Assessing the 2013 and 2017 business cycle turning points signaled by the SARB's composite leading business cycle indicator

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Abstract

The upward phase of the South African business cycle that followed the global financial crisis gradually lost momentum from 2012 onwards, resulting in a peak in the business cycle being reached in November 2013. Up to August 2019, i.e. 69 months since the preceding peak, no lower turning point in the downward phase of the cycle has officially been identified. The gradual loss of momentum in domestic output growth was not widely recognised by many economists, judging by consensus forecasts of annual real GDP growth. However, the SARB's composite leading business cycle indicator reached a peak in February 2011 before trending gradually lower, suggesting a continued deterioration in output growth. The leading indicator reached a trough in April 2016, suggesting an imminent end to the downward phase of the business cycle, in line with consensus forecasts. However, output growth slowed further at the start of 2017, and again in 2018. This paper employs the indicator approach to business cycle analysis, in particular the SARB's composite leading business cycle indicator, in order to establish whether the current downward phase in the South African business cycle could reasonably have been predicted, and also whether the strong increase in the composite leading business cycle indicator in 2016 and 2017 provided a clear signal that the current downward phase might have ended. The results show that the leading indicator and its subcomponents predicted a broad slowdown in the South African economy from 2012 in a persistent, pronounced and pervasive way. Also, the 2016-17 upward trend in the leading indicator did initially signal the end of the current downward phase in the business cycle in an unambiguous manner. However, the strength of the lower turning point signal was weakened by idiosyncratic exogenous factors.

Key words: growth cycles, composite leading business cycle indicator, cyclical turning points

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1 Introduction

Following the global financial crisis, the South African economy entered an upward phase of the business cycle[2] in September 2009 (Venter, 2011: 66). The upward phase was characterised by highly volatile output growth and various structural supply-side constraints. In particular, the domestic economy was hampered by electricity-supply disruptions throughout the upward phase of the business cycle, as well as being subjected to fairly protracted and highly disruptive labour strikes between 2011 and 2014 (Venter, 2016: 107-108). Furthermore, the global economic recovery was very weak and uneven over this period, offering little assistance to the domestic economy. The upward phase gradually lost momentum from 2012 onwards, with a peak in the business cycle being reached in November 2013. Up to August 2019, i.e. 69 months since the preceding peak, no lower turning point in the downward phase of the cycle has officially been identified.

The gradual loss of momentum in domestic output growth, and even the downward phase of the business cycle, appears not to have been widely recognised by economists when considering consensus forecasts of annual growth in South Africa's real gross domestic product (GDP). Yet, the South African Reserve Bank's (SARB) composite leading business cycle indicator reached a peak in February 2011 before trending gradually lower, amid some volatility. The continued decline in the leading indicator suggested a further deterioration in output growth over the short term.

The SARB's composite leading business cycle indicator reached a trough in April 2016 and subsequently increased fairly strongly up to February 2017 before pausing somewhat, suggesting an imminent end to the downward phase of the business cycle, in line with consensus forecasts. From mid-2017, the leading indicator continued its strong upward trend until February 2019 before receding again up to May 2019. However, South Africa's real GDP growth slowed to only 0.4% in 2016 and contracted in the first quarter of 2017. Output growth then accelerated somewhat, with real GDP expanding by 1.4% for 2017 as a whole, before slowing again to 0.8% in 2018. Although the leading indicator appeared to signal the end of the previous upward phase in the South African business cycle in advance, the question arises whether the strong increase in the leading indicator during the second half of 2016 and in 2017 represented a false signal of the end of the current downward phase?

This paper employs the indicator approach to business cycle analysis, and in particular the SARB's composite leading business cycle indicator, in an attempt to ascertain whether the current downward phase in the South African business cycle could reasonably have been predicted. It also examines whether the recent strong increase in the composite leading business cycle indicator provided a reliable signal that the current downward phase might have ended.

[2] The chronology of business cycle turning point dates determined by the South African Reserve Bank refers to growth cycles.

The next section discusses the business cycle definition employed by the SARB. This is followed by an explanation of the methodology employed in applying the indicator approach to business cycle analysis, including forecasting turning points in the business cycle. The SARB's composite leading business cycle indicator and its component time series are then analysed in relation to previous business cycle peaks and troughs. The results show that closer analysis of the leading indicator and its subcomponents would have revealed that a broad slowdown in the South African economy was underway from 2012, contrary to consensus forecasts of improving economic growth. Furthermore, the results show that the recent upward trend in the leading indicator did initially signal the end of the current downward phase of the business cycle in a pronounced, pervasive and persistent manner. However, the strength of this signal became much weaker again towards the end of 2017. The paper concludes by suggesting that the anticipated business cycle recovery appears uncertain due to idiosyncratic exogenous factors.

2 Defining the business cycle

Following decades of empirical study, arguably the most comprehensive and most frequently quoted definition of the business cycle was formulated by Mitchell in 1927, and later slightly revised by Burns and Mitchell (1946: 3):

> *'Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similar general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of change is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own.'*

The definition above is considered a 'working definition' (Fabricant, 1972: 99), i.e. a definition to be used when identifying and dating business cycle turning points. Specifically, the definition assisted in the development of three criteria that have historically been used to analyse the severity of business cycle contractions (Fabricant, 1972). First, the *duration* of a contraction in aggregate economic activity was analysed. Then, the amplitude of a contraction was analysed, e.g. the *depth* of the decline in aggregate economic activity during a contraction. Finally, the extent to which the contraction is *diffused* among different economic activities was analysed. These three criteria, namely the duration, depth and diffusion of a business cycle movement has been referred to as the three Ds (Banerji, 1999).

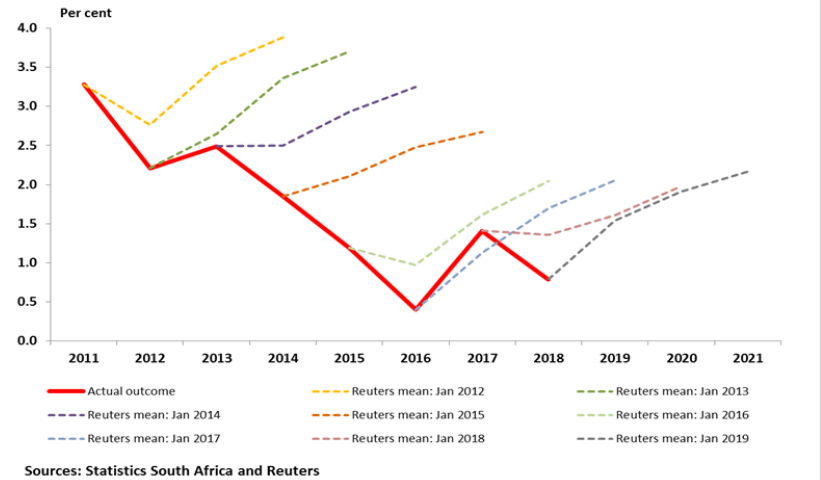
The Burns and Mitchell definition was initially formulated to define *classical business cycles*, i.e. absolute decreases/increases in aggregate economic activity. However, it also applies to *growth cycles*, which refers to fluctuations around the long-term growth trend of aggregate economic activity. The SARB has identified reference turning points (peaks and troughs) in the South African business cycle for the period since 1945. It is important to note that these reference

turning points have always been determined according to the growth cycle definition. As such, the chronology of business cycle turning points regularly published on the last page of the SARB's *Quarterly Bulletin* represents growth cycle[3] turning points, i.e. trend-adjusted business cycle turning points.

Despite the different conceptualisations of business cycles being fairly well documented, forecasting emerging stages of the business cycle has proved to be quite difficult. In an article that analysed the historical record of economists to predict economic turning points, Ahir and Loungani (2014) concluded that economic forecasters have generally failed to predict economic recessions. In fact, in an earlier article one of the authors quipped that 'the record of failure to predict recessions is virtually unblemished' (Loungani, 2001: 1).

In South Africa, the gradual loss of momentum in domestic output growth after 2011, and indeed the onset of the current downward phase of the business cycle, appears not to have been widely recognised by economists, considering consensus forecasts of annual GDP growth. Figure 1 shows annual average growth in South Africa's real GDP since 2011, together with the Reuters consensus forecast of annual average GDP growth for the current year as well as the following two years, as at the beginning of each year.[4] Since 2012, consensus forecasts consistently predicted an acceleration of annual growth in South Africa's GDP over a three-year horizon, depicted by the dotted lines. Participants appeared, on average, not to recognise that a broad slowdown in output growth was underway and that the South African economy had entered a downward phase of the business cycle.

Figure 1 Annual average growth in South Africa's real GDP and Reuters consensus forecasts



Sources: Statistics South Africa and Reuters

[3] Much of the modern business cycle literature – see Harding and Pagan (2002) – has focused on growth cycles. See Du Plessis (2006) for a discussion with reference to South Africa.

[4] For 2015, the consensus forecast for April was used instead of January, since that was the first month in that year for which annual average forecasts for the current year (2015) and the subsequent two years were available.

In January 2005, *The Economist* noted that 'The Economic Cycle Research Institute (ECRI) is perhaps the only organization to give advance warning of each of the past three recessions; just as impressive, it has never issued a false alarm' (The Economist, 2005: 63). ECRI's approach is based upon decades of empirical study of business cycles at the National Bureau of Economic Research (NBER) and later at the Center for International Business Cycle Research (CIBCR). ECRI relies on a sequential signaling system of turning points in a number of individual and composite leading, coincident and lagging indicators, covering a number of economic sectors and processes (Achutan & Banerji, 2004: 112).

Although the successful application of this methodology depends on the availability of specific relevant data series (which are readily available in the United States), many aspects of this approach can be applied to the economic indicators that are available for the South African economy. In the next section, this approach to cyclical analysis is explained in more detail. Specifically, three composite business cycle indicators are used to set up a sequential signaling system that can be employed to predict possible business cycle turning points. In addition, a composite leading business cycle indicator and its subcomponents are then analysed in terms of the duration, depth and diffusion of their movements, which could greatly improve the reliability of turning point signals obtained from the sequential signaling system.

3 Methodology

3.1 Composite business cycle indicators

One of the most important contributions made to business cycle analysis by Burns and Mitchell, and later Moore (1950), was their classification of economic time series according to their timing relation to the business cycle, i.e. as leading, coincident and lagging indicators. Coincident indicators report the current stance of the economy. They include indicators such as GDP, industrial production, retail sales and employment, and are used to measure aggregate economic activity.

The leading indicators anticipate movements in the coincident indicators. They usually represent intentions of future activity (such as job advertisements, new building plans or new manufacturing orders) or anticipations (such as business or consumer confidence). Since no individual leading indicator is completely infallible – many of them occasionally fail to lead at certain business cycle turning points – they are usually combined into a composite leading index, with a better track record than the individual leading indicators. As noted by Van der Walt (1983: 57), the timing of changes in a composite index will usually show a more stable relationship with that of the general business cycle than any individual series. Furthermore,

measurement errors and other random deviations in individual series could possibly cancel out when individual indicators are combined into a composite indicator.[5]

The lagging indicators confirm the movement first observed in the leading indicators and later in the coincident indicators. They often reflect excesses or imbalances in the economy. If the lagging indicators start rising rapidly it could signal an overheating economy. In addition, there are feedback relationships that run from the lagging indicators to the leading indicators (Moore, 1983: 361-367). As such, a movement in a lagging indicator often triggers an opposite movement in a related leading indicator, e.g. a steep rise in unit labour cost (a lagging indicator) will often lead to a decline in company profits (a leading indicator). Inverting a composite index of lagging indicators thus results in a long-leading indicator – reaching turning points in advance of those in the composite leading index. Similarly, since lagging indicators measure excesses or imbalances in the economy, expressing the composite lagging index as a ratio of the composite coincident index, yields an additional leading indicator. This ratio measures the pace at which excesses or imbalances are building up in the economy relative to the pace at which aggregate economic activity is expanding. The relationship between the lagging and leading indicators assists in explaining why one business cycle tends to generate the next one.

3.2 A sequential signaling system

Although each business cycle is unique, it is the *sequence* of turning points between the inverted lagging indicators, the leading indicators, the coincident indicators, and finally the lagging indicators that all business cycles have in common; all business cycles share the principle of this durable sequence, meaning that economic events move in a known order at turning points (Achutan & Banerji, 2004: 112). Table 1 shows the length of leads/lags in the SARB's inverted composite lagging indicator, the composite leading indicator, the ratio of the coincident to lagging indicator, the composite coincident indicator and the composite lagging indicator with respect to reference turning points in the business cycle, starting at the August 1974 reference peak. The median leads/lags of all of these indicators with respect to the reference turning points in the business cycle illustrate that the sequence of turning points described above also holds for the South African economy.

[5] See also Boshoff (2005), showing that no individual financial variable can act as a consistent leading indicator for the South African business cycle.

Table 1: Timing relationship between the composite business cycle indicators and reference turning points in the South African business cycle

Reference turning points		Timing relationship in months				
Peaks	Troughs	Lagging indicator (inverted)	Leading indicator	Ratio of coincident to lagging indicator	Coincident indicator	Lagging indicator
August 1974		-26	-12	-10	-1	+14
	December 1977	-26	-9	-11	-1	+14
August 1981		-30	-11	-3	+4	+9
	March 1983	-10	-8	-4	-1	+14
June 1984		-1	-1	-1	-1	+10
	March 1986	-11	-13	-11	0	+16
February 1989		-19	-9	-6	+4	+12
	May 1993	-39	-9	-9	-1	+6
November 1996		-36	-23	-21	-1	+23
	August 1999	-10	-10	-10	-2	+6
November 2007		-43	-16	-9	+5	+12
	August 2009	-9	-7	-7	0	+12
November 2013		-13	-32	-12	0	0
Average:		**-21.0**	**-12.3**	**-8.8**	**+0.4**	**+11.4**
Median:		**-19.0**	**-10.0**	**-9.0**	**-1.0**	**+12.0**

A minus (plus) sign indicates that the indicator leads (lags) the reference turning point

3.3 Evaluating indicator turning point signals

In order to identify possible turning points in the business cycle it is important to distinguish genuine turning point signals in the cyclical indicators from noise. It is not easy to evaluate the accuracy of composite business cycle indicators in forecasting cyclical turning points, as stated in this quotation by Granger and Newbold, taken from Banerji (1999a, 2):

> *'The index of leading indicators has become a widely quoted and generally trusted forecasting tool. However, it has been rather misinterpreted. The index is intended only to forecast the timing of turning points and not the size of the forthcoming downswing or upswing nor to be a general indicator of the economy at times other than near turning points. Because of this, evaluation of the (LEI) by standard statistical techniques is not easy.'*

One useful way to evaluate the strength of turning point signals is to analyse the indicators in terms of the three Ps (Banerji, 1999b), i.e. gauging whether the movements in the indicators are *Pronounced*, *Pervasive* and *Persistent*, analogous to the notion of the three Ds mentioned earlier. However, whereas the three Ds apply only to cyclical downturns, the three Ps apply to both upturns and downturns (Banerji and Hiris, 2001: 335).

Cyclical changes in economic indicators tend to be pronounced in magnitude, consistent with the final part of the Burns and Mitchell definition cited above, i.e. '… they are not divisible into shorter cycles of similar character with amplitudes approximating their own'. The year-on-year percentage change is often used to measure the magnitude of change in a cyclical time series, i.e. how pronounced the movement is. However, Moore (1982) introduced an alternative measure, namely the *six-month smoothed annualised growth rate* (6MSAR). The 6MSAR (S_t) of a time series (X_t) is defined as follows:

$$S_t = 100[X_t\ /((\sum_{i=1}^{12} X_{t-i})/12)]^{(12/6.5)} - 100$$

The 6MSAR has an advantage in that the denominator is smoothed over twelve months, making it less susceptible to unusual base-effects in any particular month. Furthermore, because the change is measured roughly over a six-month period as opposed to a twelve-month span, it usually reflects a cyclical upswing or downswing more promptly than the twelve-month percentage change, without being more "noisy" than the twelve-month change.

The Burns and Mitchell definition states that 'a cycle consists of expansions occurring at about the same time in many economic activities', referring to one of the fundamental characteristics of business cycles, namely the cyclical diffusion of economic movements; from one firm to another, from one industry to another and from one region to another (Banerji and Hiris, 2001: 335). A diffusion index shows the extent of the spread of a cyclical movement, i.e. how pervasive the cyclical movement is. Similar to the 6MSAR, a *twelve-month smoothed diffusion index* (12MSDI) can be constructed. The 12SMSDI shows the percentage of time series considered that are at a higher level than their respective average levels over the preceding twelve months.

A third important characteristic of a cyclical upswing or downswing is its persistence. A movement in a cyclical indicator that is pronounced and pervasive, but lasts only a few months does not qualify as a cyclical movement. The Burns and Mitchell definition states that 'in duration business cycles vary from more than one year to ten or twelve years'. Technically, a cyclical upswing or downswing has to persist for at least five months (Bry & Boschan, 1971: 21), but most last much longer. One way to measure the persistence of a cyclical movement in an indicator is to measure the number of consecutive months that the indicator has moved in the same direction. The duration of the unbroken runs in a number of time series, averaged over the time series, provides a good measure of the degree of persistence of a cyclical movement. Similar to the 6MSAR and the 12MSDI, a *smoothed average duration of run* (SADR) can be calculated as the average of the durations over which the indicators have been higher than their respective average levels over the preceding twelve months.

4 Results

This section presents the results when applying the indicator approach methodology described in section 3 to the South African economy. First, the historical evolution of the three tools (the three Ps) employed to analyse how pronounced, pervasive and persistent movements in the SARB's composite leading business cycle indicator have been are presented and discussed. This is followed by a comparison of the movements in these three tools around the November 2013 business cycle peak with their average movement around previous business cycle peaks. This provides an indication of the reliability of the turning point signal provided by the composite leading business cycle indicator prior to the November 2013 peak. Finally, the likelihood that a possible trough in the business cycle might have already been reached is investigated in a similar way.

4.1 Historical performance of the SARB's composite leading indicator

When a composite leading indicator forecasts a directional change in the business cycle in a pronounced, pervasive and persistent manner (the three Ps), the likelihood of a cyclical turning point rises significantly. In this section, the historical performance of the SARB's composite leading business cycle indicator and its component time series are analysed in terms of the three Ps described above.

Figure 2 shows the 6MSAR in the composite leading business cycle indicator from January 1972 to May 2019 – a period covering seven reference peaks and six reference troughs in the South African business cycle. This indicator provides a measure of how *pronounced* the increase/decrease in the composite leading business cycle indicator is. On only two occasions – 2001 and 2002/03 – did the 6MSAR dip below zero for a period of more than five months without a reference peak in the business cycle being identified. Although the domestic economy did experience a slowdown during both of those periods, they were not recognised as downward phases of the business cycle for a number of reasons (Venter, 2005: 69).

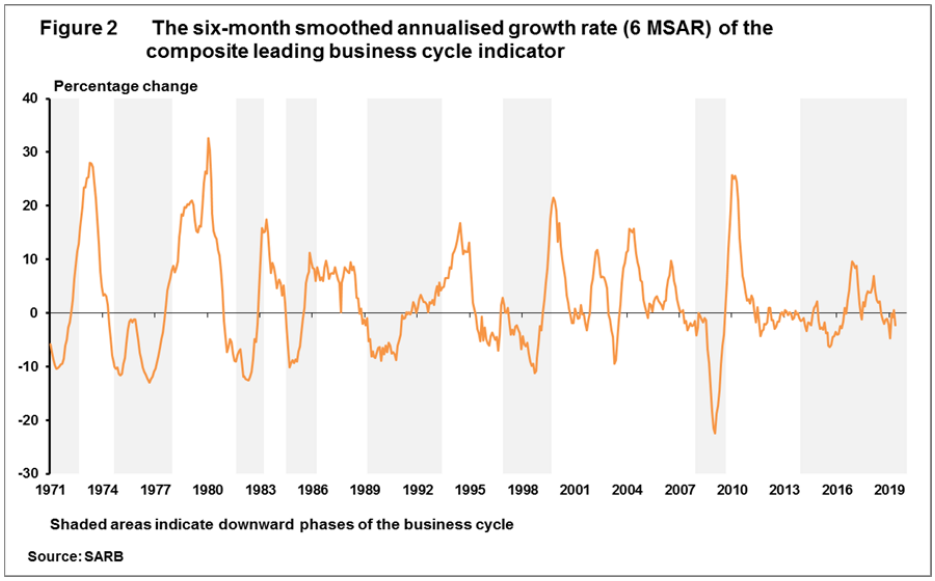


Figure 3 shows the 12MSDI in the composite leading business cycle indicator from January 1972 to May 2019. This indicator provides a measure of how *pervasive* the increase/decrease in the composite leading business cycle indicator is. As was the case with the 6MSAR, the 12MSDI dipped below 50 for a sustained period on only two occasions – around the same two 'almost-dated' downturns – without a reference peak in the business cycle being identified. Between July 2011 and September 2016 – a 63-month period – the 12MSDI was above 50 for only eight months and reached zero in April 2014, illustrating the fairly pervasive weakness among the leading indicator's subcomponents over this period. The 12MSDI then increased to above 50 from October 2016 to mid-2018, before falling back below 50 after that.

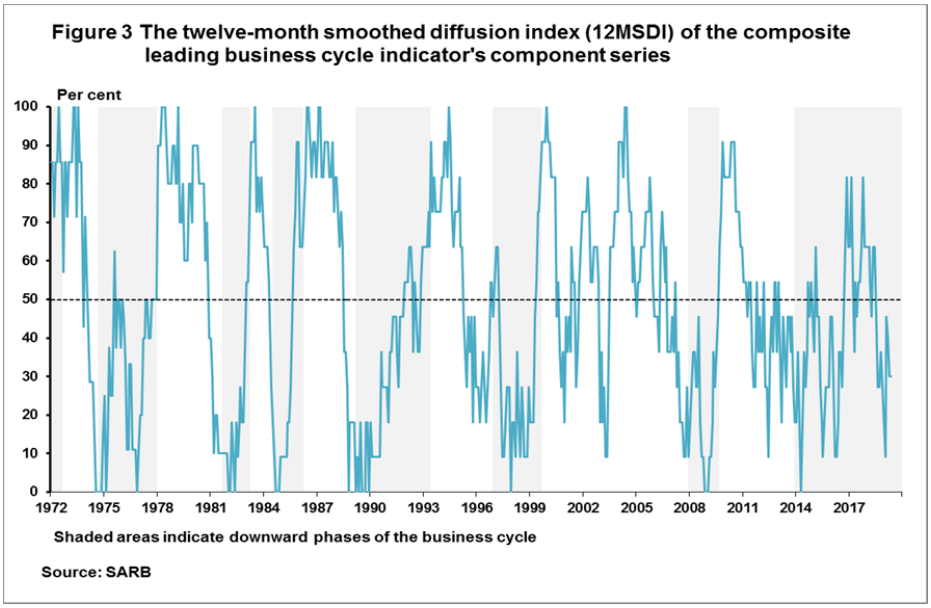
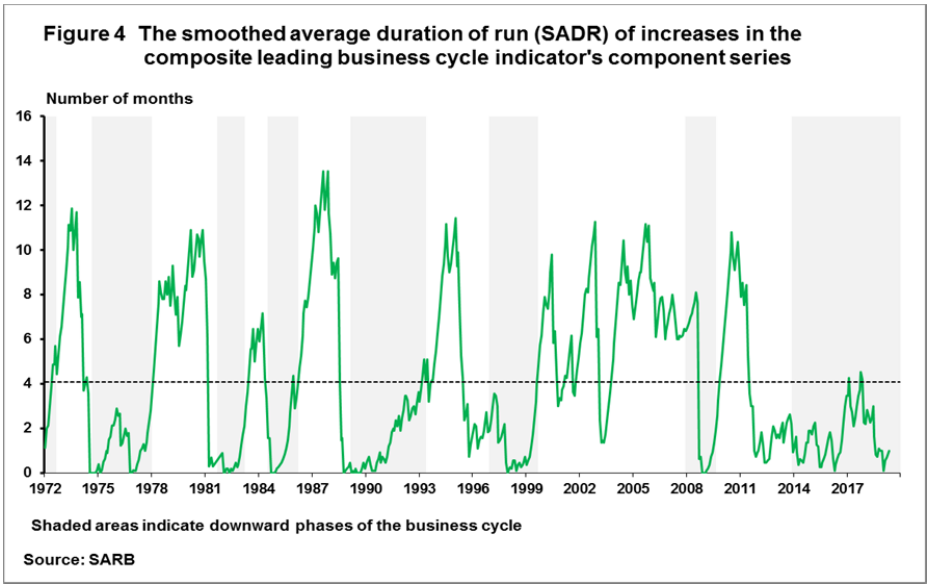


Figure 4 displays the SADR in the composite leading business cycle indicator from January 1972 to May 2019. The solid horizontal line shows the average SADR of 4.08 months over this period. The SADR provides a measure of how *persistent* the increase/decrease in the composite leading indicator is. During each of the past six downward phases of the business cycle, the SADR has fallen to zero at some stage. On two other occasions – the two 'almost-dated' downturns – the SADR dipped below its long-term average, but did not come close to zero. The SADR dipped below its long-term average in July 2011 and has remained very weak ever since, only surpassing the long-term average in three months during the second half of 2017.



An analysis of the 6MSAR, the 12MSDI and the SADR in the SARB's composite leading business cycle indicator shows that the indicator generally signalled the onset of peaks and throughs in the South African business cycle in advance, and in a pronounced, pervasive and persisent manner.

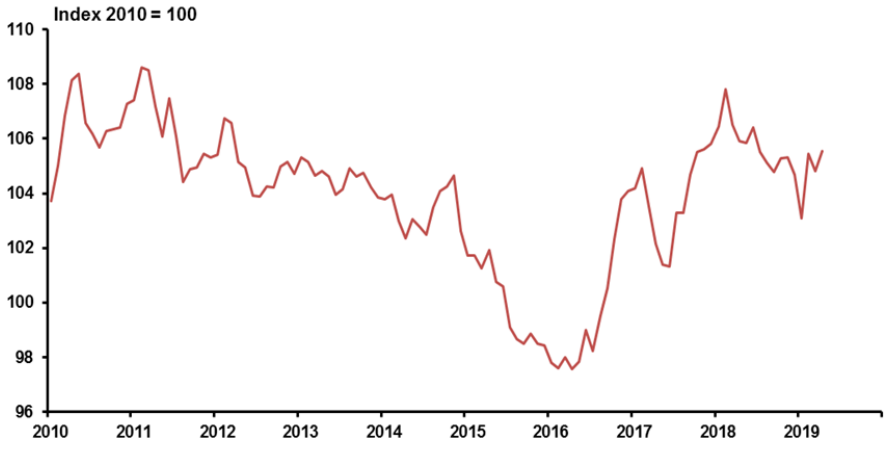
4.2 Predicting the November 2013 reference peak

In this section, we analyse the movement in the SARB's composite leading business cycle indicator during the period prior to, and around the November 2013 reference peak in the business cycle, in order to determine whether the indicator signalled the likelihood of a business cycle peak with a reasonable degree of certainty. First, the movement in the leading indicator and its vintage data are analysed, followed by an analysis of the three Ps to acertain whether they confirmed the likelihood that a peak in the business cycle may have been reached.

Figure 5 shows that the SARB's composite leading business cycle indicator reached a peak in February 2011 before trending gradually lower. Initially, the moderate downward trend was

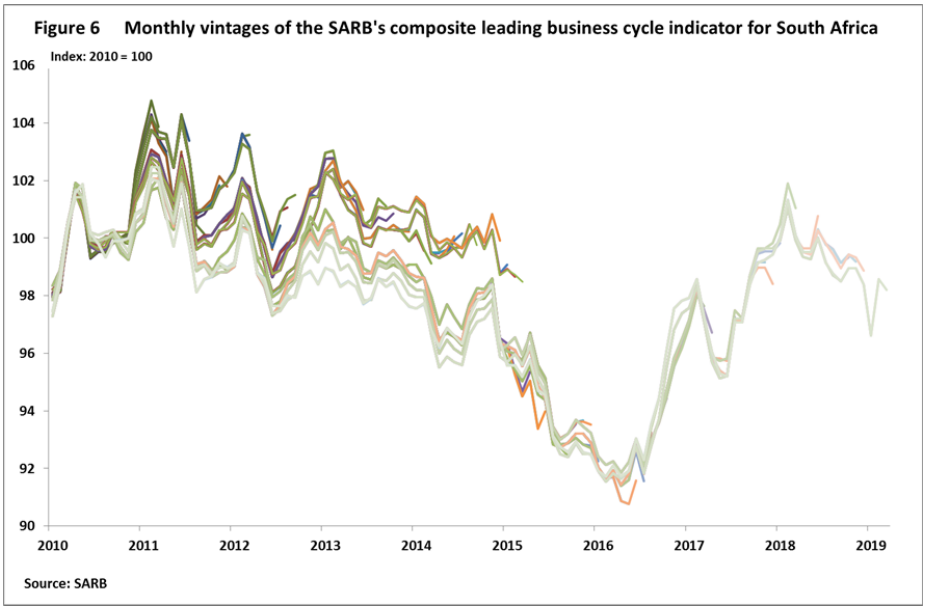
accompanied by a fairly large degree of volatility in the leading indicator, indicative of heightened uncertainty at the time. From March 2013, however, the downward trend in the composite leading business cycle indicator became more pronounced. The continued decrease in the leading indicator suggested a further deterioration in output growth over the short term, and not an acceleration as predicted by consensus forecasts.

Figure 5: Composite leading business cycle indicator for South Africa



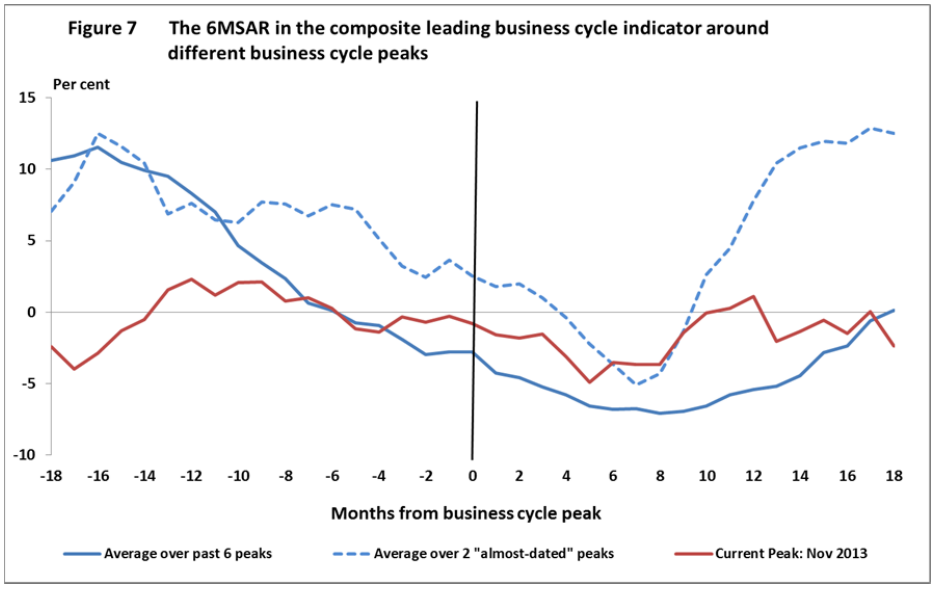
Source: SARB

Figure 6 depicts vintage data of the SARB's composite leading business cycle indicator from the January 2011 release onwards. In all of the vintages the peak remained February 2011, followed by a gradual downward trend (amid increased volatility) until early 2013, whereafter the downward trend became more pronounced. Of note, the vintages up to March 2015 are all on a higher level and displayed a slightly less pronounced downward trend than the subsequent vintages. This is because the constituent time series of the composite leading business cycle indicator were changed by the SARB in 2015 (SARB, 2015). The earlier vintages included the index representing the prices of all classes of shares trade on the Johannesburg Stock Exchange Limited. Over time, this indicator disconnected somewhat from domestic economic developments and was removed as a component series of the composite leading business cycle indicator in 2015.



In order to gauge how pronounced, pervasive and persistent a specific movement in a composite business cycle indicator is, it is useful to compare the movement to past cycles. Figures 7 to 9 compare the movement in the composite leading business cycle indicator around the November 2013 peak to its movement at previous business cycle peaks in order to gauge whether the leading indicator provided as clear a turning point signal than as it did before previous reference peaks.

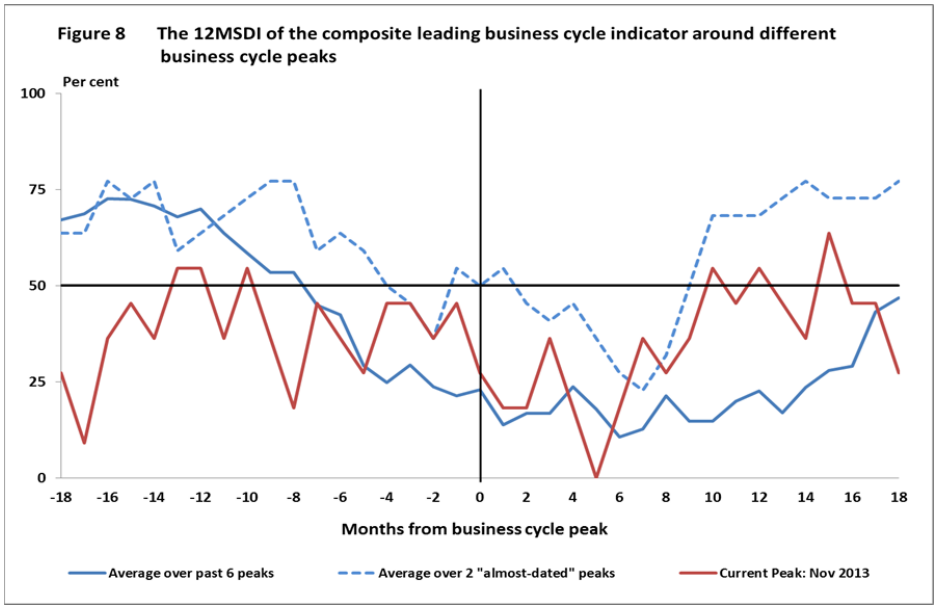
Figure 7 depicts the 6MSAR in the composite leading business cycle indicator around different business cycle peaks; from 18 months before the peaks to 18 months after the peaks. The movement in the 6MSAR around the November 2013 reference peak is compared to the average movement in the 6MSAR at the preceding six reference peaks in the business cycle, as well as to its average movement at the two 'almost-dated' peaks in the early 2000s. Based on the analysis done at the time, and for the purpose of this study, these two 'almost-dated' peaks were chosen as February 2001 and September 2002.



On average, the decline in the 6MSAR was much more pronounced around the previous six reference peaks than around the two 'almost-dated' peaks. Around the November 2013 peak, the 6MSAR remained fairly weak throughout the full 37-month period and dipped below zero much sooner than the average 6MSAR around the preceding six peaks[6]. However, although it remained fairly weak for much longer the 6MSAR did not fall to the same extent around the November 2013 peak than during the preceding six peaks on average. The 6MSAR remained more elevated in general at the two 'almost-dated' peaks than the average of the preceding six peaks as well as around the November 2013 peak. It appears that the decrease in the composite leading business cycle indicator has been slightly less pronounced at the November 2013 reference peak than at the preceding six reference peaks, on average, but the 6MSAR remained weak for much longer, considering that it fell below zero in July 2011 already (not shown in Figure 7).

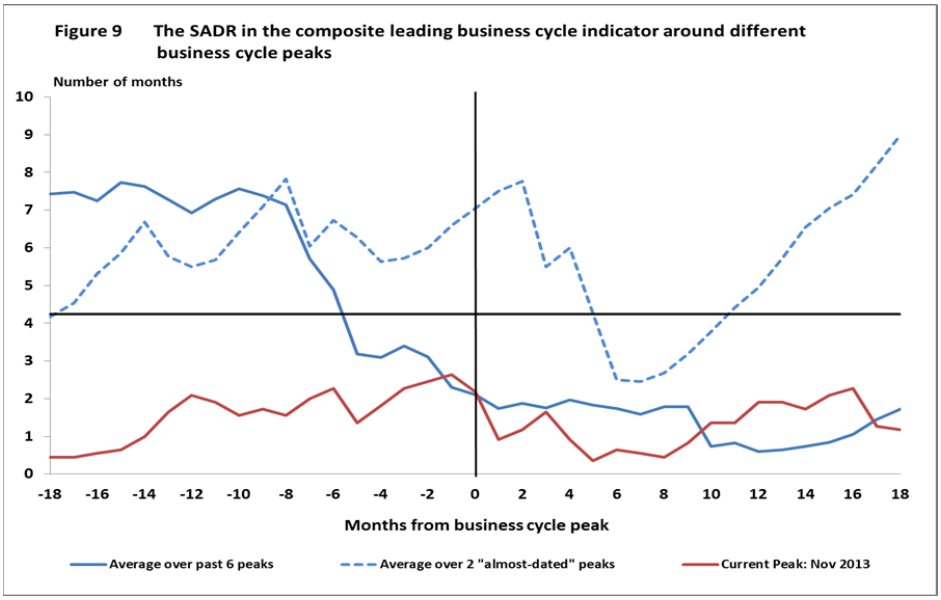
Figure 8 depicts the 12MSDI in the composite leading business cycle indicator around the November 2013 reference peak, the 12MSDI's average movement around the preceding six reference peaks in the business cycle, as well as its average movement at the two 'almost-dated' peaks in the early 2000s.

[6] The 6MSAR in the leading indicator dipped below zero in July 2011 already, and remained below zero in all but two months up to September 2012.



On average, the 12MSDI dropped much quicker and to a much lower level (below 20) around the preceding six reference peaks than around the two 'almost-dated' peaks. Around the November 2013 peak, the 12MSDI remained relatively weak throughout the full 37-month period. Similar to the 6MSAR, the 12MSDI dipped below the neutral 50 level much sooner than the average 12MSDI around the preceding six peaks. Unlike the 6MSAR, however, the 12MSDI did fall to the same extent around the November 2013 peak than during the preceding six peaks, on average, even dipping to zero in one month. The decrease in the composite leading business cycle indicator appears to have been as pervasive around the November 2013 reference peak than at the preceding six reference peaks, on average. In addition, the 12MSDI remained weak for much longer, generally staying below 50 since July 2011 (not shown in Figure 8).

Figure 9 illustrates how persistent the movement in the composite leading business cycle indicator was around selected business cycle peaks. Specifically, it depicts the movement in the SADR of the composite leading business cycle indicator around the November 2013 reference peak, its average movement around the preceding six reference peaks in the business cycle, as well as its average movement at the two 'almost-dated' peaks in the early 2000s.



The SADR's movement around the November 2013 peak appears to resemble its average movement around the preceding six reference peaks fairly closely in terms of the magnitude of the decline. However, similar to the 6MSAR and the 12MSDI, the SADR has been quite weak for much longer around the November 2013 peak, falling below its long-term average in July 2011 (not shown in Figure 9) and remaining well below the average level untill well after the reference peak had been reached. The weakness in the composite leading business cycle indicator has been quite persistent around the November 2013 peak, even more so than the persistent weakness usually observed around business cycle peaks in South Africa.

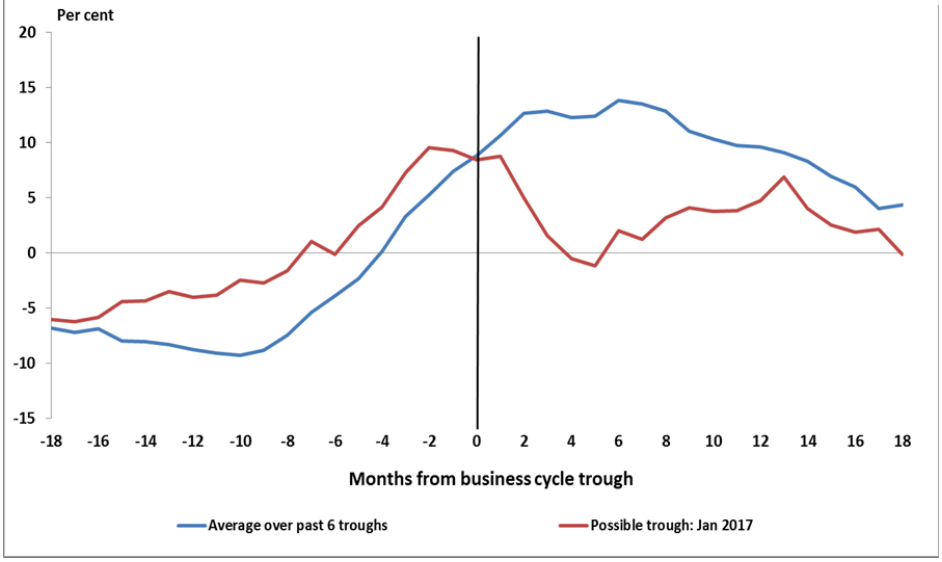
4.3 Assessing the possibility of a subsequent lower business cycle turning point

In this section, the likelihood that a possible trough in the business cycle might have already been reached is analysed. The SARB's composite leading business cycle indicator reached a trough in April 2016 and subsequently increased fairly strongly up to February 2017, suggesting an imminent end to the downward phase in the business cycle, in line with consensus forecasts. The leading indicator then receded for a few months, before resuming its strong upward trend up to February 2018. However, output growth slowed further and South Africa's real GDP contracted in the first quarter of 2017. This was followed by three successive quarters of GDP growth above 2% (quarter-on-quarter annualised), before two more contractions in the first two quarters of 2018 and a sharp contraction in the first quarter of 2019. Although the leading indicator appeared to signal the end of the previous upward phase of the South African business cycle in advance, the continued slowdown in output growth suggest that the leading indicator might have falsely signaled the end of the downward phase.

In order to gauge the reliability of the lower turning point signal the recent movement in the composite leading business cycle indicator is compared to its movement around the preceding six reference troughs in the business cycle. In particular, the movement is compared in terms of how pronounced, how pervasive and how persistent (the three Ps) it has been relative to its average movement around the preceding six reference troughs. Since the composite leading business cycle indicator reached a lower turning point in April 2016 and its median lead time over the previous six reference troughs was nine months, the most recent possible reference turning point was chosen as January 2017, nine months after the trough in the leading indicator.

Figure 10 shows the 6MSAR in the composite leading business cycle indicator around different business cycle troughs; from 18 months before the troughs to 18 months after the troughs. The movement in the 6MSAR around the possible January 2017 reference trough is compared to the average movement in the 6MSAR around the preceding six reference troughs in the business cycle.

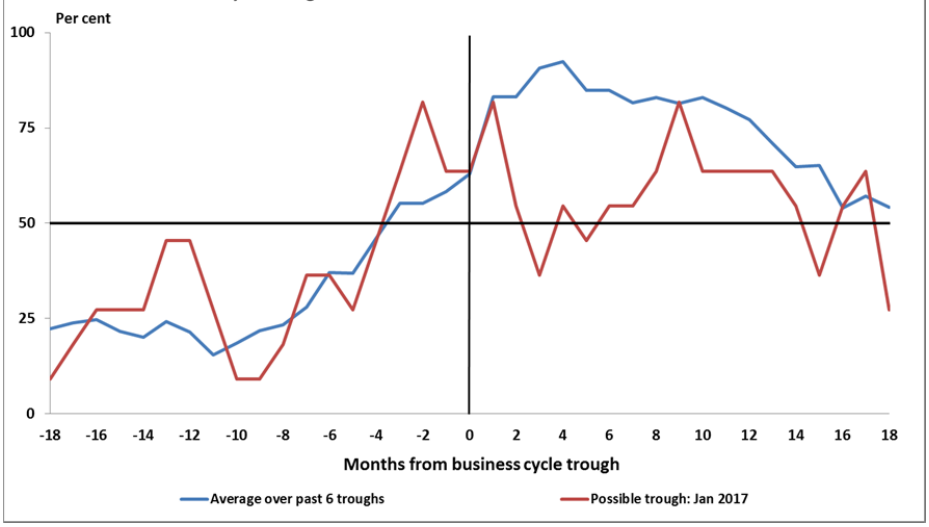
Figure 10 The 6MSAR in the composite leading business cycle indicator around different business cycle troughs



The movement in the 6MSAR prior to the possible January 2017 trough was very similar to the 6MSAR's average movement before the previous six reference troughs, suggesting that the composite leading business cycle indicator's most recent lower turning point signal was similar to previous troughs in terms of how pronounced it was. However, unlike its average movement around previous troughs, the 6MSAR slowed to below 0% five months after January 2017, before accelerating gradually once more in subsequent months, though remaining fairly weak. It appears that the initial pronounced signal of a lower turning point in the business cycle was interrupted for a few months, before tentatively returning and then subsiding again.

Figure 11 depicts the 12MSDI of the composite leading business cycle indicator's component series around the possible January 2017 reference trough, together with the 12MSDI's average movement around the previous six reference troughs in the business cycle.

Figure 11 The 12MSDI of the composite leading business cycle indicator around different business cycle troughs

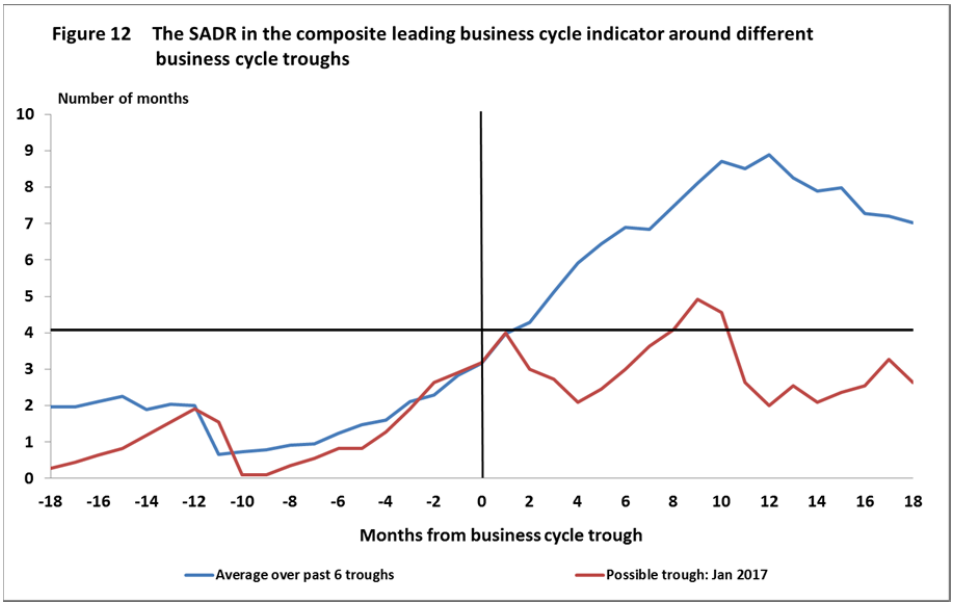


As was the case for the 6MSAR, the 12MSDI behaved in much the same manner prior to the possible January 2017 trough than before the previous six reference troughs on average. The 12MSDI broke through the neutral 50 level three months before the possible January 2017 trough, as it did before the previous six reference troughs on average. Yet, shortly after the possible January 2017 trough the 12MSDI fell back below 50, unlike the average for the previous six reference troughs, before breaking through the 50 level anew six months after January 2017. However, in subsequent months, the 12MSDI gradually receded to around the 50 level again. The increase in the composite leading business cycle indicator appears to have initially been as pervasive around the possible January 2017 reference trough as at the previous six reference troughs on average. However, the initial pervasive signal of a possible reference turning point in January 2017 became much weaker shortly after the prospective Janaury 2017 lower turning point, recovered in subsequent months, and then became weaker again.

Figure 12 illustrates how persistent (measured by the SADR) the movement in the composite leading business cycle indicator was around the possible Janauary 2017 business cycle trough and around the previous six reference troughs on average. The SADR's movement prior to the possible January 2017 trough resembles its average movement around the preceding six reference troughs fairly closely. However, after reaching its long-term average of 4.08 months in February 2017 the SADR fell back in the subsequent three months. The SADR only broke through it's long-term average in October 2017 – much later than it did after the six previous

reference troughs on average – and only for three months, before receding again in subsequent months. The SADR suggests that although the initial signal of a possible lower turning point in the business cycle was equally persistent to that before previous reference troughs, its persistence has not increased to the same extent than it did after previous reference troughs in the business cycle, reflecting the uncertainty surrounding the timing and strength of the general economic upturn.

Figure 12 The SADR in the composite leading business cycle indicator around different business cycle troughs



5 Conclusion

The upward phase of the South African business cycle that followed the global financial crisis was characterised by a number of structural impairments and fairly volatile economic growth outcomes. As such, consensus forecasts by private-sector economists largely failed to predict the ensuing downward phase of the business cycle that commenced in December 2013. However, the SARB's composite leading business cycle indicator has trended gradually lower since March 2011, suggesting a slowdown in output growth. At the start of 2017, consensus forecasts seemed to predict the end of the downward phase of the business cycle. This was corroborated by a rising trend in the composite leading business cycle indicator after April 2016.

Cyclical analysis of the SARB's composite leading business cycle indicator suggests that the decline in the leading indicator since early 2011 has been slightly less pronounced around the November 2013 reference peak than around previous business cycle peaks. Rather, the leading indicator decreased very gradually, but the downward trend lasted for a number of years. In addition, the decline among the component time series of the composite leading business cycle

indicator was more or less as widely diffused as around previous peaks in the business cycle. Also, the decline in the component series of the composite leading business cycle indicator has been even more persistent than around previous business cycle peaks. These results suggest that the composite leading business cycle indicator did provide a reliable signal that the end of the upward phase of the business cycle was reached, prior to the identification of the November 2013 reference peak.

A similar analysis suggests that the composite leading business cycle indicator initially signaled that the end of the current downward phase of the business cycle may have been reached in a pronounced, pervasive and fairly persistent manner, this time consistent with consensus forecasts. However, the signal soon became much weaker. The disconnect between expectations that a lower turning point in the business cycle might have been reached and a further slowdown in real GDP growth could likely be explained by domestic idiosyncratic factors, notably political developments that led to policy uncertainty which caused a further drop in business and consumer confidence.

Although the composite leading business cycle indicator initially provided a clear signal of a cyclical recovery in the South African economy early in 2017, these exogenous developments appear to have temporarily distorted the signal. However, the composite leading business cycle indicator resumed its upward trend during the second half of 2017, followed by a marked improvement in business and consumer confidence in the first quarter of 2018 after a number of positively perceived domestic political developments. As such, the strength of the lower turning point signal – as measured by the three Ps – improved since mid-2017, with the exception of the persistence indicator. The strength of the lower turning point signal then became weaker again from the end of 2017, reflecting the continued uncertainty around the timing and strength of the business cycle upswing as political developments continued to hamper confidence and deter investment.

By employing the indicator approach to business cycle analysis, specifically in measuring how pronounced, pervasive and persistent movements in a composite leading business cycle indicator and its subcomponents are, and comparing these movements to previous cycles, the reliability of early business cycle turning point signals can be greatly improved.

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