A Brief Review

The research of economic cyclical fluctuations in China started from the middle 1980s, later than in other countries. Sufficient attention was not paid until the 1990s. In April and August of 1985, Research Institute of Quantitative and Technical Economics of the Chinese Academy of Social Sciences, Chinese Economic Reform Institute, Jilin University and the State Information Center of China, and so on, jointly held two symposiums on China’s economic cyclical fluctuations in Beijing and Changchun, respectively. In 1987, the Scientific Research Team of Jilin University, led by Professor Wenquan Dong, and the former State Economic Commission, worked together to launch the measuring, analyzing and forecasting work of China’s economic cyclical fluctuations for the very first time, and worked out the leading indicators, coincident indicators, lagging indicators, diffusion indices, and composite indices (Dong et al, 1987). These results have been used by the state government as references for the policy-making.

In the early 1988, collaborating with Jilin University, the State Information Center of China (SICC) first formulated a practical early warning system for business cycles in China and had the system into trial operation. After 3-year tests, this system was popularized within the state economic information system in the early 1991. By 1993, the early warning system had been conducted in nearly 30 provinces and municipalities directly under the state economic planning department. At that time, the SICC had not only carried out research of the growth rate cycle but also conducted experimental research on the growth cycle and using the methods of the Phase-Average-Trend to decompose trend. The SICC had also compared the results from two methods. In 1993, Jun Zhu and Changsheng Wang et al systematically summarizes the progress in economic cycles monitoring and warning signal system between the late 1980s and the early 1990s (Zhu and Wang,1993). The book also introduces the theoretical methods for the economic cyclical analysis and warning signal system.
In 1988 and 1989, violent inflations occurred in China. The Chinese government tried to control the inflation. In 1990, Tiemei Gao, of Jilin University, and Jianmin He, of the National Statistical Bureau of China, studied the time differences between the composite coincident index and various kinds of price indices, and establish the Chinese Price Leading Indicators System (Gao and He, 1990).

In 1994, with the State Space Model and the Kalman Filter, Lei Chen and Tiemei Gao of Jilin University established the Stock-Watson Index composed of several economic variables, with trend being deducted (Chen and Gao, 1994). This was the very first time that the Stock-Watson Index was used in macro-economic analysis and forecasting in China.

In 1998, Analysis and Forecasting Methods of Economic Cycles by Wenquan Dong, Tiemei Gao, Shizhang Jiang and Lei Chen, was published by the Jilin University Publishing House. This book introduces various kinds of internationally prevailing practical econometric methods for studying economic cyclical fluctuations between 1960s and 1990s, such as the Spectral Analysis and the State Space Model, and particularly emphasizes the methods to composite the index of business condition. What makes this book very readable is that the authors developed computer software for these methods described in the book.

In 2000, using GDP as the reference indicator, Guizhen Wu and Tiemei Gao of Jilin University selected some sensitive indicators to establish the Chinese Economic Quarterly leading indicators and Warning signal System. With this system, they estimated and analyzed the economic momentum of China (Wu and Gao, 2000).

In 2001, Applying cross-spectral analysis, Lei Chen examines the correlations and timing differences among periodical fluctuations within China’s macroeconomic variables, then classifies the variables into leading, coincident and lagged economic indicators (Chen, 2001).

In 2001, using H-P Filter and the Phase-Average-Trend Methods, Xiaofang Li and Tiemei Gao of Jilin University made trend analysis of China’s economic indicators and compared these results. Then, they used coincident indicators, with trend being deducted, to constitute the Composite Index based on the growth cycle, and compared with that based on the growth rate cycle (Li and Gao, 2001).

The Spring Festival is the most important Chinese traditional festival. Since the timing of the Spring Festival moves between January and February of the Gregorian calendar, it is a
significant element in giving large fluctuations of China’s monthly economic growth rate. An important issue in conducting seasonal adjustment of China’s economic indicators is to eliminate the fluctuations caused by the festival. In the past few years, some results have been done in how to get rid of the fluctuations. A project-team led by Professor Tiemei Gao put forward two methods to get rid of the festival factor in 2003. One is the Prior Monthly Adjustment. This method involves the adjustment according to the number of working days prior to seasonal adjustment, mainly ruling out the difference in the number of working days in given months in different years caused by holidays or other reasons. It is very effective to use this method to eliminate the influence of the festival factor in the research of the changes in economic growth rate. The other one is to use the Proportional Factor Method to revise the festival factor. This method is usually adopted to study the change in the absolute level of the economic indicators and to make the nature of the time series remain unchanged (LI, Wu and Gao, 2003).

In 2003, collaborating with the Chinese Iron and Steel Association and the SICC, Tiemei Gao’s team made use of these methods as time difference correlation analysis to screen out the leading, coincident and lagging indicators of the iron and steel industry from the monthly economic indicators pertaining to the iron and steel industry, and established the composite indices for the Chinese iron and steel industry based on the growth rate cycles (Gao et al., 2003).

In the later half of 2003, the SICC re-selected the cyclical indicators taking the growth rate of value added of industry as the reference series, constituting the system of leading, coincident and lagging indicators. Since then, the SICC has released the business cycles monitoring analysis reports once each month in Shanghai Securities Daily, producing great influences in China.

In addition to the SICC, in recent years, other research institutes, such as Quantitative and Technical Economic Research Institute of the Chinese Academy of Social Sciences, Investigation and Statistical Department of the People’s Bank of China, the National Statistical Bureau of China, the State Council development and Research Center and the Jilin University, and so on, have also developed practical business cycles analysis and forecasting systems, macro-econometric models, policy analysis models, and business situation
investigation systems, and so on. These greatly advance the development in the macroeconomic fluctuation analytical and forecasting work in China. The National Statistical Bureau of China has been always applying these analysis methods to conduct economic monitoring and forecasting work. Professor Tiemei Gao’s team has made use of the cyclical indicators to study China’s business cycles, and released their reports on China economic analysis and forecasting many times at the Spring and Autumn economic situation analyzing and forecasting conferences sponsored by the Chinese Academy of Social Sciences, having good results. However, so far China has no authoritative institutions to release official cyclical indices, except for publishing analytical and forecasting results on economic cyclical fluctuations in the form of articles or research reports.

**Cyclical Indicators for China: Selected by SICC**

The cyclical indicators for China are based on the growth rate cycle. The growth rate of the value added of industry in comparabe price is the reference series. Before we select indicators, we do seasonal adjustment to the indicators, but not de-trend. The cyclical indicators selected by SICC are as follows:

### Leading Indicators

<table>
<thead>
<tr>
<th>Leading Indicators</th>
<th>Frequency</th>
<th>Starting date</th>
<th>Timeliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pig Iron Production</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
<tr>
<td>Crude Steel Production</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
<tr>
<td>Floor Space Started in Commercial House</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
<tr>
<td>Volume of Freight Handled in Major Coastal ports</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
<tr>
<td>Finished Goods Stock of the Industrial Enterprises</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
</tbody>
</table>

### Coincident Indicators

<table>
<thead>
<tr>
<th>Coincident Indicators</th>
<th>Frequency</th>
<th>Starting date</th>
<th>Timeliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Added of Industry in Comparabe Price</td>
<td>monthly</td>
<td>1995</td>
<td>t+1</td>
</tr>
<tr>
<td>Electricity</td>
<td>monthly</td>
<td>1997</td>
<td>t+1</td>
</tr>
</tbody>
</table>
When we calculate the composite leading index, we use the monthly change rate to the 12-month ago, and do standardization to the leading indicators, the weight is equal for every indicators, after we got the the composite leading indicator, we smooth it by moving average.

**Chart 1:** Composite Leading Index and Composite Coincident Index

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**Chart 2:** Composite Leading Index and the Growth Rate of Value Added of Industry in Comparabe Price (Seasonal Adjusted and Moving Average).

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References


Li, Xiaofang, Guizhen Wu and Tiemei Gao, 2003, *Study of the methods to eliminate Spring Festival factor in seasonal adjustment on economic indicators of China*, Quantitative and Technical Economic Research, the fourth issue.
