Business Cycles in India

Pami Dua
Email: dua@econdse.org

Delhi School of Economics
University of Delhi

Anirvan Banerji
Email: anirvan@businesscycle.com

Director of Research
Economic Cycle Research Institute

Working Paper No. 146

Business Cycles in India

Pami Dua,
Professor, Department of Economics, Delhi School of Economics
and Senior Research Scholar, Economic Cycle Research Institute, New York
and
Anirvan Banerji
Director of Research, Economic Cycle Research Institute

This paper describes business and growth rate cycles with special reference to the Indian economy. It uses the classical NBER approach to determine the timing of recessions and expansions in the Indian economy, as well as the chronology of growth rate cycles, viz., the timing of speedups and slowdowns in economic growth. The reference chronology for business as well as growth rate cycles is determined on the basis of the consensus of key coincident indicators of the Indian economy, along with a composite coincident index comprised of those indicators, which tracks fluctuations in current economic activity. Finally, it describes the performance of the leading index – a composite index of leading economic indicators, designed to anticipate business cycle and growth rate cycle upturns and downturns.

Business Cycles, Growth Cycles, Growth Rate Cycles

Economic cycles are characteristic features of market-oriented economies – whether in the form of the alternating expansions and contractions that characterise a classical business cycle, or the alternating speedups and slowdowns that mark cycles in growth. With the progress of the liberalisation process in India, which has transformed it into more of a market-driven economy, such cycles are destined to become prominent features of the economic landscape.

The National Bureau of Economic Research (NBER), founded in New York in 1920, pioneered research into understanding the repetitive sequences that underlie business cycles. Wesley C. Mitchell, one of its founders, first established a working definition of the business cycle that he, along with Arthur F. Burns (1946), later characterised as follows:

"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 similarly general recessions, contractions and revivals which merge into the expansion phase of the next cycle; this sequence of changes 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."

This definition of the business cycle does not make explicit the notion of 'aggregate economic activity', leading some to argue in recent years that a satisfactory proxy for this concept is a country's GDP, which is, after all, about as aggregate a measure of output as possible. On this narrow, output-based view, if one had available a monthly estimate of GDP, then its peaks and troughs would be all that would be needed to determine the peak and trough dates for the business cycle.

But Geoffrey H. Moore, who worked closely with Mitchell and Burns at the NBER, noted (1982) that "No single measure of aggregate economic activity is called for in the definition because several such measures appear relevant to the problem,

including output, employment, income and [wholesale and retail] trade… Virtually all economic statistics are subject to error, and hence are often revised. Use of several measures necessitates an effort to determine what is the consensus among them, but it avoids some of the arbitrariness of deciding upon a single measure that perforce could be used only for a limited time with results that would be subject to revision every time the measure was revised." Basically, both on the basis of the meaning of aggregate economic activity and issues of revision and measurement error, he advocated the determination of business cycle dates based on multiple measures. This approach is, in fact, the basis of the determination of the official U.S. business cycle dates by the NBER, and of international business cycle dates by the Economic Cycle Research Institute (ECRI), founded by Moore.

What is a recession?

In this context, it is important to understand something of the mechanism that drives a business cycle. A recession occurs when a decline – however initiated or instigated – occurs in some measure of aggregate economic activity and causes cascading declines in the other key measures of activity. Thus, when a dip in sales causes a drop in production, triggering declines in employment and income, which in turn feed back into a further fall in sales, a vicious cycle results and a recession ensues. This domino effect of the transmission of economic weakness from sales to output to employment to income, feeding back into further weakness in all of these measures in turn, is what characterizes a recessionary downturn.

At some point, the vicious cycle is broken and an analogous self-reinforcing virtuous cycle begins, with increases in output, employment, income and sales feeding into each other. That is the hallmark of a business cycle recovery. The transition points between the vicious and virtuous cycles mark the start and end dates of recessions.

Under the circumstances, it is logical to base the choice of recession start and end dates not on output or employment in isolation, but on the consensus of the dates when output, income, employment and sales reach their respective turning points. To do any less is to do scant justice to the complexity of the phenomenon known as the business cycle (Layton and Banerji, 2004).

That is also why a decline in GDP alone, when it does not trigger the characteristic vicious cycle of falling employment, income and sales, does not constitute a recession. Similarly, that is why a transient rise in GDP that does not ignite a self-reinforcing recovery in employment, income and sales may be part of a "double-dip recession", but does not qualify as a new expansion.

However, because of its simplicity, two consecutive quarterly declines in GDP has become perhaps the most popular rule for determining the onset of recession. Yet, the use of such a rule may produce quite a nonsensical set of business cycle dates. One could well imagine a period of depressed economic activity associated with falling output and employment and with unemployment climbing, but with two clear quarterly declines in GDP happening to have a modestly positive intervening quarter. Similarly, to automatically conclude that a country was in recession simply because of two minutely negative quarterly growth rates in GDP – particularly if they occurred simply because they followed on from one or two quarters of unusually strong quarterly growth – seems just as misguided. In the Indian case, quarterly GDP data were not available until the late 1990s, so it would be difficult in any case to base the historical business cycle dates on such a rule.

The above discussion describes classical business cycles that measure the ups and downs of the economy in terms of the absolute levels of the coincident indicators, i.e. indicators that gauge current economic activity. However, in the decades that followed the end of World War II, many economies like Japan and Germany saw long periods of rapid revival from wartime devastation, so that classical business cycle recessions seemed to have lost their relevance. Rather, what was considered increasingly germane was a second NBER definition of fluctuations in economic activity, termed a growth cycle. A growth cycle traces the ups and downs through deviations of the actual growth rate of the economy from its long-run trend rate of growth. In other words, a growth cycle upturn (downturn) is marked by growth higher (lower) than the long-run trend rate.

Economic slowdowns begin with reduced but still positive growth rates and can eventually develop into recessions. The high-growth phase typically coincides with the business cycle recovery, while the low-growth phase may correspond to the later

3

stages leading to recession. Some slowdowns, however, continue to exhibit positive growth rates and are followed by renewed upturns in growth, not recessions. As a result, all classical business cycles associate with growth cycles, but not all growth cycles associate with classical cycles.

Of course, growth cycles, measured in terms of deviations from trend, necessitated the determination of the trend of the time series being analysed. However, while growth cycles are not hard to identify in a historical time series, they are difficult to measure accurately on a real-time basis (Boschan and Banerji, 1990). This is because any measure of the most recent trend is necessarily an estimate and subject to revisions, so it is difficult to come to a precise determination of growth cycle dates, at least in real time.

This difficulty makes growth cycle analysis less than ideal as a tool for monitoring and forecasting economic cycles in real time, even though it may be useful for the purposes of historical analysis. This is one reason that by the late 1980s, Moore had started moving towards the use of *growth rate cycles* for the measurement of series which manifested few actual cyclical declines, but did show cyclical slowdowns.

Growth rate cycles are simply the cyclical upswings and downswings in the *growth rate* of economic activity. The growth rate used is the "six-month smoothed growth rate" concept, initiated by Moore to eliminate the need for the sort of extrapolation of the past trend needed in growth cycle analysis. This smoothed growth rate is based on the ratio of the latest month's figure to its average over the preceding twelve months (and therefore centred about six months before the latest month). Unlike the more commonly used 12-month change, it is not very sensitive to any idiosyncratic occurrences 12 months earlier. A number of such advantages make the six-month smoothed growth rate a useful concept in cyclical analysis. Cyclical turns in this growth rate define the growth rate cycle.

At ECRI, growth rate cycles rather than growth cycles are used along with business cycles as the primary tool to monitor international economies in real time. The growth rate cycle is, in effect, a second way to monitor slowdowns in contrast to

contractions. Because of the difference in definition, growth rate cycles are different from growth cycles. Thus, what has emerged in recent years is the recognition that business cycles, growth cycles and growth rate cycles all need to be monitored in a complementary fashion. However, of the three, business cycles and growth rate cycles are more suitable for real-time monitoring and forecasting, while growth cycles are suited primarily for historical analysis.

Dating of Business Cycles and Growth Rate Cycles in the Indian Economy

For India, Chitre (1982) had initially determined a set of growth cycle dates. Following the classical NBER procedure, Dua and Banerji (1999) later determined business cycle and growth rate cycle dates for the Indian economy. These dates were further revised and reported in Dua and Banerji (2004a)[1].

Coincident Index and Reference Chronology

The timing of recessions and expansions of Indian business cycles is determined on the basis of a careful consideration of the consensus of cyclical co-movements in the broad measures of output, income, employment and domestic trade that define the cycle. A summary combination of these coincident indicators, viz., variables that move in tandem with aggregate economic activity, is called the **Coincident Index**, whose cyclical upswings and downswings generally correspond to periods of expansion and recession respectively.

Table 1 reports the business cycle chronology for the Indian economy since the 1960s and gives the dating of peaks and troughs as well as the duration of recessions and expansions. This shows that during the 1990s, the Indian economy experienced two short recessions – the first from March 1991 to September 1991 and the second from May 1996 to November 1996. Prior to these recessions, it experienced a very long expansion from March 1980 to March 1991.

Likewise, the reference cycle, derived from the central tendency of the individual turning points in the growth rates of the coincident indicators that comprise the

---

[1] The latest updates to the chronologies are available at
http://www.businesscycle.com/internationalcycledates.php.

coincident index, gives the highs and lows of the growth rate cycle. This dates the slowdowns and speedups in economic activity. Table 2 gives the reference chronology of the growth rate cycle along with the duration of slowdowns and speedups in the Indian economy since the 1960s. While the economy experienced only two short recessions in the 1990s, it exhibited four slowdowns – March 1990 to September 1991, April 1992 to April 1993, April 1995 to November 1996, and September 1997 to October 1998. Thus, the growth rate cycle peaks led their comparable business cycle peaks, highlighting the distinction between a slowdown and a full-fledged recession.

The historical chronology of business and growth rate cycles helps to design a system for the prediction of recessions and recoveries as well as slowdowns and pick ups. In fact, the reference chronology provides a test of the performance of leading indicators in anticipating turning points of the cycles.

Leading Index: The Indian Experience

Leading indicators are designed to anticipate the timing of the ups and downs in the business cycle. They are related to the drivers of business cycles in market economies, which include swings in investment in inventory and fixed capital that both determine and are determined by movements in final demand. They also include the supply of money or credit, government spending and tax policies, and relations among prices, costs and profits. An understanding of these drivers can help identify the predictors of the downturns and upturns. Remarkably, decades of experience of the researchers at ECRI have shown that in a wide variety of market economies, both developed and developing, similar leading indicators consistently anticipate business cycles, underscoring the fundamental similarity of market economies. Such robust leading indicators can be used as the foundation for reliable cyclical forecasts.

A composite of the leading indicators yields the **Leading Index**, peaks and troughs in which anticipate or "lead" peaks and troughs in the business cycle. Also, peaks

and troughs in the leading index growth rate anticipate peaks and troughs in the growth rate cycle, i.e. slowdowns and speedups in economic growth respectively. The Leading Index for the Indian economy is described in Dua and Banerji (2004a).

The performance of the Leading Index for the Indian economy vis-à-vis the business cycle reference chronology is shown in Chart 1 while the performance of the Leading Index growth rate is shown in Chart 2. Leads are shown with a negative sign. Both charts show that the emergence of fairly consistent leads (especially with respect to troughs) started only in the post-liberalisation period that began in earnest in 1991.

Before that, the government long dominated the "commanding heights of the economy" and the assumption of a free-market economy was questionable. For the first four decades after India's independence, the government owned roughly half of the economy's productive capacity. Even the private sector was hemmed in by myriad regulations and rampant distortions of the free market, such as controls on prices and interest rates and extensive licensing procedures for the establishment of new factories or expansion of existing capacity. Generally, there were major barriers to entry and exit in most industries, including the difficulty of laying off any part of the labour force regardless of the profitability.

Under such circumstances, endogenous cyclical forces do not necessarily drive business cycles. It is thus understandable that the leading indicators that typically anticipate business cycles in market economies did not lead in a systematic manner. In fact, Indian recessions before the 1990s were mainly triggered by bad monsoons, which cannot be predicted by leading indicators. In a sense, the emergence of the leads since the early 1990s is evidence that the free market is starting to dominate the economy.

Another aspect of the liberalisation of India's economy is the growing importance of exports, which have become increasingly important to its overall growth prospects. Like domestic growth, export growth is also cyclical, but is driven by business cycles in the main export markets. Thus, in order to predict the timing of peaks and troughs in exports growth, it is logical to combine ECRI's leading indexes for those foreign economies with a real effective exchange rate, which determines the price

competitiveness of Indian exports, to arrive at a leading index for India's exports (Dua and Banerji, 2004b), which leads turning points in Indian exports growth by an average of nine months. This leading exports index complements the leading index for the Indian economy, to provide the means to monitor cycles in domestic cycles and well as exports cycles.

References

Boschan, C. and A. Banerji (1990), "A Reassessment of Composite Indexes" in *Analyzing Modern Business Cycles*, ed., P.A. Klein, M.E. Sharpe, New York.

Burns, A.F. and W.C. Mitchell (1946), *Measuring Business Cycles*, National Bureau of Economic Research, New York.

Chitre, V.S. (1982), "Growth Cycles in the Indian Economy," *Artha Vijnana*, 24, 293-450.

Dua, P. and A. Banerji (1999), "An Index of Coincident Economic Indicators for the Indian Economy", *Journal of Quantitative Economics*, 15, 177-201.

Dua, P. and A. Banerji (2004a), "Monitoring and Predicting Business and Growth Rate Cycles in the Indian Economy", in *Business Cycles and Economic Growth: An Analysis Using Leading Indicators,* ed., P. Dua, Oxford University Press.

Dua, P. and A. Banerji (2004b), "Economic Indicator Approach and Sectoral Analysis: Predicting Cycles in Growth of Indian Exports", in *Business Cycles and Economic Growth: An Analysis Using Leading Indicators,* ed., P. Dua, Oxford University Press.

Layton, A.P. and A. Banerji (2004), "Dating Business Cycles: Why Output Alone is Not Enough", *Business Cycles and Economic Growth: An Analysis Using Leading Indicators,* ed., P. Dua, Oxford University Press.

Moore, G.H. (1982), "Business Cycles" in *Encyclopaedia of Economics*, D. Greenwald, Editor in Chief, McGraw Hill Book Company, New York.

Table 1

Business Cycle Chronology for India

Dates of Peaks and Troughs		Duration (in months)	
Trough	**Peak**	**Contraction (peak to trough)**	**Expansion (trough to peak)**
	November 1964		
November 1965	April 1966	12	5
April 1967	June 1972	12	62
May 1973	November 1973	11	6
February 1975	April 1979	15	50
March 1980	March 1991	11	132
September 1991	May 1996	6	56
November 1996		6	
Average (months)		10.4	51.8
Median (months)		11	53
Standard Deviation (months)		3.3	46.6

Table 2
Growth Rate Cycle Chronology for India

Dates of Peaks and Troughs		Duration (in months)	
Trough	**Peak**	**Slowdowns (peak to trough)**	**Speedups (trough to peak)**
	September 1960		
July 1961	February 1962	10	7
November 1962	May 1964	9	18
November 1965	April 1966	18	5
March 1967	April 1969	11	25
February 1974	February 1976	58	24
September 1977	May 1978	19	8
December 1979	October 1980	19	10
February 1983	August 1984	28	18
September 1985	October 1986	13	13
December 1987	June 1988	14	6
May 1989	March 1990	11	10
September 1991	April 1992	18	7
April 1993	April 1995	12	24
November 1996	September 1997	19	10
October 1998	December 1999	13	14
September 2001	July 2004	21	34
Average (months)		18.3	14.6
Median (months)		16	11.5
Standard Deviation (months)		11.7	8.5

Chart 1: Indian Leading and Coincident Indexes (1992 = 100)
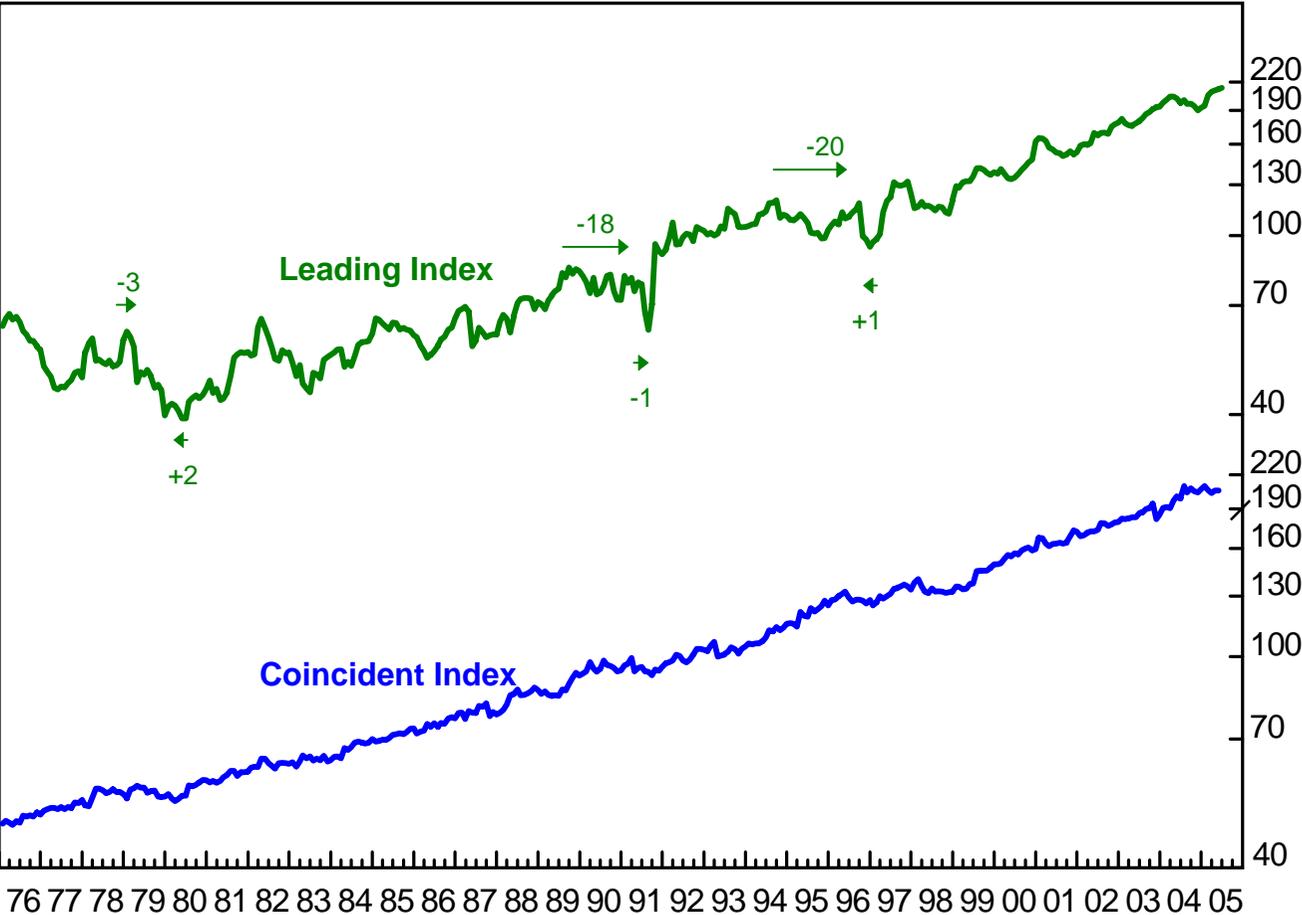
Shaded areas represent Indian business cycle recessions.
A minus sign denotes leads while a plus shows lags.

Chart 2: Indian Leading and Coincident Indexes, Growth Rates (%)
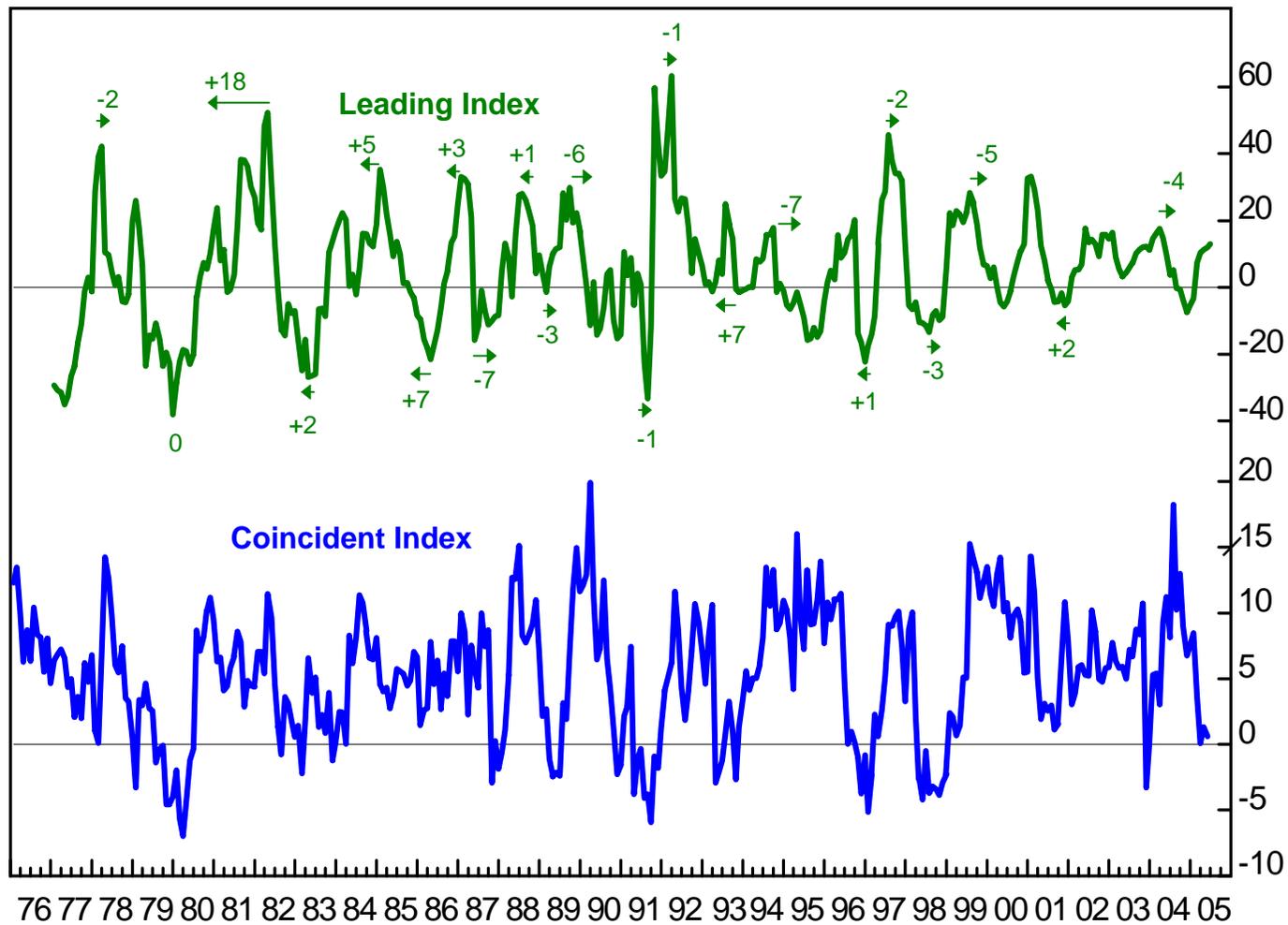
Shaded areas represent Indian growth rate cycle downturns.
A minus sign denotes leads while a plus shows lags.