# NO SPIN F⊘RECAST

## *The Enhanced Aggregate Spread -- An Owner's Manual*

### *Robert F. Dieli, Ph.D.*

# Chart 1
# The Phases of the Business Cycle

Mr. Model is a forecasting tool that was developed to do two things. First, provide a methodology for identifying where we are currently in the business cycle, indicated by the "we are here" arrow on this chart. Second, provide a methodology to identify when and why the location of that arrow might change. In the charts that follow we will show you how and why we think Mr. Model accomplishes those goals.

First we will show how Mr. Model is put together and why the charts look like they do. Then, we will show how we use the several components of the model to make the forecast you see every month.
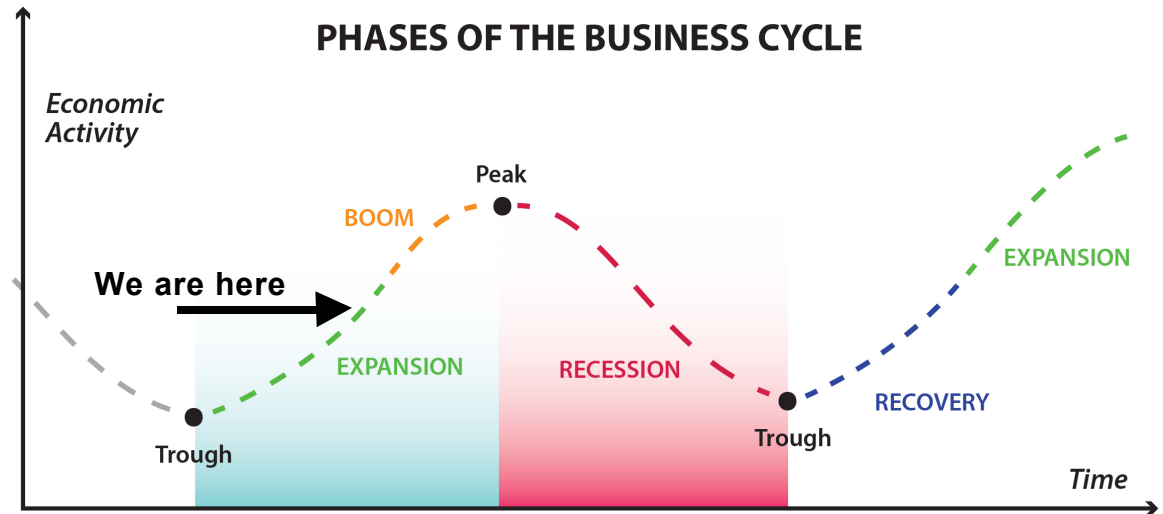
**PHASES OF THE BUSINESS CYCLE**

*Economic Activity*

Peak

BOOM

**We are here**

EXPANSION

RECESSION

EXPANSION

RECOVERY

Trough

Trough

*Time*

# Chart 2
## Expansion Periods as Defined by the
## National Bureau of Economic Research

The National Bureau of Economic Research [NBER], founded in 1920, is a private, nonprofit, nonpartisan organization based in Cambridge, Massachusetts. The Business Cycle Dating Committee of the NBER is the entity that sets the official starting and ending dates of the expansion and contraction phases of the business cycle. The process under which they make those determinations is both painstaking and time consuming. As a result, the announcement of the official peak and trough dates are made well *after* the events have occurred.

For those of us navigating the business cycle in real time, those lags are too long to allow us to take the necessary actions to protect our economic interests.

**Mr. Model was developed to provide warnings of changes in the phases of the business cycle with enough lead time to take effective action.**
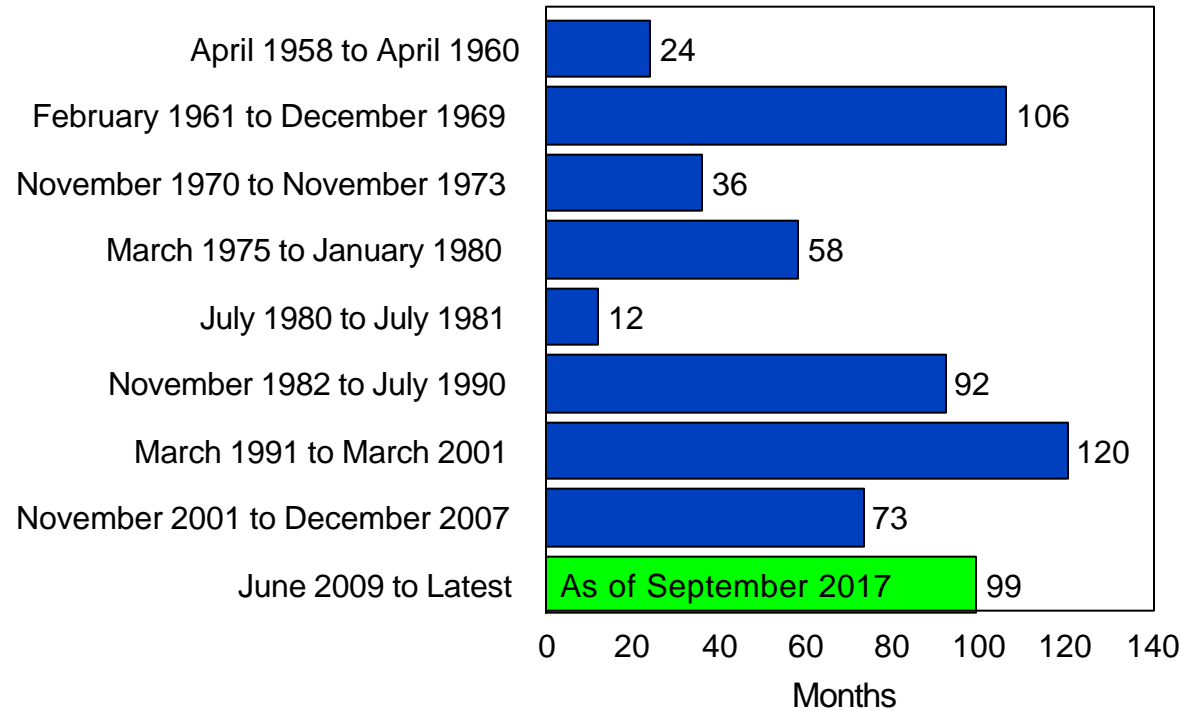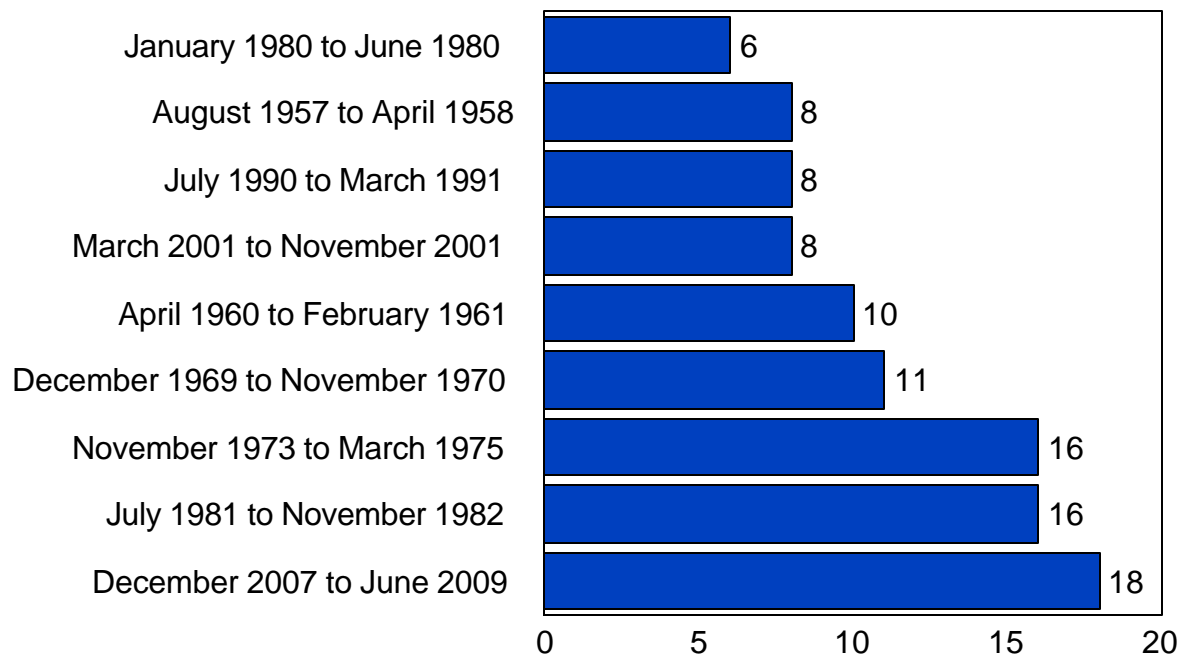
| Period | Months |
|---|---|
| April 1958 to April 1960 | 24 |
| February 1961 to December 1969 | 106 |
| November 1970 to November 1973 | 36 |
| March 1975 to January 1980 | 58 |
| July 1980 to July 1981 | 12 |
| November 1982 to July 1990 | 92 |
| March 1991 to March 2001 | 120 |
| November 2001 to December 2007 | 73 |
| June 2009 to Latest — As of September 2017 | 99 |

Months

# Chart 3
# Recession Periods as Defined by the
# National Bureau of Economic Research

As you can see from the previous chart and from this one, the length of the expansion and contraction phases are quite variable. And, as you can see from the table below, our statement about the length of time it takes the NBER to decide whether a peak or a trough has occurred is equally variable. The model is going to address those problems as part of its forecasting process.

| Recession Period | Months |
|---|---|
| January 1980 to June 1980 | 6 |
| August 1957 to April 1958 | 8 |
| July 1990 to March 1991 | 8 |
| March 2001 to November 2001 | 8 |
| April 1960 to February 1961 | 10 |
| December 1969 to November 1970 | 11 |
| November 1973 to March 1975 | 16 |
| July 1981 to November 1982 | 16 |
| December 2007 to June 2009 | 18 |

| Peak Date | Announcement Date | Lag (Months) | Trough Date | Announcement Date | Lag (Months) |
|---|---|---|---|---|---|
| January 1980 | June 3,1980 | 6 | July 1980 | July 8, 1981 | 12 |
| July 1981 | January 6, 1982 | 7 | November 1982 | July 8, 1983 | 8 |
| July 1990 | April 25, 1991 | 9 | March 1991 | December 22, 1992 | 21 |
| March 2001 | November 26, 2001 | 8 | November 2001 | July 17,2003 | 20 |
| December 2007 | December 1, 2008 | 12 | June 2009 | September 20, 2010 | 15 |

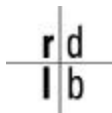Owner's Manual for Enhanced Aggregate Spread -- Page 3

# Chart 4
# Federal Funds Rate

Let's get down to business.

First thing, on this chart, and all others, the shaded areas are the recession periods as determined by the NBER.

The model consists of four inputs:

- The Federal Funds Rate [FFR]
- The 10-Year Treasury Note [10YEAR]
- The CPI Inflation Rate [CPI]
- The Short-Term Unemployment Rate [STRUC]

We will start with a chart on each of them to explain why they are in the model and what they tell us about the phases of the business cycle.

The Federal Funds Rate is the interest rate at which depository institutions (banks and credits unions) lend reserve balances to other depository institutions overnight on an uncollateralized basis.

Percent



Year and Month

While that is the technical definition of the term, what matters most to us is that the level and trend of the FFR is the way we know whether the Federal Open Market Committee [FOMC] is tightening or loosening monetary policy as part of its dual mandate to maintain full employment and price stability.

There are two other things you need to know. First, there are no random numbers on this chart. Every one is the result of the actions taken by the FOMC. Two, as you can see, every recession has been preceded by a steady and deliberate rise in the FFR.
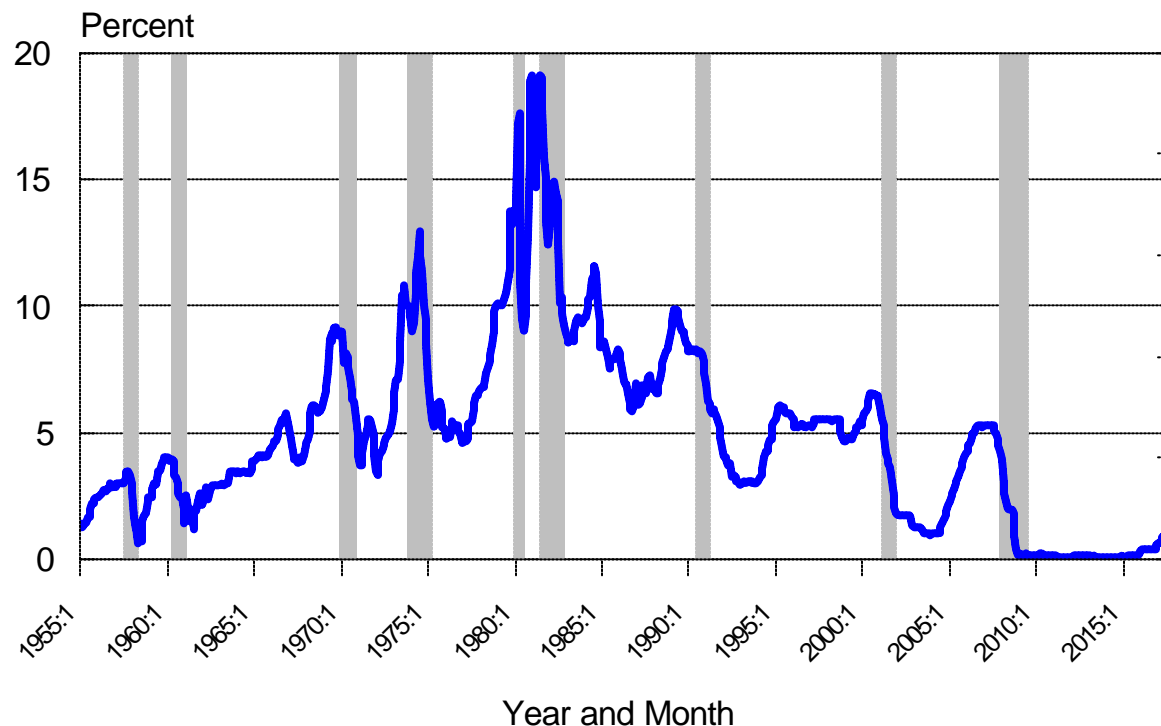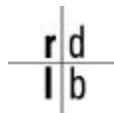
# Chart 5
# 10-Year Treasury Note

Our next input is the 10-Year Treasury Note.

As you see, this series has a much different profile than that of the Federal Funds Rate. The main reason for that is the interest rate on the 10-Year Treasury incorporates such matters as the time value of money, inflation risk, investment risk, and investor sentiment.

This series does have some cycle-associated movement, which will be easier to see when we move to a shorter time scale.

This variable is in the model precisely to capture those elements of investor sentiment that it brings with it.

The Federal Funds Rate and the 10-Year Treasury represent the financial side of the economy. And they will come together in the Enhanced Financial Spread, itself an important and powerful indicator of where we are in the business cycle as well as where we might be headed.



Year and Month
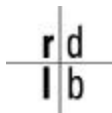
# Chart 6
# Short-Term Unemployment Rate

The next input is the Short-Term Unemployment Rate. This statistic is calculated by dividing the number of persons who have been unemployed for less than 27 weeks by the total civilian workforce. I shifted to this measure of unemployment after the last recession when long-term unemployment spiked higher and stayed high well into the recovery. The first version of Mr. Model used the official unemployment rate.

Along with the Federal Funds Rate, this series has a very pronounced cyclical pattern. Its changes in direction around both cycle peaks and cycle troughs are quite informative of the process of transitioning between the expansion and contraction phases. The only problem, as you can see from the chart, is that this series is subject to considerable variation on a month-to-month basis. Because of that, the series cannot be used in isolation to try and find the cycle turning points.
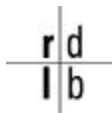
Percent

Year and Month
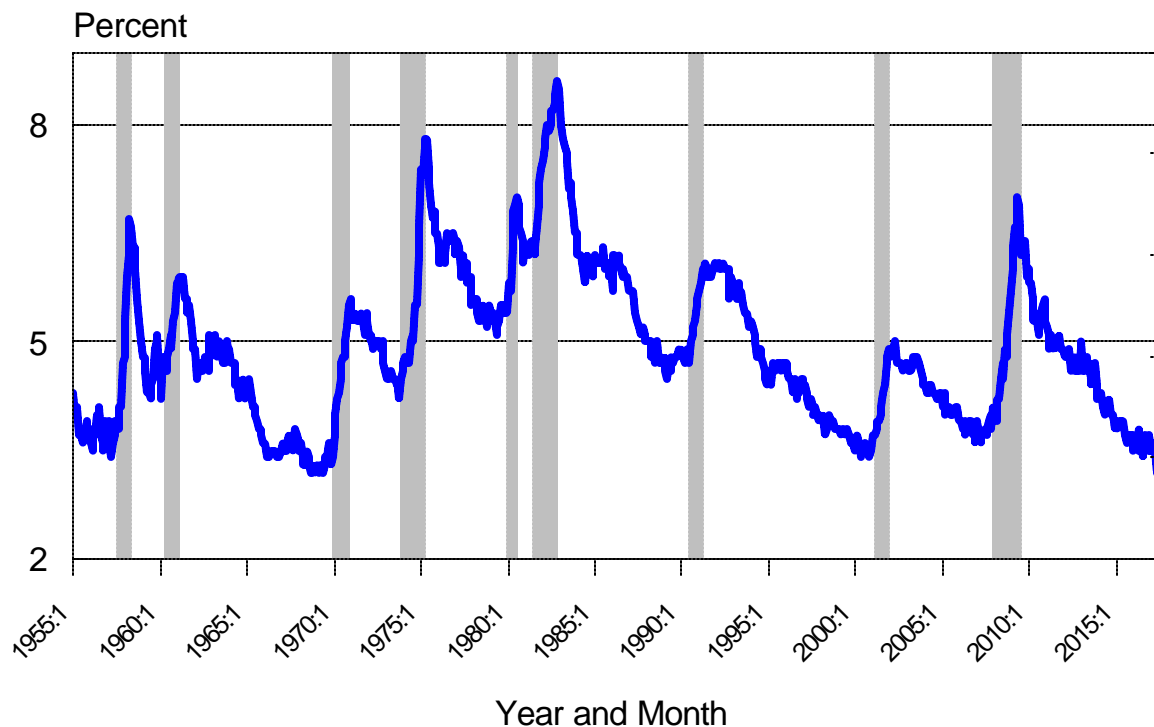
# Chart 7
# CPI Inflation Rate

The fourth, and final, input is the CPI inflation rate. CPI is short for the Consumer Price Index for All Urban Consumers, officially known as CPI-U. This index is one of several used to measure inflation in the U.S. Economy. We use it because it is the most widely known of those indexes and because it is more readily available.

As you can see here, the CPI has some cyclical tendencies, but those are less pronounced than those we saw for the Federal Funds Rate and the Short-Term Unemployment rate.

You can also see that there are two eras in the history of American inflation: the years when the rate of inflation was more less 3% and those where it went into double-digits. The memory of the double-digit years is never far below the surface at the FOMC meetings.

Percent

Year and Month
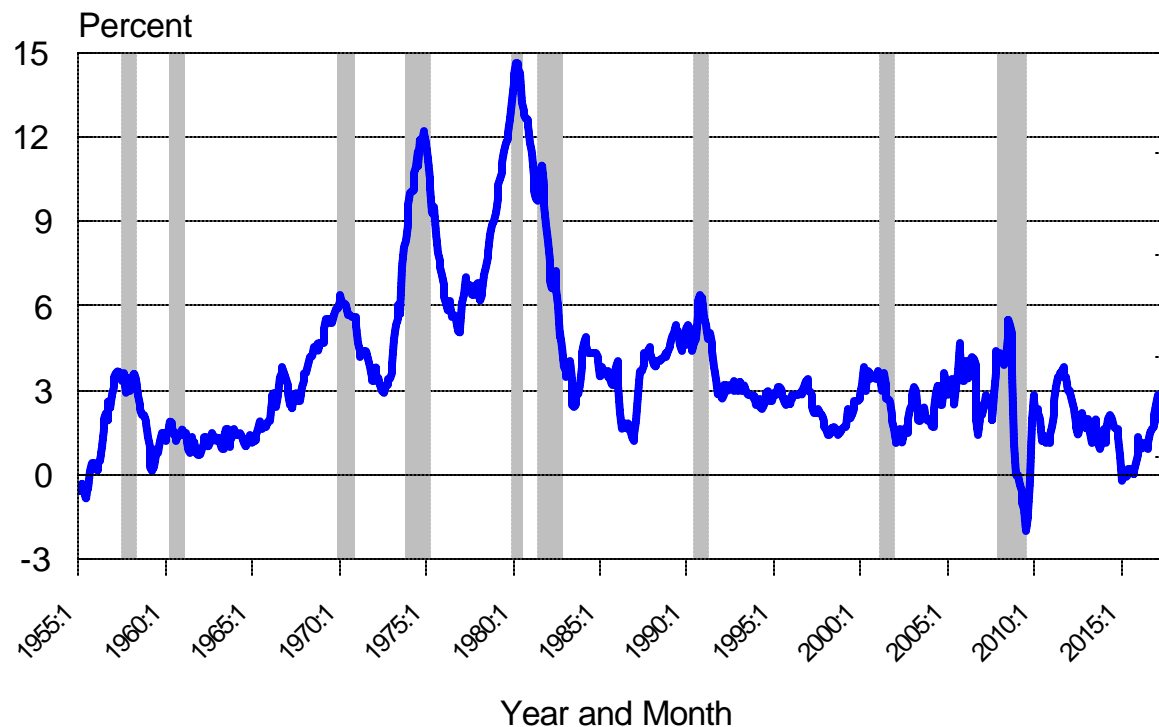
# Computation of the Enhanced Aggregate Spread

We will be repeating this information on each of the charts related to the spreads you see here. I wanted you to be able to see all of the inputs and all of the spreads in one place before we proceed to the details. First technical note. There are 100 basis points in a percentage point. So, the actual level of the 10-Year Treasury was 2.19%. We will explain why we use basis points in a moment.

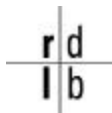| Variable | Symbol | Level (Basis Points) |
|---|---|---|
| **10-Year Treasury Note** | **10YEAR** | **219** |
| **Federal Funds Rate** | **FFR** | **104** |
| **Enhanced Financial Spread** | **EFS** | |
| | **EFS = 10YEAR - FFR** | **115** |
| **CPI Inflation Rate** | **CPI** | **160** |
| **Short-Term Unemployment Rate** | **STRUC** | **320** |
| **Enhanced Real Spread** | **ERS** | |
| | **ERS = CPI - STRUC** | **-160** |
| **Enhanced Aggregate Spread** | **EAS** | |
| | **EAS = EFS - ERS** | **115 -(-160) = 275** |

All Figures are for June 2017

# Chart 9
# Enhanced Financial Spread

The first spread we compute, because the numbers are available to us first, is the Enhanced Financial Spread. This can also be viewed as one way to compute the slope of the yield curve. What we are measuring here is the difference between the rate on the 10-Year and the Federal Funds Rate. As you see, most of the time this spread is positive. When it is not, we often find ourselves either in a recession or about to go into one.

There are many ways to calculate the slope of the yield curve. You will often see the spread between the 2-Year Treasury and the 10-Year Treasury. But the messages tend to be the same. When this spread approaches zero it is wise to start looking around for other symptoms of a business cycle peak.



Basis Points

Year and Month
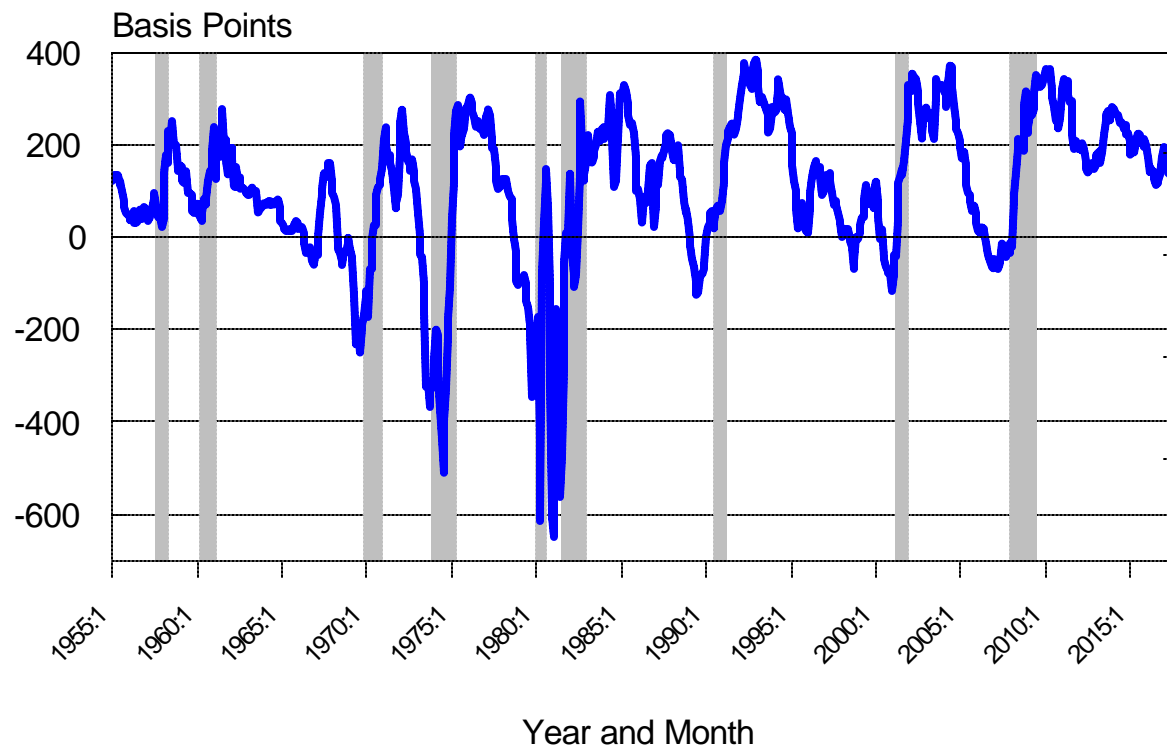
Enhanced Financial Spread = EFS

EFS = (10YEAR - FFR) * 100

For June 2017

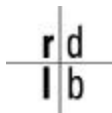EFS = (2.19 - 1.04) = 1.15 * 100 = **115**

# Chart 10
# Enhanced Real Spread

Our next spread is the Enhanced Real Spread [ERS]. This spread gets its name from its two components both of which are covering different aspects of the "real" economy as compared to the financial transactions associated with aggregate economic activity.

As you see here, the normal condition of the ERS is for it be negative because in most instances the rate of inflation is lower than the rate of unemployment. And, as you also see here, when the ERS goes toward zero, or into positive territory, we need to start looking for the symptoms of a business cycle peak.



Basis Points

Year and Month
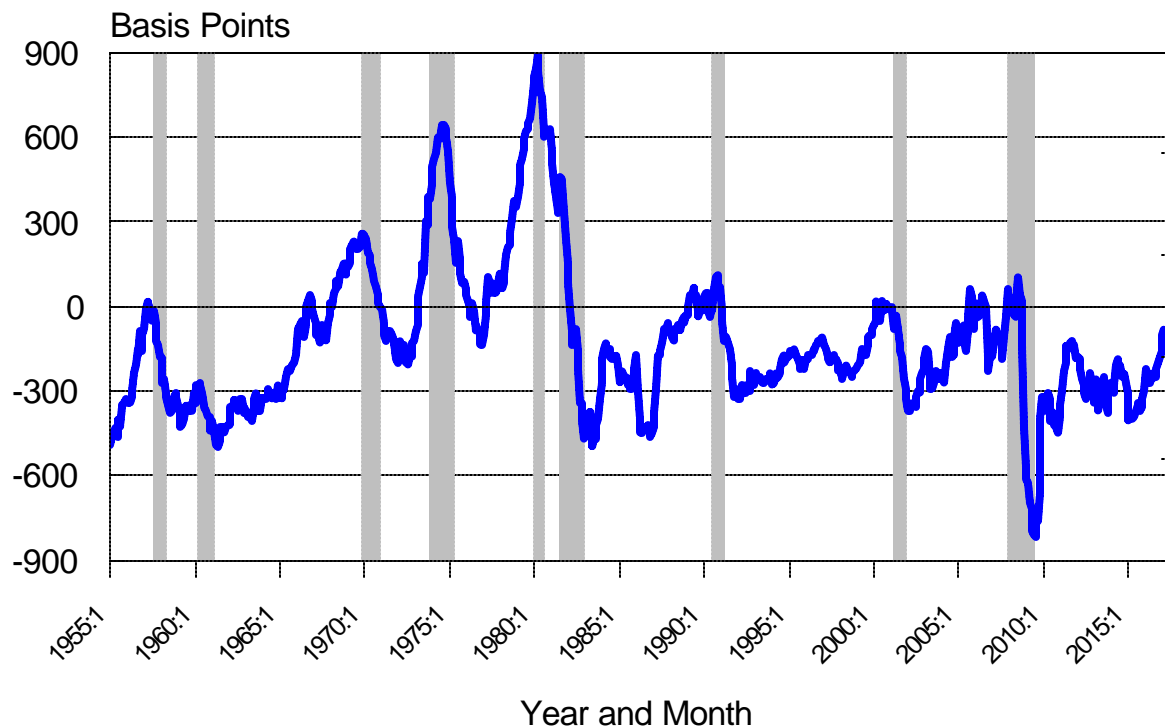
Enhanced Real Spread = ERS

ERS = (CPI - STRUC) * 100

For June 2017

ERS = (1.60- 3.20= -1.60 * 100 = **-160**

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# Chart 11
## Components of the Enhanced Aggregate Spread

Here is the first "Aha" moment. As we saw on the previous two charts, both series had significant cyclical characteristics. So, I decided to put them on the same chart, since they are in the same units. This is what popped up.

Cycle peaks, with two exceptions, happened when the lines converged. Cycle troughs happened when the lines diverged. And all of the convergences happened around zero.

That was the good news. The bad news was that in 1988, when I first came across this, we did not have color printers. So, how to get to one line? Because when you are displaying charts in black and white, anything more than one line quickly makes the chart hard to read.
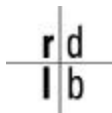


Basis Points

Year and Month

Legend: ERS — Recession — EFS
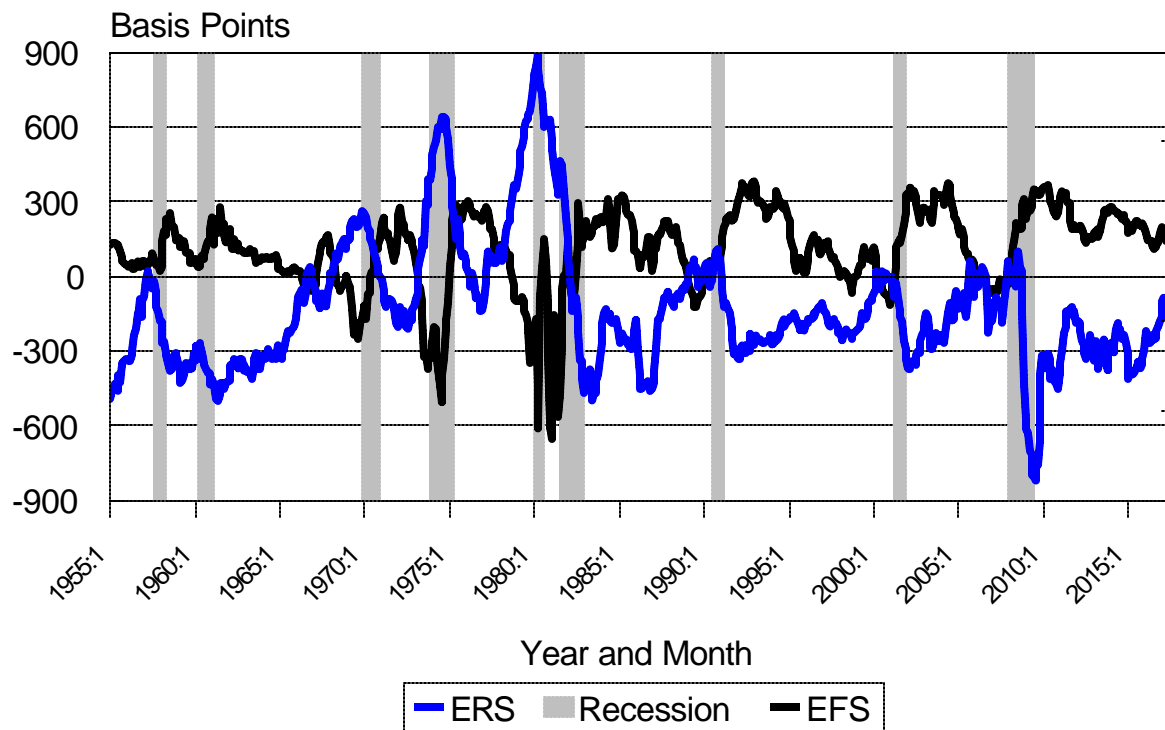
# Chart 12
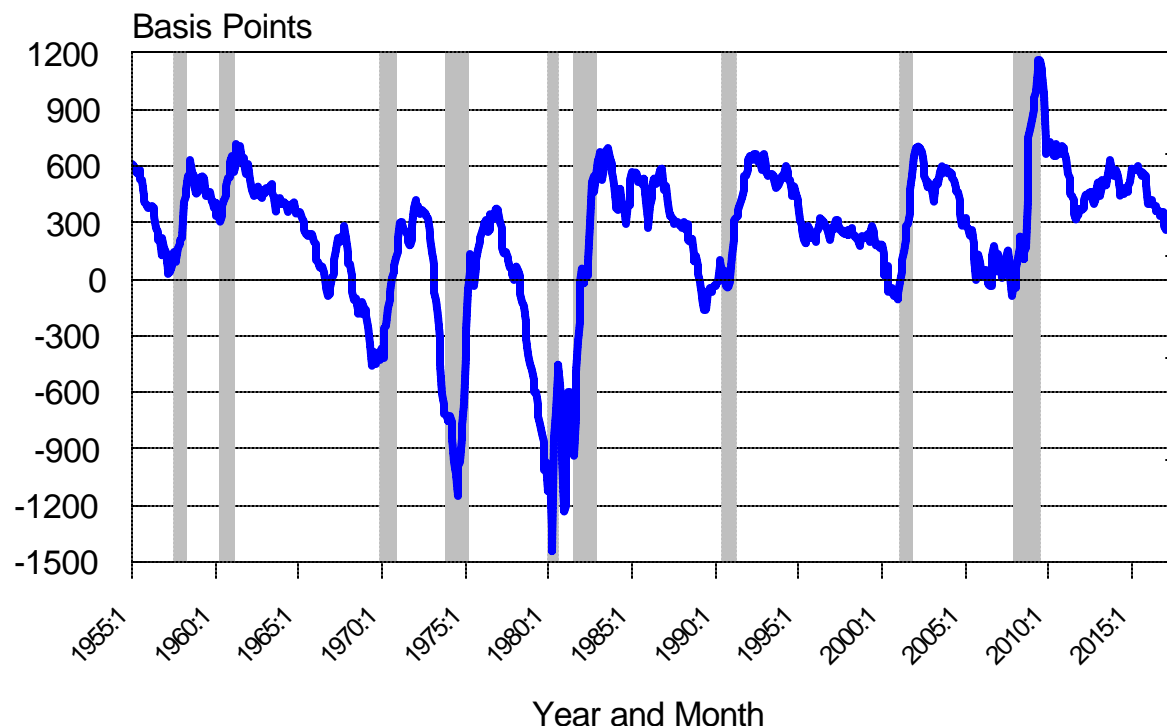# Enhanced Aggregate Spread -- Real Time

By combining the two spreads into one, which I called the Aggregate Spread, because I am really bad at making up names for things. But, it does convey the process of combination, the arithmetic for which you see below. This was the second "Aha" moment.

We now have one line, which solves the problem of how to print this in one color.

But, there is something else. Notice that when we reduce the two lines on the previous chart to one here we can see that there is a pattern to places where this line is below zero: they are all in front of the business cycle peaks. With two exceptions. I will explain those in a moment.

This where the NoSpin part of the model was born. This where you see us make a forecast without making any assumptions or projections about what the forecast inputs will do over the forecast period.

Say, what? Read on.

**Basis Points**



Year and Month

Enhanced Aggregate Spread = EAS

EAS = EFS - ERS

For June 2017

EAS = 115 - (-160) = 275

# Chart 13
## Enhanced Aggregate Spread with 9 Month Lead

Thanks to the wonders of the "cut and paste" function, I picked up the entire line that we plotted on the previous page and moved it to the right in several tries to get the intervals where the line is below zero to line up with the shaded areas. As it turned out, nine months gives you the fit that you see on the chart, and nine months was the best fit, not the absolute most perfect fit. And there are two places where the model missed. One with a false negative, and one with a false positive. Each is marked on the chart.
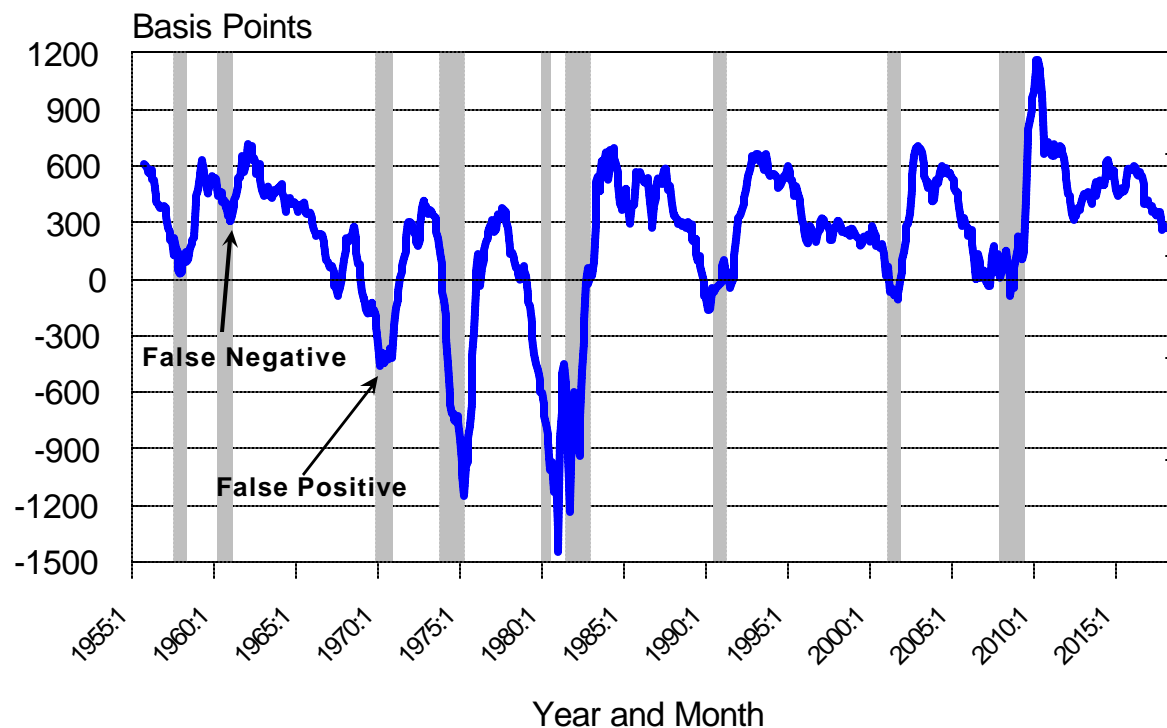
Since the recession of 1969, the model has not missed. It has provided warnings of the cycle peaks and notice of the cycle troughs. In all cases all forecasts were made the same way with the same inputs. This is the entire forecast record of the model.

Mr. Model is the only forecast that I know of that does not make assumptions about anything. The forecast is based on the level and trend of the EAS with the nine month lead. Those values are determined by the known and documented levels of the four model inputs. The rest is arithmetic.



Basis Points

False Negative

False Positive

Year and Month

# Chart 14
# Enhanced Aggregate Spread

The next sequence of charts is the run with which we open the Overview and Outlook and the Prospects and Perspectives reports every month. Now that we know where the EAS comes from, it is time to spend a couple of minutes to see it in action.

With the wider time scale on these charts it is easier to see how the EAS behaves around recessions. I use the 200 basis point level of designate what I call the Danger Zone, which is the period in which the risk of a recession is greatest. I also refer to the months when the EAS is below 200 basis points as being "recession-eligible." We will get back to that in a moment. For now, you can see that the forecast horizon for the period covered by this chart ran through March of 2018, which is nine months following June of 2017, when the data were issued.
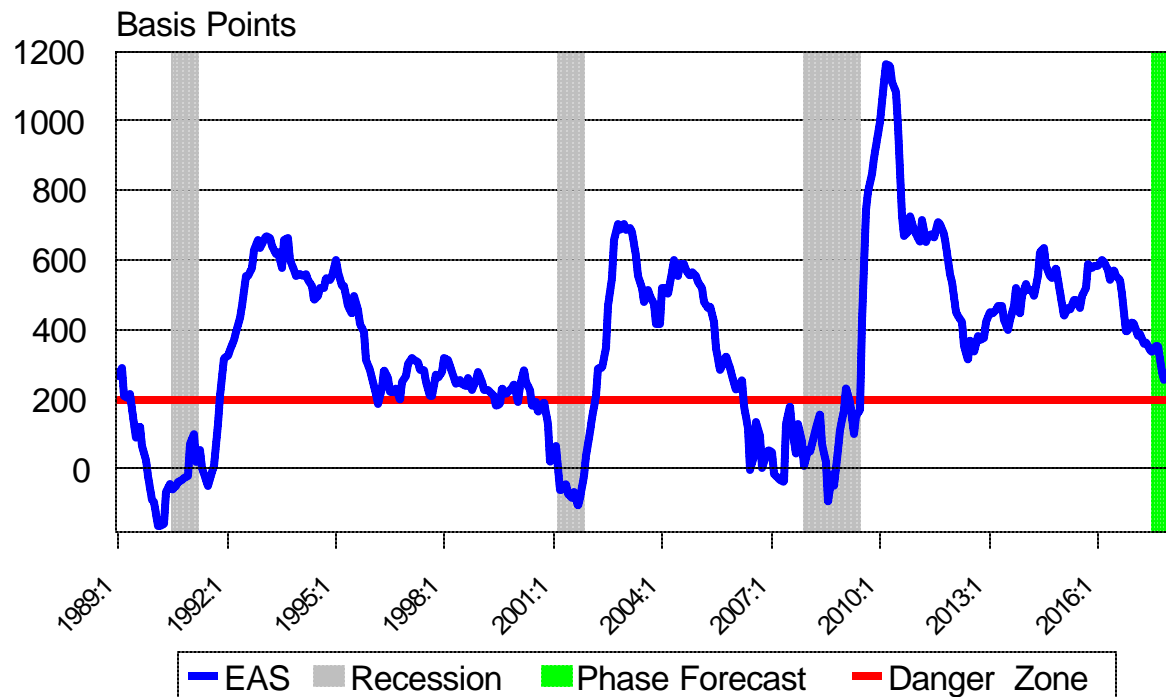
**REPORT DATE: June 2017**
**FORECAST: through March 2018**

**Basis Points**



**Latest = March 2018 = 275**

# Chart 15
## Enhanced Aggregate Spread -- Forecast Summary

The second chart we run every month is the forecast summary. On it we show you the level and trend of the EAS over the forecast period and the values of the three coincident indicators we use to check to see whether the forecast made nine months earlier was correct. If we had an instance, as we did in 1960, where the EAS was not signaling a cycle event but all the coincident indicators were, we would let the coincident evidence over rule the EAS. But, as you see on this chart, both the leading indicator and all of the coincident indicators are telling us that we are in the expansion phase and should remain there over the forecast horizon.
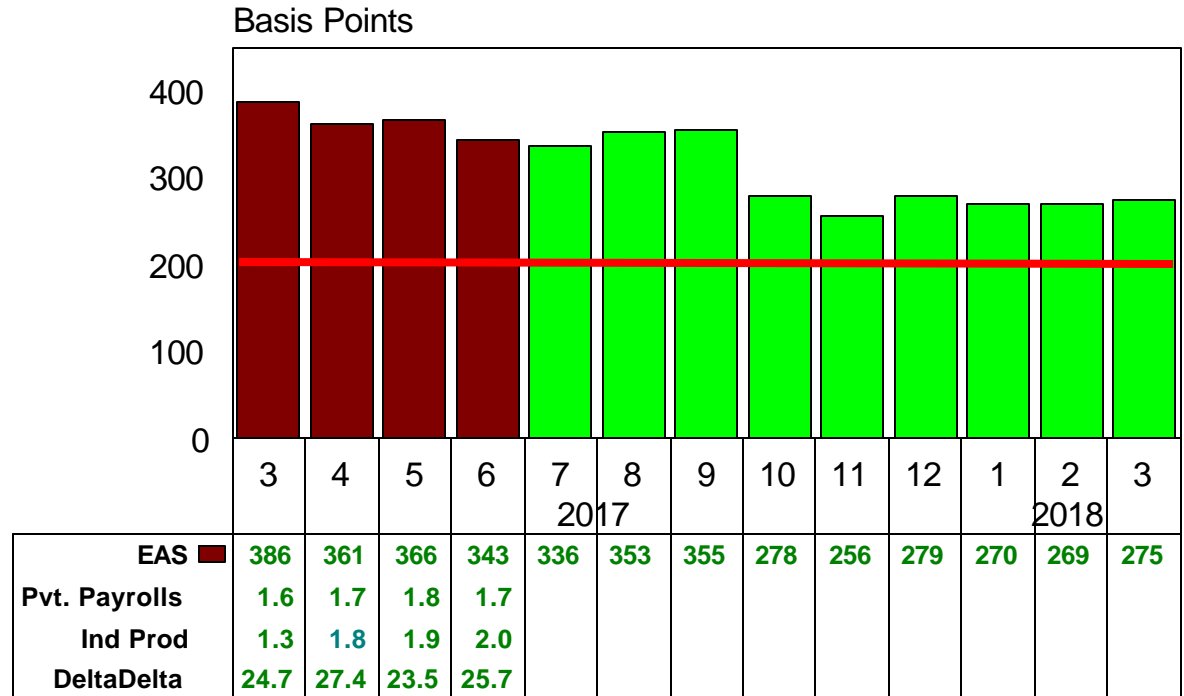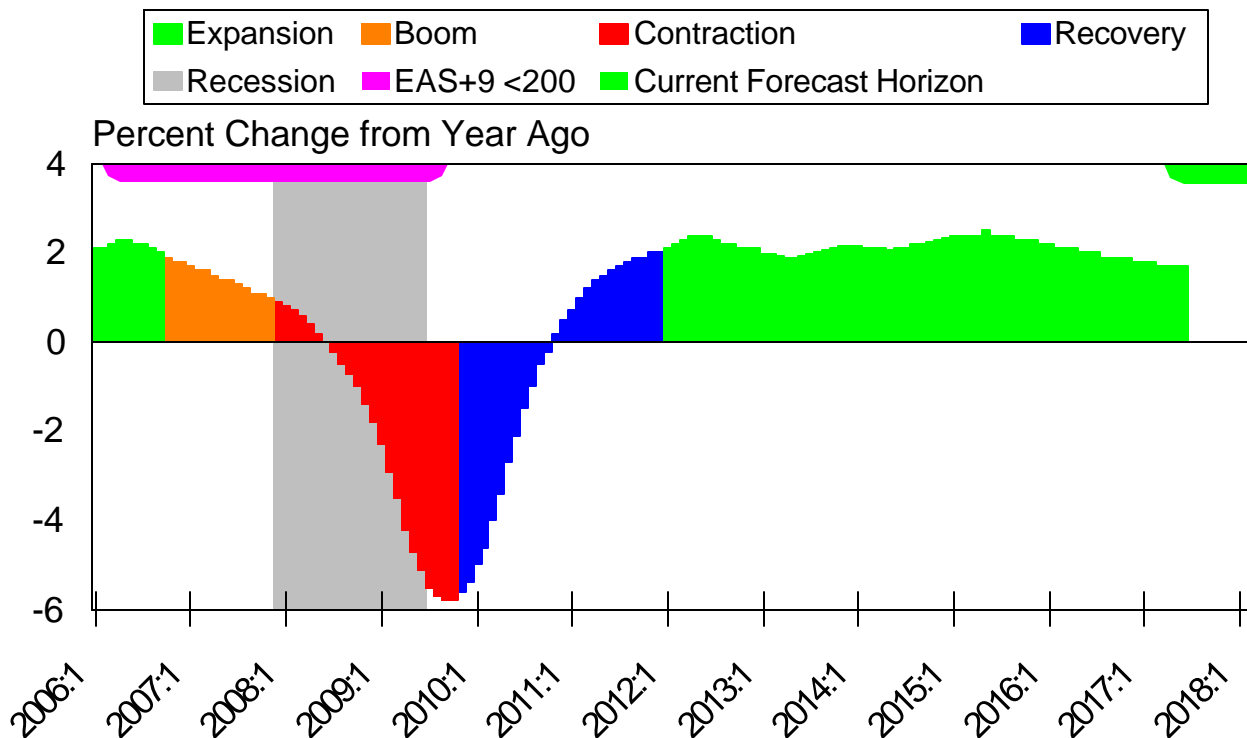
Basis Points

| | 3 | 4 | 5 | 6 | 7 2017 | 8 | 9 | 10 | 11 | 12 | 1 | 2 2018 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EAS ■ | 386 | 361 | 366 | 343 | 336 | 353 | 355 | 278 | 256 | 279 | 270 | 269 | 275 |
| Pvt. Payrolls | 1.6 | 1.7 | 1.8 | 1.7 | | | | | | | | | |
| Ind Prod | 1.3 | 1.8 | 1.9 | 2.0 | | | | | | | | | |
| DeltaDelta | 24.7 | 27.4 | 23.5 | 25.7 | | | | | | | | | |

**Recession Associated Level**
Private Payrolls <1.00% and falling
Industrial Production <1.00% and falling
DeltaDelta <0.0% and falling

Peak

Economic Activity

We are here   Trough

Time

**Phases of the Business Cycle**

| Expansion | → |
| Boom | → |
| Recession | → |
| Recovery | → |

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# Chart 16
## Total Private Nonfarm Payroll Employment

In addition to the forecast summary we just looked at, we also run this chart to help us figure out in which of the four phases of the cycle we currently find ourselves. If you recall from Chart 3, there is a considerable lag between the time the economy passes through a cycle peak or a cycle trough and when the NBER tells us the dates of those passages.

In order to have a more immediate estimate of those events, I developed this chart,  The colors of the bars are set by the rules you can see below the picture.  And, as you can see on the chart, the start of the last recession was in the period where the EAS had told us to look for it.



| | Expansion | | Boom | | Contraction | | Recovery |
|---|---|---|---|---|---|---|---|
| | Recession | | EAS+9 <200 | | Current Forecast Horizon | | |

Percent Change from Year Ago

**If EAS+9 > 200 Bars will be Green**
**If EAS+9 < 200 Color of bars will be determined by the rules below**

Six-month Moving Average

| | |
|---|---|
| **Greater than 2%** | **Expansion** |
| **Falling from 2% to 1%** | **Boom** |
| **Falling from 1% to minimum** | **Contraction** |
| **Rising from minimum to 2%** | **Recovery** |

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# Chart 17
## Components of the Enhanced Aggregate Spread

This chart appears in both the Overview report and the Prospects report. The two that follow appear only in the Prospects report.

The last chart in the sequence about the forecast is this one, and it is in the report to do two things. The first is to help us monitor the process of convergence of the two lines. The second is to remind us that the forecast is the summary document of a much larger set of data. So, what we see here helps us to set priorities for which part of that larger set of data to focus on in the monthly reports.



**Legend:** Enhanced Financial Spread [EFS] — Enhanced Real Spread [ERS] — Recession

Basis Points

y-axis: 400, 200, 0, -200, -400, -600, -800

x-axis: 1989:1, 1993:1, 1997:1, 2001:1, 2005:1, 2009:1, 2013:1, 2017:1

275
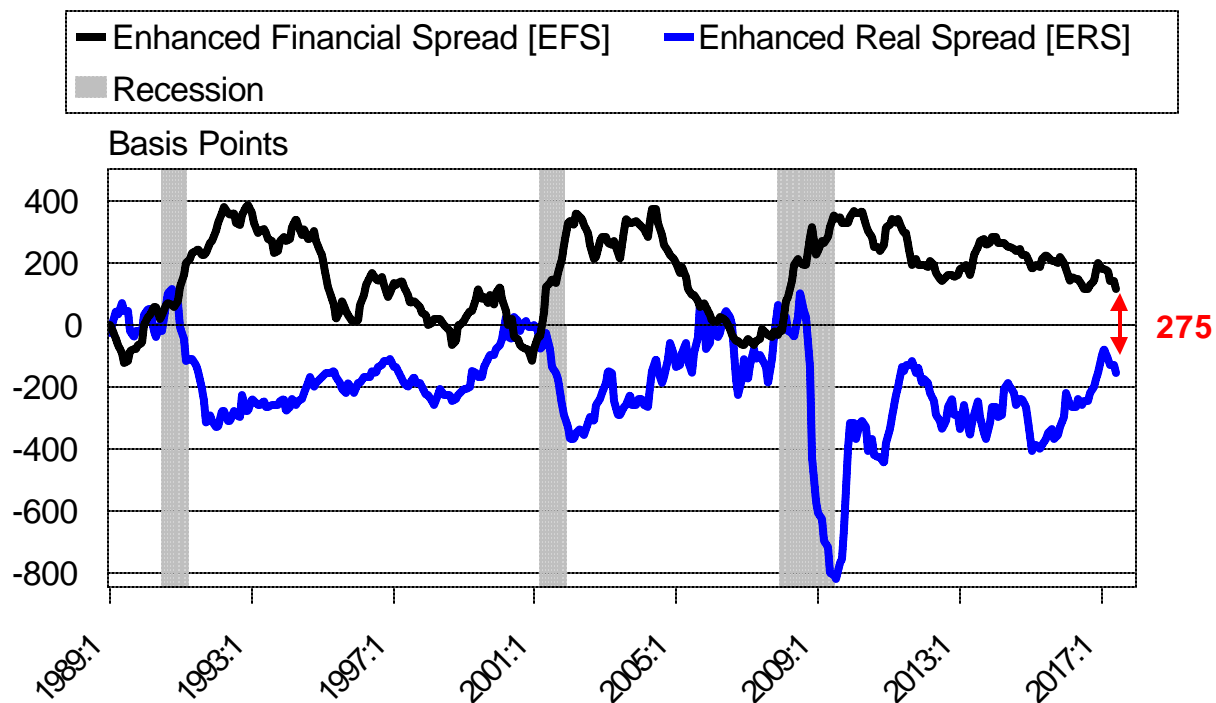
| Date | EAS | DATE | EFS | ERS |
|------|-----|------|-----|-----|
| 2017:12 | 279 | 2017:3 | 169 | -110 |
| 2018:1 | 270 | 2017:4 | 140 | -130 |
| 2018:2 | 269 | 2017:5 | 139 | -130 |
| **2018:3** | **275** | **2017:6** | **115** | **-160** |

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# Chart 18
# Components of the Enhanced Financial Spread

Readers of the Prospects report see this chart every month along with a discussion on what is going on at the FOMC. We have also used this chart as an introduction to our longer discussions about monetary policy that have been published over the past year in both the Overview and the Prospects reports.



Legend: Federal Funds [FF] — 10-Year Note [10-Yr.] — Recession
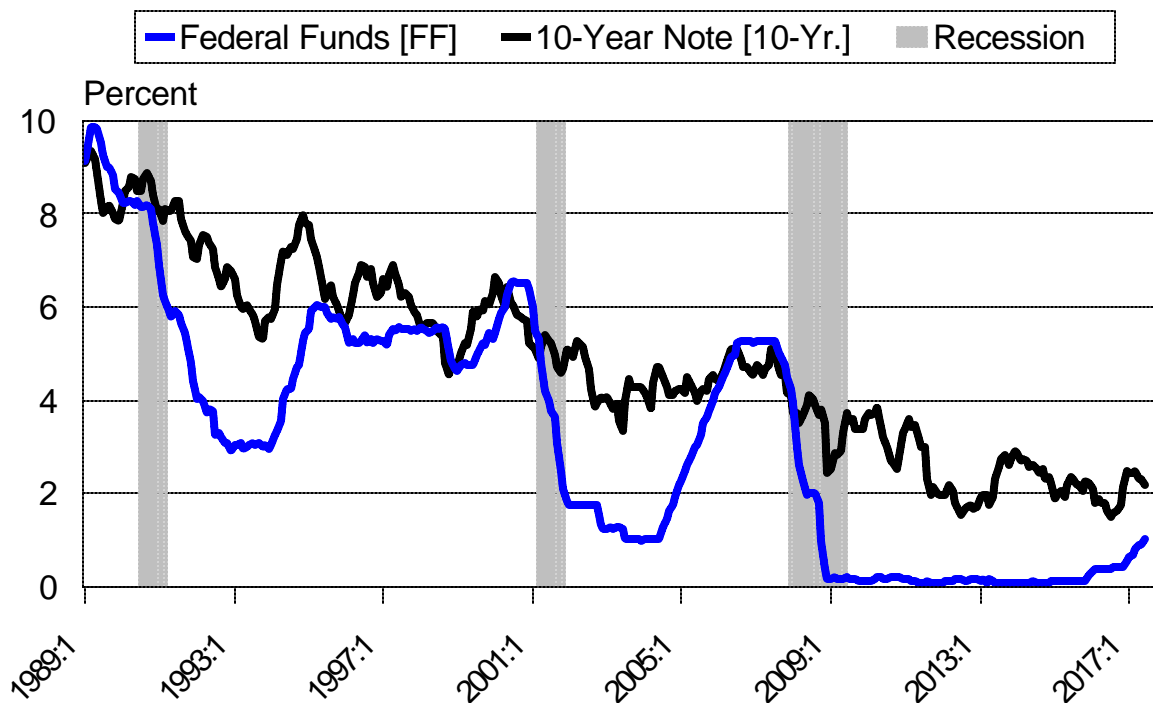
| Date | EFS | | DATE | FF | 10-Yr. |
|------|-----|---|------|-----|--------|
| 2016:9 | 123 | | 2017:3 | 0.79 | 2.48 |
| 2016:10 | 136 | | 2017:4 | 0.90 | 2.30 |
| 2016:11 | 173 | | 2017:5 | 0.91 | 2.30 |
| **2016:12** | **195** | | **2017:6** | **1.04** | **2.19** |

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# Chart 19
# Components of the Enhanced Real Spread

In addition to seeing this report in the opening chart sequence, readers of the Prospects report also get about 10 charts on the CPI and its components. That level of detail is in place to allow them to keep up with similar discussions that are found in other forecasting services.

All subscribers get the Employment Situation Report in which we cover the details of the short-term unemployment rate and the level and trend of nonfarm payrolls.

Percent

Legend: —STUR —CPI ▨ Recession
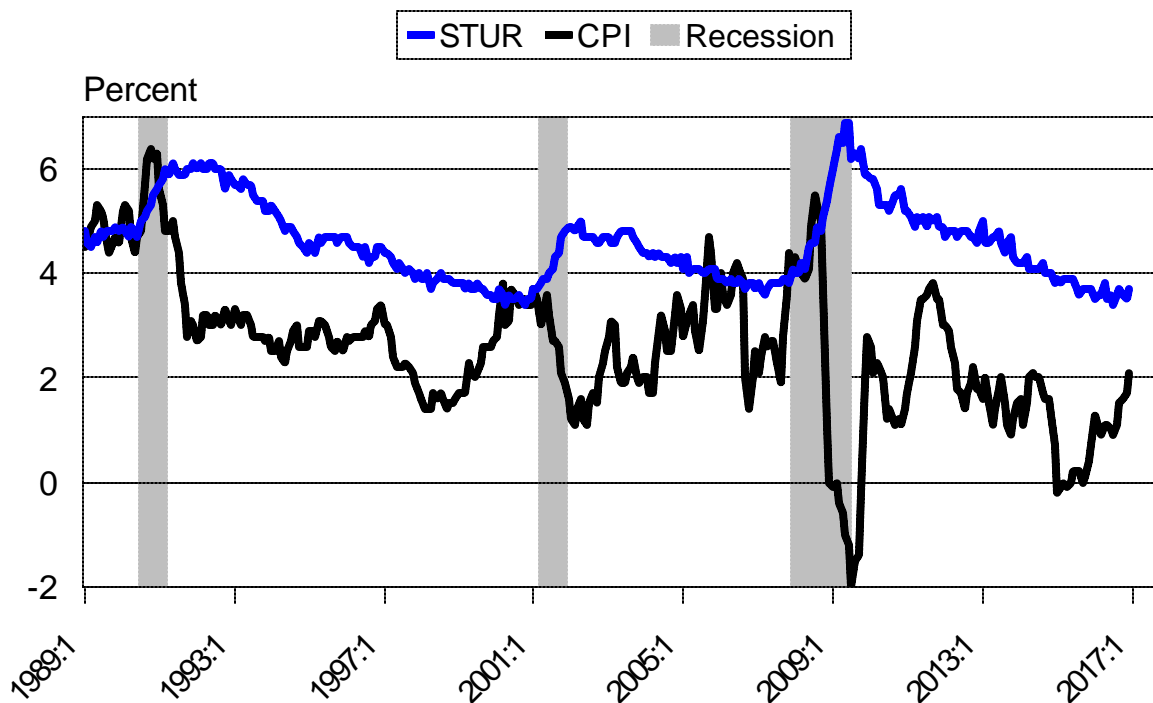
Short-Term Unemployment Rate = STUR   Inflation Rate = CPI

| Date | ERS | | DATE | STUR | CPI |
|------|-----|--|------|------|-----|
| 2016:9 | -220 | | 2016:9 | 3.7 | 1.5 |
| 2016:10 | -200 | | 2016:10 | 3.6 | 1.6 |
| 2016:11 | -180 | | 2016:11 | 3.5 | 1.7 |
| **2016:12** | **-160** | | **2016:12** | **3.7** | **2.1** |

Owner's Manual for the Enhanced Aggregate Spread -- Page 19
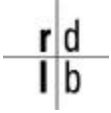
# Chart 20
# Summary and Conclusions

Over time, economic activity expands and contracts.

In the United States the dates of the expansions and contractions are set by the National Bureau of Economic Research. Their procedures are painstaking and time consuming. As a result, waiting for official notification of change in the phase of the business cycle exposes us to all of the hazards of the downturn and precludes us taking full advantage of the expansion.

**Mr. Model was created to identify business cycle turning points far enough in advance to allow for effective action to protect from the hazards of the downturn and to exploit all of the opportunities of the expansion.**

Mr. Model generates a forecast using four inputs that create the Enhanced Aggregate Spread. The level and trend of that statistic forms the basis of the forecast. To that information, data from three series of coincident indicators are used to confirm our position in business cycle.

All of the model inputs, as well all of the associated methodology, are available to subscribers upon request.

**Visit our web site at:**
**www.NoSpinFORECAST.com**

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