Research Update

Can Negative Yields Occur in America?

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GPA GOVERNMENT PORTFOLIO ADVISORS

Can Negative Yields Occur in America?

The short answer – Yes

At current, we see the potential for the 2-year Treasury yield to trade as low as -1.50%

In writing this we do not intend to be sensational, but rather prepare clients for the possibility of negative yields and layout the logic of why this can/may occur in the United States. As market yields rapidly decline and fed-funds futures currently call for a return to the "zero lower bound" (ZLB), it is critical to discuss what is different this time, and articulate the case for why yields may plunge below zero in the United States.

To be clear, we do not see the Federal Reserve setting policy rates in negative territory. Federal Reserve Chairman, Jerome Powell, has publicly stated this on multiple occasions. At current, we take the Fed Chair and the institution at their word. What we will layout herein is that a negative policy rate is not a necessary condition in the United States for us to have negative interest rates – particularly in the 2-year to 5-year portion of the curve.

This is largely due to what is different this time if/when the Fed hits the ZLB:

- Negative policy rates in major foreign central banks
- Negative yields on foreign sovereign bonds

We live in a globally connected financial system where capital freely flows. We believe this dynamic, combined with the sharply negative yields in Europe and Japan, will potentially lead to negative yields in the United States.

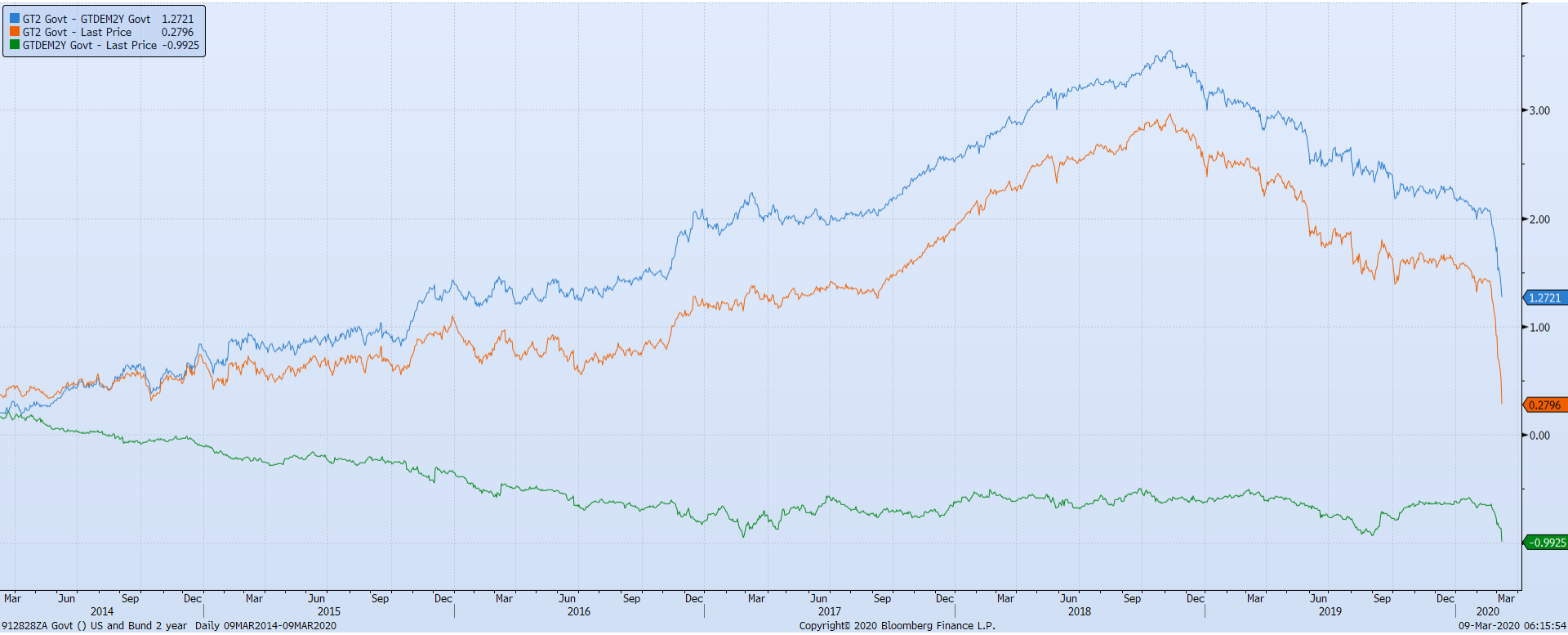
What follows is a discussion that links central bank policy rates, currency hedging costs and foreign bond yields to illustrate what may occur should the Fed hit the ZLB.

Negative Policy Rates in Europe & Japan

For this discussion we will focus on Europe and Japan. Europe and Japan have had negative policy rates in place since 2014 and 2016 respectively. At current, the European Central Bank (ECB) has a policy rate of -0.50% and the Bank of Japan (BOJ) has a policy rate of -0.10%.

- Source: Bloomberg

Yields and Yield Differentials – Germany and US 2-Year Yields

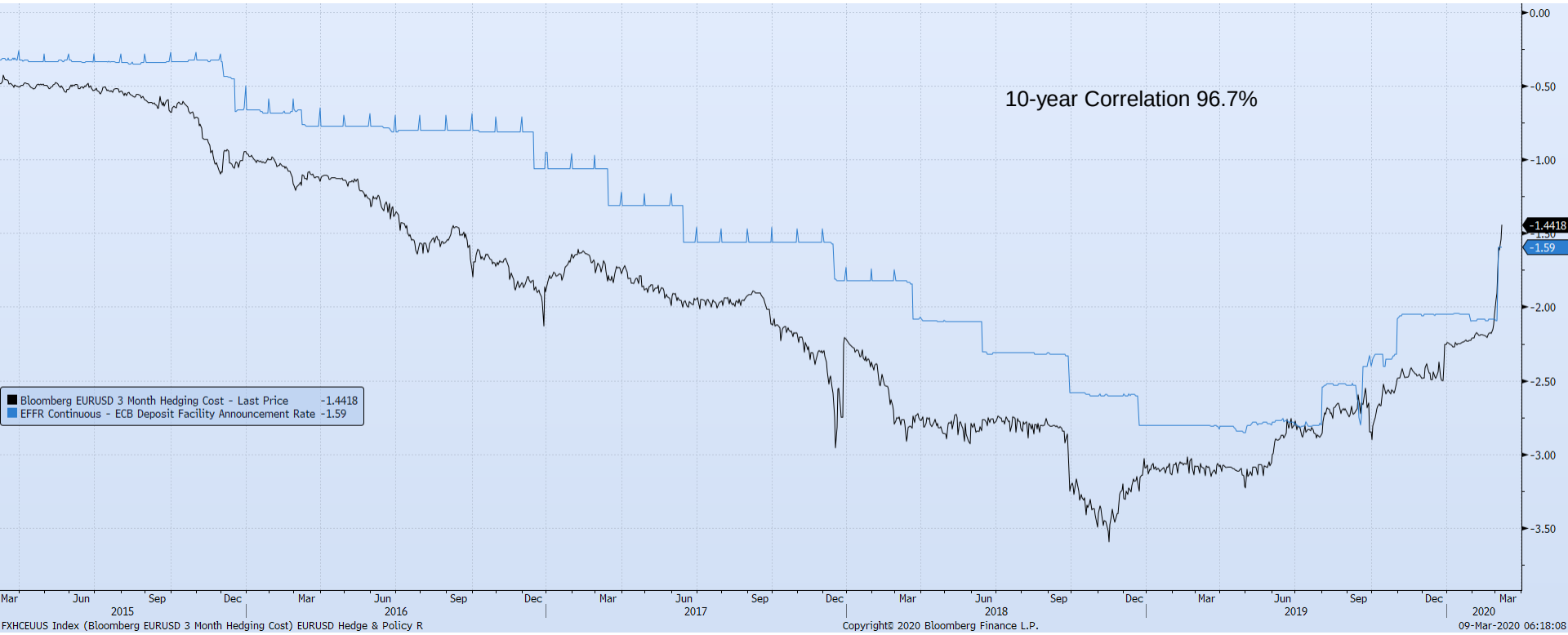


After the ECB established a negative policy rate, the 2-year German Bund (green line) slid into negative yield territory and currently trades at a negative yield of -0.99%. While this was occurring, the Federal Reserve embarked on a rate-hiking campaign that started in December of 2015. The U.S. 2-year (orange line), consistent with history, followed the policy rate higher. This divergence led to a large yield differential between the two AAA-rated government securities (blue line). This yield differential is simply the US 2-year yield minus the 2-year Bund yield.

Why the wide differential in yield? It seems obvious German Bund investors should sell their bond and buy the US Treasury. It isn't that simple and it comes down to currency risk and hedging costs. We explore this on the next page.

❖ Source: Bloomberg

Currency Hedging and Policy Rate Differentials



The chart above shows the 3-month hedging costs to hedge in EUR-USD (black line). The chart also shows the inverted difference in policy rates between the Fed and the ECB (blue line). It is clear to see, short-dated hedging costs are mostly a function of differences in policy rates. In fact, over the past 10 years, these two series are 97% correlated when using daily observations. This is intuitive in an arbitrage free world where there is no free lunch. If this condition were not to hold, one could simply sell the Euro, buy the U.S. Dollar, invest in a U.S. Treasury and hedge out the currency risk. That is truly a free lunch.

On the next page we will combine these two aspects to show the yield differential in hedged terms.

❖ Source: Bloomberg

Hedged Yield Differentials

Hedged 2-Year US Treasury/2-Year Bund Statistics	
Mean	0.05
Standard Error	0.00
Median	0.03
Mode	(0.11)
Standard Deviation	0.23
Sample Variance	0.05
Minimum	(0.79)
Maximum	0.53
Count	3654

The hedged yield differential (2-year US yield minus 2-year Bund yield plus hedging cost) between the US and German 2-year yields, again owing to an arbitrage free world, navigates in a tight corridor largely between 0.40% and -0.40%. As the statistics over the past 10 years indicate, on average this series is .05% with a high level of 0.53% and a low level of -0.79%.

There is no reason to expect this dynamic to significantly change given investors general indifference between AAA-rated global sovereign bonds. If there is a free, or even cheap, lunch to be had someone will come and take it.

❖ Source: Bloomberg

What am I getting at?

Thus far we have established the following:

1. Yields differentials between the United States and Germany are large but coming down
2. Hedging costs are largely a function of policy rate differentials – this is intuitive
3. Large yield differentials exist due to hedging costs – historical hedged differentials are low and relatively stable

Conclusion: As the Fed lowers the policy rate hedging costs will continue to come down. As hedging costs come down, yield differentials will also come down. Unless foreign sovereign bonds increase in yield – US Treasury yields will likely decline and may go negative.

Description	Current	Potential Future
2-year US Treasury Yield	0.25%	-0.71%
2-year German Bund Yield	-1.00%	-1.00%
Yield Differential	1.25%	0.28%
EURUSD Hedging Costs	-1.44%	-0.44%
Hedged Yield Differential	-0.19%	-0.16%
Fed Funds Rate	1.09%	0.09%
ECB Policy Rate	-0.50%	-0.50%
Policy Rate Differential	1.59%	0.59%

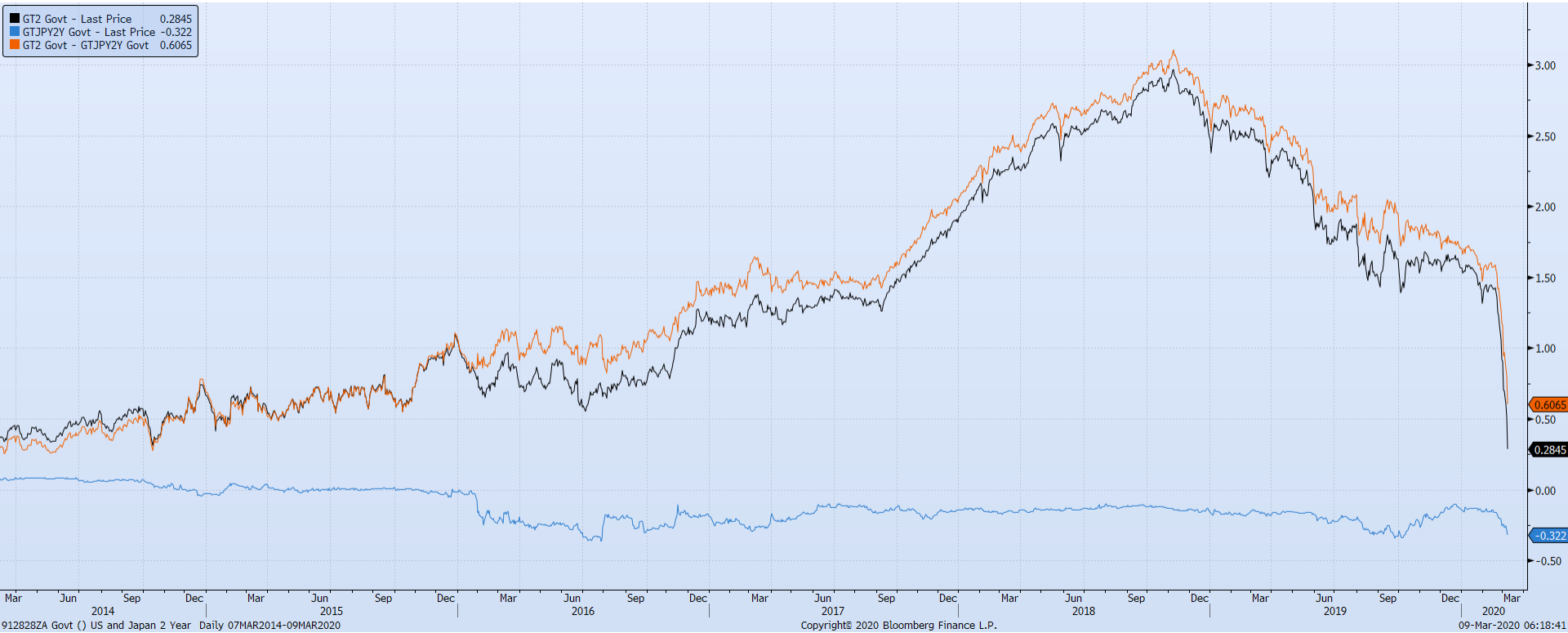
	2-Year Bund Yields									
Hedged Yield Differential	-0.713%	-1.00%	-0.75%	-0.50%	-0.25%	0.00%	0.25%	0.50%	0.75%	1.00%
	-0.80%	-1.36%	-1.11%	-0.86%	-0.61%	-0.36%	-0.11%	0.14%	0.39%	0.64%
	-0.70%	-1.26%	-1.01%	-0.76%	-0.51%	-0.26%	-0.01%	0.24%	0.49%	0.74%
	-0.60%	-1.16%	-0.91%	-0.66%	-0.41%	-0.16%	0.09%	0.34%	0.59%	0.84%
	-0.50%	-1.06%	-0.81%	-0.56%	-0.31%	-0.06%	0.19%	0.44%	0.69%	0.94%
	-0.40%	-0.96%	-0.71%	-0.46%	-0.21%	0.04%	0.29%	0.54%	0.79%	1.04%
	-0.30%	-0.86%	-0.61%	-0.36%	-0.11%	0.14%	0.39%	0.64%	0.89%	1.14%
	-0.20%	-0.76%	-0.51%	-0.26%	-0.01%	0.24%	0.49%	0.74%	0.99%	1.24%
	-0.10%	-0.66%	-0.41%	-0.16%	0.09%	0.34%	0.59%	0.84%	1.09%	1.34%
	0.00%	-0.56%	-0.31%	-0.06%	0.19%	0.44%	0.69%	0.94%	1.19%	1.44%
	0.10%	-0.46%	-0.21%	0.04%	0.29%	0.54%	0.79%	1.04%	1.29%	1.54%
	0.20%	-0.36%	-0.11%	0.14%	0.39%	0.64%	0.89%	1.14%	1.39%	1.64%
	0.30%	-0.26%	-0.01%	0.24%	0.49%	0.74%	0.99%	1.24%	1.49%	1.74%
	0.40%	-0.16%	0.09%	0.34%	0.59%	0.84%	1.09%	1.34%	1.59%	1.84%
	0.50%	-0.06%	0.19%	0.44%	0.69%	0.94%	1.19%	1.44%	1.69%	1.94%
	0.60%	0.04%	0.29%	0.54%	0.79%	1.04%	1.29%	1.54%	1.79%	2.04%

In the above table we illustrate what could happen in the current environment if the Fed were to go back to the zero-lower bound. If the German Bund yield and the ECB policy rate remain unchanged, the arbitrage free yield on the U.S. 2-year is a stunning negative 0.71%. The table on the right shows different US 2-year yields given varying environments for 2-year Bund yields and hedged yield differentials as these clearly are not static in nature. As the table illustrates, US yields may turn negative unless a sustained move higher in bund yields and/or a move higher in hedged yield differentials.

Said differently, if the Fed reduces the policy rate – hedging costs will come down and with it yield differentials and US yields.

❖ Source: Bloomberg, Bureau of Economic Analysis & Standard & Poor's

Yields and Yield Differentials – Japanese and US 2-Year

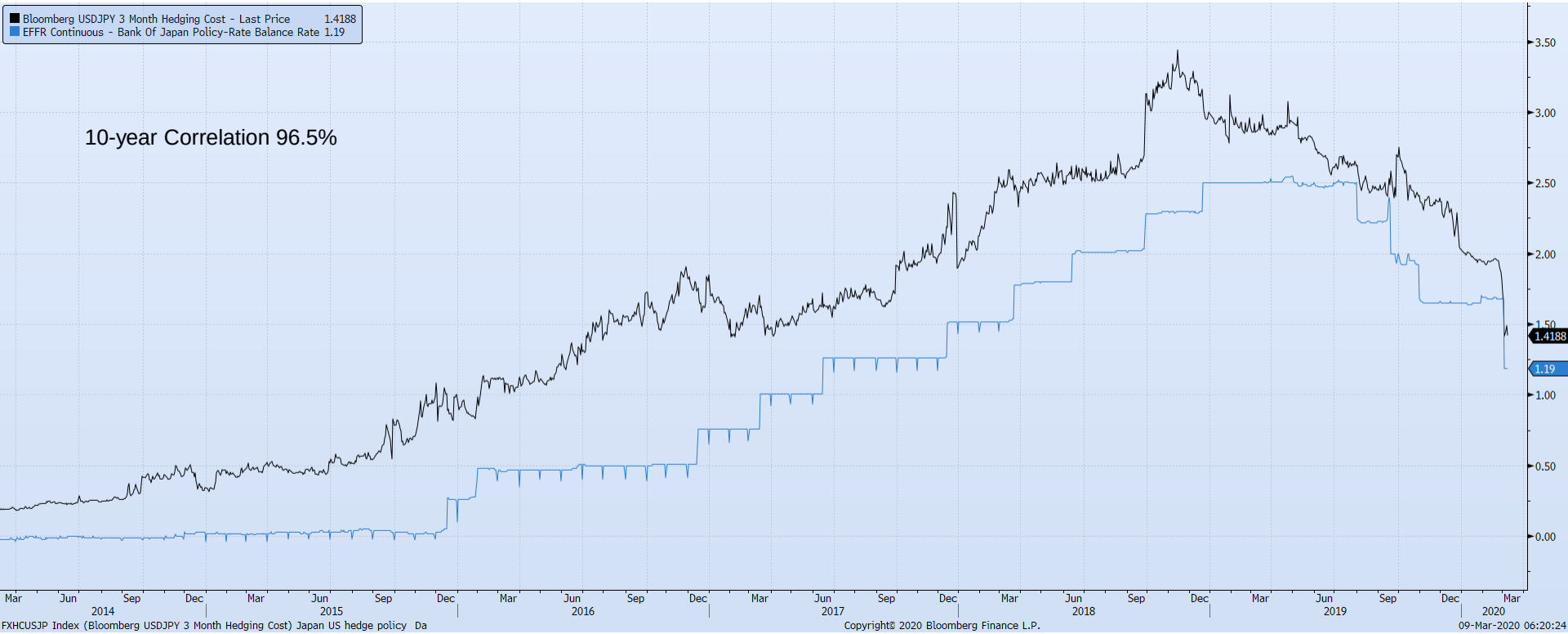


After the BOJ established a negative policy rate, the 2-year Japanese yield also slid into negative yield territory (blue line) and currently trades at a negative yield of -0.32%. While this was occurring, the Federal Reserve was in the middle of their rate-hiking campaign that started in December of 2015. The US 2-year (black line), consistent with history, followed the policy rate higher. This divergence led to a large yield differential between the two highly-rated government securities (orange line).

Like the story with German Bunds, this differential was largely due to hedging costs. We explore this on the next page.

❖ Source: Bloomberg

Currency Hedging and Policy Rate Differentials

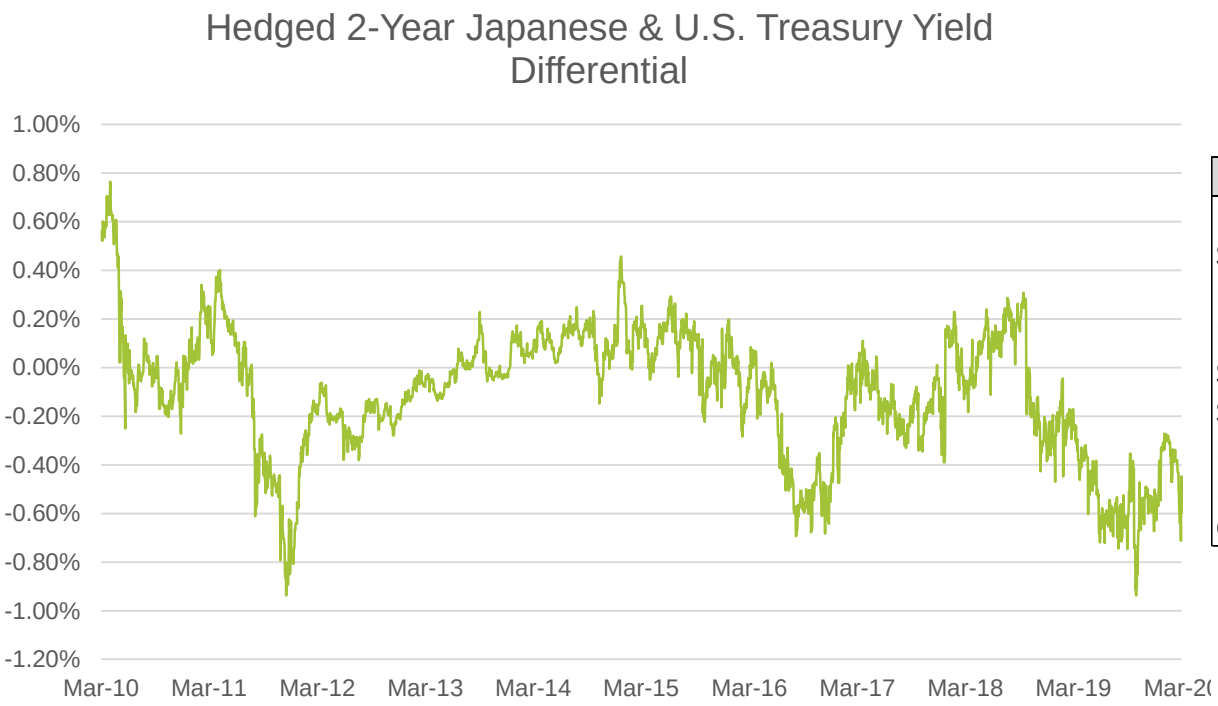


The chart above shows the 3-month hedging costs to hedge in JPY-USD (black line). The chart also shows the difference in policy rates between the Fed and the BOJ (blue line). Again it is clear to see, short-dated hedging costs are mostly a function of differences in policy rates. In fact, over the past 10 years, these two series are 96% correlated when using daily observations. Once again, this relationship intuitive in the arbitrage free world. If this condition were not to hold, one could simply sell their Japanese Yen, buy the U.S. Dollar, invest in the U.S. risk-free rate and hedge out the currency risk. Once again that is truly a free lunch and we know they do not exist.

On the next page we will combine these two aspects to show the yield differential in hedged terms.

❖ Source: Bloomberg

Hedged Yield Differentials



Hedged 2-Year US Treasury/2-Year JPY Bond Statistics	
Mean	(0.11)
Standard Error	0.00
Median	(0.07)
Mode	0.08
Standard Deviation	0.26
Sample Variance	0.07
Minimum	(0.94)
Maximum	0.76
Count	3654

The hedged yield differential between the US and Japanese 2-year yields, while less narrow than the German-US trading range, navigates in a reasonably tight corridor largely between 0.20% and -0.80%. As the statistics over the past 10 years indicate, on average this series is -0.11% with a high level of 0.76% and a low level of -0.94%.

❖ Source: Bloomberg

What am I getting at?

Once again we have established the following:

1. Yields differentials between the United States and Japan are large but coming down
2. Hedging costs are largely a function of policy rate differentials – this is intuitive
3. Large yield differentials exist due to hedging costs – historical hedged differentials are low and relatively stable

Conclusion: As the Fed lowers the policy rate hedging costs will continue to come down. As hedging costs come down, yield differentials will also come down. Unless foreign sovereign bonds increase in yield – US Treasury yields will likely decline and may go negative.

Description	Current	Potential Future
2-year US Treasury Yield	0.25%	-0.75%
2-year Japanese Yield	-0.32%	-0.32%
Yield Differential	0.58%	-0.42%
USDJPY Hedging Costs	1.42%	0.42%
Hedged Yield Differential	-0.84%	-0.84%
Fed Funds Rate	1.09%	0.09%
BOJ Policy Rate	-0.10%	-0.10%
Policy Rate Differential	1.19%	0.19%

	2-Year JPY Yields									
Hedged Yield Differential	-0.746%	-1.00%	-0.75%	-0.50%	-0.25%	0.00%	0.25%	0.50%	0.75%	1.00%
	-1.00%	-1.58%	-1.33%	-1.08%	-0.83%	-0.58%	-0.33%	-0.08%	0.17%	0.42%
	-0.85%	-1.43%	-1.18%	-0.93%	-0.68%	-0.43%	-0.18%	0.07%	0.32%	0.57%
	-0.70%	-1.28%	-1.03%	-0.78%	-0.53%	-0.28%	-0.03%	0.22%	0.47%	0.72%
	-0.55%	-1.13%	-0.88%	-0.63%	-0.38%	-0.13%	0.12%	0.37%	0.62%	0.87%
	-0.40%	-0.98%	-0.73%	-0.48%	-0.23%	0.02%	0.27%	0.52%	0.77%	1.02%
	-0.25%	-0.83%	-0.58%	-0.33%	-0.08%	0.17%	0.42%	0.67%	0.92%	1.17%
	-0.10%	-0.68%	-0.43%	-0.18%	0.07%	0.32%	0.57%	0.82%	1.07%	1.32%
	0.05%	-0.53%	-0.28%	-0.03%	0.22%	0.47%	0.72%	0.97%	1.22%	1.47%
	0.20%	-0.38%	-0.13%	0.12%	0.37%	0.62%	0.87%	1.12%	1.37%	1.62%
	0.35%	-0.23%	0.02%	0.27%	0.52%	0.77%	1.02%	1.27%	1.52%	1.77%
	0.50%	-0.08%	0.17%	0.42%	0.67%	0.92%	1.17%	1.42%	1.67%	1.92%
	0.65%	0.07%	0.32%	0.57%	0.82%	1.07%	1.32%	1.57%	1.82%	2.07%
	0.80%	0.22%	0.47%	0.72%	0.97%	1.22%	1.47%	1.72%	1.97%	2.22%
	0.95%	0.37%	0.62%	0.87%	1.12%	1.37%	1.62%	1.87%	2.12%	2.37%
	1.10%	0.52%	0.77%	1.02%	1.27%	1.52%	1.77%	2.02%	2.27%	2.52%

In the above table we illustrate what could happen in the current environment if the Fed were to go back to the zero-lower bound. If the Japanese 2-year yield and the BOJ policy rate remain unchanged, the arbitrage free yield on the U.S. 2-year is a negative 0.75%. The table on the right shows different US 2-year yields given varying environments for 2-year JPY yields and hedged yield differentials as these clearly are not static in nature. As the table illustrates, US yields may turn negative unless a sustained move higher in bund yields and/or a move higher in hedged yield differentials.

Once again, if the Fed reduces the policy rate – hedging costs will come down and with it yield differentials and US yields.

❖ Source: Bloomberg

Conclusion

- We believe yields can be negative in the United States without a negative policy rate
- As the Fed approaches or reaches the zero-lower bound, yield differentials should decline with hedging costs
- Markets are globally connected and investors will reallocate capital to follow hedged yields
- At current, we look at the 2 year to 5 year sector to be most vulnerable to this dynamic
- Policy tools exist if the Fed were to combat negative rates – yield targeting and bond buying can be used to offset market demand but this policy runs the risk of ballooning the Fed's balance sheet

❖ Source: Bloomberg

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