio, and i is the long-term interest rate.[2] The results of the primary balance sustainability gap for South Africa from 2000 to 2018, under historical market conditions, are shown in Figure 1. A positive gap indicates a fiscal balance that, if sustained, would over time diminish government debt to below its historical median. A negative gap suggests that the fiscal balance would increase the stock of debt to above d^*. Some countries may be able to support this level of debt for extended periods of time. But other countries may be forced by financial markets to reduce debt to below d^* as it may not be possible to sustain these levels without adverse implications. More precisely, d^* for AEs is higher, at 52.3% of GDP, than that for EMDEs, which is estimated at 45.2% of GDP. This suggests that AEs tend to have a higher level of debt tolerance than EMDEs.

Figure 1 shows that the sustainability gap improves from 2000 to 2001, reaching a high of 3.6%. This is followed by a steep fall in the gap, albeit still positive, between 2001 and 2003. This fall is due to a decrease in the primary balance as a percentage of GDP resulting from declining growth and hence lower revenue growth. Thereafter the sustainability improves from 2003 until 2007, reaching 3.2% in 2007. This trend is similar to the dynamics in most EMDEs, where strong fiscal positions were recorded due to falling debt stocks and narrowing deficits. The reasons for this improvement in South Africa include declining interest rates to historically low levels and the primary balance registering surpluses. High growth as well as fiscal consolidation also played a role in widening the gap. This signals countercyclical fiscal policy, whereby government expenditure growth was contained and large improvements in revenue growth were observed, thus reducing the deficit. Unfortunately, the GFC then triggered a sharp fall in the gap from 2007 to -2.4% in 2009, owing to fiscal stimulus to support the economy. Since then the sustainability gap has recovered slowly, standing at -1% in 2016. The World Bank attributes the sharp erosion of fiscal sustainability in commodity-exporting countries mainly to four factors: the fall in commodity prices after the GFC, a contraction in revenue growth, rising interest rates, and low economic growth since 2007.

The forecast period (2017 and 2018) is based on the primary balance forecast values obtained from the National Treasury.[3] This shows that even though the sustainability gap improves slightly in 2018, it is still below the neutral level, and far below the historical average of 2.6% observed prior to the

[1] The debt-stabilising primary balance is a primary balance that allows debt to converge to a target or median debt-to-GDP ratio.

[2] We use the historical median of the debt-to-GDP ratio, i.e. 38.2% over the period 1998-2016, as the targeted debt ratio. The long-term average nominal GDP growth rate is 10.09% over the same period. The long-term interest rate is proxied by the average of the 10-year government bond yield from 1998 to 2016, which amounts to 10.1%.

[3] National Treasury revised its projections in the 2017 *Medium Term Budget Policy Statement* presented on 25 October 2017. It now projects a deterioration to the primary balance (compared to previous estimates tabled in the main budget in February) with a deficit of -1.2% in 2017/18 and a slight improvement to -0.8% in 2018/19. Previous estimates showed a deficit of -0.1% in 2017/18 and a surplus of 0.2% in 2018/19.

GFC (2000 to 2007). Primary balances and debt balances would need to improve significantly, which would be quite challenging in an already constrained fiscal environment.

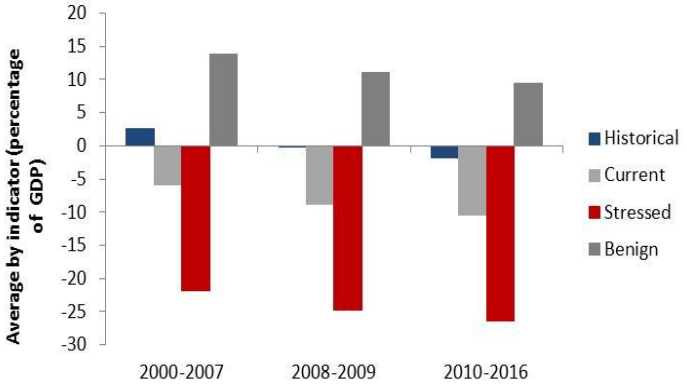
Figure 1: Primary balance sustainability gap

Figure 2 depicts primary balance sustainability gaps under historical, current, stressed, and benign conditions.[4] The historical condition is the one estimated above in Figure 1. The current condition is based on an interest rate and growth rate at their current levels. In our case, we have 9.18% for interest rates and 7.30% for the growth rate. The stressed condition is the pessimistic scenario in which long-term interest rates are high, at around 11.78%, and nominal growth is extremely low, in this case at 6.79%. The benign situation represents the optimistic scenario, with minimum interest rates and the maximum economic growth rate for the period under investigation. For this ideal situation, we set the interest rate at 8.27% and nominal growth at 12.32%. In addition, we divide our sample into three periods, namely 2000-2007 (which represents the pre-crisis period), 2008-2009 (which coincides with the GFC), and 2010-2016 (representing the post-crisis period).

From Figure 2, we have a positive primary balance sustainability gap in benign conditions in all three subsamples. The sustainability gap is larger and more positive in the pre-crisis period but relatively small in the post-crisis period. Conversely, the stressed case depicts large and negative gaps in all three periods. Even though these measures are comparable, the post-crisis period registers a relatively larger gap. They suggest that if the current situation worsens, the fiscal space will deteriorate even further. The current conditions follow the same pattern, albeit with smaller magnitudes.

[4] Refer to Kose et al. (2017) for an explanation of each measure.

Figure 2: Primary balance sustainability gap under different conditions



3. The stance of fiscal policy

This section looks at two other measures of the stance of fiscal policy, namely the overall budget balance and government consumption. It sheds light on the conduct of fiscal policy since 2000.

Figure 3 depicts the overall budget balance and the output gap. If both the budget balance and the output gap move in the same direction, i.e. if they are both improving or both worsening, the policy is countercyclical. Conversely, the policy is deemed procyclical when they move in opposite directions such as that reflected in 2000-2002 (whereby the budget balance and output gap move in opposite directions). We observe from Figure 3 that over several periods the budget balance and output gap move in the same direction. This countercyclical behaviour occurs in the following periods:

(1) 2003-2007: the budget deficit narrowed from -2.4% to a surplus of 0.75% and the output gap improved from -1.7% to 4%;

(2) 2007-2009: the budget surplus eroded sharply from 0.75% to a deficit of -4.6% together with the output gap falling form 4% to -1.1%;

(3) 2009-2011: the budget deficit declined from -4.6% to -4% while the output gap also improved from -1.1% to -0.7%.

However, in more recent years (i.e. 2012 to 2016), the country has reverted to a procyclical fiscal policy. This is reflected in the budget deficit narrowing from -5.2% in 2012 to -4.2% in 2016, while the output gap continues to fall from -0.9% to -1.3% over the same period. The National Treasury's forecast of an improving deficit despite the weak environment also indicates a more procyclical stance. This is possibly due to the tight fiscal space SA is currently in. The current procyclical stance/behaviour is also contrary to that observed in EMDEs. The new regime of low growth, high interest rates, and high sovereign debt, has hindered the prospect of following countercyclical fiscal policy to support the real economy.

We compare these results with the correlation between real GDP growth and the growth rate in consumption expenditure by government. A positive correlation is evidence of a procyclical fiscal policy while the opposite is true for a negative correlation. The results in Figure 4 confirm our findings in Figure 3. They suggest that fiscal policy was countercyclical both before and during the GFC, as

illustrated by the negative correlation between the two variables. This coincides with the period when South Africa had a positive sustainability gap and thus fiscal space, as depicted in Figure 1. It shows that fiscal space matters for the effectiveness of fiscal policy. Thereafter, fiscal policy turned procyclical in 2010 and has remained there ever since. This was as a result of excessive fiscal stimulus, which depleted the fiscal space previously accumulated.

Figure 3: Cyclically adjusted balance vs output gap[5]

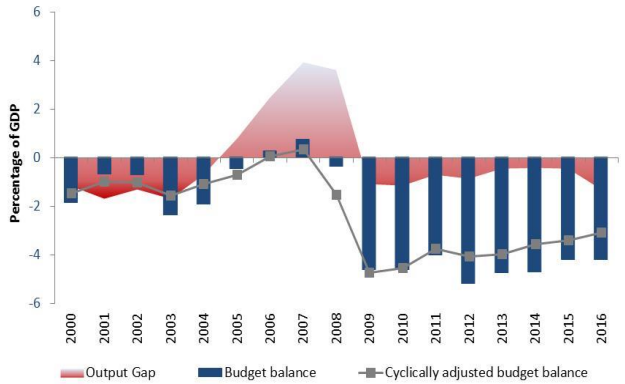
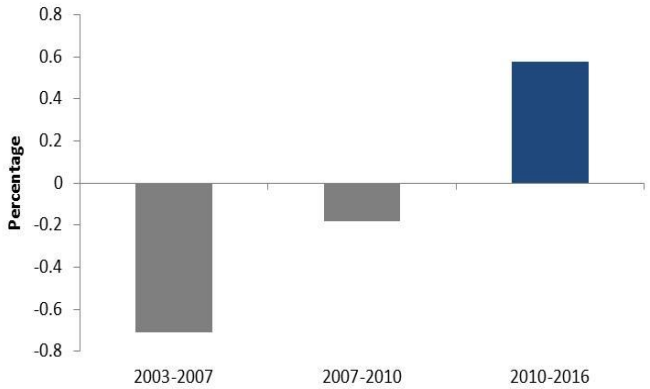


Figure 4: Correlation between government consumption and GDP



4. Conclusion

This note uses the method recently proposed by Kose et al. (2017) to estimate the primary balance sustainability gap for South Africa. Before the global financial crisis (GFC), many economies had built up fiscal space by reducing debt and closing fiscal deficits. This allowed fiscal policy to act as a countercyclical tool and boost growth when the recession hit. The results of our investigations show that, following stress episodes such as the GFC of 2008, debt dynamics deteriorated, causing fiscal balances and sustainability gaps to weaken. The recovery since then has been slow. Although the primary balance sustainability gap for South Africa shows a slight improvement in 2018 (subject to primary balance projections), it remains below the neutral level and far from its historical levels. Since the GFC, mounting government debt has brought risk to financial shocks. Fiscal positions therefore need to be strengthened. This will create fiscal space for fiscal policy to ensure the appropriate timing and effectiveness of countercyclical fiscal policy. Fiscal space, even in a low-debt environment, can erode rapidly during periods of financial stress. This emphasises the importance of creating fiscal space, which appears to have run out at the moment.

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Kose, M. A., Ohnsorge, F. L. and Sugawara, N. 2017b. 'Debt dynamics in emerging market and developing economies: a time to act? *Global Economic Prospects, Special Focus 1*. World Bank Group.

[5] The cyclically-adjusted budget balance is obtained from the World Bank Fiscal Monitor. The output gap is provided by the macroeconomic modelling unit.

Onwards and downwards
The changing role of administered prices in headline inflation
October 2017

Erik Visser, David Fowkes and Theo Janse van Rensburg

Abstract

Administered prices are often blamed for pushing up South African inflation. Yet administered price inflation has slowed in recent years, and has been close to or below headline inflation since about the middle of 2014. This decline in administered price inflation is not simply an artefact of collapsing world oil prices. We construct a measure of administered prices that excludes the basic fuel price (termed AdminXO) and show this is now inflating in line with headline. We also show that administered price disinflation is quite broad-based, with contributions from a range of categories, and demonstrate that this disinflation has been driven both by slower inflation in some categories as well as lower weights for goods that have become markedly more expensive, such as water and electricity.

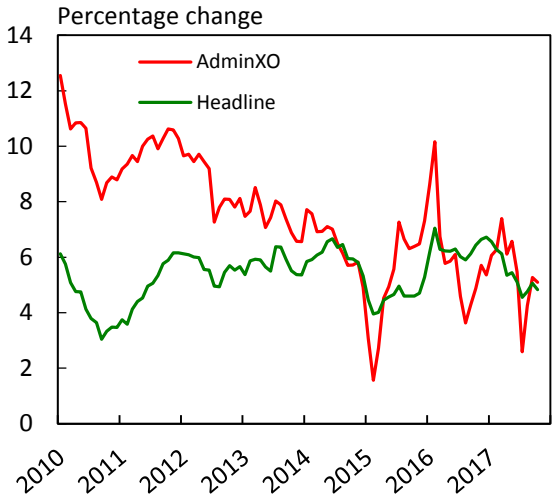
Introduction[1]

Administered prices are often blamed for pushing up South African inflation.[2] This is a reasonable view: since 2010 administered prices have risen by 7.5% annually, on average, compared to 5.4% for headline inflation. Yet administered prices are not currently the problem they once were. In fact, administered price inflation has been close to or below headline inflation since around mid-2014. This slowdown in administered prices is not simply an artefact of collapsing world oil prices. We construct a measure of administered prices that excludes the basic fuel price (termed AdminXO) and show this is now running in line with headline. We also show that administered price disinflation is quite broad-based, with contributions from a range of categories, and demonstrate that this disinflation has been driven both by slower inflation in some categories as well as lower weights for goods that have become markedly more expensive. Finally, we demonstrate that causation runs from administered prices to headline. This means that lower administered price inflation has helped lower headline; furthermore, future administered price determinations will shape broader inflation developments.

1 The authors are grateful for valuable comments from Theresa Alton and Osie van der Merwe.

2 For instance, see "Marcus: Admin prices main inflation threat" *Business Report*, https://www.iol.co.za/business-report/economy/marcus-admin-prices-main-inflation-threat-1103605, 21 July 2011.

Figure 1: Headline inflation and AdminXO



Why is the basic fuel price an administered price?

The retail fuel price consists of two parts, the basic fuel price (BFP) plus various margins and taxes. Although government administers this second portion, it does not choose the international oil price or the exchange rate of the rand. This means the BFP is not a true administered price. Treating it as administered creates distortions, both because the BFP is highly volatile and because fuel has a significant weight in administered prices (it is close to one third of that basket), so its fluctuations shape the entire administered price trend. For these reasons, the BFP component in the fuel price should be excluded from administered prices.[3]

Removing the BFP from administered prices lowers administered price inflation for much of the 2011–2014 period, but raises it for late 2014 as well as 2015, when world oil prices collapsed. More recently, the two series have behaved similarly. For instance, 2016-date inflation for AdminXO is 5.8%, versus 5.5% for broad administered prices. We also note that AdminXO is less volatile than the regular administered price series, with a standard deviation of 2.2 percentage points (pp) for the former versus 3.7pp for the latter. This coheres with the intuition that administered prices should be relatively stable, affecting broader inflation in part by setting the tone for other price adjustments.

[3] Diesel was added to the CPI in January 2017. Our calculations reflect petrol alone up to this point, and petrol and diesel thereafter. The precise weight of fuel in administered prices is 31% with the 2012 weights and 28% with the 2016 weights.

Figure 2: Basic fuel price of petrol

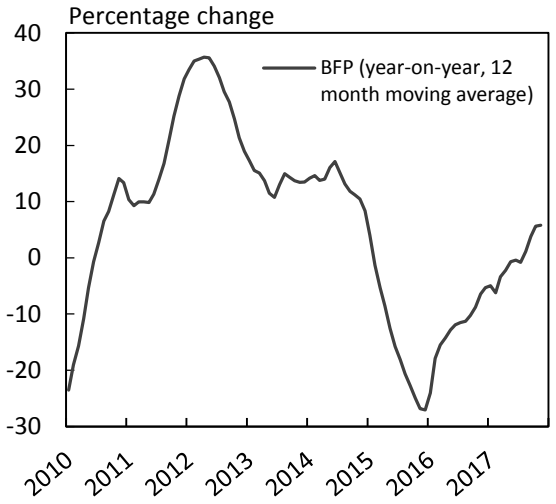
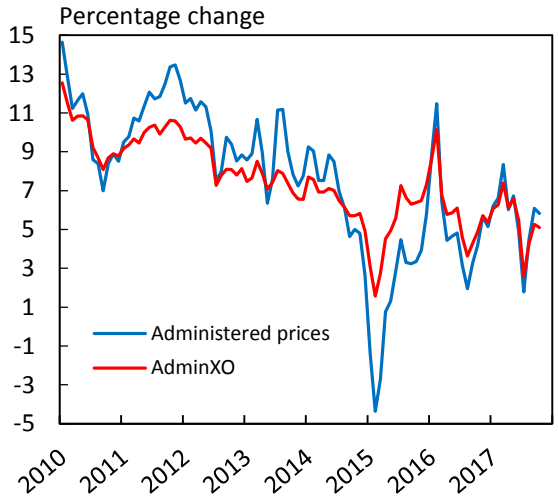


Figure 3: Administered prices including and excluding BFP



The administered price wedge has disappeared

In 2010, AdminXO inflation was running at roughly double the rate of headline inflation. The gap closed steadily over the following four years, until by about mid-2014 it had vanished entirely, and it has remained close to zero ever since.[4] The most important driver of this decline was electricity price inflation, which slowed from 26.8% in January 2010 to 7.0% in July 2014. Other categories, however, have also made meaningful contributions to lower AdminXO inflation. The table below divides the post-crisis era into two portions: the wedge period, in which AdminXO was consistently above headline inflation, and the period since, when the two have been roughly equal. It is clear electricity is both the single largest contributor to AdminXO and also the most important swing variable, with its contribution falling from 4.7pp to 1.8pp, on average, between the two phases. Other important contributors to the decline in AdminXO were fuel margins and taxes (down 2.0pp), education (primary school down 0.6pp; university fees down 0.7pp), water (down 0.9pp) and motor licenses and registrations (down 0.5pp). Together, these categories reduced AdminXO by 4.5pp, substantially more than the 2.9pp change brought about by electricity prices. The decline in AdminXO is therefore relatively broad-based. We also note that the declining gap between headline and AdminXO was not simply a consequence of headline rising. AdminXO has averaged 5.6% since August 2014, versus 8.8% in the 'wedge' period. By contrast, headline has averaged 5.5% since around mid-2014, versus 5.3% for the preceding four-and-a-half years.

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4 The only material exception occurred in 2015, when government took advantage of the sharp fall in international crude oil prices to increase the Road Accident Fund (RAF) levy from 104c/litre (as of March 2015) to 154c/litre.

5 The contributions (in percentage points) to the year-on-year changes in AdminXO inflation are calculated as follows:

Table 1: Contributions[5] to AdminXO (in percentage points)

	Averages between:	
	Jan 2010 – Jul 2014	**Aug 2014 – Oct 2017**
Electricity	4.7	1.8
Fuel margins and taxes	3.5	1.5
Communication	-1.7	0.2
Housing: assessment rates	-0.8	0.7
Water supply	1.1	0.2
University fees	0.9	0.2
Primary school fees	0.8	0.2
Motor licenses and registration	0.3	-0.2
University boarding fees	-0.2	0.0
Driving licenses	0.0	0.2
Toll fees	0.0	0.2
Secondary school fees	0.4	0.5
Television licenses	-0.1	0.0
Paraffin	-0.1	0.0
Public transport – trains	0.1	0.1
	8.8	**5.6**

Note: Stats SA re-weighted the CPI in 2012 and 2016, which affects the calculations for contributions to AdminXO. For instance, a decline in the weight of an item will lower its contribution to AdminXO – possibly resulting in a negative contribution – even if its inflation rate is positive and/or does not change between the two periods.

Sources: Stats SA and own calculations

A surprise in Table 1 is that contributions to AdminXO have fallen even where inflation rates for specific components have not decelerated. For instance, the contribution of water to AdminXO inflation has declined by almost one percentage point, yet water inflation has barely slowed (from 11.0% in the wedge period to 10.5% afterwards). A closer look at the data shows the weights are also doing some of the work, with consumers responding to higher prices by reducing consumption – which is hardly an economic surprise. This has caused the weight of higher inflation items in the AdminXO basket to decline, contributing to slower AdminXO inflation (see Table 2).

$$C_t^{Elect} = \frac{(CPI_t^{Elect} * w_t^{Elect}) - (CPI_{t-1}^{Elect} * w_{t-1}^{Elect})}{\left(CPI_t^{AdminXO} - CPI_{t-1}^{AdminXO}\right)} * \frac{\left(CPI_t^{AdminXO} - CPI_{t-1}^{AdminXO}\right)}{CPI_{t-1}^{AdminXO}} * 100$$

Where: C is contribution and w is weight.

The formula above follows the methodologies of A Bauer, N Haltom and W Peterman, 'Examining contributions to core consumer inflation measures', Federal Reserve Bank of Atlanta Working Paper Series No. 2004-7, April 2004, p. 4 and Statistics South Africa (confirmed in direct correspondence).

Table 2: Inflation rates and weights for AdminXO subcategories

Weights	Electricity	Margins and taxes (petrol)	Communication	Assesment rates	Water supply	Universities	Secondary school fees	Primary school fees	Public transport (trains)	Motor licences and registration	University boarding fees	Paraffin	TV licences	**AdminXO**
2008	1.68	1.79	2.75	2.22	1.10	0.90	0.64	0.64	0.04	0.19	0.28	0.16	0.13	**12.52**
2012	4.13	2.76	2.30	1.30	1.55	1.23	0.74	0.98	0.08	0.32	0.06	0.05	0.06	**15.56**
2016	3.75	2.54	2.31	1.30	1.08	0.99	0.78	0.76	0.13	0.13	0.06	0.04	0.04	**14.13**
*%**	*26.5*	*18.0*	*16.3*	*9.2*	*7.6*	*7.0*	*5.5*	*5.4*	*0.9*	*0.9*	*0.4*	*0.3*	*0.3*	***100.0***
Percentage changes over 12 months														
2010	23.2	12.0	0.6	8.7	10.6	8.0	9.6	11.4	25.5	8.2	9.5	-1.2	6.5	**10.0**
2011	18.5	10.0	0.0	7.9	11.5	8.4	8.2	9.7	8.5	15.5	8.9	15.6	0.0	**10.0**
2012	13.6	12.6	-0.2	7.5	11.8	9.5	8.5	8.5	17.3	9.9	9.5	15.0	0.0	**8.7**
2013	8.7	10.2	2.6	6.8	10.8	8.9	8.9	9.1	10.4	7.3	9.6	18.0	2.0	**7.4**
2014	7.2	6.2	-0.1	6.8	9.5	9.3	7.9	8.7	9.2	6.7	9.7	7.1	4.0	**6.5**
2015	9.3	12.1	-0.6	7.5	10.5	9.8	8.5	9.1	7.8	4.4	11.0	-7.6	0.0	**5.2**
2016	9.4	9.0	0.2	6.5	10.9	1.6	7.9	8.4	4.5	6.6	1.9	4.5	0.0	**6.0**
2017	5.3	8.9	-0.5	5.7	10.7	5.0	7.5	7.9	2.7	4.5	6.8	7.8	0.0	**5.5**

* These shares in AdminXO are based on 2016 weights. We used the 2008 and 2012 weights for our calculations, but only present 2016 shares for the sake of simplicity.

Notes: Driving licences (weight: 0.13) and toll fees (weight: 0.09) were added in January 2017 to administered prices, but are excluded from the table as year-on-year percentage changes could not be calculated with the limited data available.

Red shaded cells indicate inflation rates above AdminXO for that year.

Sources: Stats SA, SARB and own calculations

Administered prices shape overall inflation outcomes

Administered prices are important because of their weight in the inflation basket, but also because their prominence and official status means they may act as signals to price and wage setters. To assess this claim, we econometrically test whether AdminXO shapes the rest of headline (henceforth HeadlineXAO). Results (Table 3) from Granger causality tests indicate that at a 10% confidence level, we can reject the Null hypothesis that AdminXO does not Granger cause HeadlineXAO inflation. This indicates causality runs from AdminXO to HeadlineXAO. The implication, intuitively enough, is that administered price setters have an important role to play in moderating inflation and helping anchor inflation expectations closer to the midpoint of the target.

Table 3: Granger causality test

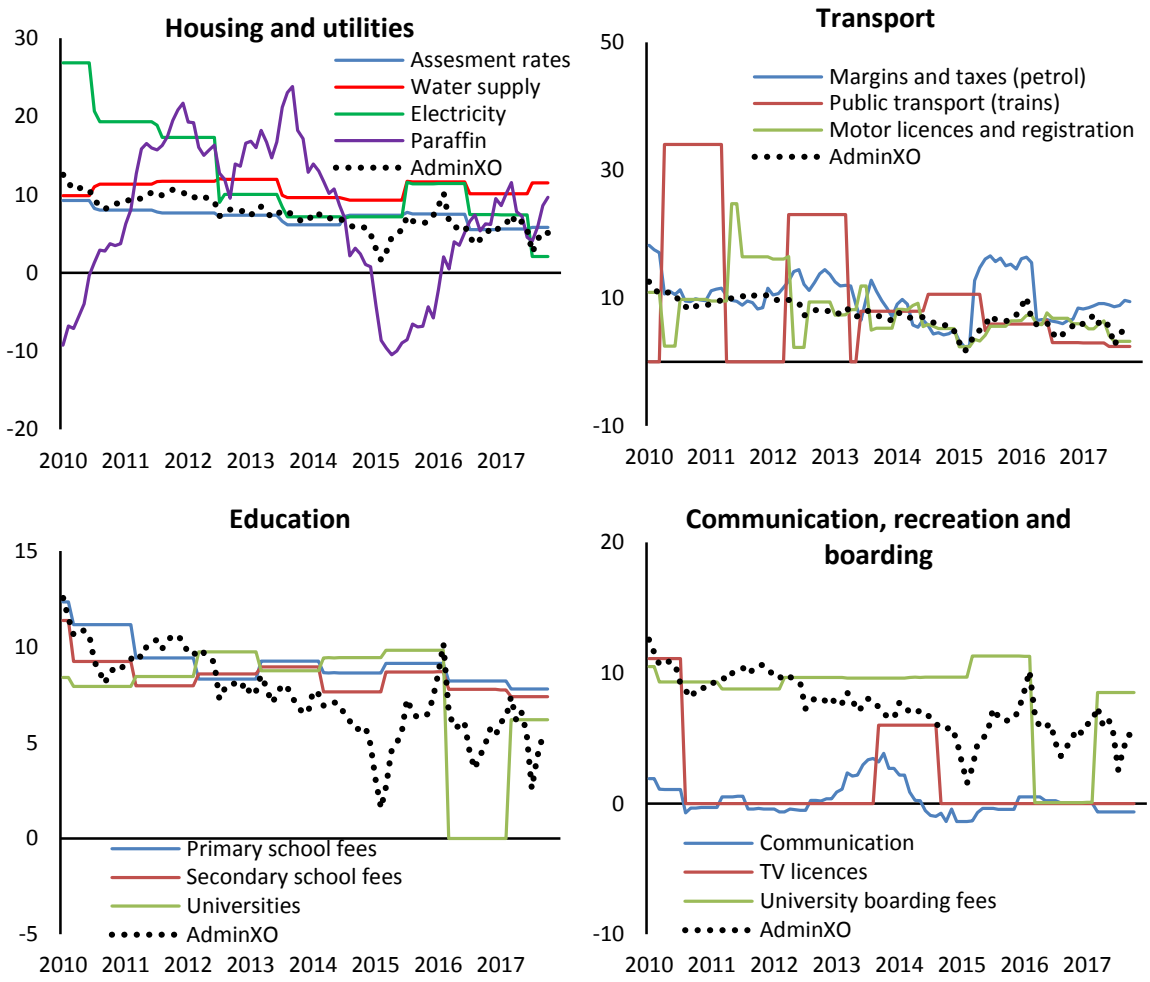
Pairwise Granger Causality Tests
Date: 08/01/18 Time: 13:22
Sample: 2010M01 2017M12
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
@PCY(IHEADLINEXAO) does not Granger Cause @PCY(IADMINXO)	94	1.57627	0.2009
@PCY(IADMINXO) does not Granger Cause @PCY(IHEADLINEXAO)		2.21152	0.0925

Conclusion

Although administered price inflation has exceeded headline inflation in the post-2010 period, the wedge has disappeared in recent years. In fact, administered price inflation has been, on average, below headline for the past two years. Instead of obstructing disinflation, administered prices have therefore become a benign influence, and sometimes even a benevolent one. NERSA's recent ruling denying Eskom a double-digit electricity price increase is just one more data point in a persistently favourable trend.

Annexure A



Is our core rotten? – November 2017

Franz Ruch

Abstract

Our current preferred measure of core inflation – headline CPI excluding food and energy – remains an ad hoc measure born out of supply shocks in the 1970s. This note presents an alternative measure based on the New Keynesian conception of core as the 'sticky' part of inflation – a theoretically more appropriate measure. Luckily, a theoretically-appropriate sticky-price inflation measure looks remarkably similar to CPI excluding food and energy, despite being constructed completely differently.

1 Introduction

In the late 1970's central banks focused their attention on a measure of inflation excluding food and energy prices – dubbed core inflation – after facing a significant oil price shock and drought.1 Exclusion-based measures of inflation such as *excluding food and energy* have been pervasive in monetary policy discussions ever since. From an optimal policy perspective, the rationale behind such core inflation measures make sense. A central bank can do nothing about relative price shocks from flexible prices such as food and energy, which respond quickly to developments in supply and demand. Responding to anything other than the second-round effects can also be costly. But the rationale for only excluding food and energy prices, or treating all food products equal, has no basis in fact or theory. These prices are generally the most common sources of relative price shocks, but are not the only flexible prices in an economy, and not always the most flexible.

A better measure of core inflation needs to be grounded in the definition of core inflation, modern theory of monetary policy and welfare economics. This note creates such a measure called "sticky-price inflation".[2] Of course, creating and using such a measure as a target for monetary policy requires micro-price-level data, lots of analysis, and hours of talking to the public. A policymaker may not care too much for this route and rather want to know if such a measure looks anything like CPI excluding food and energy. Surprisingly sticky-price inflation and the exclusion-based measure – *excluding food and energy* – look remarkably similar with completely different information sets. Headline CPI excluding food and energy is an appropriate proxy for a more theoretically-founded core measure despite its ad hoc foundations. This conclusion says nothing about an "optimal" core inflation measure, however. [3] The rest of the note covers the basics of the sticky-price inflation measure and its comparison to headline inflation excluding food and energy.

2 Why do we care about sticky-prices?

Some prices are stickier than others. In South Africa (SA), consumer prices on average change every five months; with the most frequent prices changing every month and the least frequent changing every 7 years. Firms that change prices less often generally need to take account of the likely path of future inflation when setting these prices if they want to maximise profits. For example, when an insurance company sets medical aid prices on an annual basis it needs to decide what it expects inflation to be over that period to ensure that its price is optimal. In contrast, when petrol prices change on a monthly basis, these changes are driven by contemporaneous developments in the exchange rate or the international price of oil. Therefore, prices that are sticky contain more forward-looking information and can be exploited to uncover inflation expectations and underlying, or core, inflation.

Targeting prices that are more sticky is also optimal from a welfare perspective. Walsh (2009) shows that inflation leads to the highest welfare loss in sectors where prices are more sticky (or more persistent) with few

[1] Restrictions to oil supply introduced by the Organization for Petroleum Exporting Countries (OPEC) substantially increased the price of oil in the late 1970s.

[2] The Atlanta Fed also create and track such a measure: https://www.frbatlanta.org/research/inflationproject/stickyprice.aspx.

[3] see Ruch et al. (2016) and Clark (2001) for a discussion on optimality. Clark (2001) argues that policymakers and analysts have reached consensus on the defining properties of a good measure of core inflation. These include that is must track the components of inflation that persist for several years, help predict future headline inflation over the medium term, be less volatile, and be simple. One important omission from this list is that it must be grounded in the theory used by central banks.

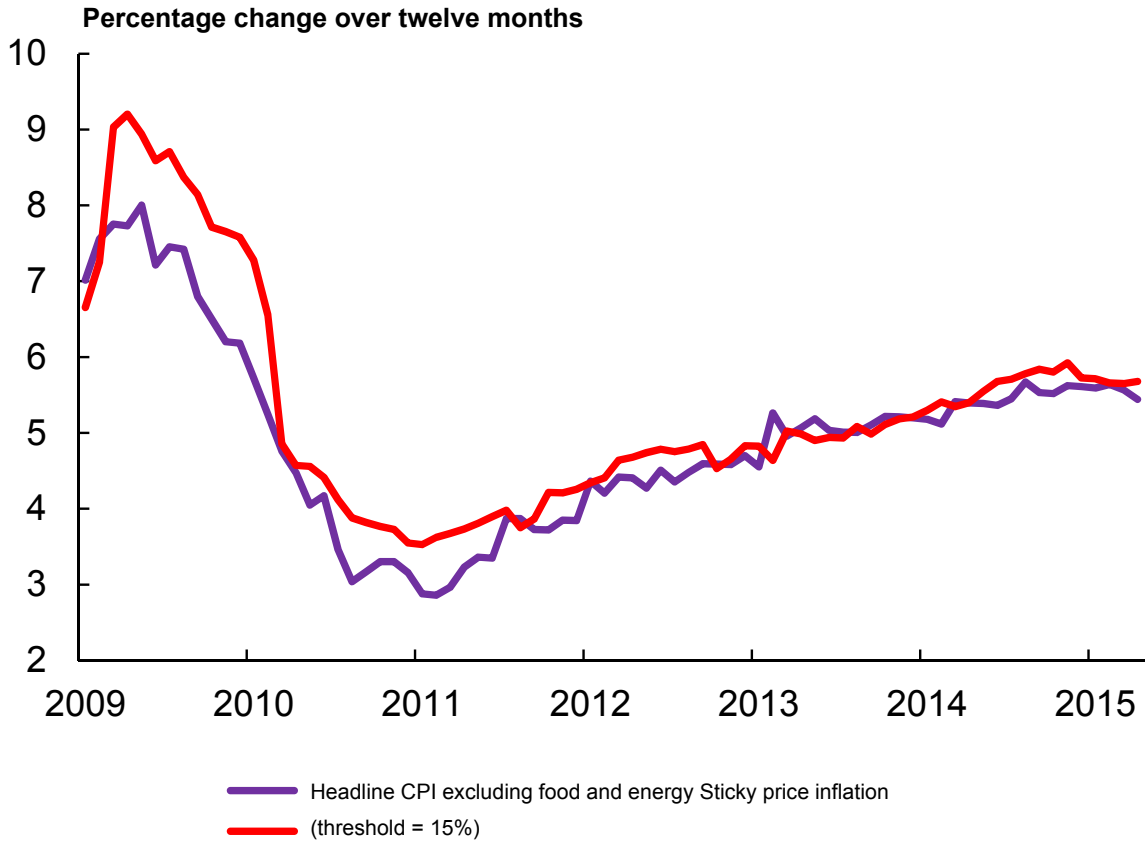
welfare costs when relative price shocks dissipate quickly. New Keynesian models such as Clarida et al. (2002), Aoki (2001), and Bodenstein et al. (2008) show that targeting core (or domestic) inflation rather than headline CPI leads to households maximising their welfare.

3 How does sticky-price inflation compare with core inflation?

In order to create a sticky-price inflation measure we have to decide which 'sticky' prices to include. If we choose prices that change 10% of the time, then only prices that change once every 10 months are included. If, however, we choose 50%, then we include prices that change once every two months. Choosing a point to censor the data remains generally ad hoc and can be based on the median, minimising the signal-to-noise ratio, or theory. Since sticky-price inflation is about trying to create a core inflation measure more grounded in economic theory, theory is what we look to. Reiff and Várhegyi (2013, pg. 7) show that using a threshold of 15% ensures that "the extent of forward-lookingness is always more than 60 percent".

Figure 1 plots core inflation against the theory-based sticky-price inflation measure from 2009 to April 2015.[4] Sticky-price inflation includes all prices that change less than 15% of the time, or once every $6\frac{1}{4}$ months.[5] The actual sticky-price inflation measure has a mean frequency of price change of 9.1%, with prices changing once every 11 months. The two measures are remarkably similar, with a correlation of 0.95 and an average absolute difference of 0.42 percentage points. Most of this difference occurs in 2009.

Figure 1. Sticky-price inflation measure most like CPI less food and energy



Sticky-price inflation at a threshold of 15% covers 16.4 percentage points of the inflation basket and includes the following categories: Education, Restaurant and Hotels, Clothing, Footwear, Miscellaneous goods and services, Alcoholic beverages, and Recreational and cultural services. The weight of these categories is significantly less

[4] Micro-price data is only available for this period.

[5] Micro-price data from Statistics South Africa is used to determine the frequency of price change at the individual product level and then aggregated up to create the sticky-price measure. The frequency of price change is determined over the entire sample.

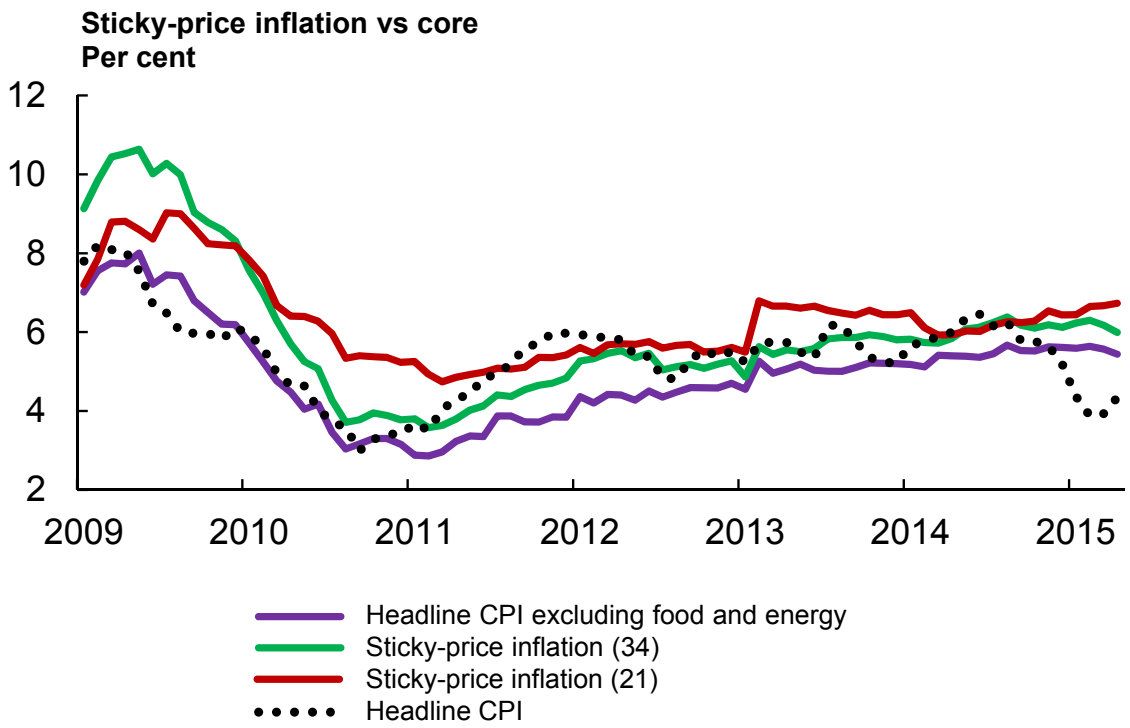
than the 75 percentage points core inflation includes, yet the inflation signals are almost identical. Sticky-price inflation includes 180 products – less than half the products included in CPI less food and energy. The products in order of largest individual weight that enter this measure are University fees, Imported beer, Lotto tickets, Primary school fees, Secondary school fees, Funeral policies, Telephone fees, Take-away foods, creche fees, General medical practitioners, Shoes, and Toll fees. These products make up almost 65% of the sticky-price inflation measure.

4 Other possible sticky-price options

There are two other approaches that could be used to determine an appropriate place to censor prices. First, a simple method is to find the median frequency of price change by product and use this. The median frequency price change is 21%. Second, a more scientific approach to determining an appropriate threshold would be to minimise a signal-to-noise ratio relative to headline inflation.[6] In order to calculate this we look at all sticky-price measures with frequencies of price changes between 4% – prices changing once every 25 months –and 60% – prices changing every 1.6 months, and calculate the signal-to-noise ratio. The signal-to-noise ratio is minimised at a frequency of 34%.

Figure 2 plots the two alternative sticky-price inflation measures. Both measures are above core inflation from Jan 2009 to April 2015. The median measure (labelled 'Sticky-price inflation (21)') is on average 1.4 percentage points above core inflation but tracks its movements well with a correlation of 0.9.[7] It contains 34.2 percentage points of the CPI basket weight and adds products from Miscellaneous goods and services (8 percentage points), Water supply and other housing services (2 percentage points), Alcoholic beverages (2 percentage points), and Telephonic equipment (2 percentage points). Products with the largest weight now included are health insurance, cellphone fees, and cigarettes.

Figure 2. Other sticky-price inflation measures



[6] Examples using the signal-to-noise ratio (SNR) in the literature on core inflation include Mankikar and Paisley (2004), Walsh (2011) and Bullard (2011).

[7] The structural break in the sticky-price series is caused by health insurance.

The measure that minimises the signal-to-noise (labelled 'Sticky-price inflation (34)') is also generally above core inflation. It includes 58 percentage points of the CPI basket and 395 products. The biggest additional product categories included in this measure are Food (5.9 percentage points), and Miscellaneous goods and services. Not all food is created equal. Some food products including biltong, dried fruits, boerewors, baking powder, prepared salads, milk formula (baby food), peanuts, and vinegar, are not as flexible as traditionally thought and excluded from our current core inflation measure. Biltong, for example, is less flexible than 329 other goods and services (of a total 491) with its price changing on average every 7.3 months.

5 Conclusion

It is important to be skeptical about which core inflation measure is used for policy deliberation. This measure should represent that part of inflation that a central bank can actually control; that part of inflation that leads to the biggest welfare loss requiring a monetary policy response; and that part of inflation that best predicts future headline inflation. Choosing headline CPI excluding food and energy as the best and most appropriate core measure should not occur without a fight. For a policymaker who wants to know how good CPI less food and energy is, luckily the answer is pretty good compared with a more theoretically appropriate measure. This doesn't tell us anything about its optimality though.

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Appendices

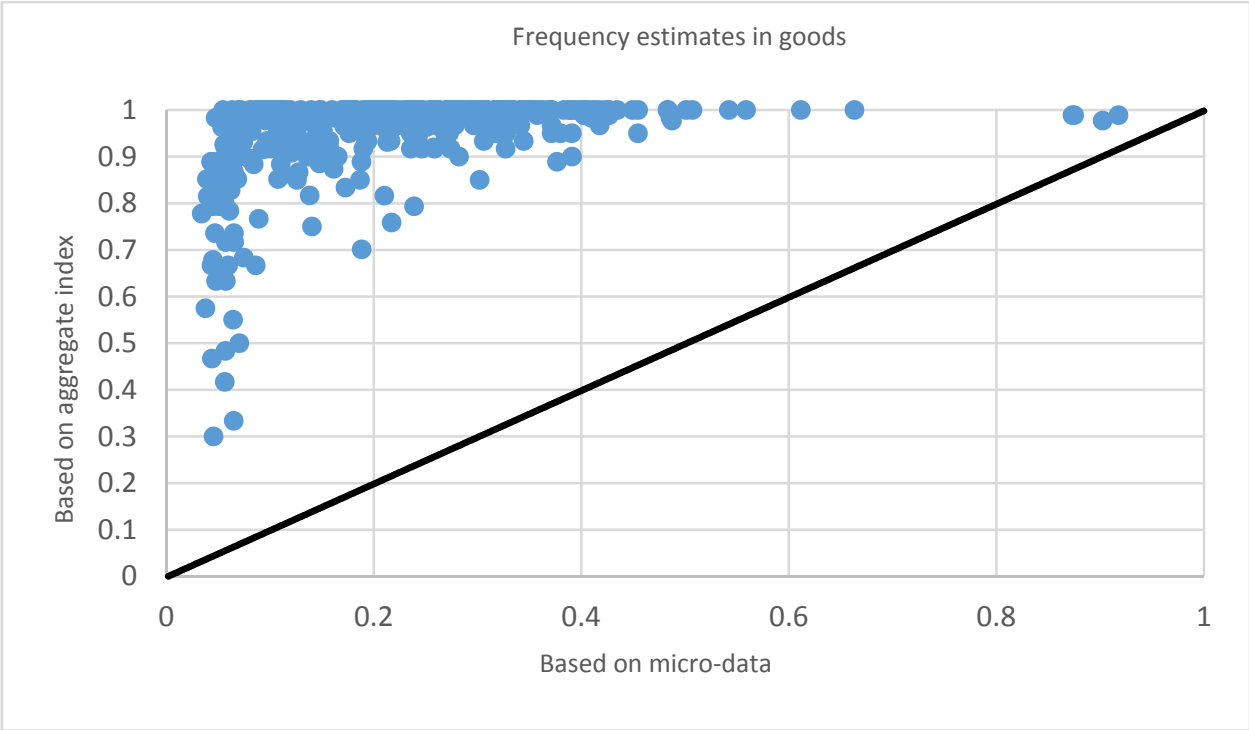
A The micro-price data

Determining whether a product's price is considered sticky or flexible requires the direct observations of prices and not just the aggregate indices. This is because aggregate data suffers from a bias which masks the true flexibility of products. This information became available in the mid-2000s when Statistics South Africa allowed researchers to analyse the micro-price data underlying the consumer price index. With this information we can

distinguish between the degree of price flexibility of products. We have this micro-price data for goods but not services. To construct these frequencies for services we exploit the fact that the bias in aggregate is likely to be significantly smaller due to the nature of collection. Many of these prices do not change often, and recognising this Stats SA does not collect them on a monthly basis.

The bias created by analysing how often prices change at the aggregate vs. at the micro-price level is plotted in figure 3. If the two were the same then all observations would be on the 45° line. However, on average the aggregate calculation of the frequency of price changes is 72 percentage points higher than the micro-price data outcomes.

Figure 3. Bias in calculating frequency of price change at aggregate index level



Crowding out: diagnosing South Africa's stubborn current account deficit - January 2018

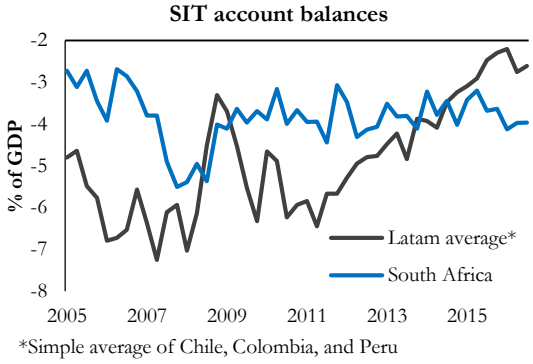
David Fowkes, Thulisile Radebe and Sihle Nomdebevana

Abstract

South Africa runs a persistently negative Services, Income and Transfers account, which has kept the current account in deficit despite a large improvement in the trade balance. The stubbornness of this deficit is surprising; amongst Latin American peers, SIT accounts have narrowed sharply. This is because these accounts are dominated by dividend payments, which are in turn closely related to commodity investments. South African net dividend flows are more independent of commodity prices and consequently less flexible. South Africa also makes large transfer payments to neighbouring countries, an obligation with no parallel in Latin America. Finally, South Africa has sold large amounts of debt to foreigners, at relatively high nominal interest rates, creating a growing interest payments deficit. This last factor in particular threatens to crowd out investment by absorbing scarce inflows of foreign savings.

Introduction[1]

South Africa's current account balance resembles an iceberg. There is a small positive trade balance above the surface, with a much larger Services, Income and Transfers (SIT) deficit below. This SIT deficit has kept the broader current account balance in deficit despite a large adjustment in the trade balance. The trade balance has received the bulk of research attention, probably because it is the swing variable in the current account, whereas the SIT balance has been stable.[2] However, the very stability of the SIT account is both puzzling and problematic.



In various peer economies, the SIT account has adjusted much more than in South Africa. Part of the explanation is simply that South Africa makes large transfer payments to SACU countries, an outflow that has no parallel amongst our peers. However, a more significant factor is that income payments have behaved very differently. In Latin America, income accounts are dominated by dividend payments, and these payments are closely related to commodity prices. This means dividends move in the opposite direction to trade balances, creating a kind of countercyclical buffer. By contrast, South Africa's net dividend payments tend to be more stable. This is because investments by non-residents in South Africa are more diversified and therefore less volatile; furthermore, South Africa's more positive international investment position generates offsetting dividend receipts. Over and above dividends, South Africa is also unusual because its income account features substantial interest payments. These income payments have expanded

[1] The authors are grateful to Zirk Jansen, Jean-Francois Mercier, Erik Visser, Theresa Alton and Theo Janse van Rensburg for valuable comments.

[2] See D. Fowkes and R. Walter (Jun 2016) 'Current account rebalancing: an exploration of the trade data', *South African Reserve Bank,* Available at: http://sarbhub.departments.resbank.co.za/sites/Research/ResearchPapers/Lists/Economic%20Notes/Attachments/42/EN1619.pdf and T. Janse van Rensburg and E. Visser (Jan. 2017) 'To zero and beyond? Estimating South Africa's structural trade balance', *South African Reserve Bank*, available at: http://zarbhub/Intranet/Research.nsf/40f5f6b806a09fb242256a01003c1e9e/53861a70371a8abc422580b40044f9cb/$FILE/EN1703.pdf

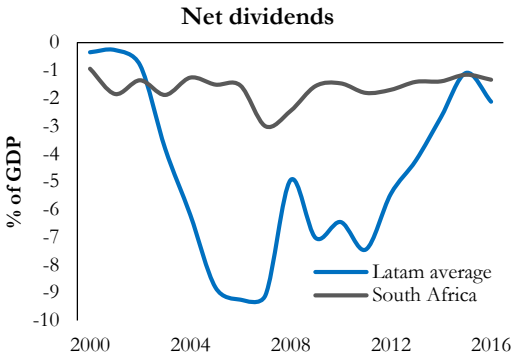
substantially in recent years, due to government having sold large amounts of debt to foreigners, at relatively high nominal interest rates.

These fiscal actions risk a new form of crowding out. Because the current account deficit settles near 3% of GDP even in the trough of the business cycle, renewed growth is likely to push the deficit to unsustainable levels as imports and dividend payments rise. Although fiscal policy is best-placed to address this problem, lower nominal interest rates would also have helpful effects. This implicates relatively high inflation expectations, and therefore monetary policy, in South Africa's current account problem.

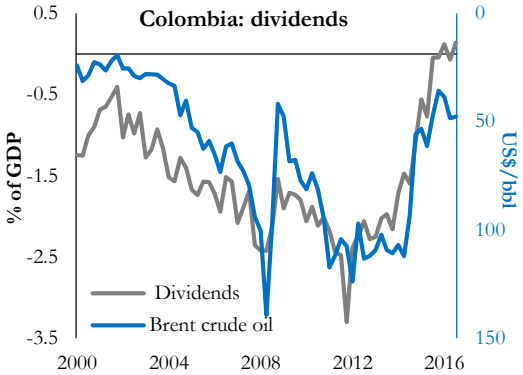
South Africa's current account adjustment in comparative perspective

South Africa has experienced significant current account rebalancing. From an annual deficit of 5.9% of GDP in 2013, the CAD is expected to dip to -2.2% in 2017. The improvement is entirely due to the trade balance, which has fallen from -2.1% to +0.6% of GDP. The SIT deficit remains near 4% of GDP, as it has throughout the post-crisis period.

Latin American countries have also achieved current account rebalancing, over a similar time frame to South Africa, with deficits peaking around 2013 and narrowing by 2016. Unlike South Africa, however, several Latin American countries have seen their SIT accounts adjust by substantial margins. In particular, Chile, Peru and Colombia have seen SIT balances improve by an average of roughly 4 percentage points of GDP.[3] This process has been driven by falling dividend payments, in turn explained by lower commodity prices and weaker domestic growth.



In Colombia, for instance, net income payments have shadowed oil prices. As an example, Ecopetrol – the largest petroleum company in Colombia – halved its dividend payments after oil prices collapsed, and a year later halved it again. The country's overall dividends account in the balance of payments improved from a 3.3% deficit at the end of 2011 to a small surplus in late 2016.

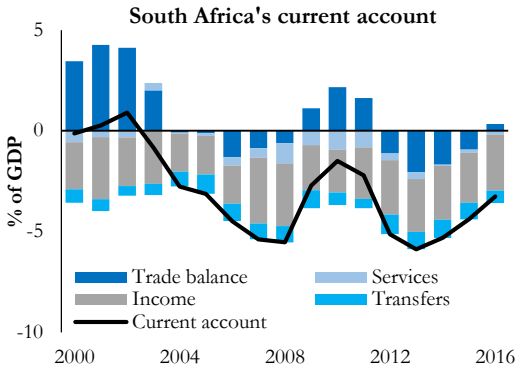


The commodity prices-income account link is also clear in Peru. For example, the share price of Volcan Compania Minera (a large mining company[4]) peaked at the height of the commodities boom. Since then the share price has fallen in line with profits, and dividend growth has been negative in every year since 2012. The profit recession has spread across the economy, with dividends in the retail and financial industry declining substantially. This decline in dividend payments has had marked effects on the balance of payments, subtracting almost 6pp of GDP, peak to trough, over a four year period.

[3] The Brazilian case is somewhat different. The SIT balance has been persistently in deficit at nearly -4% of GDP throughout the post-crisis period. This mainly reflects a large services deficit (almost -2% of GDP) as well as substantial interest payments (over 2% of GDP), in line with Brazil's high interest rates and unusually large debt stock (around 80% of GDP). Dividends payments have shrunk, as they have elsewhere in Latin America, from a trough of -2.5% of GDP to around -1% of GDP). Transfers are negligible but positive. Like South Africa, the trade balance has moved deficits to small surpluses.

[4] Although this is not Peru's largest miner, larger firms such as BHP Billiton have more international exposure and so their dividends payments reflect Peruvian conditions less clearly.

The pattern is much the same in Chile, where falling copper prices have driven the income deficit from almost 8% of GDP at the peak of the commodity super-cycle to 2.6% at the end of 2016.[5]

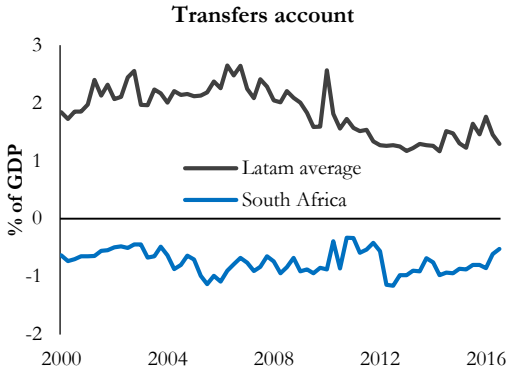


Decomposition of South Africa's SIT account

South Africa runs consistent income and transfers deficits; by contrast, services tend to behave like trade, shifting between deficits and surpluses in line with the upswings and downswings of the business cycle. For this reason, our analysis of the SIT account focusses on transfers and income payments.

Transfers

Transfers are dominated by payments to SACU countries, which are worth roughly 1% of GDP annually.[6] These kinds of payments are non-existent in Latin America, where transfer surpluses are more common. (For instance, Chile's surplus is slightly over 1% of GDP, and Peru's is over 2%.) For this reason, South Africa's large transfer deficit is clearly part of the reason its SIT account looks different to those of its Latin American peers. A more difficult problem than identifying this transfer payments exceptionalism is determining what portion of these payments are genuinely transfers.



Where South Africa collects custom duties on goods destined for other SACU members, these should be repaid (in this sense, South Africa is merely a clearing house for other countries' tariffs). Furthermore, the existence of a common SACU tariff wall diverts demand to fellow SACU members and away from other countries.[7] For instance, BLNS countries would be better off buying cars at world prices, instead of having to pay the tariffs that shelter South Africa's motor industry. Transfers compensate the BLNS countries for these losses, and are in this sense the price of trade benefits for South Africa. As such, they should be 'netted out' of the current account.

Yet these corrections explain too little of the overall transfer payments, and therefore do not solve the transfer problem. As recent research has demonstrated, full compensation for the effects described above would cover only about a third of current transfers.[8] The remaining two-thirds are essentially development payments. This interpretation is consistent with the extreme dependence of the BLNS states on transfers for fiscal revenues, as well as the highly unequal division of the revenue pool in per capita terms (see table). As such, 'true' transfer payments are probably around 0.7% of GDP.[9] Regardless of the appropriateness of these transfers – which is a subject beyond the scope of this note – such large transfer deficits are not part

[5] Though the income component accounts for most of the scale and movements in the SIT account, two other important considerations are movements within the services and transfers account. These two components are less cyclical, with relatively weak correlations to other balance of payments items.
[6] Average: 2000q1-2016q3.
[7] Following the classic argument by Jacob Viner, *The Customs Union Issue*, 1950
[8] Yash Ramkolowan, "What is fair SACU customs compensation to the BLNS?" 15 May 2017, available at: http://www.dnaeconomics.com/pages/trade_policy/?zDispID=NewsArtWhat_is_fair_SACU_customs_compensation_to_the_BLNS
[9] Based on 2014/15 financial year figures.

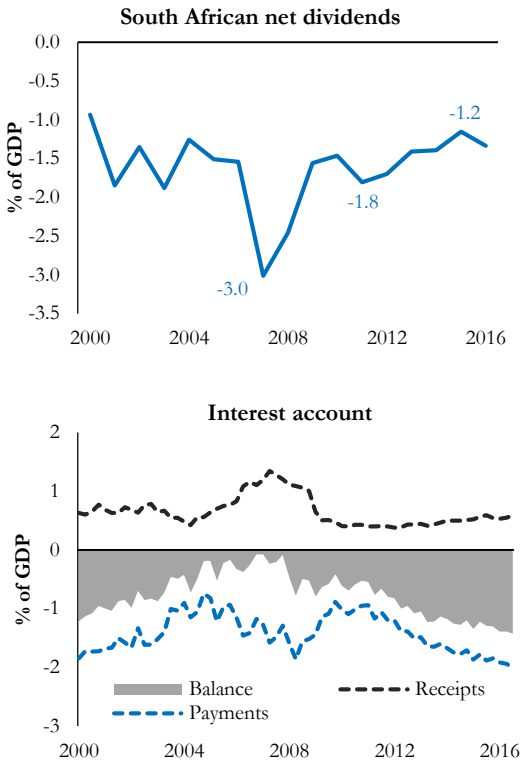
of the Latin American experience and are therefore a significant part of the explanation for differences in SIT balances.[10]

Share in Common Revenue Pool (2015/16)					
	Share in CRP (R million)	% of Total	% of GDP	% of Gov Revenue	CRP per capita
Botswana	18,663	22.2	11.5	29.5	8,664.3
Lesotho	5,802	6.9	25.3	41.8	2,995.4
Namibia	15,771	18.7	10.0	29.0	6,857.0
South Africa	37,771	44.9	0.9	3.5	675.6
Swaziland	6,188	7.3	16.1	47.0	5,466.4

South Africa's income account problem

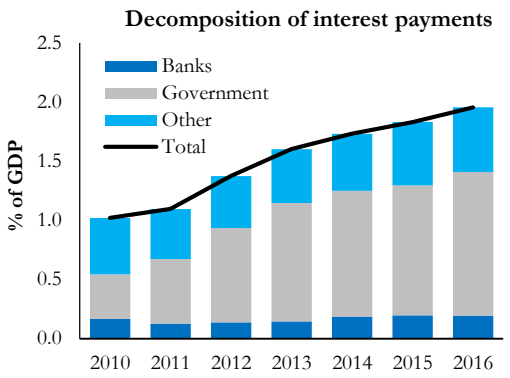
South Africa's income account has been fairly stable throughout the post-crisis period, at about -3% of GDP. Its sub-components, however, have been more volatile, with smaller dividend deficits and larger net interest payments.

Dividend payments have contracted by about 0.6pp since 2011, a small adjustment relative to the Latin American experience. The change has not been larger because foreign investment in South Africa stretches well beyond local commodity operations, to encompass a range of other domestic enterprises as well as South African firms with operations abroad. For this reason, the correlation between terms of trade and dividend payments is much stronger for Latin American countries than South Africa. (The Latin American average is 0.9; South Africa's correlation is 0.3.) Furthermore, part of the South African dividends improvement is due to stronger dividends receipts. This is consistent with a positive net international investment position, whereas the Latin American countries all have substantially negative net positions. Had South Africa's income account followed only dividend payments, the SIT account deficit would therefore have narrowed, just not to the extent seen in the Latin American cases.

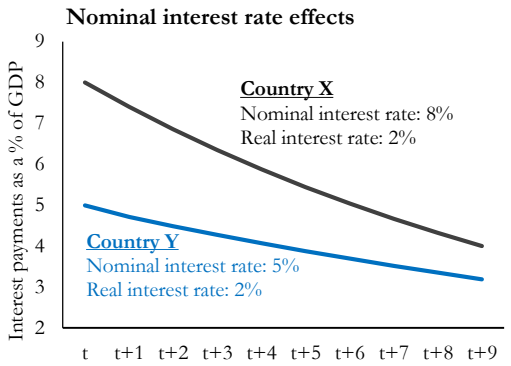


[10] The reader may be wondering if transfer payments are pro-cyclical, seeing as they increase with higher imports and fall with lower ones. However, these payments are designed to be relatively stable: the revenue formula draws on the next-year forecast for assigning shares, but the final amounts are adjusted by two-year-ago outcomes.

A more fundamental explanation for South Africa's stubbornly large income deficit is that interest payments have been rising. The growth of this sub-category is entirely due to government debt service costs, in turn reflecting rapid growth in debt as well as increased purchases of domestic debt by foreigners. South Africa's debt to GDP ratio has risen from around 30% in 2010 to over 50% now; meanwhile, the proportion of total debt held overseas has shifted from 22% in 2010 to 39% in 2017 (average, ytd)[11]. Accordingly, interest payments by government to foreigners have tripled from 0.4% of GDP in 2010 to 1.2% in 2016. We do not see the same trends in Latin American countries because these countries typically achieved fiscal consolidation, containing debt burdens at lower levels. They also have lower interest rates.[12] For instance, South African 10-year bonds trade at a spread of about 2.2pp over Latin American equivalents. This has mainly to do with inflation compensation, not tighter monetary policy: real policy rates of Chile, South Africa, Colombia and Peru have all been close to zero over the post-crisis period. By contrast, breakeven rates are on average 3.1% higher in South Africa relative to these three countries, reflecting higher inflation expectations (as well as inflation risk premia).[13]



Nominal interest rate differentials have real effects on the size of the current account deficit, measured as a proportion of output. As a matter of arithmetic, higher *nominal* rates will cause a country to devote a larger portion of income to debt repayments across the entire term of a loan. To illustrate this point, the figure below illustrates interest payments as a share of GDP for two hypothetical countries. In both cases, we assume an initial loan worth 100% of GDP, a real growth rate of 2% and a real interest rate of 2%. However, one country has a 6% inflation target and the other has a 3% target. The nominal interest rate is therefore 8% in the first case and 5% in the second, and nominal GDP growth rates are 8% and 5% respectively. As the graph shows, the higher inflation country ends up with larger debt repayments relative to GDP for the full term of the loan.



Crowding out

Large income deficits may create a novel form of 'crowding out'. Traditionally, this term has described fiscal spending which reduces demand elsewhere in the economy, leaving total output no higher. (The so-called 'Treasury view' of early Keynesian debates.) Crowding out can also occur via the current account because there are constraints on the total deficits a country can run. In the South African case, the danger is that government debt payments will use up scarce inflows of foreign savings, which then cannot be used for other purposes.

It is difficult to assess current account sustainability. The problem has duly attracted a large literature, which finds that sustainability depends on a wide range of variables, including exchange rate arrangements, national investment positions and the composition of deficits (for instance, a country which is borrowing to invest should be able to sustain a larger deficit than one borrowing to consume). The International

[11] The 2017 figure is an average from January to August 2017. Available at: http://investor.treasury.gov.za/Holdings%20of%20domestic%20bonds/Historical%20government%20bond%20holdings.xls
[12] The proportion of debt held by foreigners, however, is generally similar, averaging 38% for Chile, Colombia and Peru versus 39% for South Africa.
[13] 2017 average differentials in sovereign government and inflation linked bonds.

Monetary Fund (IMF) has attempted to model sustainability based on these sorts of considerations. The model results indicate South Africa's current account should be -0.8% of GDP, although off-model factors would justify a larger deficit. In its most recent Article IV assessment, the IMF staff concluded that the prevailing current account deficit was approximately 1.5%–2.5% of GDP *larger* than could be justified by fundamentals and optimal policy settings.[14] Nonetheless, South Africa does not appear to be having difficulty financing a deficit of between 2% and 3% of GDP, even if such deficits are too big given fundamentals. Larger deficits, however, typically prove problematic to finance, and are ultimately forced down through a process of currency depreciation, rising inflation, tighter policy settings and lower growth.[15]

Current account implications of the 2017 MTBPS

In the most recent *Medium Term Budget Policy Statement*, National Treasury described a debt path in which government debt passes 60% of GDP by 2021. In this baseline scenario, total interest payments rise from 3.4% of GDP currently to 3.9% in 2020/21. If we assume the *proportion* of total interest payments going to foreigners remains unchanged from current levels, close to 60%, then outgoing interest payments would be higher by around ¼pp of GDP by 2020/21. If we assume foreigners buy a larger portion of the debt, so that their share of payments rises to 65%, then the figure is more than ½pp of GDP. Although the Treasury forecast assumes somewhat higher interest rates on the overall debt stock, as existing bonds mature and are rolled over, they also anticipate a decline in the sovereign risk premium, which may not transpire. Furthermore, the forecasts face upside risk from exchange rate depreciation, which would affect the foreign-currency denominated portion of the debt. Interest payments in the current account will therefore end the decade at least 1¼–1½pp of GDP above 2010 levels, at around 1.7% of GDP.

This outlook underpins some unpleasant arithmetic. If we assume net transfer payments close to 1% of GDP, income payments slightly above 3% of GDP (with dividend payments below their post-crisis average of -1.5% of GDP, but interest payments making up the balance), and a balanced services account, then the SIT balance is already -4% of GDP. Adding even a small business cycle upswing, with stronger imports creating a trade deficit as well as higher dividend payments, moves the overall current account number beyond 5% and into unsustainable territory.

Conclusion

South Africa's SIT balance has been stable despite a sharp deceleration in growth over the post-crisis period. This is puzzling in that peer economies have seen SIT deficits narrow, aiding rebalancing. The puzzle is resolved by three factors: South Africa's more modest dividend payments adjustment, its unusually large transfer payments and rising interest payments. Of these, the last is a larger, and growing, problem. Higher foreign interest payments are likely to crowd out investment flows and therefore threaten medium-term growth – in turn making the debt burden less sustainable. Both fiscal and monetary policy can help address this problem, the former through containing borrowing and the latter by moderating interest rates, over the medium term, through reduced inflation expectations.

[14] IMF, "South Africa 2017 Article IV Consultation" http://www.treasury.gov.za/publications/other/imf/2017/IMF%20Art%20IV%20report.pdf, July 2017, esp. p. 42

[15] In this sense, the current account-depreciation-inflation nexus is a better indicator of slack than the output gap-inflation relationship.