

# SEVENS REPORT

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2.15.18

**Tom:** Good afternoon everyone and welcome to our latest Sevens Report Alpha webinar. We have a very special guest on with us today and because of that, this webinar has been prerecorded. With us today is JR Rieger who is the Managing Director and Global Head of Fixed Income Indices at S&P Dow Jones Indices. JR, thank you very much for joining us and being able to squeeze us in during what, I'm sure, is a very busy time for you.

**JR:** Yes, busy time for bonds. Isn't it an interesting market? It's good to be here.

**Tom:** It's very interesting. I'm grateful that you were able to come on because this is a shifting market and we're talking about big changes potentially happening in the bond space. So to have somebody with your insight on here is going to be fantastic.

Let's get right to it. We always have our goals for the webinar. We're going to review the current bond environment and then focus on how the bond environment is changing and what do we do. What are some of the things we can do from a strategy and tactical standpoint to be prepared and to be hedged against lower bonds, higher rates? Full disclosure, obviously given your role with S&P Dow Jones we're not going to get into specific securities here. That's off limits. But certainly we will touch on tactics and then people can go to their respective desks and talk about implementation of some of these tactics. With that, we'll just continue to move along. We're very pleased that S&P Dow Jones lent you to us for this 30-minute period. JR, let's start by giving us a little bit of your view on what's happening in the bond market. Obviously we can see what's going on in yields, but give us your perspective from where you sit, what you think is happening here in the market.

## Current Events Briefing:



**J. R. Rieger**  
Managing Director, Global Head of  
Fixed Income Indices  
S&P Dow Jones Indices

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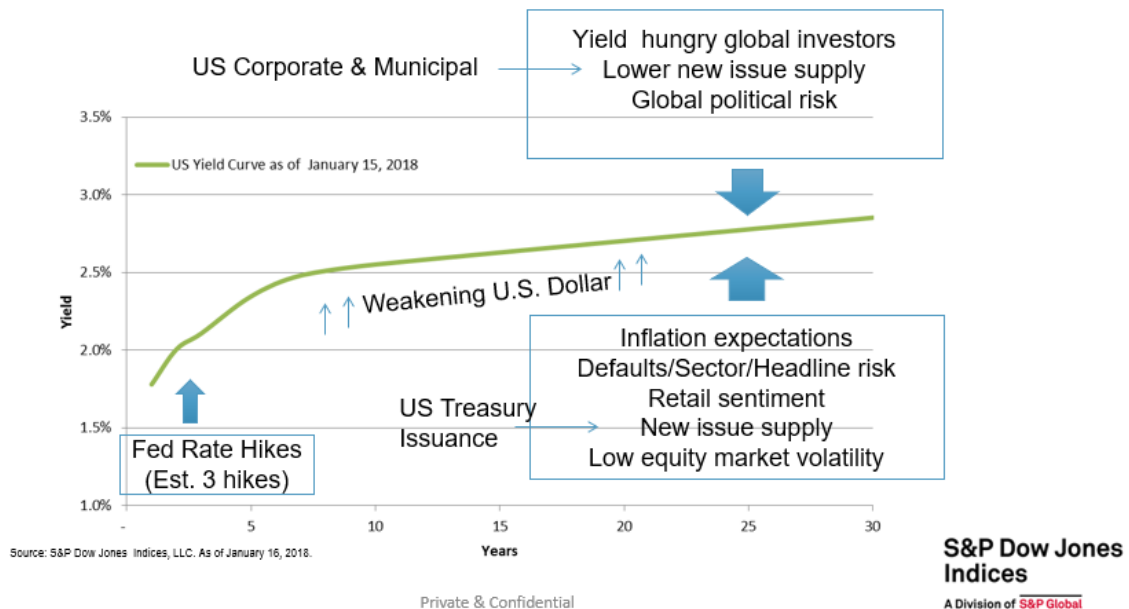


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**JR:** It's a lot of forces that are pushing up and down on the yield curve. Particularly, it's much more of a global market than it was when I was growing up in the bond markets. That has changed the dynamics of the forces on the yield curve. We still have geopolitical risk, we still have yield-hungry global investors, and still have over \$7.5 trillion in global debt that's still in negative yield territory. We've got supply issues and that impacts certain asset classes quite heavily, such as munis and corporates. You've got a weakening dollar, prospect of a continuing weakening dollar. You've got inflation. You've got uncertainty on the US treasury new supply. You've had historically low equity volatility up until just a few weeks ago, and you're starting to see volatility now. So that's driving the marketplace. You've got a change in the Fed in regard to personnel and you've got expectations of three rate hikes. The market seems to have built that in.

## Forces Buffeting Bond Yields 2018...



So there's a lot of factors that are pushing both up and down on the yield curve. We took a snapshot as of mid-January and yield curve is cheaper as we're talking now. It has done a shift as a result of inflation expectations. But that volatility has not been in place for quite some time and now we're seeing it. So I think the phrase "We live in interesting times" is not necessarily good for bonds. When bonds get exciting, that's not necessarily a good thing. People invest in bonds for predictability of cash flow and diversification, benefits, but excitement in the bond market is definitely not a good thing.

**Tom:** Absolutely. I think that as I look at this list there are a couple things I am looking at now that I think are influx a little bit and I want to get your take. Number one, the Fed rate hikes. The market has priced in three, they are telling us three. Do you think that there's risk, in your opinion, that they go more on this? That we see four? Do you think that's a legitimate risk we need to consider as investors?

**JR:** In my view, if we continue to see this equity market volatility that could hold us to three. If we still see inflation that's slightly lower than target -- it's actually above target at the moment -- or the market has built in their 2.1%, it's breakeven on inflation. If we see those kind of changes then perhaps we can see the fourth rate hike. I think the overwhelming pressure on the Fed is how do you settle down the markets when you have such dramatic volatility after a period of very low volatility?

**Tom:** That's a very good point. I think a lot of these issues that we're looking at that are pushing down on yields and also pushing up, people have a good handle on them. We're going to go over inflation expectations in a second.

The one thing I want to get your color a little more on is new issue supply. I think this is something that a lot of people don't think about when they're factoring in their outlook for bonds and where they think the bond market is going to go. Can you talk about new issue supply -- and we're talking about new treasury issuance -- and why that could be a potential upward force on yields?

**JR:** We've seen some supply, but there's big uncertainty now as to whether the Fed is going to increase issuing new bonds in this market as rates begin to rise. The issue that we have is China historically has been a buyer, they've slowed down as a buyer. Japan is still a buyer because of negative yields. That's supply-demand equilibrium that the bond markets are constantly seeking gets buffeted pretty hard by a new issue supply. Big open question mark, which drives uncertainty is what is the Fed going to do in regard to treasury issuance, particularly with this big question of how to fund infrastructure. That's a discussion that's happening today in the markets. We're all looking forward to hearing about that, and we're all believers that infrastructure needs to be improved, but that question of how that will be funded and what it means to new issue supply and what level the market finds an equilibrium at versus demand becomes a big question. Whenever you have uncertainty that also is a factor in pushing yields up.

**Tom:** If they come out and say they're going to be issuing a whole bunch of new bonds to pay for these programs and all the sudden we find that there's not the foreign demand we've come to expect, then we've got too much supply and not enough demand; we all know that's bad for prices and it will push yields higher. That's something off the radar I was very happy to see you dropped in here. People need to watch, I don't want them to get surprised by that as we move along throughout the year.

**JR:** With the weaker dollar, the foreign investor appetite begins to change.

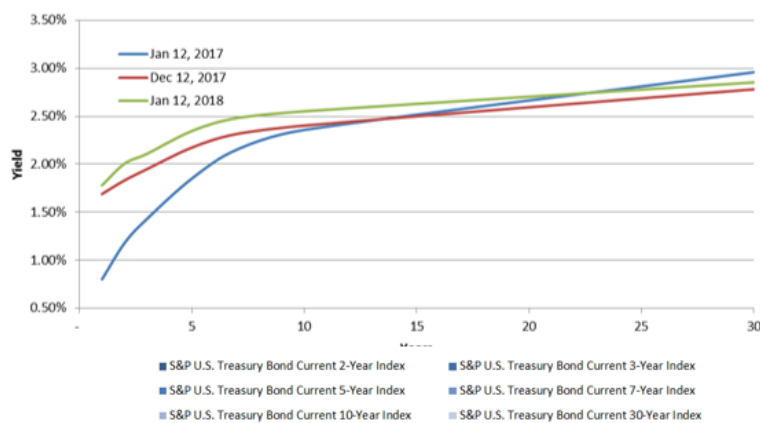
**Tom:** Absolutely. Shifting now to the yield curve. I talk a lot about the yield curve in the Sevens Report. This chart was taken a week or two before things got a little exciting in the bond market. But talk to me a bit about the yield curve and what you're seeing from a very experienced bond trader analyst.

**JR:** We're asked about what our expectations are about the yield curve and we have our hands tied to our ankles on this one because we're not supposed to make forward-looking statements. But when you look at the marketplace and the dynamics of what has been happening in the market, we can phrase certain expectations from the perspective of what your views are. So if your views are that rates are going to rise, we need to look at it from the perspective of at what point in time does the yield become attractive to those institutional investors who have been starving for high-quality yield. They have gone down the spectrum of risk both in junk bonds and other investments to get yield, and now yields are beginning to pop up everywhere. Do they need to have that risky debt or should they begin to consider these higher-yielding, higher-quality asset classes? From my perspective, you should be looking at a range as opposed to a spike. So if we see the 10-year at 2.85, people start talking about 3% pretty quickly. But at some point in time, that 10-year rate as it pushes toward a 3 becomes attractive. That equilibrium is something that we would look for in the market given the way investors, particularly institutional investors, have replaced fixed-income with high-dividend stocks, which are more volatile.

## U.S. Treasury Yields...

- Yield curve continues to flatten as Fed lifts the front via rate hikes (2-year yield topped 2% for first time since 2008) while the long end remains under 3%.

US Treasury Yield Curve



Source: S&P Dow Jones Indices, LLC. As of January 16, 2018. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results.

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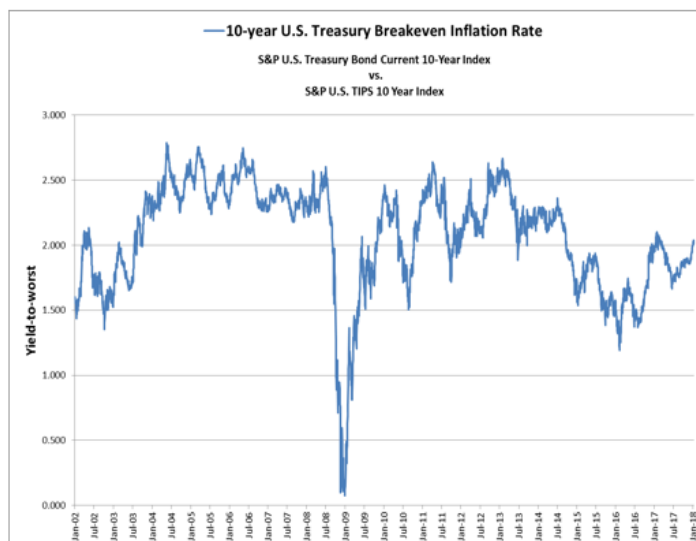
**Tom:** I'm not trying to put you on the spot here, so just say what you can. Do you think that in that scenario the outlook for junk debt has deteriorated over the last six months?

**JR:** The question I would phrase back to you is why buy junk bonds at the current yields when you can get quality assets that are yielding now what you've been looking for? You're only getting a couple hundred basis points on you high yield bonds. The question is, why? From that question, it's clear to me that high-yield bonds are in an overpriced territory and demand should be changing as a result.

**Tom:** You raise an interesting broader point that people have to think about. Let's say for argument's sake that we are in a rising rate environment, lower bonds for a while, and you're going to hear the fear mongers come out and talk about a bond bubble and a crash. At the same time, there's still a tremendous amount of demand for fixed income. It can be demographically driven too. As the largest demographic in our population – baby boomers – move fully into retirement. So there's going to be demand for fixed income. I think what you just got done discussing is a very important nuanced point that a lot of the changes will likely be within the fixed-income market as opposed to slosh one way or slosh the other. There's still going to be a tremendous amount of demand for fixed income going forward.

**JR:** I agree. When you look at the US population, particularly in my age bracket, who think need to start taking exposure off the table in regard to the equity market. What's waking me up through that is last week's volatility in the stock market. Volatility is good, there's nothing wrong with it. As an investor, I personally need to be able to make it through the volatility and get out the other side. So your point of diversification and the use of fixed income as an allocation tool or risk diversifier is spot on. My point is that the institutions that have been offering income asset classes have shifted away from fixed income into dividend stocks and other more volatile asset classes. With these yields they may be coming back to the bond market for higher quality and more stable assets.

## U.S. Inflation...



- The U.S. Treasury breakeven rate reached 2% on 1/2/2018 matching the Fed's target rate of inflation. Since then the rate has continued to creep up and as of 1/12/2018 is at 2.02%.
- With potential inflation on the horizon and the expectation of higher rates this year, Real Assets may be even more critical to diversification, inflation protection, and lowering correlations in investors' portfolios. The S&P Real Assets Bond Index returned 9.87%, while the S&P US Treasury TIPS Index returned 2.9% for 2017.

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**Tom:** Certainly makes sense. Now shifting to inflation, what we're showing here is a chart of the 10-year US Treasury breakeven inflation rate which is important because it's a market gauge of inflation expectations. It can do a better job of telling you what the market is expecting and pricing in for inflation as opposed to a CPI report which is looking backwards and – depending on people's opinion of it – either reflective or not reflective of actual inflation. The important thing here is that for the first time in a year and a half or so the 10-year breakeven is back over 2%, which is the Fed's target. JR, what is this telling you about the outlook for Fed policy and do you think that this breakeven being over 2% makes the Fed get more aggressive or do they say, "finally we've got it back where we want it, let's not kill it off just now"?

**JR:** The deeper question is are we measuring inflation the right way? I know my impact by inflation is much higher than what the Fed says it is.

**Tom:** I think everybody on this call thinks that's exactly right.

**JR:** The market is telling us that the breakeven rate of over 2% is there. That was the Fed's target. To me, I am definitely incurring higher than 2% inflation. Does that free the Fed's hand and keep them confident? I just don't know. The marketplace is very powerful and sets expectation that inflation is 2% or 2.1, that's a pretty strong indicator to me about what inflation is looking like at the moment.

**Tom:** Getting into the tactical implications of this, we're talking about real assets and the S&P Real Assets Bond Index, which had a great return at 9.8%. Can you explain to me what the Real Assets Bond Index is?

**JR:** It includes multiple asset classes, real estate being one and inflation being another and commodities such as oil and gold. The question mark that we are trying to solve with that is is there a better way to invest and still protect yourself from rising inflation? When you look at multiple asset classes that report

to be inflation hedges – like gold or real estate – they are included in that index. So it is a multi-asset-class approach to look at whether there is a way to invest as a hedge.

**Tom:** Does it hold debt oriented to those? For instance, does it hold debt of a gold miner, or will it actually hold gold?

**JR:** It holds futures of gold.

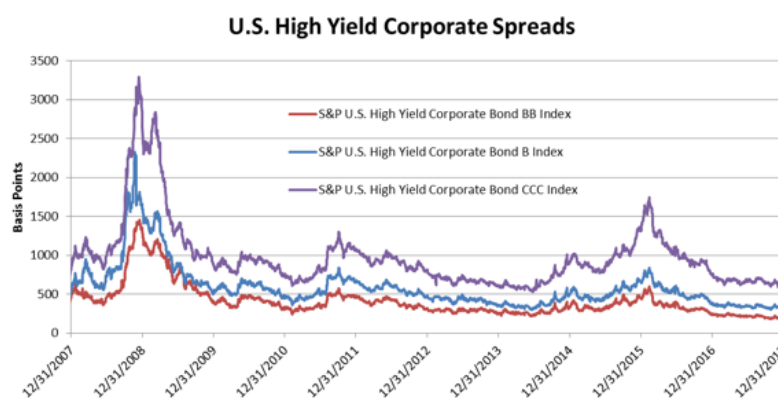
**Tom:** That makes sense. I think that's an important point. Real assets for the last decade have been, I don't want to say actively shunned, but they certainly haven't been in high demand as global central banks have tried to simulate inflation. But going forward, looking and saying, "What do I have from a real asset standpoint in my portfolio?" By real assets I mean hard assets, commodities, those sort of things that rise with inflation. Real estate, things you can touch. That could be more and more important especially when we're talking about inflation and a weaker dollar which just compounds it. It's something I don't think people have thought about for several years but it's something I'm talking about in the report and I think about as well.

**JR:** I think your point of inflation not being on investor mindset for a couple years is a little bit worrisome because now we're seeing it and it may be one of those points in time where tactical action might be needed sooner relative than to later.

**Tom:** I agree. I think that's maybe what the market was telling us with the tantrum and gyrations of last week. Moving along in the fixed income world, high-yield corporate bonds we discussed a little bit previously, but looking at spreads this is obviously a pretty important chart for a guy who really knows the bond markets. Can you explain what's going on here and why these spreads at 10-year lows are important to investors who are thinking about allocations?

## High Yield Corporate Bonds...

- The weighted average OAS of the S&P U.S. High Yield Corporate Bond Index (304 bps) is tighter than it has been since June 2007
- Spreads on "BB", "B", and "CCC" rated corporate credits are all currently at 10-year lows.



Source: S&P Dow Jones Indices LLC. Data as of January 12, 2018. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

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**JR:** When we're thinking about junk bonds, the first thing that I think about is being compensated for the risk. The risk is not just default. They're bonds, so they get impacted by rising rates. Risk is credit spreads widening and the risk is the prospect of – not necessarily the reality of – default. All that comes on top of the big question: can I sell it when I need to get out? Look at these tight spreads and it's apparent that this is a distorted market relative to the quality of the investment being made. To me, these are overpriced segments of the bond market. There's rationale why they are priced this way, but the reality is the prospect for spreads widening headline risk driving that is pretty high at the moment. I would call the high yield junk bond sector as elevated risk as a result.

**Tom:** So if you're looking through your holdings and you've made a good call over the years to go down the risk curve and get into some of these issues, it's worked. But at some point, there's always a time for change in every trade. If you're looking and you see clients have a lot of these or a decent amount of this exposure, maybe think about taking a look at that and seeing if you're still comfortable with it. As this chart is showing, you now own a market that historically is expensive relative to its higher quality peers. That's definitely something to think about.

**JR:** Agreed.

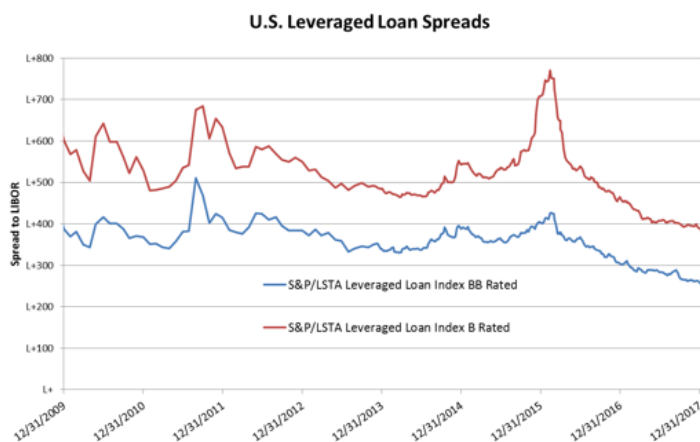
**Tom:** Leveraged loans. My first job on Wall Street, it actually was a temp job as an intern at Merrill's institutional fixed income desk was in the leveraged loan department. When I saw this it brought back good memories. Talk to me about leveraged loans and what is this telling you about the debt markets? Is this issuing any sort of caution sign to you?

**JR:** Senior loans or leveraged loans or bank loans – they go by a number of names – are in the junk category for sure. However, they are higher in the capital market structure. In other words, if there are fixed-rate, high-yield bonds issued by the same company, the senior loans get paid first in an event of distress. The floating rate aspect of senior loans gives the investor the opportunity to get a higher cash flow as rates begin to rise. That was a very simple statement but it's much more complicated than that. There are caps and floors built in to these borrowings that have been issued. It's important to note that leveraged loans are not securities, they are a loan that is syndicated out to the marketplace. So the senior loans have been available to the investor base through mutual funds for quite some time and are now available through exchange traded funds. The question marks that have to be addressed here are default rates. Defaults are low at the moment, lower than high-yield fixed-rate corporate junk bonds. The recovery traditionally has been higher. The question mark that has to be answered is am I getting enough yield out of floating rate senior loans to take advantage of that market? Look at the yield spread between senior loans and high-yield corporates. It's not that big of a spread. If you're worried about rising rates as a risk, shorter duration senior loans relative to high-yield corporate junk bond market may give you protection versus a rising rate environment. It's just one of those asset classes to monitor. It's an opaque market, which is one of the risks of that market. Traditionally, buying and selling senior loans has required as much as 25 days to settle. So it's still a very inefficient market. It's still an institutional market. The products that are available to investors now – exchange traded funds and mutual funds – have the burden of that liquidity challenge.



## Leveraged Loans...

- The market value of U.S. leveraged loans, as measured by the S&P/LSTA Leveraged Loan Index, is now over \$950 billion – up nearly \$600 billion from its 2009 low of \$358 billion.
- Rising LIBOR and strong investor demand for floating rate instruments allowed issuers to reprice \$560 billion of leveraged loans in 2017 resulting in the lowest spreads in over a decade.



Source: S&P Dow Jones Indices, LLC. As of January 16, 2018. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results.

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**Tom:** Part of the purpose of this call, and we'll get into it more in a second, is to provide or point people in the direction of some alternatives to consider. I think that's important if you see you have a lot of JNK – an ETF that tracks the high yield index – and you need that type of exposure and yield, maybe look into this leveraged loan market. It offers some additional benefits and you're not so heavy into something that is lower on the capital structure, which is important if things go haywire, but also isn't quite as followed and the spreads aren't quite as crushed down. It's a good place for people to investigate if it makes sense for you or your clients.

**JR:** The yield may not be that much between a fixed-rate high-yield and a senior loan, but the duration change is significant.

**Tom:** Let's get right into that. Rising rate environment, we've got several bullet points here. Take us through each one that you think. Is there a play book for a rising rate environment and are these all things we should be considering?

## Inefficiencies and Opportunities With an Emphasis on a Rising Rate Environment...

- Shorten duration?
- Bank loans (other floating rate instruments)?
- Munis?
- Active management?
- Other areas?

**JR:** If the expectation is on the long end of the curve, the rates are going to go up and you'll begin to see a more traditionally sloped yield curve. Duration management has been the traditional tool for fixed income investors. There's lots of products out there that can be used in this as a tactical option, whether it be ETFs with shorter duration or maturing targets. Mutual funds do the same. There are opportunities to shorten duration efficiently. We'll talk later about individual bonds, but from an ETF perspective or mutual fund, lots of different opportunities to shorten duration. The questions that I would ask is how much is it going to cost me to manage my money? How hard is it to manage a short duration portfolio? I certainly don't want to pay 90 bips for the privilege of parking my money.

**Tom:** Bank loans we covered in a previous slide. Other floating rate instruments that you think offer a viable alternative in a raising rate environment?

**JR:** Floating rate corporates currently have an incremental yield over floating rate treasuries. They're supposed to. Not quite as liquid as investment grade corporates but still an evolving marketplace. If you really want high quality then you go into US treasury floating rate, but the returns and yields are quite nominal still.

**Tom:** Munis. We talked in our pre-call about this. Considering the tax implications, and I haven't really watched the muni market that closely, do you think munis are a place to hide in a rising rate environment?

**JR:** Yes, I do. I think munis are historically cheaper than other alternatives like investment grade corporates and US treasuries. On average, investment grade munis have a 2 to 3 year shorter duration than investment grade corporates. They are higher quality. We are talking about an AA- on average versus a BBB+ average on investment grade corporates. The yield when you look at the tax exempt yield relative to corporate bond, when you look at it from a taxable equivalent yield at 37% tax rate you're earning 35 or 40 basis points more than corporate bonds even though corporate bonds have longer duration. You do have headline risk with munis and you do have a more illiquid market with munis than you do with corporates. The way I look at that yield is simply that liquidity premium because munis are

less liquid they certainly offer value in the marketplace. To me, munis are particularly in the belly of the curve and are currently historically cheap relative to their counterparts in the fixed income market.

**Tom:** That's an important takeaway as far as places to look. Active management. I think active management isn't something people really think about a ton in a fixed income market because they haven't been marketed as well as active management equity ETFs and things like that. Are you guys seeing that active management can create alpha versus laddering or passive bond investing in some of your research?

**JR:** We publish research called the S&P Index versus active. Really what that piece is is examining whether passive investing or active investing in a fixed income markets makes sense. When I joined the index business they sat me down and said, "We have this research we do and we're going to publish this on fixed income." I said, "Wait a minute, stop. You mean to tell me that active managers who are the best portfolio managers, have the best analysts, the best traders, the best access to data, the best systems, can't always beat a dumb index?" The reality is, that's true. They can't. When we see approximately 25% of the corporate bond fund managers beating an index during the last 12-month period that the study was released, that means the reverse is true. 75% of those active managers didn't beat an index. It raises questions.

The question I would raise here is timing. The active managers have to make a decision about what rates are doing and they have to begin to purchase securities. So there's a timing issue the index doesn't have. The index doesn't buy or sell anything, it's just data so there aren't purchase and transactions involved. That part of the study is very illuminating to me. You have to put those caveats on. The next part of that though is that if you beat an index one year, are you going to beat it the next? We call that persistence. We're finding that that's not the case. A good bond manager can beat the index, but may not beat it the next year. So now we're getting into manager selection risk.

How do you know that manager is going to beat the beta of the index the next year? We added to that report the Persistence Report. It's performance persistence. We put them into quartiles. If you're in the top quartile one year, it's not likely you're going to be in the top quartile the next. So it's a challenge. Now that you've got a bunch of low-cost products to invest in the beta of fixed income and based on the size of those products in the billions of dollars, it seems to me that the investment community is beginning to adopt a lower-cost beta exposure through these new products.

**Tom:** It makes sense. If you think about what you're finding in the fixed income market versus the equity market I'm sure there are some folks who can do it. As a broad sweeping data shows that often time indexing will outperform. I think that's something people are going to hear a lot more about as the bond market potentially becomes more volatile. You are going to start seeing active management marketed harder as performance discrepancies begin to shift.

JR, we've got about seven minutes left. I know we want to talk about individual bonds versus bond funds. People are going to have to really think about the different classifications. Take us through the pros and cons as you view it of what's out there in the marketplace.

**JR:** I do a study on transaction costs for fixed income. I look at two markets: the municipal bond market and the US corporate bond market. Quite frankly the reason for that is the beta is available to look at those markets because the US markets have a much higher degree of transparency than the rest of the

global markets. When you look at that data, it is very evident that when buying individual bonds of retail size, whether it be 100 bonds or 50,000 or 25 bonds or what have you, it's inefficient because of the markups. There's a markup markdown process that is going on. It's becoming much better because of the FINRA and MSRP rules that are intended to implement the rules.

## Individual Bonds vs. Bond Funds (ETFs or Mutual Funds)...

- Accessibility
- Liquidity
- Market stress
- Costs
- Price discovery



But the reality is, in this low-rate environment, if it costs you a hundred basis points to do the trade, that erodes a significant amount of your yield for that investment. That's just one way. If you have to sell a bond later, you incur the exact same erosion but the flip side – a markdown. And that if you can sell the bond. Now we're talking about liquidity. To me liquidity is, can I find the bond I need at the price I want it and when I want to sell it, can I sell the security at the price that it should be sold back? Those are good questions in regards to the bond markets. Not necessarily easy to do. I often use liquidity when referencing building a bond ladder. You've got to be able to find the bond that fits your investment objective whether it be quality, bond diversification, and make it fit on the rung of the ladder you need to fill. I think that individual bonds get costly, hard to find, and the liquidity becomes questionable at times. Individual bonds have that challenge.

I do a lot of public speaking and I just went over that same conversation that I have with audiences and I was pulled aside by an individual investor – that's not my target audience, by the way – he said he disagreed. I said, "Ok, tell me more." He said, "If I agreed that the yield of a bond that I'm getting and I agreed to it, let's say a 2% yield, that's what I'll get until the bond matures." I said, "Absolutely, that's what you'll get." "But what if the yield should have been 2.5 or 3? And what if you have to sell that bond before maturity?" Well life happens, right? People die, people go to college, people get married, people divorce, whatever the circumstances are. So that liquidity question does come up because even though you intend to buy the bond and hold it until maturity, you have to be prepared to sell prior to that and incur the liquidity risk and the markdown that will occur when you sell retail sized bonds.

**Tom:** Real quick because we only have about two minutes left before I have to let you go, are you concerned about liquidity in the ETFs if we get market stress where there's going to be individual bond liquidity problems in bond oriented ETFs?

**JR:** I think the ETFs have done a good job of explaining and demonstrating their depth of liquidity, and I'm referring to the larger ETFs. The big question is on the smaller ETFs. Over the last 10 years, ETFs have been tested very infrequently on this liquidity discussion. There is a layer of trading that does occur at the share level where the bonds don't actually have to be sold because there are people on the other side of the trade that still want to buy the shares. There are people selling the shares. So the sales transact without any underlying securities being sold on the secondary market. The real question is, if we have a severe selloff what will happen to that ETF? Very rarely has it been tested. The regulatory bodies have been pretty vocal in their examination or their studies on liquidity of these products. The reality is, there hasn't been that significant, long term selling cycle that affects ETF liquidity yet.

**Tom:** JR, we're out of time. I do want to say thank you very much for coming on with us. This has been fantastic insight. If people want to find you on S&P is there a website they can check out or a publication you would steer them toward?

**JR:** The website is SPIndices.com. It's a free access website.

**Tom:** Fantastic. We would love to have you on if you could fit us in again in the future. I think 2018 is going to be a pretty interesting year in the bond market and we're really appreciative of getting your insight. Thanks for squeezing us into your day.

**JR:** It was fun. Thank you for having me.

## Performance Disclosure

The S&P U.S. Treasury Bond Current 10 Year Index was launched on September 13, 2012, the S&P TIPS 10 Year Index was launched September 3, 2013, the S&P U.S. High Yield BB, B, and CCC indices were all launched December 15, 2016. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at [www.spdji.com](http://www.spdji.com). Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown.

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The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at [www.spdji.com](http://www.spdji.com) for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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