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Everything You Always Wanted to Know About (Getting Beyond) the Agg, But Were Afraid to Ask

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The Barclays Aggregate Bond Index: A Venerable History, an Enviable Track Record

In 1973, soon after actor/director Woody Allen released the film that inspires our title, Art Lipson and other colleagues from the venerable boutique investment bank Kuhn Loeb & Company developed what many consider to be the first bond index. Within weeks of its release, Salomon Brothers introduced a competitor index, and many others followed in time, but it was the original Kuhn Loeb index that would come to dominate the industry. After Kuhn Loeb's merger with Lehman in 1977, the index was renamed the Lehman Brothers Aggregate Bond Index, but it came to be known more colloquially in the industry as simply "the Agg." The index was taken over by Barclays Capital in 2008 in the wake of Lehman's collapse, and renamed yet again as the Barclays Aggregate Bond Index.

The Agg, as a U.S. market-capitalization-weighted and investment-grade fixed-income index, can be thought of as a passive "taker" of debt issuance. That is, it is the timing and volume of fixed-income issuance that determines the duration profile and issuer concentration of this most popular benchmark. As we have argued in these pages and elsewhere, this feature of the index presents some special challenges to fixed-income investors today.[1] Specifically, the sector composition of the Agg and its duration (interest rate risk) profile have changed markedly in the wake of the 2008 financial crisis. Since that time, we have been living in a world in which Treasuries come with minimal coupons and newly issued agency mortgages also provide extremely low yields. Even credit markets have exhibited this inexorable trend toward lower coupon levels and increased duration, in large part as a result of extremely dovish US monetary policy since the onset of the global financial crisis.

A wide-ranging debate has been taking place in the fixed-income investment community as to how best to respond to such asymmetric risks and rewards. In a recent contribution to this conversation, we used scenario analysis to examine three different portfolio strategies for navigating an environment of low yields and potentially rising rates.[2] Here we expand upon our prior analyses by careful examination of the drivers of the Agg's historical performance, as well as the challenge of asymmetric risk/reward opportunities in the benchmark today. Finally, we expand upon our proposed solutions to the Agg's current challenges, specifically by developing the concept of an alternative beta, or a "Balanced Solution," to the Agg.

Before presenting the popular arguments critical of the Agg today, it is worth analyzing its historical performance. Figure 1 shows the cumulative[3] return of the

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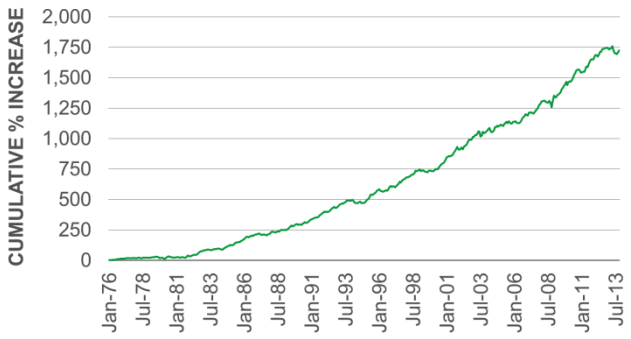
1 Mesrour, Sami. "Bonds, Benchmarks, and the Challenges Posed by Financial Repression," in By The Numbers: Perspectives on Capital Markets, BlackRock Inc., August 2012.

2 Laipply, Stephen, et. al., "Three Key Portfolio Strategies for Managing Rising Rates: A Scenario Analysis," in By The Numbers: Perspectives on Capital Markets, BlackRock Inc., March 2013.

3 Lehman started publishing performance data in 1986 and backfilled the monthly performance data for the main index and some of its sub-components going back to 1976.

Agg going back to 1976. Many investors associate the Agg's strong performance track record with a persistent rally in interest rates that started in 1981.

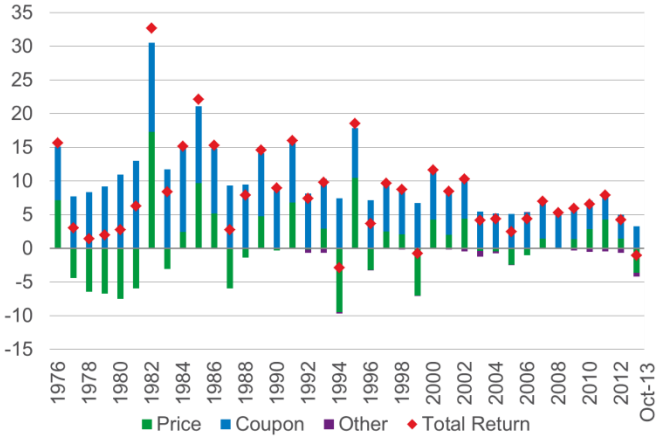
Figure 1: CUMULATIVE TOTAL RETURN OF THE AGG



Source: Barclays POINT, BlackRock

A simple performance attribution, however, portrays a different story: while the Agg's annualized total return of 7.94%, from January 1, 1976 to October 31, 2013, is quite impressive from an absolute return basis (annualized risk was 5.52% for the period, making the risk-adjusted return ratio 1.44), comparatively little of this return can be ascribed to bond price movements. Indeed, if we divide the Agg's total return into its contributions from coupon, price change and other returns,[4] we quickly see that the coupon return has contributed the vast majority of the Agg's total return since 1976. In fact, the annualized coupon return of 7.92% accounts for most of the Index return historically, with the annualized price change return of 0.44% constituting much of the remainder.[5] Moreover, the significance of coupon return also provides for a "margin of safety" to help mitigate fixed-income price volatility. As we show in Figure 2, the Agg has had only three years of negative total returns (1994, 1999, and 2013 year-to-date) going back to 1976, which is largely because its more significant coupon return has muted the Index's moderate "price change" return.

Figure 2: THE AGG'S TOTAL RETURN, BY AREA OF CONTRIBUTION (%)

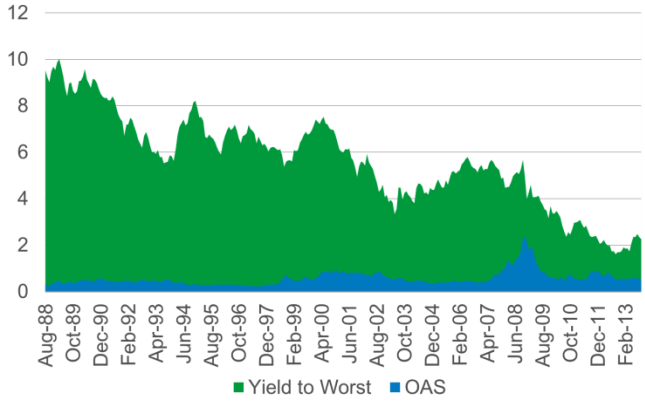


Source: Barclays POINT, BlackRock

What's in a Coupon? The Agg's Total Return Drivers of Duration and Spreads

In August 1988, Barclays started publishing "option adjusted spread" (OAS) and "excess returns." The OAS is the constant spread over the Treasury or LIBOR curve needed to price the expected cash flows of a fixed-income asset. We view OAS as a proxy for the expected return on an asset net of its exposure to interest-rate changes. As illustrated in Figure 3, OAS has been negligible relative to the Agg's yield-to-worst, which implies that most of the Agg's yield is simply a compensation for bearing interest rate risk.

Figure 3: THE AGG'S SPREAD AND TREASURY CONTRIBUTION TO YIELD-TO-WORST (%)



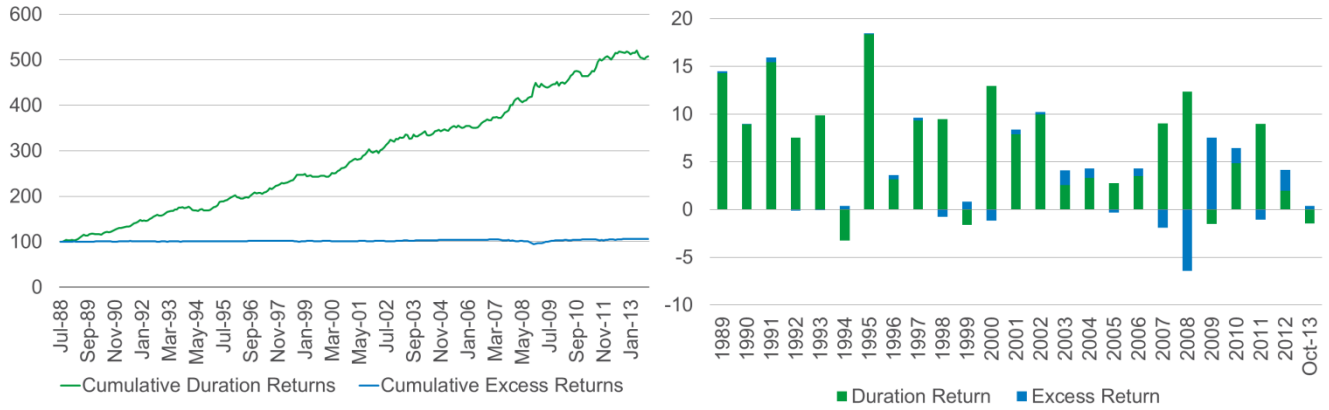
Source: Barclays POINT, BlackRock

Using the published excess returns (returns net of interest-rate hedge), it is possible to quantify how much US Treasury or interest rate risk exposure can explain the Agg's historical performance. In particular, we separate the return on a fixed-income asset into two primary factors: one representing the embedded exposure to a portfolio of key-rate-duration-matched US Treasuries, while the other represents "excess return," capturing everything left over. Historically, the cumulative "excess return" component of the Agg's performance has been fairly negligible as a contributor to cumulative total returns (see Figure 4).

4 The category of "other returns" primarily relates to bond paydowns, which represented a -0.17% total return loss for the period under consideration.

5 These numbers are obtained from Barclays' POINT Agg Return Attribution calculations, and rounding and compounding explain why price, coupon, and other do not sum to total return.

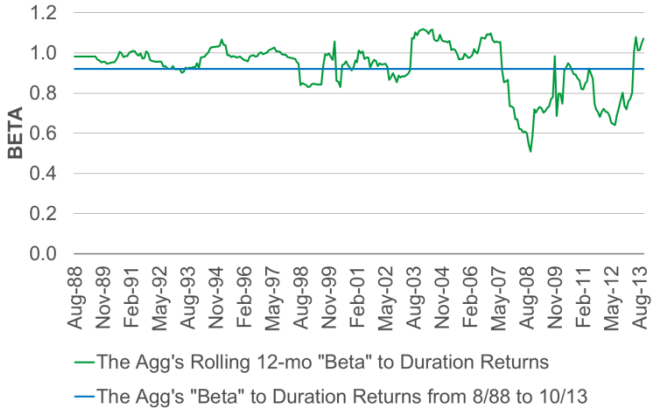
Figure 4: PERFORMANCE DECOMPOSITION OF THE AGG INTO DURATION AND EXCESS RETURN (%)



Source: Barclays POINT, BlackRock

To build upon the concepts of excess and duration returns, we calculate the Agg's total return "beta" to interest rate risk exposure by regressing the Agg's return on the return for a duration-matched position in 10-year Treasury note futures. As Figure 5 indicates, the Agg's long-run "beta" to interest rate risk has historically been 0.89 and has been the primary contributor to performance over almost every 12-month rolling period studied. If interest-rate risk has historically driven the Agg's returns, it suggests one could appropriately conclude that the 32-year bull market in rates has benefitted the Agg investor, a hypothesis that we illustrate in Figure 5. However, as noted previously, the coupon return accounts for the significant majority of the Agg's total return over this period, while changes in bond prices have only added 0.44% per year since 1976. In essence, while there has been a "bull market tailwind" for the Agg, the magnitude of its impact is often greatly overemphasized.

Figure 5: LONG-TERM AND ROLLING BETA OF THE AGG'S TOTAL RETURN TO ITS DURATION RETURN



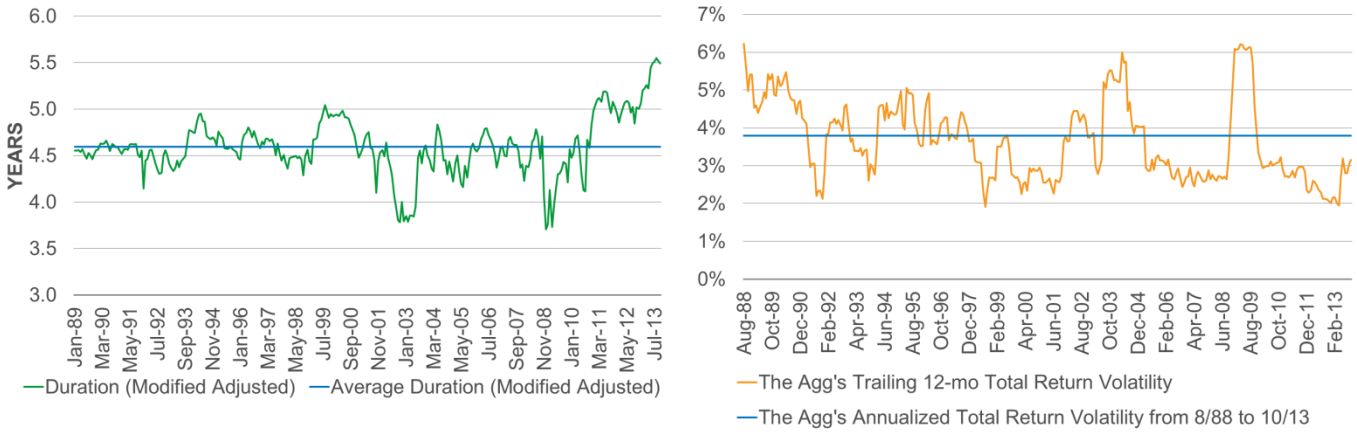
Source: Barclays POINT, BlackRock

Assessing Today's Agg: The Risk/Reward Tradeoff of Duration Exposure

The Agg's interest rate risk – as measured by duration – has recently extended well above its long-term average[6], while the overall total-return volatility of the Index has not fallen materially below its long-run average (see Figure 6). Formulated another way, the Agg's "risk" is fairly close to its long-term average, but the reward that can be expected to derive to investors tracking the Index, as approximated by its yield-to-worst, currently stands at a significant spread below its long-term average, as shown in Figure 7. Not surprisingly, the falling interest rates witnessed in recent years ultimately lead to falling yields, and therefore lower forecasted expected returns.

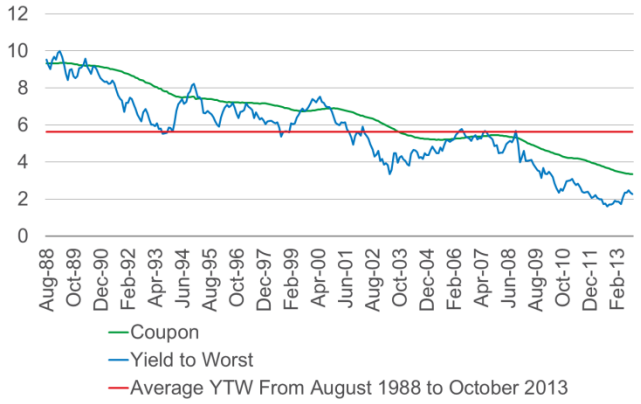
6 Part of the rise in the Agg's duration stems from MBS extension since late 2009 as well as some degree of long-duration issuance in the corporate sector. MBS started extending when refinancing became very constrained on both the lenders and the borrowers side, and was further accentuated by quantitative easing. Such dynamics matches the two-step extension in Agg's duration that we notice over the past four years in Figure 6.

Figure 6: DURATION AND VOLATILITY OF THE AGG



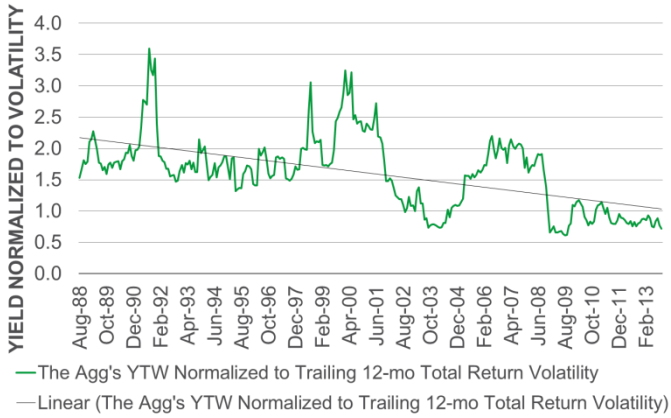
Source: Barclays POINT, BlackRock

Figure 7: YIELD-TO-WORST AND COUPON RATE OF THE AGG (%)



Source: Barclays POINT, BlackRock

Figure 8: LONG-TERM AND TRAILING OF THE AGG'S YIELD TO VOL RATIO[7]



Source: Barclays POINT, BlackRock

As discussed above, the Agg's weighted-average coupon, which determines its average index yield, has been the dominant contributor to overall performance since 1976. We can think of the Agg's overall yield as a proxy for the potential coupon return an investor could expect going forward. To measure the Agg's cushion for absorbing backups in yield levels, we normalize the index yield by the trailing historical return volatility. Higher normalized yields suggest greater ability to withstand interest rate shocks.

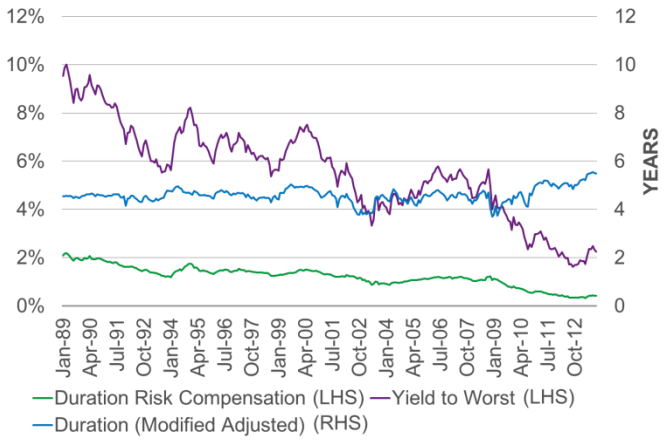
Figure 8 displays the Agg's historical volatility-normalized yield. Using trailing 12-month total-return volatility, the Agg had a vol-normalized yield of 2.0 as recently as September 2007. Roughly speaking, an investor in the Agg received a yield substantial enough to withstand a 2-standard-deviation drawdown that year. As of October 2013, however, the Agg's normalized yield had declined to 0.70, which is near its all-time lows. Thus, current Agg-based investors have a very thin cushion relative to historical experience that can only protect against very mild price volatility.

As a further example of the shrinking return profile of the current Agg portfolio, we can look at compensation (in terms of yield) for bearing the Agg's overall duration exposure. In particular, Figure 9 plots the ratio of the index duration to the overall index yield for the Agg since 1989. In 1989, the compensation was close to 2% per year of duration. As of October 2013, the duration compensation had drifted below 0.5% and, similar to the normalized yield described above, was plumbing historical lows. Since 1989, the long term average duration compensation is about 1.2% of yield per year of duration risk. The yield on today's Agg is 2.25%.[8] Historically, this level of yield would be sufficient to compensate an investor for bearing 1.9 years of duration exposure, less than half of the current Agg duration of 5.5 years.

7 The Yield-to-Vol Ratio is defined as the Agg's yield divided by its annualized 12-month trailing total return volatility.

8 As of October 31, 2013, according to Barclays.

Figure 9: HISTORICAL DURATION COMPENSATION OF THE AGG

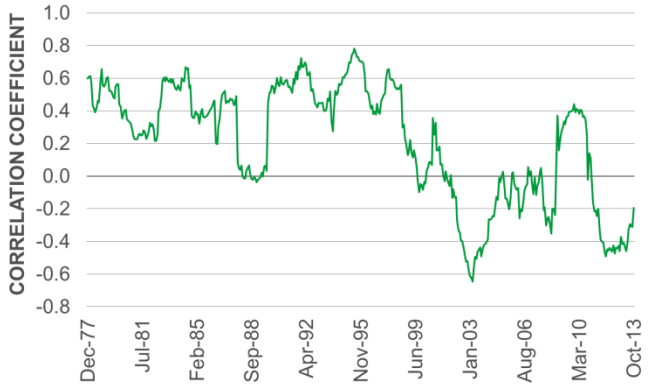


Source: Barclays POINT, BlackRock

Diversification Trumps Other Considerations: The Flight-to-Quality Factor

Low absolute yield levels and the historically low levels of compensation being awarded to duration risk might portend reduced demand for fixed-income assets, but many investors use fixed-income assets to diversify their risky, or equity-like, asset exposures. To these multi-asset investors, assessing the risk/reward tradeoff of owning fixed income on a standalone basis perhaps holds less weight than their diversification benefits across a portfolio. Historically, the Agg's returns have been only modestly correlated (and more recently negatively correlated) to equities, as displayed in Figure 10. Equities typically underperform during recessionary/deflationary and flight-to-safety market events. Historically, the Barclays Agg has helped cushion diversified investors from periods of significant equity drawdowns (as displayed in Tables 1 and 1a).

Figure 10: ROLLING CORRELATION OF AGG RETURNS VS. S&P 500 (SPX)



Source: Federal Reserve Economic Data, BlackRock

Table 1: PERFORMANCE COMPARISON OF THE AGG AND THE SPX DURING 20 WORST MONTHS FOR EQUITIES SINCE 1976

20 WORST MONTHLY EQUITY DRAWDOWNS (January 1976 to October 2013)		
DATE	S&P 500 RETURNS	BARCLAYS AGG RETURNS
October-87	-21.8%	3.6%
October-08	-16.9%	-2.4%
August-98	-14.6%	1.6%
September-02	-11.0%	1.6%
February-09	-11.0%	-0.4%
March-80	-10.2%	0.1%
August-90	-9.4%	-1.3%
February-01	-9.2%	0.9%
October-78	-9.2%	-1.4%
September-08	-9.1%	-1.3%
June-08	-8.6%	-0.1%
January-09	-8.6%	-0.9%
September-86	-8.5%	-1.0%
November-87	-8.5%	0.8%
May-10	-8.2%	0.8%
September-01	-8.2%	1.2%
November-00	-8.0%	1.6%
July-02	-7.9%	1.2%
November-08	-7.5%	3.3%
June-02	-7.2%	0.9%
Average	**-10.2%**	**0.4%**
Median	**-8.8%**	**0.8%**

Source: Federal Reserve Economic Data, BlackRock

Table 1a: AVERAGE AND MEDIAN AGG RETURNS DURING NEGATIVE SPX MONTHS SINCE 1976

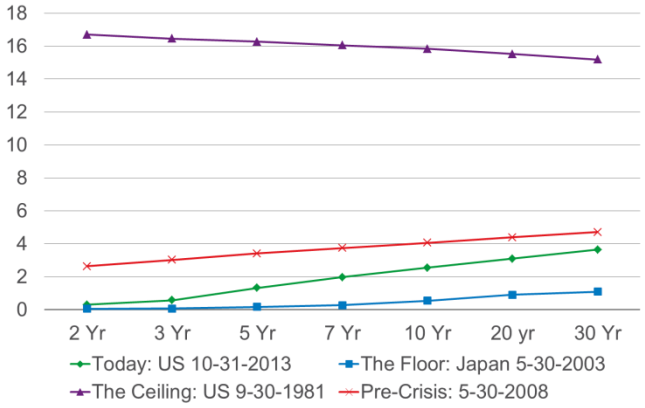
S&P 500 MONTHLY RETURNS <0% (JANUARY 1976 TO OCTOBER 2013): 179 OUT OF 452 MONTHS		
	S&P 500 RETURNS	BARCLAYS AGG RETURNS
Average	-3.4%	0.3%
Median	-2.3%	0.5%

Source: Federal Reserve Economic Data, BlackRock

Quantifying "Asymmetric" Risk: How Much is Equity Diversification Worth?

Although the 32-year bull market in interest rates has had a moderate impact on the Agg's total returns, this reduction in interest rate risk compensation has significantly reduced the value of the Agg's flight-to-quality insurance. As a thought experiment for the current state of the yield curve, we take Japan's yield curve from May 30, 2003 as a yield-curve floor, and the US yield curve from September 30, 1981 as a ceiling. We take these yield-curve bounds to represent the maximum "tail risk" upside and downside for an Agg-based investor. Figure 11 displays all three curves, while Table 2 reports returns to current Agg investors if the US yield curve suddenly shifted to either extreme. If the US has a deflationary scare on par with Japan in 2003, the upside for an Agg-based investor may be close to 10%. Conversely, if the US has a stagflation scare that ultimately leads to an interest-rate environment on par with that seen in 1981, the downside for the same Agg-based investor stands at -75%. Finally, and as a more likely base case in our view, if the US drifts back to an interest rate environment comparable to May 2008, the Agg-based investor may face a downside of approximately -8%.

Figure 11: US TREASURY YIELD CURVE PLACED IN A HYPOTHETICAL GLOBAL RATE CONTEXT (%)



Source: Barclays POINT, BlackRock

Table 2: HISTORICAL QUANTIFICATION OF ASYMMETRIC RISK IN THE AGG (%)

	THE AGG'S KRDs	"FLOOR" P&L	"CEILING" P&L	"PRE-CRISIS" P&L
	10/31/2013	5/30/2003	9/30/1981	5/30/2008
KRD 02yr	0.9	0.2	-14.3	-2.0
KRD 05yr	1.4	1.6	-20.9	-2.9
KRD 10yr	1.3	2.7	-17.8	-2.0
KRD 20yr	1.0	2.2	-12.5	-1.3
KRD 30yr	0.9	2.3	-10.4	-1.0
Total (no convexity)		**9.1**	**-75.9**	**-9.2**
Total (w/ convexity)		**8.3**	**-68.7**	**-8.6**

Source: Barclays POINT, BlackRock

SUMMARY POINTS

The Agg's coupon return has accounted for the majority of the index's historical performance.

Spread risk, as measured by "excess returns," has had very little impact on the Agg's performance.

Both the Agg's coupon and yield are near its all-time low implying low expected returns.

The Agg's yield normalized for return volatility, representing the "cushion" for Agg investors against bearing the risk of the index, is near its all-time low.

Duration compensation, an investor's yield per unit of interest rate risk, is near its all-time low as well.

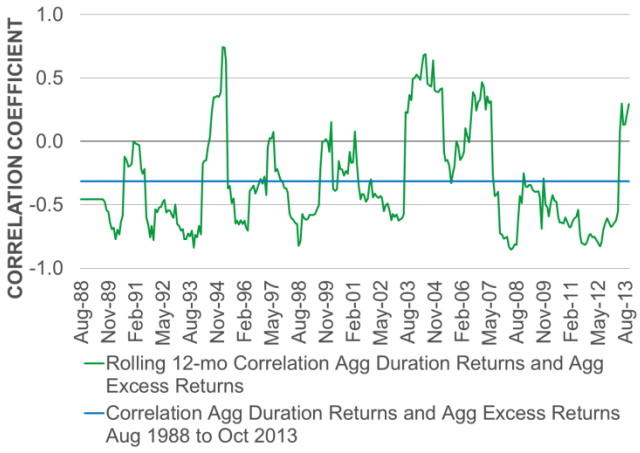
Although falling interest rates have left the Agg investor with a relatively low deflation floor (aka "flight-to-quality insurance"), duration exposure is still expected to diversify equities and other risky assets in multi-asset portfolios.

An Alternative Approach: In Search of a "Balanced Solution"

Inflation and economic growth are two of the main macroeconomic drivers of asset returns. In Table 3, we lay out a mapping of the fixed-income assets we expect to outperform under specific scenarios of growth and inflation. This table illustrates that holding a broad range of assets in a passive portfolio may be necessary in order to yield a steady return over a variety of economic backdrops. Additionally, it is important to note that the red outline on the chart roughly represents our view of the economic environments covered by the Agg's sector composition. That is, the Agg can struggle when inflation and growth are rising, making this benchmark a challenge for longer-term asset allocations in environments such as these.

To elaborate, one can think of fixed-income assets as belonging to two categories, one of deflation hedge investments (cash, government bonds, IG corporate bonds, agency MBS) and one of pro-growth investments (HY corporate bonds, high carry assets, and inflation-linked bonds, such as TIPS). The argument for holding a diversified portfolio of assets from both groups is further reinforced by the historically negative correlation between duration-based returns and excess-risk returns, as illustrated in Figure 12.

Figure 12: HISTORICAL CORRELATION BETWEEN AGG DURATION RETURNS AND EXCESS RETURNS



Source: Barclays POINT, BlackRock

As discussed extensively above, duration, or interest-rate risk (primarily from nominal bonds and IG Corp bonds), is the Agg's dominant risk factor. Spread risk is another risk exposure found in the components of the Agg, although presently that exposure is quite limited. Table 3 suggests that the Agg, in our view, would struggle in periods of rising inflation, rising growth, or both.

Therefore, we advocate investors hold a portfolio with a more balanced risk profile of deflation hedge and pro-growth assets. Because these asset families are typically negatively correlated, a feature we illustrated in Figure 12, a balanced allocation should lead to lower aggregate risk at the portfolio level. We can reasonably expect the corresponding portfolio to exhibit a more stable performance in variable regimes against any non-balanced alternative.

Table 3: MACROECONOMIC MAP OF FIXED-INCOME ASSETS (COVERING INFLATION AND GROWTH)

		INFLATION		
		FALL	FLAT	RISE
GROWTH	FALL	Cash Gov't Bonds	Gov't Bonds Cash	Inflation Linkers
	FLAT	Gov't Bonds IG Corp Bonds	High-Carry Assets	Inflation Linkers
	RISE	HY Corp Bonds	HY Corp Bonds High-Carry Assets	HY Corp Bonds

Source: Source: BlackRock. Note: Red highlight represents the economic environment covered by the Barclays Agg. The categorization of fixed income assets provided here represents the author's opinion.

Whether Looking Back or Forward, a "Balanced Solution" Balances Risk with Reward Best

We began this piece by looking carefully at the Barclays Aggregate Index's enviable track record over the past three decades, and we explained the risks many investors (ourselves included) see as embedded in the Agg today. Fundamentally, this risk comes down to the Agg's lack of risk-factor diversification, which also gets at why the Agg is likely to face difficulty in certain economic environments. Of course, there are other proposed solutions to the Agg's duration exposure and limited upside; some suggest moving capital to short-duration mandates, and others may decide to allocate to more active and opportunistic "total return" strategies. Still, many of these alternatives do not address the heavy duration-risk imbalance of the Agg's risk-factor exposures, or they may not be suitable for investors with a preference for passive investment solutions.[9] For investors explicitly seeking fixed-income beta that can solve the dilemma posed by the Agg, balancing risk factor exposures through an alternative beta can be a very sensible and potentially attractive alternative.

9 Short duration mandates reduce volatility at the expense of yield but still suffer from a lack of risk factor diversification. Regarding active/opportunistic/unconstrained strategies, not all investors want an active solution, some prefer passive mandates."

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