Using the New NLI Business Cycle Indexes (NBI) as a Policy Tool

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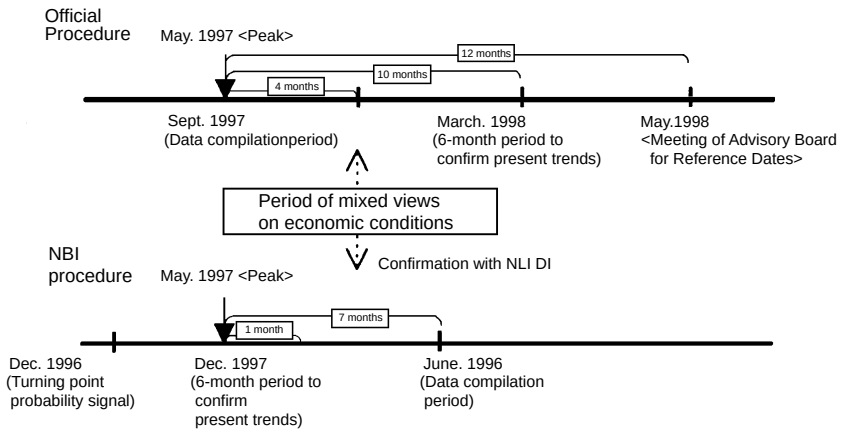
Introduction

In May 1998, the NLI Research Institute began compiling the NLI Business Cycle Indexes (NBI). The NBI incorporates monthly economic indicators to gauge sequential changes in economic conditions. It quantifies the speed, strength, and turning points in the business cycle in a way not accessible through GDP and other conventional statistics, allowing troughs and peaks to be identified approximately three to six months earlier. This paper introduces the NBI and discusses its usefulness in identifying turning points in business cycles.[1]

1. Confusion Surrounding the Identification of Business Cycles

Most people—whether they are corporate managers making investment plans, or consumers interested in buying a house—have a stake in finding out where the economy is headed, and want to know if the method of judging business conditions is objective, accurate and timely. The government is also needs a quicker, more objective way to evaluate business conditions, especially following the recent debate on the elasticity clause of the Fiscal Structural Reform Act, which gives the government great discretion in managing the economy.

Figure 1 Time Needed to Determine Business Cycle Reference Dates (most recent case)



Note: During the 6-month period to confirm present trends, the economic indicators used in the respective (coincident) diffusion indexes are all confirmed.

In practice, however, the determination of business cycles is slow and tends to create problems. This is particularly true near cyclical turning points, when divergent views clash and often lead to confusion.

The divergent views can be attributed primarily to: (1) the longer delay in releasing GDP statistics and other economic indicators compared to Europe and the U.S., and (2) the delay in official announcement of turning points in the business cycle. Presently, turning points are officially announced by the EPA's Advisory Board for Reference Dates, who waits a minimum of one year after the fact for final confirmation. In the meantime, the Monthly Economic Reports, which ostensibly provide prompt updates, use language that is intentionally vague.

For example, to confirm the recent peak in May 1997, it took four months to compile the necessary data, and another six months for confirmation. Thus confirmation of the peak could have occurred no sooner than one year after the fact.

A clear distinction needs to be made between this academically oriented approach to business cycle indexes, which uses relatively complete economic data and emphasizes accuracy and neutrality, and more practical approaches that emphasize promptness and usefulness in policy formulation.

As a practical matter, business conditions need to be determined as quickly as possible to be used effectively in policy formulation.

2. Explanation of the NBI

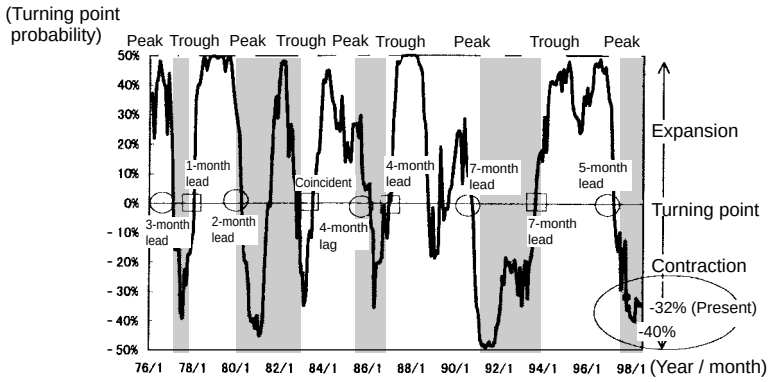
The NBI is based on the NLI CI (composite index), which is derived from quickly available economic indicators, and quantifies cyclical turning points using a probabilistic model.

(1) Measurement and Performance of the NBI

The NBI approach first quantifies economic fluctuations in past cyclical turning points, and then stochastically determines where the economy currently stands in the cycle. This approach was pioneered in the U.S. by the FRB and NBER (National Bureau of Economic Research), and is used to supply reference indicators. In Japan, there have been no practical applications of this approach to date.

We attempted to estimate a recession probability index using a Probit model.[2] In Figure 2, the cyclical turning points occur when the indexes have a probability of 0%. Presently, the NBI value of -32% indicates that the recession is still in progress.

Figure 2 The NBI



Notes : 1. Circles signal the start of expansions, and squares signal the start of contractions.
2. Shaded areas denote recessions.

As for the performance of the NBI, the average lead time for past peaks and troughs is three months. However, the performance is not always consistent. The NBI signaled the October 1985 peak four months late, while the trough signal coincided with the February 1983 trough. Thus we are working on improving the stability of the NBI by incorporating other probability models.

(2) Composition of the NLI CI

In developing the NLI CI, one criterion for the selection of economic indicators was the timing of announcement dates. Of the data series presently being used in diffusion indexes, most of the indicators are announced at the end of the following month. Since the NLI CI prioritizes the announcement dates of economic indicators, it is composed of economic indicators that are released by the end of the following month.

The NLI CI has two characteristics: (1) it reproduces with fair accuracy the movement of diffusion indexes announced by the EPA, and (2) it is compiled one to two months earlier than the EPA announcement.

3. Implications of the NBI

The NBI offers two important implications for the present recession.

(1) Earlier Determination of Turning Points

First, the NBI signaled a turning point in December 1996, which based on experience indicates that the peak occurred around March to May 1997. In other words, when the tax hikes were implemented in April, the economy had probably already entered a recession.

Table 1 Data Series Used in the NB

	Leading indicators	Coincident indicators	Lagging indicators
1. Employment	New job offers (excl. new grads)	Overtime hours (manufacturing) Effective ratio of job seekers to offers (excl. new grads)	Full unemployment rate Common employment index (manufacturing)
2. Production	Floor space of new construction starts (commerce & industry, services) Floor space of new housing starts	Production index (mining & manufacturing) Electric power usage by large consumers Capacity utilization rate index (manufacturing) Raw materials consumption index (manufacturing)	
3. Consumption	New car registrations & applications (passenger cars)	Department store sales Commercial sales index (wholesale)	Household consumption expenditure (nationwide working households)
4. Fixed capital formation	Investment climate index (manufacturing) Real machinery orders (private demand excl. ships & elec. power)	Capital goods shipment index (excl. transport machinery)	Real corporate capital investment
5. Inventory	Index of ratio of inventory of goods to final demand Index of ratio of inventory of raw materials (manufacturing)		Index of final demand goods inventory Index of inventory of raw materials (manufacturing)
6. Prices, earnings	Nikkei products index (17 categories) Next-period business forecast of small & mid-size companies (all industries)	Operating earnings (all industries) Sales of small and mid-size companies (manufacturing)	Corporate tax revenue
7. Money and credit	Money supply (M2 + CD)		Average stipulated interest rate of domestic bank loans
NLI NBI	7 series	7 series	6 series
EPA Business Cycle Index	11 series	11 series	8 series

Note: Data series used in the NBI are circled

The prevalent view is that the present recession was caused by fiscal tightening from the consumption tax hike and termination of the special income tax cuts. If the NBI is correct and the economy had indeed peaked, the fiscal tightening was inappropriate to the point of overkill. This is a case in which delayed judgment of business conditions led to inappropriate policies that exacerbated the cyclical contraction.

More recently, in January 1998 the NBI fell to -40, a level comparable to past recessions, before climbing back to -32 in March (as became clear in May). This is a signal that conditions will continue to worsen, indicating that a recovery will not be clearly felt for the next three to six months.

(2) Objective Judgment

In light of the economy's rapid decline since last November, the government has been considering introducing the elasticity clause in the Fiscal Structural Reform Act.

Unfortunately, the economic criteria to be introduced under the elasticity clause do not accurately identify turning points in the Japanese economy, and furthermore, leave the government with considerable discretion. This discretion increases the risk that economic policies implemented under the Fiscal Structural Reform Act will also be discretionary.

Table 2 Economic Criteria in the Fiscal Structural Reform Law

Criteria for invoking elasticity clause	Criteria for implementation	Examples
Very unusual and acute emergency or disaster	- Disaster equivalent to the Hanshin Earthquake	
Marked stagnation in economic activity	1. Real GDP growth is below 1% (qoq annualized) in past two consecutive quarters.	
	2. Real GDP growth is below 1% (qoq annualized) in past quarter, and consumption, capital investment, and employment indicators for relevant quarter are markedly weak.	Consumption: Consumption level indexCapital investment: Capital goods shipment indexEmployment: Effective ratio of job seekers to offer
	3. Recent real GDP growth is not in above condition, but unexpected endogenous or exogenous shock to the economy causes economic activity to slow rapidly and become comparable to conditions (1) or (2).	

Note: Compiled by NLI Research Institute based on "Concerning Elasticity and Other Matters in the Fiscal Structural Reform Act," Fiscal Structural Reform Committee, April 24, 1998.

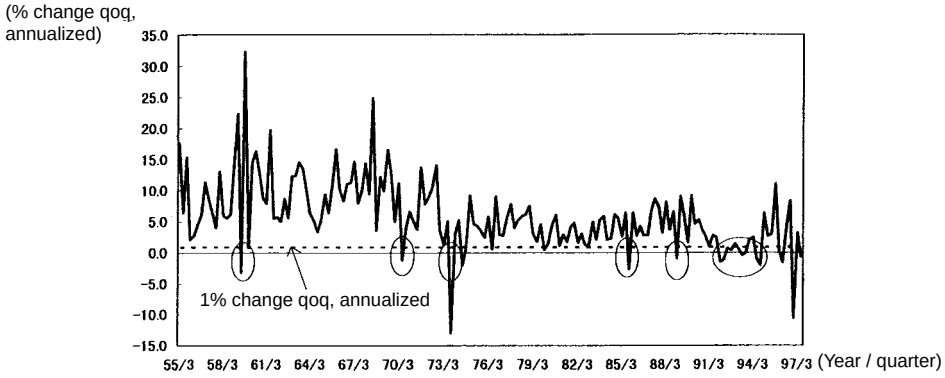
In the form proposed by the Fiscal Structural Reform Conference (April 24), the economic criteria which would trigger the elasticity clause pose three problems: (1) the statistics to be used do not accurately express economic conditions, (2) GDP statistics, which form the core of the criteria, are released late and hence produce a policy lag, and (3) no specific judgments are mentioned regarding economic abnormalities. Let us look briefly at two of the criteria.

1) GDP criterion

The GDP criterion states that "real GDP growth for the last two consecutive quarters is below 1 percent (quarterly growth rate annualized)." However, this condition has been satisfied only twice in the postwar period: during the oil shock, from October-December 1974 to January-March 1975, and during the Heisei recession, from April-June 1992 onward.

Moreover, GDP statistics are released quite late—two and a half months after the end of the quarter. To obtain statistics for two consecutive quarters would take eight to nine months after the fact, producing a recognition lag that makes the criterion impractical.

Figure 3 Business Cycles and the Real GDP Growth Rate

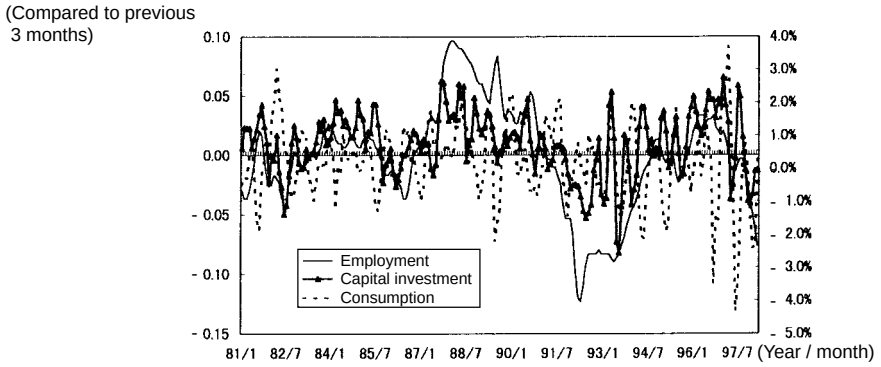


Note: Circles indicate where growth rates dip below 1% qoq, annualized.

2) Use with other statistics

Another criterion, which states that "GDP growth is below 1 percent in the latest quarter, and consumption, capital investment, and employment indicators are notably weak," lacks clarity. The three indicators have fluctuated enormously in past business cycles. For example, the consumption level index, which is at -2.5 percent in the present recession, has reached this level during expansions.

Figure 4 Using Additional Economic Indicators
(Consumption, Capital Investment, Employment)



Note: The data used for employment, capital investment and consumption were cited in the April 24 report of the Fiscal Structural Reform Committee: effective ratio of job seekers to offers, consumption level index, and capital goods shipment index.

As we have seen, it is not easy to be objective when using economic criteria.

Conclusion — Toward More Rational Criteria

In the future, the government's evaluation of business conditions will have legally binding consequences under the Fiscal Structural Reform Act. This makes it all the more important to develop criteria with rational foundations.

The development of the NBI, which quantifies the probability of recession, is intended to improve on the shortcomings in the proposed method. This approach, however, is well established in the U.S. but still in its infancy in Japan. While the NBI leaves much room for improvement, we hope that it will stimulate a wider debate to reject arbitrary methods in favor of objective criteria for evaluating business conditions.

Notes

1. A more detailed explanation of the NLI business indexes will be available (in Japanese) in the *Nissay Kisoken Shoho*, summer 1998 edition, July 22, 1998.

2. A Probit model is a statistical method of extracting qualitative characteristics (data) relating to cycles from economic variables, and is based on probability modeling with a regression analysis approach. Specifically, economic variables are assumed to take one of two states, and turning points are converted into binary form such that contractions equal 1 and expansions equal 0. The method has a long history in the U.S