Selected slides from March 18, 2019 presentation

"Connecting the Economy to the Stock Market"

by

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Today's Outline

- Key question: what does the economic cycle actually look like?
- #1 problem in viewing economic and market data: ***noise***
  - Essential to *filter* and *scale* all data *before* interpreting
  - Best comparison technique: YOY % change *(rate-of-change – ROC)*
  - Generates characteristic peak/trough patterns throughout cycle
- Cyclic behavior: oscillations viewed over time
  - Both economy and stock market exhibit cyclic behavior, broadly grouped as **leading**/**coincident**/**lagging** behavior vs. GDP *[appears as corresponding peaks & troughs shifted **L** or **R** on time scale]*
  - Stock market is among group showing **leading** economic behavior, *but this is largely a reporting anomaly*
- In reality, economics are fundamental to all markets -- both exhibit common peak/trough patterns
- Unfortunately, outside interventions – regulatory, monetary, fiscal, political – disrupt normal market tendencies and relationships
- Caveat: all forecasts routinely ***lag*** actual behavior
- Conclusions

Definitions of Noise

- **Different cause from main signal**
  - *meaningless* bits that must be removed from a data stream in order to see underlying signal
  - random variation in data *unrelated* to underlying signal
  - natural variation in process
- **Total of all errors** in the process of generating and recording a result
  - e.g. teachers / Aug ’07 emplymt
  - reminders:
    - errors multiply, not add
    - Error level (noise) reduced by ***sq rt*** of no. of observations
- **For time-based data,**
  - **Seasonal variation is largest source of noise**
  - noise inversely related to observation interval
  - *time* itself can be used as a filter.

Synonyms for Noise

Background

Static

Error

Variability

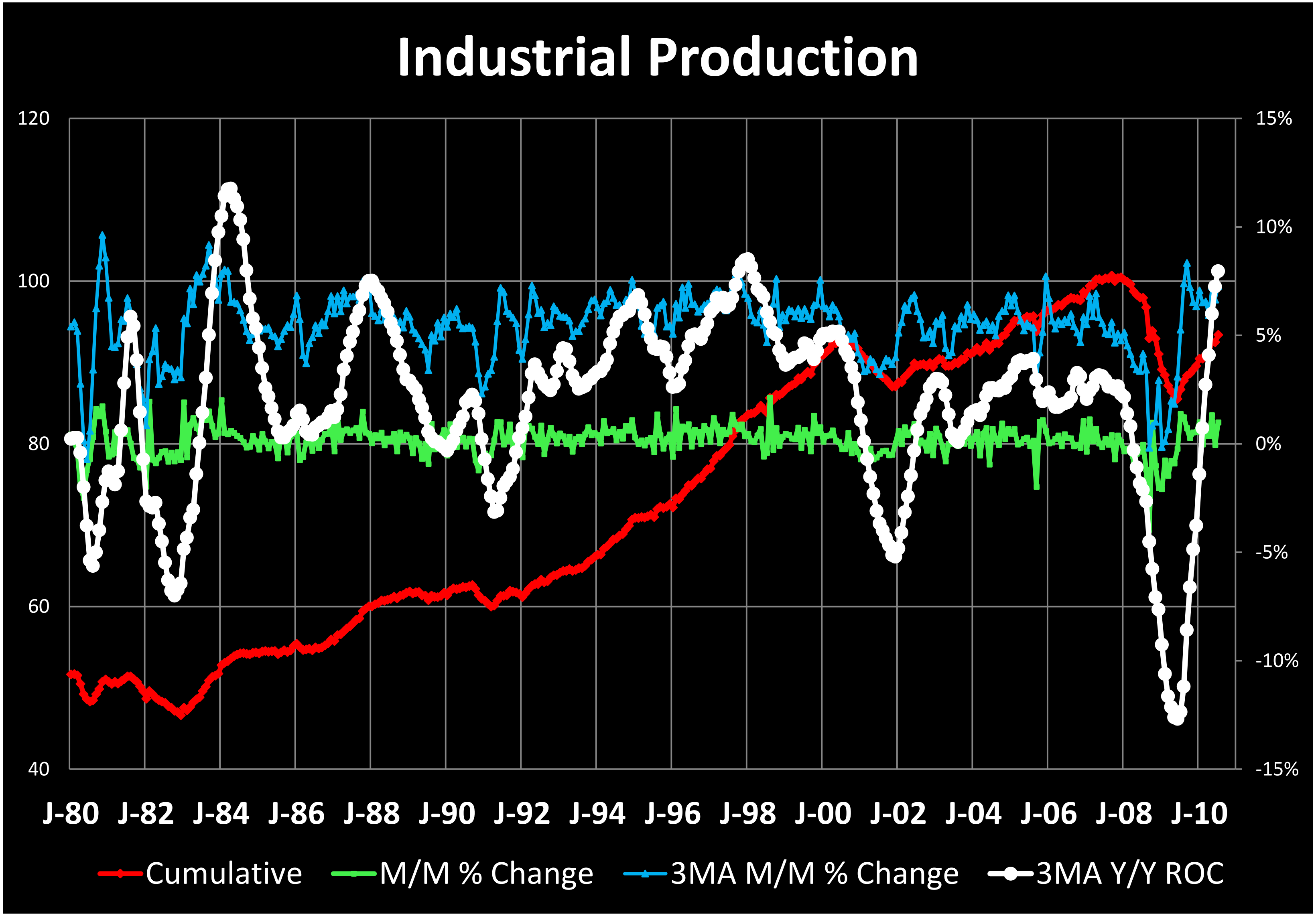
Standard deviation

Volatility

Best Noise Filters

- **Year-over-year, rate-of-change**
  - *{[(present - previous) / previous] * 100]}*
  - removes seasonality, the largest single source of noise
  - *Ref: Joseph Ellis, Ahead of the Curve*
- **Percentage** (necessary for common viewing scale)
- **Use moving average for final smoothing** (remove spikes)
  - Weekly ~6 - 8 units
  - Monthly ~ 3 - 5 units
  - Quarterly ~3 units
  - Minimum is 3: most *collection* errors (ST spikes) are corrected in next time interval
  - helps one develop *belief-sufficient-for-action (key barrier to action)*
- ***Note: aggregates much less noisy than components.***

Example of Noise Filtering



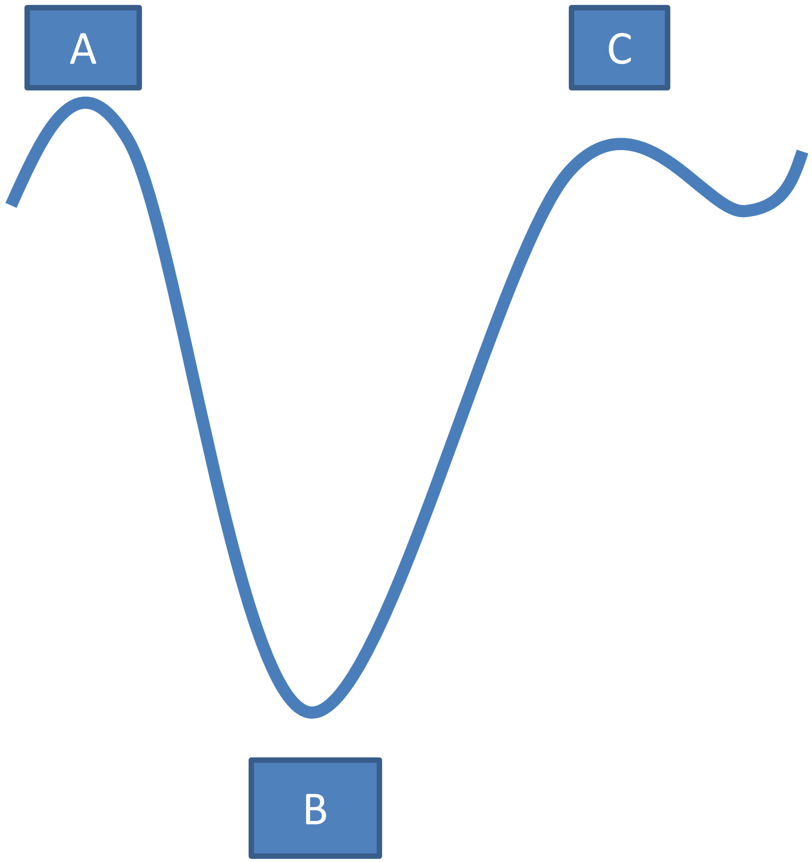
Some viewing realities

- Among various presentation forms,
  - Cumulative data contain the least useful information
  - Change from preceding interval contains the most noise
- YOY % change format
  - Contains the most useful and reliable information
  - removes seasonal variation, the largest single source of noise.
- Amplitudes are far less important than occurrence of peaks and troughs (trend changes)
- Troughs are far more reliable than peaks for identifying trend changes. *[far better defined]*

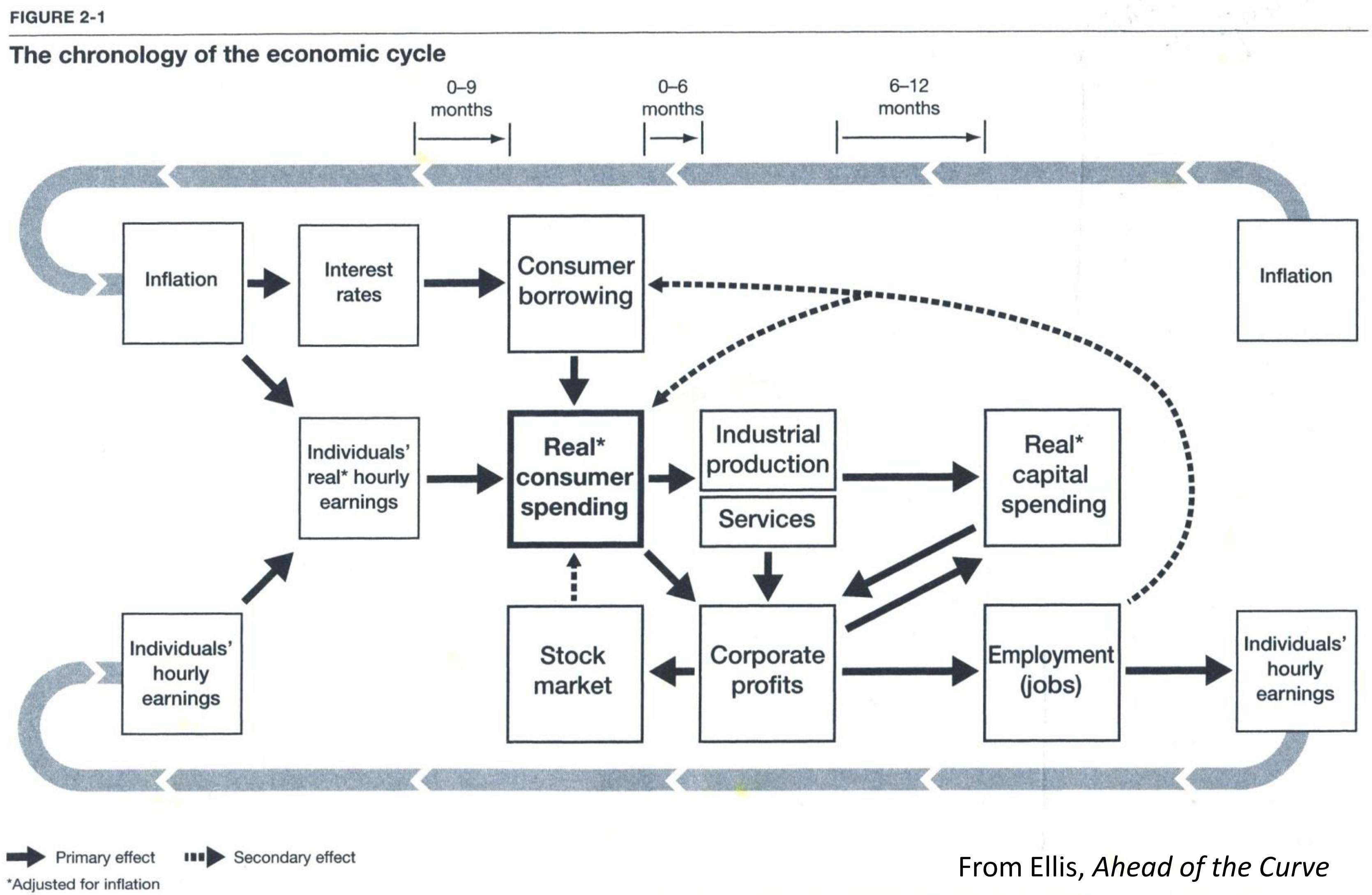
Cycle Terminology

- **Economic terminology** (NBER):
  - **Recession:** the decline portion of the recession trough (A → B)
  - **Turn-around:** the bottom of the recession trough (B)
  - **Recovery:** the upswing after the bottom of the decline (B → C)
  - *Caveat: often different from what it "feels" like*

- Note: Commentators frequently misuse the term "recovery" to mean something well up the recovery portion -- sometimes even point C and beyond – whatever serves their own ends.



Concept of Economic Cycle



From Ellis, *Ahead of the Curve*

Gross Domestic Product (GDP)

- **Sum of market value for all goods and services** produced by labor and property located in the USA. Consists of:
  - personal consumption expenditures (G&S purch by US residents),
  - gross private domestic investment (fixed invstmt plus δ inventories),
  - net exports of goods and services,
  - government consumption expenditures and gross investment.
- **Includes:**
  - Foreign residents and foreign capital employed in USA
  - Output of not-for-profit organizations
  - Both new and used goods
- **Excludes:**
  - G&S produced by US citizens and capital located outside the USA;
  - intermediate purchases of goods and services by businesses;
  - Imports.

Composite Indicators

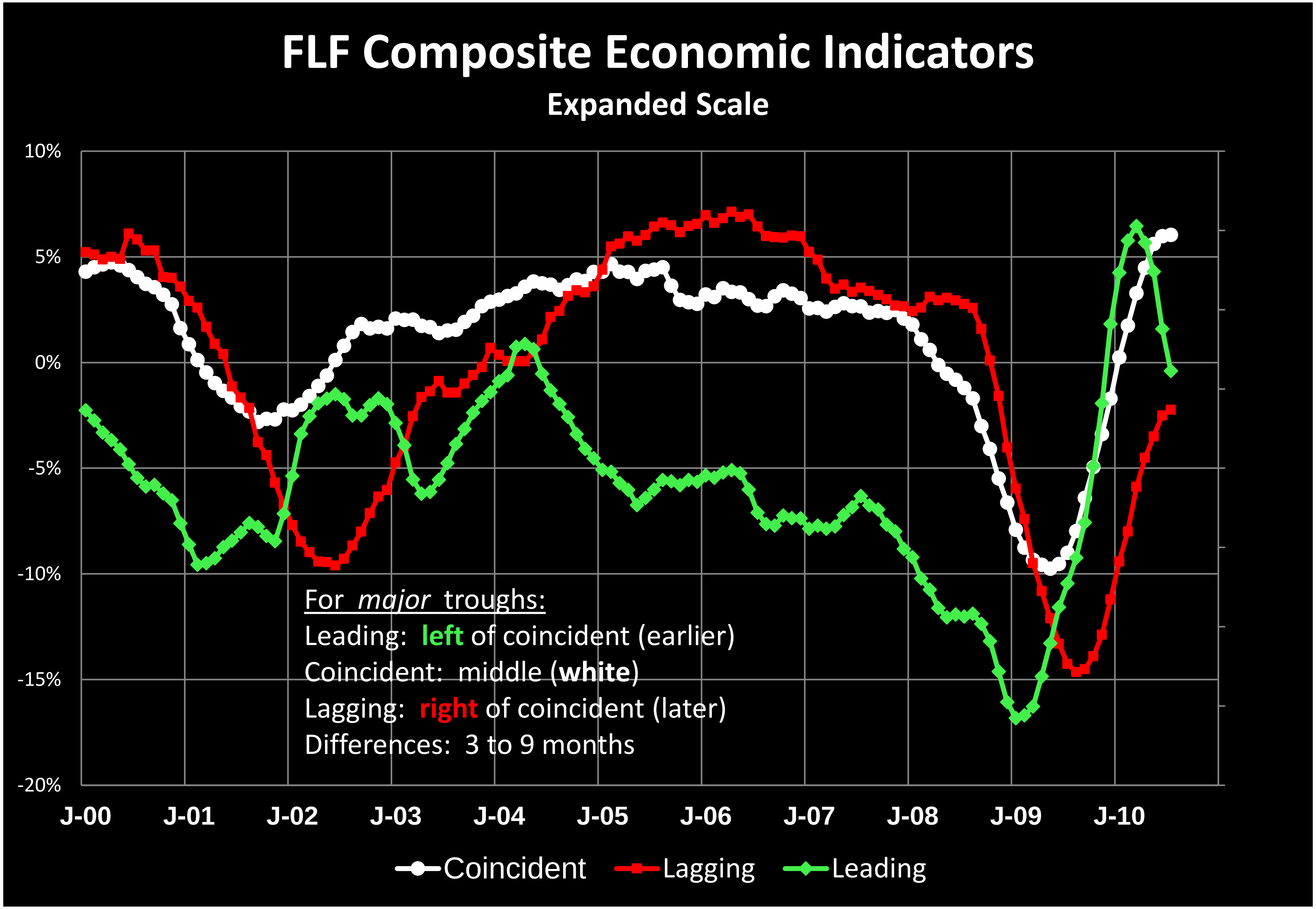
- The economy (GDP) is the sum of all businesses
  - thousands of companies
  - Dozens of components (sectors, industry groups)
  - Both manufacturing *and* services
- Those components follow a natural sequence in time:

RM purchases → **pdn of G&S** → **new cap invst** → **income**

- This sequence is commonly simplified into three groups:

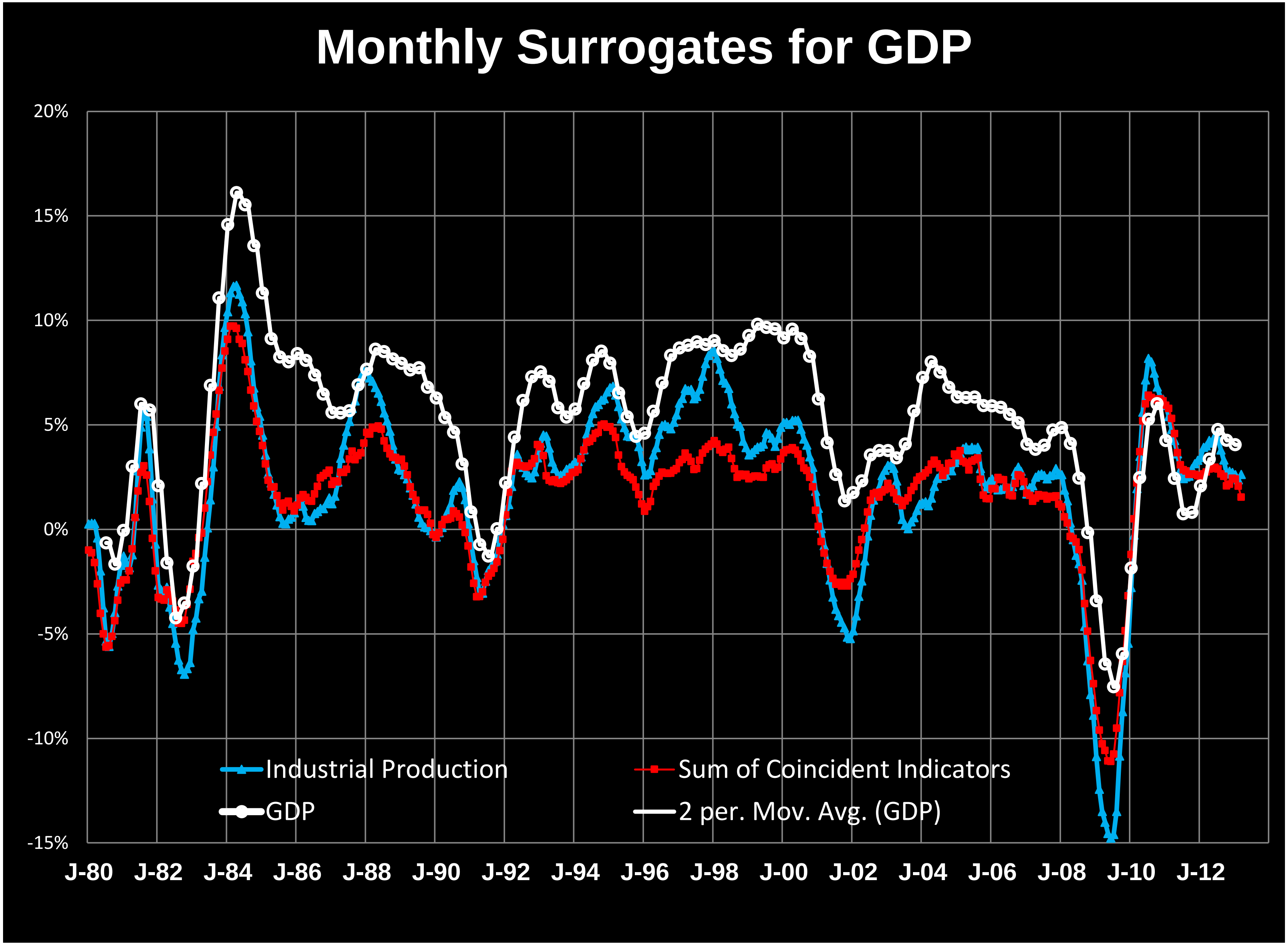
leading → ***coincident*** → ***lagging***

- Indicators can be utilized to ***describe*** *(detect)* those three behaviors – but they ***do not cause*** those behaviors.


FLF Composite Economic Indicators
Expanded Scale
10%
5%
0%
-5%
-10%
-15%
-20%
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
For *major* troughs:
Leading: left of coincident (earlier)
Coincident: middle (white)
Lagging: right of coincident (later)
Differences: 3 to 9 months
Coincident
Lagging
Leading

“Substitutes”

- “Surrogate,” “proxy” and “indicator” are all terms used to suggest that something else of interest is also likely to be occurring.
- They are said to be a *substitute* for the item of interest, and are employed because of their *ease of discovery* relative to the actual item of interest.
- Such indicators are only useful if they are highly *correlated* with the desired result. [obtained through a feature count]
- However, this does not require that a *cause-effect relationship* exists between them – only that they occur in similar time frames.


Monthly Surrogates for GDP
20%
15%
10%
5%
0%
-5%
-10%
-15%
J-80
J-82
J-84
J-86
J-88
J-90
J-92
J-94
J-96
J-98
J-00
J-02
J-04
J-06
J-08
J-10
J-12
Industrial Production
Sum of Coincident Indicators
GDP
2 per. Mov. Avg. (GDP)

References

Sources of *Free* Economic Data

- **Hard**
  - **Economic data**
    - Department of Commerce (NBER)
    - Department of Labor (BLS)
    - Federal Reserve Banks (**www.research.stlouisfed.org/FRED2**)
  - **Stock market closing data** (Yahoo; markets; some brokerages)
- **Soft**
  - Employment / unemployment (household survey -- DOL)
  - Purchasing Managers Index, Deliveries, bsns activity (ISM)
  - Consumer sentiment/confidence
    - Univ. of Michigan (best)
    - Conf. Board (decent)
    - AAII (least useful)
- **Derived**
  - Savings
  - monetary

Some Useful References