

RECESSION BAROMETER

June 7, 2019

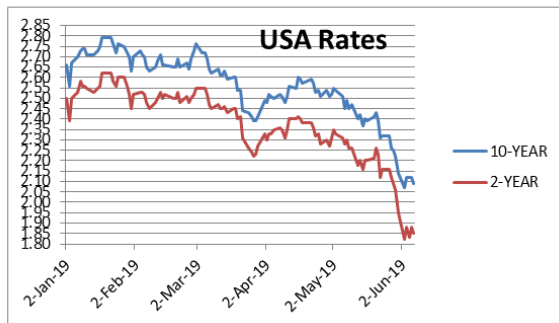
Spotlight on : Interest Rates & Yield Spreads

INTEREST RATES

The two charts below show the trend in interest rates in the United States and Canada since the beginning of 2019, for 10-year and 2-year maturities.

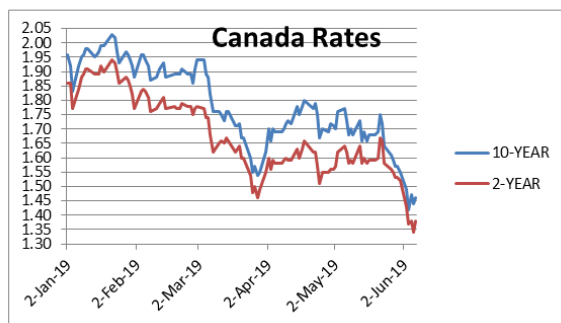
January 2, 2019 - June 7, 2019

10-Year/2-Year



January 2, 2019 - June 7, 2019

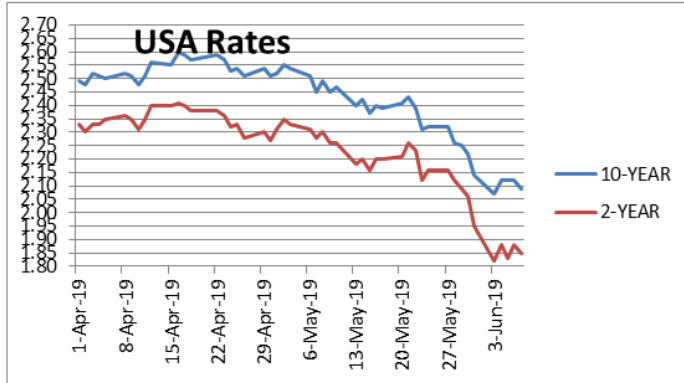
10-Year/2-Year



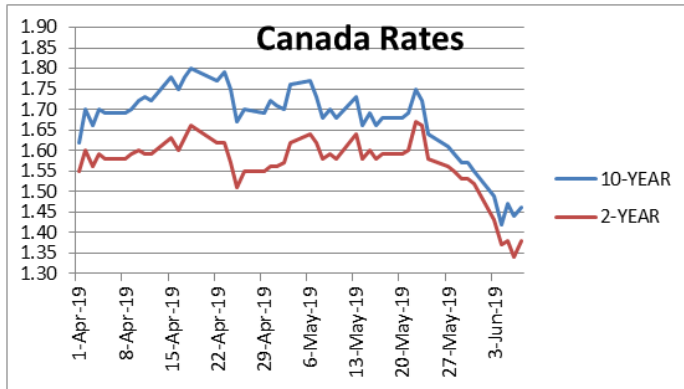
Observation: The overall trend in rates is downward. As shown, the spread (to be discussed ahead) between the 10-year rate and the 2-year rate in the USA has widened much more than in Canada.

To get a clearer picture of the differences, on the following page we look at these rates since April 1, 2019.

April 1, 2019 - June 7, 2019



April 1, 2019 - June 7, 2019



Observation: After a sharp drop the previous week, rates stabilized somewhat this past week, although the trend is still down. Falling interest rates mean rising bond prices. Lower bond interest rates and the correspondingly higher bond prices reflect increasing investor expectation that the Fed will lower interest rates later in 2019, and it also represents greater safety amidst the increasing global turmoil associated with tariffs and trade that could portend a decline in equity prices.

Interest rates are only one part of the equation. The other important consideration is interest rate spreads, i.e., the difference in interest rates between different maturities.

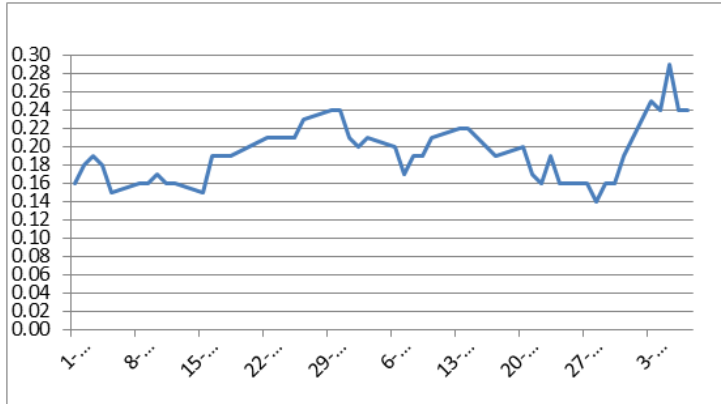
There was a marked change in Spreads last week, as shown in the charts on the following page.

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THE SPREAD

April 1, 2019 - June 7, 2019

10-Year/2-Year USA SPREAD



April 1, 2019 - June 7, 2019

10-Year/2-Year CANADA SPREAD



Observation: Compared to the previous week, Spreads this past week rose substantially in both countries. In the USA, the Spread more than doubled, from 0.14x to reach a high of 0.29x, and closed the week at 0.24x. In Canada, the Spread gained from 0.03x to reach a high of 0.10x, and closed the week at 0.08x. The possibility of an Inversion occurring for this 10-year/2-year metric has been relieved somewhat.

Almost universally across the Spread metrics, the Spread widened. However, many of the Spread metrics are still negative. We will look at some of them beginning on the next page. These are for U.S. Spreads only.

10-YEAR/3-MONTH SPREAD

In the last week of March, there was much consternation when the 10-year interest rate fell below the 3-month interest rate, which represented an Inversion. The Spread quickly corrected itself, but it has inverted once again and dramatically so.

Typically, short-term interest rates are lower than long-term interest rates. That is because an investor wants to be compensated for the greater risk of holding longer-dated bonds than shorter-term bonds that have considerably less risk as maturity approaches.

So, when the interest rate on a long-term bond falls appreciably below the interest rate on a short-term bond, market pundits become necessarily alarmed. History has shown that when an Inversion occurs, a recession soon follows, typically between 15 and 20 months later.

Here is the chart that has market pundits currently upset. As shown, the 10-year Treasury rate had a dramatic drop two weeks ago, plummeted last Monday, and then recovered slightly over the remainder of this past week. Significantly, the 10-year rate still remains substantially below the 3-month rate. After reaching a low of **-0.29x** on Monday, the Spread closed the week at **-0.19x**.

January 2, 2019 - June 7, 2019

USA SPREAD: 10-Year/3-Month



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5-YEAR/2-YEAR SPREAD

The 5-year/2-year spread has been negative, i.e., representing an Inversion, almost continually since the beginning of March 2019. However, just this past week, the Spread rebounded into positive territory, but ended the week at the neutral point of 0.00x.

January 2, 2019 - June 7, 2019

USA SPREAD: 5-Year/2-Year



ANALYZING VARIOUS YIELD SPREADS

There are a myriad of different yield spreads that can be calculated. With so many iterations possible, which one(s) is(are) the most relevant? It is too easy to choose one iteration, eg., 10-year/6-month or 10-year/3-month (both currently “inverted”) and declare “Inversion!”, while both the 10-year/5-year and the 10-year/2-year yield spreads do not currently show inversion.

Our yield-spread watch includes a total of **24** yield spread ratios, ranging all the way from 30-year/20-year to 1-year/1-month.

More than half of the spread ratios, 13 in total (15 the previous week), are in an inverted state and all are at the short-end of the curve.

Q: What is the market saying? What does this tell us?

A: It could suggest that the market is expecting that there will be a rate cut by the Fed, which would send short-end rates lower. It might also suggest that the short-end is waiting for the longer-end to “catch up” and “join it” in inversion.

COMMENT: *If we were to choose only one yield spread to measure “Inversion”, it would be the 10-year/2-year ratio. However, we monitor two different series of Spreads. The First Spread Series is a weighted average of 3 Spreads: 10-year/2-year (70%), 10-year/3-month (20%), and 5-year/2-year (10%). The Second Spread Series is an equal-weight average of 12 Spreads: 30-year/20-year, 30-year/10-year, 20-year/10-year, 20-year/5-year, 10-year/2-year, 10-year/3-month, 5-year/2-year, 5-year/3-month, 2-year/1-year, 2-year/3-month, 1-year/6-month, and 1-year/3-month.*

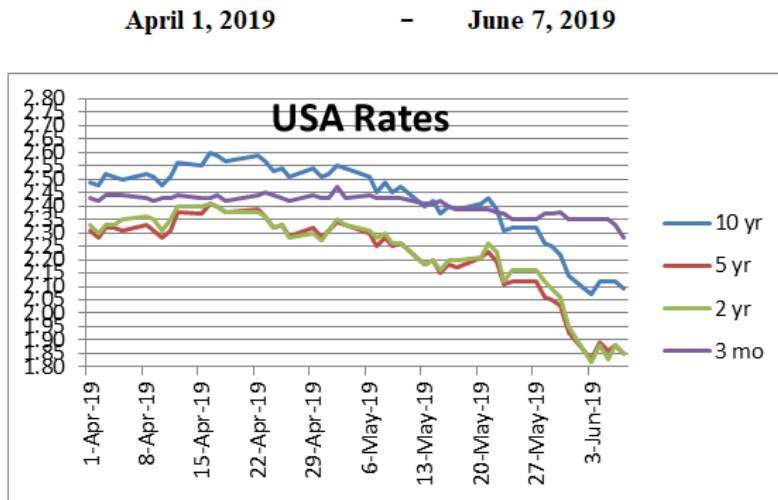
First Spread Series: Weighted Average Of Three Spreads

Our First Spread Series highlights three yield Spreads to measure “Inversion” and the possibility of a subsequent Economic Recession.

These three yield spreads feature U.S. Treasuries for: (1) 10-year/2-year; (2) 10-year/3 month; and (3) 5-year/2-year.

Let us have a look at the Spreads for each of these three yield ratios.

The chart below shows the rates since April 1, 2019.



Observation: In a normal market, the 10-year would be the highest rate, then the 5-year, and followed by the 2-year, and the 3-month. There are currently two Inversions: (1) the 10-year rate (**blue**) is below the 3-month rate (**purple**); and (2) the 5-year rate (**rust**) is below, or equal to, the 2-year rate (**green**) (and below the 10-year and 3-month). These Inversions have been consistently so for some time, particularly the 5-year/2-year.

Here are the current Spreads:

10-Year/2-Year

CURRENT SPREAD
 USA = 0.24 x
 Canada = 0.08 x

10-Year/3-Month

CURRENT SPREAD
 USA = -0.19 x

5-Year/2-Year

CURRENT SPREAD
 USA = 0.00 x

Second Spread Series: Equal-Weight Average Of Twelve Spreads

As declared in a previous COMMENT above, we have chosen an equal-weight average of 12 spreads to monitor Inversion. Here are the ratios for all 12 of these spreads over the past six weeks:

	<u>30Y</u> <u>20Y</u>	<u>30Y</u> <u>10Y</u>	<u>20Y</u> <u>10Y</u>	<u>20Y</u> <u>5Y</u>	<u>10Y</u> <u>2Y</u>	<u>10Y</u> <u>3M</u>	<u>5Y</u> <u>2Y</u>	<u>5Y</u> <u>3M</u>	<u>2Y</u> <u>1Y</u>	<u>2Y</u> <u>3M</u>	<u>1Y</u> <u>6M</u>	<u>1Y</u> <u>3M</u>
May 3, 2019	0.18	0.39	0.21	0.42	0.21	0.11	0.00	-0.10	-0.08	-0.10	-0.05	-0.02
May 10, 2019	0.19	0.42	0.23	0.44	0.21	0.04	0.00	-0.17	-0.10	-0.17	-0.09	-0.07
May 17, 2019	0.19	0.43	0.24	0.46	0.19	0.00	-0.03	-0.22	-0.13	-0.19	-0.09	-0.06
May 24, 2019	0.18	0.43	0.25	0.45	0.16	-0.03	-0.04	-0.23	-0.17	-0.19	-0.06	-0.02
May 31, 2019	0.19	0.44	0.25	0.46	0.19	-0.21	-0.02	-0.42	-0.26	-0.40	-0.14	-0.14
June 7, 2019	0.21	0.48	0.27	0.51	0.24	-0.19	0.00	-0.43	-0.12	-0.43	-0.18	-0.31

The table above shows that Inversions are increasing.

COMMENT: *Just because an Inversion occurs, it is not automatic that a Recession follows. And, when one does occur, the average lag time is 15 to 20 months. Further, if an Inversion occurs for just one day, is it automatic that the Recession count-down begins at that point? Or, should there be a certain number of days of a continuous Inversion to give confirmation? Also, which yield spreads do you choose?*

COMMENT: *We still put a lot of emphasis on the 10-year/2-year Spread and it is nowhere near an Inversion. The 10-year/2-year Spread is the major part of our First Spread Series above.*

The increasing Inversions across the spectrum seem bad enough, but the following table should cause even more angst.

Date	OBFR	<u>1 mo</u>	<u>2 mo</u>	<u>3 mo</u>	<u>6 mo</u>	<u>1 yr</u>	<u>2 yr</u>	<u>3 yr</u>	<u>5 yr</u>	<u>7 yr</u>	<u>10 yr</u>	<u>20 yr</u>	<u>30 yr</u>
1-Mar-19	2.40	2.44	2.46	2.44	2.52	2.55	2.55	2.54	2.56	2.67	2.76	2.97	3.13
15-Mar-19	2.41	2.46	2.46	2.45	2.52	2.52	2.43	2.39	2.40	2.49	2.59	2.83	3.02
1-Apr-19	2.41	2.42	2.43	2.43	2.46	2.41	2.33	2.29	2.31	2.40	2.49	2.71	2.89
15-Apr-19	2.41	2.42	2.43	2.43	2.46	2.43	2.40	2.36	2.37	2.46	2.55	2.77	2.96
1-May-19	2.44	2.42	2.41	2.43	2.44	2.39	2.31	2.28	2.31	2.41	2.52	2.74	2.92
15-May-19	2.39	2.40	2.41	2.42	2.43	2.30	2.16	2.12	2.15	2.25	2.37	2.63	2.82
31-May-19	2.38	2.35	2.38	2.35	2.35	2.21	1.95	1.90	1.93	2.03	2.14	2.39	2.58
7-Jun-19	2.36	2.30	2.32	2.28	2.15	1.97	1.85	1.82	1.85	1.97	2.09	2.36	2.57

Note: The **green** numbers are the Overnight Banking Fund Rates (OBFR).

Note: The **red** numbers are those rates that are lower than the OBFR.

COMMENT: *The table above, in the first column, shows in **green** numbers, the federal overnight banking funds rate. (The overnight bank funding rate (OBFR) is calculated as a volume-weighted median of overnight federal funds transactions, Eurodollar transactions, and domestic deposits.) The **red** numbers are those rates that are below the overnight rate. This table illustrates the anomaly that exists in the current market. How could federal overnight fund rates be higher than 5-year or 10-year rates? Or any longer-dated rates? These Inversions suggest that a Recession is on its way. Additionally, across the board, every rate this week is LOWER than last week.*

RECESSION BAROMETER READING

We have devised a barometer to depict the status of where we believe the economy is in forecasting an economic recession. The barometer runs from 0 to 10 in 0.5 intervals, with 0 being the least worrisome level for recession expectations, and 10 reflecting that an inversion has occurred. Each barometer numeric is associated with a range of yield spreads.

RECESSION BAROMETER

<u>Interest Rate Yield Spread</u>	<u>Barometer Reading</u>
>1.00x	0
0.94x - 1.00x	0.5
0.87x - 0.93x	1
0.79x - 0.86x	1.5
0.71x - 0.78x	2
0.64x - 0.70x	2.5
0.57x - 0.63x	3
0.51x - 0.56x	3.5
0.46x - 0.50x	4
0.41x - 0.45x	4.5
0.36x - 0.40x	5
0.31x - 0.35x	5.5
0.26x - 0.30x	6
0.21x - 0.25x	6.5
0.17x - 0.20x	7
0.13x - 0.16x	7.5
0.09x - 0.12x	8
0.06x - 0.08x	8.5
0.03x - 0.05x	9
0.00x - 0.02x	9.5
<0.00x	10 Inversion!

The above matrix is applied to our yield spread ratios to derive our Barometer Readings.

Here are the readings from the two spread series. As shown, the recession readings dropped for both Spread monitorings. The First Spread Series scaled back to 7.5x from 8.0x. The Second Spread Series, with a neutral 0.00, came off its Inversion status with a reading of 9.5x.

<u>Date</u>	<u>Weighted 3 U.S. Spreads</u>		<u>Unweighted 12 U.S. Spreads</u>	
	<u>Spread</u>	<u>Reading</u>	<u>Spread</u>	<u>Reading</u>
May 3, 2019	0.17	7.0x	0.10	8.0x
May 10, 2019	0.16	7.5x	0.08	8.5x
May 17, 2019	0.13	7.5x	0.07	8.5x
May 24, 2019	0.10	8.0x	0.06	8.5x
May 31, 2019	0.09	8.0x	-0.01	10.0x
June 7, 2019	0.13	7.5x	0.00	9.5x

<continued>

Recession Forecast

The following chart shows when a recession could occur for various post-inversion dates. For inversion, we are monitoring two yield spread ratios, a weighted and an unweighted measurement. These barometer readings are currently 7.5x and 9.5x.

Our current “guess” is that a recession could occur 15 months post-inversion (shown in **Red** in the table below). This is a “moving target” and will change with each ensuing month. It will also change with changes in global economic conditions.

We are mindful that an increasing number of Spreads are inverting. Already one of our monitors, the Second Spread Series, had a negative Spread last week and is neutral this week. If this continues and/or the First Spread Series edges closer to or reaches Inversion, we will be shortening our expectation of when a Recession could occur in the United States.

Forecasting the Commencement of a Recession

If an inversion occurs during the current month ... then a recession will begin at stated date projections.

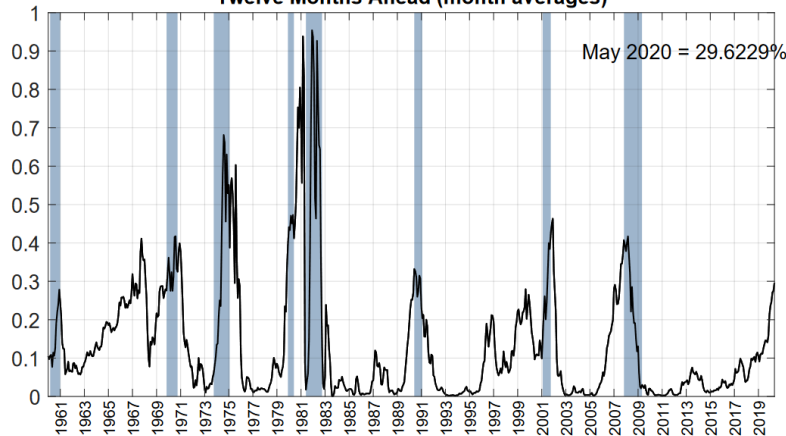
<u>Current Month</u>	<u>Inversion +12 Months</u>	<u>Inversion +15 Months</u>	<u>Inversion +18 Months</u>	<u>Inversion +24 Months</u>	<u>Inversion +30 Months</u>	<u>Inversion +36 Months</u>
June/2019	June/2020	Sept/2020	Dec/2020	June/2021	Dec/2021	May/2022

Source: eResearch

New York Federal Reserve Yield Curve Recession Indicator

The following New York Fed chart, which uses the difference between 10-year and 3-month Treasury rates to calculate the probability of a recession in the United States twelve months ahead, is as of the end of June 4, 2019. It shows the probability of a recession occurring in the next 12 months, that is, by the end of May 2020. The chart shows that probability continues to rise and has reached 29.6%.

Probability of US Recession Predicted by Treasury Spread*
Twelve Months Ahead (month averages)



*Parameters estimated using data from January 1959 to December 2009, recession probabilities predicted using data through May 2019. The parameter estimates are $\alpha = -0.5333$, $\beta = -0.6330$.

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