

# OBEN 1802 - September 2018

## Policy cyclical in the post-crisis period

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### Abstract

Most advanced economies have run countercyclical monetary policies while emerging markets have struggled with procyclicality. In the years running up to the crisis new evidence indicated some EMs were graduating towards countercyclicality. This note updates and refines earlier research into the cyclical in of macroeconomic policy, for a large sample of AEs and EMs, with a particular focus on South Africa. We find that post-crisis monetary policy has been largely procyclical for AEs as well as EMs.

### Introduction<sup>1</sup>

Most advanced economies (AE) have run countercyclical monetary policies over the past five decades.<sup>2</sup> However, emerging markets (EMs) have struggled with procyclicality, meaning policy settings have amplified booms and exacerbated busts. In the years running up to the crisis new evidence indicated some EMs were graduating towards countercyclicality. However, no subsequent research has investigated whether this improvement survived into the post-crisis period. This note updates and refines earlier research into the cyclical in of macroeconomic policy, for a large sample of AEs and EMs, with a particular focus on South Africa. We find – contrary to previous studies – that post-crisis monetary policy has been largely procyclical for AEs as well as EMs. Hardly any countries have achieved both fiscal and monetary policy countercyclicality in the post-crisis period. South African monetary policy has been consistently procyclical since 2000, and fiscal policy has also been generally procyclical.

### Methodology

Fiscal and monetary policy settings, as well as economic output, have underlying structural trend growth rates. Where growth is below trend, policy is countercyclical when it is loose relative to its own trend, and procyclical when it is tight. The measure of policy cyclical in is therefore the correlation between the cyclical components of policy and output. A challenge of this approach, however, is identifying the right measures of policy. Végh and Vuletin (2012), whose work has been central to contemporary discussions of cyclical in, relied on nominal interest rates and real government expenditure.<sup>3</sup> However, as argued in McGettigan *et al* (2013), real interest rates are more meaningful for the monetary analysis. In this note, we follow the former study for the fiscal analysis, and the latter for the monetary analysis. Of course, these choices are contestable. In particular, the overall fiscal stance is affected by taxation decisions as much as spending choices. Replicating existing research,

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<sup>1</sup> Many thanks to David Fowkes, Jean-Francois Mercier and Theo Janse van Rensburg for their valuable comments and contributions.

<sup>2</sup> McGettigan, D *et al*. 2013. *Monetary Policy in Emerging Markets: Taming the cycle*. IMF Working Paper WP/13/96

<sup>3</sup> Végh, C and Vuletin, G. 2012. *Overcoming the fear of free falling: Monetary policy graduation in emerging markets*. NBER Working Paper 18175.

however, is useful for purposes of updating findings. The policy measures used here also satisfy data requirements. We leave alternative approaches to future research.

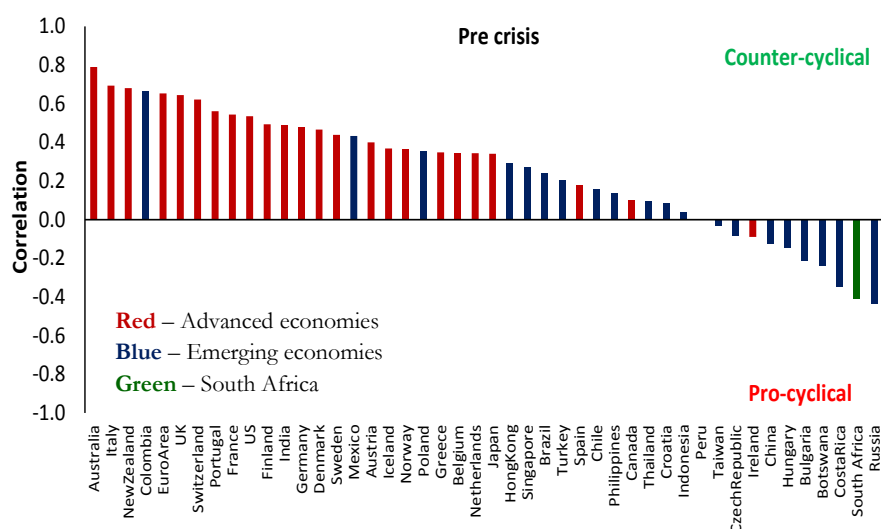
Measuring policy cyclicality requires techniques to identify trends in growth and policy settings. Both of the papers cited above employ the HP filter to de-trend the data. For this analysis we have relied chiefly on a restricted Beveridge-Nelson decomposition (BN filter), although we also consider results derived from other filters – see appendix 1.

## Monetary policy cyclicality

In advanced economies, our results indicate a broad shift to procyclicality in the post-crisis period (see Figure 1 and Figure 2). This swing, which reverses a long history of countercyclicality, is mainly due to two factors: the zero lower bound and the low inflation recovery.<sup>4</sup> In the euro area, for instance, policy rates remain steady at zero despite a robust cyclical recovery. We note, however, that a number of advanced economies have maintained policy countercyclicality, including the prominent examples of the US and UK. The advanced economy shift to procyclicality is actually mostly a European story, either of the euro area or of countries close in its orbit (such as Sweden).

McGettigan *et al* lauded emerging markets for graduating from procyclical policy to countercyclicality in the build up to the financial crisis. During this period, many emerging markets stabilised inflation and enhanced central bank credibility. This gave central banks more space to respond to growth outcomes (and demand-side drivers of inflation) when setting policy. EMs appear to have reverted to procyclical policy after the financial crisis. A general explanation for this might be that EM monetary policies were constrained by advanced economy policy settings.<sup>5</sup> This is only a partial explanation, however; the South African analysis, which will be discussed below, will show that country-specific characteristics are also significant.

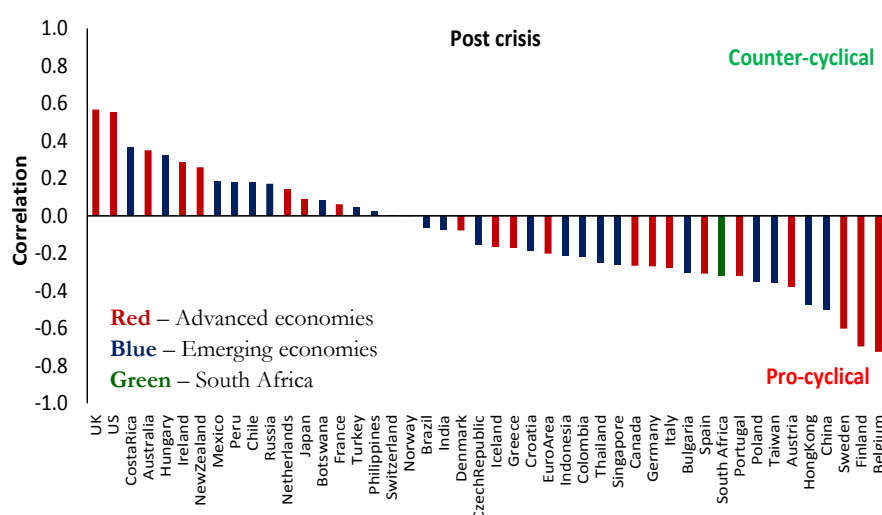
Figure 1: Monetary policy cyclicality, 2002-2008



<sup>4</sup> Our method does not account for unorthodox monetary policies, and it is possible incorporating these initiatives might yield a different verdict on the cyclicality of monetary policies.

<sup>5</sup> This is in line with Helene Rey's "dilemma" thesis. Rey, H. 2015. *Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence*. NBER Working Paper No. 21162.

Figure 2: Monetary policy cyclicality, 2010-2017Q2



### Fiscal policy and policy mixes

To assess the cyclicality of fiscal policy, we apply the same methodology used above to real government spending.<sup>6,7</sup> From a government spending point of view, there was no large swings in the cyclicality of fiscal policy between the pre- and post-crisis periods. While most advanced economies have run countercyclical fiscal policies in both time periods, the majority of emerging markets have had procyclical fiscal policies.

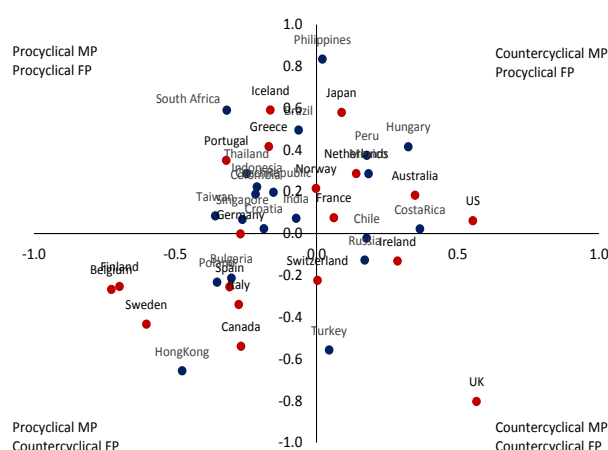
These measures of fiscal and monetary policy cyclicality allow us to assess the overall policy mix for each country, as represented in Figure 3. The top left quadrant, which combines procyclical fiscal and monetary policies, is relatively full. By contrast, the bottom right quadrant, for countries with simultaneously countercyclical fiscal and monetary policies, is almost empty.

In fact, the UK is the sole example of a strongly countercyclical policy mix in the post-crisis period. In this case, countercyclical monetary policy is being driven by inflation rather than nominal interest rates. A period of above-target inflation in the immediate post-crisis period permitted lower real interest rates and therefore an unusually accommodative monetary policy stance. Inflation then sank towards zero as the economy accelerated in 2014 and 2015, automatically raising real rates. Similarly, UK fiscal policy was also tightened as the economy started expanding, which kept it countercyclical – the opposite of the contemporary narrative, which was that untimely austerity was killing growth.

<sup>6</sup> Using this methodology on the overall fiscal balance would give misleading results as calculating cyclical revenue needs to account for tax policy changes, terms of trade and composition effects. In a previous economic note, the structural budget balance was calculated taking all these factors into account. All of which cannot be accounted for using filtering methods. See: Mercier, J.F. 2017. 2017. *SA's structural budget balance – some fiscal restraint*. Economic Note 2017-09

<sup>7</sup> When government spending is considered, a positive correlation indicates procyclical fiscal policy while a negative correlation indicates counter cyclical policy.

**Figure 3: Cyclicity of fiscal vs monetary policy in the post-crisis period**



### Monetary policy cyclicity in South Africa

Figure 4 plots the 10-year rolling correlation (using the Beveridge Nelson filter) between the cyclical components of real GDP and real interest rates. The results suggest that monetary policy has been procyclical from the early 2000s.<sup>8</sup> This contradicts the findings in McGettigan *et al*, and to some extent those of Du Plessis *et al* (2007), both of which indicated that South Africa ran countercyclical monetary policy between 1996 and 2007.<sup>9</sup> This could be a result of inaccurate real time estimates of the output gap. The analysis below discusses the implications of misleading real time output gap estimates for monetary policy cyclicity.

Figure 5 illustrates three distinct episodes of procyclical monetary policy in South Africa:

- In the period leading up to the financial crisis, procyclicality was most likely driven by misleading real time estimates of the output gap. The acceleration in growth during this period was largely interpreted as a structural improvement, not a cyclical boom. In retrospect, it appears the positive output gap was about twice as large as it appeared in real time. Furthermore, inflation was relatively low in the mid-2000s, and then accelerated faster than expected, which left real interest rates below their trend level until well into 2008.
- In the immediate post-crisis period, interest rates were cut to support growth and then kept low as growth underwhelmed. Once again, real time estimates of potential appear to have been faulty: in 2011 and 2012, the output gap – instead of being negative to the tune of about -1% of potential GDP – had almost closed.
- By the time the output gap moved markedly into negative territory, in early 2014, inflation forecasts were indicating sustained inflation target breaches. This led to the third period of procyclicality, although in this case the output gap was not so much underestimated as overshadowed by the inflation problem.

<sup>8</sup> See Appendix B for a comparison of results using different filters and a discussion on correlation window length.

<sup>9</sup> Du Plessis, S *et al*. (2008). *The cyclicity of Monetary and Fiscal Policy in South Africa since 1994*. CID working paper No. 163.

Figure 4: Cyclicity of real interest rates using a 10 year correlation window

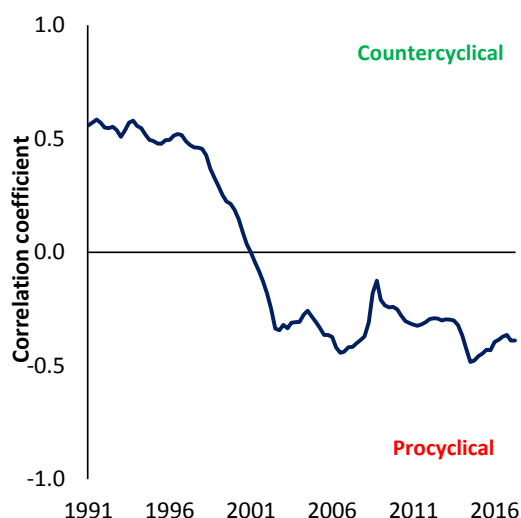


Figure 5: Cyclical components of GDP and real interest rates using the BN filter

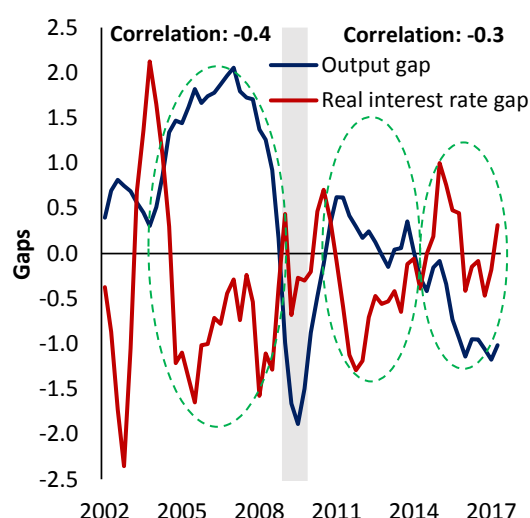


Figure 6 shows that monetary policy decisions were countercyclical based on real time output gap estimates; however, as more information became available and the output gap adjusted, it transpired monetary policy had been procyclical. (Compare figures 6 and 7.)

Figure 6: Real time output gap and real interest rate estimates

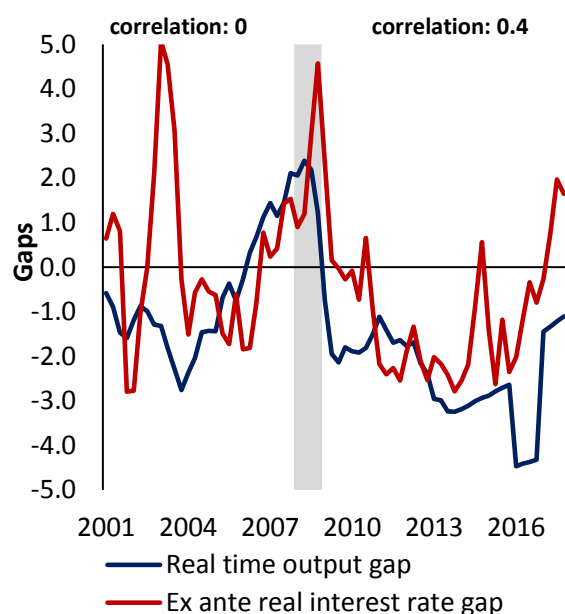
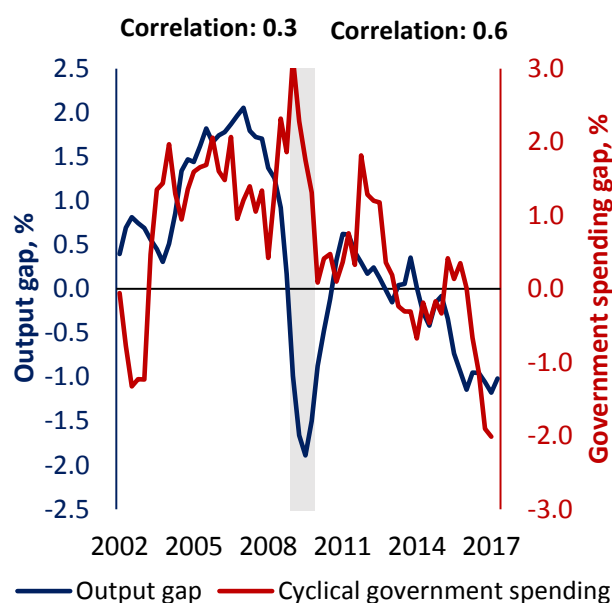


Figure 7: Cyclical components of GDP and real government spending using the BN filter



## Fiscal policy cyclicity in South Africa

Figure 7 shows that fiscal policy has been consistently procyclical, and more so in the post-crisis period. During the commodity boom of the late-2000s, South Africa had a substantial positive output gap and should therefore have been running large fiscal surpluses. In the post-crisis period, spending remained above its trend for several years (probably because much of 2009 stimulus spending was channelled into a higher civil service wage bill, a relatively permanent kind of expenditure). More recently,

spending has finally slowed below its trend as the unsustainability of government's debt trajectory has become clearer. This has coincided with a deteriorating output gap, keeping the policy stance procyclical. Again, we see the effects of prior mistakes constraining more recent policy choices; more spending restraint in earlier years and after the global financial crisis would have given government the space for a countercyclical fiscal policy now.

### **Concluding remarks**

The existing literature on policy cyclicalities tells a happy story of progress. The findings presented here complicate these accounts. Instead of countercyclical policies becoming ever more prevalent, the trend has been towards more procyclical policies in the post-crisis period. A range of factors likely explain this shift, including the zero lower bound constraint and the low inflation recovery. In the South African case, the biggest problem appears to have been the unreliability of real-time output gap estimates. For policymakers, a good rule of thumb may be imagining how current decisions would look if the output gap were markedly different to estimates. Greater reliance on observables might also benefit decision making.<sup>10</sup>

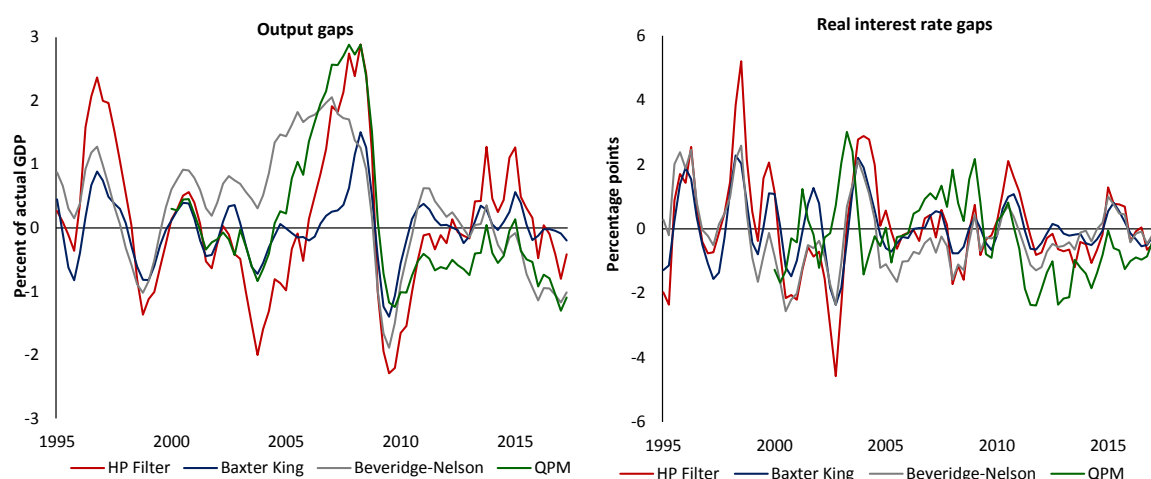
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<sup>10</sup> As discussed in Dan Tarullo, "Monetary policy without a working theory of inflation" [https://www.brookings.edu/wp-content/uploads/2017/10/es\\_wp33\\_tarullo.pdf](https://www.brookings.edu/wp-content/uploads/2017/10/es_wp33_tarullo.pdf), October 2017

## **Appendix 1 – Comparing data filters**

The papers that are used as the basis of the analysis employ the HP filter to de-trend the data. Although this technique is widely used, it is also widely acknowledged to be flawed. Nonetheless, data filters are useful because they can be easily and consistently applied over a range of indicators and countries, which facilitates large-scale cross-country comparisons. To guard against the failings of the HP filter, we supplement this measure with two other filtering techniques, the Baxter-King filter and a restricted Beveridge-Nelson decomposition (BN filter).<sup>11,12</sup> Figure 8 below illustrates how output and real interest rate gaps differ across filtering techniques, using South African data as an example. The HP filter produces the most volatile cyclical estimates for both GDP and interest rates. The Baxter King filter produces the least volatile series, while the BN filter produces estimates that are closest to those used in the Quarterly Projection Model (QPM).<sup>13</sup> (We include these for the sake of comparison. The QPM estimates are produced using a more structured approach, rather than a simple data filter.) Unless otherwise stated, the results reported in this note are based on the BN filter, which is less affected by the endpoint problem.

**Figure 8: Estimated output and real interest rate gaps for South Africa using different filters**



## **Appendix 2 – Monetary policy cyclical in South Africa – a comparison of filters**

Figure 9 plots the 10-year rolling correlation between the cyclical components of real GDP and real interest rates using different filtering techniques (1991 – 2017Q2). Although the three measures indicate that South African monetary policy became procyclical at different points in time, they all suggest that monetary policy has been procyclical from the early 2000s.

Both Végh and Vuletin (2012) and McGettigan et al (2013) use ten-year rolling correlations for measuring cyclical, although they do not explain why ten years is the optimal timeframe. As this makes a material difference to the observed outcomes, we consider alternative timeframes. We tested the results using 6-year rolling correlations (on the grounds that business cycles average around 6 years), as well as narrower 2-year correlation windows. Although the historical story does not change

<sup>11</sup> Kamber, G. 2017. *Intuitive and Reliable Estimates of the Output Gap from a Beveridge-Nelson Filter*. Reserve Bank of New Zealand Discussion Paper series DP2017/01.

<sup>12</sup> The restricted BN filter used in this note was developed by Kamber *et al* (2017). Their adapted filter produced estimates of the US output gap that were both reliable, intuitive, subject to less revisions and which moved closely with the NEBR business cycle.

<sup>13</sup> SARB forecasts were used to extend the length of the time series in order to lessen the effect of end point issues associated with HP and Baxter King filters.

much with the 6-year window, the 2-year window reveals more volatility in the post-crisis period, with policy fluctuating between pro- and counter-cyclicality.

Figure 9: Monetary Policy cyclicity in South Africa using different filters

