A brief history of business cycle analysis in South Africa

by JC Venter

Introduction

Turning points in the South African business cycle were first published in 1950, for the period 1910 to 1949 (Du Plessis, 1950). The South African Reserve Bank first published reference turning points in the business cycle in 1970 (Smit and van der Walt, 1970). Since then, reference turning points in the business cycle have regularly been determined and published by the South African Reserve Bank in its Quarterly Bulletin. The basis for business cycle analysis at the South African Reserve Bank has always been the approach followed by the NBER in the United States of America.

Determining of reference turning points in the business cycle

As mentioned above, the South African Reserve Bank has been publishing a chronology of reference turning points in the business cycle, starting in 1946, since 1970. From the outset, the South African Reserve Bank has measured business cycles in terms of the growth cycle definition, which represents the fluctuations around the long-term trend of aggregate economic activity, i.e. trend-adjusted cycles.

The reference turning points (peaks and troughs) in the South African business cycle are determined by using a combination of several methods. Firstly, the composite coincident business cycle indicator is analysed. This indicator’s deviation from its long-term trend is used for reference turning point calculation. The construction and components of the coincident indicator will be discussed in the following section.
Secondly, a comprehensive historical diffusion index is calculated. The historical diffusion index may be defined as a measure of the dispersion of the changes in a number of economic time series in a specific period. This index is constructed from a large number of seasonally adjusted time series (previously 230) covering various economic processes such as production, sales, employment and income in different sectors of the economy. The specific turning points of the deviation from trend of every time series is determined. A series is then regarded as decreasing for each period subsequent to a peak, up to and including the following trough and vice versa. The historical diffusion index value for a particular month is then obtained by expressing the number of increasing time series in that month as a percentage of the total number of time series considered. Turning points therefore occur when the index moves through the 50 per cent mark.

Thirdly, a current diffusion index is calculated. This is a comprehensive composite index compiled from the actual month-to-month symmetrical percentage changes in each of the seasonally adjusted time series that was also used to construct the historical diffusion index. The deviation of the current diffusion index from its long-term trend provides a qualitative indication of the cyclical movement in general economic activity. The Phase Average Trend (PAT) method is currently used by the South African Reserve Bank when de-trending time series for business cycle analysis purposes.

Lastly, the identification of a reference turning point is never a purely mechanical exercise. Important economic events and developments occurring near a possible turning point are also appraised in the process of determining the final turning point date.

**The composite coincident business cycle indicator**

The composite coincident business cycle indicator, in stead of real gross domestic product or manufacturing production, is used as the reference series when analysing business cycles in South Africa. The point of departure has
always been the definition of business cycles that was formulated in 1946 by Burns and Mitchell (1946:3) at the NBER. The composite coincident business cycle indicator should reflect aggregate economic activity, encompassing, where possible, aggregate indicators of production, sales, income and employment.

The following five time series are currently included as component time series of the composite coincident business cycle indicator:

- The gross value added at constant prices, excluding agriculture, forestry and fishing.
- The value of wholesale, retail and new vehicle sales at constant prices, weighted according to their respective contributions to gross domestic product.
- The utilisation of production capacity in the manufacturing sector.
- Total formal non-agricultural employment, and
- An industrial production index, comprising the physical volume of manufacturing production, the physical volume of mining production and electricity generated, weighted according to each sector’s contribution to gross domestic product.

The methodology used by the South African Reserve Bank to compile composite indices is very similar to that of The Conference Board in the United States of America. The composite coincident business cycle indicator and the chronology of growth cycle phases determined by the South African Reserve Bank is presented in Graph 1.
The composite leading business cycle indicator

The South African Reserve Bank first compiled its composite leading business cycle indicators in 1983 (Van der Walt, 1983). Various factors, such as structural changes in the economy, the identification of new economic indicators or the discontinuation of existing indicators, have necessitated the frequent reassessment of the component time series of the composite leading business cycle indicators.

The component time series of the composite business cycle indicators were last revised in 2004 (Venter and Pretorius, 2004). Prospective component time series were evaluated according to the following six criteria:
- the economic significance of the process represented by the indicator,
- the statistical adequacy of the data,
- the historical conformity to and timing relationship with the business cycle,
- the smoothness of the time series, and
- the timeliness of the data.
The composite leading business cycle indicators currently comprises of the following 13 component time series:

- Opinion survey of the volume of orders in manufacturing,
- Opinion survey of stocks in relation to demand (manufacturing & trade),
- Opinion survey of business confidence (manufacturing, construction & trade),
- Opinion survey of the average hours worked per factory in the manufacturing sector,
- Composite leading business cycle indicator of major trading-partner countries (percentage change over 12 months),
- Commodity prices in US dollars for a basket of South African export commodities (six month smoothed growth rate),
- Real M1 money supply (six month smoothed growth rate),
- Prices of all classes of shares (six month smoothed growth rate),
- Number of residential building plans passed for flats, townhouses and houses larger than 80m²,
- Interest rate spread: 10-year government bonds less 91-day Treasury bills,
- Gross operating surplus as a percentage of gross domestic product,
- Labour productivity in manufacturing (six month smoothed growth rate), and
- Job advertisement space in the Sunday Times newspaper (six month smoothed growth rate),

The composite leading business cycle indicator has consistently lead growth cycle turning points in the South African economy. The leading indicator is depicted in Graph 2, whilst the average and median lead times of the indicator are shown in Table 1.
Graph 2: The composite leading business cycle indicator

Shaded areas represent growth cycle downturns

Table 1: Timing relationship of the composite leading indicator with the reference turning points of the business cycle.

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<th>Peaks</th>
<th>Troughs</th>
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<tr>
<td>Average lead (months)</td>
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<td>6</td>
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<td>Median lead (months)</td>
<td>11</td>
<td>8</td>
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References


