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Business-Cycle Synchronicity Strengthens Between Japan and Asia

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One country's economy is strongly influenced by other economies, as aptly described by the saying that when the United States sneezes, Japan catches a cold. This being the case, to what extent are countries' economies interlinked in overall terms? The scale of the trade and investment that bonds countries together is growing year by year, and it can be postulated that the synchronicity of business cycles should strengthen.

Advanced-Country Synchronicity Fails to Grow Stronger

Conventional empirical analyses negate the assumption that synchronized business cycles are on the rise. Growth of gross domestic product is a standard measure used for judging the condition of an economy, and synchronization can be judged by the correlation of GDP growth rates. While there are also some measures, such as stock prices, that provide evidence of increasing international synchronicity, when one looks at this comprehensive economic indicators, one finds that business trends in one country are surprisingly independent of the trends in others.

Two leading researchers in the field are James H. Stock of Harvard University and Mark W. Watson of Princeton University. While conducting a series of studies, they have found that although a decline in the volatility of growth rates has been a common feature of the leading industrial countries, no rise in business-cycle synchronicity (measured using correlation coefficients of GDP growth rates) is to be observed.

The decline in volatility they refer to is a shrinking of the gap between high and low growth rates. A number of factors have been posited to explain the global contraction of the boom-and-bust cycle. Among them are (1) the growing weight of the service sector in the industrial structure (cyclical movements are easier to level out in services than in manufacturing, where inventory adjustments are prominent), (2) advances in inventory management technologies, (3) changes in monetary policies (thanks to improved policymaking capabilities, central banks can counter cyclical swings more effectively than in the past), and (4) relative stability of the prices of energy and other primary products. However, no clear conclusion has emerged on the factors involved.

The Different Scene in Asia

Even though no rise in the synchronization of business cycles may be discernible among the leading industrial countries, the situation may be different when the analysis

focuses more narrowly on certain economic spheres or is broadened to include developing countries. In the field of international business-cycle research, which thus far has centered on the advanced nations, analyses need to be conducted from new perspectives like these. Japan, which has now pulled out of an unusually protracted slump, has become a subject of the discussions on international transmission of business cycles. In Japan's case, cyclical synchronization with the neighboring countries and regions of Asia needs to be investigated.

The economy of each and every country is subject to influence from not just current circumstances but also past developments in other economies. It is possible to model the dynamic relationships involved by using a technique called vector autoregression (VAR). We used this technique in a study of Japan and other countries and regions of Asia to ascertain whether there has been a change in the cyclical transmission mechanism within the region.

First, for the period from 1992 to 2006, we estimated reduced-form VAR with a lag of one quarter for Japan, the Philippines, Singapore, South Korea, and Taiwan, all of which have usable data on quarterly GDP growth rates. Next, we investigated whether there had been a structural change in the nature of cyclical transmission over this period.

To determine whether there had been a change in the estimated coefficients between values for the full period and values when the period was divided into two parts, we performed a check using the modified likelihood ratio test for adjusting small-sample biases. By shifting the dividing point between the two parts of the period, we identified the point showing the greatest possibility of structural change.

We found that there was a change in the cyclical transmission mechanism between Japan and other Asian countries and regions around the end of 1998. The table shows the direction of change in the correlation coefficients between the period up through 1998 and the period starting in 1999. In some 70% of the cases, the correlation grew stronger in the later period than in the earlier (indicated by values displayed in bold type). It may be noted that the timing of this structural change coincided with the currency crisis that swept across the Asian region. The sharp deceleration of growth rates on that occasion lasted only for a short time, however, and did not influence the test results of the structural change.

Table Business-Cycle Correlation Coefficients Between Japan and the Asian Region (1999–2005, Figures in bold show correlation coefficients that rose over their 1993–97 values.)

	South Korea	Malaysia	Indonesia	Philippines	Singapore	Taiwan	Thailand	Japan
South Korea	1.00							
Malaysia	0.66	1.00						
Indonesia	0.17	0.41	1.00					
Philippines	0.09	0.33	0.14	1.00				
Singapore	0.52	0.48	0.06	0.36	1.00			
Taiwan	0.56	0.48	0.11	0.15	0.60	1.00		
Thailand	0.38	0.42	0.41	0.14	0.34	0.45	1.00	
Japan	0.56	0.81	0.30	0.38	0.52	0.48	0.41	1.00

Note: Calculated from the cyclical component of the seasonally adjusted monthly production index in each country or region.

Division of Labor Enhances Synchronicity

While a strengthening of cyclical synchronization with the Asian region holds true for Japan, it has not been observed in the case of the United States. Why should this be the case?

The conclusion I have reached through recent research is that the answer involves a change in the contents of trade, not growth in the volume of trade. Since the end of the 1990s, there has been a rapid expansion of networks handling what can be called fragmentation, which involves a division of labor in the supply of parts and the processes of production. Globally viewed, specialization of this type is particularly notable in the Asian region. Accompanying its evolution, trade of capital goods and intermediate goods has briskly expanded.

The international synchronization of business cycles provides a useful reference material for economists performing economic forecasts. In Asia's case, the issue is also intimately connected to the feasibility of economic and currency integration, which is becoming a matter of concern on government policy agendas. If international synchronicity in business cycles grows stronger, movements peculiar to individual economies will become relatively less volatile. In that case, it would become easier to abandon the use of exchange rates as a policy tool for absorbing country-specific shocks.

Reference:

Takeuchi, Fumihide. 2006. "Ajia keiki to no rendosei wa naze takamatte iru no ka: Dogaku ippan kinko moderu ni yoru bunseki" (Why Is Business-Cycle Synchronicity with Asia Strengthening?: Analysis with a Dynamic General Equilibrium Model). JCER Discussion Paper No. 108.

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