Aspect Capital Insight Series

Trends of The Unexpected

December 2020

Introduction

Let's face it, all of us have probably felt increased nostalgia during lockdown. Perhaps for you it was rose-tinted childhood memories, thoughts of friendly gatherings on balmy summer evenings or undulating aromas from restaurants abroad. For some of us here at Aspect, we even began to reminisce about old noteworthy trades we had experienced in our 22-year history (different strokes for different folks!). After one particular bout of recollections, we firmly concluded that contextualised trade case studies could help bring seemingly abstract or conceptual principles of an investment strategy to life. Utilising a very basic form of trend-following for its intuitiveness, we performed three realistic simulations of a relatively simple investment system with three different trading speeds to highlight interesting trades from years gone by.

1. The Basic Trend-Following System

We constructed three simple but intuitive trend strategies, applied evenly across 150 global futures and forwards markets, representing fixed income, stock indices, commodities and currencies super-sectors and spanning fast, medium and slow trend following speeds. Exponentially weighted moving average (EWMA) filters were applied to each market's returns to indicate trends. Continuous daily long or short positions were produced based on a capped linear relationship to the trend strength conviction. To ensure comparable risk contributions from each market, positions were scaled by the market's volatility before being combined into a portfolio with equal weights across and within super-sectors. The overall portfolios target 17% volatility and are simulated to include the effect of transaction costs.

The result was three simulations, entitled:

- **FAST**: Short-term trends (fast trading speeds) - 1-month half-life EWMA
- **MEDIUM**: Medium-term trends (intermediate trading speeds) - 6-month half-life EWMA
- **SLOW**: Longer-term trends (slow trading speeds) - 12-month half-life EWMA

A trade can be defined as the period in between entering and exiting a long or short position. We analysed the exposures (USD positions as a percent of USD portfolio value), risk metrics and profitability for each trade that ended between December 1998 (this could have been any other date, but we chose to start when Aspect began trading) and August 2020. You can describe a trade as a trend spotted by each system and the count for each simulation is shown below:

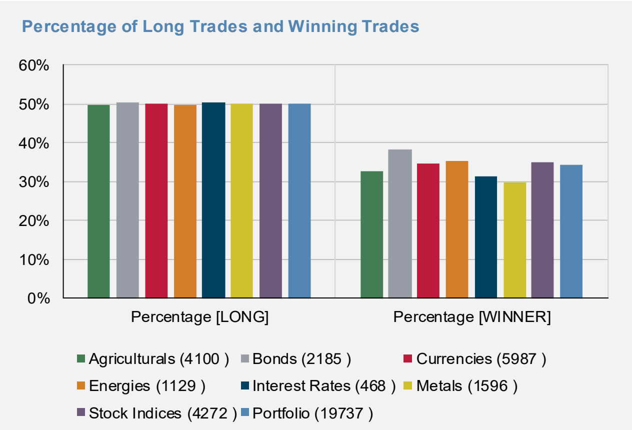
	SLOW	MEDIUM	FAST
Agriculturals (28 markets)	2867	4100	10372
Bonds (20 markets)	1093	2185	5938
Currencies (39 markets)	4063	5987	15243
Energies (13 markets)	710	1129	3445
Interest Rates (5 markets)	246	468	1636
Metals (13 markets)	1154	1596	4448
Stock Indices (32 markets)	3186	4272	11343
Portfolio (150 markets)	13319	19737	52425

Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

2. Observations on Medium-Term Trend Following Characteristics

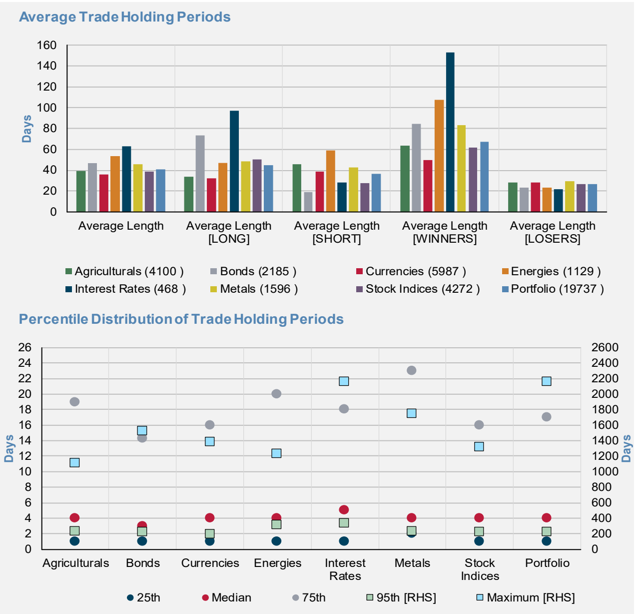
A top-down view of the MEDIUM simulation's trades reveals some properties that might be familiar within the CTA industry where medium-term outlooks are common.

Figure 1: Directional Agnosticism with a Smaller Proportion of Winning Trades



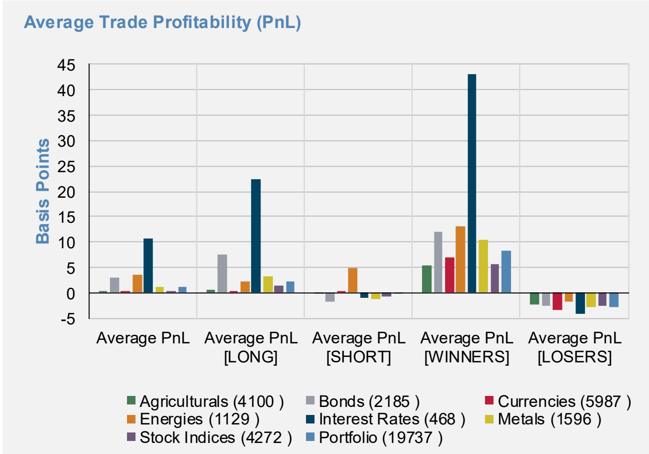
Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

Figure 2: Typical Holding Periods Vary by Sector



Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

Figure 3: A Profitable Strategy with Disparities by Sector



Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

From Figures 1 to 3, there are a few familiar takeaways. Trend-following trade directions are not biased across any sector. There are significant positive skewness style characteristics (few outsized positive trades versus copious small-sized losing trades) and winning positions are also held for longer than losing ones. This makes sense since at its heart, the strategy is designed to add to winning positions and cut losing ones. It also seems as though long positions are much more profitable than short positions and are held for longer. Energies, bonds and interest rates are both the most profitable trades and the longest holding periods. Whilst each sector had roughly similar median values and interquartile ranges, there was significant variation in maximum values. Some interest rates, metals and bond trades were held for at least 5 years.

Trend-following has shown itself to be a profitable strategy with a small 'edge' but an 'edge' nonetheless. Despite a low probability of a profitable trade in any one market, winners tend to win big. Trade this strategy in lots of different and diverse places and the portfolio's potential for return increases.

Now let us delve into some interesting and off-the-run trade examples.

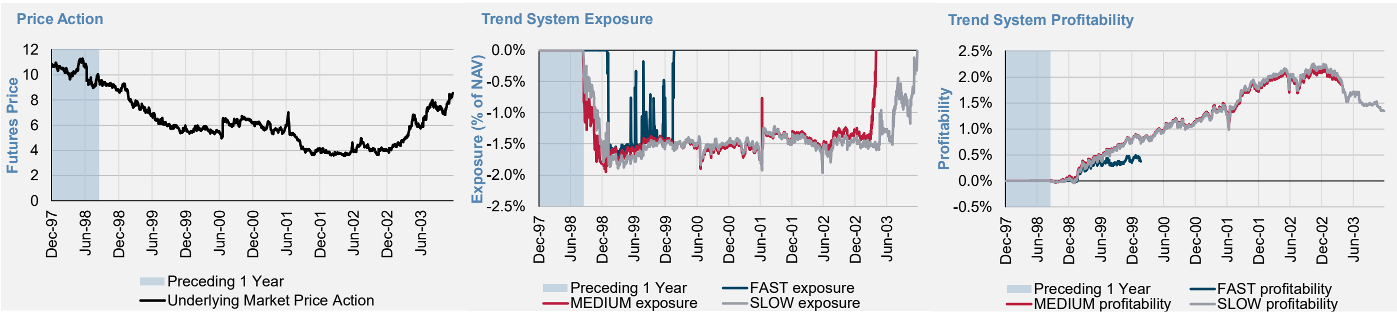
3. A Long Rough Ride for Rough Rice

Our eyes were quickly drawn to the longest trade within the FAST agriculturals sector: Rough Rice in 1999. Rice is the global staple food but in Asia it is so much more than that. For instance, languages within China, Thailand and Japan use the same word for 'rice' as they do for 'food' or 'meal'. In fact, The Great Wall of China is partly held together with sticky rice! Despite all of this, tradeable rice contracts have never been staples within famous commodity indices such as the S&P GSCI or BCOM.

This short rough rice trade is worth highlighting because it shows that trends can appear almost anywhere! One of the sturdiest trends came from a rather surprising and overshadowed market. This reinforces principles around achieving better investment outcomes through increasing the breadth within a portfolio.

Consideration was given to lower liquidity often associated with unusual markets and we estimate that an AUM of around $100m would have been viable for the trend systems in the late 90s. This investment capacity would have grown in line with maturity and increased volumes for most of the markets. The charts below show the rice future contract's price action alongside the exposures for the longest rice trade from each simulation. Even amongst the MEDIUM and SLOW simulations, this rice trade was amongst their most prolonged trends and it was also profitable for each simulation.

Figure 4: Rough Rice Case Study

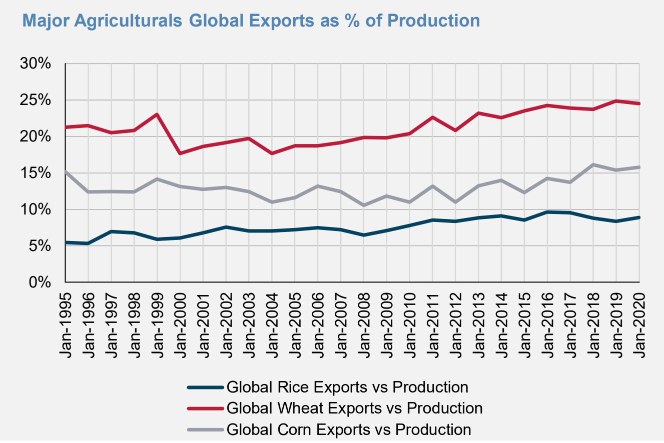


Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

So, you could say that this bearish market put the 'rice' in crisis, right? Well, the reality was that the Asian financial crisis of 1997 to 1999 served as an external shock to the entire agricultural sector and sparked subsequent multi-year downward trends. After a mid-90s period of industrialization for south Asian countries and its associated commodity demand boom, this late 90s financial crisis in that region crippled agricultural consumption and trade.

Rice prices are known to be particularly volatile, especially when compared to wheat and corn, the other two most produced agriculturals, so perhaps spells of persistent large moves in one direction can be expected. The fact that most rice is produced in only a handful of south Asian countries and less than 10% of it crosses international borders helps explain its relative vulnerability.

Figure 5: Rice Market is Not as International as Others



Source: Aspect Capital, Datastream.

This rough rice example reminded us of other powerful trends that came from more unfamiliar markets and took place more recently. Here are some that were picked up by the trend systems

WHO / WHAT?	WHEN?	HOW?
Iron Ore – Metals sector – Long Position	2016 to 2020	• Chinese Demand Growth • Supply worries from Brazilian mine disaster
Rotterdam Coal – Energies sector – Long Position	2016 to 2018	• Strong demand from Asian countries despite waning long-term coal usage amid climate change
Emerging Markets – Currencies sector – Long Positions	2016 to 2017	• Synchronised global expansion • Ultra-loose monetary policy, particularly in the US and ensuing hunt for yield

4. Doctor Copper is Ready to See You Now

The inextricable link between commodities and the macroeconomic environment is compellingly exemplified through copper prices. This base industrial metal is often referred to as Doctor Copper due to rumours that it holds a Ph.D. in Economics based on its ability to predict global economic turning points. Doctor Copper also moonlights as a physician, serving as a health check on the global economy because of its variety of industrial applications in all sectors.

Not only is copper an overly accomplished inanimate object but it also yielded the most profitable trend-following trades of the metals sector across the FAST, MEDIUM and SLOW simulations as shown below. Over the period shown below, copper prices quadrupled, and the most intense upswing coincided with the participation of the FAST simulation between 2005 and 2006. Rising copper production costs in these years sparked fears that it would be difficult for suppliers to respond to consumption increases

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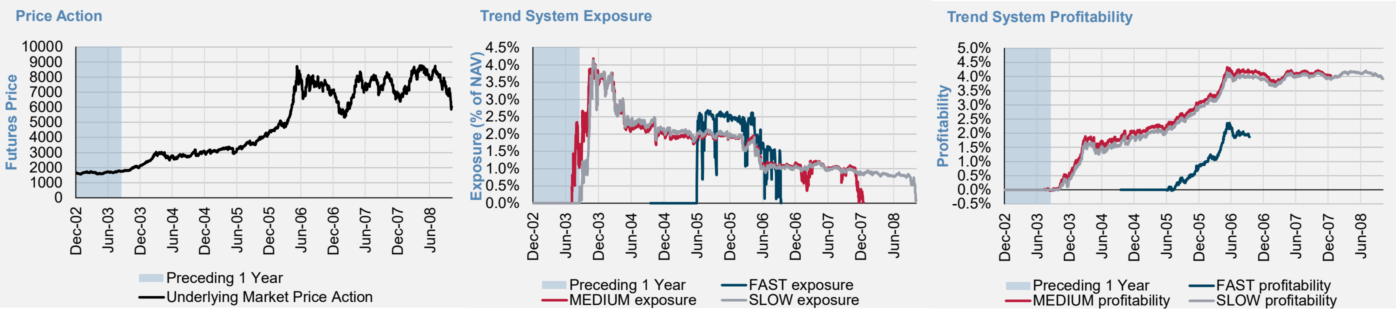
Figure 6: Copper Case Study

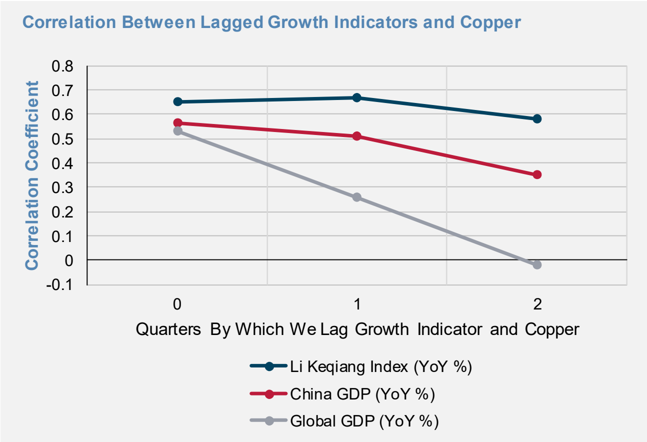


Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

This long copper trade shows how the application of trend-following (particularly over the medium and longer term) to bellwether assets allows investors to implicitly make thematic plays. Copper's mid-00s megatrend broke records with three-month copper futures approaching $9,000 per metric ton before plummeting due to the Great Recession. Ferocious demand from emerging market countries fuelled a booming commodities super-cycle. In particular, the growth in construction and manufacturing driven by Chinese urbanisation was a key driver that benefitted copper's versatility – just think of the sheer volume of apartments, vehicles, appliances and computers required!

The chart on the right shows that over the period since the trades above and now, copper prices have been quite strongly related to demand fundamentals such as global GDP. Given that China consumes around half of the world's copper, the correlation between Chinese economic growth and copper prices are stronger. Senior Chinese officials prefer to gauge their economy with the Li Keqiang Index which is based on Chinese electricity consumption, rail cargo and bank loans. The chart below shows that this statistic might be more linked to copper prices than Chinese and global GDP and that it could serve as a leading indicator (especially with a lag of one quarter) of the crucial base metal.

Figure 7: Copper is Linked to Economic Growth



Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

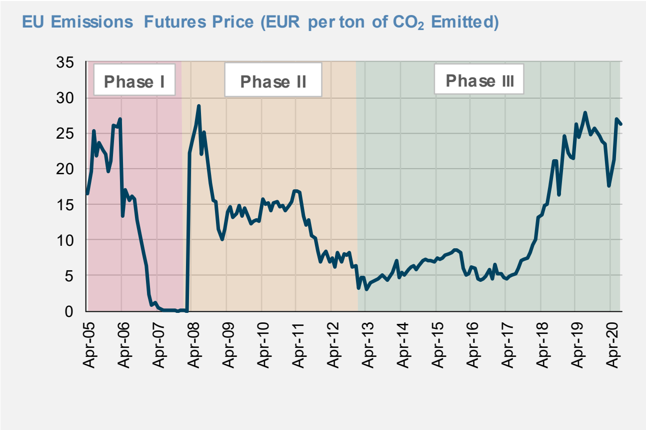
The trend systems also picked up on more recent thematic investing trends

WHO / WHAT?	WHEN?	HOW?
Palladium – Metals Sector – Long Position	2018 to 2020	**Global attempt to meet aggressive climate change goals with an eye on the automotive industry** • Growing usage in catalytics converters as regulation and society demands cleaner vehicles • Very few well established mines to deal with surging demand
Japanese Yen – Currencies Sector – Short Position	2012 to 2015	**Japan's 30-year battle against deflation and anaemic growth gets worse** • Japan continued to struggle with its aging population, declining labour force and high debt levels • Whereas previously the country was running large, consistent trade surpluses, it finds itself in steady trade deficit. • New Prime Minister Shinzo Abe pledges ultra-easy monetary policy which causes loss of confidence amongst investors

5. U Emission: Possible III – Coming to a Portfolio Near You

How about some good news to begin this section? In 2017, the EU had cut GHG emissions by 21.7 % compared with 1990 levels, exceeding their 2020 target of 20% well ahead of time. It is estimated that almost 4% of this reduction between 2008 and 2016 was down to the EU Emissions Trading System (EU-ETS). Politicians aimed to force emitting companies to invest in green technologies such as carbon capture and efficient renewables as opposed to paying for the right to emit CO2. Under this 'cap-and-trade' system, the EU put caps on permitted emissions from sectors such as energy and industrials which make up around half of total EU emissions. EU allowances (carbon credits) permit the emission of 1 ton of carbon and these are issued to emitters who can then trade them with each other for cash. In April 2005, futures contracts were launched with these carbon credits as underlying instruments, but they have not been widely included within CTA or managed futures portfolios. Aspect studied this market closely since inception and began including it in live portfolios in early 2017, fortuitously just in time for one of its blistering surges. The chart below shows how early adoption would be enough to give even the most resilient of investors a headache. Ultimately, we've decided to shine a spotlight on European Emissions futures because of their uniqueness.

Figure 8: The Rocky Path of Emissions Contracts



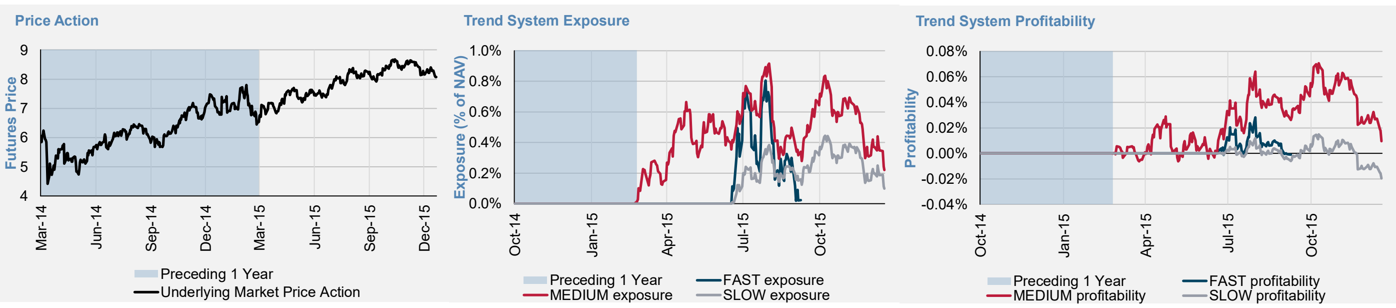
Source: Aspect Capital, Datastream.

The EU-ETS scheme has undergone many changes and has been carved into three distinct phases with a fourth lined up from 2021 onwards.

Phase I	Often described as a 'learning by doing' phase. Prices rose initially due to uptake from power producers, perceived scarcity of allowances and rising energy prices. However, a European Commission report which hinted at an oversupplied market led to rapid declines. Phase I allowances subsequently lost all value because they were not valid for Phase II.
Phase II	Whilst demand initially drove advances, the recession reduced industrial energy output lowering carbon prices. Changing attitudes to fossil fuels in favour of renewable energy also helped to revise carbon prices down.
Phase III	Frequent calls continued for the reform of the EU-ETS in order for the futures prices to reflect the societal cost of CO2 which would be high enough to effectively discourage emissions. Anticipation of various reforms aimed at curbing supply through political intervention drove surges in the price.

If tradeable markets were modern subcultures, emissions contracts might be hipsters; its drivers are distinct from the mainstream and there have been questions around its authenticity. Our simulations picked up on some quantifiable quirks, for instance, the marginal contribution to risk (MCTR) from emissions trades was often negative. In the example below, the FAST, MEDIUM and SLOW simulations took long positions towards the start of Phase III amid efforts to reform the EU-ETS and the average MCTR for each simulation's trade was negative. When trend-following, you can't win them all and this was certainly the case as sharp price reversals detracted from each trade's profits. In spite of this, it is useful to include markets such as emissions contracts because they reduce the overall portfolio risk on account of their diversifying properties.

Figure 9: EU Emissions Case Study

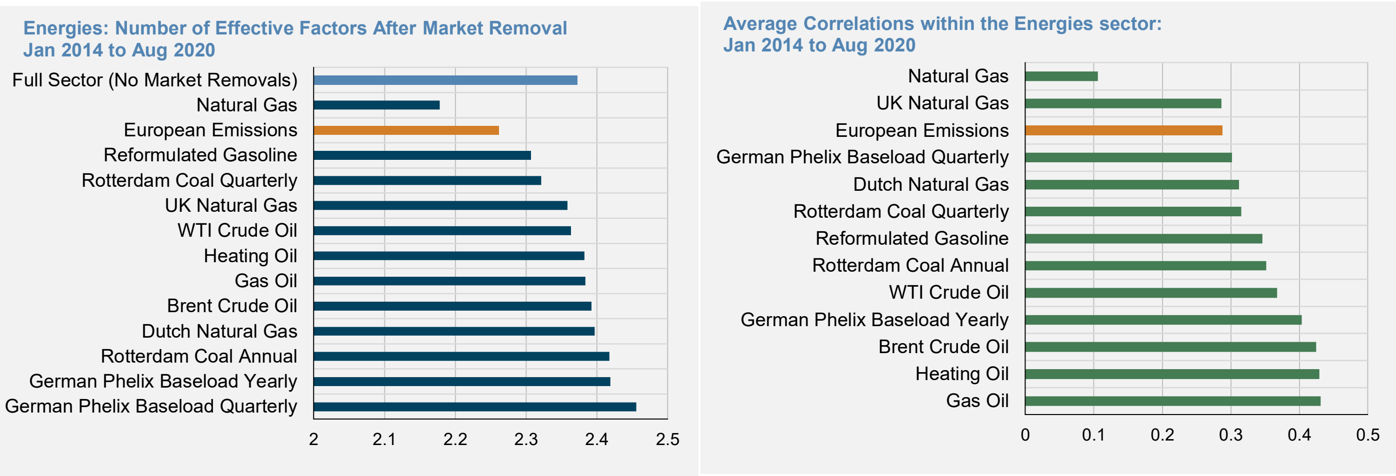


Source: Aspect Capital. Simulated data, please see disclaimer on pages 9 and 10.

We can illustrate the diversifying properties in different ways and in practice, this analysis is necessary prior to the addition of any markets during portfolio construction. Using a principle components analysis (PCA) applied to the energy sector positions within our simulation portfolios, the number of effective factors can be derived. The amount by which this value drops when each market is removed in turn from the sector indicates the level of diversification that each market brings to the table. This chart below on the left which shows that aside from natural gas, the absence of European

Emissions has the largest adverse effect on the number of effective factors (i.e. the energy sector's diversity). Another way to put this is that the presence of European Emissions enhances the spread of weights amongst the principle components. Inter-market correlations play a big role in this and the chart below on the right demonstrates that these are amongst the lowest for European Emissions. This market is almost inimitable since it is a political instrument motivated by climate change ambitions and it adds a certain 'je ne sais quoi' to the portfolios.

Figure 10: Emissions are Differentiated



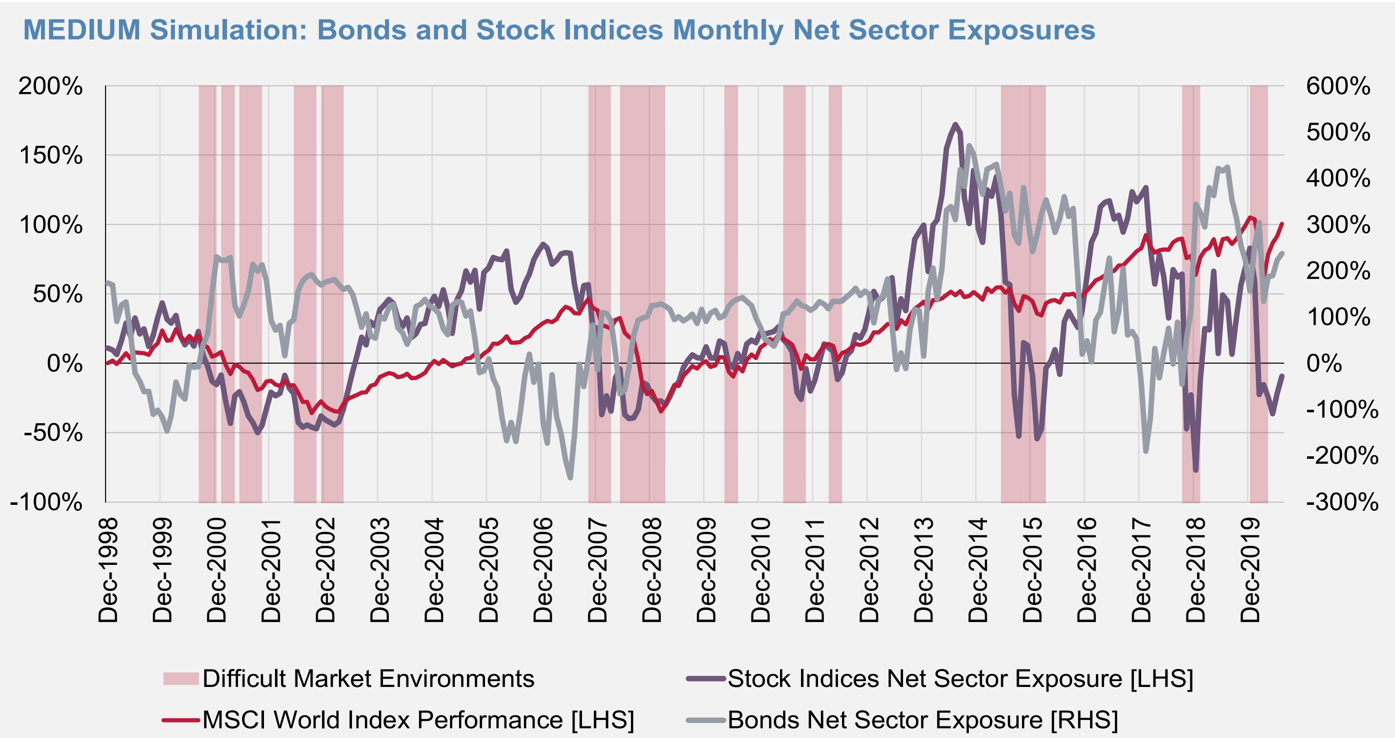
Source: Aspect Capital.

Final Thoughts

So far, we have not delved much into trades involving equity and bond markets, the two unwavering bastions of most traditional investment portfolios. Traditional portfolios undergo intense stress during equity market selloffs. We highlight these difficult market environments below with periods where MSCI World lost significant value within one to four months. Using the MEDIUM simulation as a proxy for the CTA industry, bond and stock index sector net exposures are superimposed. Instead of looking at individual stock and bond trade examples, holistic sector views can reveal an encouraging result. On an aggregate basis, the simulation tended to short global stock markets whilst maintaining long exposure to global bond markets during challenging market environments. Given this nature of the strategy, its addition within traditional portfolios may well have had the effect of drawdown reduction during difficult market environments.

We would also invite you to the explore the chart, think back to noteworthy periods and share (with us) memories from those times!

Figure 11: Over 20 Years of Bonds and Stock Sector Exposures Alongside Global Equities



Source: Aspect Capital, Datastream. Simulated data, please see disclaimer on pages 9 and 10.

Let us leave you with a recap of some attractive features of trend-following we have gleaned through case studies:

- Trends can come from anywhere; trend-following focused on broad market diversification tends to lead to better risk-adjusted returns as well as lower inter-market correlations. Positioning at market and sector level is also rather intuitive.
- Access to idiosyncratic opportunities as well as participation in generation-defining thematic megatrends.
- Operation over multiple different time scales (ranging from fast trading speeds to slower ones) provides another form of diversification and increased opportunities.
- Trades are agnostic about direction which allows the strategy to profit from both rising and falling markets.

These characteristics are just some of the reasons to consider and maintain a consistent allocation to trend-following.

Charts Disclaimer

Table page 1 and figures 1, 2, 3, 4, 6, 7, 9, 11: These results are based on simulated or hypothetical performance results that have certain limitations. unlike the results shown in an actual performance record, these results do not represent actual trading. Please read important disclaimer below.

Figures 7 and 11: .The data above with respect to various indices is shown for illustrative purposes only. Detailed descriptions of the indices used in this paper are available from Aspect upon request.

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