

Executive Summary

This paper presents a method for predicting cyclical downturns and upturns in India's exports using the 36 country real effective exchange rate and leading indices of major trading partners. These leading indices are developed at the Economic Cycle Research Institute, New York and forecast the onset and end of recessions in overall economic activity in these economies. The results show that the new leading index of Indian exports (in level and growth form) would have anticipated most of the cyclical turns in real exports, the price of exports, and their value over the past 25 years.

The rationale for the construction of the leading index for exports is that peaks and troughs in the business cycle and/ or growth rate cycle in the domestic economy are likely to be associated with exports to and imports from respective trading partners. For any economy, these cyclical upswings and downswings can be predicted by leading indices, typically six to nine months in advance, or, better still, by long leading indices that typically have a few months' extra lead over traditional leading indices. These cyclical changes in domestic demand also encompass the demand for imports. This implies that a leading index of a trading partner can provide useful information on exports of any exporting country. This notion can be extended to a group of countries importing goods from a country and a weighted average of the leading indices of these countries can be used to predict fluctuations in that country's exports.

In addition to the cyclical fluctuations in a given country's trading partners, movements in the exchange rate are also a vital harbinger of future exports. It is of course expected that a cyclical expansion in the economies of the trading partners would herald an increase in exports of a given country. If, however, this is accompanied by a depreciation in the currencies of the trading partners, the net impact on the given country's exports will be ambiguous since the expansionary impact will be partly or wholly offset by the increasing cost of imports faced by the trading partners. Therefore, exchange rate fluctuations must also be taken into account along with cyclical factors in a given country's trading partners to accurately gauge current and future exports of the country.

The leading index for the level of future Indian exports comprises the Real Effective Exchange Rate (REER) and a 15-country long leading index. The REER index (RBI, 1993) used is based on export weights and official exchange rates from January 1975 to February 1992 with base 1985=100. From March 1992, FEDAI indicative rates are used and the base moves to 1993-94=100. The number of countries used is 36 that represent 65-70 percent of total exports/trade during 1975 and 1991. The 15 country index is a weighted average of the ECRI long leading indices for 15 economies that trade with India. The 15 countries are the U.S., Canada, Mexico, Germany, France, the U.K., Italy, Spain, Switzerland, Sweden, Japan, Korea, Taiwan, Australia and New Zealand, which collectively account for about half of India's total exports.

Three target variables are used:

- Real exports measured by the quantum index of exports;

- Price of exports measured by the unit value index of exports; and
- Total value of exports which is the product of the above two variables.

The leading exports index is used to predict each of these variables. The economic rationale is very simple. The leading exports index has two basic components – the exchange rate which determines price competitiveness and the 15 country long leading index covering the export markets which determines the cyclical movement of demand in the consuming countries. It follows that both these variables predict the movements in the future level/growth rate of exports.

Traditionally, the leading exports index has been used to forecast exports. In the case of India, we extend the analysis to encompass the price of exports as an additional target variable. The logic is as follows. When the rupee weakens, the unit value of future exports in rupees tends to rise, and vice versa. Further, when demand in the consuming countries rises, so does the price, raising the unit value of the exports. Another motivation for using the unit value series as a target variable is the numerical quotas (rather than value) that many Indian exports like textiles have traditionally faced. The implication is that exporters would try to export higher unit value items. The analysis is further generalized by using the total value of exports as an alternative target variable. If the economic rationale holds for real exports and the price of exports, it must also be valid for the product of the two.

Since cyclical declines in the level of exports are relatively rare whereas cyclical movements in the growth rate of exports are more prevalent, our analysis uses both the level and its growth rate to predict the three target variables in level as well as in growth form. The estimations begin in 1975 since REER is not available before this period. The leading index for exports is constructed with base 1992=100. Since the components of the leading index are available monthly, the leading index is estimated on a monthly basis. The target variables are, however, currently available only on a quarterly basis and are converted to monthly series by simple step interpolation, that is, the quarterly series is repeated three times corresponding to the months of the quarter. Although monthly data on the export variables is available up to 1985, this is converted to quarterly to conform to data after 1985 as well as to smoothen the series. The data for the entire period are seasonally adjusted using the Census X-11 procedure.

The reference chronology (peaks and troughs) of the three target variables in level as well as in growth form are determined using the NBER procedure.

The main findings are as follows:

Target Variables: Level and growth rate of quantum index of exports:

- The level of the leading index for exports leads the level of the quantum index 60% of the time at peaks, by an average of 2 months. However, it leads only half the time at troughs.

- The growth rate of the leading index leads the quantum index growth rate at 100% of peaks and 80% of troughs, with the average lead being 9 months at peaks and 1 month at troughs.

Target Variables: Level and growth rate of unit value index of exports

- The level of the leading index leads the level of the unit value index 100% of the time at peaks and also at the one trough, the average lead being 8 months at peaks and 11 months at the only trough.
- The growth rate of the leading index leads the unit value index growth rate at 100% of both peaks and troughs, with the average lead being 16 months at peaks and 15 months at troughs.

Target Variables: Level and growth rate of total value of exports

- The level of the leading index leads the level of the total value index 100% of the time at peaks and 50% of the time at troughs, the average lead being 8 months at peaks and 3 months at troughs.
- The growth rate of the leading index leads the growth rate of the total value index at 100% of peaks and 80% of troughs, with the average lead being 9 months at both peaks and troughs.

The significance of the cyclical leads is further tested on the basis of non-parametric statistical tests which yield the lead profile. The lead profile is a graphical depiction of the leads in strictly probabilistic terms that aids meaningful comparisons between two indices or an index and the reference cycle.

On the basis of the lead profiles, we can conclude that in general, the performance of the growth rates is better compared to the level variables. Further, in order of performance of the variables, the growth rate of the unit value index ranks first followed by the growth rate of the total value of exports.

In sum, the findings of the study indicate that the level of the leading index for exports leads the quantum index, the unit value index, and the total value index. Furthermore, the growth rate of the leading index leads the growth rates of each of the above three target variables. These findings are very encouraging considering how volatile the series are. The results are also robust in the sense that the standard deviations of the leads are typically low, under 10 months for the overall lead. It is also noteworthy that despite data limitations and other problems experienced by a developing country dominated by the public sector and import substituting industrialisation in the past, the leading index performed reasonably well. In light of its past performance, we can confidently infer that its performance can only be expected to improve further in the future.