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 \( \sqrt{\text{no. of observations}} \)

• **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**
  - \{[(\text{present} - \text{previous}) / \text{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 \sim 6 - 8 units
  - Monthly \sim 3 - 5 units
  - Quarterly \sim 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

Industrial Production

Cumulative M/M % Change
3MA M/M % Change
3MA Y/Y ROC
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 $\rightarrow$ pdn of G&S $\rightarrow$ new cap invst $\rightarrow$ income

- This sequence is commonly simplified into three groups:
  
  leading $\rightarrow$ coincident $\rightarrow$ lagging

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

Expanded Scale

For major troughs:
Leading: left of coincident (earlier)
Coincident: middle (white)
Lagging: right of coincident (later)
Differences: 3 to 9 months
“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

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](http://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

- **Ahead of the Curve**
  - A Commonsense Guide to Forecasting Business and Market Cycles
  - Joseph H. Ellis

- **A Random Walk Down Wall Street**
  - The Time-Tested Strategy for Successful Investing
  - Burton G. Malkiel
  - Completely Revised and Updated

- **The Signal and the Noise**
  - Why So Many Predictions Fail—But Some Don’t
  - Nate Silver

- **Business Cycles**
  - History, Theory and Investment Reality
  - Lars Tvede
  - Third Edition

- **Mastering the Market Cycle**
  - Getting the Odds on Your Side
  - Howard Marks

- **The Myth of the Rational Market**
  - A History of Risk, Reward, and Delusion on Wall Street
  - Justin Fox