Fixed Income Risk Premium Investing

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Overview

Risk Premium Investing: Prevalent in Stock Selection
- Empirical Evidence on Key Styles/Factors

Applying Styles to FI: Is the Limited Use Due to Poor Fit?
- Empirical Evidence on Key Styles/Factors

What Do Active FI Managers Do?
- Factor Regressions on Active Managers and a Peek at a Superstar

Risk Premium Investing in Practice
- Govt Bonds and Corporate Bonds; Long-Only vs Long/Short; Public vs Proprietary Factors

Appendices

Risk Premium or Style or Factor Investing in Stock Selection and in Multiple Asset Classes

The Style Premia Perspective

Focusing on Four Broad Styles

These four styles have historically generated positive long-run returns across a variety of asset groups: Persistent, pervasive and robust long-run evidence.

Value		The tendency for relatively cheap assets to outperform relatively expensive ones
Momentum		The tendency for an asset's recent relative performance to continue in the near future
Carry		The tendency for higher-yielding assets to provide higher returns than lower-yielding assets
Defensive	Quality	The tendency for higher-quality assets to generate higher returns than lower-quality assets
	Low Beta	The tendency for lower-risk assets to generate higher risk-adjusted returns

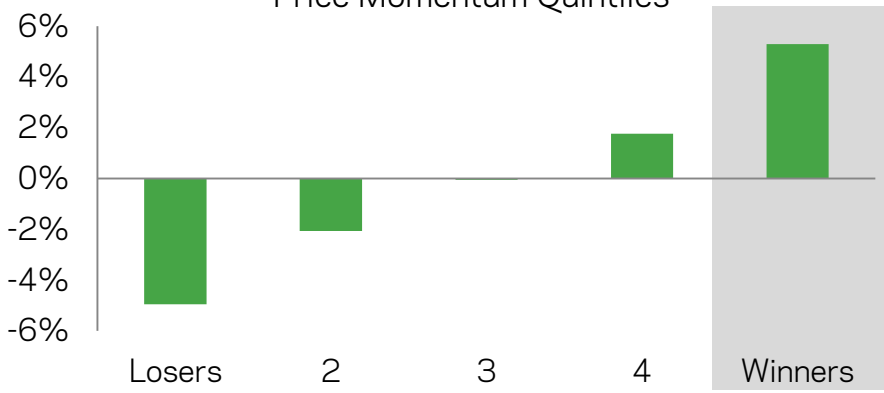
Source: AQR. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

Single-Style Premia in Stock Selection ("Smart Beta")

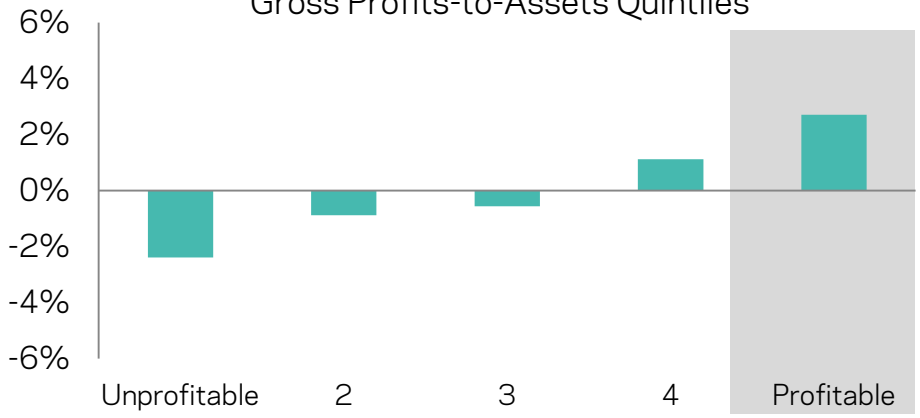
Long-Term Evidence of Hypothetical Excess Returns Among U.S. Stocks

Value (1951–2015)
Book-to-Market Quintiles

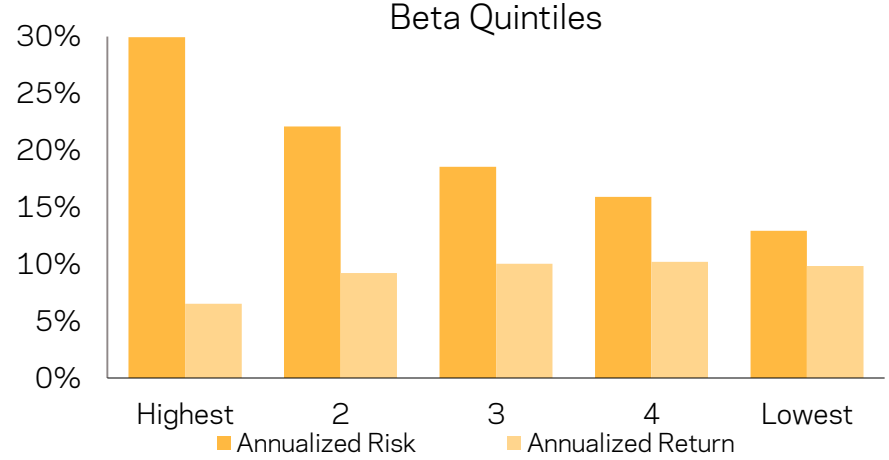
Momentum (1951–2015)
Price Momentum Quintiles



Quality: Profitability (1951–2015)
Gross Profits-to-Assets Quintiles



Defensive: Low Beta (1951–2015)
Beta Quintiles

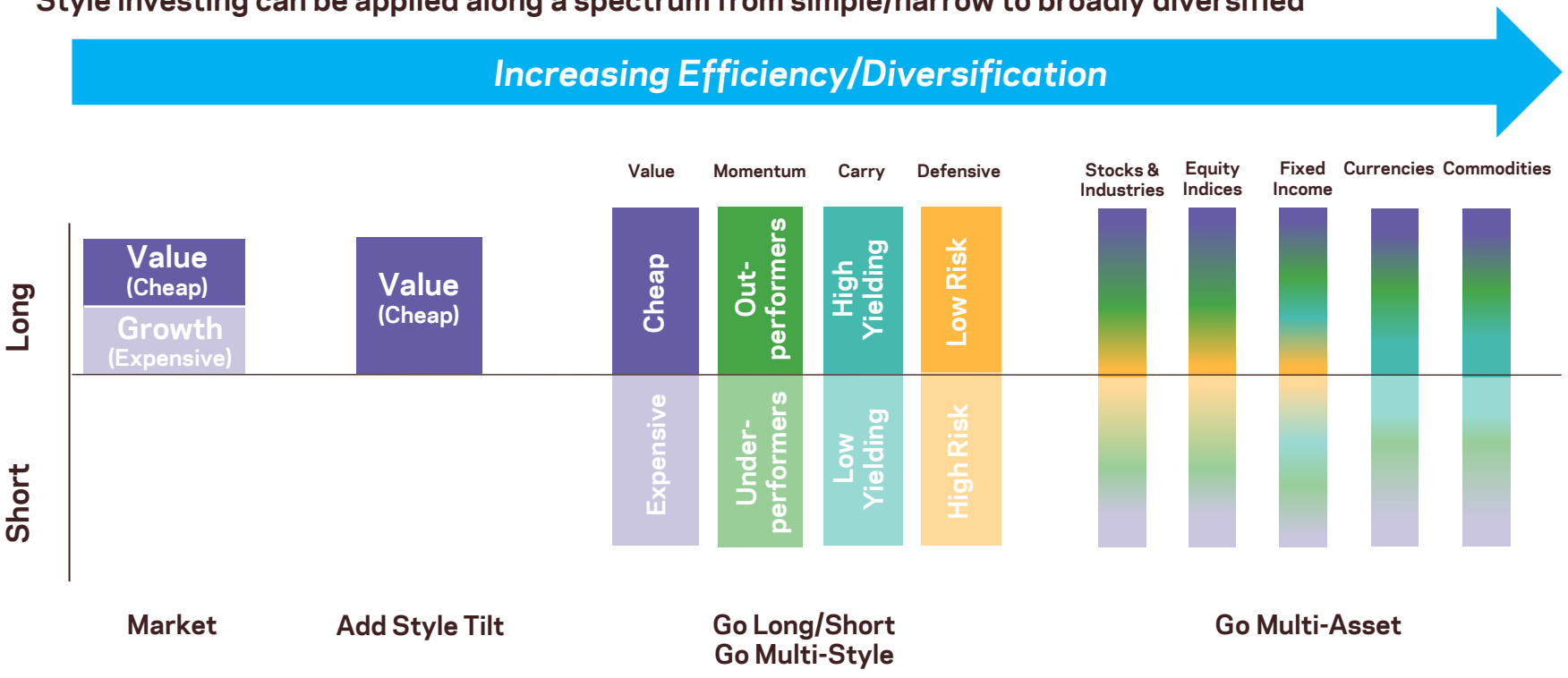


Source: AQR, Ken French Data Library and CRSP/Compustat. Value returns sourced from "Portfolios Formed on Book-to-Market." Momentum returns sourced from "10 Portfolios Formed on Momentum." See Kenneth R. French Data Library for further details. Quality is formed by sorting data from the CRSP/Xpressfeed universe of U.S. stocks by Gross Profits Over Assets (GPOA). Low Beta is an updated and extended version of the data used in the AQR paper "Betting Against Beta" (Frazzini and Pedersen, 2013). Quintiles are equal-weighted; returns are excess of cash. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix. These are not the returns of an actual portfolio AQR manages and are for illustrative purposes only. Please see the appendix for an explanation of the construction of the backtest. Please read important disclosures in the Appendix.

Accessing Style Premia in Multi-Style, Multi-Asset Approach

More Efficiently Capturing Styles

Style investing can be applied along a spectrum from simple/narrow to broadly diversified



- Improved portfolio with more favorable characteristics
- Returns largely driven by market beta

- More active, less constrained exposure to styles
- Uncorrelated to traditional markets
- More diversified than single style tilt

- Even more diversified
- Higher risk-adjusted return
- Even greater improvement from implementation choices

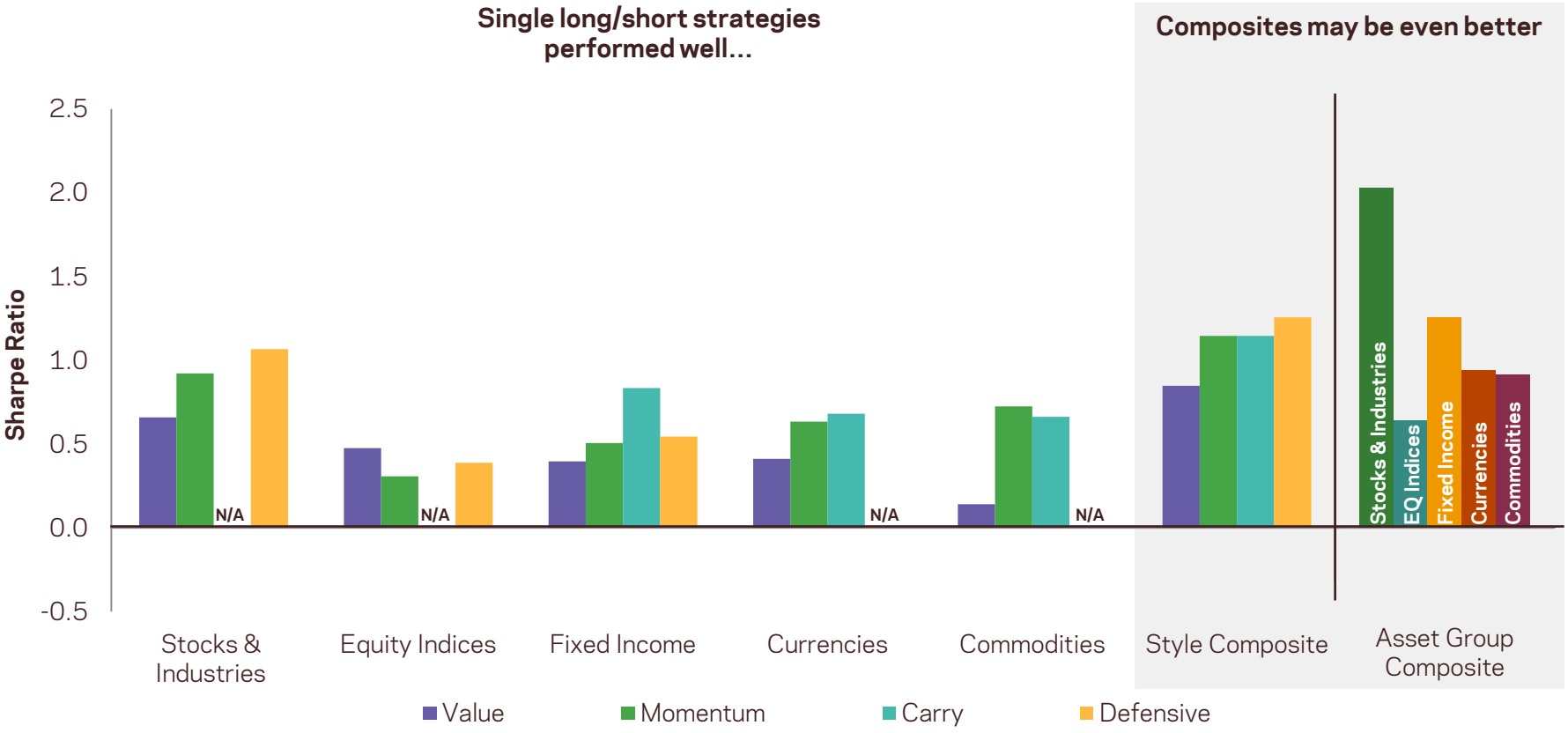
Source: AQR. For illustrative purposes only. Diversification does not eliminate the risk of experiencing investment losses.

Evidence on Styles Across Many Asset Groups and Styles

Single Long/Short Strategies and Broader Composites

Hypothetical Gross Sharpe Ratios of Long/Short Style Components Across Asset Groups

January 1990–December 2016



Source: AQR. Above analysis reflects a backtest of theoretical long/short style components based on AQR definitions across identified asset groups, and is for illustrative purposes only and not based on an actual portfolio AQR manages. The results shown do not include advisory fees or transaction costs; if such fees and expenses were deducted the Sharpe ratios would be lower; returns are excess of cash. Please read performance disclosures in the Appendix for a description of the investment universe and the allocation methodology used to construct the backtest and composites. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix.

Applying Styles to Fixed Income: Is the Limited Use Due to Poor Fit?

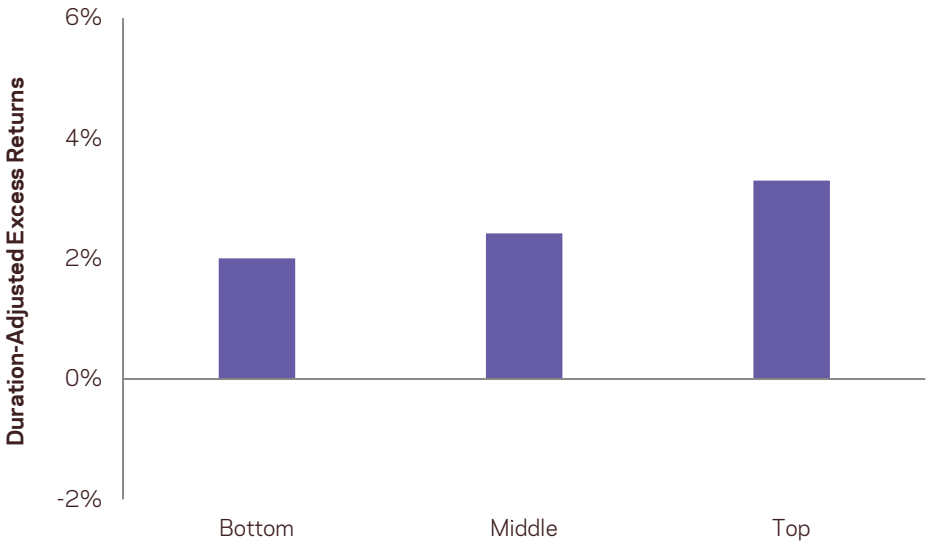
- Academic Evidence on Factors and Their Combo
- Two Applications: Allocating Across 13 Global Government Bond Markets* and Selecting Corporates Within U.S. (IG&HY) Universe

* This is only one way Systematic FI strategies can be applied in government bond markets. Both more directional and more relative-value (curve) strategies could be used in addition.

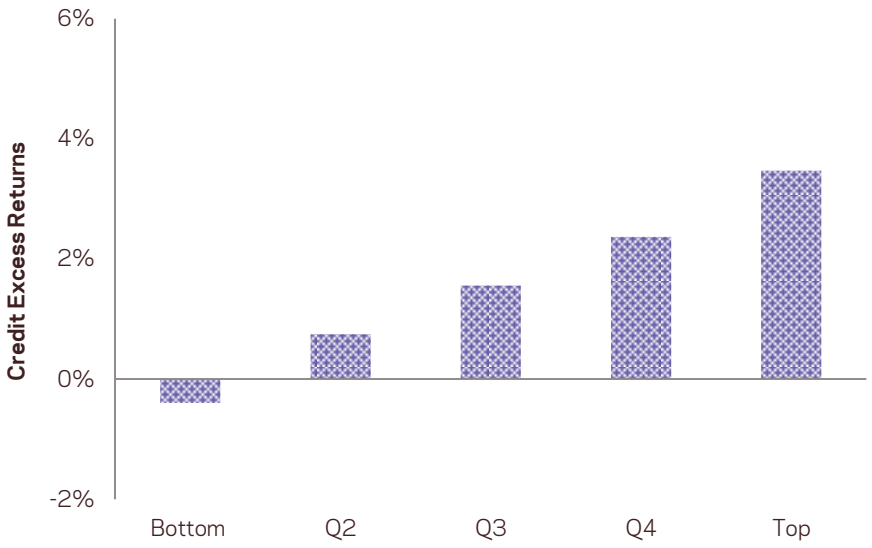
Value: Long-Term Evidence of Excess Returns

Fair Value Anchored to Inflation or to Default Risk

Government Bonds
Value (1995–2016)



Corporate Bonds
Value (1997-2015)



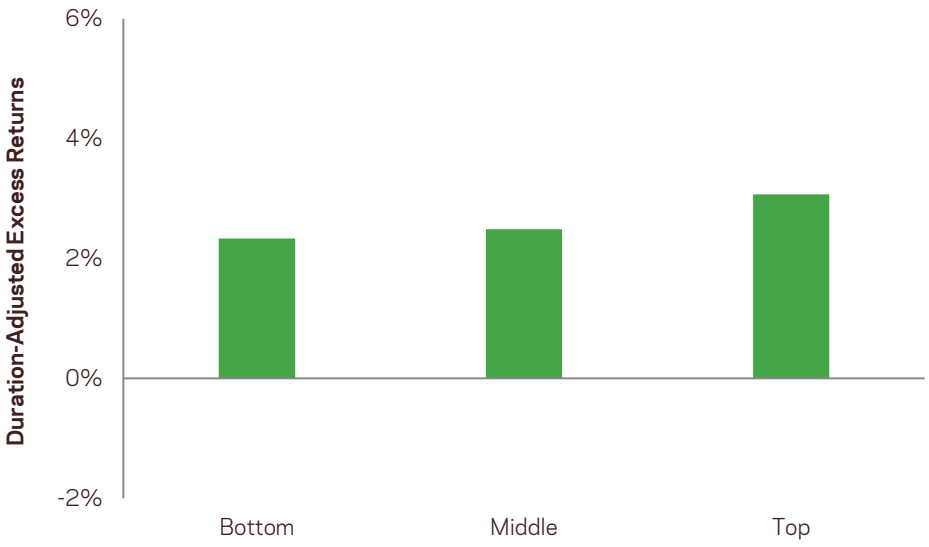
Source: AQR, J.P. Morgan, Consensus Economics, Bank of America Merrill Lynch. Value is applied across countries. Government Bond Portfolios formed by ranking all bonds along the value theme described on the slide heading, and then going long the top tercile, short the bottom tercile. All returns are excess of local cash. Within each tercile, the bonds are equal-weighted. Corporate Bond Portfolios are formed by ranking the bonds along value theme, and then sorting into quintiles. The portfolios go long the top quintile and short the bottom quintile. Within each quintile, bonds are value-weighted. All returns are excess of key-rates-duration-matched treasury portfolios. Government Bonds universe includes developed market (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, U.K., U.S.) bonds across maturities. Corporate Bond universe is based on the constituents of the Bank of America High Yield and Investment Grade Indices. Past performance is not a guarantee of future performance. These are not the returns of an actual portfolio AQR managed and are for illustrative purposes only. Please read important disclosures in the Appendix for more details on construction of these portfolios.

Momentum: Long Term Evidence of Excess Returns

Price and Fundamental Momentum Measures

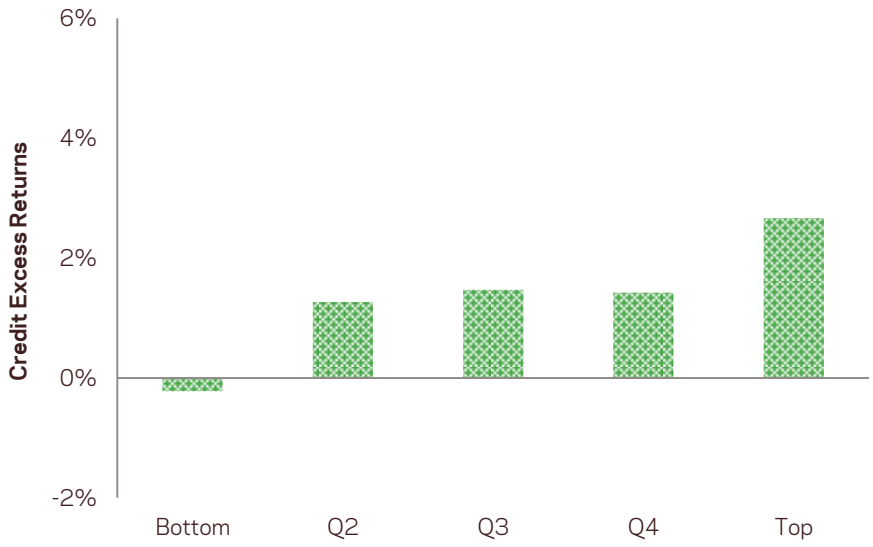
Government Bonds

Momentum (1995-2016)



Corporate Bonds

Momentum (1997-2015)



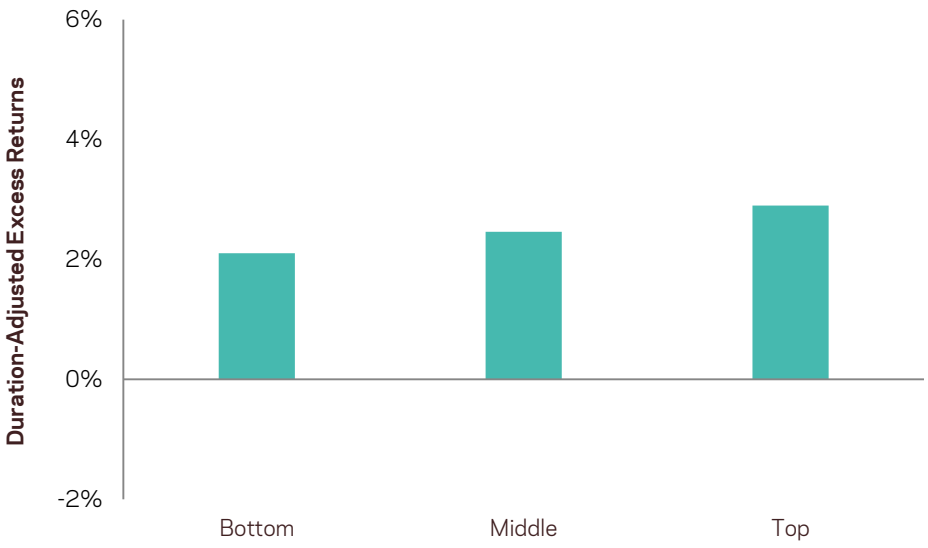
Source: AQR, J.P. Morgan, Consensus Economics, Bank of America Merrill Lynch. Momentum is applied across countries. Government Bond Portfolios formed by ranking all bonds along the momentum theme described on the slide heading, and then going long the top tercile, short the bottom tercile. All returns are excess of local cash. Within each tercile, the bonds are equal-weighted. Corporate Bond Portfolios are formed by ranking the bonds along the momentum theme, and then sorting into quintiles. The portfolios go long the top quintile and short the bottom quintile. Within each quintile, bonds are value-weighted. All returns are excess of key-rates-duration-matched treasury portfolios. Government Bonds universe includes developed market (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, U.K., U.S.) bonds across maturities. Corporate Bond universe is based on the constituents of the Bank of America High Yield and Investment Grade Indices. Past performance is not a guarantee of future performance. These are not the returns of an actual portfolio AQR managed and are for illustrative purposes only. Please read important disclosures in the Appendix for more details on construction of these portfolios.

Carry: Long Term Evidence of Excess Returns

Term Spread and Corporate Spread vs Treasury

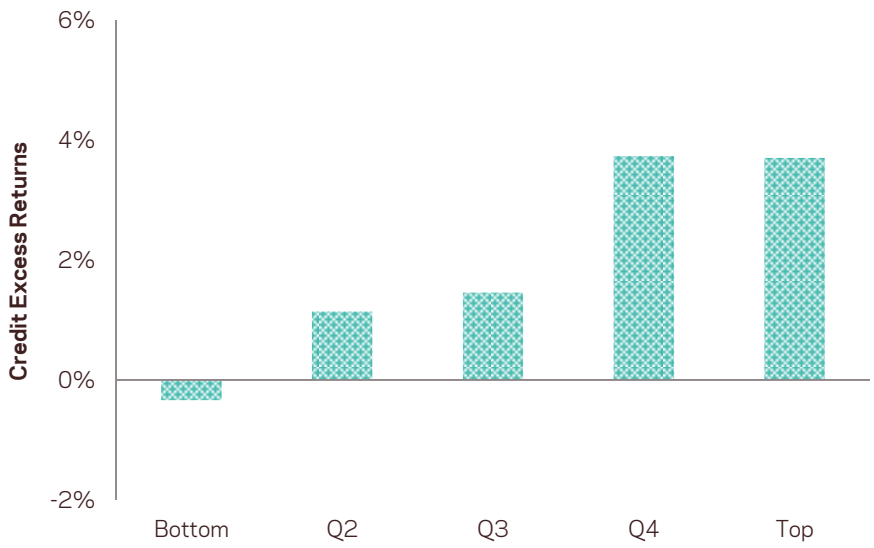
Government Bonds

Carry (1995-2016)



Corporate Bonds

Carry (1997-2015)



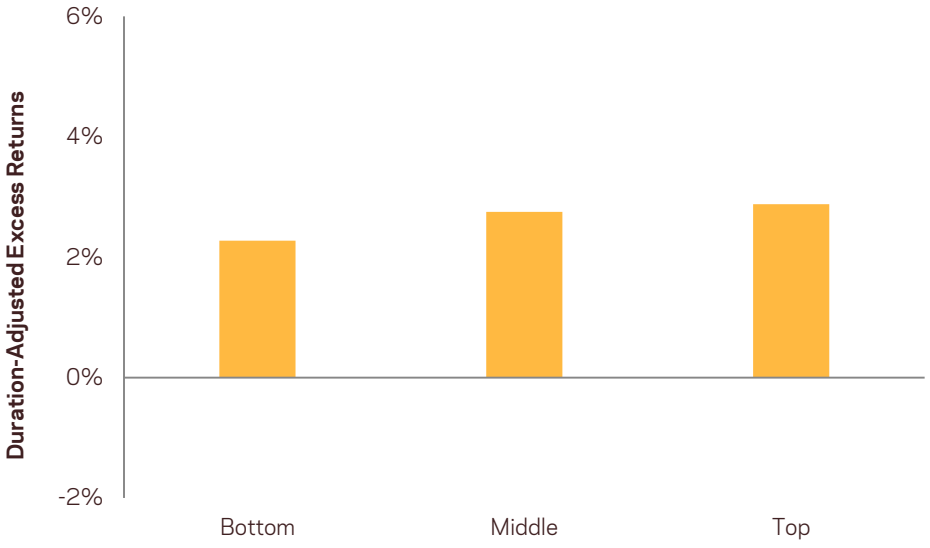
Source: AQR, J.P. Morgan, Consensus Economics, Bank of America Merrill Lynch. Carry is applied across countries. Government Bond Portfolios formed by ranking all bonds along the carry theme described on the slide heading, and then going long the top tercile, short the bottom tercile. All returns are excess of local cash. Within each tercile, the bonds are equal-weighted. Corporate Bond Portfolios are formed by ranking the bonds along the carry theme, and then sorting into quintiles. The portfolios go long the top quintile and short the bottom quintile. Within each quintile, bonds are value-weighted. All returns are excess of key-rates-duration-matched treasury portfolios. Government Bonds universe includes developed market (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, U.K., U.S.) bonds across maturities. Corporate Bond universe is based on the constituents of the Bank of America High Yield and Investment Grade Indices. Past performance is not a guarantee of future performance. These are not the returns of an actual portfolio AQR managed and are for illustrative purposes only. Please read important disclosures in the Appendix for more details on construction of these portfolios.

Defensive: Long Term Evidence of Excess Returns

Low Duration; Credit and Balance Sheet Quality, Low Duration

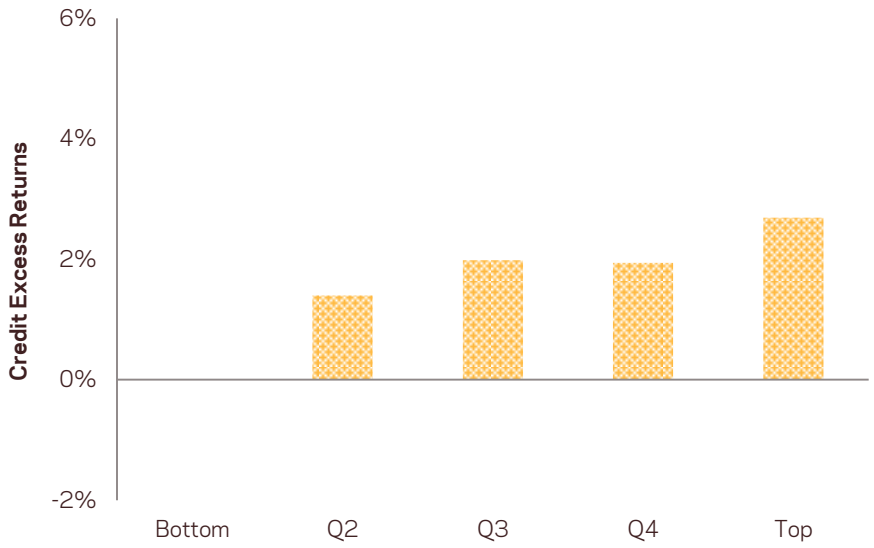
Government Bonds

Defensive (1995-2016)



Corporate Bonds

Defensive (1997-2015)



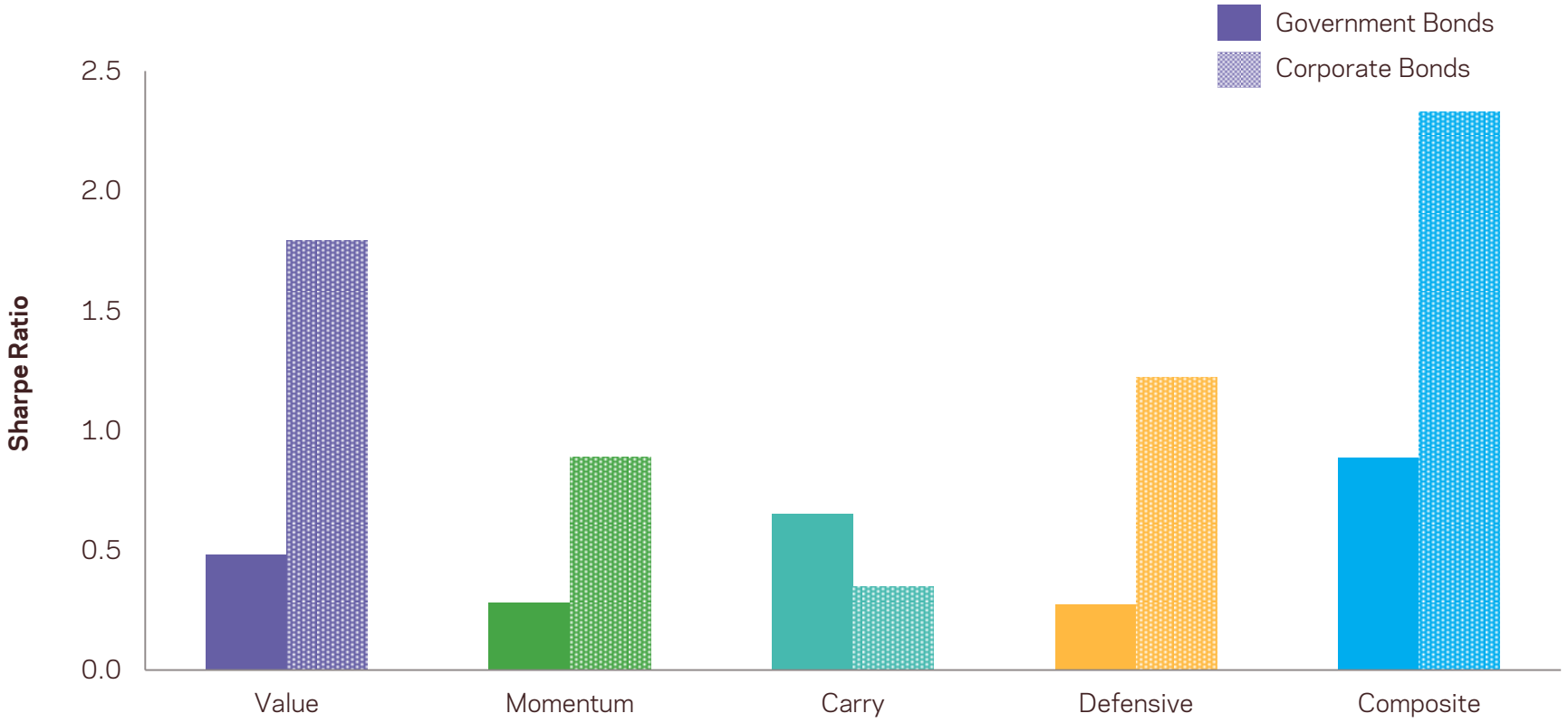
Source: AQR, J.P. Morgan, Consensus Economics , Bank of America Merrill Lynch. Defensive is applied across maturities within each country. Government Bond Portfolios formed by ranking all bonds along the defensive theme described on the slide heading, and then going long the top tercile, short the bottom tercile. All returns are excess of local cash. Within each tercile, the bonds are equal-weighted. Corporate Bond Portfolios are formed by ranking the bonds along the defensive theme, and then sorting into quintiles. The portfolios go long the top quintile and short the bottom quintile. Within each quintile, bonds are value-weighted. All returns are excess of key-rates-duration-matched treasury portfolios. Government Bonds universe includes developed market (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, U.K., U.S.) bonds across maturities. Corporate Bond universe is based on the constituents of the Bank of America High Yield and Investment Grade Indices. Past performance is not a guarantee of future performance. These are not the returns of an actual portfolio AQR managed and are for illustrative purposes only. Please read important disclosures in the Appendix for more details on construction of these portfolios.

A Systematic Approach to Government and Corporate Bonds

Whole is Greater Than the Sum of the Parts

Hypothetical Gross Sharpe Ratios of Simple Long/Short Portfolios

Government and Corporate Bonds (1997-2016)



Source: AQR, J.P. Morgan, Bank of America Merrill Lynch. Above analysis reflects a backtest of underlying theoretical long/short themes generated by AQR definitions and is for illustrative purposes only and not based on an actual portfolio AQR manages. The composite portfolio combined the value, momentum, carry and defensive portfolios at equal weights. The results shown do not include advisory fees or transaction costs; if such fees and expenses were deducted the Sharpe ratios would be lower. The risk-free rate is the Merrill Lynch 3 Month T-Bill. For government bonds, portfolios formed by ranking all bonds along the four themes (V, M, C, D), and then going long the top tercile, short the bottom tercile. All returns are excess of local cash. Within each tercile, the bonds are equal-weighted. For corporate bonds, portfolios are formed by ranking the bonds along the four themes (V, M, Q, D) and then sorting into quintiles. The portfolios go long the top quintile and short the bottom quintile. Within each quintile, bonds are value-weighted. All returns are excess of key-rates-duration-matched treasury portfolios. Please read important disclosures in the Appendix for more details on construction of these portfolios. Diversification does not eliminate the risk of experiencing investment loss. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix

Benefits of Combining Themes

Combine Themes for More Consistent Returns: Low Correlations

Government Bond Portfolio
1995-2016

	Value	Momentum	Carry	Defensive
Value	1.00			
Momentum	-0.25	1.00		
Carry	0.39	-0.36	1.00	
Defensive	0.18	-0.25	0.11	1.00

Corporate Bond Portfolio
1997-2015

	Value	Momentum	Carry	Defensive
Value	1.00			
Momentum	-0.33	1.00		
Carry	0.17	-0.36	1.00	
Defensive	0.30	0.49	-0.12	1.00

Source: AQR. JP Morgan, Consensus Economics and Bloomberg data. Above analysis reflects a backtest of underlying theoretical long/short themes generated by AQR definitions and is for illustrative purposes only and not based on an actual portfolio. Government bond data is from March 1997 - April 2016 and Corporate Bond data is from January 1997 - June 2015. AQR manages. Government bonds include all bonds covered by the J.P. Morgan Government Bond Index (GBI). Corporate bonds include 1,300 bonds that roughly comprise the Bank of America Merrill Lynch investment grade (U.S. Corporate Master) and high yield (U.S. High Yield Master) corporate bond indices. Please see the appendix for a detailed description of the data used. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix.

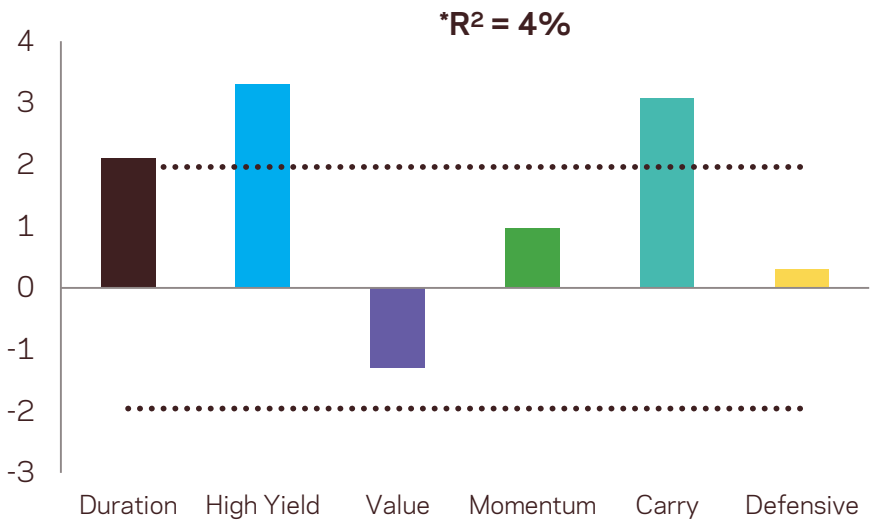
What Do Active FI Managers Do?

- Evidence of Limited Use of Style Premia
- Factor Regressions of Active FI Managers in Govt Bonds and Credits
- A Peek at Superstars: Bill Gross

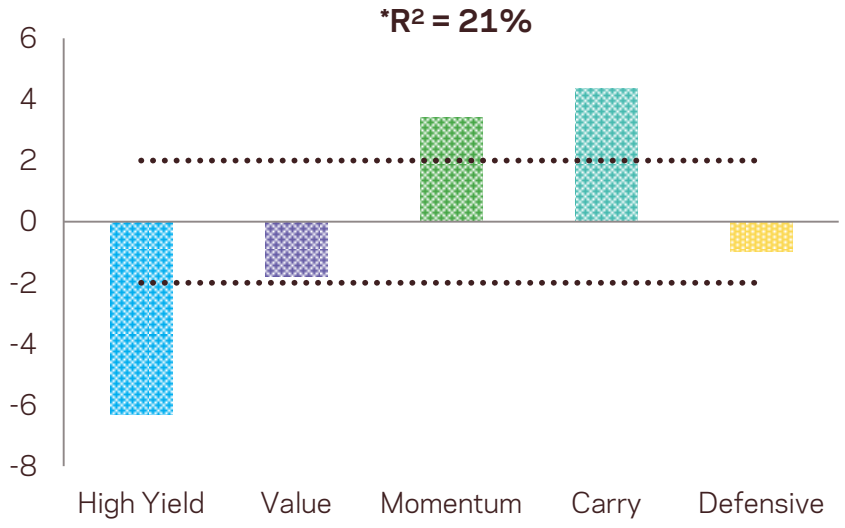
Analysis of Active Bond Manager Returns

Bond Managers on Average Provide Limited Exposure to Systematic Return Factors

t-stats in Regressions of Government Bond Managers' Active Returns
(April 1995- April 2016)



t-stats in Regressions of (HY) Corporate Bond Managers' Active Returns
(January 1997 - June 2015)



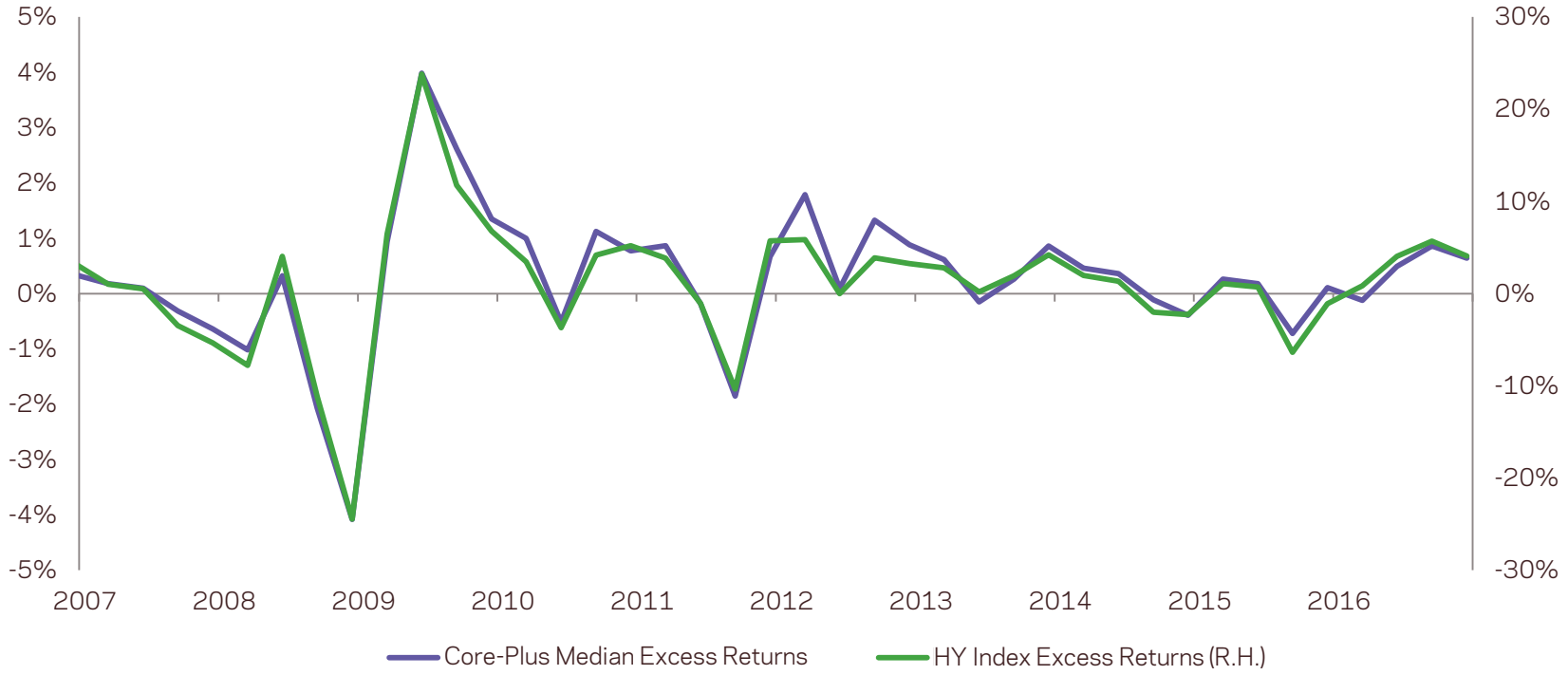
Source: AQR, eVestment, Barclays, Morningstar. The Universe used for the Government Bond regression was eVestment's "Global Government Fixed Income Managers"- Global Fixed Income products that invest in bonds anywhere in the world and specialize in Sovereign securities. The expected benchmarks for this universe would include the Citigroup WGBI Hedged or UnHedged. Managers in this category will typically indicate a "Fixed Income theme Emphasis" equal to Govt/Agency Only. For the regression, "Duration" is represented by the JPM Global Bond Index and "High Yield" is represented by the Bloomberg Barclays US Corporate High Yield Index. "Value" is defined above as countries sorted on real bond yield. "Momentum" is defined as countries sorted on 12 month excess return. "Carry" is defined as countries sorted on term spread and "Defensive" is defined as long 1-5 year and short 10-30 year bonds in each country. The excess monthly returns used in this regression are equal-weighted average excess returns (vs their stated benchmark) of mutual funds in the Morningstar Institutional Category "High Yield Bond", whose Primary Prospectus Benchmark name contains "High Yield" or "HY", with at least 80% invested in corporate bonds and at least 24 months of history. For the regression, "Duration" is represented by the JPM Global Bond Index and "High Yield" is represented by the Barclays US High Yield Index. Value is defined above as countries sorted on real bond yield. Momentum is defined as countries sorted on 12 month excess return. Carry is defined as countries sorted on term spread and Defensive is defined as long 1-5 year and short 10-30 year bonds in each country. The data on this slide has not yet been updated through 2016. Please read important disclosures in the Appendix. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix. Please read important disclosures in the Appendix.
*Represents the partial R^2 with respect to Value, Momentum, Carry, and Defensive.

Most Active Managers Load on Credit (Beta) Risk, Not on Styles

Core-Plus Managers Generate Excess Returns With Persistent Spread Allocation

Core-Plus Median Excess Returns vs. High Yield Index Excess Returns*

Quarterly Returns (2007-2016)



- **High Yield explains 95% of the outperformance of Core-Plus managers over the past 10 years**
- **This tilt makes these managers +0.3 correlated with equities while the index has been -0.3 correlated, thereby reducing the diversification benefit of FI investments. These managers have only mild style exposures.**

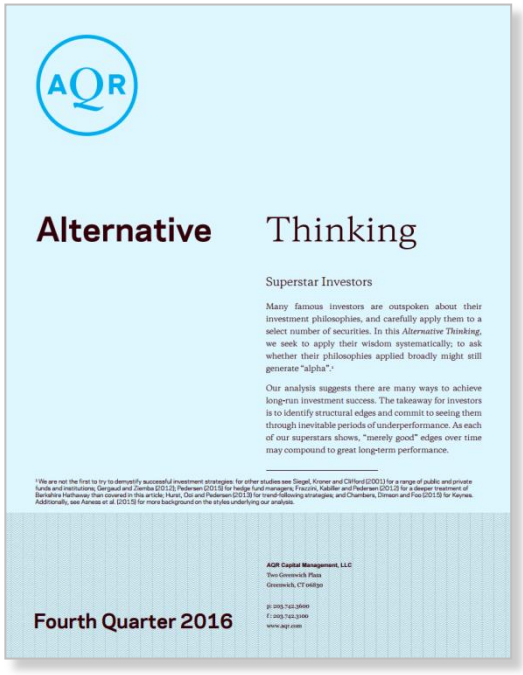
*Core-Plus Median Excess Returns are in excess of the Bloomberg Barclays US Aggregate Index. High Yield Index Excess Returns are in excess of duration adjusted U.S. Treasuries.
Source: AQR, eVestment Alliance. Core-Plus and Non-Traditional Bond refer to eVestment's categories and manager returns are pulled from their database. Returns are shown in USD. The HY Index is the Bloomberg Barclays US Corporate High Yield Index. These are not the returns of an actual portfolio AQR managed and are for illustrative purposes only. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

What About Superstar Investors?

Our Colleagues Recently Studied the Factor Exposures of Four Stars

Superstars for our paper:

Investor	Returns We Analyze	Asset Class	Period
Warren Buffett	Berkshire Hathaway	Stock	Jan 1977 – May 2016
Bill Gross	PIMCO Total Return Fund	Bond Mutual Fund	Jan 1994 – Sep 2014
George Soros	Quantum Fund*	Global Macro	Mar 1985 – May 2004
Peter Lynch	Magellan Fund	Stock Mutual Fund	May 1977 – May 1990



*Unfortunately, due to data availability we have "only" 20 years of returns to analyze.

Sources: AQR, 4Q2016 *Alternative Thinking*, AQR data library, CRSP, HFR, Morningstar.

Note: our focus is on performance, and not how much of it a specific portfolio manager was responsible for. In other words, we cannot say how much our Berkshire Hathaway results reflect the contributions of Warren Buffett versus Charlie Munger, or how much of Quantum Fund's results reflect decisions by George Soros versus Stanley Druckenmiller, or how much the many colleagues of Bill Gross and Peter Lynch at PIMCO and Fidelity contributed. Although these names are generally associated with these successful track records, we recognize that success is often the result of a team effort.

What Do We Find?

PIMCO TRF— High Yield Credit, Short Maturity, Short Volatility

"On a somewhat technical basis, my/our firm's tendency to sell volatility and earn 'carry' in a number of forms—outright through options and futures, in the mortgage market via prepayment risk, and on the curve via bullets and roll down as opposed to barbells with substandard carry—has been rewarded over long periods of time"*

	Average Return	Volatility	Sharpe Ratio	Annual Outperformance	Information Ratio
PIMCO Total Return Fund	4.3%	4.1%	1.05	1.4%	0.83
Barclays U.S. Aggregate	2.9%	3.6%	0.80	-	-

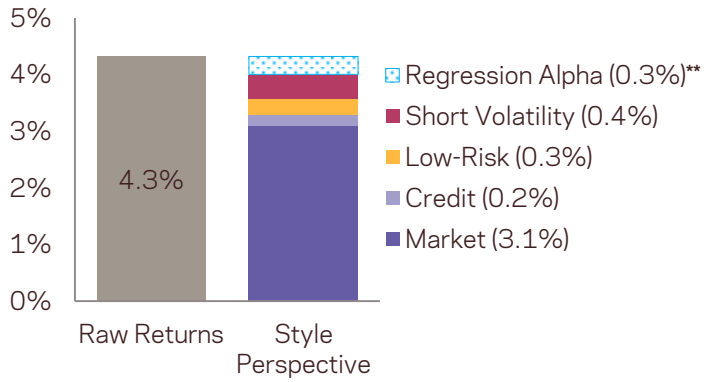
Factors Used

Market: Barclays U.S. Aggregate Bond Index
Credit: Five-year U.S. High Yield CDX
Low Risk: duration neutral, long two- and five-year, versus short 10- and 30-year U.S. bond futures
Short Volatility: selling one-month, 30-delta strangles on 10-year Treasury futures (delta hedged)

Regression Statistics

	Alpha (ann'l)	Market	Credit	Low-Risk	Short Volatility	R^2
Coefficient	0.3%	1.06	0.06	0.07	0.04	88%
T-stat	0.9	41.0	6.0	8.0	4.5	

Regression-based Return Attribution

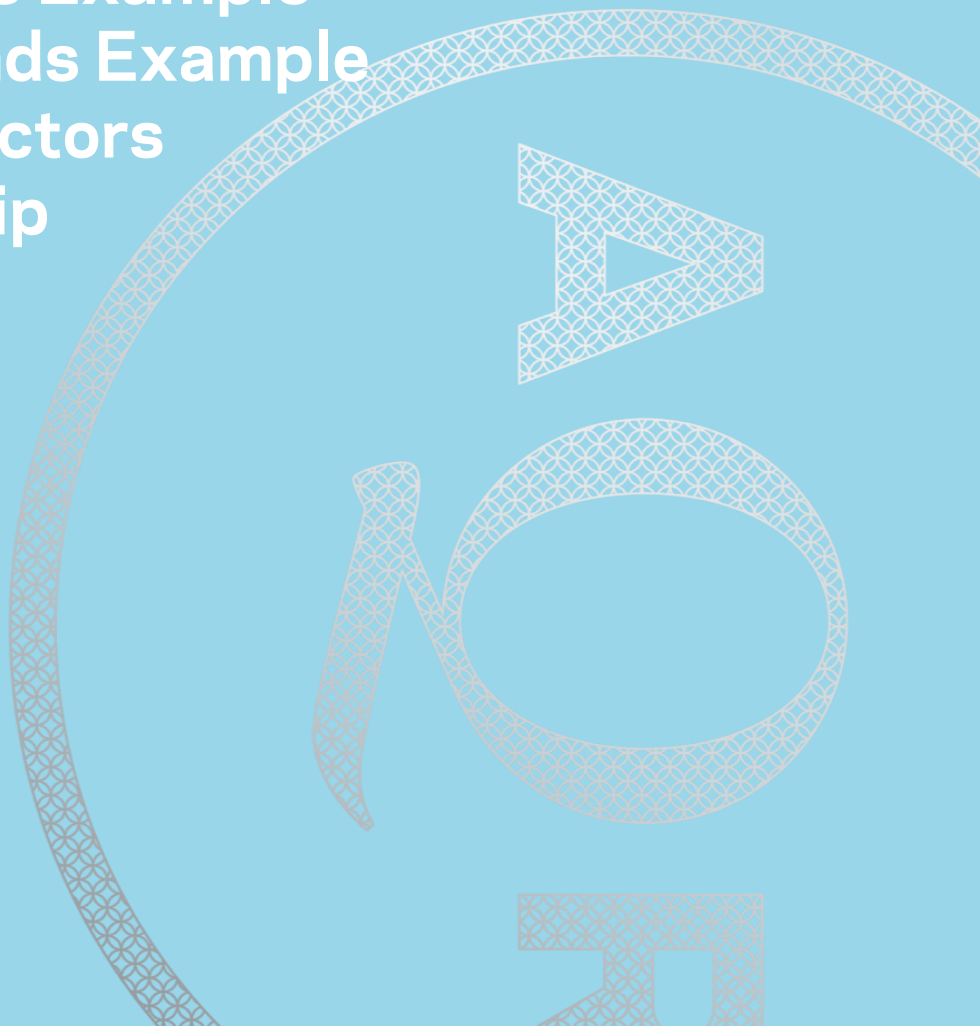


*Bill Gross, Investment Outlook, April 2013.
**Not statistically significant at 95% confidence

Sources: AQR, 4Q2016 Alternative Thinking, AQR, CRSP (for TRF data), Barclays. Risk-free rate is 1-month Treasury bills. Factor returns are all gross of fees and transactions costs. All data on this page is from Jan 1994 - Sep 2014. See appendix for details on factor construction. Market is the Barclays U.S. Aggregate Bond Index, excess of cash, credit is 5-year US High Yield CDX, short maturity (rank-sorted portfolio of negative maturity on U.S. 2/5/10/20-year bond futures), and short volatility (the returns from selling 1-month, 30-delta strangles on 10-year Treasury futures, delta-hedged). Past performance is not a guarantee of future performance; please read important disclosures at the end of this presentation.

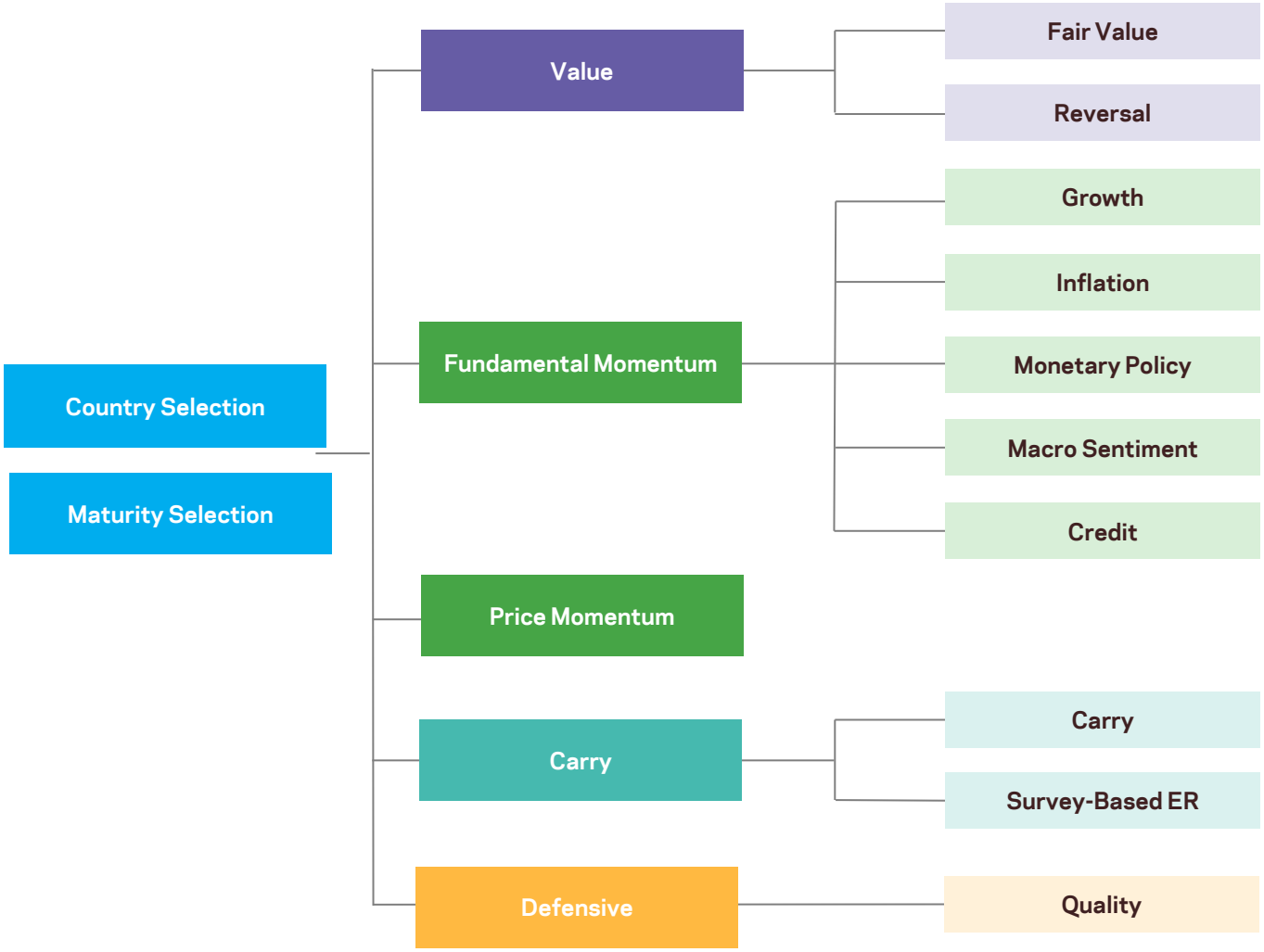
Risk Premium Investing in Practice:

- Global Government Bonds Example
- High-Yield Corporate Bonds Example
- Beyond Widely-Known Factors
- Emphasis on Craftmanship



Example of a Global Government Bond Allocation Model

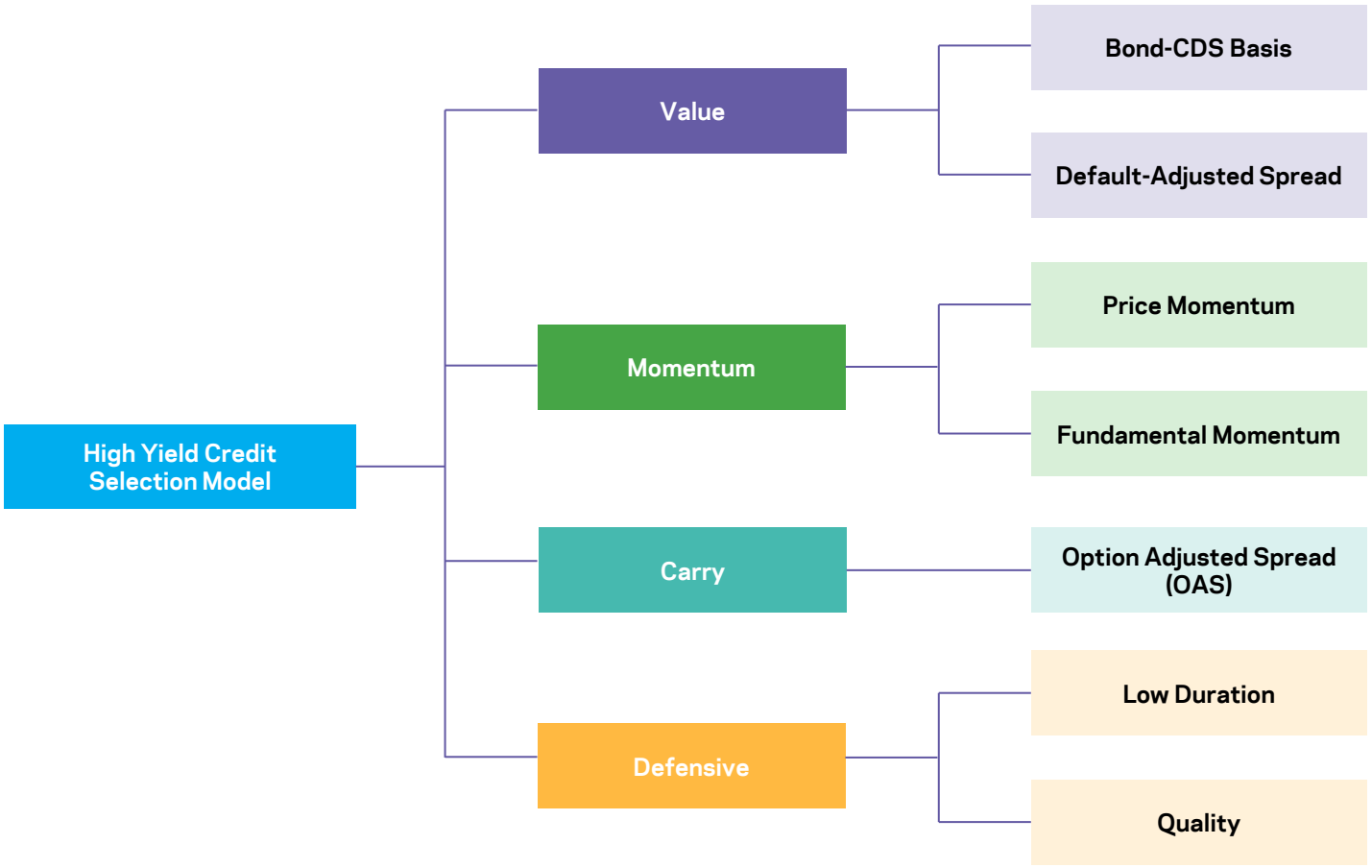
Selection Across Countries and Maturity Subsectors



Source: AQR. The above model is for illustrative purposes only. Investment process subject to change at any time without notice. Please read important disclosures in the Appendix.

Example of a High-Yield Corporate Bond Allocation Model

Within-Sector Security Selection Among U.S. High Yield Bonds



Source: AQR. The above model is for illustrative purposes only. Investment process subject to change at any time without notice. Please read important disclosures in the Appendix.

Possible Applications

Long-Only and Long/Short

The most common applications are long-only vehicles where styles and other active positions are overweighted and underweighted versus the benchmark.

- Given constraints, market exposures (directional duration and credit risks) tend to dominate total portfolio risk and also active risk
- LDI applications may be modified by active tilts to enhance portfolio's return potential

Long/short applications may involve both cross-sectional (relative value) positions and directional (timing) positions

- More effective risk diversification is enabled by manager use of shorting and leverage
- Styles can be applied in a more balanced way in different FI market segments and FI strategy types, mitigating the concentration on directional duration and credit risks

Classic vs. Proprietary Factors in Systematic Investing

"Smart Beta" Factors are the Well-Known Subset of All Style Signals

Each Factor Theme:

– Can have multiple factors within it

We believe that "Smart Beta" factors:

– Are a subset of broader factor themes

– Are better known and more transparent

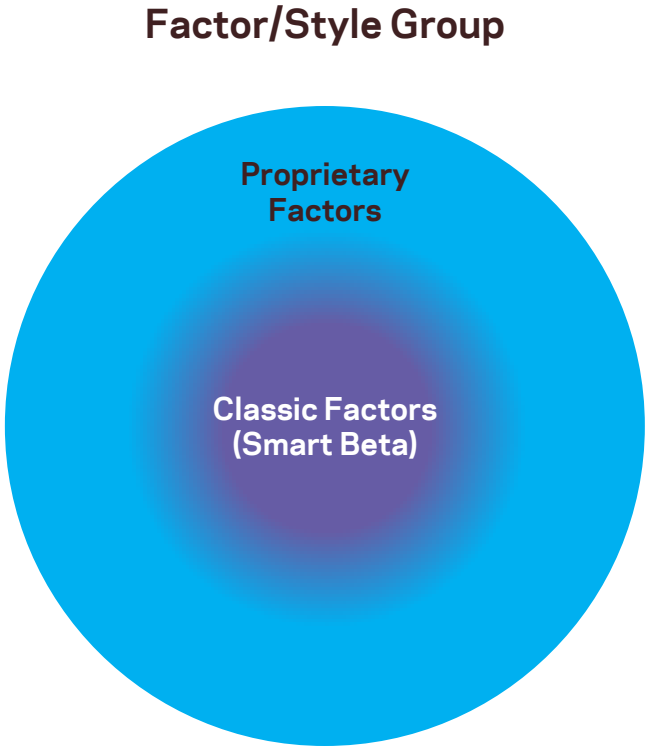
Proprietary factors:

– Are less commoditized and more complex

– Have higher alpha potential on average

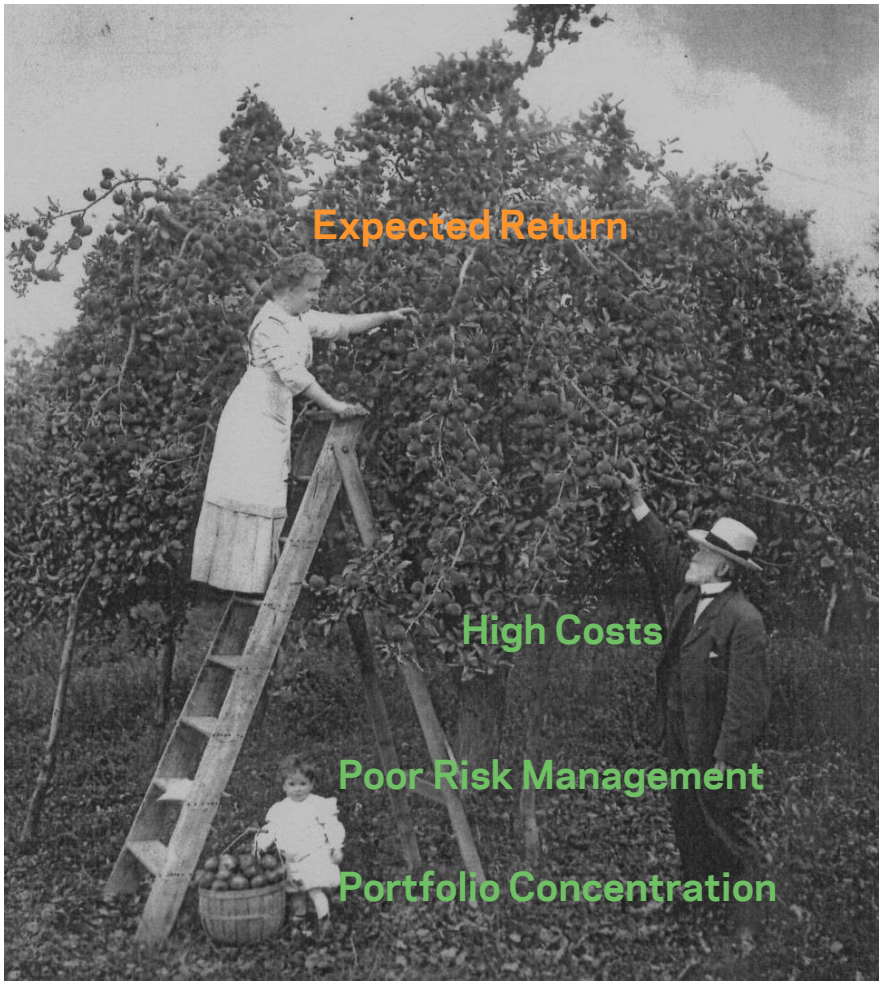
"Full model" systematic investing:

– Encompasses both proprietary and classic factors per style group



Craftmanship in Harvesting Matters As Much As Return Sources

Pay Attention to Every Step of the Investment Process

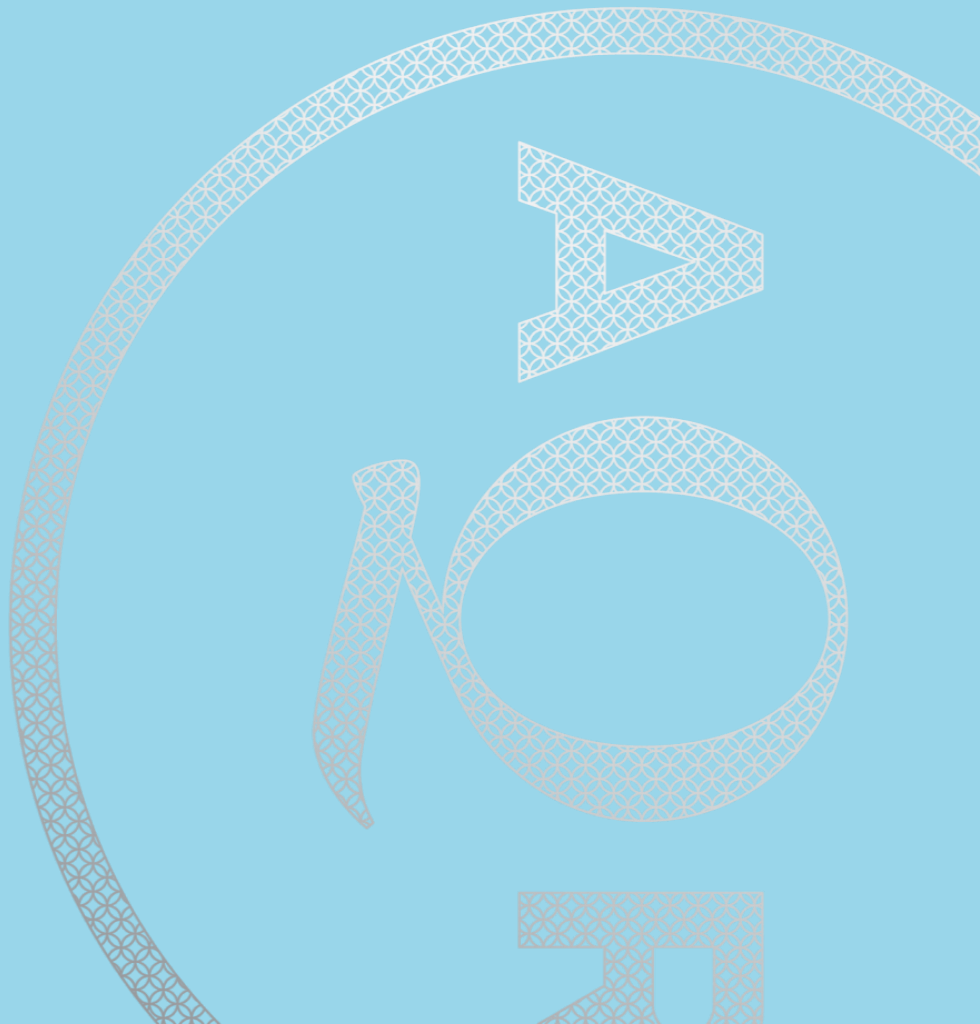


← What Investors Seek

What They Miss

Source: Penrose, Colorado Chamber of Commerce. http://www.penrosechamber.com/LocalInformation/History.aspx

Appendix



AQR's Long History of Systematic Investing Research

If You Want To Hear It Straight From the Horse's Mouth, Ask Them…

2016	Brooks and Moskowitz examine **style investing in government bonds** in "The Cross Section of Government Bond Returns" Boudoukh, Brooks, Richardson and Xu examine **price discovery in sovereign bonds** in "The Complexity of Liquidity: The Extraordinary Case of Sovereign Bonds"
2015	Israel, Palhares and Richardson examine **investing with style in corporate bonds** in "Common Factors in Corporate Bond and Bond Fund Returns" Asvanunt and Richardson document and examine "The Credit Risk Premium" Asness, Frazzini, Israel and Moskowitz summarize what we know and dispel myths about **value** in "Fact, Fiction, and Value Investing" Asness, Frazzini, Israel, Moskowitz and Pedersen resurrect the **size** premium in "Size Matters, if You Control Your Junk"
2014	Ilmanen, Maloney and Ross explore the **macro sensitivities of styles** in "Exploring Macroeconomic Sensitivities" Asness, Frazzini, Israel and Moskowitz summarize what we know and dispel myths about **momentum** in "Fact, Fiction, and Momentum Investing"
2013	Asness, Frazzini and Pedersen examine the **quality** factor in "Quality Minus Junk"
2012	Koijen, Moskowitz, Pedersen and Vrugt document pervasiveness of **carry** strategies in "Carry" Correia, Richardson, and Tuna document **pervasive evidence of 'value' style** in "Value Investing in Credit Markets" Frazzini and Pedersen demonstrate pervasiveness of **low-risk** style in "Betting Against Beta" Asness and Frazzini challenge the traditional construction of the **value** premium in "The Devil in HML's Details" Israel and Moskowitz show robustness of **equity styles** in "How Tax Efficient Are Equity Styles" and "The Role of Shorting, Firm Size and Time on Market Anomalies" Israel, Ilmanen and Moskowitz combine **four styles in multiple contexts** in "Investing with Style"
2010	Asness, Frazzini and Pedersen examine applications of the **low-risk** style in "Leverage Aversion and Risk Parity" Ilmanen presents long-term evidence for **major strategy styles, and the credit risk premium** in his book, *Expected Returns* Berger, Israel and Moskowitz describe potential role for **momentum** in "The Case for Momentum Investing"
2008	Asness, Moskowitz and Pedersen demonstrate the pervasiveness of **value** and **momentum** in "Value and Momentum Everywhere" Brunnermeier, Nagel and Pedersen analyze risks to **carry** strategies in "Carry Trades and Currency Crashes"
2007	Penman, Richardson and Tuna discuss leverage and **quality** in "The Book-to-Price Effect in Stock Returns: Accounting for Leverage"
2006	Frazzini investigates behavioral explanations for **momentum** in "The Disposition Effect and Under-Reaction to News"
2005	Richardson, Sloan, Soliman and Tuna examine **quality** in "Accrual Reliability, Earnings Persistence and Stock Prices"
1998	**AQR Founding Principals began managing investments** Moskowitz and Grinblatt document the **momentum effect in industries** in "Do Industries Explain Momentum?" Asness, Liew and Stevens study **styles across countries** in "Parallels Between the Cross-Sectional Predictability of Stock and Country Returns" Asness documents case for **two major styles** in "The Interaction of Value and Momentum Strategies"
1994	Asness shows the implications for a combined **value/momentum** approach in his Ph.D. dissertation

Source: AQR. Please read important disclosures in the Appendix.

Overview of AQR's Fixed Income Strategies

- **AQR has been managing fixed income strategies since its inception, and today manages the equivalent* of >$100bn in fixed income.**

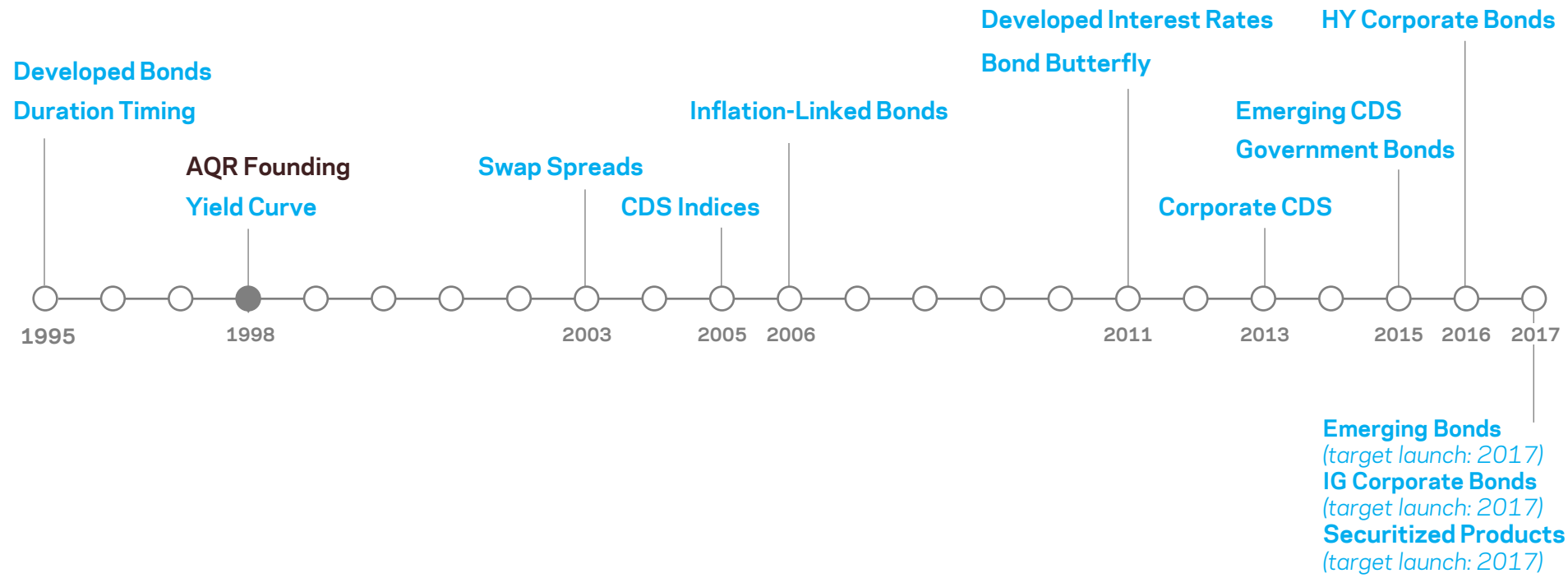
- **We employ the same systematic, fundamental approach to fixed income investing that we use in our other strategies (and its FULL MODEL).**

- **A systematic approach has the potential to offer diversification benefits:**
  - AQR Systematic Fixed Income seeks to deliver multiple intuitive sources of return
  - AQR Systematic Fixed Income provides exposure that is neither traditional market risk premium nor alternative risk premia from other asset classes
  - AQR Systematic fixed income seeks to deliver excess returns that are very different from incumbent traditional active managers

Source: AQR. *10 year U.S. Treasury equivalents are computed by scaling long notional position sizes by the ratios of their volatilities to the volatility of a 10yr U.S. Treasury bond. As of 12/31/2016.

Evolution of AQR Fixed Income Strategies

History of Fixed Income Experience, Product Launches and Pipeline



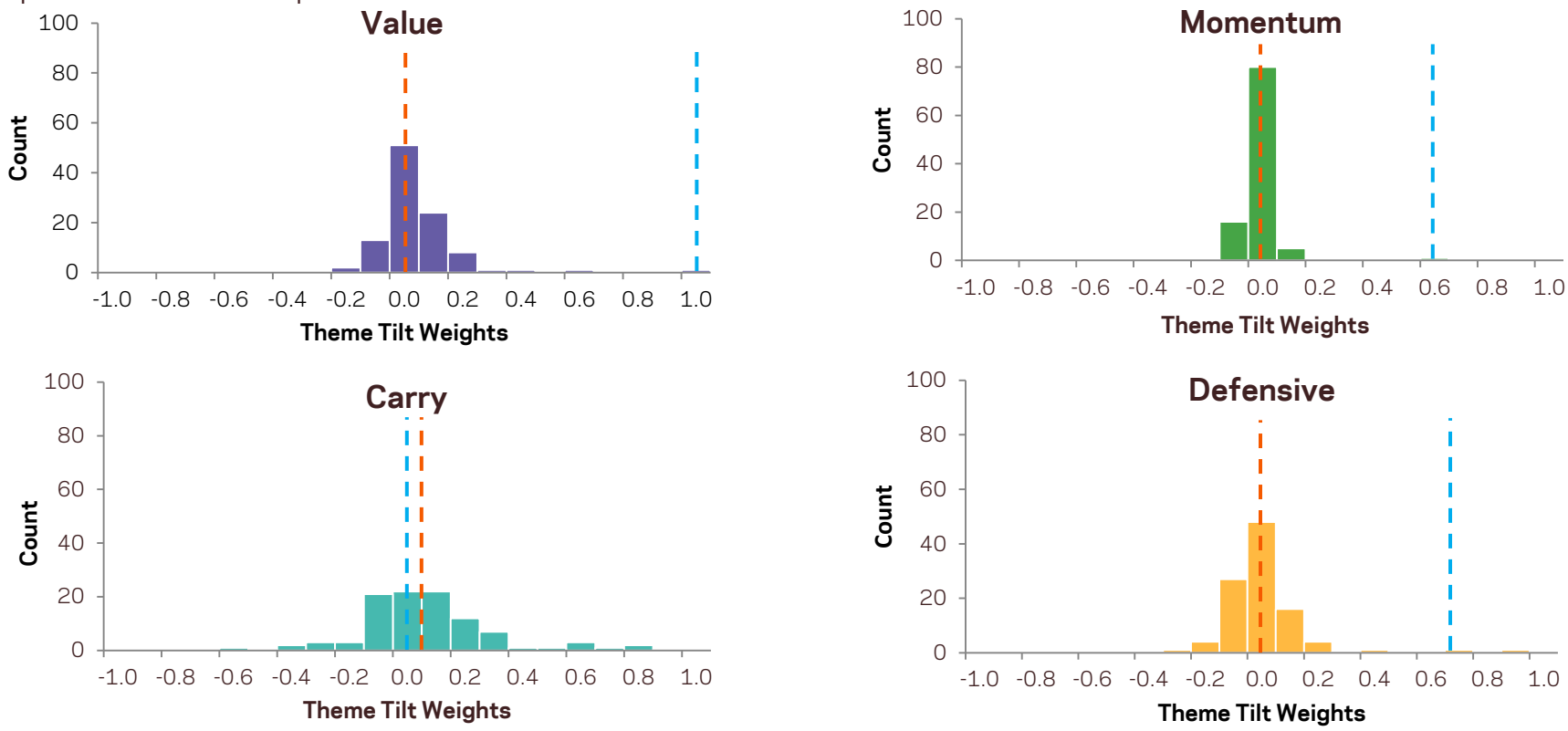
Source: AQR. When AQR was founded in 1998, all prior strategies employed at Goldman Sachs were utilized, except Japan Stock Selection, which was reincorporated in 2003. All dates are approximate. There is no guarantee that these products will come to market or be profitable. Please read important disclosures in the Appendix.

High-Yield Manager Exposures to Themes

Holdings Analysis Reveals Muted Loadings on Style Themes

Distribution of Fund's Weight Tilts

September 1997 – April 2015



Source: AQR, Morningstar. The table above displays the distribution of theme tilts in a population of 102 high-yield funds based on 3,890 mutual fund reports between September 1997 and April 2015. Theme tilts are the average of the product of active weights of a fund and theme scores. We identify the 102 funds by selecting all mutual funds in the Morningstar database with an explicit high-yield benchmark belonging to the two most popular benchmark providers: BofA Merrill Lynch and Barclays. We then source bond holding information from Lipper Emaxx for these 102 funds. The tables display the distribution of fund's thematic tilts, the product of active weights and thematic scores averaged across time. Active weights are weights in excess of the benchmark where the benchmark is specific to each fund. Please refer to the Appendix for an explanation of the hypothetical strategy. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix.

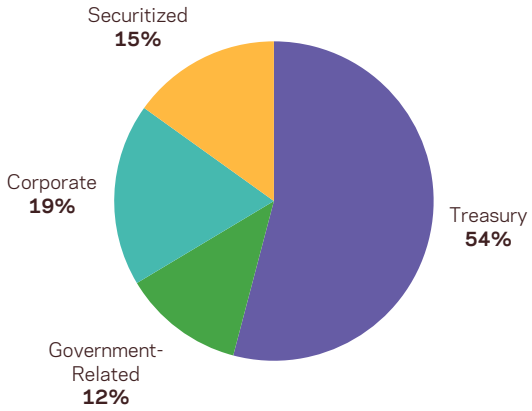
The Global Fixed Income Universe

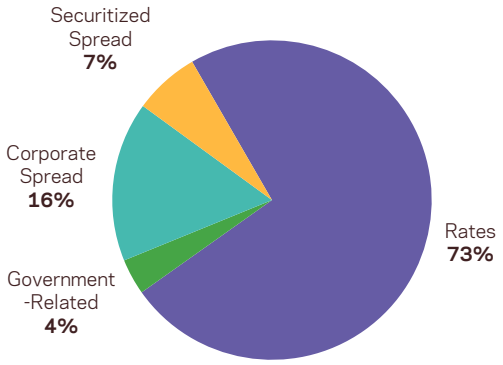
Market Value and Risk Attribution

Market Value

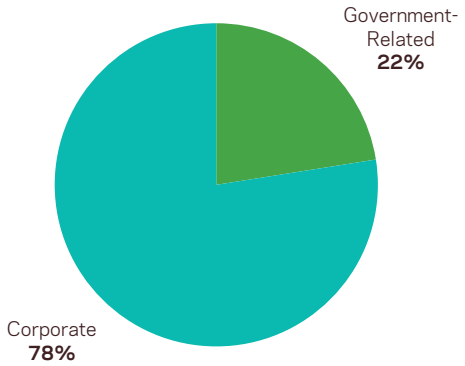
Risk Decomposition

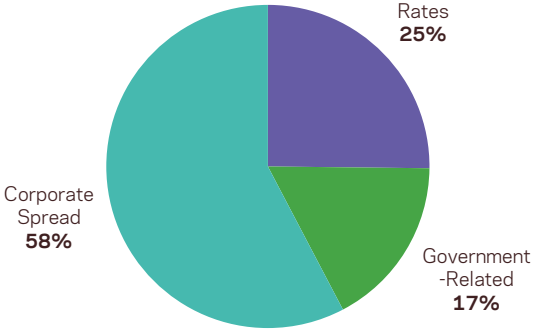
Global Agg ($45.1 Trillion)





Global High Yield ($2.4 Trillion)





Barclays, Bloomberg, AQR. Global Agg and Global High Yield universe based on membership of Bloomberg Barclays Global Aggregate and Global High Yield Indices. Market Value is based on market values in USD as of December 31, 2016. For risk decomposition, we first decompose total return of each sector into rate and spread returns. For Treasury, rate return is the total return. For Government-related, Corporate and Securitized, rate returns are the returns of key-rate-duration-matched Treasury portfolios, and spread returns are total returns minus rate returns. Risk Decomposition is then calculated using the annualized volatility of rate and spread returns for the period covering August 1, 2001-December 31, 2016.

Performance Disclosures

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Actual performance figures contained herein reflect the reinvestment of dividends and all other earnings and represent unaudited estimates of realized and unrealized gains and losses prepared by AQR Capital Management, LLC ("AQR"). There is no guarantee as to the above information's accuracy or completeness. **PAST PERFORMANCE IS NOT A GUARANTEE OF FUTURE PERFORMANCE.** There is no guarantee, express or implied, that long-term return and/or volatility targets will be achieved. Realized returns and/or volatility may come in higher or lower than expected. Diversification does not eliminate the risk of experiencing investment losses.

Hypothetical performance results (e.g., quantitative backtests) have many inherent limitations, some of which, but not all, are described herein. No representation is being made that any fund or account will or is likely to achieve profits or losses similar to those shown herein. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently realized by any particular trading program. One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or adhere to a particular trading program in spite of trading losses are material points which can adversely affect actual trading results. The hypothetical performance results contained herein represent the application of the quantitative models as currently in effect on the date first written above and there can be no assurance that the models will remain the same in the future or that an application of the current models in the future will produce similar results because the relevant market and economic conditions that prevailed during the hypothetical performance period will not necessarily recur. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results, all of which can adversely affect actual trading results. Discounting factors may be applied to reduce suspected anomalies. This backtest's return, for this period, may vary depending on the date it is run. Hypothetical performance results are presented for illustrative purposes only. In addition, our transaction cost assumptions utilized in backtests , where noted, are based on AQR's historical realized transaction costs and market data. Certain of the assumptions have been made for modeling purposes and are unlikely to be realized. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered. Changes in the assumptions may have a material impact on the hypothetical returns presented. Hypothetical performance is gross of advisory fees, net of transaction costs, and includes the reinvestment of dividends. If the expenses were reflected, the performance shown would be lower. Where noted, the hypothetical net performance data presented reflects the deduction of a model advisory fee and does not account for administrative expenses a fund or managed account may incur. Actual advisory fees for products offering this strategy may vary. There is a risk of substantial loss associated with trading commodities, futures, options, derivatives and other financial instruments. Before trading, investors should carefully consider their financial position and risk tolerance to determine if the proposed trading theme is appropriate. Investors should realize that when trading futures, commodities, options, derivatives and other financial instruments one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading derivatives or using leverage. All funds committed to such a trading strategy should be purely risk capital.

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Performance Disclosures

Corporate Bonds themes Backtest

AQR backtests of Value, Momentum, Carry and Defensive theoretical long/short theme components are based on monthly returns, undiscounted, gross of fees and transaction costs, and scaled to 5% annualized volatility. Each strategy is designed to take long positions in the assets with the strongest theme attributes and short positions in the assets with the weakest theme attributes, while seeking to ensure the portfolio is market-neutral. The universe is based on the constituents of the Bank of America High Yield and Investment Grade Indices.

Value: Value strategies favor investments that appear cheap over those that appear expensive based on fundamental measures related to credit spreads, seeking to capture the tendency for relatively cheap assets to outperform relatively expensive assets.

Momentum: Momentum strategies favor investments that either have performed well recently or have related securities that have performed well recently. It seeks to capture the tendency that an asset's and related securities recent relative performance predict the performance of the asset in the near future.

Carry: Carry strategies favor high-yielding assets, seeking to capture the tendency of high-yielding assets to outperform lower-yielding assets.

Defensive: Defensive strategies favor investments with strong drivers of credit valuation. It seeks to capture the tendency for assets with strong fundamentals to generate higher risk-adjusted returns than assets with weak fundamentals.

Government Bonds themes Backtest

AQR backtests of Value, Momentum, Carry, and Defensive theoretical long/short theme components are built as follows. We first rank the universe of securities (i.e., the 39 country-maturity buckets) by the raw measure of a given theme. We then standardize the ranks by subtracting the mean rank from each rank and dividing by the standard deviation of ranks to convert them into a set of standardized weights. Next we scale each side of these portfolios (long and short) to sum to one. Lastly, we apply these weights to our asset returns, which are always expressed in a constant duration of four.

Global Government Bond Strategy Backtest

The AQR Global Government Bonds backtest invests in developed market (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, UK, US)government bonds and bond futures, as well as currency forwards. Each strategy is designed to take active long-short tilts around the JP Morgan Government Bond Index, by take long (or overweight) positions in attractive fixed income markets or currencies, and short (or underweight) positions in unattractive fixed income markets or currencies. Returns are based on hypothetical returns, discounted, net of transaction costs, but gross of fees

Broad-based securities indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index. The Barclays Capital US Corporate High Yield Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below. The Bank of America Merrill Lynch US High Yield Index tracks the performance of below investment grade, but not in default, US dollar denominated corporate bonds publicly issued in the US domestic market, and includes issues with a credit rating of BBB or below, as rated by Moody's and S&P. The J.P. Morgan Global Government Bond Index tracks 13 countries and three maturity buckets per country: 1y-5y, 5y-10y, and 10y-30y. The BofA Merrill Lynch BB-B US High Yield Constrained Index contains all securities in the BofA Merrill Lynch US High Yield Index rated BB+ through B- by S&P (or equivalent as rated by Moody's or Fitch), but caps issuer exposure at 2%. Index constituents are capitalization-weighted, based on their current amount outstanding, provided the total allocation to an individual issuer does not exceed 2%. The iShares iBoxx High Yield Corporate Bond ETF seeks to track the investment results of an index composed of U.S. dollar-denominated, high yield corporate bonds. The SPDR® S&P 500® ETF Trust seeks to provide investment results that, before expenses, correspond generally to the price and yield performance of the S&P 500® Index. The BofA Merrill Lynch 7-10 Year Treasury Bond Index measures the performance of U.S. Treasury securities that have a remaining maturity of at least seven years and less than 10 years. The Barclays Global Treasury Index tracks fixed-rate local currency government debt of investment grade countries. The Barclays Global Aggregate Corporate Index represents the corporates portion of the Barclays Global Aggregate index grouping. The Barclays Global Aggregate index is an unmanaged index that is comprised of several other Barclays indexes that measure fixed income performance of regions around the world.

Spread returns are excess returns over duration-matched treasury returns; spread risk is the volatility (standard deviation) of the previously defined spread returns.
Rate returns are the difference between total returns and spread returns; rate risk is the volatility (standard deviation) of the previously defined rate returns.

Performance Disclosures

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Government Bonds: Government bonds include all bonds covered by the J.P. Morgan Government Bond Index (GBI). The GBI is a market-cap-weighted index of all liquid government bonds across 13 markets (Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, U.K., U.S.). It excludes securities with time-to-maturity (TTM) of less than 12 months, illiquid securities, and securities with embedded optionality (e.g., convertible bonds). The GBI is sub-divided into two country-maturity partitions. We use the first, more coarse partition in this analysis, which divides bonds into 1yr-5yr TTM, 5yr-10yr TTM, and 10yr-30yr TTM. We sort the bonds into terciles based on the theme metrics described on page 2. The portfolios go long the top tercile and short the bottom tercile. Bonds are equal-weighted in each tercile.

Corporate Bond: Corporate bonds include 1,300 bonds that roughly comprise the Bank of America Merrill Lynch investment grade (U.S. Corporate Master) and high yield (U.S. High Yield Master) corporate bond indices. Of the 1,300, 600 are investment grade, and 700 are high yield bonds. We sort the bonds into quintiles based on the four theme metrics described on page 3. The portfolios go long the top quintile and short the bottom quintile. Bonds are value-weighted, not equal-weighted, within each quintile.