Business Cycle Chronology For Indian Economy: A Turning Point Analysis

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Business cycle analysis is important for estimating and monitoring the fluctuations in an economy. In the present study, the classical, growth and growth rate cycles have been identified for the Indian economy using monthly Index of Industrial Production (IIP) as the reference series. The Bry-Boschan (BB) procedure has been used for dating the turning points for respective approaches for the period 1971: M1 to 2017: M10. Two classical cycles, thirteen growth cycles, and sixteen growth rate cycles were identified in IIP with an average duration of 215, 38 and 32 months respectively. The expansions are much larger than contractions in classical cycles, however, growth and growth rate cycles exhibit more or less same durations.

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Introduction

It is pertinent to observe and account for the business cycles in every economy in order to ensure smooth functioning of all the sectors by taming the fluctuations in time with the help of before hand signals.Moreover, the macroeconomic policies rely heavily on the phase of the business cycle. The monetary and fiscal policies are also subject to revision from time to time for stabilizing the business cycle fluctuations in the market economy and for reducing the extent of business cycle volatility. Therefore, for policy makers, the identification of expansion and contraction phases is of utmost significance so that stabilization policies can be framed accordingly and macroeconomic stabilization can be achieved. This calls for the dating of business cycles for an economy so that the identified chronology can be utilized by the policy makers for designing the appropriate polices and roadmap for smoothening out the fluctuations occurring in the economy from time to time.

The pioneering research work towards the study of repetitive forces triggering business cycles was undertaken by the

National Bureau of Economic Research (NBER) in 1920 and its dating committee has been dating the business cycles for the U.S. economy. Business cycle analysis is of paramount importance for the Indian economy, keeping in view its changing characteristics, with increasing openness and market orientation and the concentration of more and more economic activities in the organized sector. However, in the pre-liberalized era, business cycle phenomenon was not so prevalent in the Indian economy since it was predominantly agricultural in nature and investment demand was also highly stable as it was majorly in the hands of the government sector. But in the following years, the Indian economy has undergone major changes (Patnaik & Sharma, 2002; Shah, 2008) which incorporated structural transitioning of the economy, making it vulnerable to cyclical uncertainties.

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Business cycles can be seen as fluctuations in the aggregate economic activity and therefore, can be dated with the help of a reference series or an aggregate measure of economic activity. Often a single series has been used as the measure of aggregate economic activity for research purpose in business cycle analysis. While dealing with a single series, the most common rule of thumb is to date recessions if GDP experiences at least two successive quarters of decline. However, the two-quarters of decline is bound to happen in most recessions but it is neither necessary nor a sufficient condition for a recession to happen (Layton & Banerji, 2003). The exceptions to this rule of thumb can be found in empirical findings of many nations. The mere GDP declines are not always accompanied by the pronounced, pervasive and persistent declines in output, income, employment and trade (Banerji &Dua, 2011). So, this "two-quarter decline" rule of thumb is not applicable everywhere and if applied may give misleading results. Further, a composite index of coincident indicators from all the major sectors of an economy may also be compiled in order to date and measure business cycles. Nonetheless, in case of a single series to be adopted for business cycle analysis, GDP holds good proposition and it is the universally accepted measure for aggregate economic activity. However, in all economies, GDP is not recorded for higher frequencies and same is the case with the Indian economy. For Indian economy, annual estimates of GDP have been compiled and the quarterly estimates were made available from 1996. The monthly chronology of business cycles necessitated the need to analyze alternative monthly estimates of economic activity so as to precisely look for turning points in particular months. Therefore, another reference variable has to be chosen to carry out business cycle analysis which is maintained on a monthly frequency. Out of all the coincident variables available, IIP is the most celebrated one when it comes

to be used as a proxy for GDP. Accordingly, the present paper attempts to date monthly business cycles for the Indian economy by taking IIP as the proxy for aggregate economic activity.

Review of Empirical Attempts

Some of the important studies are reviewed and reported below in order to get deeper insights into the comprehension of business cycles dating methods and procedures. Gangopadhyay and Wadhwa (1997) analyzed monthly IIP series for the period 1975 to 1995 and obtained the chronology of Indian business cycles. Dua and Banerji (2000) dated the classical and the growth rate cycles by constructing a coincident index for the Indian economy, following the traditional NBER procedure for the time period 1964 to 1997. The study identified six recessions and five expansions for the Indian economy. In a subsequent paper, Dua and Banerji (2001) constructed a composite leading index covering monetary, construction and the corporate sectors to anticipate business cycle and growth rate cycle upturns and downturns. Chitre (2001) analyzed 94-monthly indicators to study the business cycles in India for the period 1951 to 1982. The reference series was constructed based on eleven economic indicators.

Patnaik and Sharma (2002) examined the presence of business cycles in the Indian economy and revealed that GDP growth has declined in 1957-58, 1965-66, 1979-1980 and 1991-92. Mohanty et al. (2003) attempted the cyclical analysis of monthly index of the industrial production in India and indicated that there have been 13 growth cycles in the Indian economy with varying durations during 1970-1971 to 2001-2000 and a composite leading index (CLI) was constructed and forecasted the turning points of the reference series with a lead period of about 6 months. A study by OECD (2006) for the period 1978 to 2004, identified seven growth cycles with an average duration of 38 months, using data on monthly IIP. OECD further developed a Composite Index of Leading Indicators (CILI) for India from the set of 30 indicators which registered a median lead of four months for all turning points. Nandi (2010) studied the role of global financial crisis in the Indian context by dating the growth cycles for Indian economy with IIP as the reference series from 1995 to 2010 by applying a dating algorithm developed by Bry and Boschan (1971), hereafter referred as BB procedure. The study revealed that the cycle has started its downturn from as early as August 2007, indicating a domestic industrial downturn before the global financial crisis. Further, the leading indicator index signaled a quick recovery from its trough in September 2007.

Banerjee and Dua (2011) defined business and growth rate cycles and described the importance of key coincident indicators and reference chronologies, subsequent to reflections on the definition of a recession. They further evaluated the robustness of the indicator approach for predicting business and growth rate cycles. Dua and Banerji (2012) described business and growth

rate cycles with special reference to the Indian economy. The study employed the classical NBER approach to determine the timing of recessions and expansions as well as the chronology of growth rate cycles for the Indian economy. It described the performance of the leading index designed to anticipate business cycle and growth rate cycle upturns and downturns. Ghate et al. (2013) presented a comprehensive set of stylized facts for business cycles from 1950 to 2009. The study revealed that the nature of the business cycles has changed dramatically after India's liberalization reforms in 1991.

Business Cycle Conceptualizations

The present section attempts to outline and discuss the concepts, data and the methodology of the present study with the objective of obtaining insight and for lending precision to the empirical estimates. There are two methods of dating business cycles- a non-parametric method associated with the NBER and a parametric method based on estimating a Markov-Switching (MS) model. Bry and Boschan (1971) described a method that was a replication of business cycles in the U.S. as measured by the dating committee of the NBER. They coded the BB procedure into an algorithm that could be easily applied. On the other hand, the Markov Switching model of Hamilton (1989), also known as the regime switching model, is one of the most popular nonlinear time series models in the literature for characterizing the time series behaviors in different regimes for business cycles analysis. Harding and Pagan (2003) compared both the methods by analyzing quarterly U.S. GDP. And upon the comparison, the traditional NBER methods (coded into an algorithm by Bry and Boschan) were preferred over Markov-Switching models due to greater robustness and transparency of the former over the latter. Accordingly, following the Harding and Pagan (2003) conclusions, the Bry-Boschan procedure has been followed in the present endeavor.

The business cycle analysis, in the first place, calls for defining the concept or an approach used for dating of a cycle. Then, the dating procedure begins with identification of the turning points in the measure of aggregate level of economic activity. The early NBER approach followed the classical approach and identified cycles as recurrent sequences of alternating phases of expansion and contraction in the levels of economic time series (Burns & Mitchell, 1946; Bry & Boschan, 1971). Thus, the classical cycles are ups and downs in absolute economic activity and therefore identifies expansions and recessions in the level of economic activity. However, the real decline in the economic activities in major industrial economies during 1960s gave way to slowdowns in the pace of expansion. And accelerations and slowdowns in growth rather than expansion and contraction in the level of economic time series became a prominent feature of business cycles and paved way for a revised concept of growth cycles (Mintz, 1974). The growth cycles, also known as deviation cycles, are computed by extracting the cyclical component from the

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output. Basically, these are the deviations from a long-term trend growth. So, a growth cycle marks the boom phase, when the actual output is above the estimated trend and a recession is marked when the actual output is below the estimated trend or in others words, it can be defined as the ups and downs in the deviations of the actual growth rate of the economy from the long-run trend growth rate. Another approach for business cycle analysis is the growth rate cycles which is related to Mintz's earlier work on step cycle (Dua & Banerji, 2001) and measure the upswings and downswings in the growth rate of the aggregate economic activity. The concept of growth rate cycles was explored by Moore in late 1980s for measuring cyclical slowdowns (Layton & Moore, 1989). The growth rates can be computed as annual point-to-point or six-month smoothened growth rate. Thus, growth rate cycles analyze the upswings and downswings in the growth rate of economic activity. It has been recognized that business cycles, growth cycles and growth rate cycles all need to be monitored in a complementary fashion. But, out of all the three approaches discussed, business cycles and growth rate cycles are more suitable for real-time monitoring and forecasting, while growth cycles are more suitable for historical analysis (Klein, 1998).

Estimation of Classical Cycles, Growth Cycles&Growth Rate Cycles

IIP has been taken up as a single measure to be adopted as a reference series for obtaining the chronology of classical, growth and growth rate cycles from 1971: M1 to 2017: M10. The data series for such a long-time span has been sourced from the International Monetary Fund- International Financial Statistics (IMF-IFS) database. The classical cycles are estimated from the level series; therefore, the series is subject to seasonality adjustment using X-12 ARIMA method, developed by US Census Bureau (2007) and irregular component adjustment and then used for turning point analysis. The steps followed for estimating the growth cycles include seasonal adjustment of the series, trend Estimation using Hodrick-Prescott filter (1997) with lambda= 129600 as suggested by Ravn and Uhlig (2002) and Trend Elimination from seasonally adjusted series to obtain cyclical component. Later on, elimination of short-term irregular component by applying the weighted moving average (with 5 months window) technique. However, the steps for estimating the growth rate cycles can be outlined as seasonal adjustment of the series and calculation of simple annual point-to-point growth rates. Finally, the elimination of short-term irregular component is done by applying the weighted moving average technique.

The smoothened series obtained from thereafter is used for obtaining the classical cycles, growth cycles and growth rate cycles respectively, by applying the

BB procedure. For the identification of turning points in the reference series, the BB Procedure has been applied in R statistical package using the package "*datation"* developed by Frank Arnaud (2006).The BB procedure is a replication of the process for dating business cycles in the US as measured by the dating committee of the NBER. They coded the BB procedure into an algorithm that could be easily applied.

Monthly Chronology of Classical Cycles

Table1 reports the chronology for classical cycles in the Indian economy. As can be seen from the Table two complete business cycles have been reported with an average length of 215 months. The expansions have registered quite larger durations on an average of 205 months as compared to recessions which have lasted for an average of 11 months only. Initially, the recession lasted for 12 months from 1979:M4 to 1980:M4, followed by an expansion of 132 months from 1980:M4 to 1991:M4. However, the recession from 1991:M2 to 1992:M8 can be attributed to the ongoing reforms and structural adjustment program for the Indian economy which caused an absolute dip in the levels of industrial production, for the time being, preparing the economy for a liberalized makeover. Further, the economy witnessed an even longer expansion spanning from 1992:M9 to 2015:M10 of about 258 months. And the more recent contraction of 2015:M10 to 2016:M3 can be explained by a continuous decline in GDP growth rate from January-March 2016 till April-June 2016. GDP growth rate slipped from 9.2 per cent to 7.9 per cent during this time period even before the episode of demonetization which was announced in November 2016. This slowdown can be attributed to probable factors viz. declining demands, rising NPAs, declining capacity utilization, declining manufacturing production etc. Since classical cycles report expansions and contractions in the absolute level of reference series and keeping in mind the structural transitioning of the Indian economy, for the post-reforms period in India, the absolute decline in the level of variables is not seen. Thus, the classical cycles seem to be vanishing. Therefore, it is more appropriate to use the growth or growth rate cycle approach over the

It is more appropriate to use the growth or growth rate cycle approach over the classical approach for measuring the business cycles.

Table1 Classical Cycle Chronology for IIP (Period in Months)

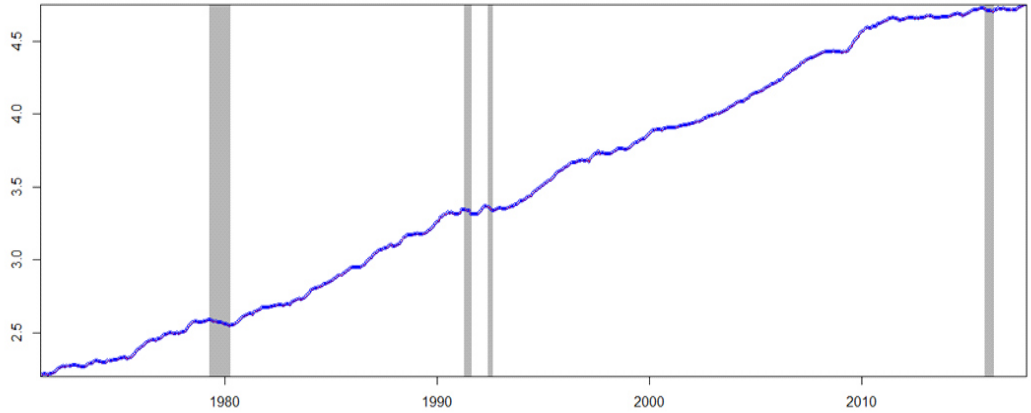
Peak	Trough	Expansion (Trough to Peak)	Contraction (Peak to Trough)	Full Cycle Duration (Peak to Peak)
1979 M4	1980 M4	-	12	-
1991 M4	1992 M8	132	16	148
2015 M10	2016 M3	278	5	283
Average Duration		205	11	215.5

Source: Author's Calculations.

classical approach for measuring the business cycles.

Fig.1 presents the plot of the chronology of classical business cycles in IIP. The grey bars represent the recessionary period in the absolute level of reference series, IIP while white area shows the expansionary period for the same series. The oscillating line represents fluctuations in IIP. The period of grey bars can be confirmed from chronology reported in Table1. It can be noted that two grey bars pertaining to the period of early 1990s have been omitted from the tabular chronology because of the censoring rules as chalked out in BB procedure. Those turning points were less than the duration of 5 months each, therefore, they were not reported in Table 1.

Fig. 1 Chronology of Classical Business Cycles in IIP



Source: Author's elaborations using package *"datation"* developed by Arnaud (2006)

Monthly Chronology of Growth Cycles

Table 2 reports the occurrence of growth cycles in the Indian economy and reveals that thirteen growth cycles occurred in the Indian economy with an average duration of 38 months. The upturns and downturns on an average registered similar duration like 19 and 21 months respectively.

The first downturn in the period considered for the study occurred from 1972:M6 to 1975:M6 and which lasted for 36 months. This episode of the recession began with the bad scene in the agricultural sector with massive rains resulting in 8 per cent drop in agriculture and food grain production (Joshi & Little, 1996). And India being an ally of the then East-Pakistan (now Bangladesh) for its freedom struggle resulted in a war with Pakistan in 1972 because of which relations between India and the U.S. soared and the foreign aid declined sharply. Thus, the government had to undertake heavy expenditure for drought and war situations without any foreign aid. Further, the oil price shock in 1973 affected the economy adversely triggering the recession even more. After an upturn, the In-

Table 2 Growth Cycle Chronology for IIP (Period in Months)

Peak	Trough	Upswing (Trough to Peak)	Downswing (Peak to Trough)	Full Cycle Duration (Peak to Peak)
1972 M6	1975 M6	-	36	
1977 M3	1977 M11	21	8	29
1978 M8	1980 M4	9	20	29
1981 M10	1983 M2	18	16	34
1985 M10	1986 M6	34	6	40
1987 M4	1988 M3	10	11	21
1988 M8	1989 M5	5	9	14
1990 M7	1993 M4	14	33	47
1996 M5	1998 M12	37	31	68
2000 M3	2003 M6	15	39	54
2004 M11	2006 M3	17	16	33
2007 M5	2009 M4	14	23	37
2011 M6	2013 M9	26	27	53
2015 M10	2017 M2	25	16	41
Average Duration		18.84615	20.78571	38.46154

Source: Author's Calculations.

dian economy again faced a massive recession of 20 months from 1978:M8 to 1980:M4. The drought of 1973 severely affected the economy with a drop of over 15 per cent in agricultural production (Joshi & Little, 1996). The economy also suffered from global oil price rise and domestic agitations in Assam which provided one-third of domestic oil supply. These factors clubbed together caused power shortages for coal and transport facilities which combined with the drought situation caused shortages of key inputs leading to an industrial recession (Dua & Banerji, 2000). After this, the economy grew rapidly in the 1980s with larger durations of upswings in comparison to downswings. However, a drought in 1987 caused a mild slowdown. The period from1990: M7 to 1993: M4 again marked the period of prolonged recession. In the early nineties, the Indian economy was suffering from macro-economic crisis primarily due to large and mounting fiscal imbalances over the 1980s. The incidents like Gulf War, drying up of foreign exchange reserves, rising oil import bills, scanty export growth, the balance of payments problems etc. led to a severe economic crisis for Indian economy which called up for a massive structural adjustment program to take the economy out from the deep crisis. The economic reforms started in June 1991 with immediate goals of pulling down inflation, reducing fiscal deficit, improving the balance of payments position by devaluing Indian rupee, opening avenues for foreign investments, following fiscal contraction, streamlining the industrial policy etc. The immediate impact of such measures on the economy was recessionary in nature, though the economy picked up in a later stage. So, the expansionary phase started in 1993 lasted till 1996 and later on again the recessionary pressures picked up and the economy again fell into the recession trap

for 31 months till 1998: M12. The reform process lost its instinct in 1996 and the elections held at that time also produced a short-lived government by Bhartiya Janata Party (BJP) that couldn't give consideration to major economic issues and the country was forced back to polls in 1998. Moreover, the Asian financial crisis which started in 1997 also rumored a global economic meltdown. The outcome of all these disturbances was slack in industrial investment, production, and consumer demand. However, the economy took an upswing in 1999 which lasted for 15 months. But the time period from 2000:M3 to 2003:M6 again became a witness to 39 months long recession because of sluggish GDP growth, low gross fixed investment to GDP ratio, lesser FDI inflows because of Asian financial crisis, the decline in software export growth etc. (Nagaraj, 2013). Nonetheless, the upswing from 2003 onwards by a boom in investment financed by domestic savings and the revival of foreign capital inflows in the form of unprecedented inûux of foreign private capital and a high credit growth in Indian economy. Nagaraj (2013) has quoted it as India's dream run achieved through cyclical credit boom, boosted by a surge in foreign capital inûows.

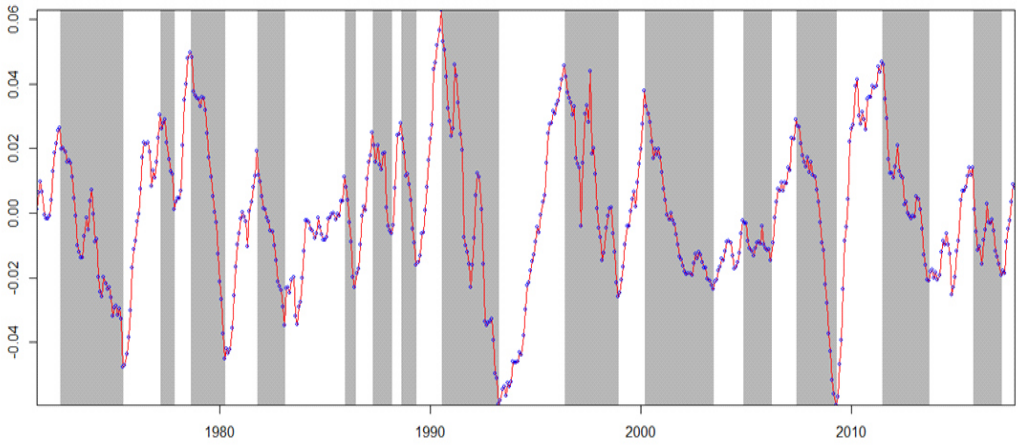
The recession from 2007:M5 to 2009:M4 was contributed by the global sub-prime crisis which originated in the U.S. because of Lehman Bros. collapse. The financial crisis emanated there, affected the Indian economy too, because of trade and financial linkages. There was a sharp deceleration in exports growth (Patnaik & Shah, 2010). The crisis got transmitted to Indian economy up to some extent because of certain synchronization of Indian business cycle with the world economy through a slowdown in credit flows which got reflected in an overnight increase in call money rate up to 20 per cent in October and November 2008.

Investment growth also took a setback and the GDP growth stood at 6.72 per cent in 2008-09. With an upswing of about 18 months from 2009: M5 to 2010: M4, the GDP growth recovered to 8.6 per cent in 2009-10 and strengthened further to 8.9 per cent in 2010-11. The upswing was the consequence of a coordinated monetary and fiscal stimulus package announced in 2008-09. For instance, RBI increased the liquidity in the banking system by cutting down the cash reserve ratio and statutory liquidity ratio. RBI took major steps to avoid depreciation of Indian rupee because of massive capital outflow. The government of India also gave fiscal stimulus through tax cutting, increasing public expenditure to lift consumer demand. The Fiscal Responsibility Budget Management Act, 2003 was also suspended in 2009 to allow the stimulus policies. However, this macroeconomic stimulus to ease out the previous slow down paved way for a successive downswing in 2011-12 by creating demand pressures resulting in high rates of inflation. An upturn of 25 months is seen from 2013:M9 to 2015:M10 owing to the new initiative of "Make in India" drive of the government to boost the manufacturing sector. But, the next 16 months again gave way to a downturn which ultimately witnessed the sudden demonetization on 8thNovember 2016 that

can be considered as a monetary shock to the Indian economy which resulted in the cancellation of legal tender of 85 per cent of Indian currency (i.e., making it redundant). Subsequently, the Indian economy started experiencing a dip in the growth rates from 7 per cent in January-March, 2017 to 5.7 per cent in quarter April-June, 2017.

Fig. 2 presents the plot of the chronology of growth cycles in IIP. The grey bars represent the period of a downswing in the trend-adjusted reference series, IIP while the white area shows the period of upswings for the same series. The oscillating line represents fluctuations in IIP. The period of grey bars can be confirmed from chronology reported in Table 2.

Fig. 2 Chronology of Growth Cycles in IIP



Source: Author's elaborations using package *"datation"* developed by Arnaud (2006) .

Monthly Chronology of Growth Rate Cycles

Table 3 reports the chronology of growth rate cycles in the Indian economy and reveals that sixteen growth rate cycles occurred in the Indian economy with an average duration of 32 months. The upturns and downturns on an average registered similar durations like 18 and 15 months respectively.

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The time period from 1976 to 1980 has faced two episodes of a downswing in growth rates of IIP and it can be explained by the deceleration and retrogression experienced in Industrial growth patterns in India during that time. In 1976-77, the annual rate of growth of industrial output was 6.1 per cent. In 1979-80, a negative annual growth rate of -1.6 per cent was recorded in respect of industrial output. The industrial sector faced a structural retrogression during the period. The capital goods industries registered its annual average growth rate of only 2.6 per cent during the second phase. Fifth Plan recorded the annual growth rate of

Table 3 Growth Rate Cycle Chronology for IIP (Period in Months)

Peak	Trough	Upswing (Trough to Peak)	Downswing (Peak to Trough)	Full Cycle Duration (Peak to Peak)
-	1973 M6	-	-	-
1974 M7	1974 M12	13	5	18
1976 M6	1978 M3	18	21	39
1978 M9	1980 M4	6	19	25
1981 M7	1982 M10	15	15	30
1984 M9	1985 M2	23	5	28
1985 M12	1986 M6	10	6	16
1987 M5	1988 M4	11	11	22
1990 M7	1991 M9	27	14	41
1992 M12	1993 M4	15	4	19
1995 M9	1998 M8	29	35	64
2000 M3	2001 M3	19	12	31
2004 M12	2006 M1	45	13	58
2007 M3	2009 M4	14	25	39
2010 M4	2012 M7	12	27	39
2013 M2	2014 M2	7	12	19
2015 M10	2016 M10	20	12	32
Average Duration		17.75	14.75	32.5

Source: Author's calculations.

5.7 per cent which was far below as compared to that of first three five-year plans. For, basic industries, the annual growth rate during the second phase was far below as compared to that of the Third Plan. The causes of deceleration and structural retrogression were droughts in 1971-73, and oil crisis of 1973 responsible for supply constraints, considerable slackening of real investment, unsatisfactory performance of the agricultural sector, policy constraints and bureaucratic obstacles on industrial growth.

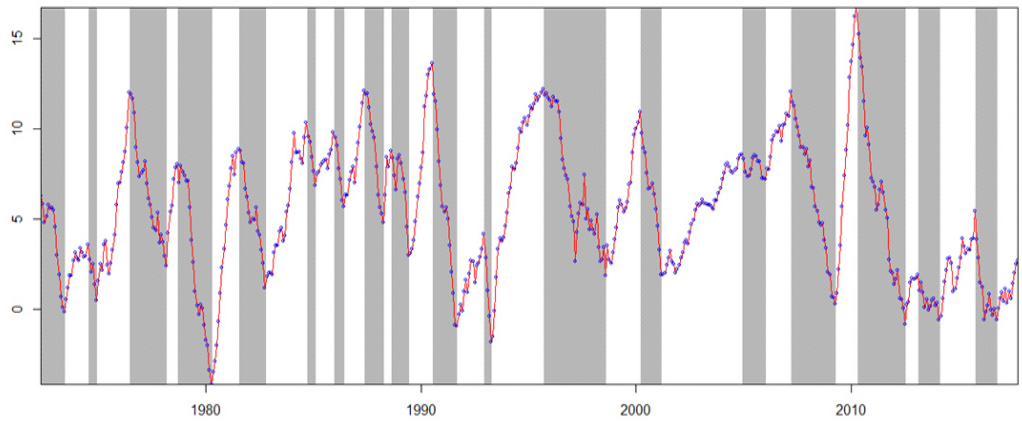
Now for the period covering 1981 to 1991 marks the phase of industrial recovery. During the period 1981-85, the average annual rate of growth of industrial production was accelerated to 7.0 per cent which further increased to 8.6 per cent during 1985-90. The main factors which led to this recovery are the introduction of new industrial policy and liberal fiscal period, higher contribution of agricultural sector in some of the regions in the country which helped in raising the demand for industrial inputs used for agricultural production and revival of investment in the infrastructure sectors and its effects in raising the degree of efficiency of the industrial sector. However, the period from 1991-92 to 1997-98 experienced a sharp industrial retrogression followed by an immediate upturn in the industrial growth of the country.The period from 2007:M3 to 2009:M4 was of the global financial crisis which affected all the nations worldwide because of strong trade and financial linkages. Further, the Indian economy took an upswing from 2014:M2

The "Make in India" drive contributed tremendously to Indian investment sector by capturing 46 per cent growth in Foreign Direct Investment equity inflows.

to 2015:M10, as "Make in India" initiative, was launched worldwide in September 2014 for evolving the Indian manufacturing sector. The "Make in India" drive contributed tremendously to Indian investment sector by capturing 46 per cent growth in Foreign Direct Investment equity inflows amounting to US$ 55.5 billion in 2015-16. After the launch of Make in India initiative, India has emerged as the fastest-growing major economy with GDP growth rate above 7.6% in 2015-16. The next 12 months again paved the way for a downswing.

Fig. 3 showcases the plot of the chronology of growth rate cycles of IIP. The grey area represents the downswing period in growth rates of reference series

Fig. 3 Chronology of Growth Rate Cycles in IIP



Source: Author's elaborations using package *"datation"* developed by Arnaud (2006)

IIP while the white area shows the upswing period for the same series. The oscillating line represents fluctuations in growth rates of IIP. The period of the grey area can be confirmed from Table 3.

Concluding Remarks

The dating of business cycles for the Indian economy has been accomplished in the present paper. The classical, growth and the growth rate cycles have been identified by taking seasonally adjusted monthly IIP series from 1971: M01 to 2017: M10 as reference series and by applying a dating algorithm (BB procedure) developed by Bry and Boschan (1971) based on NBER methodology. The findings suggested that the economy has experienced two classical cycles for the time period under consideration, with an average length of 215 months. The expansions are found to average around 205 months as compared to recessions which lasted for an average of 11 months

only. These results suggest the rare occurrence of cyclical fluctuations in the absolute level of economic activity and signal towards the probable disappearance of the classical cycles. The structural transformation and advancement of the Indian economy account for the presence of a trend growth of the economy and rules out any absolute decline in the level of aggregate economic activity.

Further, thirteen growth cycles are seen in IIP with an average duration of 38 months and the upswing lasted for an average of 19 months while a downswing registered an average duration of 21 months. More or less similar patterns are observed for the growth rate cycles wherein sixteen growth rate cycles are reported with an average duration of 32 months and the upturn and the downturn survived for an average of 18 and 15 months respectively. It can be seen that the expansions are much larger than contractions in classical cycles, however, for growth and growth rate cycles they exhibit more or less same durations. Also, the results suggested that the classical cycles seem to be vanishing. Therefore, it is more appropriate to use the growth or growth rate cycle approach over the classical approach for measuring the business cycles.

The expansions are much larger than contractions in classical cycles, however, for growth and growth rate cycles they exhibit more or less same durations.

The episodes of droughts, war situations, oil price shocks, macro-economic crisis due to fiscal imbalances, rising import bills, scanty forex reserves, economic reforms, devaluation of the Indian rupee, global sub-prime crisis, demonetization etc. are certain factors which are responsible for bringing a downturn in the aggregate economic activity situation. But every time the economy has picked up with a strong upturn contributed by its resilience achieved through stable and steady growth along with diversified production structure and trade basket. Moreover, the ever-increasing share of stable investment and export growth with a diverse number of trading partners have always helped the economy to deal with temporary disruptions in the economic activity.

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