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Dating Rules for Turning Points of Growth Cycles in Korea

Kyung Sam, Min and Sung Joo, Lim

Korea National Statistical Office^{*}

Abstract

The business cycle is recognized as a growth cycle in a continuously growing economy such as in Korea. This paper suggests logical dating rules for the reference date of the business cycle using various measures of a growth cycle. These measures are a cyclical component of the coincident CI, a coincident cumulative diffusion index, and a historical diffusion index with coincident component indicators. Dating rules include identifying turning points based on these measures of a growth cycle, and various approaches which confirm and review whether these turning points are appropriate for reference dates. And the rules have the administrative process to determine and disseminate these turning points as the reference dates of growth cycles in Korea. This process provides a strategy that gives authority to the released reference dates and minimizes errors in the dating.

However, these dating rules have vigilant procedures to determine the reference date because the measures of a growth cycle are revised annually and their turning points could be affected by their revisions. Usually, a new reference date requires approximately three years before it is released officially. Due to the delayed dating strategy, the present and future business conditions need to be reviewed by detecting and forecasting models of the coming turning points with leading indexes and coincident indexes.

Key Words: growth cycle, reference date, composite index of business cycle indicators, diffusion index, turning point

JEL Classification:{C5, E32, E37}

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1 Importance of dating

1.1 Business cycle and reference date

The business cycle is defined as an economic phenomenon in which the aggregate activities of an economy repeatedly increase and decrease around the long-term growth trend. This type of the business cycle, which is defined as a growth cycle in most developed and developing countries including the OECD, is different from the classical cycle defined in the USA. Therefore, the dating rules of a growth cycle are different from ones of the classical cycle.

According to the ABCD approach, the turning point of a growth cycle is the time when the growth of an economy equals the long-run growth trend, because a growth cycle is measured by removing the long-term trend factor from the economic growth. In other words, a growth cycle includes only cyclical components by removing the long-term trend factor from the economic aggregate time series with a continuously right-upward trend cycle¹. Therefore, turning points of a growth cycle include peaks and troughs on the cyclical component like ones represented in the classical cycle. The difference is whether or not the long-term trend factor is removed from the original time series. Hence, the trend factor is removed in view of a growth cycle, while it is included in the classical cycle. Comparing turning points of a growth cycle with turning points of the classical cycle, expansion duration of a growth cycle is shorter than that of the classical cycle, while contraction duration of a growth cycle is longer than that of the classical cycle. On the other hand, the typical asymmetric experience would be valid in that the expansion duration is longer than the contraction duration in both types of the business cycle² methods.

1.2 Uses of the reference date

The reference date of an economy³ is used to assess the economic policies and the co-movement of economic indicators. Academic studies for the business cycle are based on this reference date. Three cases are explained in the following examples.

First, the reference date is used as an appraisal standard of timeliness and usage of various economic regulation measures. When the typical economic condition turns from expansion to contraction, soft-landing economic policies need to be carried out to alleviate an abrupt slowdown. If a trough of a growth cycle, i.e. a starting point, is disseminated at this time, economic units which consist of the government, private enterprises, and households can identify symptoms of changes in the economic conditions according to this turning point of a trough. This, in turn, could produce empathy towards the fact that the business cycle has turned immediately from an expansion to a contraction

¹ The cyclical component is interpreted to be a deviation from the long-term growth trend.

² In the USA, where the business cycle is defined as the classical cycle, durations of expansions have been quite long since 1980s, while durations of the contraction periods have been relatively short .

³ A nation is usually considered as an economic system unit.

phase. Under these circumstances, the effect of an economic policy is maximized, while the social loss is minimized by suppressing the affect of a strong economic slump⁴.

Second, the reference date is utilized as the standard classifying the individual economic indicators into leading, coincident or lagging categories. As mentioned earlier, the business cycle is defined as a growth cycle in Korea. According to this definition, individual economic indicators are seasonally adjusted, and trend factors are removed from the seasonally adjusted series. Then, the cyclical component of an indicator can be computed. Next, specific turning points are estimated from each cyclical indicator. Now, we can identify whether specific turning points are located before or after reference dates, and classify the indicator into the leading or lagging category. The classification needs to satisfy the condition that specific turning points of an indicator and official reference dates are correlated with a stable leading or lagging time⁵ as well.

Third, the reference date is used for testing the business cycle behaviour and studying the characteristics of economic movements. The scope of the study is often selected to investigate the cause and effect relationship of the corresponding cycle era according to reference dates. Also, economic models for the diagnosis of the present and future business conditions use official reference dates. For example, after modelling the past economic expansion and contraction phases, a researcher wants to review the present economic situation, and forecast the future business conditions by using this model. In this case, the researcher needs to be knowledgeable about the duration and amplitude of previous business cycles, relationship between the business cycle and the growth rate or unemployment rate. The knowledge of these facts is available when reference dates of the business cycle are detected and disseminated officially.

1.3 Background

In this paper, we intend to suggest logical dating rules for reference dates using various measures of a growth cycle in a continuously growing economy, where the business cycle is defined as a growth cycle. In order to estimate a growth cycle, the coincident composite index of business cycle indicators is compiled by using total change rate of main economic component indicators like the method of the NBER and then de-trending techniques are applied to this index. Because turning points of growth cycles are identified and detected by cyclical components of the composite indexes, which correspond to the measure of a growth cycle. However, an administrative process is introduced in order to minimize dating errors of the official reference dates, and the proposed turning points are finally and officially determined as reference dates in this process. These procedures will be described briefly in this study.

In the USA and Japan, reference dates are also officially released according to similar procedures. In the USA where the business cycle is considered as the classical cycle, there is an independent dating committee in the NBER, which is comprised of 7 members. The committee reviews turning points of the business cycles and determines them as reference dates through discussions about corresponding economic conditions. Then, these determined reference dates are

⁴ Not to mention, if the corresponding economic policy is delayed or carried out in a recovery period, the policy could affect the volatility of the business fluctuation more than if no policy had been carried out, thus increasing the instability of economic markets.

⁵ The NBER classified economic indicators into the strong or weak leading category in cases of identifying as stable leading indicators during long-term periods.

released officially. In Japan, where indexes of business conditions are compiled as the measure of the business cycle, peaks and troughs of the business cycles are determined on the basis of these indexes. The cabinet office⁶, which is responsible for measurement of the business cycle in Japan, decides and disseminates reference dates through significant discussions with experts in corresponding fields.

1.4 Contents of the study

This study is comprised of 4 sections. In section 2, the methods identifying turning points of a growth cycle will be introduced, and approaches reviewing them as reference dates will be explained. The administration process will be introduced in section 3, in which these identified turning points are ultimately determined as reference dates. Also, the recent dating experience on August 2008 will be explained as a case study in section 4. Finally, a summary of this study will be presented in section 5.

2 Dating rules for turning points

2.1 Components for the business cycle

The definition provided by Burns and Mitchell(1946) is very well-known, and clearly explains the characteristics of the business cycle.

Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in the business enterprises: a cycle consists of expansion 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. (Burns, A. F. and W. C. Mitchell, *Measuring Business Cycles*, 3p)

In the context of this definition, three components⁷ are considered in the business cycle by which turning points of the business cycle and economic phases can be identified. First, the business cycle has pronounced movements. Namely, the ups and downs of an economy need to be divided clearly. In a continuously growing economy where most of economic rises are observed, it is not easy to define the business cycle as the classical cycle. Therefore, the business cycle is redefined, in terms of a growth cycle, as “aggregate economic activities which repeatedly move up and down on long-term growth trends.” Second, the business cycle has a tendency to diffuse. That is, a number of economic activities move simultaneously and repeat the trends of boom, slowdown, recession, and recovery. These movements are diffused throughout various economic sectors including production, employment, sales, income, investment, international trade, and finance. Hence, when most of economic activities reach the boom or recession, the economy is probably near the peak or trough of the business cycle. Third, an economic phase has a tendency to be maintained for a certain period of

⁶ Economic and Social Research Institute, or ESRI compiles and releases these indexes.

⁷ Referred to 3P (Pronounced, Pervasive, Persistent) or 3D (Depth, Diffusion, Duration)

time. Burns and Mitchell (1946) suggest that the duration of a cycle is from more than one year to less than 12 years. Based on a number of empirical studies about economic indicators, the NBER also suggests the minimum duration is as follows; the duration must be 15 months or more in a single cycle, and 5 months or more in a single phase of expansion or contraction.

2.2 Methods identifying turning points

In the context of the depth and diffusion in which the first and second components of the business cycle were earlier mentioned, three indicators are introduced in order to identify turning points of an economy; a cyclical components of the coincident index, a coincident cumulated diffusion index, and a historical diffusion index (HDI). These indicators are considered as various measures of a growth cycles in a continuously growing economy. Hence, the method identifying turning points is the technical process in which a peak or trough is detected in three indicators. This method uses the Bry and Boschan (1971) algorithm and 50 point mark in the HDI for detecting turning points, which are regarded as non-parametric methodology.

2.2.1 Cyclical component of the coincident composite index

The Korea National Statistical Office (KNSO) produces composite indexes of business cycle indicators by using the compiling method, which was developed by the NBER. The composite index (CI) is used for measuring the duration and depth of the business cycle.

The coincident composite index is compiled with 8 component indicators, which represent the sectors of employment, production, sales, and trade. These indicators are sensitive to the business cycle. Each component series is adjusted by removing the non-business factors such as seasonal and irregular factors. To prevent a more volatile component series from dominating the index, the symmetric percent change for each component is standardized by its standard deviation. The summation of the standardized change rates for all components becomes the total change rate. Then, the total change rate is adjusted by the GDP trend adjustment technique in order to equalize the growth trend of the coincident composite index with that of the GDP. The final coincident composite index is updated monthly according to this adjusted total change rate.

The cyclical component is computed by removing the long-term trend⁸ from the coincident composite index in order to measure a growth cycle, because the business cycle is defined earlier as a growth cycle. The highest point on the cyclical component series is interpreted as a peak and the lowest point is considered as a trough in terms of the depth of the business cycle, because the cyclical component is regarded as the measure of a growth cycle. The turning point of a peak or a trough needs to satisfy the minimum duration rule. Technically, turning points on the cyclical component series are identified by the Bry and Boschan (1971) algorithm, in which the minimum duration rule as previously mentioned, is guaranteed.

⁸ The triplet Phase Average Trend (PAT) technique is applied for measuring the long-term trend in the KNSO.

2.2.2 Coincident cumulated diffusion Index

The diffusion index (DI) needs to be compiled for the second concept of the business cycle, so called a “diffusion” because a disadvantage of the composite index is that it does not include a diffusion of economic activities. The diffusion index is defined as a proportion of the components that contribute positively to a growth cycle. Therefore, the diffusion index can be calculated easily by using the percent change rates of all selected component series for the coincident composite index before the standardization procedure. However, in practice, it is more complicated to calculate the diffusion index in the economy where the business cycle is defined as a growth cycle. In other words, the percent change rate can not be applied directly for compiling the diffusion index, because the percent change rate has a long-term trend, and the degree of its contribution to a growth cycle, i.e. positive or negative contribution, can not be evaluated with only its change rates. Hence, the diffusion index is computed by the definition that “if the percent change rate of the component series is more (less) than the long-term trend of the change rate⁹, the component series is regarded as having a positive (negative) contribution to a growth cycle.”

Typically, turning points of the diffusion index tend to be shown at near the 50 point mark. Also, the cumulated diffusion index (CDI) can be calculated by cumulating¹⁰ the pure degree of the diffusion in economic activities as greater than or less than 50. Now, this index is the coincident cumulated diffusion index as another measure of a growth cycle in terms of diffusion. The coincident CDI corresponds to the cyclical component of the coincident composite index, because they are both based on the same component series. But the coincident CDI tends to have a right-upward movement behaviour, which is different from the cyclical component series, because the asymmetric characteristics that “the expansion duration is longer than contraction duration” are reflected in the CDI. Technically, turning points in the coincident CDI series are also identified by the Bry and Boschan (1971) algorithm. They are considered as a peak or a trough in terms of the diffusion of a growth cycle.

2.2.3 Historical diffusion index (HDI)

A new cycle index can also be compiled by aggregating states of expansion or contraction phases in the component indicator series. Namely, the concept of the probability that the aggregate economic activities are in the expansion phase is introduced as a measure of a growth cycle. The compiling procedure is very simple, because all of the component series for the coincident composite index is used.

First, a cyclical component of each series is computed by removing the growth trend estimated through the PAT or Hodrick-Prescott Filter Technique from the seasonally and irregularly adjusted series. Then, turning points on each cyclical component are identified by the Bry and Boschan (1971) algorithm, which are termed as specific turning points of the individual cycle series. Second, each series is identified with a 100 in periods of the expansion phase and 0 in those of the contraction phase, determining phases based on the specific turning points. Therefore, the value of each series classifies the state of business condition into expansion or contraction phase in individual economic activity. Then, the historical diffusion index (HDI) is obtained by averaging all values of the component

⁹ The mean of the percent change rate is considered as the long-term trend of each component series.

¹⁰ The present CDI = CDI of previous month + (DI of the present month - 50).

series, which means aggregating states of individual business conditions in an economy. The HDI is interpreted according to the standard of 50 such as in a typical diffusion index. In other words, turning points of the HDI are regarded as dates when the index moves through the 50 point mark. For example, a peak (trough) occurs in the period when the HDI passes 50 point mark from up to down (from down to up).

2.3 Approaches confirming identified turning points

Turning points of these three indicators are identified by a technical process, which is called non-parametric methodology. However, these indicators maybe give biased measures about an economy because of bad components of composite indexes. Hence, it is necessary to confirm that the identified turning points are expected to become reference dates of growth cycles. In this study, three approaches are suggested for confirming the identified turning points as a predicted reference date.

2.3.1 Distribution chart analysis of specific turnings

Specific turning points of each component series are identified in the process compiling the HDI. Hence, a distribution chart of these turning points can be made. Now, identified turning points of a growth cycle with previous three measures can be confirmed through this chart because it is possible to review whether identified turning points are located within a range of the specific turning points.

2.3.2 Growth rate of GDP and the detailed data

The GDP is compiled to measure a value-added produced in an economy for a certain period of time. This GDP indicator represents the aggregated economic performance as well. Hence, turning points identified earlier can be confirmed by comparing them with turning points of the GDP growth rate. Because the GDP is produced quarterly and the change rate is based on the same quarter of the previous year, turning points of the GDP growth rate usually tend to lead one quarter or become included in the same quarter in comparison with identified turning points in three measures of a growth cycle.

On the other hand, identified turning points can be confirmed by monitoring whether the economic phases of expansion and contraction based on them are correct or not in context with the detailed data of the economic growth. This includes the boom or slump of private consumption, investment of equipment or buildings and facilities, and exports lead the economic expansion or contraction. Hence, expansions or contractions based on identified turning points are confirmed by reviewing growth rates of detailed items of the GDP. For example, growth rates of most detailed items tend to go upward positively during an economic expansion period and go downward reversely in an economic contraction period, even to the point of negative figures.

2.3.3 Review of economic situations

The authority for economic and financial policy tends to recognize turning points of business conditions carefully by monitoring every available economic indicator because it is impossible to prepare and carry out economic regulation actions or measures to avoid a recession without the accurate and diagnostic recognition of economic phases. Therefore, records of economic policies or

events become important data indirectly in reviewing whether the period before or after of previously identified turning points correspond to economic expansion or contraction. For example, economic measures for stimulating consumption or investment are announced by economic agencies of government. Also, the call rate as a reference interest rate is often lowered by the monetary authority in a period of recession. Hence, the economic event diary¹¹ is created and used for reviewing whether identified turning points are referenced to the released dates of economic and financial policies.

3 Administrative process for dating

In order to detect a predicted reference date as mentioned earlier, identified turning points of the cyclical component of the coincident CI, the coincident CDI and HDI are confirmed through various approaches. Now, a report about predicted reference dates is produced on the basis of identified and confirmed results concerning turning points of growth cycles. This report is used in a meeting with a group of experts, which is a step in the administrative process for dating. This administrative process consists of three steps; discussion with a group of experts, deliberation at Economic Statistics Committee, and determination and dissemination of reference dates.

About 50 months is the average duration of a single cycle in growth cycles of Korea, and 30 months is approximately the average duration of a single expansion phase. Hence, the dating of a new reference date needs to be reviewed with the passage of about 3 years from the announcement of the most recent reference date.

3.1 Discussion with a group of experts

The meeting with a group of experts in the business cycle field is a very important process for dating in Korea. The meeting advances with significant discussions about the statistical accuracy and the validity of the predicted reference date in the context of economic situations at that time. The discussion is authorized because the group of experts is mainly comprised of professors in the business cycle field, researcher in the same field, and government officers currently analyzing economic indicators. After the meeting with the experts, the report about the predicted reference dates is revised according to the comments of the experts.

3.2 Deliberation at Economic Statistics Committee¹²

The revised report is presented to the Economic Statistics Committee under the National Statistics Committee. The committee for economic statistics deliberates on the predicted reference dates in the revised report. The committee can ask technical experts to participate in the meeting and

¹¹ The diary includes economic policies, social and political events, and various actions or measures that were released before and after turning points. Also, it is used for monitoring the economic situation in meeting with a group of experts as well as reviewing the predicted reference date internally.

¹² The committee is established for deliberating upon the work plan of economic statistics, and is comprised of 11 members who are knowledgeable in economics and statistics or have a large amount of experience in analyzing or compiling economic statistics. The commissioner of the KNSO appoints one person among the 11 members as a chairperson, who has significant expertise in economic statistics and experience in leading the meeting. The meeting of the committee for economic statistics is valid when more than half of the 11 members participate, and the decision of the meeting is effective in the case that a majority of the participants agree to a proposed agenda.

give professional opinions about the predicted reference dates. In the case of dating, the committee asks the official in charge to explain the revised report and proposed agenda concerning the predicted reference dates before the deliberation. Then, the members of the committee discuss and review the proposed reference dates. Following the deliberation, the committee members vote to either agree or disagree with the proposed reference dates.

3.3 Determination and dissemination of reference dates.

The final report about reference dates is produced on the basis of the proposed and then agreed upon reference dates from the committee for economic statistics. Following the approval of this final report by the commissioner of the KNSO, the determination of reference dates are completed. Then, the determined reference dates are released to the public through a referenced document¹³, which is given to a pressman at the time of a briefing about the monthly composite indexes of business cycle indicators. In addition, the determined reference dates are described in the monthly publication, "Composite Indexes of Business".

4 Recent dating experience

4.1 Recent reference dates

Korean Composite Indexes of Business Indicators have been compiled since March 1981, and the monthly data has been available since 1970. From that time, the composite indexes have been revised 7 times by changing their component series and minor options of compiling in order to prevent composite indexes from making a false representation of a growth cycle, while the release of reference dates has been conducted 11 times during 9 growth cycles from 1970 to the present.

In 2007, turning points of the 8th and the 9th cycles were reviewed by various detecting and estimating models about turning points of a growth cycle. In March 2008, revised data of various component series¹⁴ were reflected¹⁵ in the composite indexes, and the base year of these indexes was changed in 2005 which means that the index of 2005 represents the average value of 100. Therefore, three measures of a growth cycle, i.e. cyclical component of the coincident CI, coincident CDI, and HDI, are revised with the changed data of the coincident composite index and its component series. Also, turning points of the 8th and 9th cycles were re-identified with this data concerning growth cycles. Identified turning points are shown in Figure 2 and Figure 3 of the Appendix.

These identified turning points had been confirmed previously by various approaches until June 2008. Then, a draft report about predicted reference dates was created. The meeting with a group of experts was held in July 2008, and we had significant discussions with a draft report at the meeting. The report was revised by reflecting comments proposed in the meeting. The revised report was

¹³ This document is a 2 page summary.

¹⁴ Indexes revised by changing the weights of detail items and base year include the Industrial Production Index, Wholesale and Retail Sale Index, and Service Industry Activity Index. At the beginning of the year, the preliminary data previously released is usually revised as the final data in cases of other component series.

¹⁵ According to reflecting the revised data of the component series, parameters applied in compiling composite indexes are changed, which include seasonal factors, standardization factors, and trend factors. Then the previous data of composite indexes are re-adjusted.

presented to the committee for economic statistics in August 2008, and the committee agreed to determine the proposed reference dates. Then, the final report about reference dates was produced and approved by the commissioner of the KNSO. The determined reference dates were officially released through a briefing with the referenced document on August 29, 2008.

4.2 Keynotes during the 8th and the 9th cycles

The period from July 2001 to April 2005 was estimated as the 8th cycle of the Korea economy. Namely, the trough and peak of the 8th cycle were finalized as July 2001 and December 2002¹⁶. Also, the trough of the 9th cycle was determined preliminarily as April 2005. The 8th cycle had durations with 17 months of expansion and 28 months of contraction. This cycle had unusual characteristics in that the expansion period was shorter than the contraction. The causes of this phenomenon seem to be both cyclical movements of the domestic sector and the cycle of exports with delayed lags.

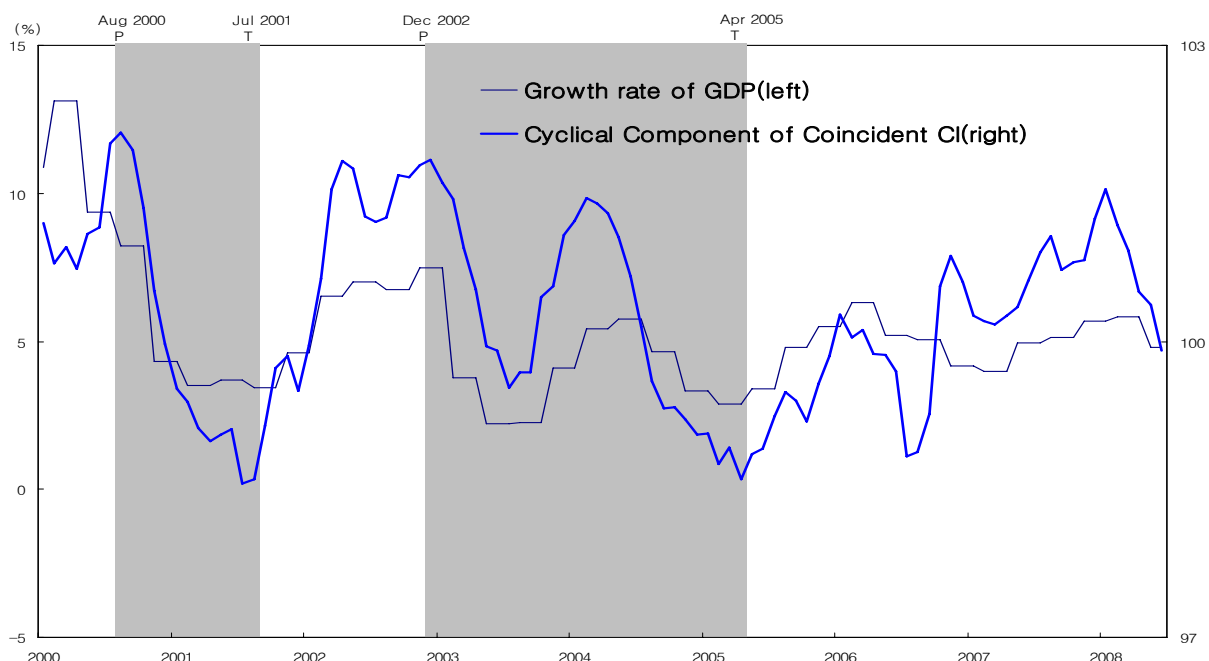
There were a few keynotes during the 8th and 9th cycles. First, because of the impact of the worldwide IT business depression since 2000, the overseas demand for Korean commodities decreased, and the investment of equipment was in recession. Then, various fiscal and monetary policies were carried out at that time. For example, the call rate was continually lowered in 4 stages (from 5.25% to 4.0%) during the 8 months from February to September 2001. The comprehensive countermeasures for stimulating the domestic demand were released in October 2001, which included reinvigoration of home construction and service industry, removing a part of restrictions on business of enterprises, promotion of investment in the information and communication field. Due to effects of these policies, the business conditions started to recover from July 2001.

Second, the growth rate of the GDP reached 6~7% in 2002 due to a boom in consumption and investment. Also, exports increased vigorously in the second half of this year, and business conditions reached a peak in December 2002. After then, consumption and investment decreased sharply or slowed down because of an insolvency of household loans and credit crisis, in which the business conditions started to decrease. A recovery of domestic demand was delayed until early 2005 due to the slow progress of household living conditions and the instability of job markets. Even though exports were favourable in 2004 due to synchronism with world business, they did not stimulate the depressed domestic demand¹⁷. Hence, there was a long-term depression of domestic demand at that time. The duration of the contraction in the 8th cycle was 28 months, which was longer than the 19 months of an average duration for contractions in Korea.

¹⁶ At the 7th revision of composite indexes, the dates, i.e. the trough and the peak of the 8th cycle, were determined preliminarily.

¹⁷ There was a short boom for 7 months in this contraction, but it was not identified as a normal cycle. Because of the depression of consumption and investment, experts held the opinion that the short period could not be recognized as an expansion. Also, the Committee for Economic Statistics agreed with opinions of experts.

Figure 1 Growth Cycle in Korea since 2000



Third, the trough of April 2005 was determined preliminarily as the starting point of the 9th cycle. Around April of 2005, the IT business escaped from a depression, and the bubble of household consumption settled down. Also, both exports and consumption started to increase gradually. However, the business recovery progressed slowly due to a slump in investment and the low diffusion effects of growth in main industries such as the semiconductor industry. Therefore, the growth rate of the GDP was around 5% during that period.

4.3 Assessment of dating rules in Korea

Dating rules in Korea are evaluated as very logical procedures. First, the business cycle in Korea is defined not as the classical cycle in the USA, but as a growth cycle like the OECD. If it were defined in the classical cycle, the economy would have had only two recessions; one in 1980 which the economy had an unstable politics and was affected by the second oil shock, the other in 1998 when it suffered from the foreign exchange crisis. However, Korea's economy had slumps in consumption and investment between these two periods. Hence, if the business cycle of a continuously growing economy like Korea were defined in the classical cycle, it would not be considered as a good representation¹⁸. Second, turning points of a growth cycle are identified with 3 representative indicators¹⁹ which are measured in terms of a growth cycle. Then, the identified turning points are

¹⁸ Burns and Mitchell (1946) suggested that the business cycles vary from more than one year to ten or twelve years. But in this case, the duration of the business cycle become about 18 years longer than the maximum duration of Burns and Mitchell (1946).

¹⁹ The three indicators are the cyclical component of the coincident CI, coincident CDI, and HDI.

reviewed and confirmed through various approaches. The predicted reference dates are estimated and reported on the basis of these identified turning points. Third, the administrative process is introduced in order to determine reference dates. Professional opinions are collected through a meeting with a group of experts. Then, the report about the proposed reference dates are presented to the Committee for Economic Statistics under the National Statistics Committee. After deliberation, the final report about the agreed upon reference dates from the committee is submitted, and approved by the commissioner. This process gives authority to the released reference dates and provides a system to minimize the error of determining reference dates through biased recognition about economic conditions.

5 Conclusion

This study introduces rules for dating a growth cycle in Korea, which include the method of identifying turning points by various measures of growth cycles, various approaches in reviewing these turning points, and the administrative process in determining the final reference dates. These dating rules for a growth cycle can be benchmarked in a continuously growing economy such as Korea, where the business cycle should be defined as a growth cycle.

In summary, there are three important and necessary procedures in the dating rules of Korea. First, composite indexes of business cycle indicators are compiled by using the method developed in the NBER. Various measures of a growth cycle are estimated on the basis of these composite indexes in terms of depth and diffusion in a growth cycle, and their turning points are identified by the Bry and Boschan (1971) algorithm. These identified turning points of a growth cycle are reliable. Second, these turning points are reviewed through various approaches in terms of their qualification as reference dates of a growth cycle. In this procedure, various measures of a growth cycle can be confirmed as good business cycle indicators. Third, the administrative process is the procedure that determines and disseminates these turning points as reference dates of growth cycles. This process is expected to give an authoritative basis to the released reference dates and minimize errors in the dating.

However, these dating rules require vigilant procedures because these measures of a growth cycle are revised annually and their turning points could be affected by their revisions. Usually, a new reference date requires approximately three years before it is released officially. Hence, detecting and forecasting models of the coming turning points are necessary in order to review the present and the future business conditions. For example, the two or three months' consecutive method and analysis of lead time in a leading composite Index may be used. Also, with a coincident index and a leading index, the sequential signals method and Neftchi probability may be utilized. Therefore, future studies will focus on the development of econometric models for detecting and forecasting turning points of a growth cycle.

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Appendix

Figure 2 Cyclical Component of Coincident CI and Coincident CDI in Korea

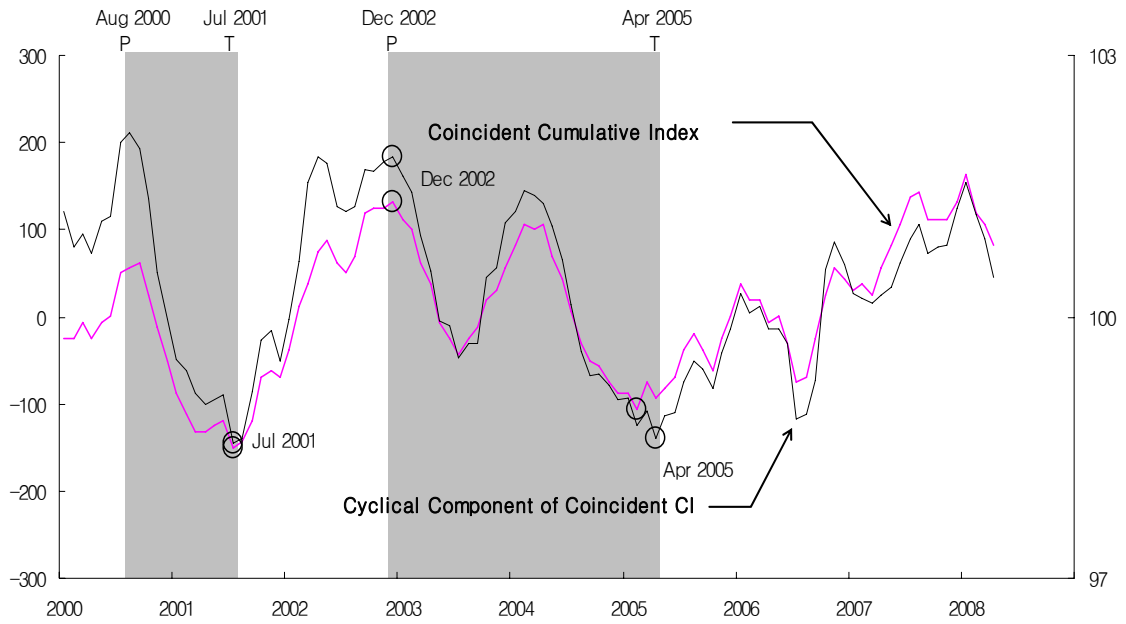


Figure 3 HDI (Historical Diffusion Index) in Korea

