Introduction

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It is a well-known fact that industrialized market economies exhibit business cycles. The importance of monitoring business cycles was recognized more than a half-century ago, and various efforts have been made to measure and forecast these cycles. Nowadays, for most of the industrialized economies, it has become common to compile business cycle indicators and to conduct business cycle surveys. Private research institutions also publish their own business cycle indicators. Such information is widely used in both the public and private sectors. Governments and monetary authorities utilize the information for their economic policy-making and budget planning. The private sector makes use of the information for production and investment planning.

The business cycles measured in this way represent a combination of short- and medium-term cycles but are basically dominated by the short-term cycles. Short-term cycles have a duration of approximately three years per cycle and are usually caused by inventory adjustment. Medium-term cycles have a duration of about eight years and are caused by the movement of fixed capital.

Monitoring business cycles has been largely neglected in developing countries. Their economic cycles have been simple, representing agricultural cycles or the influence of external economic shocks. In countries where the production structure is dominated by agriculture, the fluctuations in climate, especially in rainfall, generate fluctuations in harvests and consequently affect income. Also, when the economic system is basically open to the world economy, developing countries with a relatively small economic size are easily influenced by such external factors as the fluctuation in primary commodity prices and in interest rates.

With the recent progress of industrialization in developing countries, however, the manufacturing sector has occupied a more significant share in the industrial structure, and this change has made room for self-contained business cycles. Moreover, the intensification of economic interdependence

between industrialized and developing countries through trade, direct investment, and other financial flows has strengthened the international diffusion of business cycles. In particular, business conditions in such large industrialized areas as the United States, Japan, and the EC have come to have an ever larger impact on the economies of developing countries, mainly through import demand for light manufactured goods.

The Asian NIEs began to exhibit business cycles, originating from the manufacturing sector, in the early 1970s as a consequence of their rapid industrialization since the 1960s. Rapidly industrializing ASEAN countries likewise began to experience business cycles in the late 1970s. In addition, the export-oriented industrialization of these economies has made them sensitive to the business cycles of industrialized countries. The Asian NIEs and the ASEAN countries have in this way come to experience the coexistence of manufacturing-based business cycles and agricultural cycles, and also the international diffusion of business cycles.

Such complication of the business cycle pattern, which characterizes the transitional economy as it moves toward an industrialized state, caused increasing difficulty for national policy makers and business people in judging the status quo of each economy. People therefore came to realize the need for up-to-date, short-term, and comprehensive indicators of business conditions. Such a need cannot be fulfilled solely by the collection of a series of important monthly economic data nor by annual national income statistics. Because of this, by the 1980s the ASEAN countries began to feel a serious need for business cycle indicators to identify business cycle phases and provide short-term forecasts.

Korea and Taiwan preceded other Asian countries in this field. They have compiled business cycle indicators since the 1970s. Singapore and Malaysia began to conduct business surveys in the mid-1970s. With the exception of a few experimental cases, however, no ASEAN countries have developed and published business cycle indicators.

The reason why business cycle indicators have not been compiled in the ASEAN countries—despite both their need and the existence of well-established methodologies for compiling business cycle indicators, such as DIs and CIs—lies in the various constraints peculiar to developing countries. Such constraints are:

1. High growth trend in most of the economic variables. This necessitates from a theoretical standpoint the application of the growth cycle approach and from a technical standpoint the development of an appropriate trend estimation method.
2. Coexistence of agriculture and manufacturing. The transitional indus-

trial structure is characterized by a roughly equal weight for agriculture and manufacturing. This requires the explicit inclusion of agricultural variables as components of indicators, but it is not easy to find appropriate monthly variables because most agricultural products are seasonal.

3. Poor availability of data. Variables which are widely used as components of diffusion indices (DIs) or composite indices (CIs) for industrialized countries are often not available. Examples are inventory data, floor space authorized by construction permits, orders for machinery production, and consumer product sales. The relatively long time lag before data are released is also a problem since DIs or CIs should be a quick indicator of business conditions.

With the need for business cycle indicators for developing countries, the Institute of Developing Economies (IDE) started in April 1984 a project called Short-term Economic Prediction in Asia, or SEPIA. The project covers five of the ASEAN countries (Burunei has been excluded). In addition, Korea has been included as a reference of the NIEs, and India is also included as a country of large economic size with relatively inward-looking industrialization. The project has undertaken the development of DIs and a data base, identification of the turning points of business cycles in the past (reference dates), and analysis of business cycle patterns and mechanisms. The project has been conducted as a joint undertaking with universities, research institutes, and government agencies in each country. The development of DIs was finished in March 1989, which enabled the measurement of business cycles in the seven countries. Since that time IDE and the partner organizations have been working independently but with a close exchange of information to regularly maintain the DIs.

The SEPIA project has made it possible for the seven subject countries to measure their business cycles. The analysis of each country's DI not only has shown the existence of business cycles but also has clarified the historical pattern of each country's business cycle. Moreover, the comparison of cyclical patterns in the seven countries with those of the United States and Japan indicates a strengthening international synchronization of business cycles, especially during the 1980s.

At the same time the mechanism of business cycle generation and diffusion in developing countries was analyzed to some extent. During the development process of the DIs, a few problems in such statistical techniques as seasonal adjustment and trend estimation were also examined and an easy-to-use computer software system was developed.[1]

This book has been compiled in order to present the first comprehensive readings on business cycles in the seven Asian countries studied under the

SEPIA project. Most of the papers included here were first presented at the SEPIA workshop held at IDE in February 1990 and have been further revised.

Part I summarizes the results of IDE's measurements for the business cycles of the seven countries. Chapter 1 explains the concepts and framework of DI compilation. Chapter 2 presents in a standard format for each country the component variables of the leading, coincident, and lagging DIs; the reference dates for approximately the last ten years; and an economic chronology for interpreting each country's cyclical phases. Chapter 3 discusses the characteristics of business cycles in developing countries in relation to the structural features of their economies and points out the problems still awaiting DI compilation.

Part II presents individual country studies. The papers written by the counterparts of the SEPIA project in each of the ASEAN countries (Chapters 4, 5, 7, 9, and 10) set forth the details of the DI compilation done by each partner organization and also highlight the features of each country's business cycle pattern. Here it should be noted that for some countries the component variables of the DIs and reference dates given in these chapters are slightly different from those of IDE given in Part I. This reflects two things: the difference between IDE and the counterpart organizations in ready accessibility to up-to-date data and the independent efforts of each organization to improve the accuracy of the DIs after completion of DI development in March 1989. We believe such freedom on both sides assures the further improvement of the DIs as long as accompanied by the close exchange of information. Korea is one of the pioneers among the developing countries in business cycle measurement. Chapter 13 outlines the Korean history of measuring cycles and provides the details of the CI compilation method used by that country's Economic Planning Board. A comparison of business cycles measured by the indicator method and those measured by business expectation surveys is also of interest. Chapter 6 makes such a comparison statistically for Malaysia and proceeds to examine the possibility of forecasting CIs using the results of expectation surveys. Chapters 7 and 9 also touch upon analytical aspects.

The remaining chapters of Part II examine business cycle patterns and the diffusion mechanism of cycles. Chapter 8 examines the impact of external shocks on a country's business cycles and compares these with domestic causes for such cycles. The Philippines has been used as a case study for this analysis. Chapter 11 looks at the influence of a country's industrial structure as it changes over time on the diffusion channels of business cycles. Thailand, with its rapid industrialization, has been used for this study. Chapter 12 examines the situation of the coexistence of

agriculture and manufacturing and measures the sectorial business cycles. Such cycles are identified in the nonagricultural sector of India and are examined for their impact on agricultural income, public investment, and exports. Chapter 14 examines the consistency between business cycles and cycles generated from the monetarist macro model in order to look into the theoretical interpretation of business cycles.

Part III contains broader studies of business cycles and problems related to statistical techniques. The degree of industrialization naturally influences the pattern of business cycles. A comparative study of four Asian NIEs and four ASEAN countries is made in Chapter 15. Cycles measured by DIs largely reflect the short-term inventory cycles but are also influenced by the medium-term fixed capital investment cycles. Chapter 17 identifies, using annual data, these inventory cycles and fixed capital investment cycles for nine Asian countries. Chapter 16 evaluates the business cycle phases observed in the IDE-compiled DI, using the movement of quarterly GDP as estimated by the Goldstein-Khan method. The growth rates of the quarterly GDP also supplement information on the amplitude of business cycles. The two important statistical techniques used in the compilation of DIs are discussed in Chapters 18 and 19. The phase average trend method, although a widely used technique of trend estimation in the compilation of DIs and CIs, has a shortcoming in that the trend of the latest business cycle phase is a little unstable. Chapter 18 presents an alternative method for trend estimation and for the identification of turning points. Chapter 19 deals with the problem of the X-11 seasonal adjustment method, which produces inaccuracy problems on both sides of a series of data. To overcome these, the X-11 ARIMA method was developed, and Chapter 19 examines the applicability of this newly developed method and also proposes the application of the univariate intervention model to cope with the X-11 ARIMA shortcomings.

Though this book covers many topics, a number of areas need elaboration in the future. First, in the field of indicator development, an effort needs to be made to compile CIs. The SEPIA project started with the compilation of DIs because that compilation procedure is simpler than for CIs and fits in better with first attempts at measuring business cycles. The DI shows whether an economy is in an expansionary or contractionary phase, but it can not indicate the amplitude of expansion or contraction. The CI is superior to the DI on this point. Therefore, as a second stage of measurement, the compilation of CIs is needed. When doing this, the procedure of weighting the component variables of the CIs should be very carefully studied to keep the intrusion of arbitrariness to a minimum.

Second, further efforts should be made to clarify the diffusion process

and the mechanism of business cycles in developing countries. This book introduces such analysis for each of the countries studied, but it is far from enough. More detailed country analyses should be made, utilizing the results of business cycle measurements. Moreover, based on such country studies, an effort needs to be made to develop a generalized theory of business cycles for developing countries.

Third, the process and mechanism of the international diffusion of business cycles should be studied further through the comparative study of the DIs for Asian countries and those for industrialized countries. Such studies would contribute to a better understanding of the increasing economic interdependence among countries.

Note

1 See Toshirō Takagi, *SEPIA Software Manual* (Tokyo: Institute of Developing Economies, 1990).