Trend Following in Focus

Introduction

Over the last decade, trend-following performance spanned a range of outcomes. Strong performance in the midst of the Global Financial Crisis later gave way to more modest returns until another strong run from mid-2013 through early-2015. More recently, trend following's performance has been challenging. Recent challenges prompt several key questions about the strategy and long-term expectations.

To start, it is important to highlight that trend following is a long-established investment approach with a history that dates back to at least the eighteenth century.[1] Managed futures funds became publicly available starting in the late 1940s and early 1950s.[2] In this piece, we use live data of trend-focused managers starting in 2000 via the SG Trend Index to contextualize recent performance and to re-affirm the merits of the strategy.

Key takeaways:

- Drawdowns are unfortunate but expected.
- Is industry size a problem? Not likely.
- Trend following is a good strategy going through a tough time.
- Trend following can be an important source of diversification.

[1] Eighteenth century economist David Ricardo described his investment strategy as trend following; he summarized his strategy as one that "[c]ut short your losses" and "[l]et your profits run on." The Great Metropolis, Volume 2. James Grant (1838).

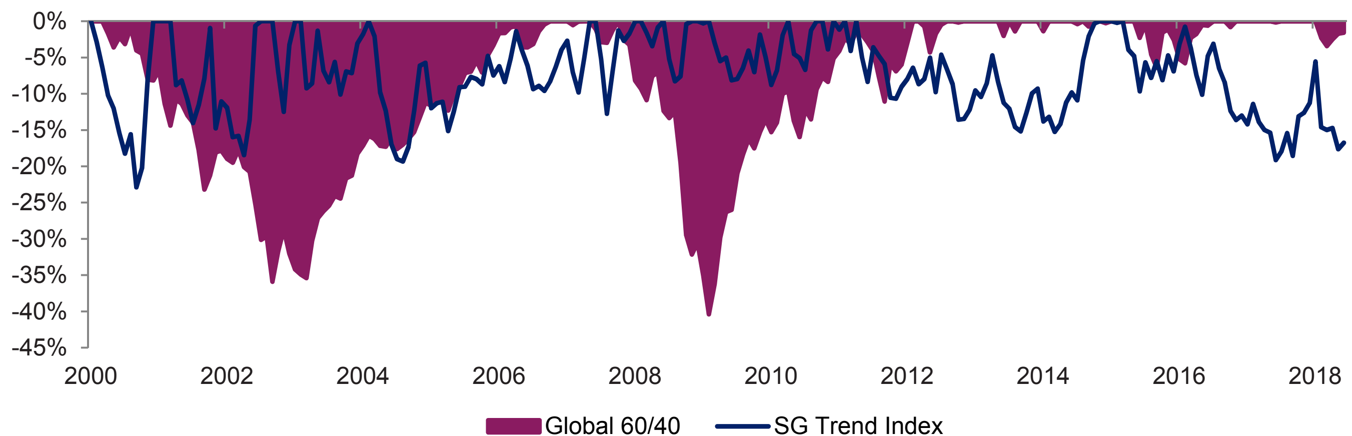
[2] "Trend Following Realized", Futures, May 13, 2009.

Drawdowns are unfortunate but expected

All strategies that take risk, even great ones, are likely to experience intermediate-term drawdowns commensurate with their risk profile. *Exhibit 1* shows the historical drawdown profile of trend managers and the drawdown profile of a 60/40 stock-bond portfolio.[3] We consider and compare the drawdown profiles of both strategies as trend managers and a global 60/40 portfolio have had similar levels of realized volatility over the long term.

Analyzing a long history of live returns for trend-following managers shows that drawdowns are to be expected. Notably, this most recent drawdown is commensurate with the magnitude of other large drawdowns. Thus while the recent performance experience has been challenging, it is not uncharacteristic of the strategy. It is also worth noting that the largest drawdowns in a traditional portfolio have been significantly more severe than those of trend managers historically.

Exhibit 1: Trend following has historically experienced less severe drawdowns than traditional portfolios
Cumulative Drawdowns
January 1, 2000 – June 30, 2018

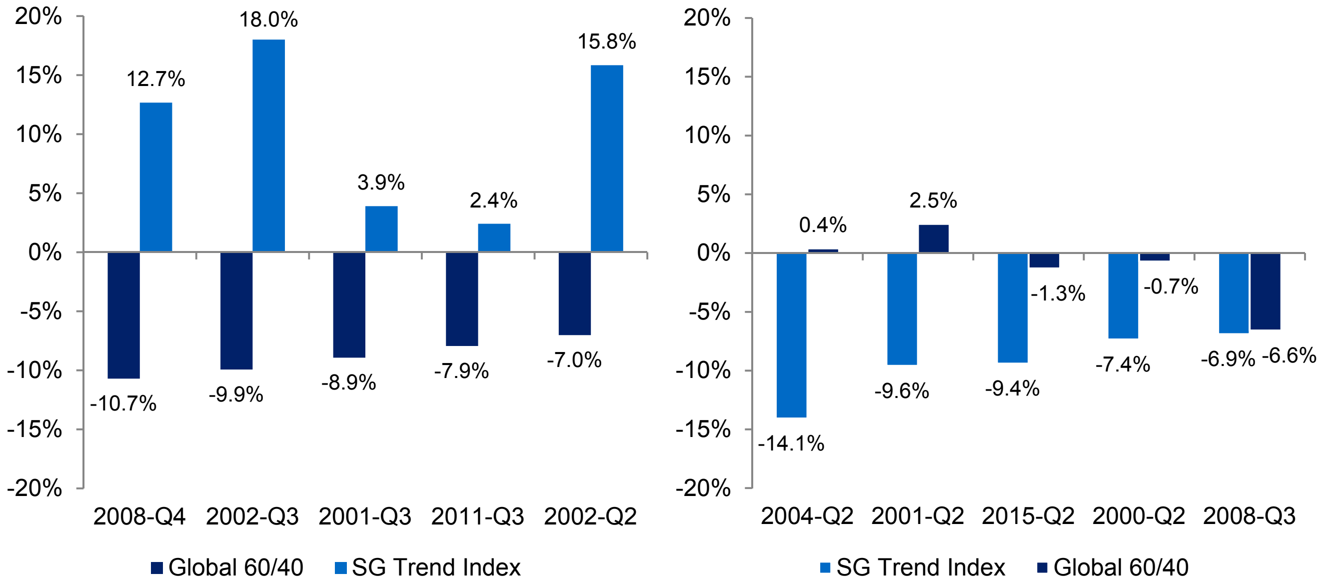


Source: AQR, Bloomberg. Cumulative drawdowns are measured based on the arithmetic sum of excess returns to abstract away from the effects of varying cash rates over time. Risk-free rate is the ICE BofAML U.S. 3-Month Treasury Bill Index. The global 60/40 portfolio has 60% of the portfolio invested in the MSCI World Index, synthetically hedged to USD, and 40% invested in the Barclays Capital Global Aggregate Bond Index. Past performance is not a reliable indicator of future performance. For Illustrative purposes only and not representative of any strategy that AQR currently manages.

A key feature of trend following is its uncorrelated relationship with traditional stock and bond investments. While this is true over the long term, one of the core benefits of trend following is its tendency to be negatively correlated during difficult periods for a traditional portfolio. *Exhibit 2* below demonstrates this tendency. The exhibit also suggests that during difficult periods for trend following, there does not appear to be a strong correlation or relationship between trend following and the returns to a traditional portfolio.

[3] The global 60/40 portfolio has 60% of the portfolio invested in the MSCI World Index, synthetically hedged to USD, and 40% invested in the Barclays Capital Global Aggregate Bond Index.

Exhibit 2: Trend following has been diversifying to traditional portfolios
Worst Quarters for Global 60/40 (left side) and SG Trend Index (right side)
January 1, 2000 – June 30, 2018



Source: AQR, Bloomberg. The global 60/40 portfolio has 60% of the portfolio invested in the MSCI World Index, synthetically hedged to USD, and 40% invested in the Barclays Capital Global Aggregate Bond Index. Diversification does not eliminate the risk of experiencing investment losses. Past performance is not a reliable indicator of future performance. For Illustrative purposes only and not representative of any strategy that AQR currently manages.

Trend's value as a diversifying strategy may be difficult to appreciate when traditional portfolios are doing well. Recently, trend following showed its merit as global equities saw a prolonged but relatively shallow decline in late-2015 and early-2016, and trend followers delivered positive returns. That example aside, equity markets have generally produced benign and positive annual returns since the Global Financial Crisis.[4] This is not the type of environment where trend following tends to excel, but does serve as an important reminder that investment decisions made based on recent history may not fully reflect future possibilities.

Is industry size a problem? Not likely.

Some looking for an explanation of recent difficult performance for trend following point to industry size as problematic. However, this argument breaks down when analyzing the data. Assets invested in trend-following strategies have declined over the last decade. Industry assets peaked in mid-2008 at approximately $211 billion, and have largely fallen since. More recent estimates of industry size show roughly $124 billion invested in trend-following strategies.[5] More broadly, assets in quantitative strategies overall are still only a fraction of total hedge fund assets, and are an even smaller fraction of actively managed assets.[6]

[4] Source: Bloomberg. Since 2009, the MSCI World Index and S&P 500 Index have both posted positive returns in every calendar year but two (2011 and 2015).

[5] Source: eVestment Managed Futures Category as of June 30, 2018. Please read important disclosures in the Appendix. Estimates of industry assets may not capture the exposure of bank swaps, which we estimate at roughly $350 billion in AUM equivalent for alternative risk premia. Even after accounting for the portion of these additional exposures that represent trend following, the trend-following industry is still relatively modest in size.

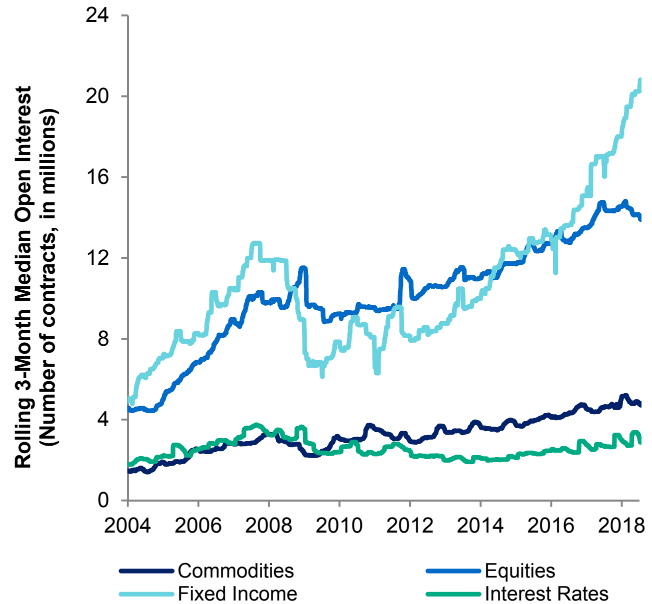
[6] For example, systematic hedge fund strategies are estimated to account for approximately $500 billion in AUM, or 17% of hedge fund industry assets. There are also an additional roughly $100 billion in risk premia product offered by hedge funds and other managers, and roughly $500 billion in premium long only quant products. Barclays, "Rise of the Machines", June 2017.

Second, futures market size has increased over this same time period. With fewer assets in the trend industry overall and increased size of the markets traded by trend followers, there is little evidence to support the notion that there is "too much money" chasing trend following.

Exhibits 3 and 4: Trend following has not outgrown opportunity

Exhibit 3: Estimated Managed Futures AUM
January 2004 – June 2018

Exhibit 4: Futures Markets Open Interest
January 2004 – June 2018



Source: (For both Exhibit 3 and Exhibit 4) eVestment Managed Futures Category, AQR, Bloomberg. As of June 30, 2018.
For Exhibit 4: The above open interest, per asset class, is based on a hypothetical basket of aggregated open interest for individual futures markets across equities, fixed income, interest rates, and commodities. Please read the disclosures in the Appendix for a full list of the individual markets considered. Open interest is computed using the rolling 3-month median on the aggregated open interest for each asset class. Hypothetical data has inherent limitations some of which are disclosed herein. Please read important disclosures in the Appendix. For Illustrative purposes only and not representative of any strategy that AQR currently manages.

Trend following is a good strategy going through a tough time

A natural question during difficult performance is whether the strategy is somehow broken. Looking carefully at the underlying dynamics of the current drawdown, we find evidence that recent performance is not a result of a broken process, but is due to a macro environment that produced very few meaningful trends in markets since mid-2016.

Interestingly, trend followers do not need a majority of the markets they trade to exhibit large moves in order to be profitable. Trend followers will exit their losing trades, minimizing losses, and will continue to hold onto winning trades as long as those trends continue. The end result is that, typically, a minority of markets exhibiting sizable and prolonged trends tend to generate returns that outweigh the comparatively small losses realized elsewhere.

One way to measure the opportunity set for trend followers is to examine the number and magnitude of large consistent market moves, positive or negative, over any given year. This is an intuitive and objective measure that is strongly correlated to trend-following returns. *Exhibit 5* below shows, for each year since 2000, the set of markets that experienced an above-average risk-adjusted move, with shading indicating the degree of magnitude and consistency of the move. In recent years, although some markets have presented opportunities for trend followers, these have been fewer in number and smaller in magnitude than in other years, explaining recent performance.

Exhibit 5: Recent market environment has produced few meaningful trends

Large Moves in Major Markets by Calendar Year

January 1, 2000 – June 30, 2018

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
SG Trend Index Yearly Total Return	11.7%	-0.1%	26.1%	11.9%	2.7%	0.7%	8.2%	8.6%	20.9%	-4.8%	13.1%	-7.9%	-3.5%	2.7%	19.7%	0.0%	-6.1%	2.2%	-5.3%
Risk-Adjusted Moves in Major Markets - Sorted High-to-Low Per Year																			
	MSCI EM	Euro dollar	Euro dollar	CAD	MSCI EM	NKY	MSCI EM	CAD	MXN	MSCI EM	Coffee	EU10y	Coffee	NKY	EU10y	CAD	MXN	MSCI EM	Euro Dollar
	US10y	MXN	Euribor	MSCI EM	Corn	MSCI EM	Corn	Euro dollar	US10y	CAD	Euro dollar	US10y	JPY	JPY	Oil	Oil	EU10y	S&P	Oil
	Euro dollar	JPY	US10y	EUR	Oil	JPY	DAX	MSCI EM	DAX	Euribor	Euribor	Euribor	NKY	S&P	EUR	MXN	S&P	EUR	CAD
	NKY	Corn	EUR	Gold	EU10y	MXN	Euribor	US10y	MSCI EM	Gold	Gold	Euro dollar	DAX	Gold	Coffee	EUR		Euro Dollar	MSCI EM
	JPY	JP10y	EU10y	NKY	Euribor	DAX	Gold	Oil	EU10y		JPY	JP10y	Euribor	DAX	JP10y	JP10y			US10y
	Coffee	CAD	DAX	S&P	Coffee	EUR	EUR	EUR	S&P		EU10y	MXN	MXN	Coffee	US10y	Euribor			Coffee
	MXN	DAX	Gold	JPY	CAD	EU10y	S&P	DAX	Euro dollar		US10y	MSCI EM	EU10y	Corn	CAD	Euro dollar			EU10y
	EUR	Coffee	JP10y	DAX	EUR	Oil	EU10y	Gold	NKY		JP10y	DAX	JP10y	US10y	S&P	MSCI EM			EUR
	EU10y	NKY	Oil	Oil		Gold		JP10y	Euribor		Corn	NKY		CAD	JPY	Corn			Gold
	S&P	Euribor	S&P			Corn			JPY						Euribor	Gold			
			JPY						CAD						MXN				
			MXN						Oil										
									JP10y										
									Coffee										

Risk-Adjusted Move = 0.7 — ≥ 2.0

Source: AQR, Bloomberg. As of June 30, 2018. Risk-adjusted market excess returns are calculated from the ratio of the specified year's returns and the previous year's standard deviation for the same market. Highlighting begins for markets with a risk-adjusted excess return of 0.7, which corresponds to the full sample median. Markets considered are: Equities: S&P500 (S&P), German DAX (DAX), Japanese Nikkei 225 (NKY) and MSCI Emerging Markets (MSCI EM). 10-year government bond markets for U.S. (US10y), Europe (EU10y) and Japan (JP10y). Short-term interest rate markets for the U.S. (Eurodollar) and Europe (Euribor). Currencies shown are CAD, EUR, JPY and MXN and are versus USD. Commodities: Grains (Corn), Softs (Coffee), Energies (Oil), and Metals (Gold). Please read important disclosures in the Appendix. For Illustrative purposes only and not representative of any strategy that AQR currently manages.

Notably, the S&P 500 Index is identified as one of the more profitable recent opportunities for trend followers in 2017. This can lead to a false perception that markets more broadly have been trending, in light of how much attention is generally paid to the Index. However, trend followers generally trade a large and diverse set of underlying markets, with the S&P as only one among many.

Market environments with relatively few large and consistent market moves are characteristically difficult for trend-following strategies. To see performance challenges in this kind of environment is not new historically, and is within the realm of the strategy's expected behavior.

Trend following can be an important source of diversification

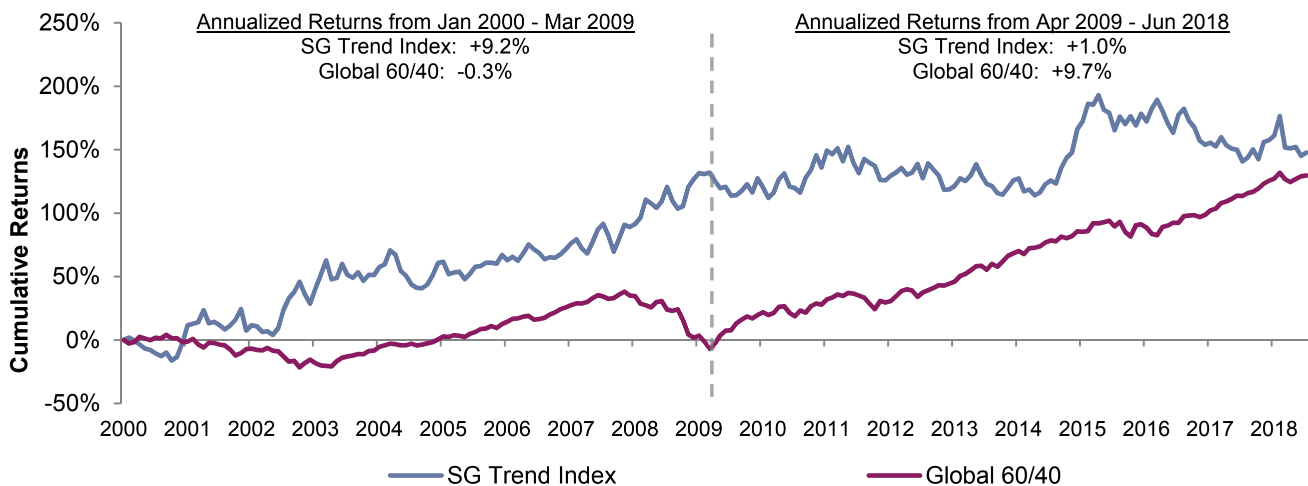
Expectations should be informed by a long-term view. In statistics, many data points are required to inform reasonable expectations. In the shorter term, when too few data points are considered, realizations can deviate from long-term expectations – sometimes considerably. For example, a strategy that experiences 5% annualized excess returns over the long term is equally likely, in any given year, to experience excess returns greater than 15.0% as it is to see returns worse than -5.0% above cash, assuming a symmetric distribution.[7] Recently,

[7] A hypothetical example helps illustrate this point. Consider a 10% targeted-volatility investment strategy that is known, with certainty, to be a 0.5 Sharpe strategy (i.e., generates a +5.0% return excess of cash). This strategy will go through periods where it realizes greater than a 1.5 Sharpe (+15.0% excess returns), and periods of time where it realizes less than a -0.5 Sharpe (-5.0% excess returns). These outcomes collectively are expected to occur slightly over 30% of the time, assuming a normal distribution.

traditional asset allocations have benefited from short-term outcomes that exceeded long-term expectations. A global 60% stock / 40% bond portfolio realized nearly 6.0% annualized excess returns (a realized Sharpe ratio of 1.0) over the last three years. In that same period, a U.S. 60% stock / 40% bond portfolio realized nearly 6.5% annualized excess returns (a realized Sharpe ratio greater than 1.0). Using roughly 150 years of data to inform long-term expectations, the same portfolio delivered a 3.9% annualized excess return (and a realized Sharpe of 0.4).[8] In other words, recent outcomes may not be representative of long-term expectations.

Exhibit 6 below shows the cumulative returns to the SG Trend Index since 2000 alongside a global 60/40 stock-bond portfolio to further illustrate this point. The exhibit demonstrates the difference in return dynamics experienced by these two strategies over the past nearly 20 years, and helps underscore their diversification potential to one another. In the first half of the time period, the global 60/40 portfolio produced zero (or even negative) returns, while trend following performed well. As of that point, the stock-bond portfolio under-realized its long-term expectations while trend following performed particularly well and offered strong diversification benefits. The stock-bond portfolio's performance in this first half is not an indication that the strategy was broken, and indeed it was not. In the second half of this time period, the 60/40 portfolio experienced strong returns that exceeded long-term expectations per unit of risk, while trend following underperformed its long-term expectations primarily due to the drawdown since mid-2016. Taking the whole time period in mind, both are good long-term strategies that maintained a diversifying profile to each other.

Exhibit 6: Returns of trend following have been diversifying to traditional allocations
Cumulative Returns to Trend Following and Global 60/40
January 1, 2000 – June 30, 2018



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Conclusion

Digging into the dynamics behind recent performance challenges for trend followers gives us confidence that the strategy is in fact behaving as expected, and a lean opportunity set in markets is the culprit behind poor performance. As such, we continue to anchor our expectations for trend following to the long-term evidence. Going forward, we expect trend following to continue to serve as a meaningfully additive and diversifying allocation to traditional investor portfolios.

[8] AQR, Bloomberg. The global 60/40 portfolio has 60% of the portfolio invested in the MSCI World Index, synthetically hedged to USD, and 40% invested in the Barclays Capital Global Aggregate Bond Index. Past performance is not a reliable indicator of future performance.

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Futures market open interest is evaluated for individual markets in the following categories: agriculturals, livestock, energies, and base and precious metals; developed and emerging equities; and developed government bond and interest rate markets. The specific individual markets considered for each asset class are as follows:

Equities	Fixed Income	Commodities
Developed Country Indices	**Government Bonds**	**Agricultural**
Australia (ASX SPI 200)	3-Yr Australia	Cocoa
Canada (S&P/TSX 60)	10-Yr Australia	Coffee
Europe (EuroStoxx 50)	10-Yr Canada	Cotton
France (CAC 40)	10-Yr France	Corn
Germany (DAX)	2-Yr Germany	Cotton
Hong Kong (Hang Seng)	5-Yr Germany	Soybeans
Italy (FTSE-MIB)	10-Yr Germany	Sugar
Japan (TOPIX, Nikkei)	30-Yr Germany	Wheat (Chicago)
MSCI EAFE	10-Yr Italy	Wheat (Kansas)
Netherlands (AEX)	10-Yr Japan	
Spain (IBEX 35)	10-Yr U.K.	**Livestock**
Sweden (OMX30)	2-Yr U.S.	Cattle
Switzerland (SMI)	5-Yr U.S.	Lean Hogs
United Kingdom (FTSE 100)	10-Yr U.S.	
United States (S&P 500, S&P 400,	20-Yr U.S.	**Energies**
NASDAQ 100, Russell 2000, DJIA)	Ultra Long Bond U.S.	Brent Crude Oil
		WTI Crude Oil
Emerging Country Indices	**Short-Term Interest Rates**	Gasoil
Brazil (Bovespa)	Australia	Heating oil
China (HSCEI, FTSE China A Share)	Canada	Natural Gas
MSCI Emerging	Euro	RBOB Gasoline
Singapore (MSCI)	Switzerland	
South Africa (All Share Index)	United Kingdom	**Metals**
South Korea (KOSPI 200)	United States	Aluminum
Taiwan (MSCI, TAIEX)		Copper (COMEX)
		Nickel
		Zinc
		Gold
		Silver

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