Introduction:

The business cycle approach for analysis of economic indicators, which owes its origin to the pioneering work by the National Bureau of Economic Research has received considerable attention in the Indian context. There has been a fairly long history of research on business cycles on the Indian economy. The studies span the different approaches viz., the classical business cycle, growth cycle and growth rate cycle.

The classical business cycles are identified as recurrent, alternating phases of expansion and contraction in a large number of economic activities such as output, consumption, prices, investment, employment, etc. The cycles are characterized by co-movements in the fluctuations of the economic activities, with periodicities larger than one year. The concept of growth cycles can be defined in terms of the deviations of the actual growth rate from the long-term growth rate. On the other hand, the growth rate cycles refer to the cyclical changes in the growth rate of economic activity.

The leading indicator approach for analysis of business cycles and growth cycles gained prominence since the 1970s with growing interest in detection of early signals of recession and recovery. In this approach, usually variables such as industrial production, manufacturing output, etc., for which high frequency, and long time series data are available, are used as reference series and other indicator series exhibiting co-movements (lead, co-incident or lag) are used for turning point detection, as forecasting tools for growth predictions, etc. The contemporary framework of business cycle analysis and leading indicator approach can be summarized into the following tasks:

(i) Identify reference series and its cyclical chronology
(ii) Identify potential leading, coincident and lagging economic indicators (for the reference series)
(iii) Select the economic indicators in different categories after assessing their suitability
(iv) Construct composite leading indicator (CLI)
(v) Forecast reference series using CLI and evaluate forecasts

2. Highlights of Indian experience

Some highlights of the Indian experience in the business cycle analysis are presented here in the above perspective.

Chitre, in a series of studies starting from the early eighties, presented evidence of synchronous movements in respect of a large number key economic processes including non-agricultural NNP, industrial production, capital formation, money stock, bank credit, etc. Chitre (1982) identified 15 indicators of growth cycles in India and constructed diffusion index and a composite index of these indicators and on the basis of these, characterized the Indian economy as having passed through five growth cycles in the overall economic activity during the period from 1951 to 1975.

Coincident indicators for the Indian economy were identified by Nakamura (1991) using Net national product as the reference series. Around this period, there have been several other studies to examine the causes of various phases of growth and their linkages with productivity.

Gangopadhyay and Wadhwa (1997) studied the monthly data on index of industrial production for 1975 – 1995 for obtaining the chronology of Indian business cycles. Hatekar (1994) studied the historical paths and co-movements of annual time series data on Indian economy for the period 1951 to 1985 after de-trending based on H-P filter.

Dua and Banerji (1999) have used the classical NBER approach to determine the dates of Indian business cycles and growth rate cycles and have reported six business cycle recessions in the Indian economy as given below:

- November 1964 to November 1965
- April 1966 to April 1967
- June 1972 to May 1973
It has also been observed that Indian business cycles have averaged over six years in length, with recessions averaging just less than a year and expansions just over five years. The Indian growth rate cycles were reported as follows:

<table>
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<tr>
<th>February 1962 to November 1962</th>
<th>April 1982 to November 1983</th>
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<tr>
<td>November 1963 to November 1965</td>
<td>August 1984 to October 1987</td>
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<tr>
<td>February 1976 to December 1979</td>
<td>April 1992 to October 1993</td>
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In a subsequent paper (2001), they have identified leading indicators and constructed a CLI index designed to anticipate business cycle and growth rate cycle upturns and downturns. However, the component series are not published in the above study.

Chitre (2001) studied the business cycles in India for the period 1951-1982 and, inter-alia, presented a selected list of leading, coincident and lagging indicators (at peaks and at troughs) and the turning points and the diffusion index for the indices. Some of the selected leading indicators are production of iron and aluminum, electricity generation, cheque clearances, etc.

Mall (1999) studied the cyclical behaviour of output variables such as real GDP, non-agricultural GDP, GDP from manufacturing, trade; IIP, index of sales of private corporate sector, etc. and has concluded that non-agricultural GDP can be taken as a reference series for tracking business cycles in India. Using spectral analysis method, he has constructed a composite index of leading indicators to forecast cyclical movements in IIP from manufacturing sector.
A Working Group of the Reserve Bank of India (2002) on economic Indicators in 2001 examined the information base for the analysis of business cycles and explored the leading indicators approach for study of business cycles and forecasting. It has been observed that business cycle analysis is of paramount importance in view of changing structure of Indian economy, with more and more activities being channelised through the organised business sector and the information base on business cycle indicators need to be strengthened. It has been suggested that while the quarterly time series of non-agricultural GDP can be considered as the main reference series. There are several important considerations behind this. First, agriculture is often excluded in the traditional business cycle analysis in view of its dependence on weather, rainfall, etc. and the relatively low inter-play of market forces in determining their levels. Second – the shift in the composition of Indian GDP with declining share of agriculture and industry. Third, movements in the cyclical components of major output variables in the non-agricultural sector are closely related and among these, non-agricultural GDP has maximum coverage. It has also been observed that Indian economy is continually evolving and far too complex to be summarized in a single reference series. As such there is a need to identify other series also for determining reference cycle turning points. Considering the IIP as the reference series, six series viz., Narrow money (M1), Non-food credit, WPI-raw materials, Production of coal and aluminium, and rail good traffic originated have been identified as leading indicators and the composite index has been constructed based on principal component analysis.

In a recent study, Mohanty et al (2003) attempted dating of business cycles in India based on Bry-Boschan procedure and have identified 13 growth cycles of varying duration from 1970-71 to 2001-02. They have reported that average duration of recessions is higher at 16 months as compared to expansions with average duration of 12 months and the average of the cycles is 27 months.

Some Issues
Given the above glimpse of the Indian experience in business cycle analysis, some important issues that require attention by the researchers in the Indian context can be broadly summarized as under:

(i) While empirical studies have been conducted using the available database of annual series, there has been a constraint of availability of long time series data of frequency less than one year, preferably monthly or quarterly frequency, which would facilitate research for construction of robust estimates of the business cycles and testing of the theories. For the same reason, a number of business cycle indicators used in developed economies are not being used as information variables in India. These include quarterly estimates of GDP and its components, private final consumption expenditure, capacity utilization, employment statistics, etc., to name a few. The data gap needs to be addressed.

(ii) In Indian context, a single reference series may not be adequate to summarise the business cycles in India. Therefore, there is a need to find other indicators in addition to the main reference series, which together can be expected to yield a more satisfactory description of the business cycles.

(iii) Research on business cycles in India has been mostly confined to empirical investigations. There is a need for theoretical research for a better understanding of the complexities in Indian context.

Conclusion

There has been considerable interest and a number of studies in business cycles in Indian economy. Keeping in view the need for and availability of long time series data with high frequency, IIP is often chosen as the reference series in Indian studies. Notwithstanding the present limitations of availability of long time series of monthly/quarterly data of output indicators with wider coverage, the research is ongoing
in the quest of characterizing the business cycles, identifying appropriate indicators and construction of composite indicators based on latest methodologies.

References


Jaya Mohanty, Bhupal Singh and Rajeev Jain (2003), Business Cycles and Leading Indicators of Industrial Activity in India.