

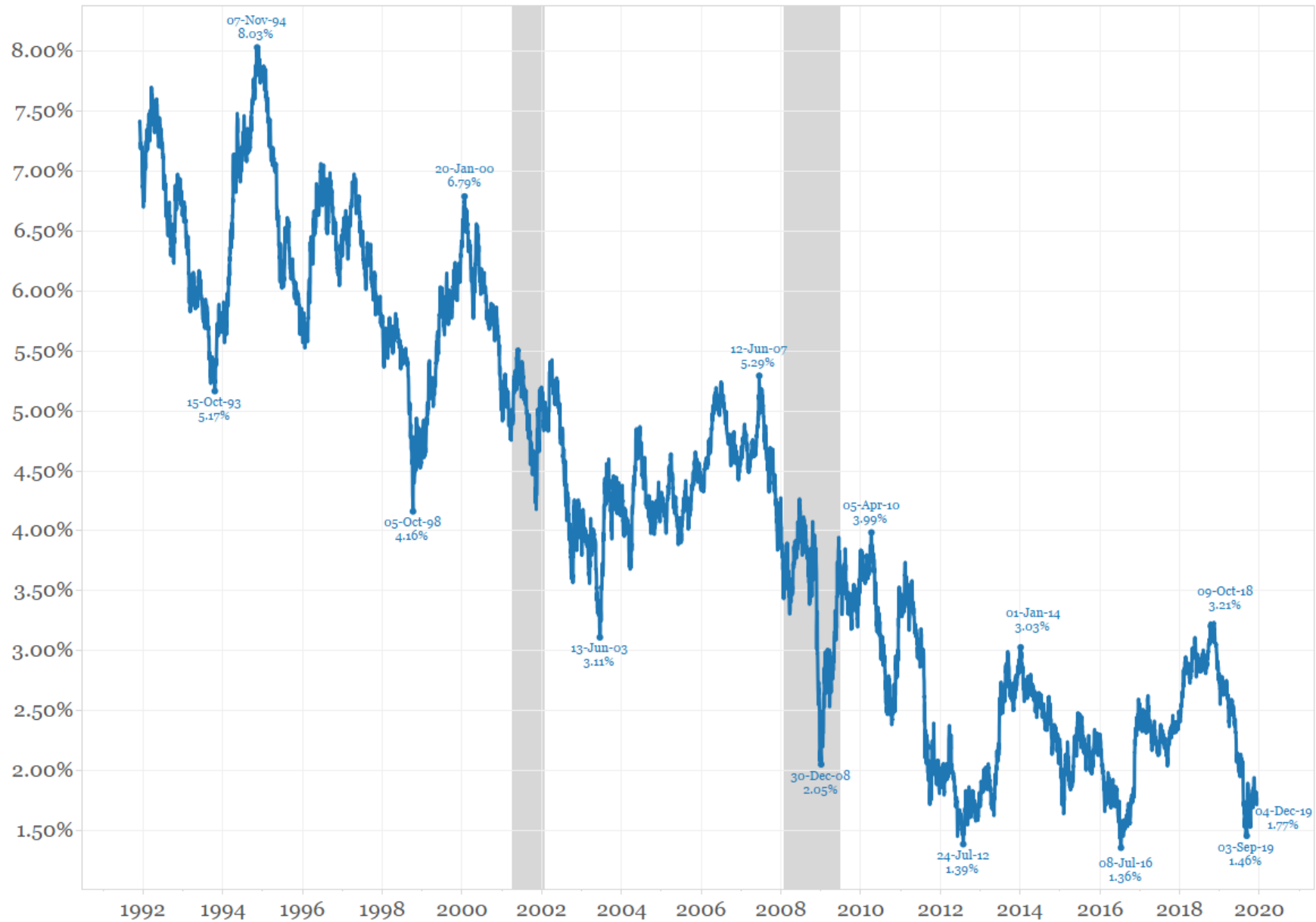
James Bianco

## Understanding Fixed Income

Fixed Income Analysts Society, Inc  
New York, New York  
December 5, 2019



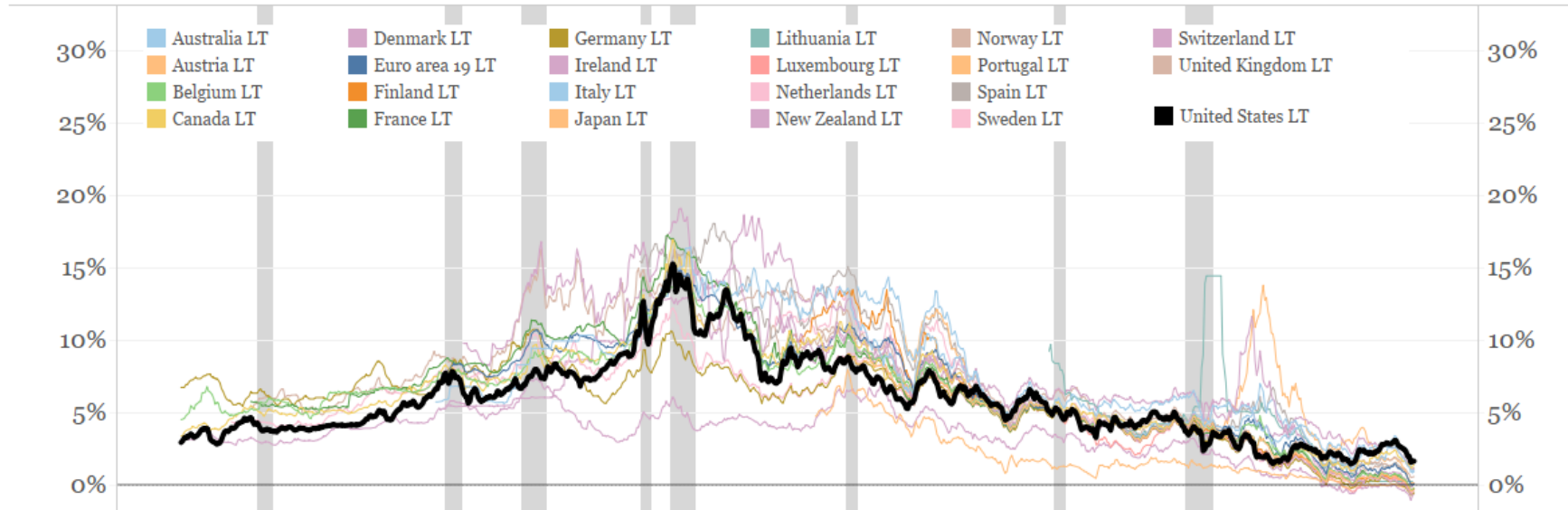
# U.S. 10-Year Yield



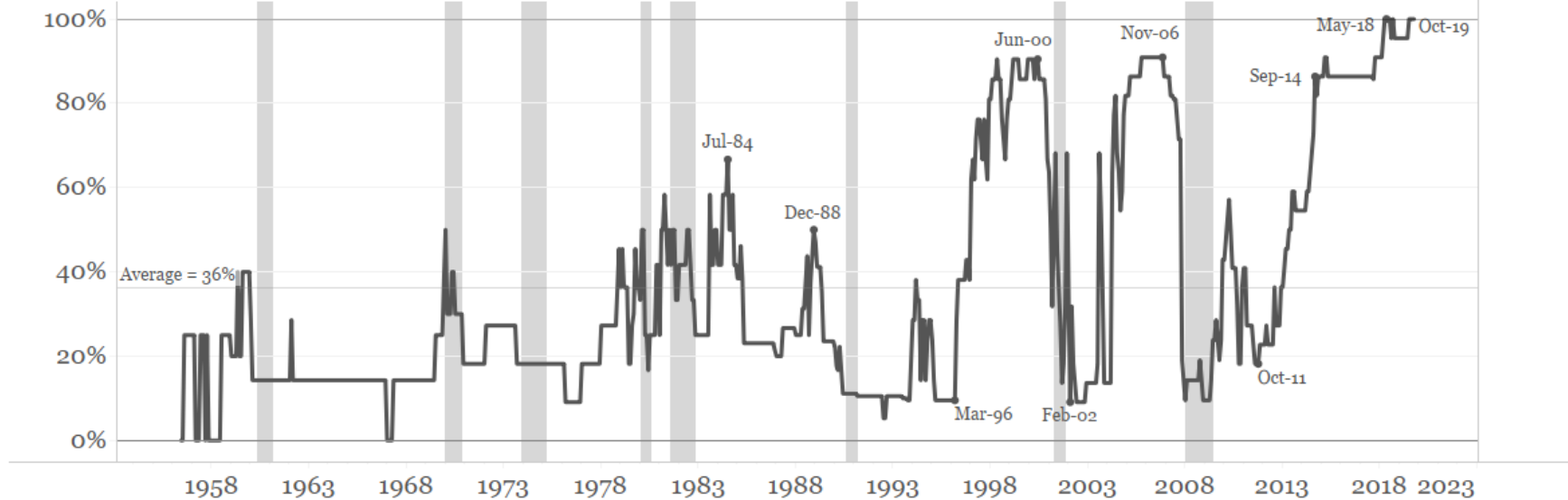
Data Source: Bloomberg

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# Long-Term Yields - Developed Countries



## Percentage of Countries With Long-Term Yields Below The United States



Source: Organization for Economic Cooperation and Development

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## Interest Rates in the Developed World

As of 12/04/2019

Country	Policy Rate	6-Month	1-Year	2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year	9-Year	10-Year	15-Year	30-Year
Switzerland	-0.75	-0.83	-0.87	-0.81	-0.81	-0.79	-0.76	-0.74	-0.72	-0.68	-0.66	-0.64	-0.48	-0.32
Germany	-0.50	-0.66	-0.65	-0.63	-0.65	-0.63	-0.57	-0.55	-0.50	-0.46	-0.39	-0.32	-0.17	0.20
Netherlands	-0.50	-0.64		-0.64	-0.64	-0.61	-0.53	-0.46	-0.40	-0.32	-0.26	-0.19	-0.05	0.21
Denmark	-0.75	-0.77		-0.68			-0.53			-0.43		-0.30		
Finland	-0.50		-0.62	-0.63	-0.60	-0.54	-0.49	-0.36	-0.31	-0.21	-0.14	-0.08	0.15	0.41
Austria	-0.50		-0.61	-0.59	-0.58	-0.53	-0.44	-0.37	-0.29	-0.24	-0.17	-0.10	0.16	0.49
Japan	-0.10	-0.21	-0.17	-0.16	-0.16	-0.17	-0.16	-0.18	-0.17	-0.15	-0.11	-0.05	0.11	0.42
France	-0.50	-0.64	-0.60	-0.60	-0.58	-0.50	-0.38	-0.34	-0.26	-0.21	-0.09	-0.01	0.25	0.77
Belgium	-0.50	-0.64	-0.60	-0.63	-0.59	-0.49	-0.40	-0.35	-0.27	-0.18	-0.10	-0.03	0.25	0.80
Sweden	-0.25	-0.38		-0.32		-0.34	-0.31	-0.24		-0.16	-0.07	0.03	0.19	
Ireland	-0.50		-0.56		-0.51	-0.51	-0.41	-0.29	-0.22		-0.07	0.02	0.30	0.83
Spain	-0.50	-0.47	-0.50	-0.40	-0.37	-0.21	-0.09	0.06	0.15	0.27	0.37	0.44	0.83	1.31
Portugal	-0.50	-0.54	-0.53	-0.58	-0.37	-0.21	-0.13	0.06	0.14	0.23	0.33	0.37	0.75	1.30
Italy	-0.50	-0.23	-0.18	0.03	0.26	0.43	0.59	0.63	0.96	1.04	1.10	1.29	1.86	2.42
United Kingdom	0.75	0.78	0.69	0.57	0.54	0.55	0.56	0.52	0.55	0.59	0.65	0.74	1.00	1.27
Australia	0.75	0.91	0.77	0.71	0.67	0.68	0.72	0.79	0.87	0.98	1.04	1.06	1.30	1.66
New Zealand	1.00		1.73	1.01			1.17		1.29			1.39	1.75	
Canada	1.75	1.69	1.72	1.64	1.62	1.59	1.57		1.56			1.54		1.63
<b>United States</b>	<b>1.63</b>	<b>1.54</b>	<b>1.55</b>	<b>1.58</b>	<b>1.58</b>		<b>1.60</b>		<b>1.70</b>			<b>1.77</b>		<b>2.22</b>

Concept courtesy of @CharlieBilello

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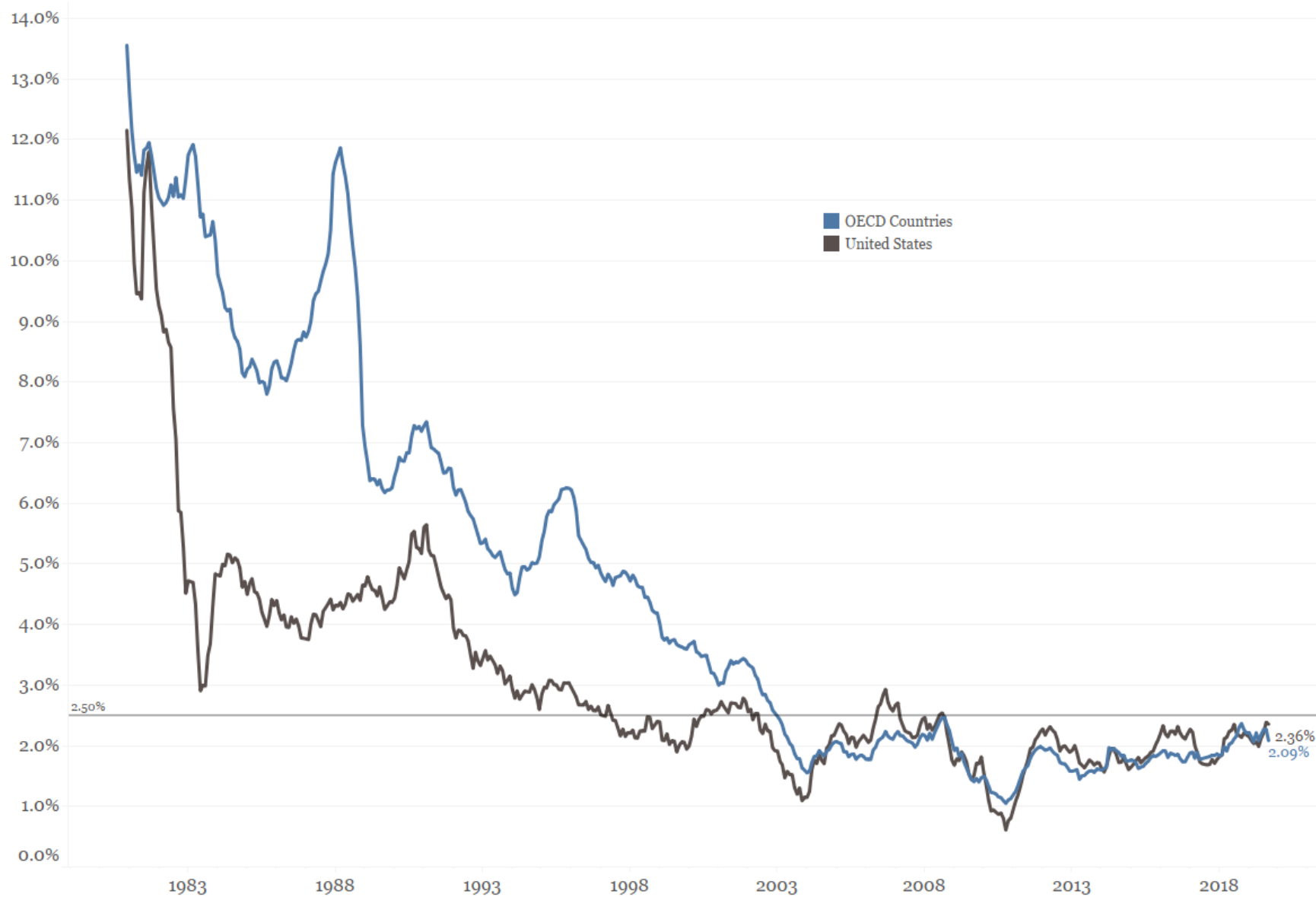
# Total Negative Yielding Bonds Outstanding



Source: Bloomberg

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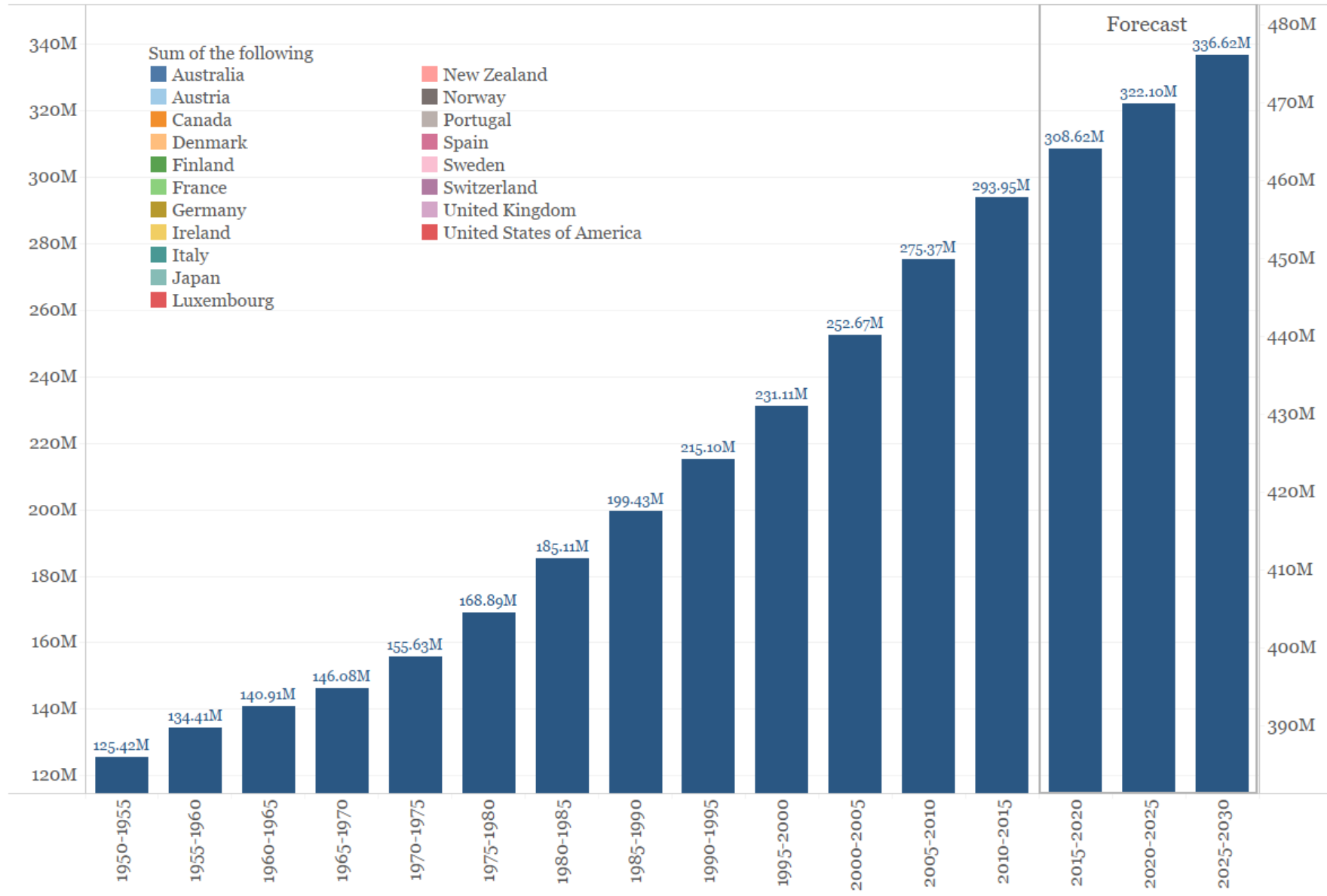
# Technology Squashes Inflation



Source: Organization for Economic Cooperation and Development

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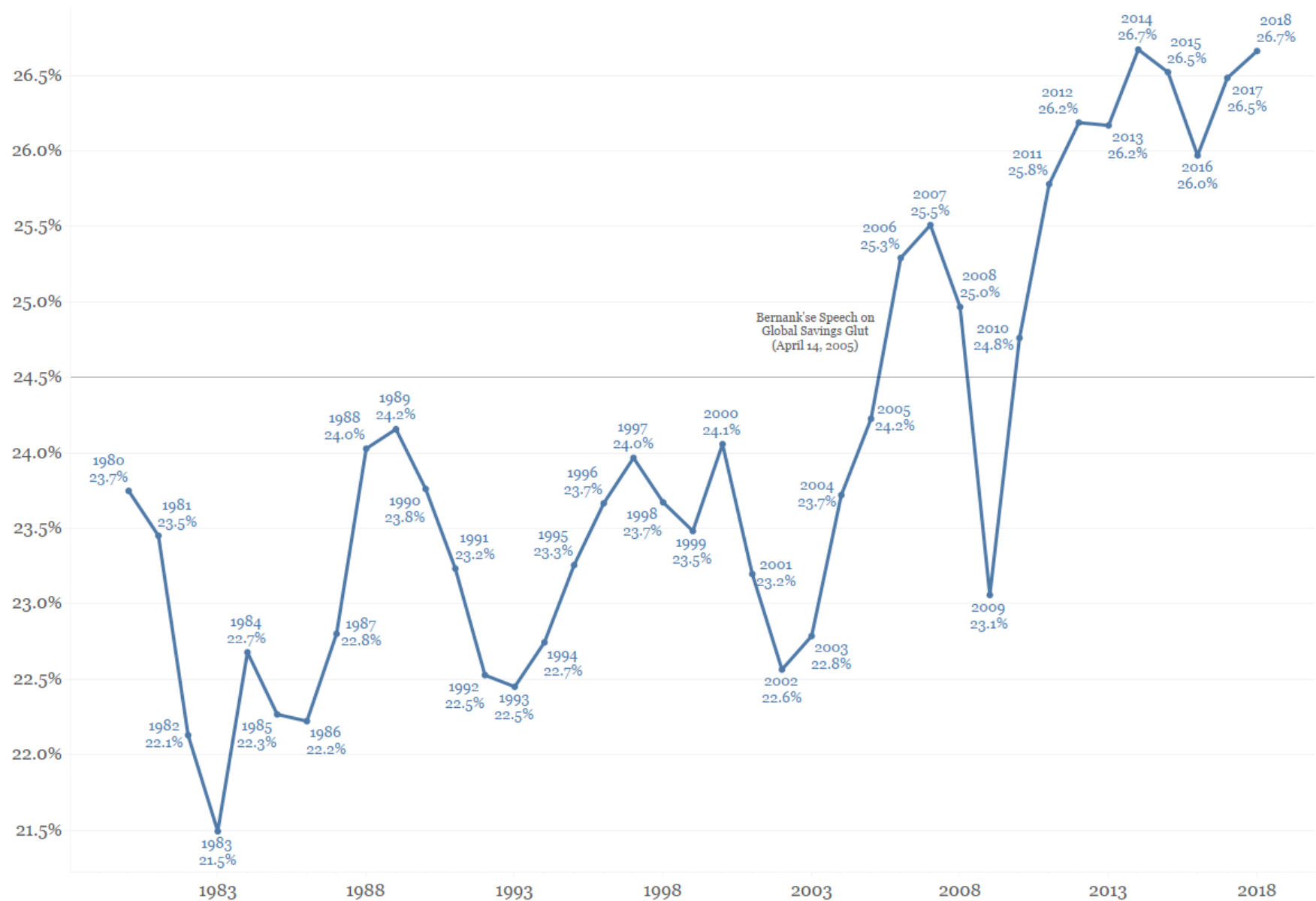
## Total Population over 65



Data Source: United Nations, Department of Economic and Social Affairs, Population Division  
<http://population.un.org/wpp>

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## IMF World Gross National Savings as a Percent of GDP



Data Source: International Monetary Fund, Bloomberg

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## Real Interest Rates in the Developed World (Nominal Minus CPI)

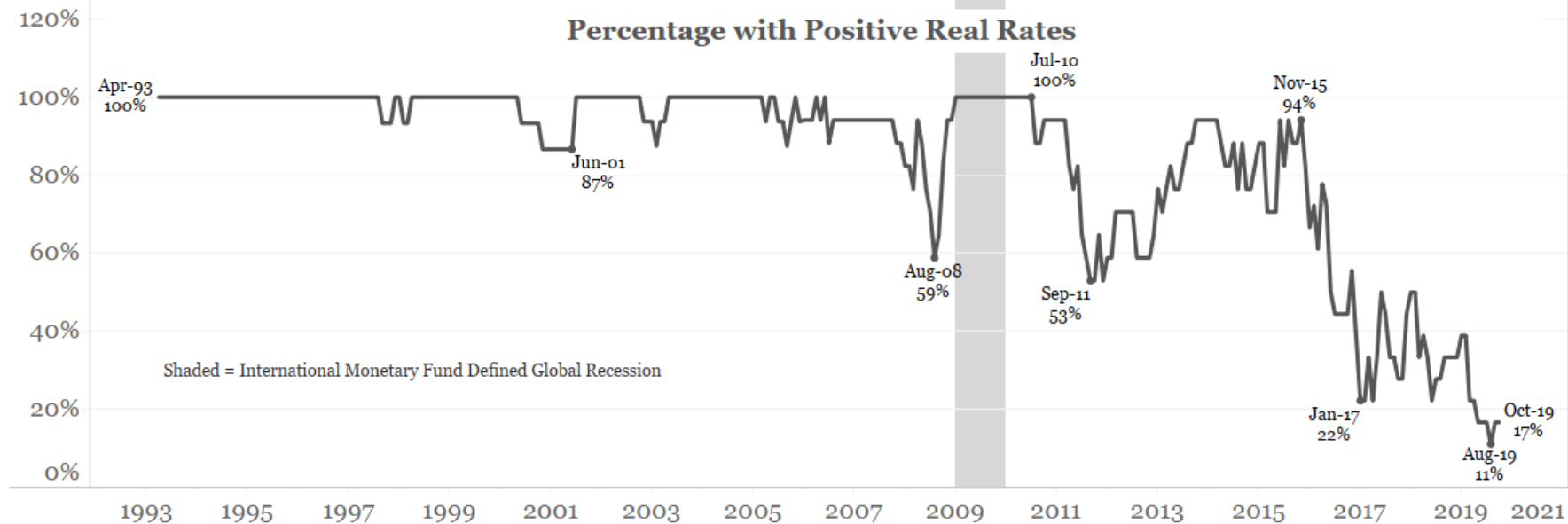
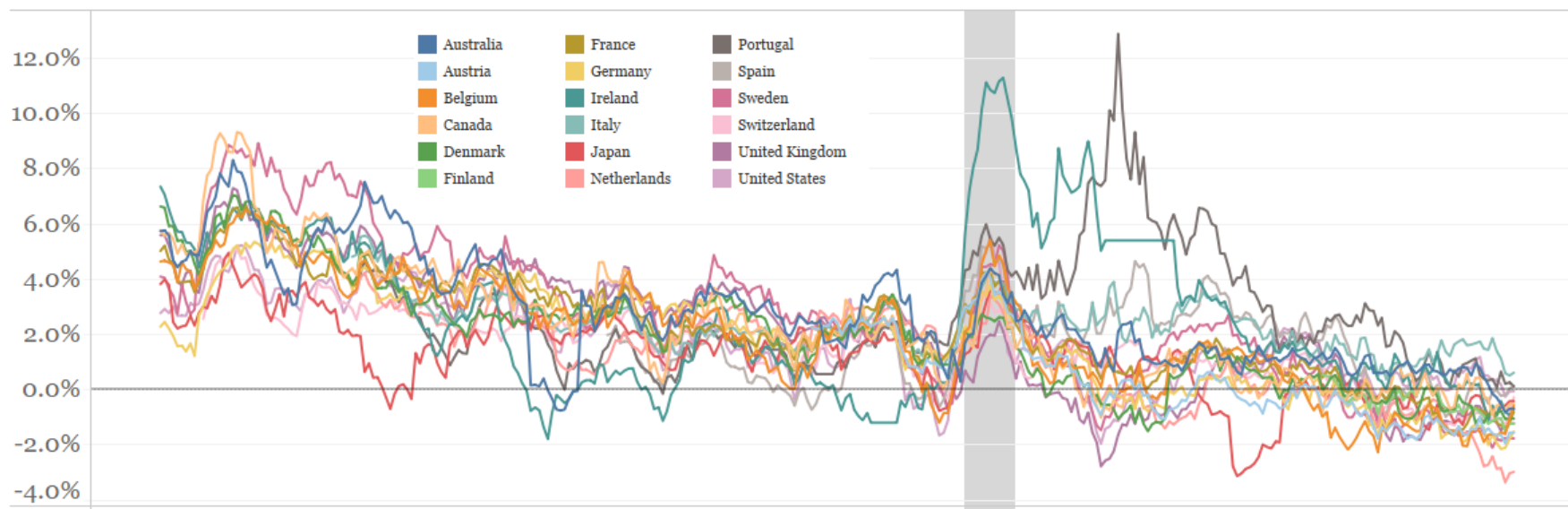
As of 12/04/2019

Country	Inflation Rate	Policy Rate	6-Month	1-Year	2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year	9-Year	10-Year	15-Year	30-Year
Switzerland	-0.10	-0.65	-0.73	-0.77	-0.71	-0.71	-0.69	-0.66	-0.64	-0.62	-0.58	-0.56	<b>-0.54</b>	-0.38	-0.22
Germany	1.10	-1.60	-1.76	-1.75	-1.73	-1.75	-1.73	-1.67	-1.65	-1.60	-1.56	-1.49	<b>-1.42</b>	-1.27	-0.90
Netherlands	2.70	-3.45	-3.47		-3.38			-3.23			-3.13		-3.00		
Sweden	1.60	-1.85	-1.98	-1.60	-1.92	-1.60	-1.94	-1.91	-1.84	-1.60	-1.76	-1.67	-1.57	-1.41	-1.60
Denmark	0.60	-1.35	-1.37		-1.28			-1.13			-1.03		-0.90		-0.60
Finland	0.70	-1.20		-1.32	-1.33	-1.30	-1.24	-1.19	-1.06	-1.01	-0.91	-0.84	<b>-0.78</b>	-0.55	-0.29
Austria	1.10	-1.60		-1.71	-1.69	-1.68	-1.63	-1.54	-1.47	-1.39	-1.34	-1.27	<b>-1.20</b>	-0.94	-0.61
Japan	0.20	-0.30	-0.41	-0.37	-0.36	-0.36	-0.37	-0.36	-0.38	-0.37	-0.35	-0.31	<b>-0.25</b>	-0.09	0.22
France	1.00	-1.50	-1.64	-1.60	-1.60	-1.58	-1.50	-1.38	-1.34	-1.26	-1.21	-1.09	<b>-1.01</b>	-0.75	-0.23
Belgium	0.39	-0.89	-1.03	-0.99	-1.02	-0.98	-0.88	-0.79	-0.74	-0.66	-0.57	-0.49	<b>-0.42</b>	-0.14	0.41
Ireland	0.70	-1.20		-1.26		-1.21	-1.21	-1.11	-0.99	-0.92		-0.77	<b>-0.68</b>	-0.40	0.13
Spain	0.40	-0.90	-0.87	-0.90	-0.80	-0.77	-0.61	-0.49	-0.34	-0.25	-0.13	-0.03	<b>0.04</b>	0.43	0.91
Portugal	0.30	-0.80	-0.84	-0.83	-0.88	-0.67	-0.51	-0.43	-0.24	-0.16	-0.07	0.03	<b>0.07</b>	0.45	1.00
Italy	0.40	-0.90	-0.63	-0.58	-0.37	-0.14	0.03	0.19	0.23	0.56	0.64	0.70	<b>0.89</b>	1.46	2.02
United Kingdom	1.50	-0.75	-0.72	-0.81	-0.93	-0.96	-0.95	-0.94	-0.98	-0.96	-0.91	-0.85	<b>-0.76</b>	-0.50	-0.23
Australia	1.70	-0.95	-0.79	-0.93	-0.99	-1.03	-1.02	-0.98	-0.91	-0.83	-0.72	-0.66	<b>-0.64</b>	-0.40	-0.04
New Zealand	1.50	-0.50		0.23	-0.49			-0.33		-0.21			<b>-0.11</b>	0.25	
Canada	1.90	-0.15	-0.21	-0.18	-0.26	-0.28	-0.31	-0.33		-0.34			<b>-0.36</b>		-0.28
<b>United States</b>	1.80	-0.18	-0.26	-0.25	-0.22	-0.22		-0.20		-0.10			<b>-0.03</b>		0.42

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# Falling 10-Year Headline Real Rates

10-Year Yields Deflated by Headline CPI

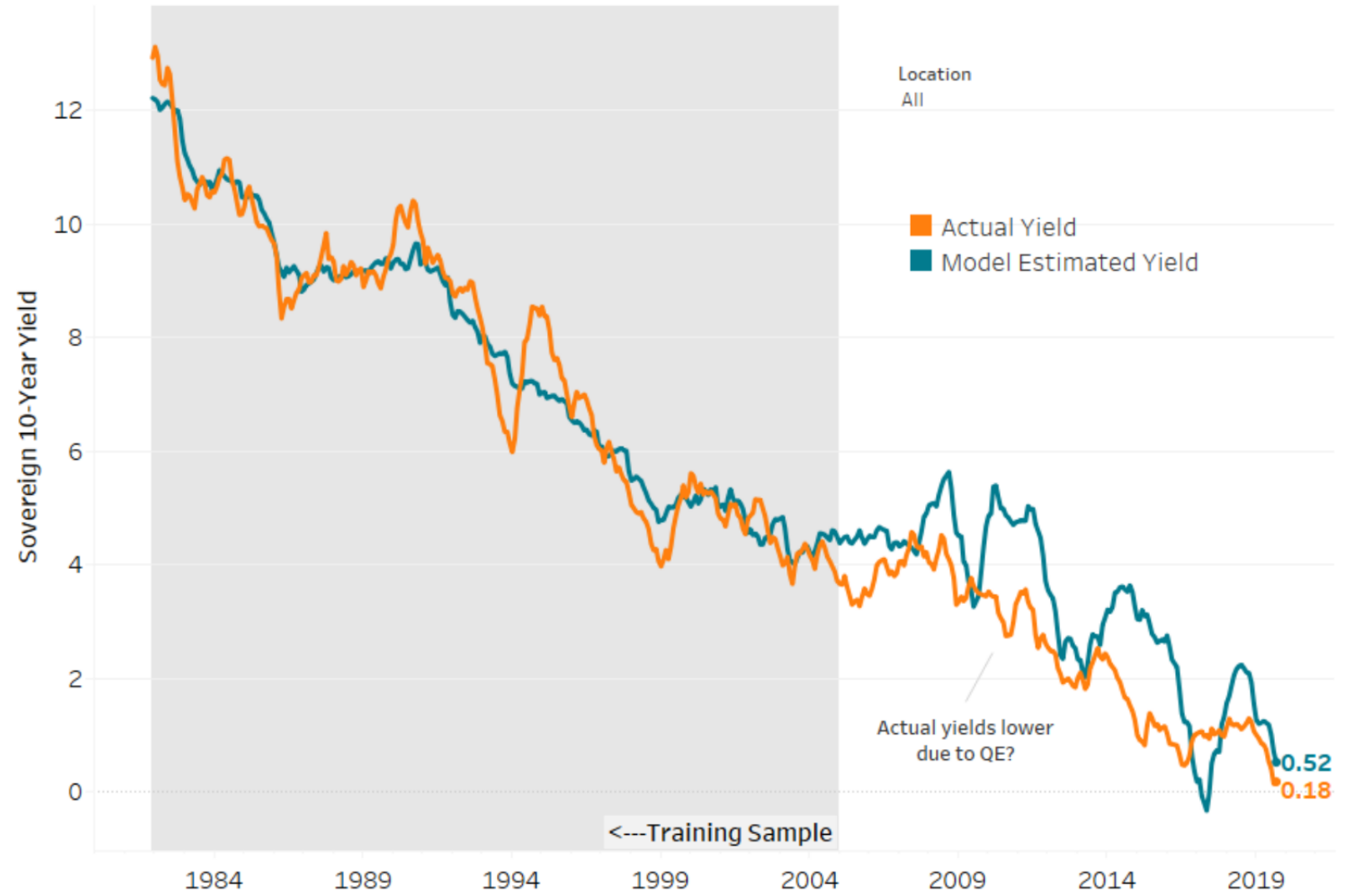


Source: Bloomberg, International Monetary Fund

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### All 10-Year Yields Estimated From 2005 - Current

Ensemble of models using 12 variables covering growth, inflation, demographics, and policy uncertainty



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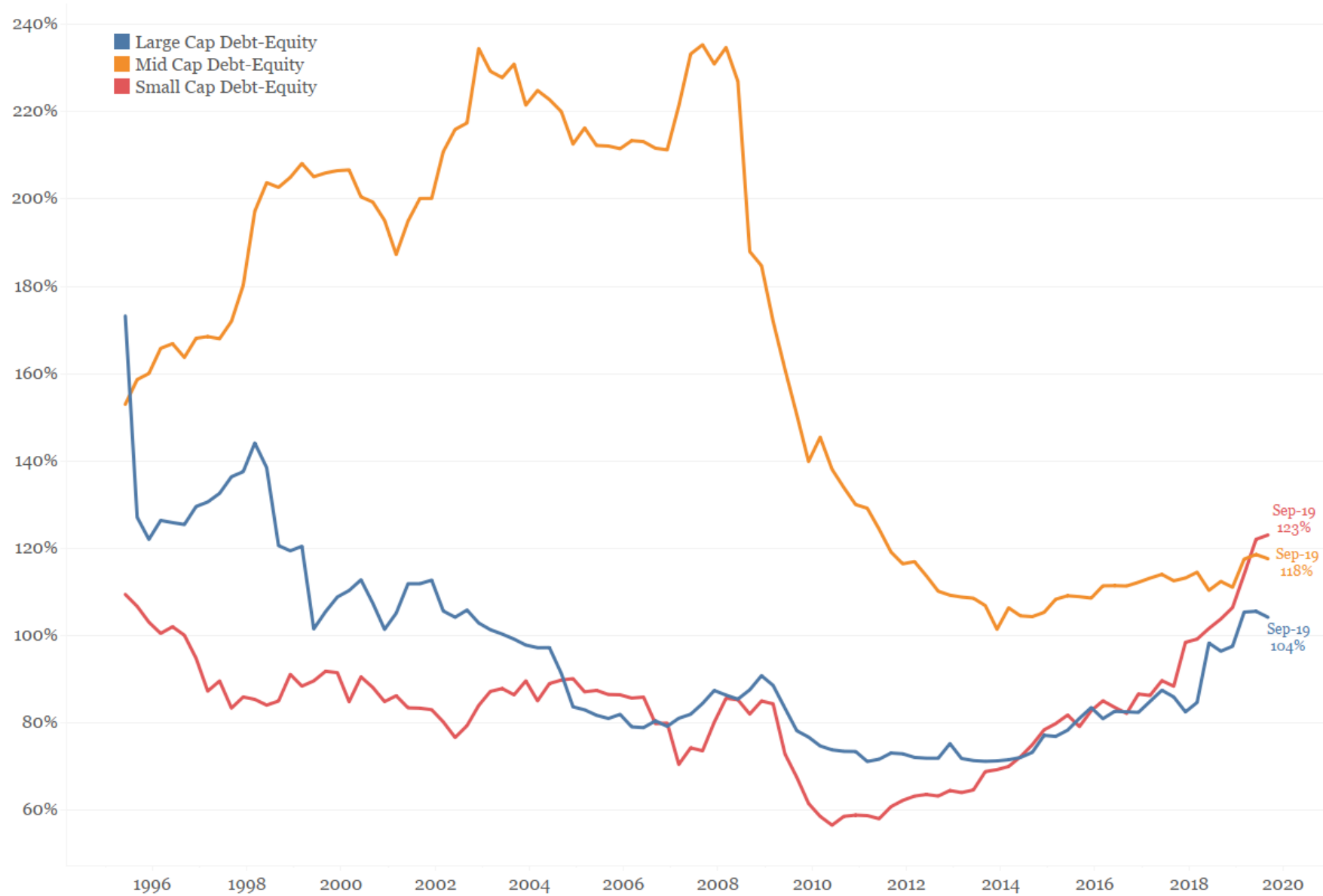
datascience.arborresearch.com

We purposely exclude central bank target rates and balance sheets to demonstrate yields are explainable with structural factors and traditional growth measures during and after the financial crisis.

The chart shows the **average estimate** and **actual yield** for all developed 10-year yields.

Out-of-sample estimates (2005-current) have moved higher than actual yields during obvious periods of quantitative easing. In other words, central banks efficiently dampened volatility.

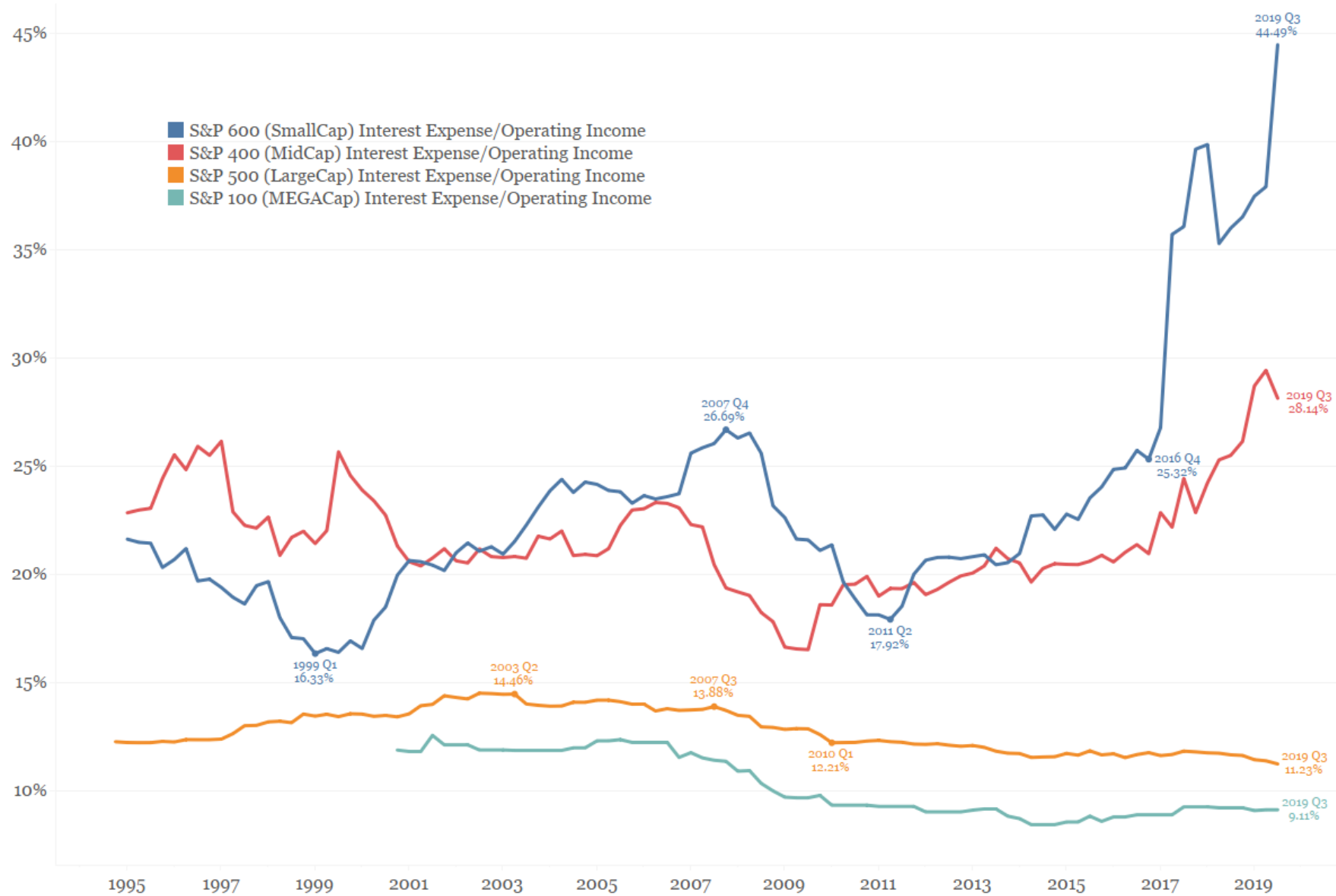
## Debt to Equity Ratio



Source: Bloomberg

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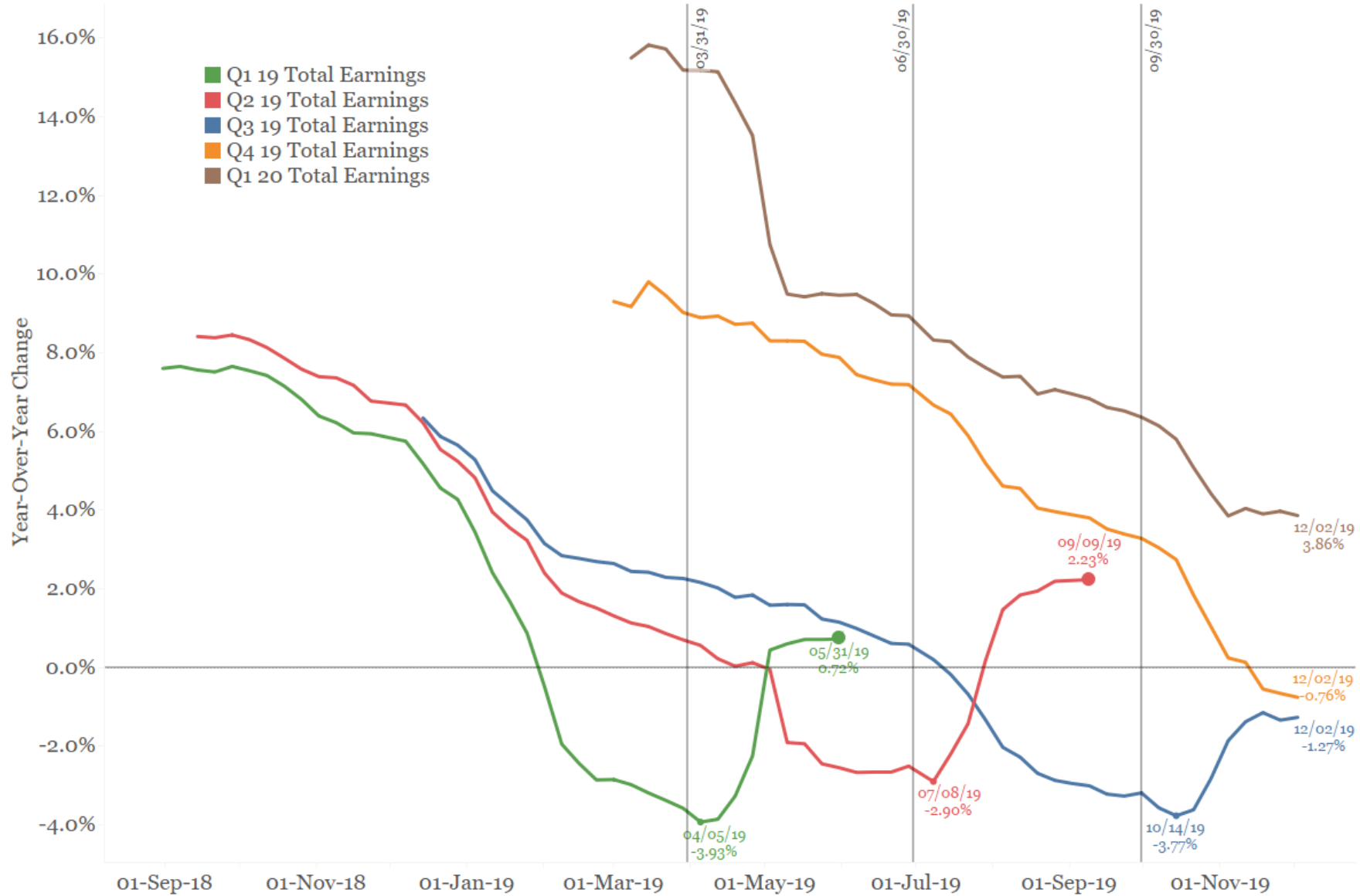
## Interest Expense As A Percentage Of Operating Income



Source: Bloomberg, Standard & Poors

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# 2019 S&P 500 Operating Earnings Expectations

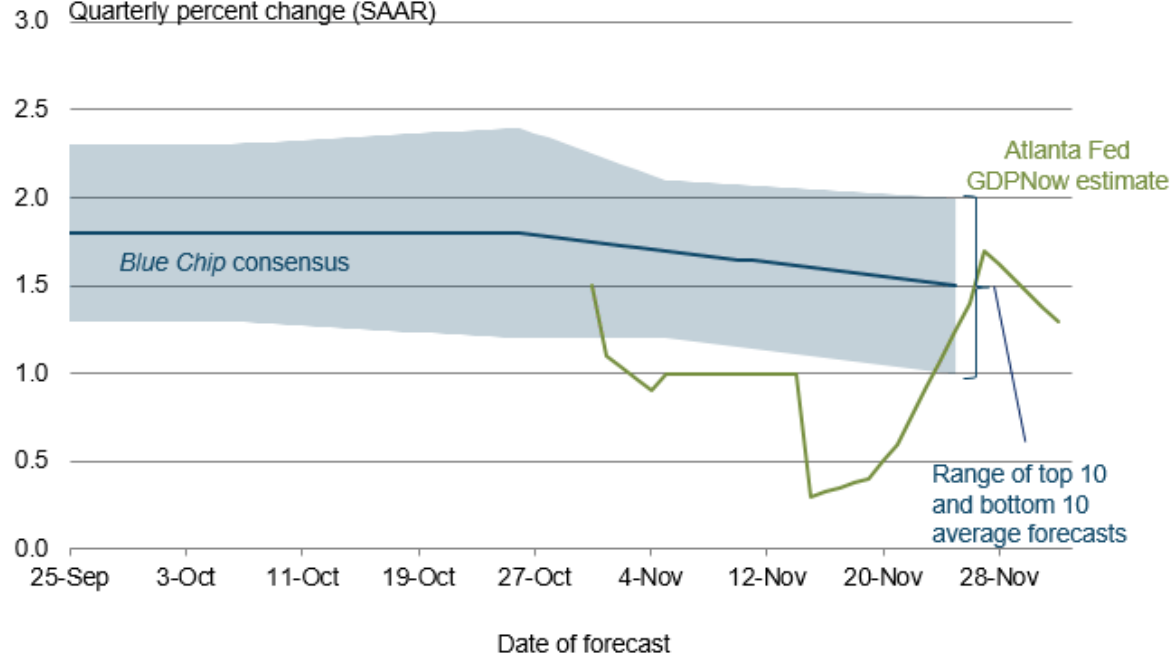


Source: Bloomberg

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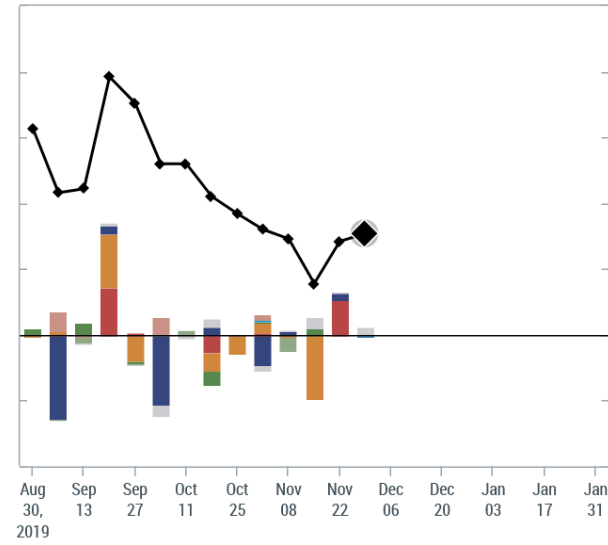
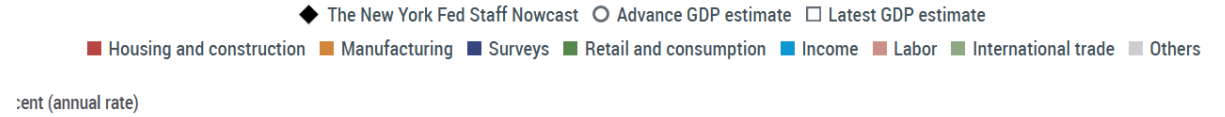
### Evolution of Atlanta Fed GDPNow real GDP estimate for 2019: Q4

Quarterly percent change (SAAR)



Sources: *Blue Chip Economic Indicators* and *Blue Chip Financial Forecasts*

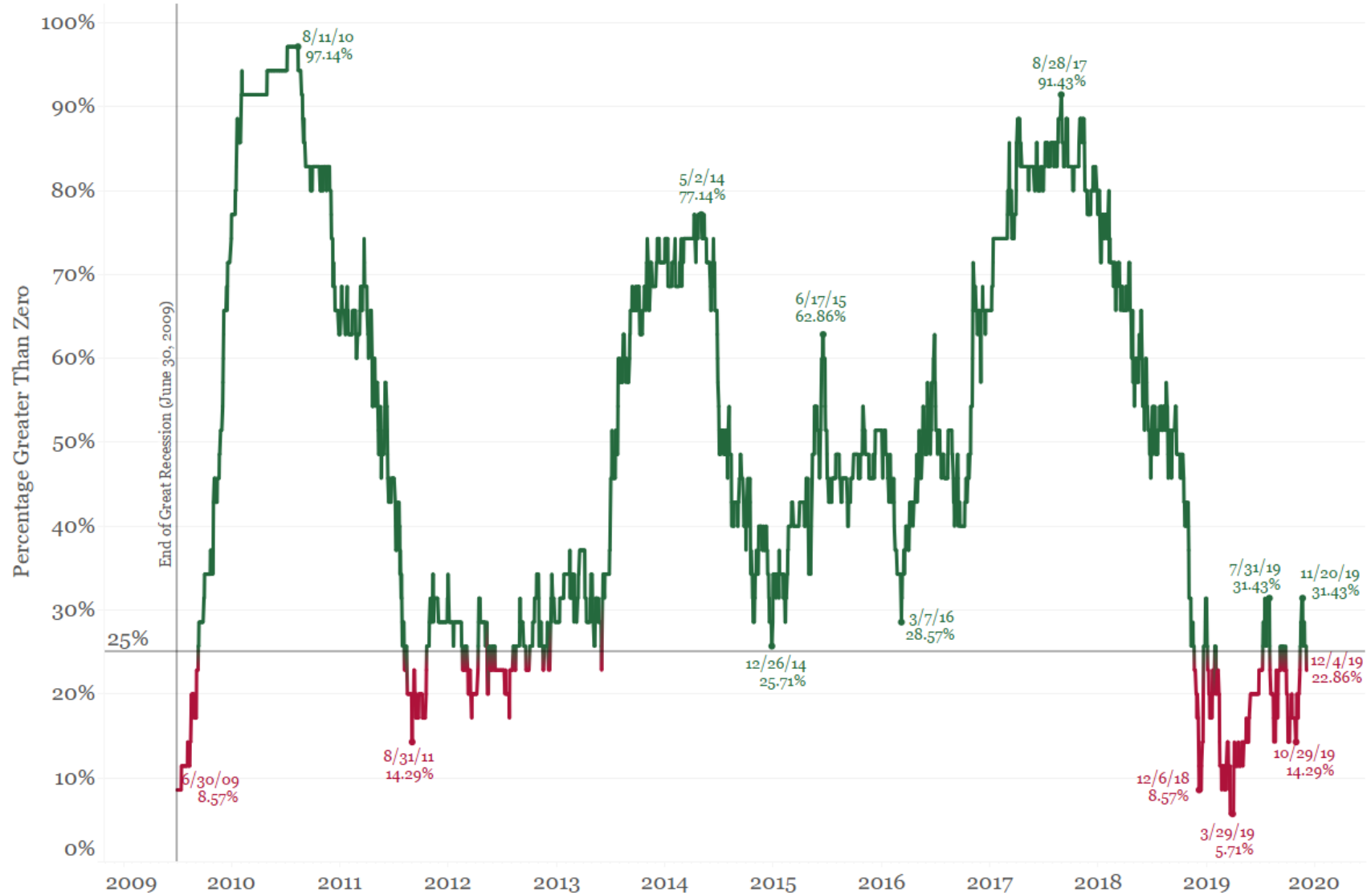
Note: The top (bottom) 10 average forecast is an average of the highest (lowest) 10 forecasts in the *Blue Chip* survey.



Data Flow (Nov 29, 2019)					
Model Update	Release Date	Data Series	Actual	Impact	Nowcast GDP Growth
Nov 29					0.77
	10:00AM Nov 27	Real personal consumption expenditures	0.08	0.00	
	10:00AM Nov 27	PCE: Chain price index	0.19	0.02	
	10:00AM Nov 27	PCE less food and energy: Chain price index	0.08	-0.01	
	10:00AM Nov 27	Real disposable personal income	-0.26	-0.01	
	8:30AM Nov 27	Real gross domestic income	2.36	0.01	
	8:30AM Nov 27	Manufacturers' inventories: Durable goods	0.33	-0.06	
	8:30AM Nov 27	Manufacturers' unfilled orders: All industries	0.12	-0.00	
	8:30AM Nov 27	Manufacturer's shipments: Durable goods	0.01	0.05	
	8:30AM Nov 27	Manufacturers' new orders: Durable goods	0.60	0.02	
	10:00AM Nov 26	New single-family houses sold	-0.68	0.01	
	8:30AM Nov 26	Merchant wholesalers: Total inventories	0.17	-0.01	
		Data revisions		0.03	
Nov 22					0.71

# Percentage of Citi Data Change Measures Above Zero Worldwide

*Citigroup tracks over 40 worldwide measures of economic Growth*



Data Source: Citigroup and Bloomberg

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# 2019 US GDP Forecast and the 10-Year Yield

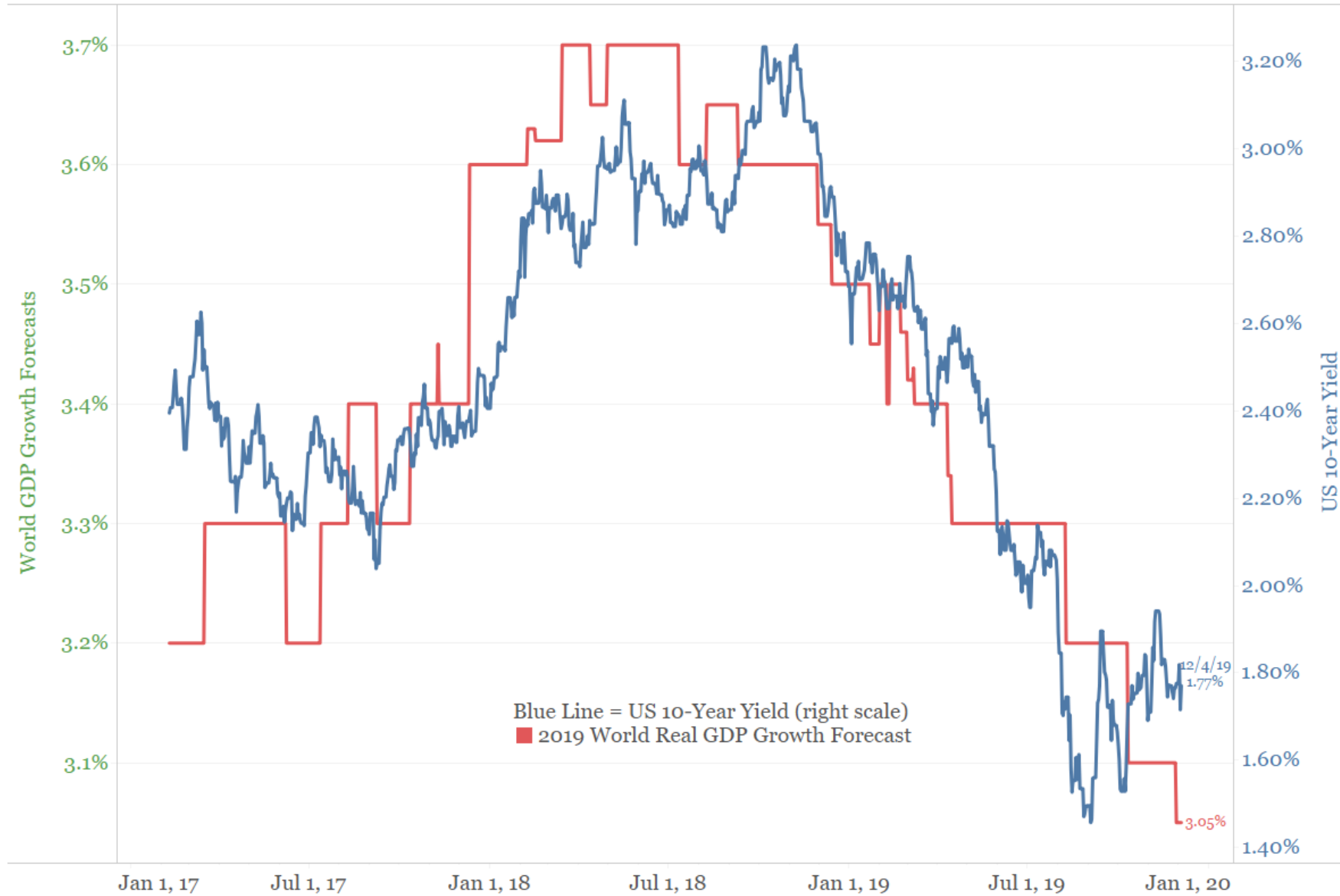
From a Regular Survey of Economists by Bloomberg



Data Source: Bloomberg

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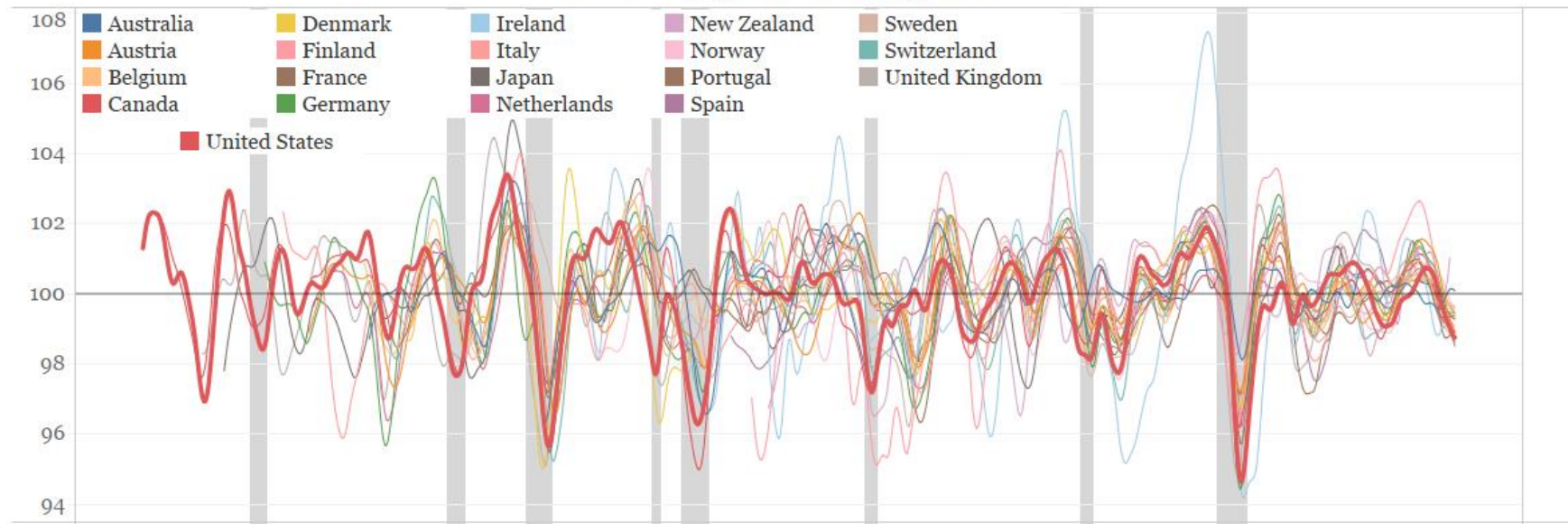
# 2019 World GDP Forecast and the 10-Year Yield



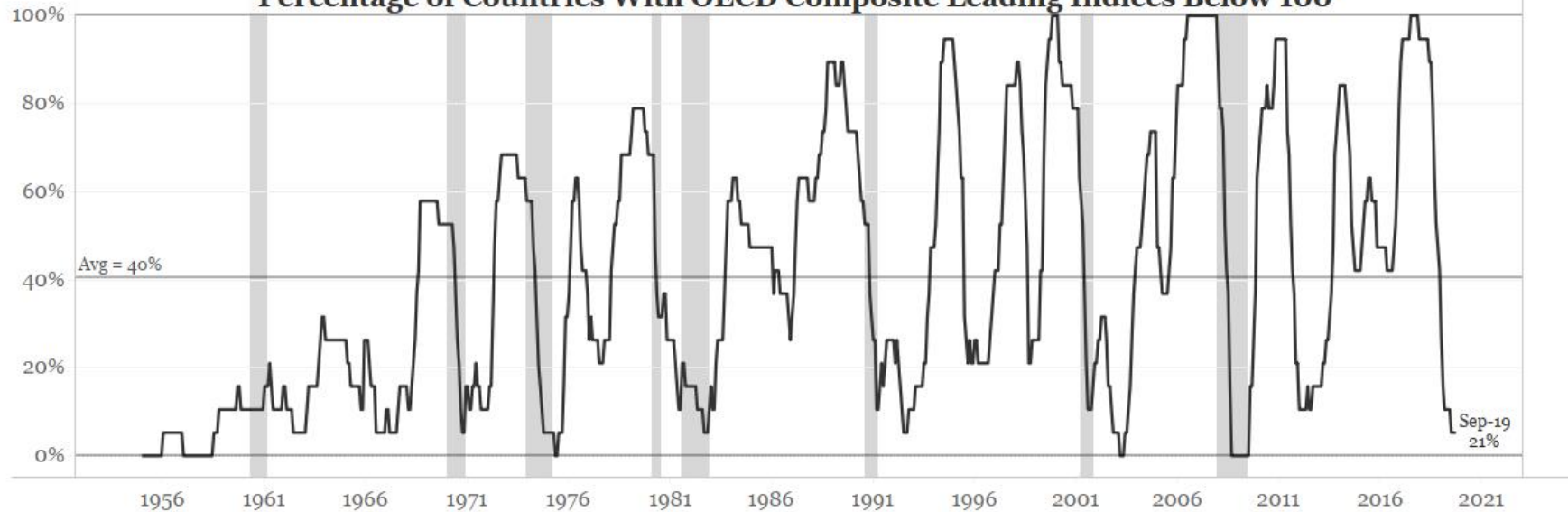
Data Source: Bloomberg

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## OECD Composite Leading Indices



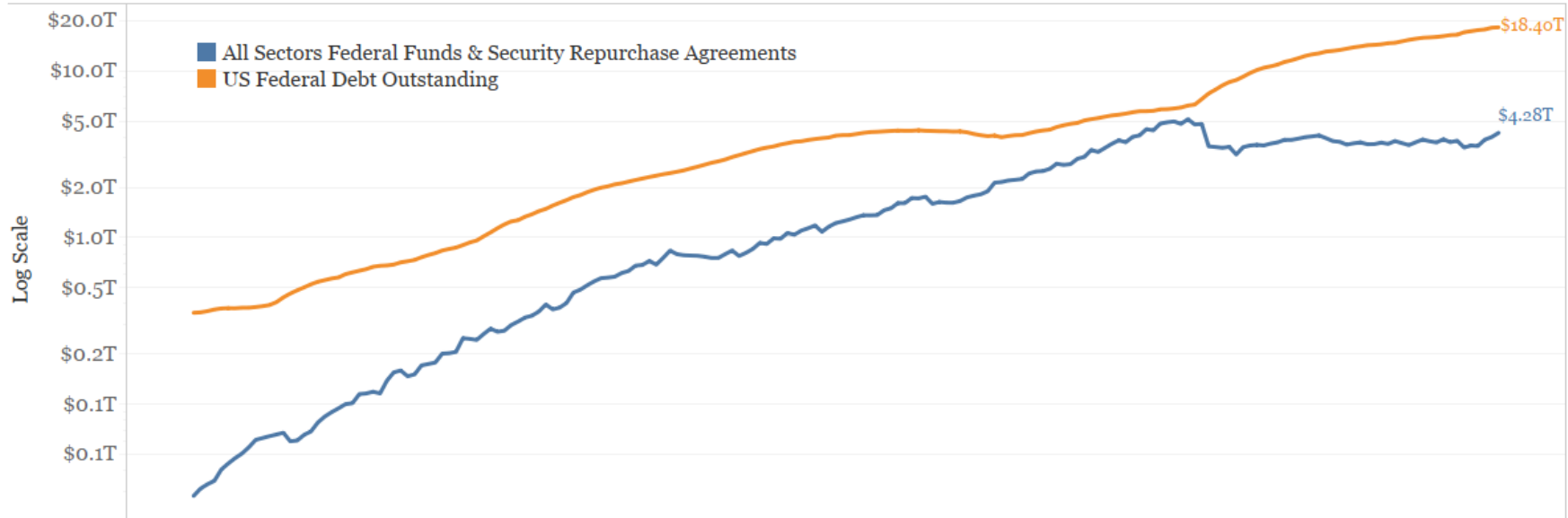
## Percentage of Countries With OECD Composite Leading Indices Below 100



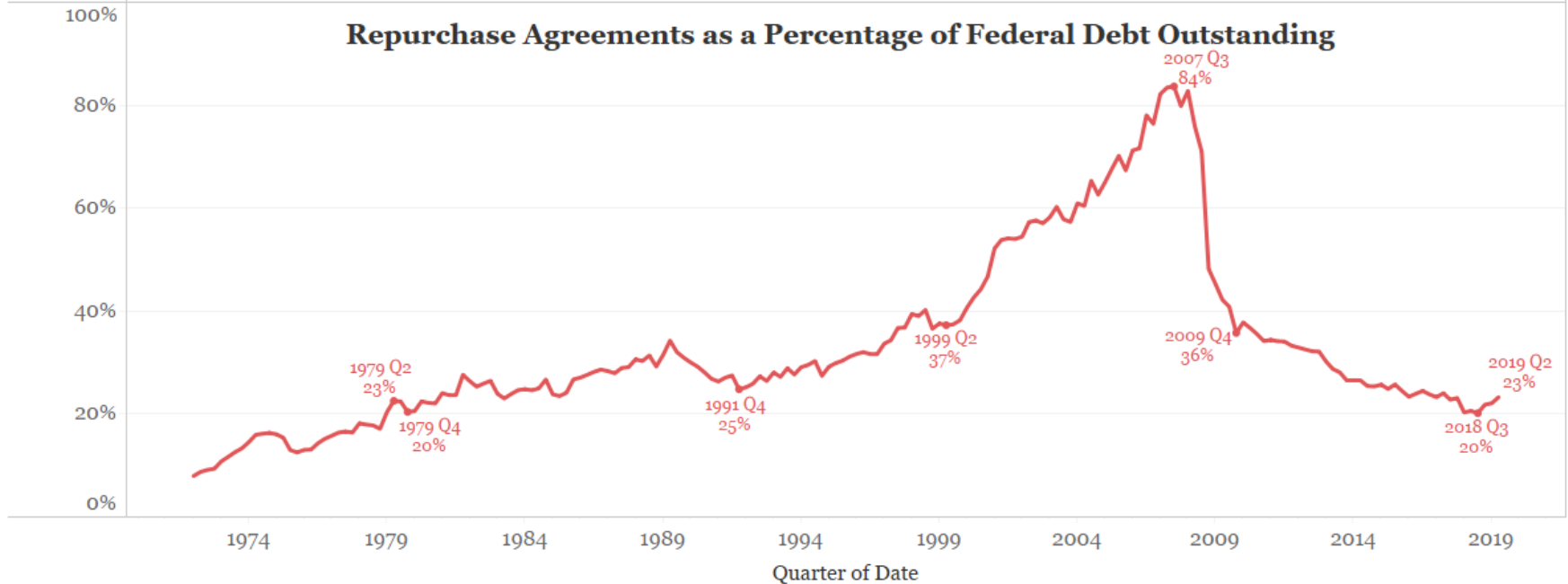
Data Source: Organization for Economic Cooperation and Development

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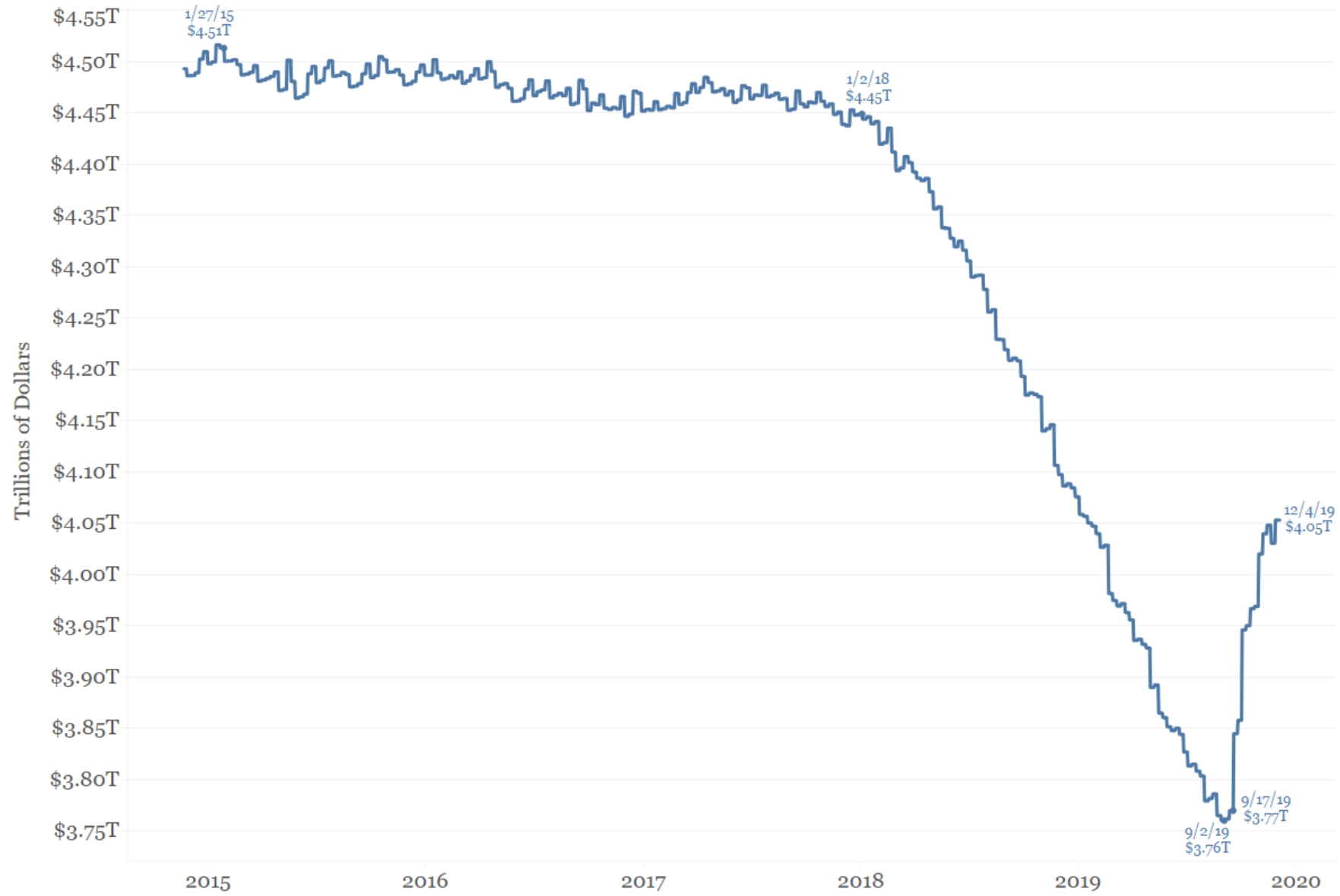
## The Shrinking Repo Market



## Repurchase Agreements as a Percentage of Federal Debt Outstanding



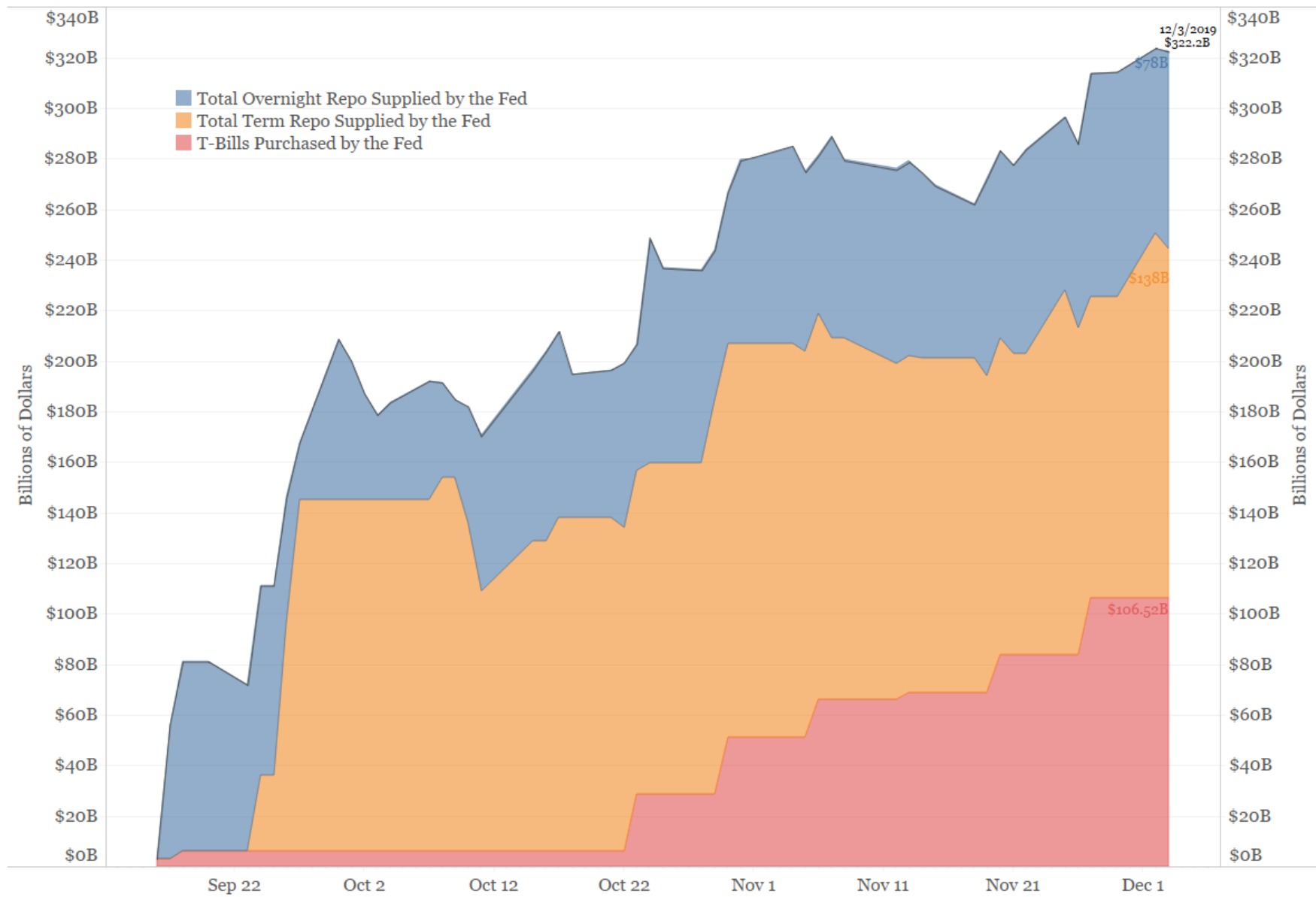
# The Federal Reserve's Balance Sheet



Data Source: Fed, Bloomberg

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## How Much Fed Support is Needed to Calm the Repo Market?



Source: NY Federal Reserve

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### How Long Until the Recession?

When the 3-month to 10-year yield curve inverts for **10 consecutive trading days**

Date of Inversion	Consecutive Trading Days Inverted	Date of Next Recession	Calendar Days to Next Recession
1/10/1969	24	Dec-69	325
6/14/1973	177	Nov-73	140
12/8/1978	91	Jan-80	389
11/7/1980	102	Jul-81	236
6/6/1989	30	Jul-90	390
7/31/2000	135	Mar-01	213
8/1/2006	217	Dec-07	487
6/6/2019	41	????	????
<b>Average</b>	<b>111</b>		<b>311</b>

1/10/1969 = inverted for 24 calendar days, went positive for 33 days, then inverted again for 53 days

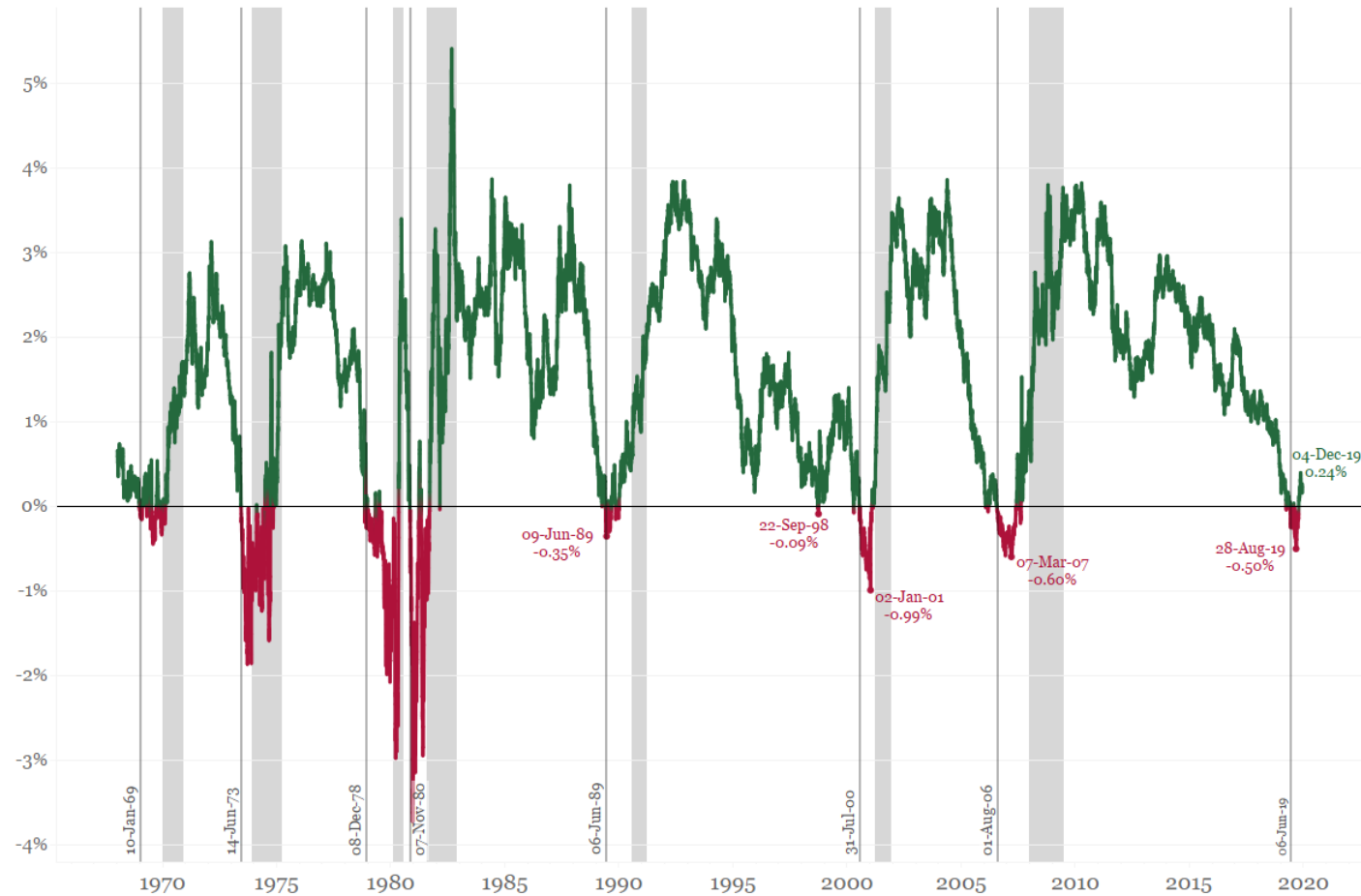
6/6/1989 = inverted for 30 calendar days, went positive for 9 days, inverted again for 26 days

6/6/2019 = As of July 31 the inversion has been 41 consecutive trading days.

Positive for 1 day, inverted since (67 days through October 10)

### Yield Curve Inversions Lead Recessions

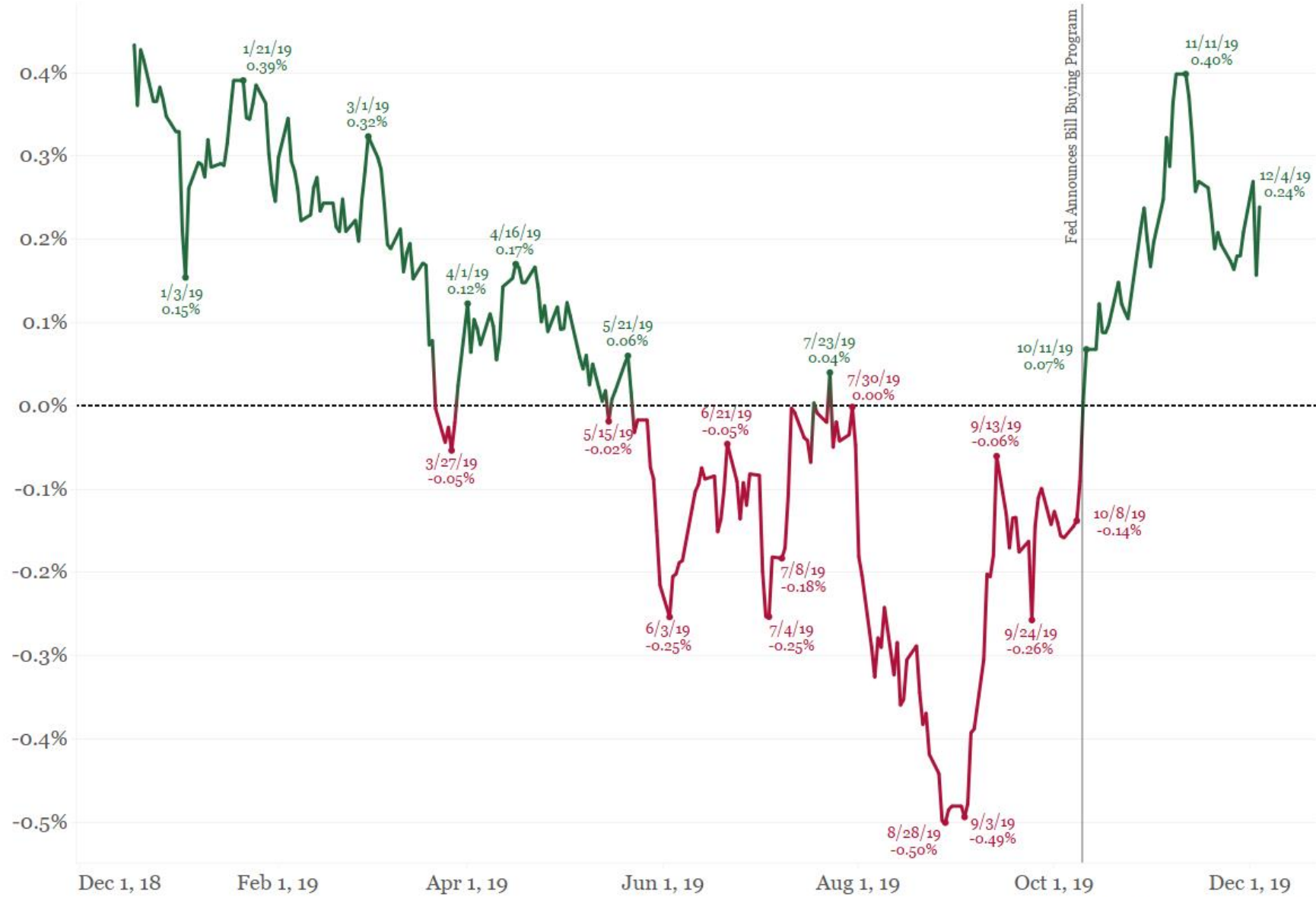
10-Year less 3-Month Yield Curve



Data Source: Federal Reserve and Bloomberg

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# The 10-Year less 3-Month Yield Curve



Source: Bloomberg

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