Fi360 Conference: The Art of Economic Forecasting & the US Economic Outlook

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The Art of Economic Forecasting

I. The Problem: The Plight of the Fortune Tellers
II. Types of Forecasting
III. Our Model: The Narrative
IV. The Output: GDP, Employment, Inflation, Interest Rates
The Problem: The Plight of the Fortune Tellers
The Problem: How do we make decisions about the future in a world of uncertainty?

Where is the economy headed?

What is the path of interest rates?

What are the inflation/deflation risks?

_The Cardsharps_, Cavaggio (1594)
The Economist or the Meteorologist: Which is More Accurate?

**Meteorology**
- Physical science
- Rain
- Snow
- Wind
- Laboratory Experiments

**Economics**
- Social science
- Human Beings
- Human Choice
- Data Availability
- History, But Few Labs

“Most fundamentally, and perhaps most challenging for researchers, the crisis should motivate economists to think further about their modeling of human behavior.” – Ben Bernanke commenting on economics in the wake of the financial crisis
Types of Forecasts
### Types of Forecasts

<table>
<thead>
<tr>
<th>Forecast Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Theory-free” forecasts</td>
<td>Leading indicators</td>
</tr>
<tr>
<td>Mathematical “models” of the economy</td>
<td>The Fed model</td>
</tr>
<tr>
<td>Market-based models</td>
<td>The Yield Curve</td>
</tr>
<tr>
<td>“The Mental Model”</td>
<td>Combines narrative + economic indicators + market-based indicators</td>
</tr>
</tbody>
</table>

“Human behavior is simply too complex and nuanced to be fully represented mathematically, at least with the maths known to modern man. Maths can help us to gain insight into economic processes, but it is not the only way to gain such insight, nor even the most productive.”

-- DeLisle Worrell, Governor of the Central Bank of Barbados
The US Index of Leading Indicators Suggests Growth Will Improve

The Conference Board’s Leading Economic Index (LEI) leads turning points in the economy by an average of 7 months. The index correctly predicted a rebound in real GDP growth over the past year. At the present time, it is pointing to an improved pace of expansion for the first half of 2011.
What Are Leading Economic Indicators?

Leading Economic Indicators are economic and financial market variables that have a proven track record of changing direction ahead of shifts in the overall economy.

Two main categories:

- **Real variables** are reflective of actual economic activity whether it involves production, employment, income or sales.

- **Financial variables** are reflective of stock or bond market performance and monetary aggregates.
**None of Our Leading Indicators Are Pointing to a Double Dip**

<table>
<thead>
<tr>
<th>Financial Indicators</th>
<th>Lead Time (months)</th>
<th>Reliability</th>
<th>Growth Momentum (3-Month Change)</th>
<th>Pointing to Double-Dip?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Curve</td>
<td>12 to 24</td>
<td>High</td>
<td>Moderating</td>
<td>X</td>
</tr>
<tr>
<td>M2</td>
<td>12 to 24</td>
<td>Low</td>
<td>Improving</td>
<td>X</td>
</tr>
<tr>
<td>Stock Prices</td>
<td>3 to 6</td>
<td>Medium</td>
<td>Moderating</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Real Indicators</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Existing Home Sales</td>
<td>6 to 9</td>
<td>High</td>
<td>Stable</td>
<td>X</td>
</tr>
<tr>
<td>ISM Manufacturing Index</td>
<td>3 to 6</td>
<td>High</td>
<td>Improving</td>
<td>X</td>
</tr>
<tr>
<td>Consumer Expectations</td>
<td>3 to 6</td>
<td>Low</td>
<td>Improving</td>
<td>X</td>
</tr>
<tr>
<td>New Orders for Durable Goods</td>
<td>1 to 3</td>
<td>High</td>
<td>Improving</td>
<td>X</td>
</tr>
<tr>
<td>Unemployment Insurance Claims</td>
<td>1 to 3</td>
<td>Medium</td>
<td>Improving</td>
<td>X</td>
</tr>
<tr>
<td>Average Weekly Hours</td>
<td>1 to 3</td>
<td>High</td>
<td>Stable</td>
<td>X</td>
</tr>
</tbody>
</table>

**Conclusion: Medium-Term Outlook Has Improved**
The yield curve tends to lead the economy by between 1 to 2 years, and is defined as the difference between 2- and 10-year US Treasury yields. To illustrate, if investors think the coming two years will be much better for the economy than the next six years, the yield spread will be small or even negative. Currently, however, the curve is pointing towards a continued expansion.
After falling sharply during the recession, the money supply (M2) began to expand again in mid-2010. M2 tends to lead the economy by between one to two years, so the recent expansion is a positive sign for future growth.
Despite a recent slowing, the S&P 500 is over 13% higher than it was one year ago. Stock prices generally lead the economy by between three to six months.
After Plummeting Post-Tax Credit, Home Sales Show Some Life

Existing Home Sales and Economic Growth

The federal homebuyer tax credit produced a large spike in sales of existing homes in 2009-2010. Following the expiration of the credit, homes sales experienced the largest month-to-month percentage drop in history. However, after the initial adjustment, sales appear to be growing again, perhaps aided by record low mortgage rates and investors looking for deals on foreclosed homes.
ISM Purchasing Managers Index and Non-Residential Business Investment

The Institute of Supply Management’s Index of manufacturing activity rose dramatically following the recession and continues to rise as demand returns and companies replenish their low inventories. Recently, the index reached a 25-year high. Business investment is likely to continue to grow in coming months.

Sources: Institute for Supply Management and the Commerce Department
Confidence and Consumer Spending Improving

Consumer Expectations Six Month Hence and Real Consumer Spending

After faltering in the summer of 2010, consumer confidence and consumer spending have rebounded. Over the past decade, expectations have had an 89% correlation with consumer spending.

Sources: The Conference Board and The Commerce Department
Non-Defense Capital Expenditure Growth is Still Strong

Business Investment and New Orders for Capital Goods Excluding Defense and Aircraft

After a precipitous rise following the recession, growth in new orders for durable goods excluding aircraft and defense goods has moderated. However, growth remains strong at about 15% over the previous year. Business investment has maintained its rapid upward trajectory, but may moderate in the first half of 2011.

Sources: Census Bureau and Conference Board
Improvement in the labor market is critical for supporting aggregate demand, but job growth in this recession has been quite slow. However, the average manufacturing workweek has now returned to pre-recession levels, suggesting that the recent improvement in unemployment claims will continue.
The yield curve is the single most reliable predictor of recessions. Over the past 40 years, each time the yield curve “inverted,” or 3-month yields were higher than 10-year yields, the business cycle peaked about 18-24 months later and a recession followed. There was one false signal during the mid-1960s. Currently, the curve is very steep, indicating that the expansion is likely to continue.
Mathematical Models of the Economy

The Economy

Abstracting Further...

Standard Regression Model:

\[ Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \]

Example IS (Investment-Savings) Equation of a National Economy

\[ Y = C(Y-T(Y)) + I(i) + G + NX(Y) \]
Our Forecast: The Economic Narrative
"Shadow Banking" System vs. The Traditional Banking System

"Shadow Banking" (Repo, GSEs, ABS, CDOs, VRDNs, etc.)* System Liabilities
George Bailey "It's A Wonderful Life" Traditional Banking System Liabilities

USD Trillions

Source: Federal Reserve, *=Shadow Banks are financial intermediaries without access to central bank liquidity or public sector guarantees (Pozar, Adrian, Ashcraft, Boesky, 2010)
Good News: The Economy is Growing…Slowly

Recession Begins

* Real GDP is indexed to 100 at the onset of the recession.

Where We Are Today

Sources: Commerce Department, Payden & Rygel Estimates
Bad News: Job Growth Remains Too Slow to Bring Unemployment Rate Down Quickly

To achieve 8% unemployment by 2012

Needed for “robust” growth

300K per month

150K per month

Recovery Begins (July 2009 estimated)

Net Monthly Change (Thousands)

Source: US Dept. of Labor

Updated through: Feb 2011
It’s Taking Workers Far Longer To Shift to New Jobs

The average length of unemployment has more than doubled during the recession. The dramatic rise is partially attributable to a worker-job mismatch.

Unprecedented in post-war era

Source: BLS
And Current Inflation Rates Are Lowest in 30 Years

Core Inflation

Core CPI
Lowest level in 30 years…and below implicit “target zone”

...but not outright deflation

Source: BLS

“If action is taken by the Fed, a clear option is to grow the size of the balance sheet since the policy interest rate, for all practical purposes, cannot go any lower” – Dennis P. Lockhart, President, Federal Reserve Bank of Atlanta, 9/28/2010
Another Way To Think of Monetary Policy

The Fed wants some positive rate of inflation (approximately 2%) and higher inflation expectations...

....but not too much inflation!
Would Further “QE” Have an Impact?

On the Real Economy? Probably Not

On Capital Markets? Yes
The US Economy is Like A Giant Jigsaw Puzzle
Boom and Bust Cycle Still in the Unwinding Phase

After building too many homes and employing too many workers in housing-related industries, the 2007 bust forced a reallocation of resources (both labor and capital) across the economy.

Source: Federal Reserve
The Limits of QE: Banks Accumulate Excess Reserves, Not New Loans

In textbooks, reserves work through the "money multiplier" to increase aggregate lending and demand.

The banks are hoarding money...

...and not making new loans.

Source: Federal Reserve
Job Gains Are Still Weak Compared to the 1990s and 2000s…

Gross job losses each quarter

Gross job gains each quarter

Source: BLS

Updated through Q2 2010
The Limits of QE: We Need Innovation To Create Jobs

Net job creation, 1985-2005

Innovative, creative start-up firms are net job creators, not Fed QE

“It is hard to see how the Fed can do much to cure this [worker mismatch] problem. Monetary stimulus has provided conditions so that manufacturing plants want to hire new workers. But the Fed does not have a means to transform construction workers into manufacturing workers.”

-Narayan Kocherlakota, Minneapolis Fed President

Source: Business Formation and Dynamics By Business Age
And More Business Investment Needed To Promote Job Gains

As businesses expand investment they are also usually adding to payrolls as we saw in the 1990s...

Weak business investment in the 2000s corresponded with weaker job gains.

Source: BLS
Larger Businesses Are Not Hiring

Total Private Employment

Nonfarm Private Payroll Employment, Businesses with More Than 500 Employees

No recovery in hiring by big businesses
Small Businesses, Critical to Job Growth, Are Slowly Hiring

Total Private Employment

Growing, but small businesses added fewer than 1 million jobs in last 12 months...
Is Inflation A Risk? Broad Money & Credit Growth Usually Precede Consumer Price Inflation

Sources: Federal Reserve Flow of Funds and Federal Reserve Bank of New York Report #458, July 2010
Wage Growth Also Usually Precedes Inflation

Sources: U.S. Labor Department

Updated through Feb 2011
CPI Inflation Subdued Even If You *Include* Food & Energy

Instead of excluding food and energy prices (like core CPI), the Cleveland Fed measure includes all prices.

Sources: Conference Board and Cleveland Fed

Recession Periods - United States

Updated through Feb 2011
Non-Treasury Debt Contraction versus Treasury Debt Surge

The increase in public debt (net of Fed purchases) is dwarfed by the decline in private sector debt.

Reduced supply exerts downward pressure on interest rates.

Source: Federal Reserve

Updated through Q3 2010
The Chalk Board: Fundamental versus Technical Factors Drive Interest Rates

Shorter-Term Technical Factors

Long-Term Fundamental Trend

% vs. Time
## U.S. Interest Rate Scorecard

### Fundamental Factors – Help to establish long-term fair value

<table>
<thead>
<tr>
<th>Comment</th>
<th>Explanatory Power</th>
<th>Impact on Rates</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Growth</td>
<td>Around long-term average of 3%</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Inflation</td>
<td>At historic lows</td>
<td>High</td>
<td>Economic fundamentals point to continued low yields. Though the US debt load is on investors’ radar, it is not currently weighing on rates.</td>
</tr>
<tr>
<td>Demographics</td>
<td>Retiring boomers switching from equities to bonds</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Required Risk Premium</td>
<td>Budget deficits a potential concern</td>
<td>Low</td>
<td>Technical factors point to higher rates, with market sentiment the most important driver.</td>
</tr>
<tr>
<td>Bank Lending and Private Debt Issuance</td>
<td>Banks are buying Treasuries instead of making loans</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>

### Technical Factors – Influence near-term volatility

<table>
<thead>
<tr>
<th>Comment</th>
<th>Explanatory Power</th>
<th>Impact on Rates</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Sentiment</td>
<td>Concern for higher rates</td>
<td>High</td>
<td>Technical factors point to higher rates, with market sentiment the most important driver.</td>
</tr>
<tr>
<td>Investor Demand for Treasuries</td>
<td>High global demand for a safe-haven investment</td>
<td>Medium</td>
<td>Technical factors point to higher rates, with market sentiment the most important driver.</td>
</tr>
<tr>
<td>Treasury Auctions</td>
<td>Record funding requirements</td>
<td>Medium</td>
<td>Technical factors point to higher rates, with market sentiment the most important driver.</td>
</tr>
<tr>
<td>Federal Reserve Purchases (QE2)</td>
<td>$600 billion program over 8 mos. plus mortgage reinvestment</td>
<td>Medium</td>
<td>Technical factors point to higher rates, with market sentiment the most important driver.</td>
</tr>
</tbody>
</table>

**Conclusion:** Yields on benchmark 10-year US Treasuries should fluctuate between 3% and 4% in 2011. As for the federal funds rate, we do not anticipate rate hikes in 2011. This implies a steep yield curve throughout the year.
Fundamental: Strong Relationship Between Inflation and 10-Year Interest Rates

Source: The Federal Reserve and The Labor Department

Updated through Feb 2011
Interest Rates Tend to Follow GDP Growth

Despite market volatility, interest rates follow trend in nominal GDP over time…

Source: Federal Reserve

Updated through Q4 2010

Holding US Treasuries gives investors exposure to the US dollar as well as lower risk

Source: Federal Reserve

Data through Q3 2010
**High Interest Rates are the Anomaly, Not Low Ones**

Nominal Long-Term Monthly Yields since 1871

Interest rates have been below 5% over 70% of the time since 1871!

*Source: Robert Shiller*

Updated through Nov. 2010
# 2010-2011 Baseline US Economic Forecast*

"I can calculate the motions of heavenly bodies, but not the madness of people." – Sir Isaac Newton

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th></th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
</tr>
<tr>
<td>Real GDP (quarter-to-quarter annualized percent change)</td>
<td>1.6</td>
<td>5.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Unemployment Rate (percent)</td>
<td>9.6</td>
<td>10.0</td>
<td>9.7</td>
</tr>
<tr>
<td>Headline CPI Inflation (year-over-year percent change)</td>
<td>-1.6</td>
<td>1.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Core CPI Inflation (year-over-year percent change)</td>
<td>1.5</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Federal Funds Rate (percent)</td>
<td>&lt;0.2</td>
<td>5</td>
<td>&lt;0.2</td>
</tr>
<tr>
<td>10-Year Treasury (percent)</td>
<td>3.30</td>
<td>3.54</td>
<td>3.71</td>
</tr>
</tbody>
</table>

*Data represent quarterly averages

**Unemployment will remain high**

**Inflation below Fed’s target**

**Fed Keeps “Foot on Pedal”**
The Risks to the Forecast

“I can calculate the motions of heavenly bodies, but not the madness of people.” – Sir Isaac Newton

State & Local Government Fiscal/Debt

Oil Prices Shock (Middle East Tensions)

Fiscal/Regulatory Uncertainty

Housing Market Supply Overhang

International Currency War

Global Growth Slowdown

QE3?