

## Business cycles in South Africa during the period 1999 to 2007

by J C Venter<sup>1</sup>

### Introduction

The South African Reserve Bank (the Bank) has identified reference turning points in the cyclical movement of the economy since 1946. These upper (peaks) and lower (troughs) turning points in the business cycle were discussed in various articles and notes published in earlier issues of the Bank's *Quarterly Bulletin*. The most recently identified trough in the business cycle occurred in August 1999.<sup>2</sup>

The previous two longest upward phases of the business cycle – both lasting 44 months – occurred from September 1961 to April 1965 and from January 1978 to August 1981. The current upward phase, which started in September 1999, surpassed this record in May 2003. Although there were two periods – in 2001 and again in 2003 – when the growth rate of aggregate economic activity briefly moderated, neither of these periods qualified as downward phases of the business cycle.<sup>3</sup>

The purpose of this article is to discuss the determination of a reference peak in the business cycle, following the trough in August 1999. The first section briefly describes the methodology employed by the Bank in determining a reference turning point in the business cycle. This is followed by the statistical results obtained if this methodology is applied to recent data. A brief overview of macroeconomic events and developments between 1999 and 2007 is then presented, followed by a graphic comparison of movements in selected economic indicators during this upward phase and the two previous longest upward phases of the business cycle. Finally, the date of the upper reference turning point is identified.

### Methods used to determine reference turning points in the business cycle

It is important to note that the Bank determines reference turning points in the business cycle in terms of the growth cycle definition of business cycles. Growth cycles represent the fluctuations around the long-term growth trend of aggregate economic activity; so-called trend-adjusted cycles. Therefore, the Bank's business cycle chronology, published regularly in the *Quarterly Bulletin*, represents reference turning-point dates that distinguish between upward phases when the pace of growth in aggregate economic activity exceeded its long-term growth trend, and downward phases when aggregate economic activity either contracted or increased at a slower rate than its long-term growth trend.

The Bank uses a combination of methods to determine whether a reference turning point in the business cycle has occurred. The three *composite business cycle indicators* – leading, coincident and lagging – are continuously analysed. A composite business cycle indicator is compiled by integrating various economic indicators into a single index. The composite leading business cycle indicator currently comprises 12 economic indicators, which have historically preceded turning points in the business cycle. Similarly, 5 economic indicators, which have historically coincided with turning points in the business cycle, form the composite *coincident* business cycle indicator. The composite *lagging* business cycle indicator is calculated by using 7 economic indicators, which have historically followed turning points in the business cycle.

1 The author wishes to thank N Maphalala, A Bosch, N Mahlo and N Phadime for valuable assistance in applying the statistical methods employed during this analysis.

2 Venter, J C and Pretorius, W S. 2001. "A note on the business cycle in South Africa during the period 1997 to 1999". *Quarterly Bulletin*. September. Pretoria: South African Reserve Bank.

3 Venter, J C. 2005. "Reference turning points in the South African business cycle: Recent developments". *Quarterly Bulletin*. September. Pretoria: South African Reserve Bank.

Once the composite indicators point to the likelihood that a turning point in the business cycle has occurred, two comprehensive diffusion indices are calculated. Similar to the calculation of the composite business cycle indicators, the *current diffusion index* is compiled from the actual month-to-month symmetrical percentage changes in each of 186 seasonally adjusted time series. These time series represent economic processes, such as production, sales, employment and investment, in the various sectors of the economy. The deviation of the current diffusion index from its long-term trend provides a proxy for the cyclical movement in aggregate economic activity.

The same 186 time series are used to calculate the *historical diffusion index*, which can be defined as a measure of dispersion of the changes in a number of time series. This index depicts the number of time series that are increasing (relative to each one's long-term trend) as a percentage of the total number of series considered. Therefore, an index value exceeding 50 indicates that the majority of time series considered is increasing in that particular month, implying that the economy is in an upward phase of the business cycle. Following the same logic, an index value below 50 indicates that the economy is in a downward phase of the business cycle. In the construction of both the current and historical diffusion indices, the sectoral contributions are weighted according to each sector's contribution to gross value added.

Despite the invaluable information the composite and diffusion indices provide, a reference turning point in the business cycle is never determined as the result of a purely statistical exercise, since these methods seldom all point to exactly the same turning point date. Consequently, various other macroeconomic indicators, together with significant economic events and developments occurring near a possible turning point, must be considered in order to identify the reference turning point date finally.

## Statistical results

When the statistical methods as described are applied, the results confirm that a definite upward phase of the business cycle commenced subsequent to the most recent trough in August 1999. The results also indicate two brief periods of weaker expansion – during 2001 and again during 2003 – followed by four years of exceptional economic growth. Furthermore, the analysis provides evidence that a reference peak in the business cycle has already occurred.

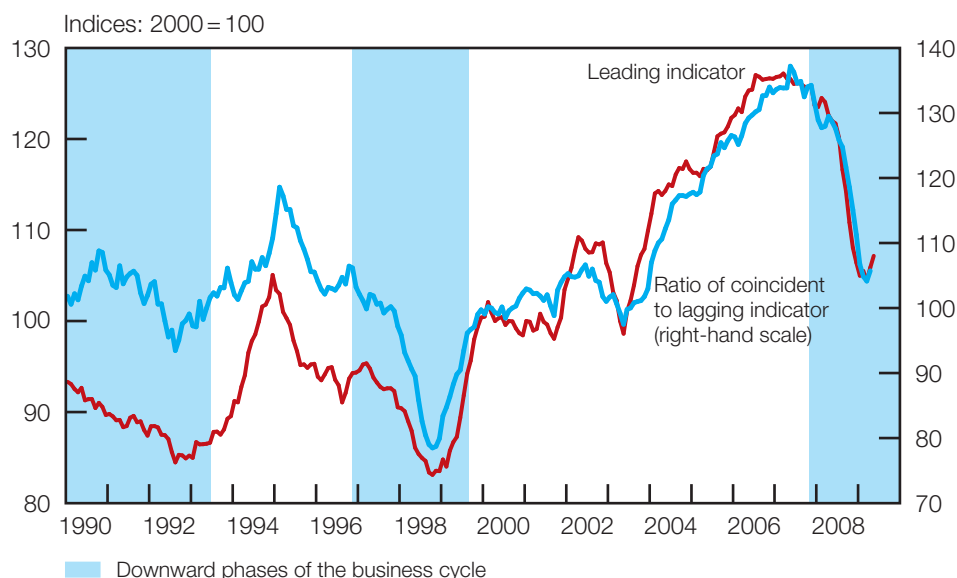
### The composite business cycle indicators

The composite leading business cycle indicator reached a lower turning point in October 1998, ten months before the most recent business cycle trough. The leading indicator then increased significantly before reaching a peak in February 2000, whereafter it followed a moderate downward trend up to September 2001. After another steep increase, the indicator again reached a peak in April 2002, decreasing abruptly until May 2003. Hereafter, the indicator rose markedly up to July 2006 and then moderated somewhat before reaching its most recent peak in March 2007. The leading indicator has since decreased significantly. Based on its historical relationship with the business cycle, the leading indicator pointed to a possible peak in the business cycle towards the end of 2007 or early in 2008.

The ratio of the composite coincident business cycle indicator relative to the composite lagging business cycle indicator serves as an additional leading indicator of the business cycle.<sup>4</sup> As depicted in Graph 1, the movements in this ratio were quite similar to those in the composite leading business cycle indicator, with the ratio peaking in May 2007; two months after the peak in the leading indicator.

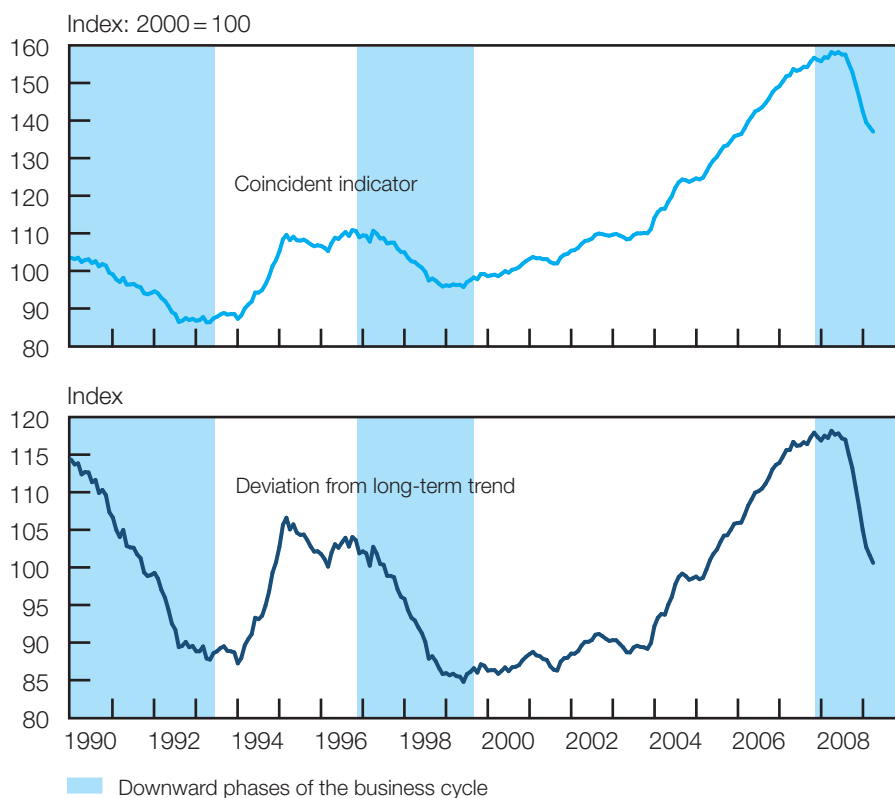
4 Venter, J.C. 2004. "Note on the revision and significance of the composite lagging business cycle indicator". *Quarterly Bulletin*. December. Pretoria: South African Reserve Bank.

**Graph 1 Composite leading business cycle indicators**



The composite coincident business cycle indicator – expressed as the deviation from its long-term trend – reached a lower turning point in June 1999, followed by a protracted upward movement. Initially, this upward trend was fairly moderate, with a number of brief interruptions – notably in 2001 and 2003. Since the beginning of 2004, the rising medium-term trend in the coincident indicator had become much more pronounced, as the economy expanded at a brisk pace. The indicator moderated somewhat during 2007 and reached its most recent peak in April 2008. The composite coincident business cycle indicator and the deviation from its long-term trend are shown in Graph 2.

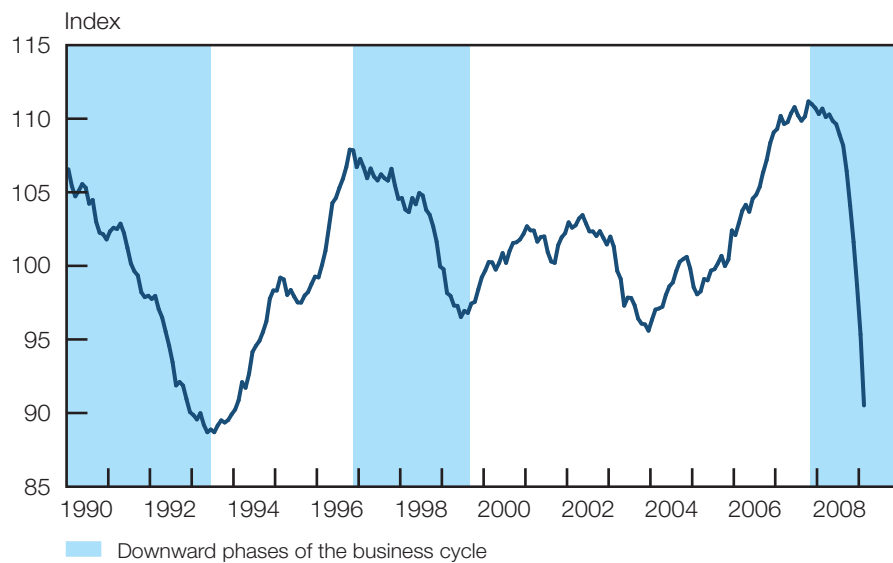
**Graph 2 Composite coincident business cycle indicator**



### The current diffusion index

The deviation of the current diffusion index from its long-term trend reached a lower turning point in June 1999. Graph 3 shows that the indicator then increased steadily during the remainder of 1999 and 2000, before falling back somewhat in 2001. Following another brief period of increase, the trend-adjusted current diffusion index displayed a rather pronounced drop from the second half of 2002 to the end of 2003. The decline in the deviation-from-trend indicator was exaggerated somewhat by the steep rise in the index from 2004 onwards. This steep rise resulted in a probable overestimation of the trend rate of growth during 2003, thereby over-accentuating the downward movement in the current diffusion index's deviation from its long-term trend during that period. After increasing significantly for a period of almost four years, the indicator reached a peak in October 2007, followed by a striking decline.

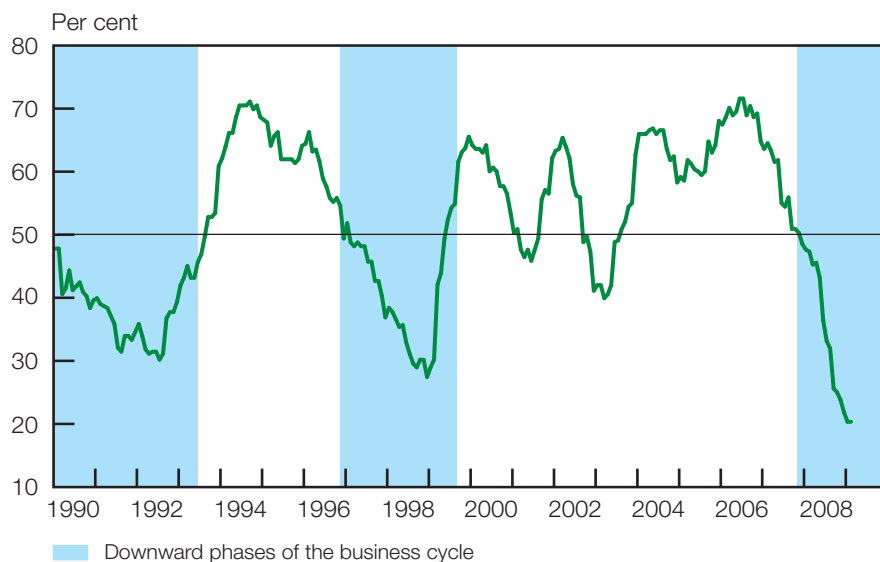
**Graph 3** Current diffusion index (deviation from long-term trend)



### The historical diffusion index

The historical diffusion index (depicted in Graph 4) rose above 50 per cent in June 1999, indicating that an upward phase in the business cycle had commenced. The number of

**Graph 4** Historical diffusion index



economic time series that were decreasing (relative to their respective long-term trends) briefly outnumbered those increasing in 2001, and again between 2002 and 2003. The historical diffusion index then remained above the 50 per cent mark until November 2007, whereafter it declined notably to around 20 per cent – suggesting that a peak in the business cycle had been reached.

## Macroeconomic events and developments

During most of 1999 the downward phase of the business cycle, which was exacerbated by the Asian financial crisis, continued, but then started to give way to a recovery in general economic activity, with the South African economy entering an upward phase of the business cycle in September 1999.

This record-length upward phase of the business cycle may readily be divided into two distinct periods. The earlier part of the recovery – from 1999 to 2003 – was characterised by a fairly moderate expansion in aggregate economic activity, occasionally interrupted by brief retardations in the growth rate of general economic activity that threatened to end the upward phase prematurely. The latter part of the upward phase represented a period of exceptional economic expansion, characterised by unprecedented growth in certain sectors of the economy, alongside extraordinary increases in the prices of commodities and most asset classes.

Demand for South African exports was spurred on by brisk economic activity in most of South Africa's major trading-partner countries during 1999 and 2000, with local manufacturing production subsequently responding favourably from the second half of 1999. The export-led recovery in domestic output growth was aided further by a pick-up in international commodity prices over the period. Initially, the cyclical recovery was also supported by sturdy growth in agricultural output.

World economic activity decelerated noticeably during 2001, mainly as a consequence of developments in the United States (US), where a mild recession occurred. This resulted in a sharp global contraction in investment spending, particularly in computing and electronics equipment. The bursting of this so-called dot-com bubble initially affected exports from Asia and then spread to commodity-producing economies, such as South Africa. Although the weaker international demand conditions caused domestic output growth to decelerate somewhat during 2001, export volumes held up fairly well, supported by improved price competitiveness of domestic producers brought about by a sustained depreciation in the exchange rate of the rand since the start of 2000. With the slowdown in global economic growth fairly short-lived, domestic output growth once again accelerated from the fourth quarter of 2001 and throughout 2002.

Consumption expenditure by households had expanded at a fairly rapid pace since the second half of 1999. A marked reduction in lending rates in the aftermath of the Asian financial crisis significantly reduced the debt-financing cost of households, boosting expenditure on durable and semi-durable goods in particular. In the face of the slowdown in global economic growth in 2001, domestic final demand showed remarkable resilience. Consumption expenditure by government and households increased at a lively pace, which continued throughout 2002, the latter underpinned by further reductions in lending rates during 2001.

The slowdown in world output growth in 2001 caused international crude oil prices to decline meaningfully during that year. As a result, consumer price inflation briefly declined to slightly less than 6 per cent during the third quarter of 2001. However, consumer price inflation picked up notably throughout 2002, due to an increase in international crude oil

prices, rising food prices and, in particular, imported goods prices following the marked depreciation in the exchange rate of the rand in the second half of 2001. These observed inflationary pressures prompted a cumulative increase of 400 basis points in the Bank's repurchase rate in 2002.

Even though the recovery in general economic activity began in the third quarter of 1999, the South African economy failed to create significant formal-sector employment opportunities until the fourth quarter of 2001. This resulted partly from continued pressure on domestic producers to become more competitive in the global market and a shift in the domestic economy to become more capital-intensive. However, the decline in formal-sector employment may have been exacerbated by the under-measurement of employment numbers in certain services sectors, where employment opportunities were, in fact, created.

Early in the recovery, the national government continued to consolidate the fiscal position and to manage public finances prudently. As a result, government expenditure initially grew at a very moderate pace, before accelerating from 2002 onwards. During the first four fiscal years of the upward phase of the business cycle, continued improvements in the efficiency of tax collection and a broadening of the tax base resulted in consistently higher-than-budgeted revenue collections by government. This enabled government to embark gradually on a more expansionary fiscal policy stance later on in the upward phase, targeted at improved social service delivery, expanded public works programmes and the extension of the social safety net in the form of various grants.

Lacklustre international economic growth, particularly in the euro area, led to diminishing demand for South African exports during 2002 and the first half of 2003. The decline in domestic export volumes was aggravated by the considerable appreciation in the exchange rate of the rand from January 2002 onwards, resulting in pressure on the international price competitiveness of South African exporters. These developments contributed towards a slowdown in the growth rate of gross domestic product, with output in the manufacturing sector actually contracting in 2003.

Contrary to the supply side of the economy, the significant appreciation in the exchange value of the rand kept aggregate demand fairly buoyant throughout 2003. Notable declines in the prices of imported goods resulted in a considerable deceleration in overall consumer price inflation, enabling lending rates to be lowered by a cumulative 550 basis points in 2003. This underpinned demand, with all the components of gross domestic expenditure recording healthy growth rates during the year.

From about the second half of 2003, the global economy gathered momentum and continued to grow briskly until 2007. This period was characterised by a number of factors, which included the continued and rapid rise in international commodity prices, notably crude oil prices; and rapid economic growth in most emerging-market economies, particularly in China, India and other Asian countries. This was accompanied by widening current-account imbalances in a number of countries. Furthermore, consumer price inflation moderated worldwide, resulting in a fairly accommodative monetary policy stance globally. In addition, marked increases were recorded in the international prices of most assets, especially those of shares, bonds and residential property.

Against the backdrop of these developments, the South African economy shifted gear early in 2004 and set off on an elevated growth path. During the four years up to 2007, gross domestic product increased at an annual average rate in excess of 5 per cent. The services sector performed exceptionally well throughout this period, reflecting the strength of domestic expenditure. Strong demand for residential and non-residential



buildings, as well as a number of infrastructure development projects, led to the construction sector registering double-digit growth rates throughout this four-year period. Manufacturing output expanded due to robust global and domestic demand. Despite an extraordinary rise in international commodity prices during the latter part of the upswing – driven by strong demand from China, India and other Asian countries – the overall volume of mining production remained disappointingly subdued.

Growth in real gross domestic expenditure continued to outpace that in real gross domestic production. All the components of domestic final demand increased at a brisk pace between 2004 and 2007. The real disposable income of households increased rapidly over this period, augmented by continued tax relief, employment gains, subdued consumer price inflation and further interest rate reductions. Household consumption expenditure increased apace, particularly spending on imported goods, as the sustained appreciation in the exchange rate of the rand resulted in cheaper imported goods. Between 2004 and 2006, new vehicle sales expanded vigorously. Growth in real fixed capital formation generally outpaced the other components of final expenditure. This robust growth was widely dispersed, with both the public and private sectors increasing their capital expenditure over a range of sectors due to necessary infrastructure development and the expansion of production capacity.

Since 2002, growth in the volume of imports has consistently outpaced growth in the volume of exports, resulting in a continuous deterioration of the deficit on the current account of the balance of payments. This was exacerbated by the appreciation in the exchange rate of the rand, South Africa's high propensity to import consumer goods, and increased imports of capital goods related to the boom in fixed capital formation.

The strong growth in expenditure was accompanied by rapidly rising debt levels, as households' debt relative to their disposable income reached a new record high in each successive quarter from the middle of 2005 onwards. Debt was mainly incurred in order to purchase durable consumer goods and real estate. The steep upward trend in the prices of residential property and other financial assets created strong wealth effects. Since the second half of 2004, credit extension has increased markedly, spearheaded by vigorous growth in mortgage advances. Despite the robust credit growth, households' debt-service cost relative to their disposable income remained fairly well contained, on account of lower interest rates.

The sharp depreciation in the exchange rate of the rand from May 2006, and sustained high and rising international crude oil prices, together with sharply rising international food prices, caused consumer price inflation to accelerate from about the middle of that year. As a result, interest rates were gradually raised from the middle of 2006 up to about the middle of 2008. Growth in household consumption expenditure slowed in each successive quarter from the fourth quarter of 2006. Real retail trade sales reached a plateau in 2006, while new vehicle sales contracted sharply during 2007 and 2008 as demand from heavily indebted consumers ceased abruptly.

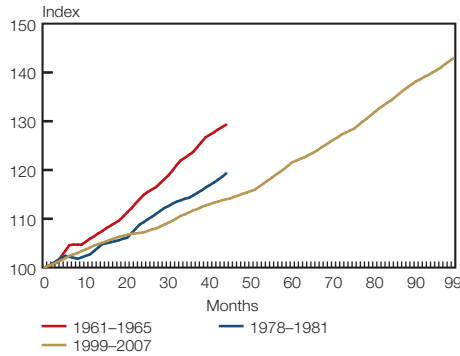
During the third quarter of 2007 widespread concerns developed around the risky sub-prime segment of the mortgage market in the US. This led to a loss of confidence and a severe reduction of liquidity in global credit markets, causing the re-pricing of risk globally. Despite these developments, growth in real gross domestic product remained fairly buoyant throughout 2007, but started to decelerate from the first quarter of 2008 as global and domestic demand waned. However, the poor output growth registered in the first quarter of 2008 was exaggerated by electricity-supply disruptions impacting heavily on the mining and manufacturing sectors in particular. Growth in virtually all the sectors of the economy receded sharply throughout 2008 and into 2009, indicating that the upward phase of the business cycle had come to an end.

## Upward phase comparison

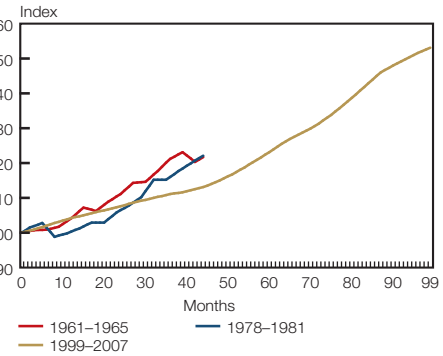
Graph 5 shows the movements of selected economic indicators during the most recent upward phase of the business cycle, as well as during the previous two longest upward phases on record, subject to data availability. For each indicator, the data were indexed to set the trough-month equal to one hundred.

Graph 5 Upward phase comparison of selected economic indicators

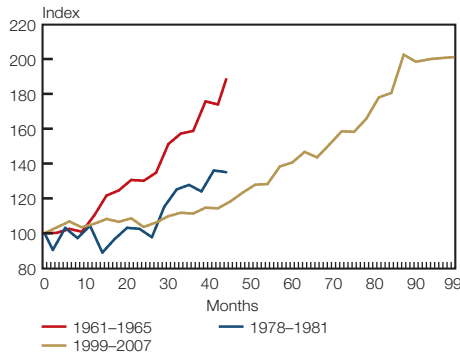
Real gross value added excluding agriculture



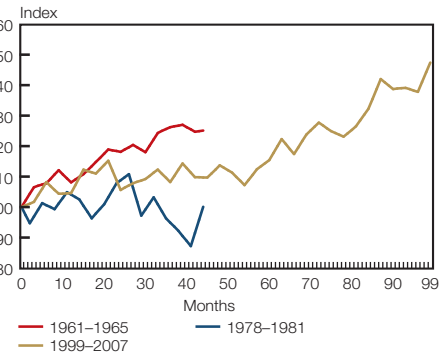
Real final consumption expenditure by households



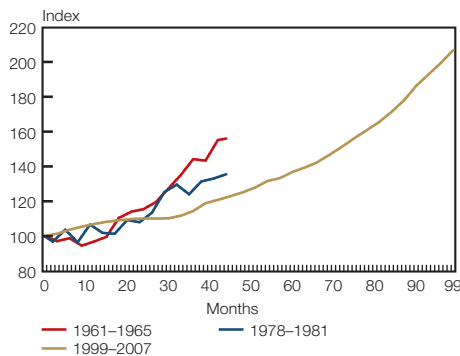
Volume of imports of goods and services



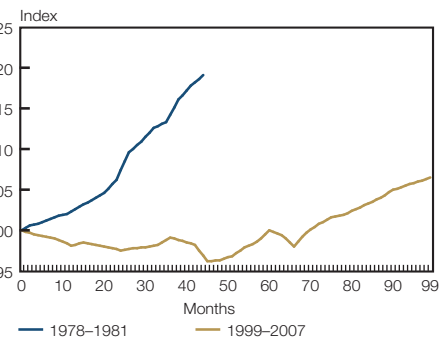
Volume of exports of goods and services



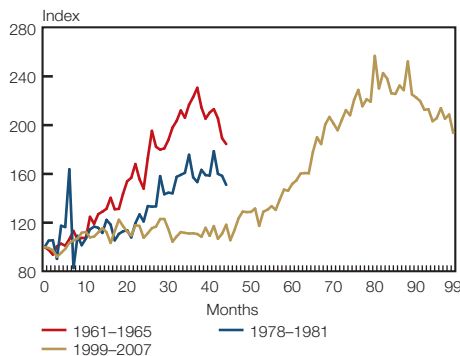
Real gross fixed capital formation



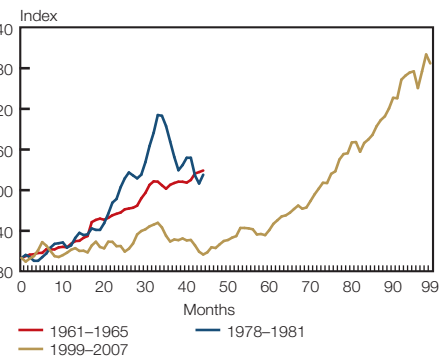
Total formal non-agricultural employment



New vehicle sales



Prices of all classes of shares





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## Conclusion

With household debt at record-high levels, accelerating consumer price inflation and a concomitant rise in lending rates, consumer demand petered out during 2007. Similarly, rising global inflation and high debt levels in most developed countries resulted in a slowdown in global demand. Developments in global credit markets further tainted the outlook for world output growth.

The statistical results show that the composite leading business cycle indicator reached an upper turning point in March 2007, whereafter it has followed a sustained downward trend. The composite coincident business cycle indicator lost momentum throughout 2007 and the deviation from its long-term trend peaked in April 2008. The deviation of the current diffusion index from its long-term trend reached a peak in October 2007. The historical diffusion index indicated an upper turning point in the business cycle one month later in November 2007.

After all the available information had been duly considered, the final reference date for the upper turning point in the South African business cycle was established as November 2007, with the most recent upward phase of the business cycle lasting a record 99 months.