



Building a Better Global Macro Portfolio

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Global macro funds have historically delivered attractive returns and diversification benefits to institutional investors. This paper presents AQR's approach to building a global macro portfolio.

AQR's global macro strategy trades predominately on macroeconomic news and trends, using a systematic, bottom-up approach that integrates both quantitative and discretionary trading signals. The strategy is long-term market-neutral, but can take directional views over the short term. Historically, the strategy has generated attractive returns with low correlation to traditional and alternative assets. In addition, it has tended to be particularly diversifying during persistent equity market drawdowns.

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Introduction

Global macro has been a top-performing hedge fund strategy over the past 20 years.¹ In addition to delivering attractive returns, global macro strategies can offer diversification benefits, including low correlations to both traditional and alternative assets. Institutional investors have long been able to access global macro strategies, and have made them a core of their alternative holdings. Global macro currently makes up approximately 20% of the hedge fund industry with approximately \$400 billion allocated — almost all by institutional investors.²

This paper outlines AQR's approach to building a global macro portfolio. Our investment philosophy is rooted in the insight that financial markets tend to underreact to macroeconomic news. This implies that macroeconomic news tends to have a persistent effect on asset prices. Our strategy seeks to take advantage of this tendency by investing across liquid markets on the basis of macroeconomic news and trends, an investment approach we call *macro momentum*. We form macro momentum views by evaluating both quantitative and discretionary indicators across a variety of dimensions, from growth and inflation to monetary policy and international trade. By integrating both quantitative and discretionary indicators of macro momentum in a bottom-up, risk-controlled portfolio construction, we capture the best features of both approaches while maintaining the benefits of a systematic and disciplined process.

Along with the potential to provide attractive risk-adjusted returns, trading on the basis of macro momentum results in a portfolio with the potential to perform well during equity market

turning points, as well as during protracted equity market drawdowns. This tendency arises because deteriorating macroeconomic conditions, which our macro momentum indicators capture, tend to precede persistent bear market environments.

With macro momentum at the core of our investment philosophy, we also consider price momentum, value and carry indicators. This multifactor approach provides a more holistic picture of each asset's attractiveness than trading on macro momentum alone does. Macro momentum tends to drive asset positioning (long or short) in our portfolio, but the degree of agreement between macro momentum, on the one hand, and price momentum, value and carry, on the other, determines ultimate position sizing. Our bottom-up portfolio construction — in which we evaluate the attractiveness of each asset across a large number of dimensions — allows us to build a highly diversified portfolio that does not depend on a few “best ideas.”

Our global macro strategy invests across four liquid asset classes: fixed income, currencies, commodities and equities. Within each asset class, we take both relative value and directional positions. A point of contrast with many global macro managers is that our strategy is long-term market neutral. While at a given point in time we may be tactically long or short any asset class based on our directional views, there is no “passive beta” component to our portfolio; over a full market cycle, we expect our global macro strategy to be uncorrelated with traditional assets.

We believe that our global macro strategy can lead to attractive long-run results: high risk-adjusted returns that are independent of traditional and alternative assets, coupled with the propensity to outperform during persistent equity market downturns.

¹ Credit Suisse Hedge Fund Index, Global Macro sub-strategy returns, January 1994 to December 2013.

² HFR Global Hedge Fund Industry Report, Q1 2013, based on approximately \$2 trillion of hedge fund assets and 20% of hedge fund assets in the HFR Macro category.



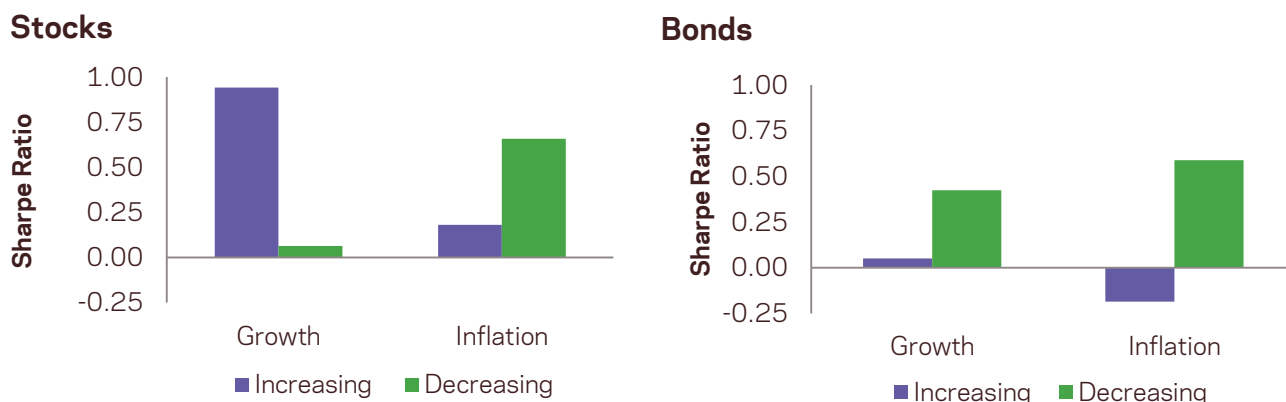
Part I: Asset Prices and the Macroeconomy

The defining feature of global macro investing is that an evaluation of broad economic conditions forms the core of the investment process. Global macro strategies, therefore, should only be profitable if asset prices are sensitive to economic conditions. [Exhibit 1](#) illustrates that asset prices are indeed quite sensitive to the macroeconomic environment. The exhibit shows the performance of U.S. stocks and bonds in increasing and decreasing growth and inflation environments during the postwar period. Stocks have tended to significantly outperform during quarters in which economic growth increased, while significantly underperforming during quarters in which inflation increased. Bonds likewise have underperformed in increasing inflation environments, but, contrary to stocks, have also tended to underperform in increasing growth environments. The magnitudes of these sensitivities are highly economically significant. For example, stocks have realized about a 1.0 Sharpe ratio during quarters in which economic growth increased, but their performance was nearly flat otherwise.³

Since asset prices are sensitive to the macroeconomic environment, it follows that if an investor can predict how macroeconomic conditions will evolve in the future, then he could use that information to generate exceptional returns. But, is investor clairvoyance necessary to profitably trade based on macroeconomic fundamentals? Fortunately, the answer is no.

Exhibit 1 presents evidence that asset prices respond *contemporaneously* to changes in macroeconomic conditions. [Exhibit 2](#) documents a *predictive* relationship between macroeconomic news and *future* asset returns, illustrating that the full effects of news are often not incorporated into asset prices immediately. Exhibit 2 traces the effect of positive quarterly growth and inflation surprises on stock and bond returns over the subsequent six months. Whereas Exhibit 1 shows that equities tend to outperform during periods in which economic growth increases, Exhibit 2 shows that equities also tend to outperform *subsequent* to positive growth news. Similarly, while bonds tend to underperform during periods in which economic growth increases, they also

Exhibit 1: Asset Returns Can Be Very Sensitive to Macroeconomic Conditions

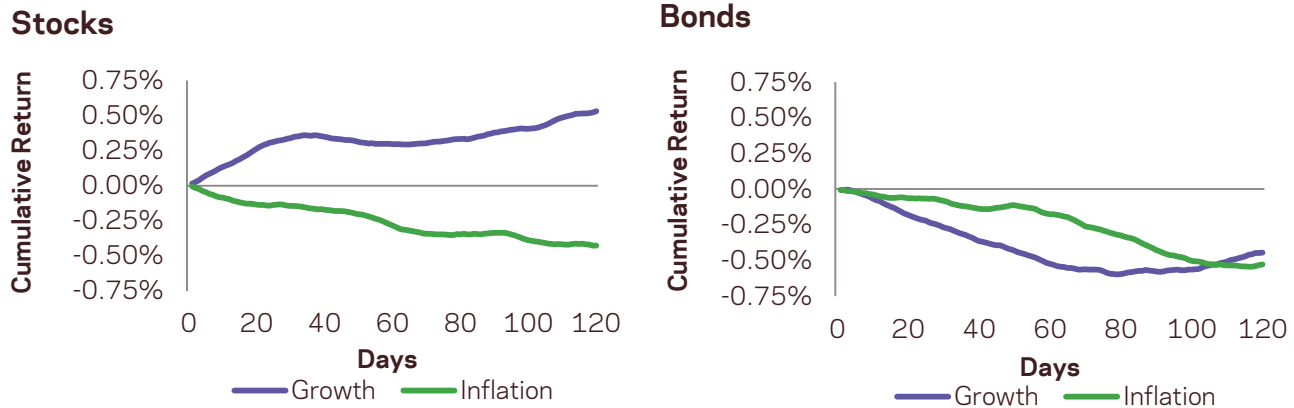


Sources: Index data from December 1947 to March 2013. U.S. stock returns are the S&P 500 Index from Ibbotson, Bloomberg and Datastream. U.S. bond returns are for U.S. 10-year government bonds from Global Financial Data (GFD), Datastream, Morgan Markets and Bloomberg. Growth is defined as the year-over-year percent change in industrial production. Inflation is the year-over-year percent change in the U.S. Consumer Price Index. Industrial production and U.S. CPI data are from the Federal Reserve Bank of Saint Louis.

³ AQR Alternative Thinking (Q4 2013); "Exploring Macroeconomic Sensitivities," Ilmanen, Maloney, Ross (2013).



Exhibit 2: Economic News Has a Persistent Impact on Asset Prices



Notes: This graph displays Fama-Macbeth regression coefficients in univariate regressions of k -day stock and bond excess returns on growth and inflation surprises. Coefficients are scaled such that the time series of one-day return regression coefficients has a realized volatility of 10% over the sample. Returns are the excess returns of global baskets (made up of the regions listed below) of stock and bond futures. Growth and inflation surprises are built using AQR's proprietary methodology. The value of the growth (inflation) surprise index at each point in time is the normalized sum of standardized surprises for all growth (inflation) related releases over the past 60 days. Surprises are measured as the difference between the actual announced value of an economic indicator and the Bloomberg median forecast immediately prior to the announcement. The stocks regression is run over a global region that includes Australia, Canada, Eurostoxx, Hong Kong, Japan, Sweden, Switzerland, U.K. and U.S. The bonds regression is run over a global region that includes Australia, Canada, Germany, Japan, U.K. and U.S. Regressions are from January 2002 to February 2014, with the starting date constrained by the availability of data for economic releases and forecasts.

tend to underperform subsequent to positive growth news. Delayed market reaction is not unique to news about economic growth, as both stocks and bonds tend to underperform subsequent to positive inflation surprises as well. Delayed reaction to macroeconomic news appears to be a pervasive phenomenon.

But why does macroeconomic news tend to have a persistent impact on asset prices? Two related phenomena are at work: *underreaction to news* and *serial correlation in news*.

First, markets have a tendency to underreact to new information. This is consistent with the price momentum literature in which empirical work (including our own) has generally found that price movements persist specifically when associated with news, while price movements unrelated to news do not persist.⁴ Theories for

underreaction to news widely cite behavioral biases of anchoring and inattention.

Second, news itself tends to be serially correlated over time. Multiple academic papers document serial correlation in equity earnings surprises and forecast revisions, and our own research (available on request) shows that this phenomenon carries over to macroeconomic news as well.⁵ For example, we find that if economic growth has surprised to the upside over the past year, it is more likely to surprise to the upside over the next month to year as well.

Underreaction to news and serial correlation in news imply that past news can predict future returns, and thus motivate an approach to profitably trade on macroeconomic developments. By systematically identifying macroeconomic news and trends, we can position our portfolio to take advantage of underreaction

⁴ "Momentum and Reversals in Equity-Index Returns During Periods of Abnormal Turnover and Return Dispersion," Connolly, Stivers (2003); "Stock Price Reaction to News and No-news: Drift and Reversal after Headlines," Chan (2003); "The Disposition Effect and Under-Reaction to News," Frazzini (2006).

⁵ "Revenue Surprises and Stock Returns," Jegadeesh, Livnat (2006a); "Evidence that Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings," Bernard, Thomas (1990); "Streaks in Earnings Surprises and the Cross-Section of Stock Returns," Loh, Warachka (2012).

and serial correlation. We call this investment concept “**macro momentum**.”

Part II: Understanding Macro Momentum

Macro momentum — investing on the basis of macroeconomic news and trends — lends itself to a systematic approach that integrates both **quantitative** and **discretionary** indicators. The rigor and scope of a quantitative process is needed to efficiently and objectively process the multitude of available macroeconomic data, and to create a well-diversified portfolio comprised of many relatively small positions. However, while quantifiable macroeconomic inputs are able to recognize a wide variety of macroeconomic trends across the globe, nonquantifiable information also comprises a significant portion of the macro news flow.

Quantitative and discretionary macro inputs are natural complements. For example, in evaluating monetary policy in a particular country, a quantitative indicator may use forecasts of growth and inflation, financial market conditions, and the current stance of monetary policy to project a trajectory for future interest rates. A discretionary process also incorporates speeches and statements by the central bank and its governors, as well as indicators that may influence policy episodically (e.g., currency market trends). Together, quantitative and discretionary inputs are able to span a much wider space of macroeconomic news than either process could achieve independently.

We have developed a unique framework for fully integrating quantitative and discretionary inputs into one systematic, risk-controlled process. Our framework preserves the diversification and empirical rigor of a quantitative approach, while maintaining the adaptability and ability to

incorporate nonquantifiable inputs that a discretionary process affords.

Our research indicates that macro momentum is a robust trading strategy that works over a wide range of markets and indicators. There are four broad dimensions across which we form macro momentum views:

- The business cycle
- Monetary policy
- International trade
- Macro sentiment

Within each of these dimensions, we incorporate multiple inputs, integrating quantitative and discretionary information.

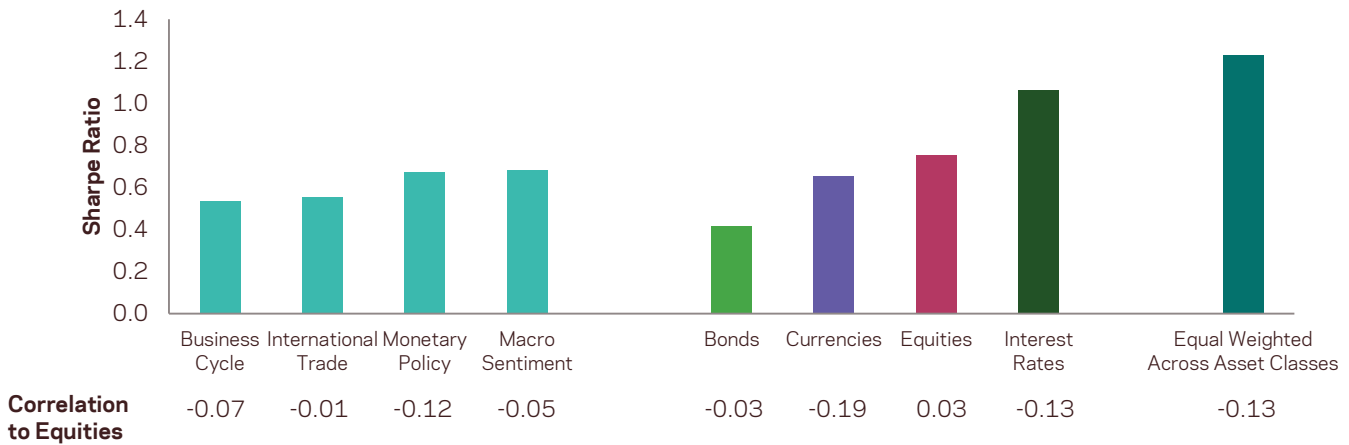
Historical simulations show that macro momentum is indeed able to profit by identifying and trading on macroeconomic trends. To illustrate this point, we created stylized long/short portfolios in four liquid developed markets (equity indices, bonds, currencies and interest rates). We constructed the portfolios using four simple, illustrative quantitative macro momentum measures: one-year changes in growth and inflation forecasts to represent news about the business cycle; one-year changes in two-year bond yields to represent news in monetary policy;⁶ recent stock market performance for variations in macro sentiment;⁷ and one-year changes in the nominal exchange

⁶ In addition to capturing the current policy rate, two-year yields embed expectations of future monetary policy. Brian Sack, former head of the New York Fed trading desk said, “The best measure of the stance of monetary policy is the two-year Treasury yield.”

⁷ For macro sentiment in all asset classes except equities, we use the current equity index level divided by an exponentially weighted average of lagged levels, as described in Ilmanen (1995). For equities, this sentiment measure is almost identical to price momentum, so we instead use a sentiment measure that is based on analyst earnings revisions. Specifically, for each company in an index we compute the number of upward earnings revisions minus the number of downward earnings revisions by analysts over the past month, divided by the total number of active analysts. We then aggregate to the index level based on the weight of each company within the index.



Exhibit 3: Simple Macro Momentum Hypothetical Simulations 1990-2013



Source: AQR. These are simplified, hypothetical simulations for illustrative purposes only, gross of transaction costs. Correlations are measured against the S&P 500 Index. Hypothetical data have inherent limitations, some of which are disclosed in the Disclosures.

rate for trends in international trade.⁸ These choices are intended to represent the core of each dimension in an intuitive and clear way.⁹

Exhibit 3 shows the performance of macro momentum for each dimension (aggregated across asset classes), for each asset class (aggregated across dimensions), and for a combined macro momentum portfolio that takes equal weight in each asset class.¹⁰ The different dimensions each have Sharpe ratios in the range of 0.5 to 0.7. Across asset classes, Sharpe ratios range from 0.4 for bonds to 1.0 for interest rates. The simulation demonstrates the efficacy of macro momentum investing within each asset class and across each macro momentum

dimension. **Exhibit 3** also highlights macro momentum's low correlation to equities, suggesting macro momentum may be especially additive to traditional equity-centric portfolios.

Exhibit 4 shows the correlations of macro momentum strategies across asset classes and dimensions. The generally low correlations across dimensions indicate that different macro momentum themes capture different aspects of macroeconomic news, and are thus diversifying to each other. Macro momentum strategies across asset classes are also lowly correlated. Given the low correlations, there are benefits to a diversified approach that combines all dimensions and asset classes. We see this in **Exhibit 3**, where the Sharpe ratio of the combined portfolio is higher than any individual dimension or asset class.

The above stylized example used the simplest quantitative indicators. The performance of macro momentum can be further enhanced by utilizing additional and more sophisticated quantitative signals, as well as by incorporating discretionary inputs.

⁸For currencies, this measure is very similar to simple price momentum, so we instead use one-year changes in terms of trade as a measure of variations in international trade conditions.

⁹ The indicators that we use in this simulation to build long-short portfolios are signed within each asset class as follows. For bonds and interest rates, we go long (short) countries with — relative to the cross-section — decreasing (increasing) growth and inflation forecasts, decreasing (increasing) two-year yields, a strengthening (weakening) exchange rate, and poor (strong) equity market performance. For equity indices, we go long (short) countries with increasing (decreasing) growth forecasts, decreasing (increasing) inflation forecasts, decreasing (increasing) two-year yields, a weakening (strengthening) currency, and positive (negative) earnings revisions. For currencies, we go long (short) countries with increasing (decreasing) growth and inflation forecasts, increasing (decreasing) two-year yields, improving (worsening) terms of trade, and strong (weak) equity market performance.

¹⁰ Within each asset class we equally weight each dimension. The combined portfolio is equally weighted across asset classes.

Exhibit 4: Simple Macro Momentum Hypothetical Simulations — Cross Correlations 1990-2013

	Business Cycle	Int'l Trade	Monetary Policy	Macro Sentiment
Business Cycle	1.00			
International Trade	-0.15	1.00		
Monetary Policy	0.22	-0.05	1.00	
Macro Sentiment	0.17	-0.03	-0.14	1.00

	Equities	Bonds	Currencies	Interest Rates
Equities	1.00			
Bonds	0.03	1.00		
Currencies	0.18	0.00	1.00	
Interest Rates	0.07	0.44	0.03	1.00

Source: AQR. These are simplified, hypothetical simulations for illustrative purposes only, gross of transaction costs. Correlations are measured against the S&P 500. Hypothetical data have inherent limitations, some of which are disclosed in the disclosures at the end of this document. Past performance is not an indication of future performance. Please see Disclosures for more details.

Part III: A Multifactor Approach

While macro momentum is a powerful strategy on its own, in our global macro portfolio we employ a multifactor approach that also incorporates **price momentum**, **value** and **carry** signals. Although the macroeconomic environment may be ripe for an asset to outperform, if the asset is overpriced or has poor price momentum, it may not be an attractive investment opportunity. Alternatively, given two assets with the same macroeconomic catalyst, we would favor the asset offering the more attractive carry. A multifactor approach addresses these considerations.

Price momentum investing is buying securities that have had recent strong performance and selling securities that have had recent weak performance. Price momentum forms a powerful combination with macro momentum. Both themes aim to trade on delayed market reaction to new information, but while macro momentum looks to identify changes in economic news directly, price momentum identifies news via trends in asset prices. Both approaches have

merit, with strong historical performance and rigorous theoretical justification.

Value investing seeks to take advantage of the tendency for relatively cheap assets to outperform relatively expensive assets. Incorporating value signals may help avoid taking positions on the basis of economic news that is already completely priced in or investing on the basis of a price trend that is overextended.

Carry investing seeks to take advantage of the tendency for higher-yielding assets to provide higher returns than lower-yielding assets. Carry strategies are ubiquitous across global macro investors. The economic logic is elegant in its simplicity: all else equal, we tend to prefer a position we are paid to hold over a position that we must pay to hold.

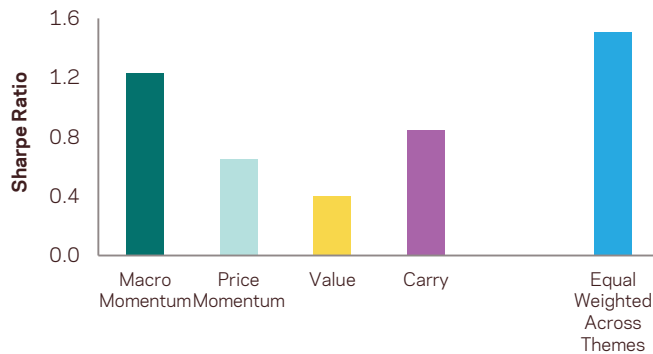
Exhibit 5 shows that, like macro momentum, simple measures of price momentum, value and carry also exhibit attractive risk-adjusted returns.¹¹ Each investment theme is profitable on a stand-alone basis, but due to the benefits of diversification, a multifactor approach that incorporates all themes outperforms any individual theme.

Discretionary inputs are a key component to our macro momentum implementation. Our price momentum, value and carry indicators, however, are purely quantitative. While we acknowledge that soft data may be additive in extracting price trends, determining fair value or measuring asset carry, it is crucial in distilling the macroeconomic news flow.

¹¹Returns are from long/short portfolios in equities, bonds, currencies and interest rates. Macro momentum is as shown in Exhibit 3. Price momentum is simple one-year momentum. Value is the book-to-price ratio in equities; real bond yield in bonds; real interest rates in interest rates; and deviations from purchasing power parity in currencies. Carry is the term spread in bonds; short term interest rate in currencies; slope of the futures curve in interest rates; and there is no measure in equities. Within each theme, asset classes are equal risk weighted. The "Combined" portfolio is equal risk weighted across the four themes.



Exhibit 5: Hypothetical Theme Performance 1990-2013



	Macro Momentum	Price Momentum	Value	Carry
Macro Momentum	1.00			
Price Momentum	0.32	1.00		
Value	-0.02	0.36	1.00	
Carry	0.00	-0.24	-0.27	1.00

Source: AQR. These are simplified, hypothetical simulations for illustrative purposes only, gross of transaction costs and advisory fees. Hypothetical data have inherent limitations, some of which are disclosed in the disclosures at the end of this document. Past performance is not an indication of future performance. Please see Disclosures for more details.

For more details on value, momentum and carry investing, we refer to “Value and Momentum Everywhere” (Asness, Moskowitz and Pedersen, 2012) and “Carry” (Kojien et al., 2013).

In our global macro strategy, positions (long or short) are generally driven by macro momentum, but their sizing tends to depend on how macro momentum agrees with price momentum, value and carry. In an environment where all of our investment themes align, we will tend to take larger positions than average. In an environment where price momentum, value and carry views are in the opposite direction of macro momentum, we will tend to take smaller positions than average.

Part IV: Portfolio Construction

In the previous two sections we highlighted the factors that drive positioning within our global macro strategy. In this section we focus on the key features of our portfolio construction approach.

Our **bottom-up** approach, in which we evaluate the attractiveness of each asset across multiple dimensions, contrasts sharply with a top-down portfolio construction in which portfolio managers form a handful of high-level views (e.g., slowing growth in China), then put on one or more positions to express each of these views. We believe that our bottom-up approach results in a more diversified portfolio. A top-down portfolio, by construction, can only be as diverse as the number of independent top-down views that drive its positioning. A bottom-up approach, on the other hand, can incorporate a very large number of relatively uncorrelated positions. Our portfolio, therefore, relies significantly less on the outcome of any specific input. In addition to reduced portfolio concentration, a bottom-up approach often presents attractive investment opportunities even in the absence of strong conviction top-down macro theses.

Our global macro strategy targets low to zero correlation to traditional asset-class beta (equity market, bond market and commodity market) over a full market cycle. But, while the strategy is **long-term market neutral**, at a given point in time we do take tactical (directional) exposure. Directionality is a critical component in building a portfolio that has positive convexity: a propensity to outperform in persistent equity market drawdowns. We examine this characteristic in Part V.

Diversification is a key element in our portfolio design. We apply our investment philosophy across four major asset classes: fixed income, currencies, commodities, and equities — and across both developed and emerging markets. Long-term asset class risk allocations are set to maximize diversification, while also taking into account liquidity considerations.



Part V: Global Macro as a Portfolio Diversifier

In this section we focus on the hypothetical performance of our simulated global macro strategy. This simulation employs our full spectrum of quantitative macro momentum signals, as well as all price momentum, value and carry indicators — not just the simple signals used in the above stylized simulations. Note, however, that we omit discretionary indicators from this historical simulation.

Exhibit 6 presents performance and correlation statistics based on discounted backtest returns.¹² The strategy has historically been quite profitable, realizing a Sharpe ratio in excess of one. High risk-adjusted returns stem from the efficacy of macro momentum investing, as well as the diversification benefits of a multifactor and multi-asset-class approach.

The global macro strategy is essentially uncorrelated with equity markets over the sample. As a result, we expect the strategy to be quite diversifying to a typical investor's portfolio that is often dominated by equity risk. Currently, with anemic expected returns for stocks and bonds¹³, there is a strong impetus to access diversifying return sources, and our global macro strategy provides significant diversification along with attractive returns. In addition, the global macro strategy is uncorrelated to a broad composite of alternative investments, and thus can be a key diversifying component within a portfolio of alternatives.

¹² Simulated gross of advisory fee portfolio is discounted, as undiscounted performance is too high to be the basis of return expectations (with a Sharpe ratio of 2.7). Even if every effort is made to avoid overfitting or data mining, the general field of study may still contain some overfitting biases due to the focus on studies that yield the most significant results, so we discount to adjust for any upward biases that may be present in the results. Note that macro momentum only contains the quantitative inputs for macro momentum, as the qualitative inputs cannot be backtested.

¹³ AQR's *Alternative Thinking* (Q1 2014); "The 5 Percent Solution," Asness, Ilmanen (2012).



Exhibit 6: Hypothetical Global Macro Simulation 1990-2013

	Hypothetical Global Macro Strategy
Annual Average Excess Return	9.7%
Volatility	8.7%
Sharpe Ratio	1.1
Correlation to Equities	0.00
Correlation to 60/40	0.01
Correlation to Alternatives	0.06

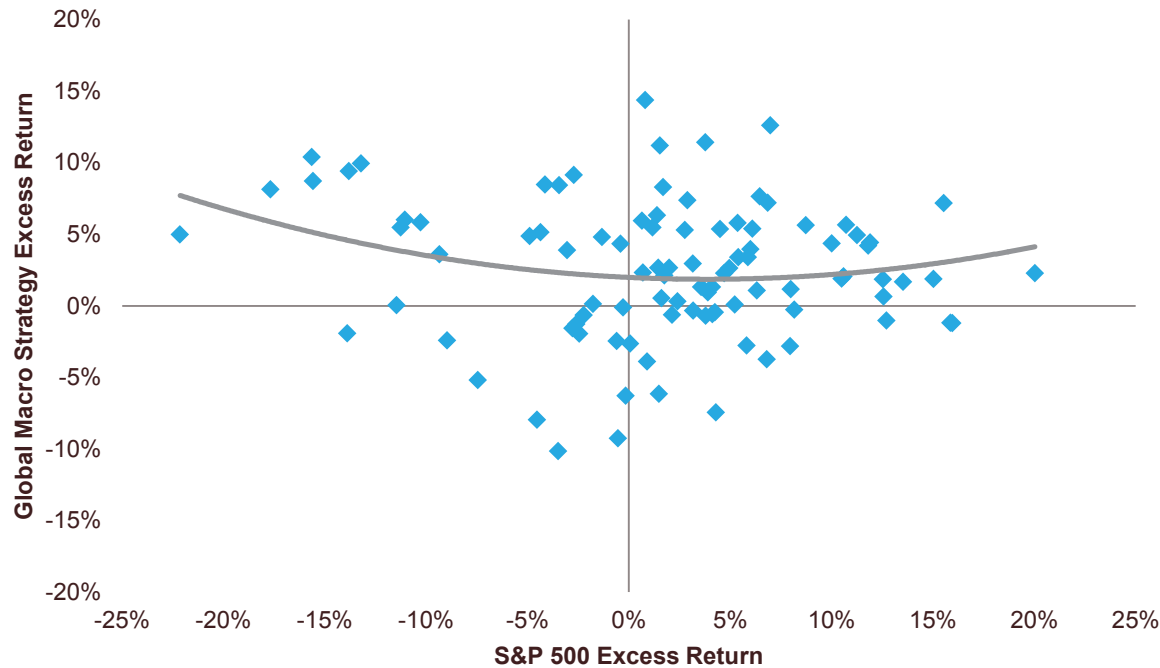
Source: AQR. Hypothetical strategy returns are gross of advisory fees from a backtested systematic global macro strategy described herein. These are not the returns of an actual portfolio and are for illustrative purposes only. The simulated portfolio targets 10% volatility and is based on backtests of the quantitative macro momentum, price momentum, value, and carry factors we employ. Equities are represented by the S&P 500 Index; 60/40 is the 60% S&P, 40% Barclays US Aggregate Index; Alternatives are represented by the HFRI. Hypothetical data have inherent limitations, some of which are disclosed in the Disclosures hereto. Past performance is not a guarantee of future performance.

In addition to providing diversification to traditional and alternative assets, the global macro strategy has an additional beneficial characteristic: a tendency to outperform in bear market environments. This positive convexity is captured in **Exhibit 7**, a scatter plot of our simulated strategy returns against the S&P 500. The strategy exhibits a pronounced negative correlation to equities during periods of negative equity market performance. In the ten worst quarters for equities (1990-2013), during which equity returns averaged -14.6%, the global macro strategy averaged +6.1.¹⁴ Strong performance in bear equity markets is consistent with our expectations. Persistent equity market drawdowns tend to be preceded by a sharp deterioration in macroeconomic fundamentals. Thus, macro momentum tends to be positioned short equities during bear markets. As the economy tends to lead markets, macro momentum also has the potential to capture equity market inflection points, environments that are notoriously difficult for a variety of trading strategies, including trend following.

¹⁴ Based on quarterly excess returns. This result is robust over different periods: the worst 5, 15, 20 etc. quarters for the S&P 500 all have positive average returns from the hypothetical global macro strategy. Over the full 33 down equity quarters since 1990, the S&P 500 averaged -6.9% while the hypothetical global macro strategy averaged +2.1%.

Exhibit 7: Hypothetical Global Macro Strategy vs. S&P 500 Index

Quarterly Returns
1990-2013

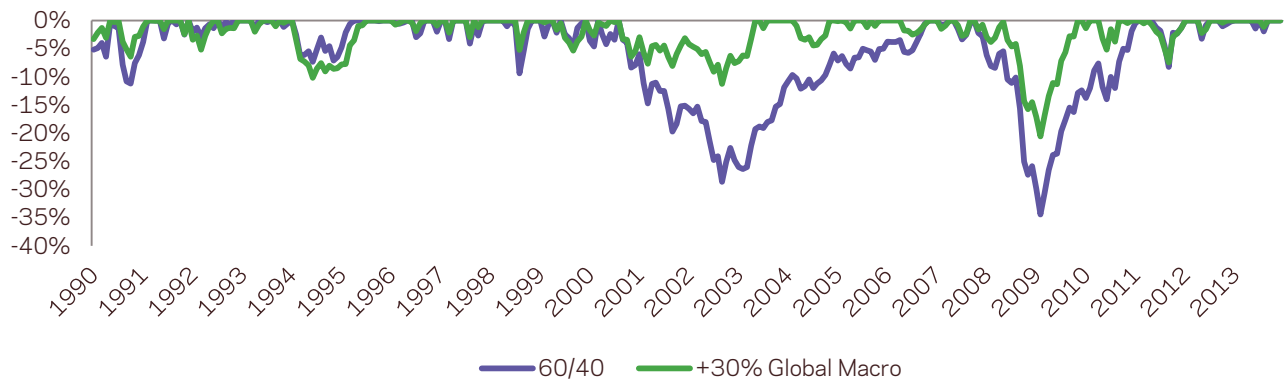


Source: AQR proprietary models and Bloomberg. Hypothetical strategy returns are from a backtested systematic global macro strategy described herein, targeting 10% volatility. The above graph is based on non-overlapping quarterly excess returns 1990-2013, net of transaction costs and gross of advisory fees. These are not the returns of an actual portfolio and are for illustrative purposes only. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Disclosures hereto.

Exhibit 8: Hypothetical Impact of Adding the Global Macro Backtest Portfolio to 60/40

1990-2013

	60/40	+10% Global Macro	+20% Global Macro	+30% Global Macro
Annual Excess Return	5.3%	5.7%	6.2%	6.6%
Volatility	9.2%	8.3%	7.6%	7.0%
Sharpe Ratio	0.6	0.7	0.8	0.9

Hypothetical Drawdown

Source: AQR proprietary models and Bloomberg. Hypothetical strategy returns are gross of fees from a backtested systematic global macro strategy described herein, targeting 10% volatility. These are not the returns of an actual portfolio and are for illustrative purposes only. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Disclosures hereto.



Exhibit 8 shows the impact of allocating pro-rata away from a 60% stocks / 40% bonds portfolio into the global macro strategy. Expected portfolio returns rise as we allocate to the global macro strategy, even as return volatility declines. Adding the global macro strategy also meaningfully reduces drawdowns. The reduction in drawdowns is due both to the fact that allocating to the global macro strategy reduces portfolio volatility, as well as to the tendency of the global macro strategy to outperform during bear equity markets.

Conclusion

Global macro strategies have been a staple in institutional alternative investing for many years. AQR utilizes an innovative approach to construct a global macro strategy that we believe can create an attractive portfolio for a wide range of investors. Our multifactor investment philosophy combines macro momentum — trading on the basis of macroeconomic news and trends — with price momentum, valuation and carry indicators to build long-term market-neutral portfolios across liquid fixed income, currency, commodity and equity markets. Our systematic, bottom-up portfolio formation integrates quantitative and discretionary macroeconomic inputs, seeking to simultaneously preserve both the rigor and diversification afforded by a quantitative approach along with the flexibility and ability to react to nonquantifiable data afforded by a discretionary process. The resulting portfolio aims to deliver attractive returns with low correlation to traditional and alternative assets, as well as a propensity to outperform during persistent equity market drawdowns. We believe that our global macro strategy provides investors with an excellent complement to their existing portfolios.



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Gross performance results do not reflect the deduction of investment advisory fees, which would reduce an investor's actual return. For example, assume that \$1 million is invested in an account with the Firm, and this account achieves a 10% compounded annualized return, gross of fees, for five years. At the end of five years that account would grow to \$1,610,510 before the deduction of management fees. Assuming management fees of 1.00% per year are deducted monthly from the account, the value of the account at the end of five years would be \$1,532,886 and the annualized rate of return would be 8.92%. For a 10-year period, the ending dollar values before and after fees would be \$2,593,742 and \$2,349,739, respectively. AQR's asset based fees may range up to 2.85% of assets under management, and are generally billed monthly or quarterly at the commencement of the calendar month or quarter during which AQR will perform the services to which the fees relate. Where applicable, performance fees are generally equal to 20% of net realized and unrealized profits each year, after restoration of any losses carried forward from prior years. In addition, AQR funds incur expenses (including start-up, legal, accounting, audit, administrative and regulatory expenses) and may have redemption or withdrawal charges up to 2% based on gross redemption or withdrawal proceeds. Please refer to AQR's ADV Part 2A for more information on fees. 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



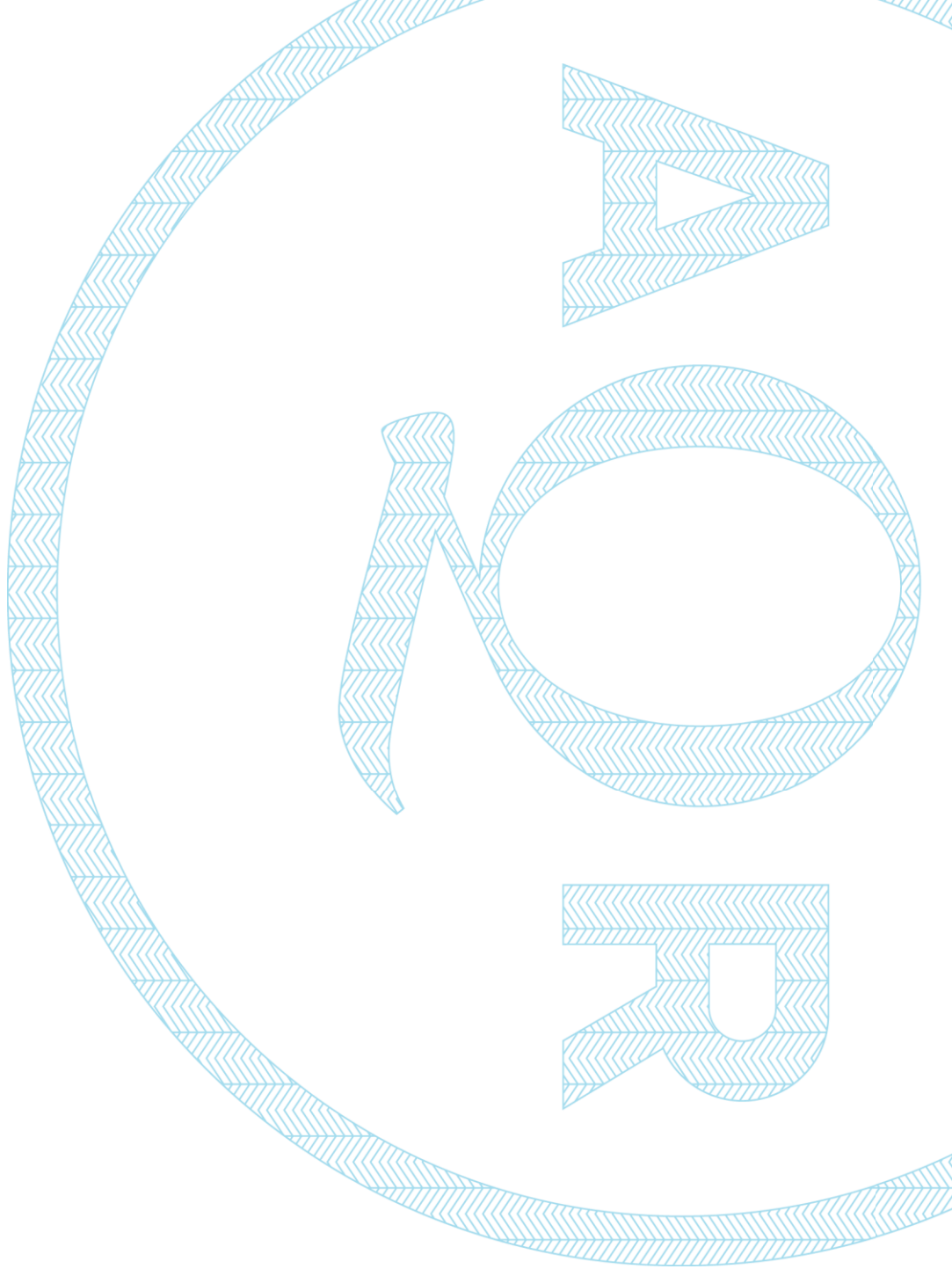
position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when trading futures, commodities, options, derivatives and other financial instruments one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading derivatives or using leverage. All funds committed to such a trading strategy should be purely risk capital.

AQR backtests of Value, Momentum, Carry, and Defensive strategies shown in Exhibits 3 & 4 are undiscounted, gross of fees and transaction costs. Adjusted composite in Exhibit 5 is discounted, net of estimate transactions costs, gross of fees. Each strategy is designed to take long positions in the assets with the strongest style attributes and short positions in the assets with the weakest style attributes, while seeking to ensure the portfolio is market-neutral. Please see below for a description of the Universe selection.

Stock and industry selection: approximately 1,500 stocks across Europe, Japan, U.K. and U.S. Developed-economy equity indices: Australia, Canada, Eurozone, Hong Kong, Japan, Sweden, Switzerland, U.K., U.S. Within Europe: Italy, France, Germany, Netherlands, Spain. Emerging-economy equity indexes: Brazil, China, India, Russia, South Africa, South Korea, Taiwan. Bond futures: Australia, Canada, Germany, Japan, U.K., U.S. Interest rate futures: Australia, Canada, Europe (Euribor), U.K., U.S. Developed-economy currencies: Australia, Canada, Euro, Japan, New Zealand, Norway, Sweden, Switzerland, U.K., U.S. Emerging-market currencies: Brazil, India, Mexico, Poland, Russia, Singapore, South Korea, Taiwan, Turkey. Commodity selection: Silver, Copper, Gold, Crude, Brent Oil, Natural Gas, Corn, Soybeans.

The white papers discussed herein can be provided upon request.





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