

BEA Regional Advisory Committee  
October 19, 2017

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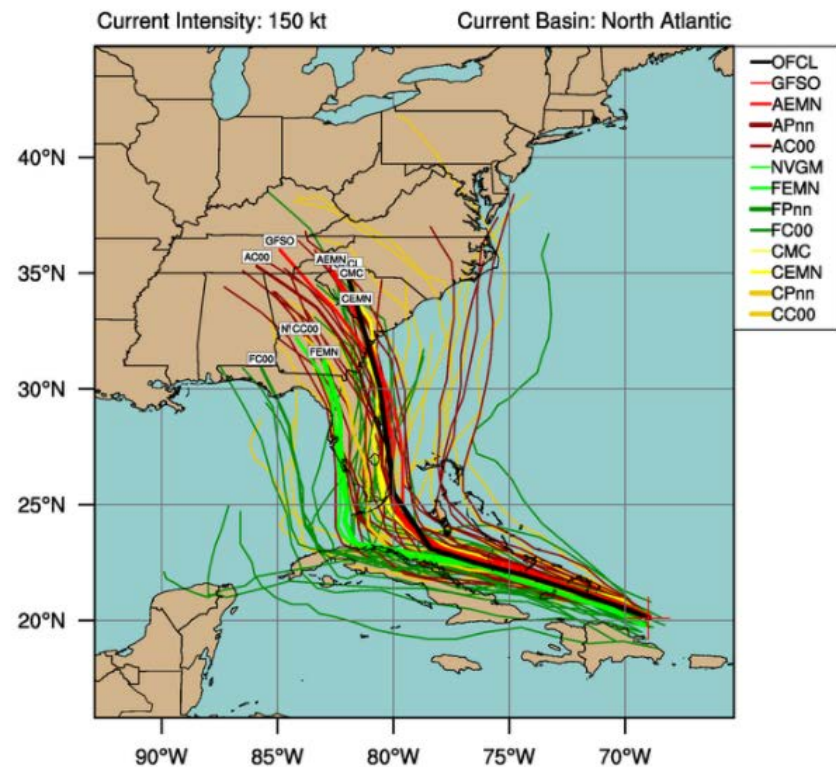


# Assessing Prior Accuracy:

The science of forecasting improves by subjecting past predictions to the test of their after-the-fact accuracy.

## MAJOR HURRICANE IRMA (AL11)

EPS track guidance initialized at 1200 UTC, 07 September 2017



# Assessing Prior Accuracy:

In 2015 the BEA began providing us with the data to begin assessing our own forecasts better so we may improve going forward.

South Carolina Board of Economic Advisors  
Survey Results of Regional Advisory Committee  
Summary of Economic Forecast Assumptions


Most recent	Current 1/ Forecast Rates FY2016-17	Regional Advisory Committee Forecast Rates Forecast for FY2016-17					Simple Average	Olympic Scoring	MEMO BEA
		Brown	Hefner	Kaglic	Sobel	von Nessen			
4.2%	4.90%	4.50%	4.30%	4.32%	4.04%	4.00%	4.23%	4.22%	4.75%

I begin with a third year assessment of this prior to turning to my forecasts.

# Which Averaging Methodology?

## Question 1: Olympic vs. Simple Average Methodology for Combining Forecasts

**My Prior Conclusions:** Olympic came closer in three of the five in both 2015 and 2016

 = Closest to Actual

<b>FY2016-17</b>	<b>Simple Average</b>	<b>Olympic Scoring</b>	<b>Actual</b>	<b>Winner?</b>
Personal Income	4.23%	4.22%	3.30%	Olympic
Employment	2.26%	2.33%	1.90%	Simple
Inflation	1.80%	1.80%	1.80%	[Tie]
Sales Tax	4.55%	4.65%	2.80%	Simple
Inc. Tax	4.17%	4.80%	7.20%	Olympic

**October 2017 Update:** Olympic and simple tied (two better each, with one tie)

**Implication:** Olympic still slightly better including all three years, but need more evidence

# Individual Accuracy vs. Averages


## ***Question 2: How Are We Doing Individually & Wisdom of Crowds Logic***

***My Prior Conclusions:*** “(1) I have tended to systematically underestimate employment growth, (2) no one person dominates forecasts, showing the value of having multiple forecasters; (3) the Olympic averages have done better all years than any one person in total.

<b><i>Variable</i></b>	<b><i>Closest Forecast (Oct. 2015 Results)</i></b>	<b><i>Closest Forecast (Oct. 2016 Results)</i></b>
Personal Income	Sobel	von Nessen
Employment	Witte (Hefner)	Hefner
Inflation	Witte (Hefner)	Kaglic
Sales Tax	Sobel	Brown
Income Tax	Sobel	Hefner

# Individual Accuracy vs. Averages

<i>Variable</i>	<i>Closest Forecast (Oct. 2015 Results)</i>	<i>Closest Forecast (Oct. 2016 Results)</i>	<i>Closest Forecast (Oct. 2017 Results)</i>
Personal Income	Sobel	von Nessen	Sobel / von Nessen (tie)
Employment	Witte (Hefner)	Hefner	Kaglic
Inflation	Witte (Hefner)	Kaglic	Hefner / Sobel (tie)
Sales Tax	Sobel	Brown	Sobel
Income Tax	Sobel	Hefner	Hefner

 = Closest to Actual

<b>FY2016-17</b>	<b>Brown</b>	<b>Hefner</b>	<b>Kaglic</b>	<b>Sobel</b>	<b>von Nessen</b>	<b>Actual</b>
Personal Income	4.5%	4.3%	4.3%	4.0%	4.0%	3.3%
Employment	2.9%	2.5%	2.1%	1.4%	2.4%	1.9%
Inflation	2.1%	1.8%	1.5%	1.8%	<2.0%	1.8%
Sales Tax	4.8%	5.9%	4.5%	3.0%	N/A	2.8%
Ind. Inc. Tax	4.8%	5.0%	N/A	2.7%	N/A	7.2%

# Individual Accuracy vs. Averages

*October 2017 Update: All three still hold... \*\*I'm changing my employment forecast method\*\*;  
Also, importantly.....Olympic average is still better than any one of us overall.*

## W-L-T Records vs. Olympic

Brown	0-4-1
Hefner	1-3-1
Kaglic	2-2-0
Sobel	2-2-1
von Nessen	1-2-0

# Summary of Major Economic Forecasts:

I rely on three major national forecasts as the basis for my state-level forecasts:

1. IMF World Economic Outlook (July 2017 Update and April 2017 original)
2. Federal Reserve Bank of Philadelphia's Livingston Survey (June 2017)
3. Survey of Professional Forecasters (Third Quarter 2017 released August 11, 2017)

I will skip quickly through the detail slides, but have them in case there are questions (and they are in the handout).

# Summary of Major Economic Forecasts:

## 1. IMF World Economic Outlook (July 2017 Update and April 2017 original)<sup>1</sup>

	<i>World Output Growth</i>	<i>U.S. Real GDP Growth</i>	<i>U.S. Inflation</i>	<i>U.S. Nominal GDP</i>
2017:	3.5%	2.1%	2.4%	4.5%
2018:	3.6%	2.1%	2.3%	4.4%
<i>Long Term (through 2022) only:</i>		1.7%	2.2%	3.9%

Averaging these two gives 2.35% for **FY2017-18**

Long term for **FY2018-19** average of these two is 2.25%

Averaging these two gives 4.45% for **FY2017-18**, and averaging lower two gives 4.15% for **FY2018-2019**.

# Summary of Major Economic Forecasts:

## 2. Federal Reserve Bank of Philadelphia's Livingston Survey (June 2017)<sup>2</sup>

	<i>U.S. Real GDP Growth Rate</i>		<i>U.S. Nominal GDP Growth Rate</i>	
2017Q2 to 2017Q4:	2.5%		4.8%	} 2017Q3 to 2018Q2 is FY2017-2018, the average of these two is 4.6%
2017Q4 to 2018Q2:	2.5%		4.4%	
Annual 2016 to 2017:	2.2%		4.3%	
Annual 2017 to 2018:	2.5%		4.6%	} FY2018-2019, average 4.55%
Long Term (Next 10 Years):	2.2%		4.5%	
 <i>Unemployment Rate</i>				
	December 2017: 4.3%			
	June 2018: 4.2%			
	Annual 2016 to 2017: 4.5%			
	Annual 2017 to 2018: 4.2%			
 <i>CPI Inflation Rate</i>				
	June 2017 to Dec 2017: 2.3%	} June 2017 to June 2018 is roughly FY2017-2018, the average of these two is 2.25%		
	Dec 2017 to June 2018: 2.2%			
	Annual 2016 to 2017: 2.4%			
	Annual 2017 to 2018: 2.3%			
	Long Term (Next 10 Years): 2.3%	} Looking out into FY2018-2019, inflation average 2.3%		

# Summary of Major Economic Forecasts:

## 3. Survey of Professional Forecasters (Third Quarter 2017 released August 11, 2017)<sup>3</sup>

	<i>Real GDP%</i>	<i>Nominal GDP%</i>	<i>Unemployment Rate</i>	<i>Employment Growth%</i>
Quarterly data:				
2017:Q3	2.6%	4.3%	4.3%	1.5%
2017:Q4	2.3%	4.2%	4.2%	1.3%
2018:Q1	2.2%	4.3%	4.2%	1.3%
2018:Q2	2.4%	4.3%	4.1%	1.3%
2018:Q3	2.4%	4.5%	4.1%	1.3%
Annual data (based on annual average levels):				
2017	2.1%	3.8%	4.4%	1.5%
2018	2.4%	4.3%	4.2%	1.4%
2019	2.2%	N.A.	4.3%	N.A.
2020	2.0%	N.A.	4.3%	N.A.

2017Q3 to 2018Q2 is **FY2017-2018**, the average of these four is 4.275%, **FY2018-19** begins 4.5% for 2018Q3

2017Q3 to 2018Q2 is **FY2017-2018**, the average of these four is 1.35%, **FY2018-19** begins 1.3% for US. [My new adjustment is: SC=1.3\*US] or 1.65% and 1.59%

### Probability of Negative Real GDP Growth by Quarter:

2017:Q3	6.7%
2017:Q4	10.5%
2018:Q1	14.2%
2018:Q2	15.9%
2018:Q3	18.1%

The chance of a negative quarter of GDP growth during FY2017-18 (2017Q3 to 2018Q2) averages 11.83%, and the probability grows as we move toward first quarter of FY2018-19 – **LOWER THAN A YEAR AGO**

# Summary of Major Economic Forecasts:

## 3. Survey of Professional Forecasters (Third Quarter 2017 released August 11, 2017)<sup>3</sup>

### U.S. Inflation Rate (CPI):

#### Quarterly Data

2017:Q3	1.6%
2017:Q4	2.3%
2018:Q1	2.2%
2018:Q2	2.1%
2018:Q3	2.2%

2017Q3 to 2018Q2 is FY2017-2018, the average of these four is 2.05%

#### Q4/Q4 Annual Averages

2017	1.7%
2018	2.2%
2019	2.3%

2018Q3 into 2019 is FY2018-2019, the average of these two is 2.25%

#### Long-Term Annual Averages

2017-21	2.2%
2017-26	2.25%

## Summary of Forecast Data:

### Economic Estimates:

	FY 2017-2018			FY 2018-2019		
	SC Personal Income Growth (=US Nominal GDP Growth)	CPI Inflation Rate	SC Employment Growth	SC Personal Income Growth (=US Nominal GDP Growth)	CPI Inflation Rate	SC Employment Growth
International Monetary Fund	4.45%	2.35%		4.15%	2.25%	
Livingston Survey	4.6%	2.25%		4.55%	2.3%	
Survey of Professional Forecasters	4.275%	2.05%	1.75%	4.4%	2.25%	1.70%
<b>Average</b>	4.44%	2.22%	1.75%	4.37%	2.27%	1.70%
<b>Median</b>	4.45%	2.25%	1.75%	4.40%	2.25%	1.70%

**\*\*I use the Medians as the basis for my overall forecast\*\***

### Revenue Estimates:

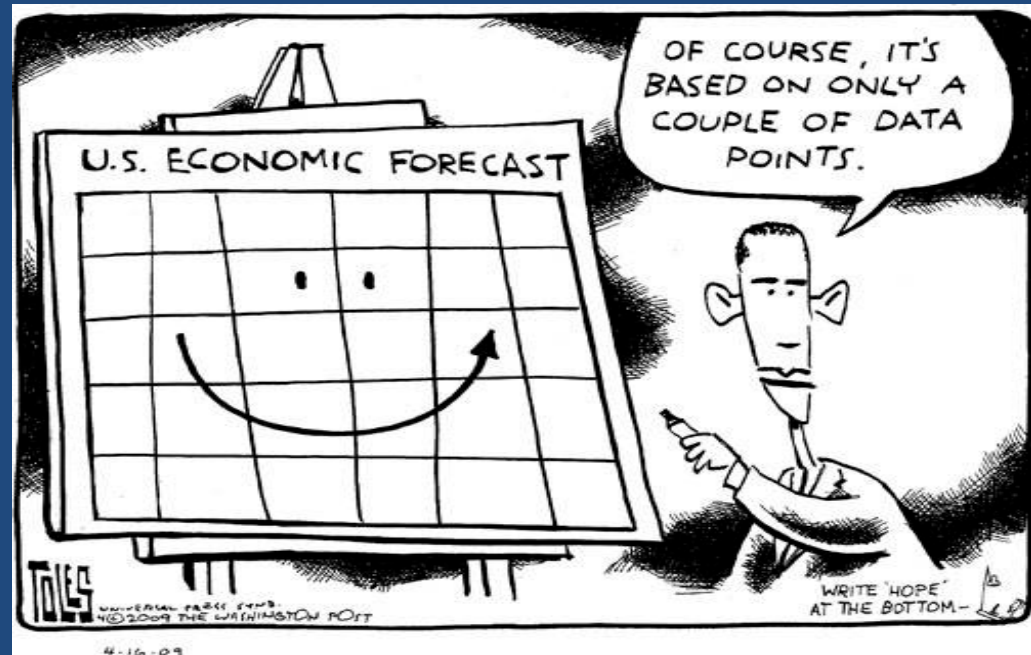
	FY2017-2018	FY2018-2019
Sales Tax Revenue	3.2%	3.1%
Individual Income Tax Revenue	3.2%	3.2%
<i>Using estimated elasticities per Sobel &amp; Holcombe (1996) method.</i>		

# Forecast Table:

What is your forecast growth rate for the following variables:

Variable	Actual FY2016-17	Most Recent 2/	Current 1/ Forecast Rates FY2017-18	Forecast FY2017-18	Forecast FY2018-19
S.C. Personal Income	3.3%	3.71%	4.75%	4.45	4.40
S.C. Employment	1.9%	1.6%	1.8%	1.75	1.70
Inflation Rate (CPI-U)	1.8%	1.9%	2.0%	2.25	2.25
Sales Tax (Y-T-D)	2.8%	1.3%	5.0%	3.2	3.1
Individual Income Tax (Y-T-D)	7.2%	1.4%	4.6%	3.2	3.2

# Caveats & Notes:



- (1) The above forecasts do not include any impact of September 2017 Hurricane Irma, which may result in a short run increase in inflation and an unclear impact on income growth.
- (2) I'm trying a new adjustment factor for my employment forecasts which have been systematically low.... So we can discount my employment estimates if we want until the new method is proven more accurate.
- (3) Ask that the BEA continue to provide us with the numbers necessary to continue to assess the accuracy of our methodologies.