IMF Book Forum
Beating the Business Cycle:
Can Turning Points Be Predicted?

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Is it too Late?

Outline of Discussion

- Overview of Book
- Composite Leading Indicators: State of the Art
- Composite Leading Indicators and the IMF
- Economic Forecasting: What is New? (time permitting)

Business Cycles are not Dead

- Central Banks, Firms, and Individuals face risks from not recognizing Turning Points
  - Before
  - During
  - After
- Leading Indicators offer a Tool to reduce risk.

Leading Indicators

- Economic Cycle Research Institute (ECRI) follows in the tradition of Mitchell and Burns.
- "Beating the Business Cycle" provides laymen a disciplined approach to understanding how leading indicators can be used in a world deluged with information and conventional thought.
- Achuthman and Banerji emphasize that there are *opportunities* not just dangers with the ups and downs of economic fluctuations.
- Anticipating and being able to act/hedge is valuable.

Beating the Business Cycle: A Snapshot

- There are three parts and ten chapters.
- **Part I** discusses the history of business cycles, business cycle research, and the experience of the last fifteen years.
- **Part II** emphasizes the Leading Indicator approach to anticipating Turning Points. It explains development and importance of multiple indicators: real sector(s),inflation, and international.
- **Part III** provides scenarios and advice for How to use Leading Indicators.

Etymology of "forecast"

- **Fore** – is clear, denoting "in front" or "in advance"
- **Cast** – dice, lots, spells, horoscopes are all cast
- "Anything can be forecast, but not everything can be predicted."
- Prediction vs. Forecast

Maxine Singer (1997)
"Thoughts of a Nonmillenarian"

- Two reasons on why forecasting the future is uncertain

1. Because of the things we don't know [that] we don't know, the future is largely unpredictable.

2. Because some developments can be anticipated, or at least imagined, on the basis of existing knowledge. (This is known as measurable uncertainty.)

- The first source is the basic problem. The second one can make us too confident or arrogant of our ability to forecast.

Forecast Uncertainty

- Forecast uncertainty is intrinsic and ubiquitous. The uncertainty comes from two sources. The first is the one that we know is present and have some understanding about the probabilities. The second is due to factors that we do not even know exist.

- Suppose that you engage in a dice game with Tony Soprano. You know the probability any pair of numbers will be face up. What you don't know and will not know is whether the dice are loaded.

Methods of Forecasting Include:

1. **Guessing, rules of thumb,** and informal models – luck, you never know when you might be right.
2. **Surveys** – are informative about future events, but they rely on the interviewees plans being realized. If they are not then the survey can only provide an ad hoc explanation for the differences between the plan and outcome.
3. **Extrapolation** – works so long as the extrapolated tendencies continue and make sense. However, they offer no information about a change in tendency. Consider extrapolations of individual stock prices.
4. **Time series models** can be quite good and can provide relative robustness to deterministic shifts.
5. **Leading indicators** – rely on clarity of the relationship. Unfortunately, the indicators must be frequently monitored and changed as the economy and its structure changes.
6. **Econometric forecasting models** – consolidate empirical and theoretical knowledge for how economies function. They can even explain their own failures.

Composite Leading Indicator (CLI)

- CLI is an aggregate time series displaying a reasonably consistent leading relationship with the reference series for the macroeconomic cycle variables in a country or sector (OECD).
- The CLI is constructed by aggregating together component series selected according to the criteria specified for turning points.
- Individually, their explanatory power is weak, because the nature and cause of turning points in business cycles differs.
- Taken together, however, the components capture the elements that foreshadow changing economic conditions.

Composite Leading Indicators (CLI)

- ECRI uses the CLI as a forecasting technique for "events", turning points.
- It is important to emphasize that component series are not selected according to a strict quantitative criteria based on the cross-correlation with the reference series.
- Component weights will change over time.
- They can be used to give an early indication of turning points in the reference series but not for quantitative forecasts.

CLI: State of the Art

- CLI depend on the consistency of recurring sequences of economic events over business cycles.
- Three factors needed for the CLI to signal a turning point.
- 3 P's in the movement in the CLI:

1. Pervasive – co-movement or extent of change across the economy almost like contagion (Reinhart & Kaminsky).
2. Pronounced – Magnitude to Noise Ratio, compare with past cycles.
3. Persistent – technically 3-12 months depending on CLI, average about 5 months.

CLI: State of the Art

- Evaluating CLI's performance with Coincident Indicators (Bry and Boschen 1971).
- Two Criteria in **Real Time**
- How well?

$$Proportion\ Correct = \left(\frac{Peak\ Calls}{Actual\ Peaks} \right) and\ or \left(\frac{Trough\ Calls}{Actual\ Troughs} \right)$$

- What is Lead Time or Lead Profile?

$$Average\ Lead\ in\ Months = \sum_{n=1}^{TP} \sum_{i=1}^{Month} Actual\ TP_{t,n} - CLI\ Call_{t-i,n}$$

CLI: State of the Art

- The discipline of the 3 Ps is important for using CLI in real time, but
- What are rules for:
- Calling a turn for a peak and trough?
- What is the tradeoff between the rule and false errors?
- What are the effects of data revisions in components on the CLI?
- Where can one obtain information on the 3Ds?
  - Depth (or Strength)
  - Duration
  - Diffusion

The IMF and CLIs

- Concerned with recognizing Crises before they happen.
- Responding to prevent or minimize the damage.
- The regular use of multiple CLIs can be valuable tool: Real sector(s), Inflation, and Global or Regional.

The IMF and CLIs

- Economic Downturns and Financial Crises
- What is the Direction?
- Is there feedback?
- Are there "Windows of Opportunity"?
- In terms:
  - Timing
  - Causality

The IMF and CLIs

- High Growth Large Countries: China and India.
- Current growth rates 5%-9%
- How much is due to catching up?
- What is the long-run sustainable rate?
- Are there Economic Development Indicators that can signal the transition to the long-run rates?

Successful forecasting requires that:

1. there are regularities to be captured,
2. the regularities are informative about the future,
3. the proposed method captures those regularities, and yet
4. it excludes non-regularities.
5. LUCK!

In Defense of Macroeconometric Models

- "The [worldwide] record of failure to predict recessions is virtually unblemished." (P.L. 2001)

- They are asked to provide quantitative measures.
- They are asked to provide "scenarios".

- Non-stationarities and infrequent large structural shocks can lead to forecasting problems and forecasting failure – a significant deterioration in the forecast performance relative to the anticipated outcome.

- How can macroeconometric forecasting models and modelers improve?

The "New" Theory of Economic Forecasting

- A theory of economic forecasting must have the realistic assumptions that

1. Forecasting models may be incorrect in unknown ways.
2. The economy itself is complicated.
3. The economy is changing over time.
4. The economy is often measured inaccurately.

- The goal is to avoid systematic forecast failure.
- Research by Clements, Mizon, Hendry and Ericsson, Understanding Economic Forecasts

The "New" Theory of Economic Forecasting

- Clements and Hendry (and Mizon) have developed a taxonomy of sources for forecast errors.
- Unanticipated changes in the values of deterministic terms matter. In particular when the economy moves and the model forecasts do not.
- Deterministic shifts may reflect changes elsewhere in the economy that are interacting with the incomplete specification.
- Formulating models to minimize the effects of possible changes in deterministic terms is generally beneficial.
- Successful modeling of deterministic terms pays handsome dividends, even if only by using simply corrections

Partial Taxonomy of Forecast Errors

- The slope has been incorrectly estimated.
- There has been a shift in the intercept so that that sample mean is incorrect in both regimes.
- The data trend has shifted but the model has not
- A temporal change in the trend and forecasts from 3. First differences of the trend shift may only differ at the pulse or jump point.
- The stochastic elements may be mis-specified.
- There is uncertainty due to estimating their parameters.

The "New" Theory of Economic Forecasting

- The main problem appears to be **unanticipated shifts in the underlying mean of the series or its trend.**
- In some cases these may be easy to detect.
- If so a flexible model can adapt to the shifts a reduce future forecast problems
- Recognizing causality relationships from pure statistical ones.
- Avoid Bandwagon or Herding effects. (ECRI)

The "New" Theory of Economic Forecasting

In the non-stationary data case frequently observed with economic variables, there are three potential solutions.

1. **Specify in differences or even acceleration to convert intercept shifts to pulses or blips.** It is near impossible to forecast breaks in levels, but differences appear to be robust estimators once the break is past. Second differences removes the linear trend and thus reduces the shifts in the growth rate to blips.

2. **Updating** is necessary to adapt to changing properties in the data. This can come at the cost of precision though.

3. When the first of a sequence of forecasts is in error, the remaining forecasts often suffer similarly. An **intercept shift or add factor equal to the last error** may improve forecast performance.

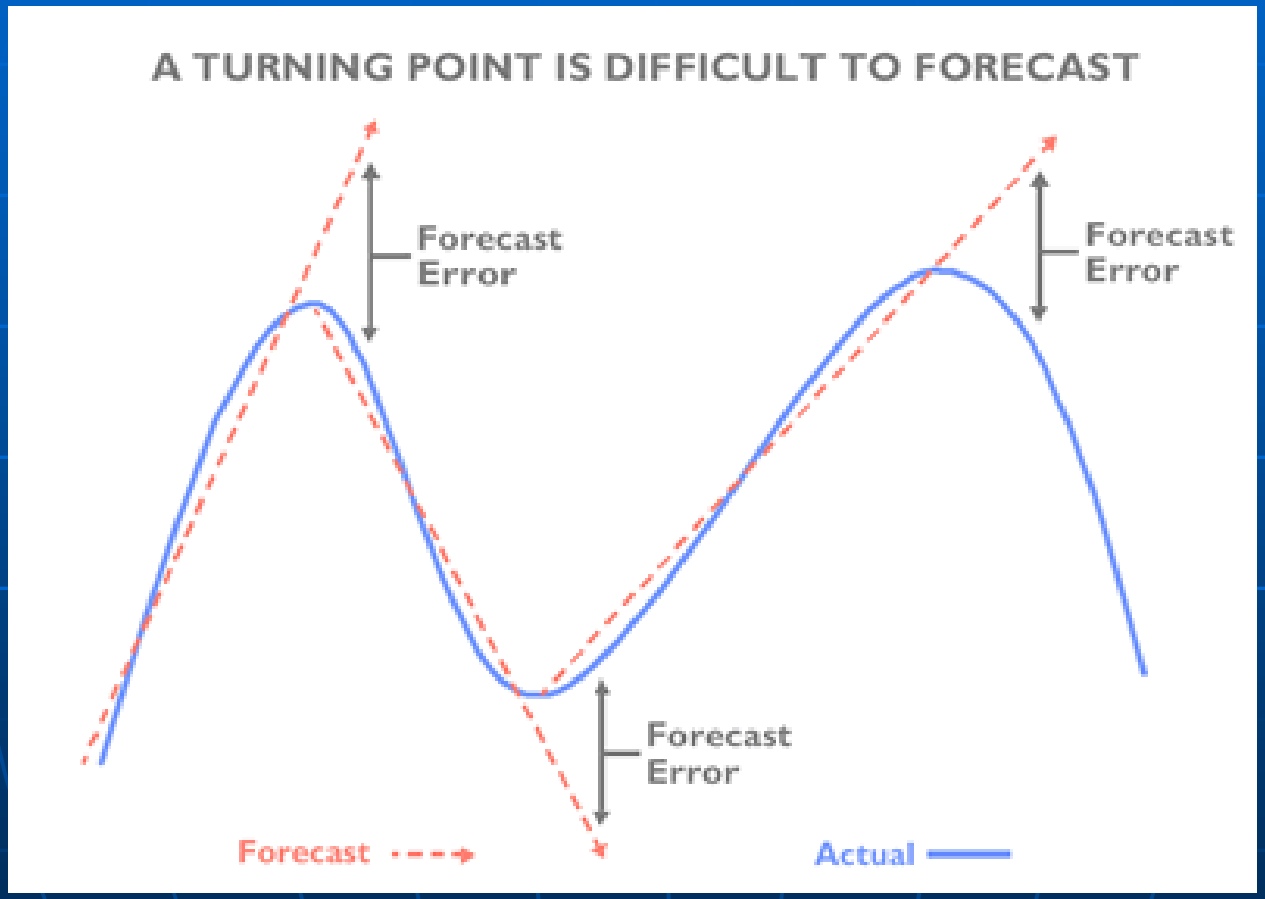
The "New" Theory of Economic Forecasting

When the first of a sequence of forecasts is in error, the remaining forecasts often suffer similarly. An **intercept shift or add factor equal to the last error** may improve forecast performance. (See ECRI Figure.)

The use of Composite Leading Indicators as complements in within or in addition to Macroeconometric and Financial Forecasting Models.

Real Sector and Inflation CLIs may help to modify or serve as add factors.

The "New" Theory of Economic Forecasting



http://www.businesscycle.com/approach.php