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Estimating South Africa's output gap and potential growth rate

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The potential output of an economy is an unobservable variable which represents the level of output that an economy can sustain without affecting inflation. The associated output gap is the difference between actual and potential output. The potential growth rate is the growth rate associated with potential output.

This paper reviews the methodologies that have been used to estimate potential output by various multilateral agencies and central banks, including the South African Reserve Bank.

In estimating potential output, we employ a range of univariate filters as well as a production function approach. We apply the techniques to four distinct measures of output. On comparing the different output gaps generated by the different methods, we conclude that measures of potential output are sensitive to the different methodologies used, potentially strongly so. This is true in terms of the amplitude of the implied output gap. It is also true with respect to the volatility of the implied output gap through the business cycle. It is even true in terms of whether a positive or a negative output gap is implied for the South African economy at crucial time points.

We find that high-pass filters display greater cyclical variation than band-pass filters do. Strikingly, at the end of the sample period of our study, we find that the high-pass filters display a positive output gap; by constrast band-pass filters display a negative output gap. We generate three more output gap measures by (a.) using a disaggregated production function for eight individual sectors of the economy, then aggregating the individual output gaps by means of weighting their sums in proportion to the sectoral contribution to aggregate output, (b.) employing a composite approach involving the disaggregated production function in conjunction with two univariate filters (Hodrick-Prescott and Christiano-Fitzgerald) for sectors where the production function coefficients lacked theoretical coherence, in order to determine the potential output of those sectors prior to aggregating them via their proportion to aggregate output. The disaggregated production function approach gives an output gap structure closer to the results of the band-pass filters than to the results of the high-pass filters.

We then employ these univariate filters along with a multivariate Kalman filter to estimate the potential growth rate for South Africa. We derive the implied potential growth rate of the economy obtained from from the filter-based and production function based measures of potential output as well as directly by means of filtering the reported growth rate of the economy. Irrespective of the measure of output used, we report a long-term decline in the growth rate from 1960 to 1995, a growth recovery from 1995 to 2008, and a sharp decline post-2008 to the present. The potential growth rate as of 2015 is between 1.9-2.3 per cent.

Finally, we considered the natural growth rate derived for the eight two-digit sectors of the economy. The core implication to emerge is that the current growth deceleration is concentrated in the real economy, mining and manufacturing in particular, but also in the public utilities sector. By contrast, growth in the service sectors has been relatively buoyant, especially in the financial services sectors. Nonetheless, even sectors that showed growth resilience have shown a dramatic decrease in their growth performance after 2008.

The contrasting findings on the growth performance of the economy pre- and post-2008 raises the crucial question of whether the growth recovery of 1995-2008 was merely a temporary reflection of unusually buoyant international demand conditions or whether it reflected greater fundamental strengths in the South African economy. Unfortunately the long-term downward trend in South African growth, in which the 1995-2008 performance is an abberation, and the absence of policy reforms that address the structural constraints on South African growth identified in the literature (labour and output market rigidities, human and infrastructure capital constraints, moderate investment rates in physical capital), raises the likelihood that the potential growth rate of the economy will continue to be weak rather than recover to 1995-2008 levels.