

LEADING ECONOMIC INDICATOR SYSTEM IN THE PHILIPPINES

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Workshop on Short-term Statistics

Beijing, China

May 18-20, 2015



Republic of the Philippines
PHILIPPINE STATISTICS AUTHORITY

Outline

- Development of Leading Economic Indicator (LEI) System
- Main Users of the LEI System
- Composite LEI
- Issues and Limitations of the Composite LEI
- Way Forward
- Initiatives Done for the Enhancement of the LEI System



Development of LEI System

- Started in 1993 through a joint project of the Statistical Research and Training Center (SRTC) and the National Statistical Coordination Board (NSCB).
 - SRTC - now the Philippine Statistical Research and Training Institute (PSRTI)
 - NSCB - now part of the Philippine Statistics Authority (PSA).
- To fully develop a leading economic indicator in the country, a research project was undertaken jointly by the NSCB and the National Economic and Development Authority (NEDA) in 1996.



Development of LEI System

- The compilation of the regular LEI officially started in 1997.
- The LEI was evaluated and strengthened in 2002 through a project with the University of the Philippines School of Statistics (UPPS).



Main Users of the LEI System

- National Economic and Development Authority (NEDA)
 - as inputs in its Quarterly Growth Indicators System (QGIS), an internal forecasting model used to benchmark forecast the GDP
- Bangko Sentral ng Pilipinas (BSP)
 - uses the values and quarter-on quarter slopes of the composite LEI to generate a one-quarter ahead forecast of GDP
- Other Economic Planners and Policy Makers
 - to track future movements of the economy in the short run



Composite LEI

- The Leading Economic Indicator System (LEIS) of the Philippines estimates growth cycles and not classical business cycles.
- The main output of the LEIS is the quarterly composite LEI.
- The composite LEI provides a one-quarter ahead forecast of the direction of the country's economic performance.



Composite LEI

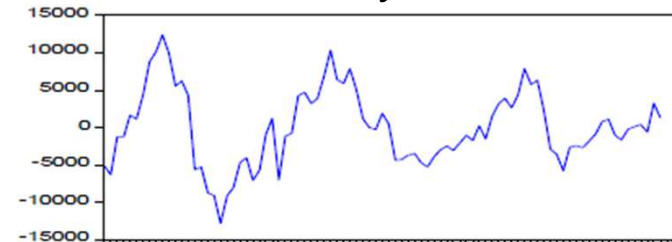
- The computation of composite LEI uses nonmodel-based technique.
- The main output of the LEIS is the quarterly composite LEI.
- The computation involves the following:
 - Reference Series
 - Leading Economic Indicators



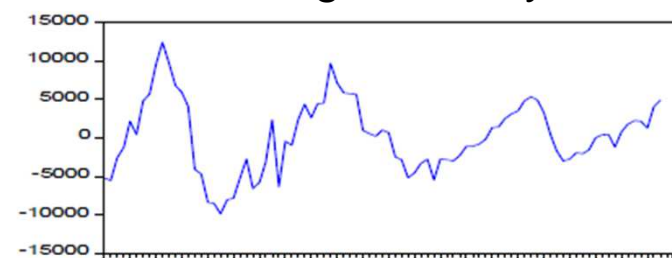
Composite LEI: The Reference Series

- The reference series used in the LEI System is the Non-agriculture Gross Value Added (GVA)
 - Cycles of GDP and Non-agriculture GVA are the same while the cycle of Agriculture GVA is different from them

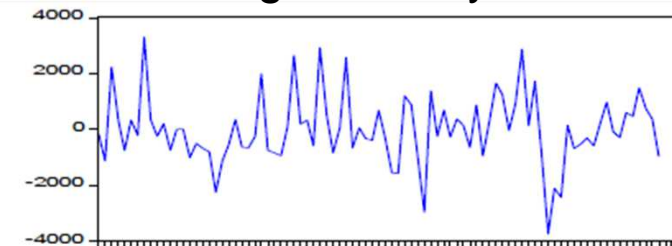
GDP Cycle



Non-Agri GVA Cycle



Agri GVA Cycle



Composite LEI: **Leading Economic Indicators**

- There are 11 indicator series used in the LEIS, namely:
 - Consumer Price Index
 - Wholesale Price Index
 - Electric Energy Consumption
 - Peso-Dollar Exchange Rate
 - Hotel Occupancy Rate
 - Money Supply



Composite LEI: **Leading Economic Indicators**

- Number of New Business Corporations
- Stock Price Index
- Terms of Trade Index
- Total Imports
- Tourist/Visitor Arrivals



Composite LEI: **Leading Economic Indicators**

Criteria in the Selection of Indicators

1. Economic Criteria (de Leeuw, 1991 and Yap, 2001 as cited by Bersales, et. al, 2002)
 - Production time
 - Market Expectations
 - Policy Impacts
 - External Shocks
 - Buffer Stocks



Composite LEI: **Leading Economic Indicators**

2. Statistical Criteria

- high correlation with reference series
- timely release of new values
- high data quality
- small size revision of provisional data
- availability of long historical as well as high frequency data
- presence of clear trends not dominated by irregular components
- consistency with the general upturns and downturns of the reference series
- ability to lead turning points of the reference series



Composite LEI: Methodology

1. Seasonal adjustment

- Seasonal adjustment of the reference series and each leading indicator series using X11 ARIMA to obtain their trend cycles.

2. Detrending

- Removal of the trend component from the seasonally-adjusted series to obtain the cycle component by using Hodrick Prescott (HP) Filter



Composite LEI: Methodology

3. Standardization of cycle values of the indicator series and reference series
4. Determination of the lead period
 - Correlate the cycle of each indicator with the cycle of the non-agriculture GVA. The lead period is the period with the highest correlation coefficient.
 - Lead period determines the number of quarters the cycle series of each indicator is moved forward when computing for the composite indicator.



Composite LEI: Methodology

5. Computation of the composite leading indicator
 - Computed as the linear combination of lagged indicator series with the simple correlation coefficients of the indicators with the non-agriculture GVA as weights.



Composite LEI: Methodology

- In determining the relationship between the non-agriculture GVA and the composite indicator, the following simple linear regression model is used:

$$\text{Non - Agri GVA}_t = \beta_t \text{LEI}_t + \varepsilon_t$$

where:

Non - Agri GVA_t = cycle component of the non - agriculture
GDP

β_t = amount of increase in the cycle component of the
non - agriculture component of the GDP

ε_t = error term



Issues and Limitations of the Composite LEI

1. Timeliness and availability of the indicators

- Data are forecasted/imputed for indicators that are not yet available using:
 - ARIMA model available in X11 ARIMA for extrapolation or
 - Growth rates for imputation

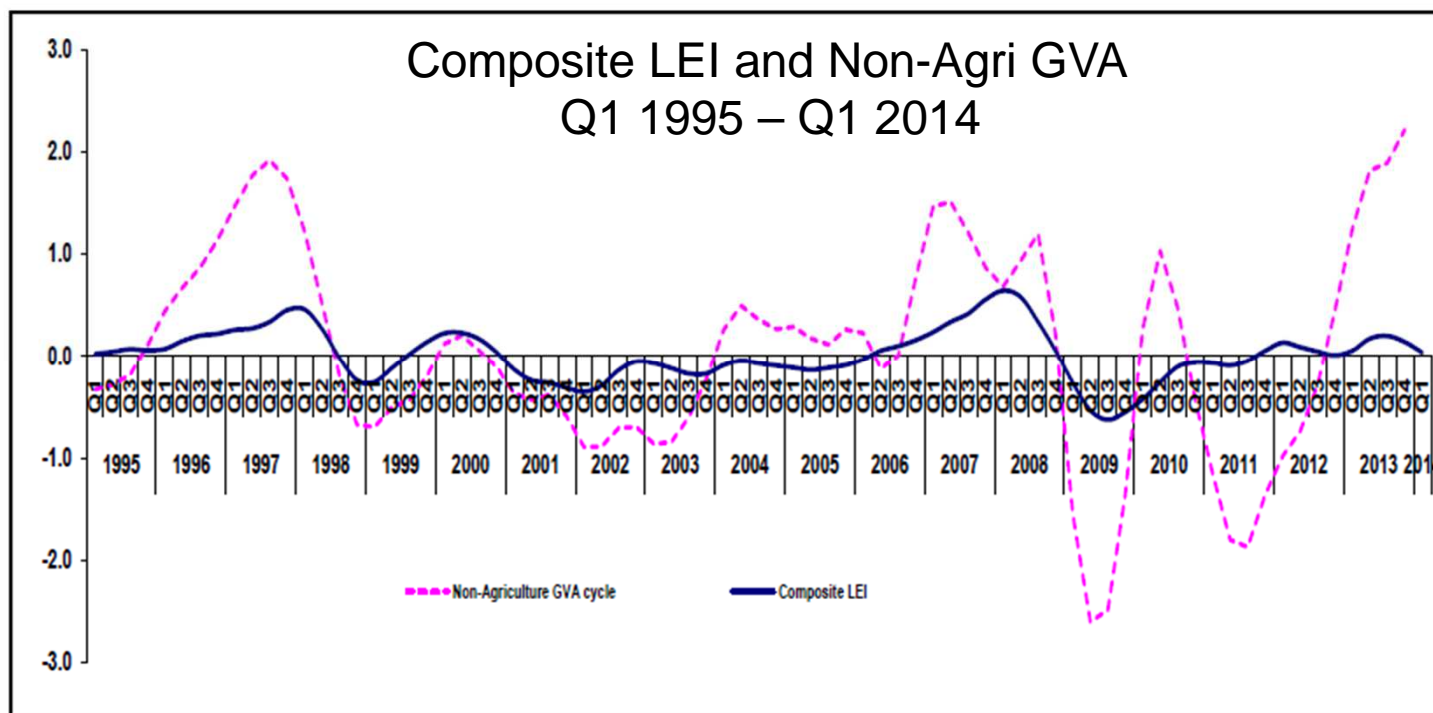
2. Weighing scheme is not fixed over time

- Weights are the correlation coefficients and are computed everytime there is a new data.
- Part of the variation in the weights could be due to estimation or forecasting errors



Issues and Limitations of the Composite LEI

3. The leading economic indicators in the LEI System may no longer be relevant and appropriate to analyze and predict economic fluctuations.



Way Forward

PSA to undertake efforts in improving the LEI System. These include:

1. Evaluation of the current set of indicator series used in computing the composite LEI.
2. Improvement of the current methodology or use of model-based technique in computing composite LEI using expanded/reduced set of indicators.
3. Automation of the estimation procedure to generate composite LEI using updated statistical package.
4. Technical capacity building of personnel involved.



Initiatives Done for the Enhancement of the LEI System

1. Preparation of timeline of activities for the enhancement of the Philippine LEI System.
2. Benchmarking of the research works done relative to the enhancement of the Philippine LEI System.
3. Researching/learning about other countries' methodologies.
4. Series of meetings of concerned units of the PSA and the UPSS.



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Quarterly LEI Publication



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