The Yield is Gravity

November 12, 2018

SUMMARY

- Rolling 12-month returns for the Newfound Multi-Asset Income strategy are currently ranked 47th of 49 since strategy inception in September 2013.
- We reflect upon research performed over the last several years that continually points back to one critical idea: yield matters.
- We rebuild this foundational idea from basic building blocks to establish that in the world of fixed income, mark-to-market returns often just push and pull future returns forward and backward in time.
- Using several fixed income ETFs, we demonstrate that yield remains the dominant force of returns over time, though price volatility and default risks are necessary components if we expect to earn anything above the risk-free rate.
- Like gravity, yield serves as a constant attracting force for portfolio returns and we believe the same holds true for our Multi-Asset Income strategy going forward.

NEWFOUND RESEARCH

November 12th, 2018

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While other asset managers focus on alpha, our first focus is on managing risk. We know investors care deeply about protecting the capital they have worked hard to accumulate. And as investors approach and enter retirement, managing "sequence risk" becomes even more important.

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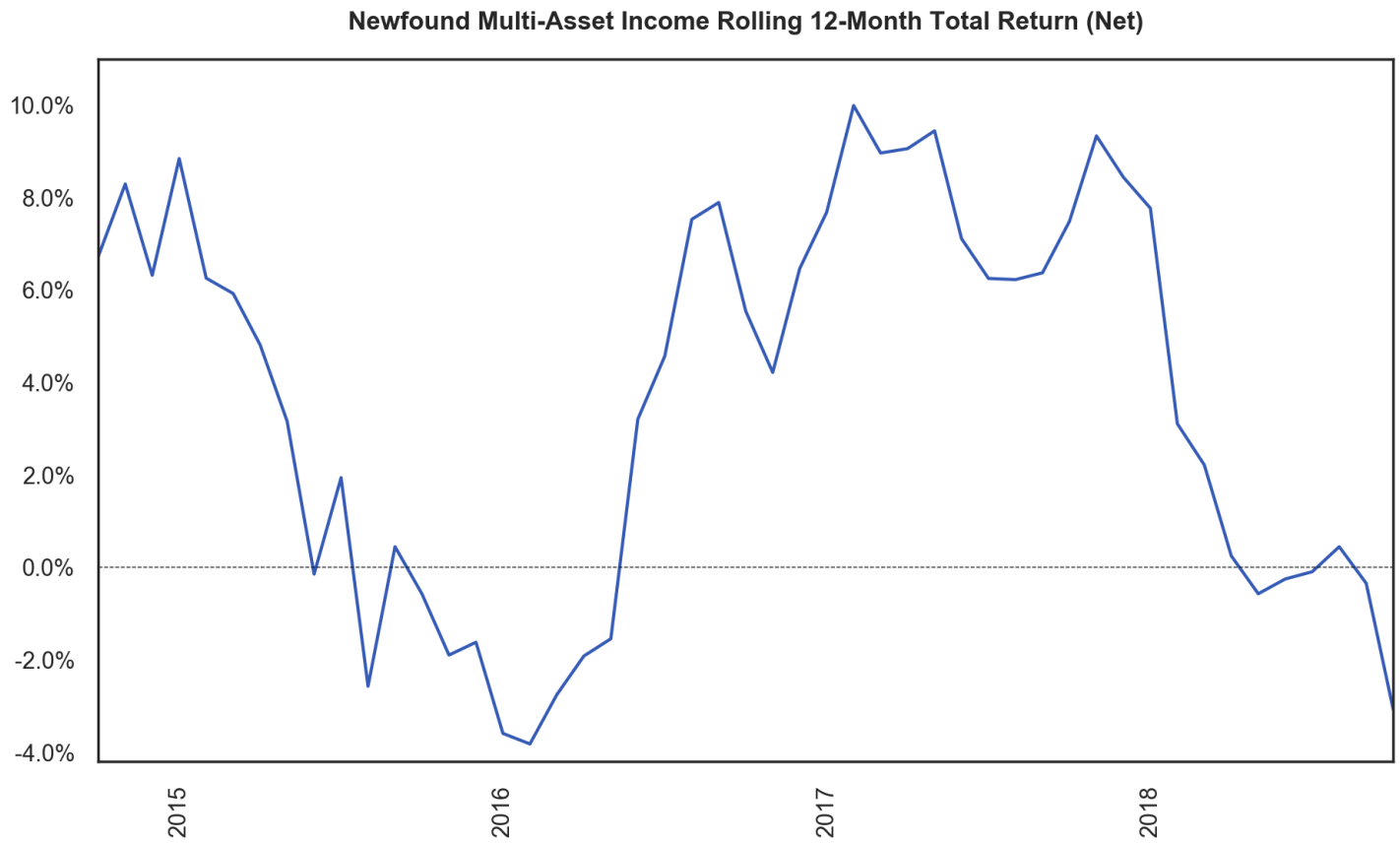
Newfound Research LLC | 425 Boylston Street, 3rd Floor | Boston, MA 02116 | **p:** 617-531-9773 | **w:** thinknewfound.com

1. Introduction

Figure 1



Source: Newfound Research. Returns reflect a hypothetical model index tracking the Newfound Multi-Asset Income strategy and do not reflect the results achieved by any individual. Net model results are shown net of Newfound's fees using Newfound's highest management fee of 50bps for licensing the Multi-Asset Income strategy, calculated daily (but not net of an advisor's fees, commissions, custodian's fees, and other fees that may apply for you). Actual fees may vary. Real-time tracking of the strategy index began on 9/14/2013. Money was first invested in the strategy on 11/27/2013. The index is assumed to be traded the first trading day after a rebalance is required. The execution price prior to 10/1/2015 was assumed to be the open price. On and after 10/1/2015, the execution price is an estimate of TWAP. You cannot invest in an index. Past performance does not guarantee future results. GIPs compliant returns are available upon request.

This is, currently, my least favorite graph. I've taken to staring at it almost daily.

This graph plots the trailing 12-month returns of Newfound's Multi-Asset Income strategy since it went live in late 2013. One thing is quite clear: every month since the end of last year has pretty much pushed me deeper into a trough of sorrow.

Now, we've spilled plenty of ink about the futility of analyzing short-term results. They are, for the most part, random and meaningless. That does not make me immune from their effects, however. "This isn't so bad," I tell myself. "Remember late 2015! That was worse! Plus, the math is funny: you've got a bunch of good months rolling off that make this seem worse than it is."

If I need a pick-me-up, I'll just look at the trailing 12-month returns of the Bloomberg Barclay's Aggregate or some investment grade bond index. Neither of which, I should point out, are even the benchmark for this strategy.

And, if all else fails, I'll try to psych myself up in a mirror with a good old chant of, "no pain, no premium!"

Clearly, I am not immune to the same behavioral foibles that haunt most investors. We can preach about the long run all we want, but my experience is that negative performance has a black-hole-esque effect on spacetime, creating a time dilation effect for all that get too close. Weeks become months and months become years and suddenly it feels like we will never escape the vortex.

It probably does not help that I am personally heavily invested in the strategy. Not only do I have significant implicit exposure to this strategy as an owner of Newfound, but as of the time of writing I have a not-insignificant portion of my own money invested in it as well.

Over the last several years, we have written quite a bit about fixed income, the role of yield, and the impact of rate variation. In July 2017, when the 10-year rate was bouncing off of multi-generational lows, we wrote *Bond Returns: Don't Be Jealous, Be Worried* wherein we argued that year-to-date gains were simply future yields realized early.

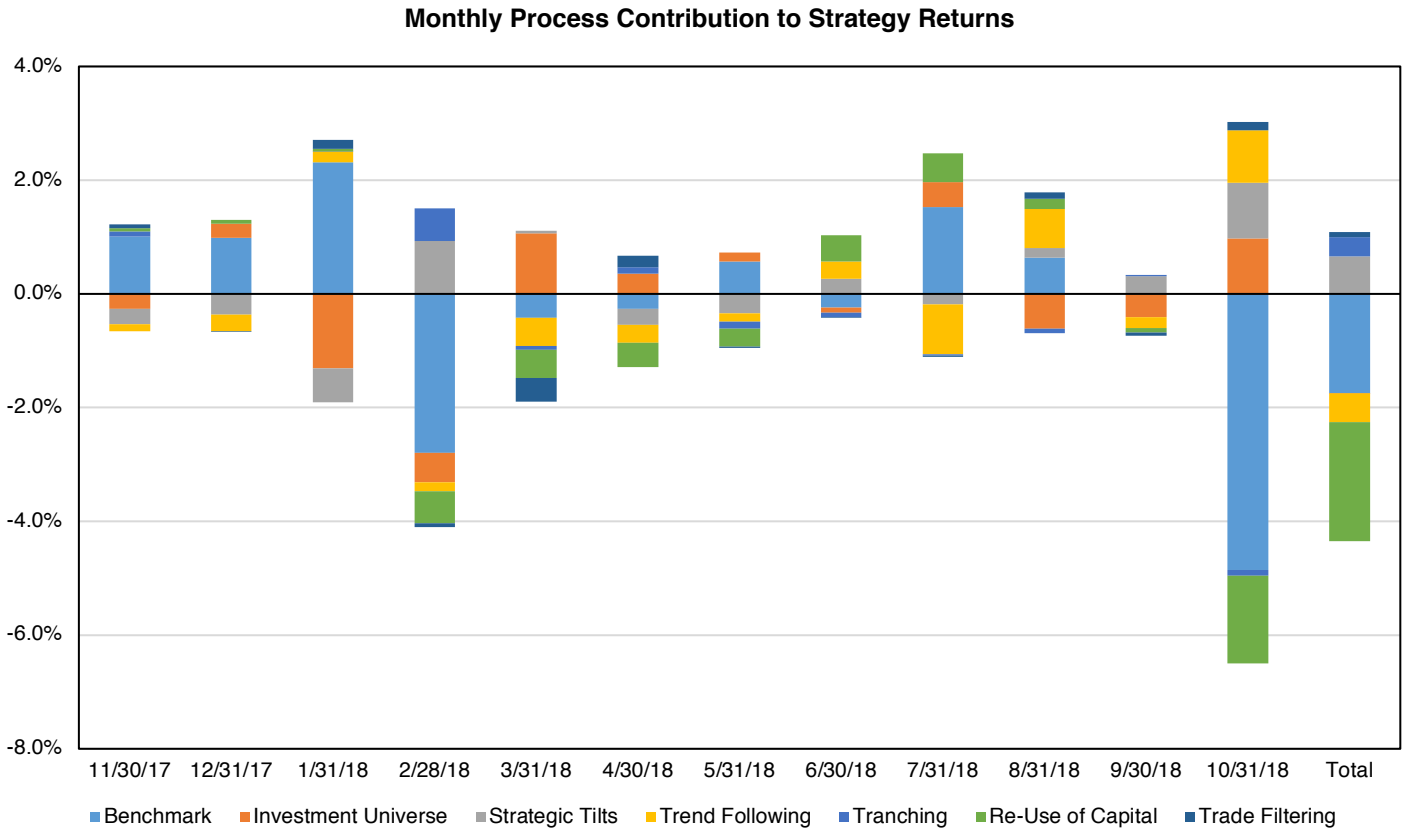
A few months later we explored the balance between coupon return and rebalance return in constant-maturity bond funds in *Should we celebrate rising rates?* We found that even when we assumed the rate increase over the next 40-years would be a mirror copy of the decline over the prior 40, coupon yield substantially offset rebalance returns.

Which then made us wonder: is the broadly accepted narrative about declining rates being a significant tailwind to bond returns correct? We explored this topic in *Did Declining Rates Actually Matter?* and found that starting coupon yield typically accounted for more than 70% of annualized total return over the declining rate period.

More recently, we penned *Mean Reversion and Bond ETF Returns* where we demonstrated that future fixed-income ETF returns could be modeled as a function of current yield and prior price returns, an indication that total return appears to mean-revert around yield.

Finally, we tackled performance of our Multi-Asset Income portfolio directly in July with a full process-based performance decomposition. Candidly, identifying the precise sources of return did little to assuage my consternation when almost every single step of our process (from universe selection to trend overlay to the re-use of available capital) has been a drag relative to the benchmark. Figure 2 demonstrates that month-to-month, no single piece of the portfolio construction was a systematic detractor. We know that tracking error cuts both ways, but saying "statistically speaking, this sequence of events is an outlier" is still an emotionally terrifying phrase no matter the probabilities.

Figure 2



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Alas, there is only so much catharsis in analysis. And if our philosophy of "no pain, no premium" is right, then this is the merry-go-round of psychological torture I signed up for. So, this commentary is not for you, dear reader: it is for me, to revisit every couple of years and remind myself that this too shall pass.

2. Pricing is Replication

The consistent thread of our research in fixed income has been that yield matters. In fact, yield(-to-worst) can be a terrific predictor of future annualized total returns for many fixed income portfolios.

The foundation of this concept is very simple.

Pretend, for a moment, that you are in the business of making 1-year loans in $100 denominations; i.e. you will loan some amount of money and in a year's time you expect to be repaid exactly $100 for that loan. The actual *amount* you are willing to loan is a function of your views on inflation, opportunity cost, and the borrower's credit worthiness.

As a simple example, assume that inflation is 0% and the 1-year U.S. Treasury rate is 3%. This means that you know you will not lend out any more than $97.09, as you would otherwise be better off simply buying a 1-year U.S. Treasury.

I walk into your office looking for a loan. You deem me fairly credit worthy and therefore only add 100 basis points as a "credit spread" to account for my default risk. With a total yield of 4%, you hand me $96.15, I hand you an I.O.U., and I walk out the door.

What we have constructed is a zero-coupon bond: a single bullet payment whose price is equal to the net present value of the future cash flow. In this example in particular, I sold you the bond for $96.15, which at maturity will amount to an effective rate of return of 4%.

The next morning you wake up to a surprise 100 basis point rate hike from the Federal Reserve. How much is your I.O.U. worth? Assuming my creditworthiness was not affected by the rate hike, had I walked in the door today you would have only bought my bond for $95.24. Thus, you are now underwater on the resale value of your I.O.U.

Does it really matter, though? Barring a default, you'll receive the $100. Therefore, as time passes, the value of your I.O.U. will approach $100. In fact, given that it now has to cover more ground over the same amount of time, the bond will appreciate in value at a *faster rate* than it would have before the rate hike.

It should be noted that the new, faster appreciation rate is not an exploitable feature. The rate will simply match the rate of return required for newly issued bonds. The immediate discount in price simply makes the market indifferent between new bonds and our existing bond.

Now let's consider the opposite scenario. What would have happened if you woke up to a surprise 100 basis point cut? The I.O.U. would now be worth $97.09 and suddenly you would be sitting on a profit in your position. As before, however, you will only receive $100 at the end of the day and the $97.09 will now appreciate at a slower rate to approach $100 in one year's time.

In the case of a rate hike, the present value in the bond was taken and pushed out into the future, effectively increasing our future rate of return. In the case of a rate cut, future returns were pulled forward to the present, effectively decreasing our future rate of return. In both cases, the return will ultimately be 4% (again assuming no default), regardless of the mark-to-market path taken to get there. We should point out here that the further in the future the zero-coupon bond matures, the smaller the annualized rate change needs to be.

What does this very simple example of zero-coupon bonds have to do with fixed-income portfolios? In the master's degree program Justin, Nathan and I all attended, a key tenet was "pricing is replication." To price a complex derivative, all we have to do is break it down into a portfolio of simple-to-price (and understand) building blocks.

Bonds with coupon payments, for example, can be replicated as a portfolio of zero-coupon bonds. A portfolio of coupon bonds, then, is simply a portfolio of portfolios.

Nowhere in this aggregation do we lose the fundamental concept that rate changes simply push and pull future returns forward and backward through time. This affects our mark-to-market results, but, barring default, if we hold to maturity it is the initial yield that ultimately dictates our return.

3. But Does the Center Hold?

Assumptions of *ceteris paribus* ("all else held equal") are useful to understand effects in isolation but are rather unrealistic in practice. For example, changes in interest rates may affect a company's ability to manage its debt, particularly if it plans on rolling obligations during a rising rate environment. In such a scenario, increasing rates can lead to decreased earnings levels, which may reduce reinvestment and therefore decrease future earnings growth rates.

Variations in rates can also affect the behavior of borrowers in other ways. For example, declining rates increase the prepayment risk in mortgage-backed securities as individuals look to refinance. Similarly, callable bonds may be called by the issuer so that debt can be issued at a lower rate.

We also assumed that bonds in our portfolio were held to maturity. This is certainly unrealistic in most ETFs that target a particular maturity profile. Even for those that do not – for example, broad U.S. aggregate bond exposure – turnover rates can still be very high due to issuance, deletion, and reinvestment of income. Turnover means that portfolios can realize mark-to-market gains.

Yet for all these potentially unrealistic assumptions, starting yield remains a surprisingly powerful predictor.

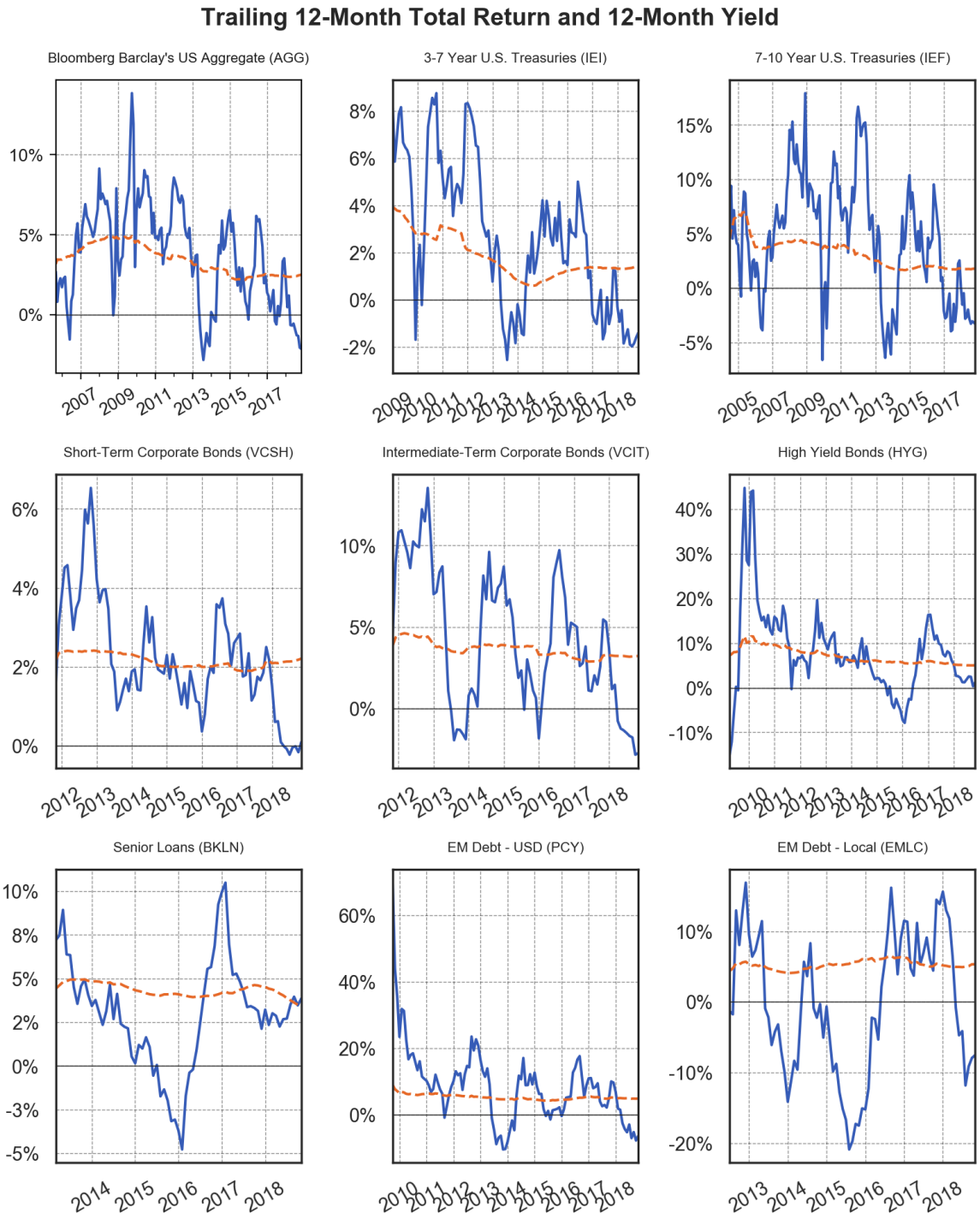
For example, we demonstrated in *Did Declining Rates Actually Matter?* that shifts in rates and harvested roll yield only explained approximately 25% of total returns in constant maturity U.S. Treasury indexes. The results from that commentary were specifically measured from the peak of U.S. interest rates in 1981 to what was the deepest trough at the time of writing (2012). Despite the effort to bias results in favor of a declining rate story, the tailwinds only accounted for a quarter of total returns.

In Figure 3, we plot the trailing 12-month return (solid blue line) and the trailing 12-month yield (dashed orange line) for a number of fixed-income ETFs, ranging from U.S. Treasuries to senior loans and emerging market debt. While yield is a poor predictor of short-term results, we see the same pattern repeat over and over: yield is an anchor which returns oscillate about.

This should not come as a huge surprise. After all, yield is the primary driver of return in almost all of these portfolios. Other drivers – such as shifts in interest rate and credit spreads, roll yield harvested from rates and credit spreads, currency

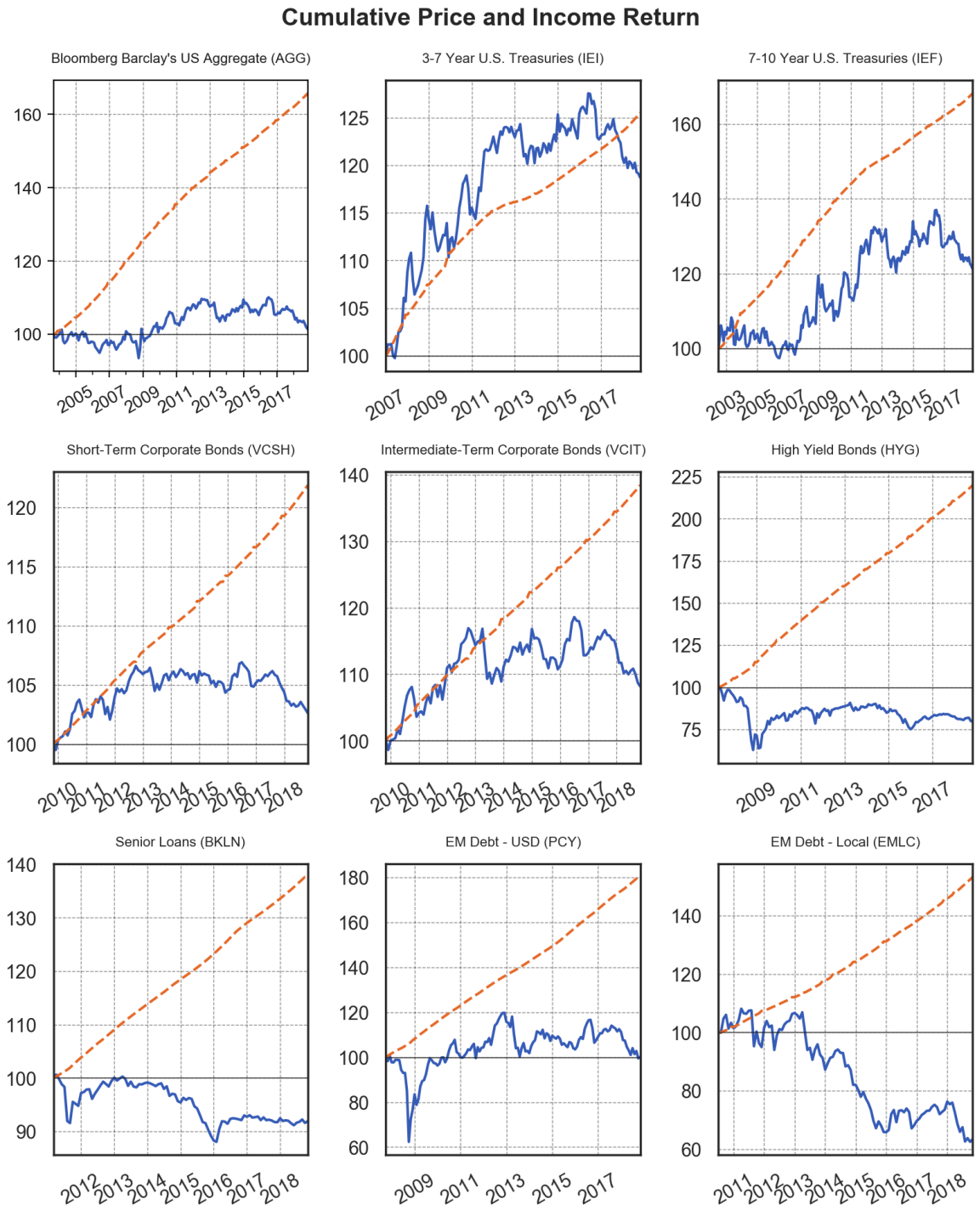
fluctuations, et cetera – can have a non-insignificant impact over the short run, but tend to be idiosyncratic contributions with respect to the consistency of yield. In Figure 4 we plot cumulative price return (solid blue line) and cumulative income return (dashed orange line) for the sample of fixed income ETFs. We can see in some cases that price return has been a significant positive contributor (e.g. 3-7 year U.S. Treasuries) and in some cases a significant detractor (e.g. local currency emerging market debt). When we look at the broad U.S. aggregate, however, we see that price return has had almost zero contribution (other than volatility) over the last fifteen years and the entirety of the return has been income-based.

Figure 3



Source: CSI Analytics. Calculations by Newfound Research.

Figure 4



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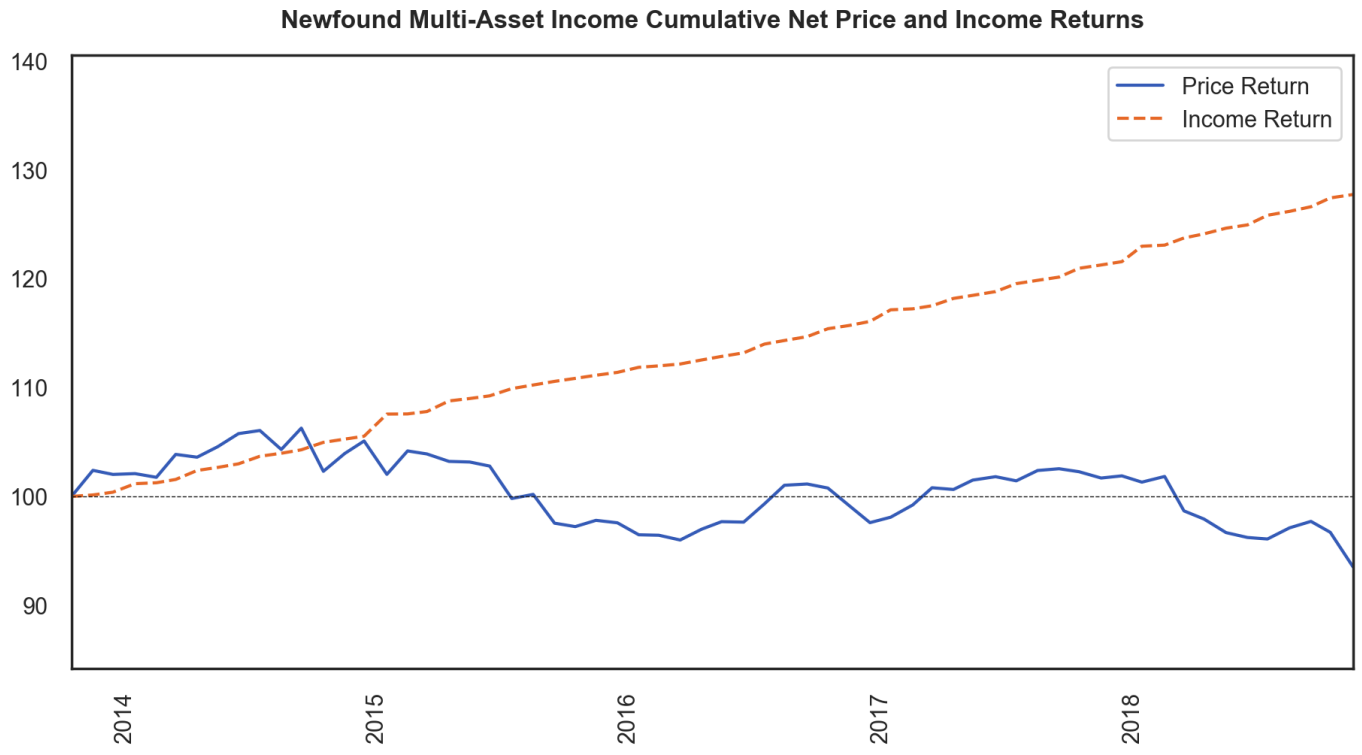
4. The Weight of Yield

The investment universe of Newfound's Multi-Asset Income portfolio is comprised of a global cross-section of high-income asset classes, ranging from the traditional (e.g. dividend equities, investment grade corporate bonds, high yield bonds, and REITs) to the non-traditional (e.g. convertible bonds, bank loans, option buy-write, and EM debt). We strategically tilt the portfolio towards those exposures that our models indicate offer the greatest risk-adjusted yield and overlay a trend-following process in an effort to clip the large left tail that can be associated with the returns of these higher yielding assets.

By composition, the portfolio tends to be heavily tilted towards fixed income (with the remainder in dividend equities, REITs, MLPs, and option-overlay strategies) and we generally expect approximately 80% of portfolio returns to be income-based with the remainder being driven by capital appreciation in the equity-like exposures.

From 9/31/2013 to 10/31/2018, the annualized net price return of the strategy was -1.3% while the annualized net total return (i.e. assuming the reinvestment of all income) was 3.5%. Income-based returns, then, actually exceeded 100% of total portfolio return over the period. To be clear, a negative price return is not an indication of poor strategy returns; as a point of comparison, the iShares US Core Bond ETF ("AGG") had a price return of -0.5% and a total return of 1.9% over the same period.

Figure 5



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If we believe the income is perfectly reliable then arbitrage arguments imply that the price return has to be volatile. Otherwise, we could borrow funds at the risk-free rate to construct a higher yielding portfolio and lock in the yield difference. Easy arbitrages are ephemeral and this is another example of *no pain, no premium:* the higher income is compensation for bearing higher price return risk (as well as recognition that the income component is always subject to being cut).

We would love to point to Figure 6 and say, "returns over the next 12-18 months will overshoot yield to compensate for the current undershoot." Unfortunately, that is simply not how it works. Despite the fact the 1-year total returns appear to oscillate around the 1-year yield in Figure 2, the behavior is not an iron-clad law of any sort. That would be far too exploitable and the only thing reliable about it is that it is unreliable.

Recall that in an efficient market the rate of return of our zero-coupon bond only increased to *match* the yield of new bonds, not overshoot them. Things get a bit more complicated with portfolios with additions, deletions, reinvestments, and reweighting, but we can clearly see in Figure 4 that cumulative price returns need not be zero-sum over any horizon.

The best we can say is, "the yield is gravity." Like gravity, yield serves as a constant attracting force for portfolio returns. And, like gravity, yield can be temporarily overcome by other forces. In Figure 7, for example, we can see the estimated contribution of common systematic factors over the last year to price returns for different exposures within our investable universe.

But barring being broken through tremendous effort (perhaps a multi-decade secular decline in rates is the equivalent of a 25,000 mile-per-hour escape velocity), we believe that yield remains a persistent and powerful force. This holds especially true in a portfolio where idiosyncratic price return effects may be partially offset via diversification in multiple risk factors. For the drag on returns that increasing interest rates, a strong U.S. dollar, and poor local currency international equity returns have been on many exposures, positive U.S. equity returns have helped offset in others.

We do believe that negative price returns have increased internal rates of return within the Multi-Asset Income portfolio, but only in a manner commensurate with the increase in underlying asset yields. We estimate that negative price returns in the last year have caused the average expected yield in our investable universe to increase by 60 basis points and we estimate that expected portfolio yield, with the risk-adjusted yield weighting and trend-following overlay, has actually increased by 164 basis points due to our strategic and tactical tilts.

That all said, we do believe that *some* exploitable behavior does exist. We believe that investors tend to under- and over-react, anchoring their beliefs to prior information and then exhibit herding characteristics. Our research suggests that mean-reversion may be exploitable and our process seeks to take advantage of that fact by strategically tilting the portfolio towards exposures with higher risk-adjusted yields in effort to exploit relative value opportunities. We also employ a trend

following process in effort to take advantage of autocorrelation effects we believe exist due to the misbehavior of investors, particularly in the tails of the return distribution.

The carry and trend factors themselves often exhibit stochastic performance, though we believe their behavioral foundations allow them to persist over the long-term. Any active strategy will necessarily underperform over some short-term periods. How long any given bout within those factors will last, I cannot tell. By following a systematic process, our goal is that the strategy can capitalize on these factors as they exist in the high-income asset classes.

Figure 6

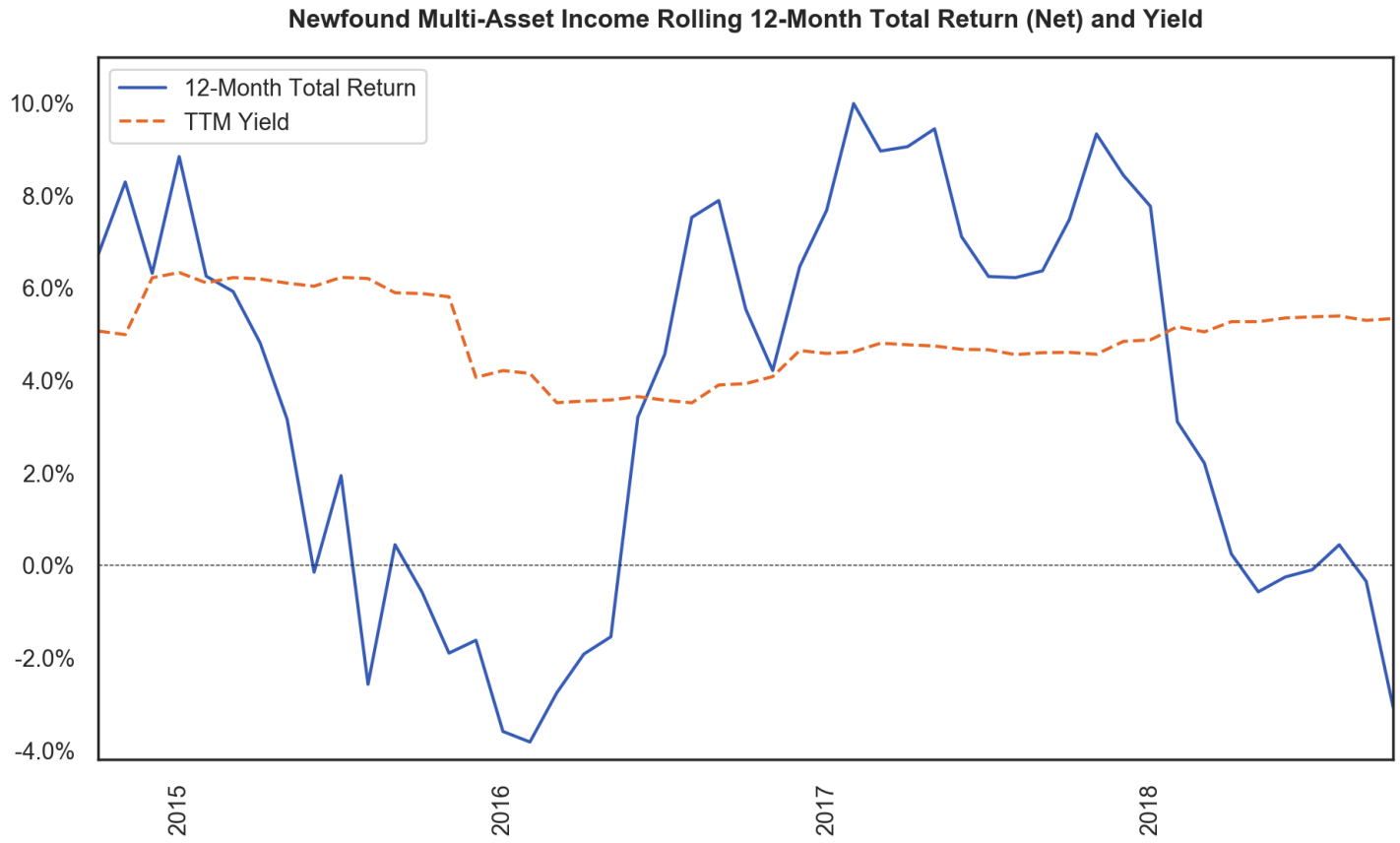

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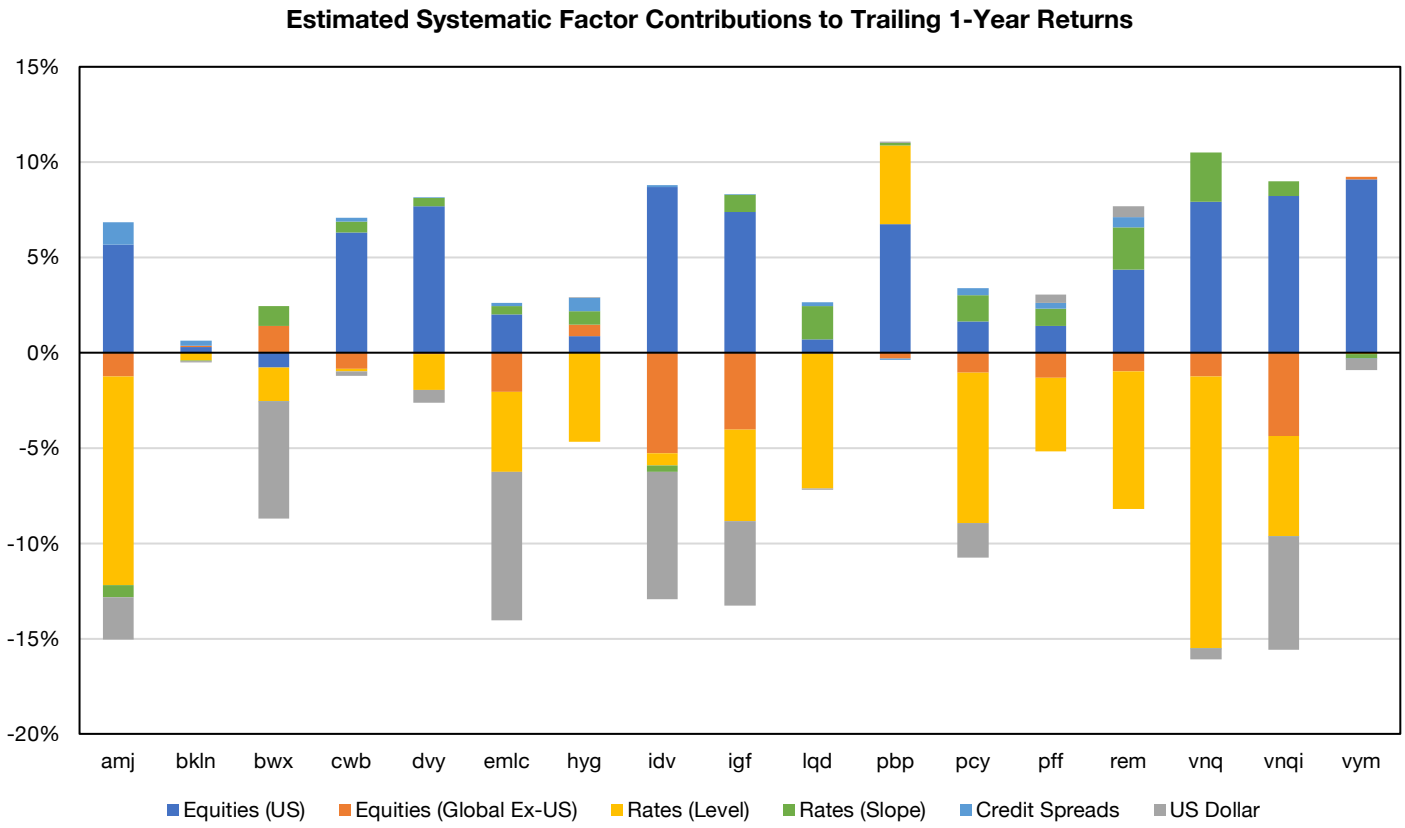
Figure 7



Source: Federal Reserve of St. Louis, MSCI, and CSI. Calculations by Newfound Research. The U.S. equity factor is excess returns of the S&P 500. The Global Ex-US equity factor is the MSCI World Ex-US (Net; Local Currency) index returns in excess of the S&P 500 returns. Interest rate level is the change in 10-year U.S. Treasury rate. Interest rate slope is the change in 10-year minus 1-year U.S. Treasury rates. Credit spreads is change in the ICE BofAML US High Yield Master II OAS Spread. US Dollar is change in the return of the trade-weighted U.S. dollar index.

5. Conclusion

In many income generating assets classes, the yield is the gravity that draws total returns over rolling, annual intervals. Changes in yield often result in either pushing returns into the future or realizing them up front. The price return adjusts accordingly.

While this is only an approximation when things become more complicated than static portfolios of bonds, it is still a good framework for examining performance.

Our Multi-Asset Income strategy has experienced some headwinds over the past year, much like many fixed income asset classes. However, with higher current yields, we believe that the gravitational attraction of yield could be a boost going forward if potential detractors in applied active styles are managed.

While a declining and negative 12-month trailing return is rough to look at, it is an indication that the potential for a long-term premium exists. By employing a fully rules-based process, we hope that the strategy will be poised to exploit the long-term premiums of the factors that underpin the framework.

I may lose sleep over short-term performance results, but knowing that there is a system in place gives me assurance that, even though the future is uncertain, I don't have to compound the results with my own biased decisions.

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