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Tactical Asset Allocation (TAA) insights from ETF flows

Introducing TAARSS: a novel relative strength indicator for TAA

We have created a proprietary relative strength indicator to implement Tactical Asset Allocation strategies by considering the magnitude and path of ETF flow trends.

ETF flows: a more powerful tool for predicting asset class performance

Most recently, the emergence of Exchange Traded Funds (ETFs) along with their growing popularity among both retail and institutional investors have brought about a new dimension to fund flow analysis. Moreover, ETFs both as products and industry have several distinct features that differentiate them from traditional mutual funds. We believe it is this set of unique features what makes ETF flows a more powerful tool for predicting investor sentiment and asset class performance compared to mutual funds.

ETF flow trend path and magnitude provide stronger read for TAA

While most fund flow analysis metrics focus on the magnitude of the trend, we focus on both the path and the magnitude of it. Our analysis has shown that an ETF flow trend with steady and consistent path combined with a large flow magnitude is more likely to develop into future price performance momentum. We believe that this behavior is grounded on the fact that a large directional and steady ETF flow trend is an indication of an investment demand shift and hence should be accompanied by the corresponding price move. This behavior can be measured and used to identify the most attractive asset classes based on ETF flow trend relative strength.

TAARSS: a versatile indicator for implementing TAA strategies

Our Tactical Asset Allocation Relative Strength Signal (TAARSS) methodology is very versatile and can be implemented in multiple ways. In general, most of the implementation ideas would seek to take advantage of the relative strength of the asset classes as indicated by the signal. Investors can build core portfolios around it or they could use it for implementing tactical trades as satellite positions. Some examples of portfolio implementations are: direct rotation strategies, layered rotation strategies, and enhanced rotation strategies using levered ETFs. Tactical trades could also be implemented based on normalized TAARSS rankings.

TAARSS says overweight Fixed Income during Q2. Prefer Europe, especially Spain and Italy, within equities; and stay away from commodities in May

Our TAARSS rotation strategies say overweight fixed income during Q2. Within fixed income favor convertible bonds and Intl DM debt during May. Also for May, within equities prefer broad EM and Europe at a market and region levels, respectively; in the US prefer Large Caps, and in the DM outside the US favor Spain and Italy. Finally, within commodities stay in the sidelines in May. Overall, Spanish and Italian equities have the strongest TAARSS rankings for May.

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Predictive Power of ETF Flows

For many years investors have been following fund flows as a market sentiment indicator in an effort to understand where the money and asset prices, presumably, are moving. However whether fund flows are a leading or a lagging indicator of performance has been much debated.

Most recently, the emergence of Exchange Traded Funds (ETFs) along with their growing popularity among both retail and institutional investors have brought about a new dimension to fund flow analysis. Moreover, ETFs both as products and industry have several distinct features that differentiate them from traditional mutual funds. We believe it is this set of unique features what makes ETF flows a more powerful tool for predicting investor sentiment and asset class performance compared to mutual funds (Figure 1).

In this report we present a new methodology to predict asset class price performance momentum based on the relative strength of different asset classes as indicated by ETF flow trends. Although we do use a quantitative measure for gauging the relative strength of ETF flows, we should mention to our readers that our approach comes more from experience rather than from a traditional quant approach. Our quantitative metrics are just the means we use for reading a phenomenon we have observed for years. Therefore, the reader will find that our knowledge of the industry, understanding of the product mechanics, and experience in reading ETF flow patterns are the main factors that make of our methodology unique in its space.

Figure 1: Five reasons why ETF flows can be a strong sentiment indicator

Characteristics	ETFs	Mutual Funds
Stage of the industry	Growth phase	Maturity, entering decelerating phase
Investor demographics	Mostly Institutional	Mostly Retail
Main usage	Asset Allocation	Accumulation
Nature of flows	Investment Demand	Liquidity & Investment Demand
Availability of the data	Transparent calculation, accurate, daily update, and widely available	Subject to estimation, universe coverage, difficult to compile, and update limitations

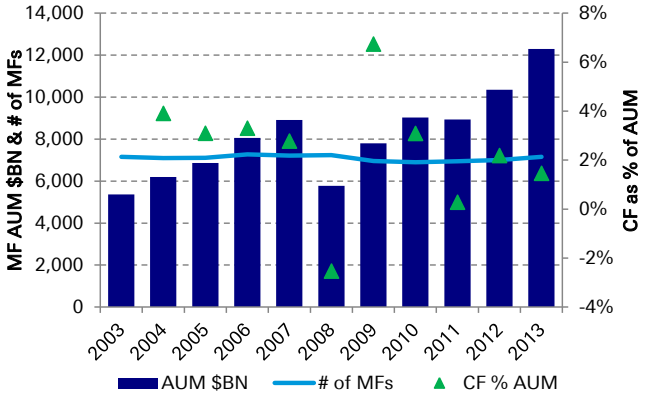
Source: Deutsche Bank

Stage of the industry[1]

Net new flows into ETFs have been the main driver of the divergence in asset growth between them and Mutual Funds.

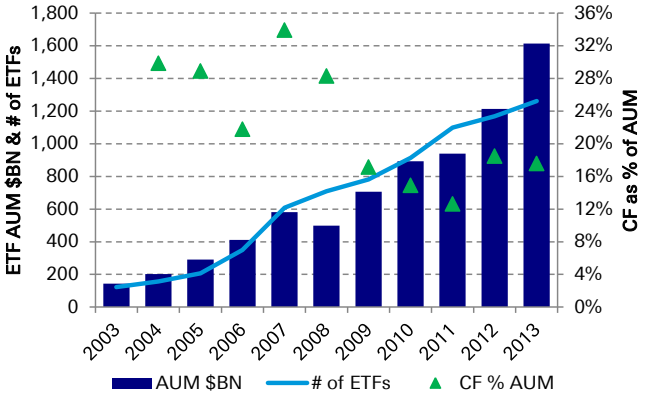
ETFs and Mutual Funds are in very different stages of life. On one hand, ETFs are in a growing phase still on their way to reach maturity. In fact, as of the end of 2013, ETF assets had grown at a Compound Annual Growth Rate (CAGR) of 26.5% and 27.5% in the previous 5 and 10 years, respectively; in addition, the net number of products has been growing consistently despite discrete fund closures. Meanwhile, Mutual Funds have already reached maturity and are showing signs of entering a decelerating phase. Actually the CAGR for Mutual Fund assets for similar periods were significantly lower at 16.3% and 8.7% for the 5 year and 10 year periods, respectively; and the net number of products has been practically flat in the last 10 years. Moreover, most of the growth differences have been driven by new cash flows into the products, ETFs have received $692bn (138.7% of initial AUM) and $1,161bn (813.3%) in the last 5 and 10 years compared to $1,004bn (17.4%) and $1,632bn (30.4%) for Mutual Funds in the same periods, respectively (See Figure 2 and Figure 3).

Figure 2: Historical US Mutual Fund Industry Growth



Source: Deutsche Bank, ICI

Figure 3: Historical US ETF Industry Growth



Source: Deutsche Bank, Bloomberg Finance LP

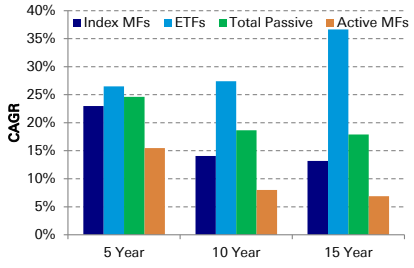
However this is not the full story. A closer look at the Mutual Fund figures reveals another interesting dynamic between two different types of mutual funds: active funds and passive index funds. Over the last 5, 10, and 15-year periods Index Mutual Funds have grown at a significantly faster pace than Active Mutual Funds. Therefore, in the absence of Index Mutual Funds, the decline of the Mutual Fund industry would have been even more accelerated (See Figure 4).

Now don't get us wrong, we are not trying to say that active mutual funds are struggling because active management is going away. In our view, the weakness experienced by them can be attributed to two larger phenomenons affecting the asset management industry. On one side we have the transition from stock picking to asset allocation picking (more on this one later), and on the other side we have the polarization of asset management with beta strategies on one end and alpha strategies on the other. The latter point can be

[1] For the purpose of this research report we will focus only in the US industry, where the ETF market is more matured and developed. In addition, we only focus in Long Term Mutual Funds (LTMFs). LTMFs exclude Money Market Funds and are more comparable to ETFs, as there are no Money Market ETFs. We use the term Long Term Mutual Fund and Mutual Fund interchangeably in this report.

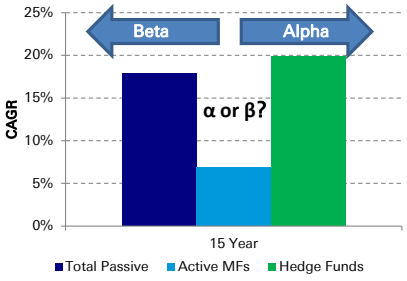
illustrated by looking at the growth rates of passive index funds and ETFs which represent the beta end, and the growth rates of hedge funds which can serve as a proxy for the alpha end; both ends have experienced very strong growth during the last 15 years, however it is the middle ground (i.e. active mutual funds) the one that has been under pressure and will probably keep being under pressure until the closet indexers disappear and only the truly-active mutual fund managers remain (See Figure 5).

Figure 4: Asset growth comparison of ETFs, active and index funds



Source: Deutsche Bank, Bloomberg Finance LP, ICI. Total Passive corresponds to Index Mutual Funds and ETFs combined. Data as of the end of 2013

Figure 5: Polarization of Asset Management



Source: Deutsche Bank, ICI, Bloomberg Finance LP, Barclay Hedge. Data as of the end of 2013. Total Passive corresponds to Index Mutual Funds and ETFs combined

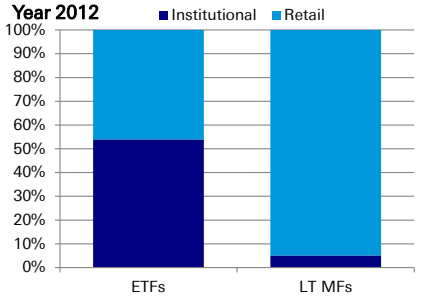
Investor demographics

What if you could identify a sample of institutional fund flows? This has been a common question among investors that track fund flows; however it hasn't been easy to find a clean institutional fund flow sample. We believe that ETF flows provide a very good proxy for institutional flows, while Mutual Fund flows tend to be more retail in nature. First, ETF flows are generated through the creation/redemption process, which typically involves the issuance/destruction of new/existing ETF shares in creation unit multiples; a creation unit is usually a block of 50,000 to 200,000 shares equivalent to an amount between $2mn and $10mn, which is more representative of institutional size trades. On the other hand, mutual fund shares can be issued in single units and from as little as under $100 making them more accessible for retail investors. Furthermore, retail investors usually trade ETFs through the secondary market by using the established liquidity of the ETF shares; this, however, doesn't affect the ETF flow figures[2], but rather the ETF volume.

In general, creation or redemption of ETF shares happens in institutional sizes.

Product ownership can also help us to understand the investor demographics behind the flows. At the end of the year 2012, 5% of long term mutual funds (LTMFs) were owned by institutional investors compared to a 54% of ETFs owned by institutional investors (See Figure 6).

Figure 6: Product Ownership - 2012



Source: Deutsche Bank, Factset, ICI

[2] It is possible that liquidity providers act as liquidity aggregators and execute a creation or redemption if they see enough combined retail volume; however this is the exception and not the norm.

Main usage

ETFs are mainly an asset allocation product; while mutual funds are mainly an accumulation product.

ETFs can serve several portfolio functions such as cash management and risk management, but first and foremost they are an asset allocation product; while on the other hand mutual funds are an accumulation product.

In our previous study about ETF investor demographics[3] we found that while a small sample of products (20-50) ranked high on multi-usage, the majority of the products (over 1,000) were mostly asset allocation products. In addition, nearly all ETFs have been developed as liquid building blocks for constructing asset allocation strategies or to provide efficient access to asset classes not available to investors previously. Furthermore, the granularity available via ETFs and via other similar funded products such as ETVs, which mostly offer access to commodities, have expanded the investment breadth and horizon of investors and have made these products the ideal choice for implementing diversified, liquid, transparent, funded, and tax-efficient global asset allocation strategies (See Figure 7).

Figure 7: Example of asset class investable granularity offered by ETFs and ETVs

Equity

Capitalization

Mega Cap	Large Cap	Mid Cap	Small Cap	Micro Cap

Style

Growth	Value			

Sector

Cons. Stpls	Cons. Disc.	Energy	Industrials	Financials
Healthcare	Materials	Technology	Telecom	Utilities

Industry

Banks	Fin. Services	Reg. Banks	Real Estate	Retail
Biotech	Homebuilders	Oil & Gas E&P	Semi conduc.	and more...

Region

Global	Dev. Mkts	Emer. Mkts	Frontier Mkts.	North America
DM Europe	EM Europe	Asia Pacific	Latam	and more...

Country

Australia	Austria	Brazil	Canada	Chile
China	Colombia	France	Germany	Hong Kong
India	Indonesia	Israel	Italy	Japan
Malaysia	Mexico	Netherlands	New Zealand	Peru
Philippines	Poland	Russia	Singapore	South Africa
South Korea	Spain	Sweden	Switzerland	Taiwan
Thailand	Turkey	UK	US	and more...

Strategy

Dividend	Low-Risk	Factor-based	Option-based	Active

Thematic

Sustainability	Commodities	MLPs	Infrastructure	and more...

Fixed Income (also available in diffirent maturities)

Broad	US Treasury	Securitized	Municipal	IG Coporates
HY Corporates	Senior Loans	Inflation	International	EM debt
Preferred	Convertible			

Commodities (available in diversified or single exposure)

Broad	Agriculture	Energy	Prec. Metals	Ind. Metals

Alternative, Currencies, Multi Asset

Volatility	Private Equity	Hedge Fund	USD	Carry
JPY	EUR	AUD	Target date	and more...

Source: Deutsche Bank

On the other hand, mutual funds are mainly an accumulation product. We based this opinion on the fact that mutual funds play a major role in retirement accounts and dollar cost averaging investment strategies. For example, the Investment Company Institute mentioned in its 2013 Factbook that out of the $19.5 trillion in retirement assets, $5.3 trillion were invested in mutual funds at the end of 2012. That is a 27% of all retirement assets or 41% of all the US mutual funds assets, including money market funds. Furthermore, retirement accounts and dollar cost averaging tend to be more susceptible to status quo bias, which would contribute to a less tactical and a more accumulation driven allocation process in mutual funds. In contrast, although ETFs have tried to penetrate the retirement market, any significant progress has been meager and is yet to come.

[3] See "US ETF Holder Demographics: Understanding ETF Usage", published by Shan Lan and Sebastian Mercado on March 21st, 2012, Deutsche Bank.

We believe that another factor contributing to the asset allocation usage of ETFs has nothing to do with passive investing. We refer to the pursuit of alpha by moving away from stock picking towards an asset allocation picking approach. This is a new investment paradigm which has been able to take shape in most part because of the rise and proliferation of ETFs. However ETFs are not the real driver behind this new force, they are just the means to an end. The actual phenomenon is even larger than ETFs themselves and it has been affecting all aspects of the world in which we live for over the last two decades. It is not the purpose of our report to deep dive into an analysis of the world's cultural change, but it doesn't take much to realize that the world has become a more interconnected place, with instant communication, global businesses, flat access to information, etc; and as the world changed, so is asset management changing as well; and ETFs are part of that.

We believe that the pursuit of alpha by moving away from stock picking towards an asset allocation picking approach has been one of the main drivers behind ETF asset allocation usage.

In our opinion, the best and cleanest example of this changing landscape is the rapid growth experienced by a segment of asset managers that we call ETF Asset Managers[4]. These are asset managers like many others that focus on implementing asset allocation strategies. The main difference with other traditional asset managers is that these managers happen to implement most of their views and models via ETFs and thus the name ETF Asset Managers. They offer a diverse range of strategies which invest in multiple asset classes, segments, and rotation strategies. They often take a tactical, strategic, or a combination of both allocation approaches. Their models are usually based out of fundamental, technical, macroeconomic, and/or quantitative analysis. In general they aim to offer long term growth with downside protection achieved, in most cases, through asset class diversification, portfolio construction, or tactical positioning. As of the end of 2013, Morningstar, who has been tracking this space for some years now, was tracking 648 strategies from 153 firms with total assets of $96bn fueled by a 40% growth during the year (See Figure 8).

ETF Asset Manager assets grew 40% in 2013 to $96bn, according to Morningstar.

Figure 8: Top ETF Asset Managers covered in Morningstar space [$millions]

Name	Strategy Assets	2013 Growth
F-Squared Investments, Inc.	19,841.4	11,307.4
Windhaven Investment Management	18,573.5	4,974.5
Good Harbor Financial, LLC	10,440.9	6,683.7
Morningstar*	5,032.9	1,467.2
RiverFront Investment Group, LLC	4,238.2	876.7
Innealta Capital	3,292.2	(420.5)
Churchill Management Group	2,732.4	269.6
Sage Advisory Services Ltd CO	2,327.7	(196.0)
Cougar Global Investments Limited	1,371.0	(727.0)
Clark Capital Management Group, Inc.	1,359.6	(106.2)
Stadion Money Management,LLC	1,333.7	(159.3)
NEW Frontier Management Company, LLC	1,129.6	130.3
Forward Management, LLC	1,113.8	(421.9)
Tactical Allocation Group LLC	1,090.1	672.7
Windham Capital Management, LLC	1,048.0	113.4

*Morningstar assets include assets of its three wholly-owned subsidiaries Morningstar Associates, LLC, Ibbotson Associates, Inc., and Morningstar Investment Services Inc.

Source: Morningstar

[4] Also referred by others as ETF Investment Strategists, ETF Strategists, ETF Managed Portfolios, RIAs, and Third Party Model (TPM) providers.

Nature of flows

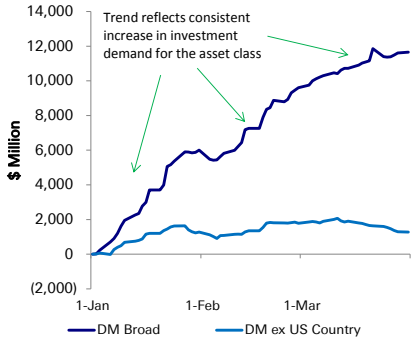
The nature of mutual fund flows is a blend of liquidity and investment demand; however the nature of ETF flows is mostly coming from investment demand.

The nature of mutual fund flows is a blend of liquidity and investment demand; however the nature of ETF flows is mostly coming from investment demand as ETFs have a separate line of liquidity in the secondary market volume of ETF shares.

ETF flow dynamics are all about micro economics. Basically, it all comes down to the interaction of supply and demand in the underlying market represented by the asset class or segment replicated by the ETF. To be more specific we are interested in the securities offered in the underlying market (i.e. security supply) and the investment interest for those securities (i.e. investment demand). In the short-run the security supply is fairly stable, while the investment demand is more likely to move depending on investor sentiment; hence, it is these shifts of the investment demand curve what will eventually move the market (i.e. asset class) to new price equilibriums.

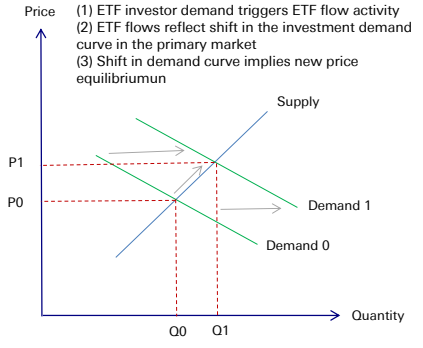
Given the way ETF flows are generated, we believe that ETF flows are a very good proxy to understand where overall investment demand is moving within a specific market. In addition, we see ETF flow trends as a possible directional indicator of price equilibrium discovery. Let us explain how this would work. For a seasoned and mature ETF with developed secondary market liquidity for ETF shares, ETF flows are an indication of market imbalances. Basically, in a normal equilibrium situation we should not see much flow activity in ETFs as the ETF shares volume should be sufficient to satisfy the liquidity required by investors for the asset class; however if the investment demand begins to increase then sooner than later investment demand will outgrow the liquidity of the ETF secondary market pushing the price away from the NAV. This deviation will result in the investor or an authorized participant having to tap the ETF primary market for additional liquidity via the creation/redemption process in order to bring the ETF price back in line with its NAV. If this process is repeated consistently in one direction we will end up with a directional flow trend as seen on Figure 9 which can be used as a proxy for investment demand shifts (Figure 10).

Figure 9: ETF flow* trends can be used as proxy for investment demand shifts



*Source: Deutsche Bank, Bloomberg Finance LP. *Long-only ETF cumulative flow for Intl DM Broad and DM ex US Country equities*

Figure 10: Potential price discovery in primary market due to ETF flow activity



Source: Deutsche Bank

Availability of the data

Although mutual fund cash flow figures can be obtained through specialized data vendors that collect and distribute these information; the numbers are still subject to universe sampling, estimations, and time of update and distribution limitations. On the other hand, ETF cash flow data is calculated from shares outstanding and NAV data which in the case of US-listed ETFs are widely and timely available. For example, ETFs have to disseminate a specific time series for their shares outstanding and NAV, each with their own tickers. This information has to be published on a daily basis after the market closes and before the market opens (i.e. 9:30am) the next business day. These data are available through several data vendors. In our case we utilize Bloomberg Finance LP. We believe that the availability of the data and the smaller pool of products compared to mutual funds allow ETFs to be a more accurate and timely source of flows data.

ETF Flows Explained

What are they and how are they calculated?

ETF flows reflect the net new money that is coming in or existing money that is going out of the fund. Basically, it measures the net change in shares outstanding for the fund. We convert the net change in shares outstanding (SO) into a money figure by multiplying the net change of shares by the fund's net asset value (NAV). Mathematically speaking:

ETF flows reflect the net new money that is coming in or existing money that is going out of the fund.

$$\text{NET CASH FLOW}(t) = [SO(t) - SO(t-1)] \times NAV(t) \qquad (1)$$

- **Shares outstanding** for ETFs are calculated and disseminated on a daily basis under their own ticker, usually taking the form <ETF TICKER>SO; for example the shares outstanding ticker for the SPDR S&P 500 ETF (SPY) is SPYSO. We should add that although shares outstanding figures are released on a daily basis, the actual number usually corresponds to the day before. For instance, if SPY had net 100,000 shares created on Wednesday, this increment will actually be reflected in the SO time series on the next day i.e. Thursday. Therefore, ETF SO numbers in practice carry a 1-day lag.
- **Net asset value** corresponds to the aggregated value of the fund holdings minus liabilities for any given day. This number is calculated and disseminated on a daily basis without any lag. Similar to shares outstanding figures, ETF NAV numbers also have their own moniker built from a combination of the ETF ticker and the NV suffix. For example, the NAV time series ticker for SPY is SPYNV.

These data can be available via different market data vendors. In our case we utilize Bloomberg Finance LP and we use the respective time series tickers for SO and NAV. After using and evaluating different vendor alternatives we chose Bloomberg because of its reliability, accuracy, and ease of access and delivery for these specific data points.

The next subsections discuss some ETF flow issues that any tactical asset allocation signal based on ETF flows should be prepared to deal with.

ETF flows and directional trends

Fund flows and market directional price trends should be consistent in order for fund flows to have any performance predictive power. For instance, if you see inflows you should be able to see price appreciation, and if you see outflows you should be able to see price depreciation. Most ETFs that function predominantly as an asset allocation vehicle are consistent with this rationale. However, investors and ETF flow data users should be aware of the fact that some ETFs also serve other portfolio functions such as cash management and risk management that do not necessarily comply with the above rationale.

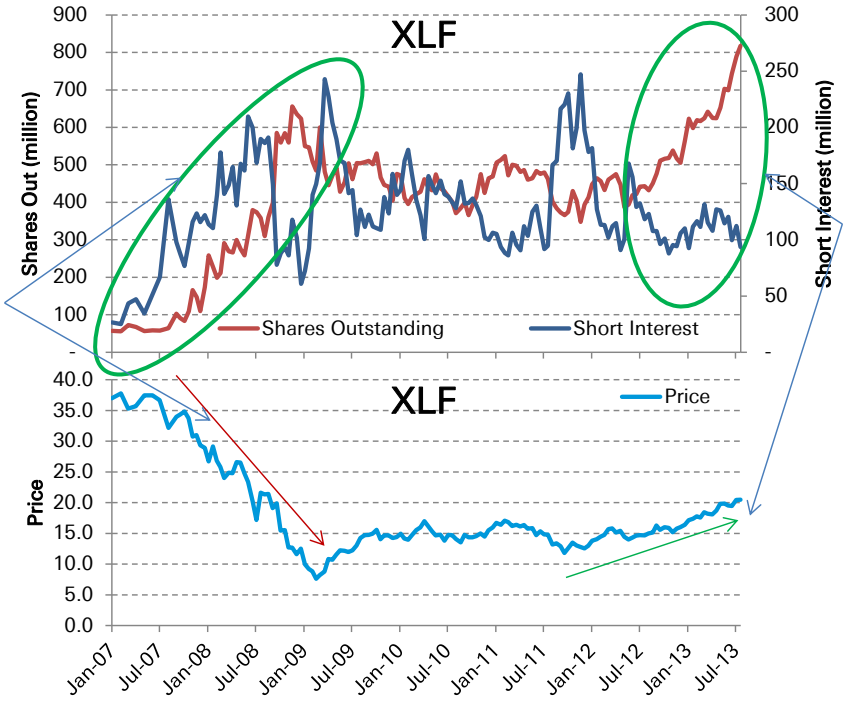
Fund flows and market directional price trends should be consistent in order for fund flows to have any performance predictive power.

For example, ETFs utilized as risk management tools can at times experience inflows or outflows for reasons that have nothing to do with directional asset allocation preferences or sentiment. The most common occurrences are what the industry calls create to lend or create/redeem to cover (Figure 11).

- **Create to lend**: this refers to an Authorized Participant (AP), usually a large Broker/Dealer, creating new ETF shares to lend out to a client that wants to take a short position. In this case the AP facilitates the liquidity of an ETF on the short side so the client can fulfill their risk hedging or short views on the respective asset class. This activity is registered as an increase of ETF shares outstanding and therefore an inflow to the fund. Because the actual nature of the trade (investor's intention) was bearish and the actual flow into the fund is positive, this flow reading would be a misleading indication of the actual underlying sentiment driving the flows.
- **Create/redeem to cover**: When the above investor that went short on the ETF desires to unwind the position, she will have to obtain the ETF shares in order to deliver them to the AP and cover her position. The AP in turn will release the ETF position in their book by most likely redeeming the shares with the ETF issuer. This process in which the investor is exiting a bearish view, which could be considered as a positive sentiment indicator, would be translated into an outflow from the fund which could be interpreted as a bearish sign.

Figure 11: ETF flows and directional trends divergence and parallelism examples - Financials

This is how it should look like when flow is being driven by create to lend activity, both short interest and shares outs should be moving in the same way. Moreover, ETF price and shares outs are diverging. The flow read during this period would be non-directional and misleading.
*Note that the drop in short interest is probably related to the SEC ban on short selling financials stocks.



On the other hand, during this peroid Shares outs and short interest moved mostly in opposite ways. The divergence between shares outs and short interest and the parallelism between price and shares outs would suggest that the increase in shares outs is directionally bullish.

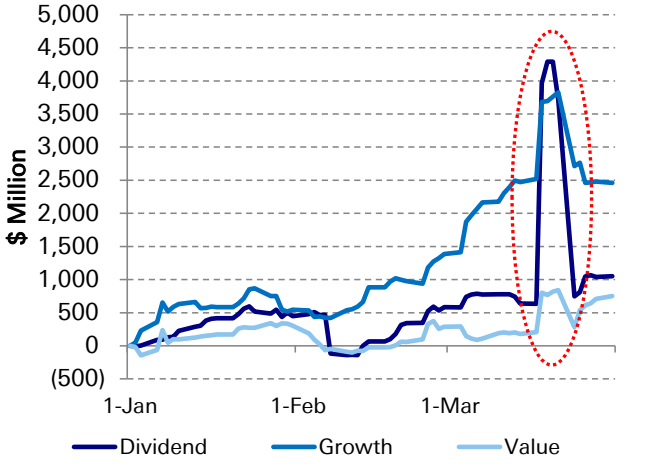
Source: Deutsche Bank, Bloomberg Finance LP

ETF flow anomalies

ETF flow anomalies can also be misleading trend indicators such as the one discussed in the previous subsection; however their origin may be more related to the cash management function of ETFs or other unique situations rather than risk management. We called this type of flow anomalies the operational flows or just non-asset allocation flows.

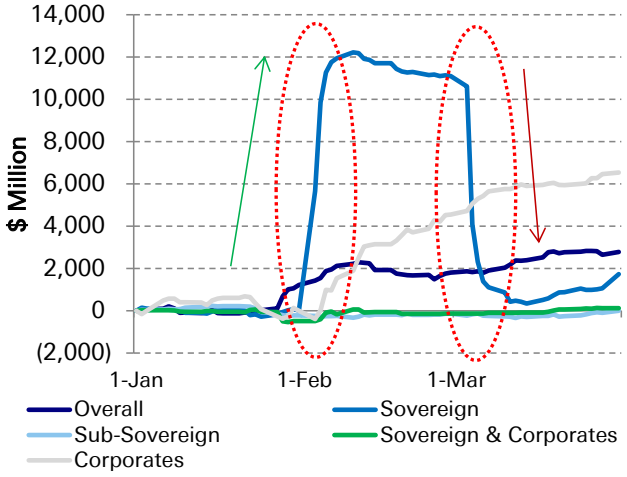
- **Rebalancing flows**: some ETFs can experience unusual flow patterns around their underlying index rebalancing dates. In most cases, they will experience a spike in flows about 3 days before the effective rebalancing date followed by an outflow of similar size on the effective date. In general, these flows are not driven by asset allocation decisions, but are rather driven by passive asset managers trying to work the index rebalancing in a more tax efficient way by taking advantage of some of the unique ETF features such as in-kind creation/redemption. Outflows are usually recorded in shares outstanding on a Monday; therefore somebody that is tracking weekly flow data would get a misleading signal. Some ETFs which have portrayed this behavior are the SPY and some Vanguard US equity products (Figure 12).
- **Model trading**: following the financial crisis of 2008 investors began to flock towards asset allocation strategies encouraged by the benefits that asset class diversification provided during the turmoil. Moreover, the rising popularity of asset allocation not only fueled growth in asset allocation products such as ETFs, but also in ETF-based strategies. Now, with many of these strategies reaching multi-billion dollar sizes, their trading needs can, at times, require accessing the primary market via the creation/redemption process in order to satisfy a trading order. In addition, many of the trading decisions can be model driven and could be completely unrelated to the underlying market trends. These flow anomalies can be easily recognized as one-off spikes or drops in the cash flow time series (Figure 13).

Figure 12: Impact of Rebalancing flows in ETF flows*



*Source: Deutsche Bank, Bloomberg Finance LP. *Long-only cumulative ETF flows by US Equity Style*

Figure 13: Impact of model trading in ETF flows*

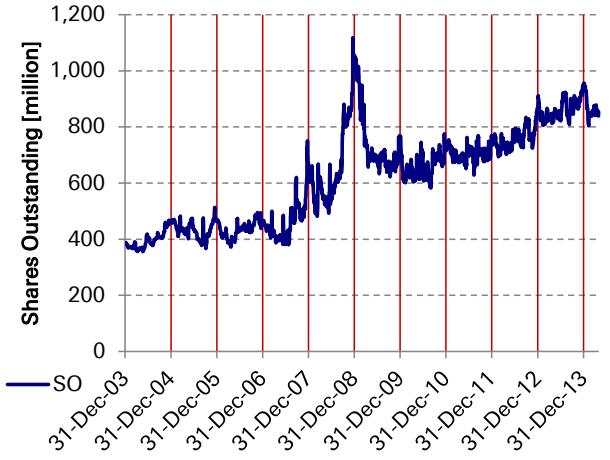


*Source: Deutsche Bank, Bloomberg Finance LP. *Long only cumulative ETF flows by Fixed Income sector*

- **SPY December effect**: in most cases ETFs do not display any seasonality pattern; however SPY is the exception to the rule. Featuring the most abundant liquidity of any other traded security, and the largest and most diverse investor base among ETFs, SPY is probably the poster child of multi-purpose ETFs. For this reason, SPY's net cash flows can usually be dominated by risk management and cash management-driven flows rather than by asset allocation ones. The most clear flow anomaly observed in this ETF is what we call the SPY December effect. Basically, SPY tends to form peaks around each end of year. More specifically, the fund begins pulling in new money

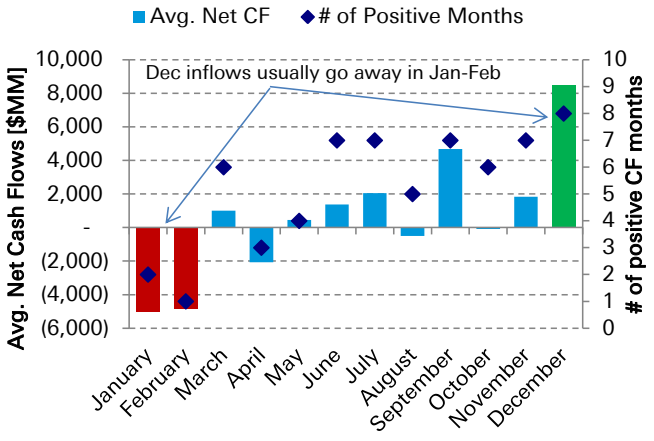
towards the beginning of December and continues into the end of the month, just to be followed by a similar amount of outflows in the next couple of months of January and February (See Figure 14 & Figure 15). We believe that this activity is probably driven by cash management related decisions such as tax-loss harvesting or cash equitization.

Figure 14: Historical SPY Shares Outstanding - Daily



Source: Deutsche Bank, Bloomberg Finance LP

Figure 15: 10-Year Monthly Avg. Net Cash Flows - SPY



Source: Deutsche Bank, Bloomberg Finance LP

ETF Tactical Asset Allocation Relative Strength Signal (TAARSS)

In this section we introduce our new Tactical Asset Allocation Relative Strength Signal (TAARSS) based on ETF flow trends. The objective of the signal is to identify those asset classes that seem more attractive based on investors asset allocation preferences.

The objective of the signal is to identify those asset classes that seem more attractive based on investors asset allocation preferences.

The underlying principle behind our signal is that at the end of the day what moves markets are the technical forces of supply and demand. In other words, although fundamentals are very important they do not move markets, but rather serve as a catalyst of technical forces that in turn will be the ones driving the investment demand for a specific asset class or market and therefore move markets. For example, even if the fundamentals for a country are very strong that country is not going to experience a price rally until enough investors are convinced of the fundamental story and begin to manifest their preferences through their asset allocation decisions; this would translate into an increase in investment demand for the specific country and hence would drive its price higher. In general, the supply curve for an asset class tends to be more stable in the short or medium term than the demand side of the equation; hence the reason why we have focused on understanding the investment demand shifts.

Our new methodology seeks to measure the strength of the directional consensus among different asset classes in order to identify those that have the best potential for price appreciation based on shifts in the investment demand curve. Because of the points discussed earlier in the report, we believe that ETF flow trends can serve as an ideal proxy to identify and measure the strength of these trends. In the next subsections we discuss in detail our TAARSS methodology, its governing principles, and parameters.

Universe

Our objective is to measure investors' directional asset allocation preferences. Therefore we should focus on asset allocation products that offer non-levered (i.e. delta one) directional access (i.e. only long products). In addition, we care about products that can reflect their activity in the underlying market; therefore we only consider funded products. In ETP terms, we only consider US-listed long-only non-levered ETFs and ETVs as part of the initial universe; ETNs are excluded because they are not funded as well as leveraged and inverse products because they are more of a trading vehicle than an asset allocation one.

Classification

Using the right classification is as important as selecting the right universe. The ideal classification should be asset allocation-driven and have enough granularity to allow for sufficient tactical insight and implementation. In our case we use our proprietary classification system which identifies 181 different investment segments distributed among 4 main asset classes, multiple dimensions, and multiple levels. Furthermore, our classification is completely investable via ETFs and ETVs. All of the 181 investment segments can be accessed through a single product, with two exceptions which are accessed via two products. Figure 16 and Figure 17 display our classification system with the corresponding AUM for the whole segment as of the end of April 2014 and an ETP implementation for each individual segment. Because we use the product prices in the backtesting of the strategies presented in the next section, we selected most of the ETPs based in their listing date and size; therefore these should not be necessarily seen as the best or only alternative for each asset class but rather as a representative one, especially for the backtesting period. We have also included a column to indicate whether we consider an investment segment seasoned or not; we provide more details about the meaning of being a seasoned investment segment in the next section.

We have identified 181 different investment segments distributed across four main asset classes: Equity, Fixed Income, Commodity, and Currency.

The classification of products is also very important because it allows us to aggregate the flow data in a more meaningful way. For example, some of the small individual product flow anomalies may dissipate at an aggregated level.

Figure 16: DB ETF Classification System for Tactical Asset Allocation – Fixed Income, Commodity, Currency

Categories	AUM $MM	Sea-soned	ETF
Fixed Income	269,179	Y	BND
FIXED INCOME - SECTOR			
US Treasury	25,350	Y	IEF
Convertible	2,641	Y	CWB
IG Corporates	61,359	Y	LQD
HY Corporates	36,184	Y	HYG
Inflation	20,351	Y	TIP
Municipal	12,375	Y	MUB
IG Broad	67,520	Y	BND
International DM Debt	4,466	Y	BWX
EM Debt	10,180	Y	EMB
Preferred	13,802	Y	PFF
Collateralized Debt	6,594	Y	MBB
Senior Loans	8,308	Y	BKLN
FIXED INCOME - DURATION			
Floating	12,596	Y	FLOT
Very Short	8,183	Y	SHV
Short	67,476	Y	SHY
Intermediate	55,435	Y	IEI
Long	8,270	Y	TLT
FIXED INCOME - CREDIT			
Investment Grade	198,160	Y	LQD
High Yield	47,032	Y	HYG

Categories	AUM $MM	Sea-soned	ETF
Commodity	61,033	Y	DBC
COMMODITY - SECTOR & SUBSECTOR			
Diversified Broad	7,850	Y	DBC
Energy	2,065	Y	DBE
Crude Oil	989	Y	USO
Natural Gas	736	Y	UNG
Gasoline	45		UGA
Heating Oil	5		UHN
Agriculture	1,729	Y	DBA
Sugar	3		CANE
Corn	111		CORN
Soybean	5		SOYB
Wheat	13		WEAT
Industrial Metals	318		DBB
Precious Metals	49,072	Y	DBP
Copper	3		CPER
Gold	40,735	Y	GLD
Silver	6,699	Y	SLV
Platinum	749	Y	PPLT
Palladium	509	Y	PALL
Currency	2,616	Y	UUP
Bull USD	706	Y	UUP
Bear USD	1,911	Y	UDN

Source: Deutsche Bank, Bloomberg Finance LP. AUM as of April 30, 2014.

Figure 17: DB ETF Classification System for Tactical Asset Allocation – Equity

Categories	AUM $MM	Sea-soned	ETF
Equity	1,362,789	Y	ACWI
EQUITY - US SECTOR & INDUSTRY			
Consumer Discretionary	8,847	Y	XLY
Leisure & Entertainment	178		PEJ
Media	171		PBS
Retail	751	Y	XRT
Industrials	15,319	Y	XLI
Aerospace & Defense	534	Y	ITA
Construction & Engineering	124		PKB
Transportation	979	Y	IYT
Financials	65,367	Y	XLF
Capital Markets	429	Y	IAI
Commercial Banks	5,668	Y	KRE
Insurance	445	Y	KIE
Real Estate	34,675	Y	VNQ
Real Estate Intl*	8,460	Y	VNQI
Financial Services	593	Y	IYG
Thrifts & Mortgage Finance	8		KME
Technology	29,643	Y	VGT
Communication Equipment	349	Y	IGN
Internet Software & Services	2,038	Y	FDN
Semiconductors	878	Y	SMH
Software	1,343	Y	IGV
Energy	21,104	Y	XLE
Energy Equipment & Services	2,308	Y	OIH
Oil, Gas, and Cosumable Fuels	1,529	Y	XOP
Materials	12,461	Y	XLB
Construction Materials	3,171	Y	XHB
Metals and Mining	640	Y	XME
Consumer Staples	9,718	Y	XLP
Food & Beverage	434		PBJ
Healthcare	29,595	Y	XLV
Biotechnology	7,648	Y	IBB
Pharmaceutical	2,964	Y	PJP
Health Care Providers & Services	497	Y	IHF
Health Care Equipment & Supplies	738	Y	IHI
Telecom	1,305	Y	VOX
Utilities	9,165	Y	XLU
EQUITY - GEO. FOCUS: MARKET			
EM	132,589	Y	EEM
DM	217,518	Y	EFA
US	951,965	Y	SPY
Global	60,717	Y	ACWI
EQUITY - GEO. FOCUS: REGION			
North America	956,745	Y	SPY
Latin America	9,191	Y	ILF
Asia Pacific	59,955	Y	AAXJ+EWJ
Europe	60,690	Y	VGK
Global	275,125	Y	ACWI
Middle East & Africa	1,084	Y	MES+AFK

Categories	AUM $MM	Sea-soned	ETF
EQUITY - GEO. FOCUS: COUNTRY			
Developed Markets			
Australia	1,999	Y	EWA
Austria	73		EWO
Belgium	76		EWK
Canada	3,395	Y	EWC
Denmark	48		EDEN
Finland	38		EFNL
France	420	Y	EWQ
Germany	5,941	Y	EWG
Hong Kong	1,891	Y	EWH
Ireland	178		EIRL
Israel	169		EIS
Italy	1,497	Y	EWI
Japan	25,454	Y	EWJ
Netherlands	244		EWN
New Zealand	182		ENZL
Norway	114		NORW
Portugal	23		PGAL
Singapore	1,041	Y	EWS
Spain	2,132	Y	EWP
Sweden	567	Y	EWD
Switzerland	1,214	Y	EWL
UK	4,400	Y	EWU
US	952,779	Y	SPY
Emerging Markets			
Argentina	7		ARGT
Brazil	4,554	Y	EWZ
Chile	306	Y	ECH
China	7,477	Y	FXI
Colombia	134		GXG
Egypt	74		EGPT
Greece	210		GREK
India	2,795	Y	EPI
Indonesia	718	Y	EIDO
Malaysia	765	Y	EWM
Mexico	2,856	Y	EWW
Nigeria	16		NGE
Peru	254	Y	EPU
Philippines	355	Y	EPHE
Poland	387		EPOL
Russia	1,601	Y	RSX
South Africa	531	Y	EZA
South Korea	4,335	Y	EWY
Taiwan	2,961	Y	EWT
Thailand	556	Y	THD
Turkey	540	Y	TUR
Vietnam	498	Y	VNM
EQUITY - MARKET CAP SIZE			
Large Cap	495,262	Y	SPY
Mid Cap	83,326	Y	MDY
Small Cap	85,451	Y	IWM

Categories	AUM $MM	Sea-soned	ETF
EQUITY - STYLE			
Growth	78,483	Y	IWF
Value	76,824	Y	IWD
EQUITY - THEMES			
Commodities			
Agribusiness	3,194	Y	MOO
Coal	169		KOL
Commodities	92		CRBQ
Copper	62		COPX
Gold	9,819	Y	GDX
Industrial Metals	103		HAP
Natural Gas	540	Y	FCG
Natural Resources	5,900	Y	IGE
Nuclear	310	Y	URA
Platinum	11		PLTM
Rare Earth	97		REMX
Lithium	59		LIT
Silver	253	Y	SIL
Steel	103		SLX
Timber	565	Y	WOOD
Socially Responsible Investing			
Clean Energy	1,280	Y	TAN
Clean Tech	85		PZD
Equality	5		EQLT
ESG	643	Y	DSI
Water	1,797	Y	PHO
Industry Trend			
American Industrial Renaissance	34		AIRR
Cloud Computing	289		SKYY
Consumer	1,408	Y	ECON
Defensive	133		DEF
Gaming	80		BJK
Infrastructure	1,346	Y	IGF
MLP	9,387	Y	AMLP
Robotics	105		ROBO
Shipping	117		SEA
Smartphone	11		FONE
Social Media	127		SOCL
Unconventional Oil & Gas	58		FRAK
Other			
Analyst Recommendations	293		RYJ
Buybacks	2,920	Y	PKW
Forensic Accounting	12		FLAG
Hedge Fund 13F	521	Y	GURU
Insider	238		NFO
IPO	506	Y	FPX
Nashville	7		NASH
No-Analyst Coverage	58		WMCR
NYSE Century listed	4		NYCC
Spin-Off	729	Y	CSD

*Source: Deutsche Bank, Bloomberg Finance LP. *This is the only industry presented under US Sector & Industry which is not US-focused. AUM as of April 30, 2014.*

Methodology

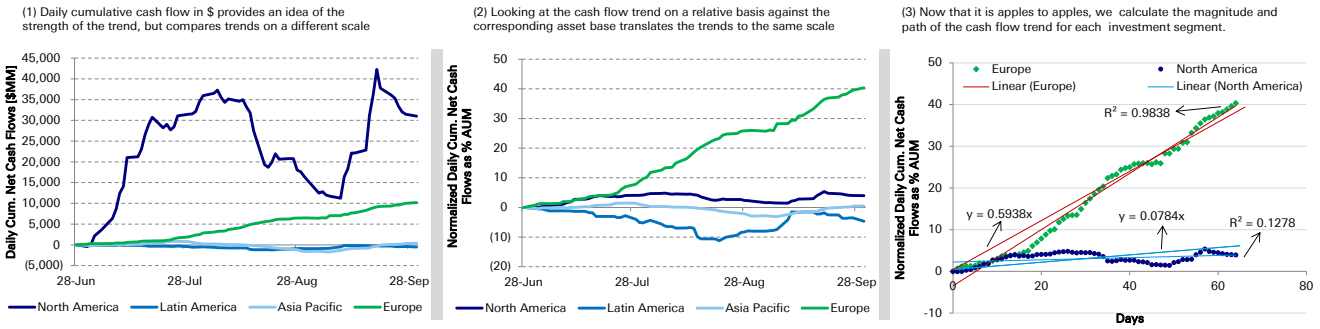
Our calculation methodology is an interpretation of a phenomenon we have observed for the last five years of live ETF flow analysis. As we studied ETF flow cumulative trends across asset classes we noticed that not all trends were created equal. For example, some were very choppy; others exhibited significant step patterns as a result of lump sum inflows or outflows; and others were very steady in one specific direction. We also realized that those flow trends that presented a steadier path and larger size were more likely to be related to future directional performance compared to other trends. We believe that this behavior is grounded on the fact that a large directional and steady flow trend is an indication of an investment demand shift and hence should be accompanied by the corresponding price move. With these insights in mind we sought to develop a quantitative measure that would help us quantify this behavior and provide a gauge of the strength of each ETF flow trend.

The first challenge we faced in order to use our measure as a relative strength indicator was the fact that we were looking at ETF flow trends in absolute dollar terms which we realized was not an apples to apples comparison; therefore we decided to adjust each ETF flow trend relative to the assets under management within the respective asset class in order to look at asset classes on a more comparative basis. For instance, from Figure 18 we could say that, in absolute terms, North American equity ETFs received over $30bn in new flows compared to $10bn received by European equity ETFs over a period of 3 months; or we could also say, in relative terms, that North American equity ETFs received about 5% of AUM in new flows compared to about 40% of AUM in new cash for European equity ETFs in the same period. As shown by this example, we can clearly see that the strength reading from an absolute scale compared to a relative scale can vary significantly. In our case, we are more concern with relative scale comparisons as these would actually provide a better understanding of investors' sentiment towards different asset classes.

Now that we were able to compare apples to apples, the second challenge was to measure the steadiness and the size of the trend, or to put it in other words the path and the magnitude of the ETF flow trend. We propose to measure the path and magnitude of the trend with the help of two single linear regressions. Both regression lines would be based on the flow trend (known Ys) and the number of days over which the signal is being calculated (known Xs). For measuring the consistency of the trend path we use the R-squared of the line of best fit, this gives us an idea of how linear or how steady the ETF flow trend is; the higher the R-squared the more linear and steady the trend. On the other hand, we use the slope of a single linear regression through the origin as a proxy for measuring the size or magnitude of the trend; the steepest the slope the stronger the trend. Embedded within the size measure, we should add that the sign of the slope also reflects the direction of the trend (Figure 18).

The steeper and steadier the ETF flow trend, the stronger the signal.

Figure 18: Measuring ETF flow trend strength



Source: Deutsche Bank, Bloomberg Finance LP.

The last step in our calculation is to combine our path and magnitude measures to get an overall strength indicator for the flow trend. We do this by multiplying magnitude by path, or in other words, slope times R-squared. Mathematically:

Single linear regression through origin (SLRTO)

$$\hat{Y}_i = \hat{\beta}_1 X_i \qquad (2)$$

where $\hat{\beta}_1$ = slope parameter (used for magnitude and direction measure)

$\hat{Y}_i$ = Estimated values for cash flow relative to AUM [%]

X_i = days in the calculation period

Single linear regression – line of best fit (SLR)

$$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 X_i \qquad (3)$$

where $\hat{\beta}_0$ = intercept

$\hat{\beta}_1$ = slope parameter

$\hat{Y}_i$ = Estimated values for cash flow relative to AUM [%]

X_i = days in the calculation period

$$R^2 = \frac{\sum_1^n (\hat{Y}_i - \overline{Y}_i)^2}{\sum_1^n (Y_i - \overline{Y}_i)^2} \qquad (4)$$

where R^2 = coefficient of determination (used as proxy for measuring flow trend path consistency)

$\overline{Y}_i$ = Mean of the observed Y values

Y_i = Actual observed cash flow relative to AUM [%] values

Tactical Asset Allocation Relative Strength Signal (TAARSS)

TAARSS = $\hat{\beta}_1$ (SLRTO) x R^2 (SLR) (5)

where $\hat{\beta}_1$ (SLRTO) = slope parameter of the single linear regression through origin.

R^2 (SLR) = coefficient of determination of the single linear regression (line of best fit).

This calculation suggests that a flow trend with steep slope and linear path will translate into a stronger trend compared to a flow trend with just one of the two components (e.g. steep slope, but very low R-squared).

In addition, the combination of path and magnitude also help us to adjust for the effects of some of the ETF flow anomalies described in the previous section. For example, while rebalancing or model trading inflows would have the effect of increasing the slope of the trend, they would also translate into a lower R-squared; therefore the combination of both would keep the overall strength of the flow trend in check.

Signal and Rebalancing Frequency

Another important input for the signal computation is the period of time over which the signal is going to be calculated or in other words the flow trend data that is going to be considered in the calculation. We refer to this as signal frequency. We think of the signal frequency as the formation period over which a flow trend gathers enough flow momentum from investors' allocations so as to translate into price performance momentum.

On the other hand, we refer to rebalancing frequency to the time interval between signal calculation updates. The rebalancing frequency should be reflective of how often investors tend to reexamine their allocations in order to have enough flexibility to capture new market rotations. As mode of example, a signal that is calculated every quarter using data from the previous month would have a quarterly rebalancing frequency with a monthly signal frequency.

Analysis and Results

An empiric approach to evaluate TAA signal strength

We employ an intuitive asset allocation rotation portfolio approach to measure the success of our TAARSS

In order to evaluate the predictive power of our relative strength signal, we created rotation portfolios that could take positions based on investors' preferences as suggested by each asset class TAARSS. This asset allocation rotation approach is ideal to test the accuracy of the signal in successfully identifying the most attractive asset classes. In addition, these rotation portfolios should also be representative of actual investor asset allocation patterns. For example, experience has shown that investors do allocate among asset classes such as equity, fixed income, and commodities; but it is not as clear whether they allocate across different equity themes such as Gold miners, SRI, and buybacks by following any allocation pattern. Therefore our rotation portfolios have been tested and built in order to be as intuitive and representative of investors' asset allocation behavior.

We construct the portfolios by calculating the TAARSS for each individual asset class or investment segment in the specific rotation portfolio for the corresponding rebalancing and signal frequency periods. Then we select all positive signals and build a long-only portfolio weighted according to the signal values (i.e. signal-weighted); hence an asset class with a higher positive TAARSS will have a larger weight in the portfolio than other asset class with a lower positive one, while an asset class with a negative TAARSS would not be part of the portfolio; if all TAARSS are negative the portfolio goes 100% to cash.

TAARSS rotation portfolios are easily implementable via ETFs

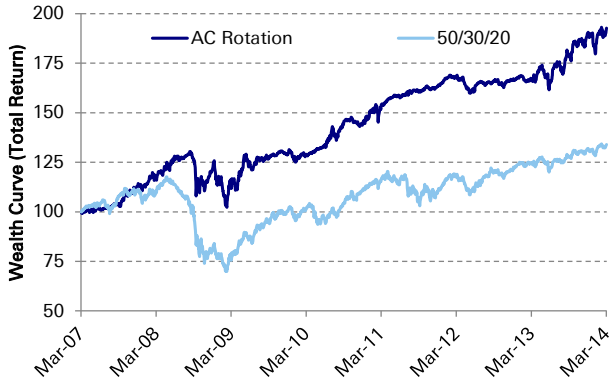
Another very distinctive feature of our TAARSS rotation portfolios is that each asset class is represented by an investable ETF, and therefore can be easily implemented. We have actually used ETF prices in practically all of our backtesting calculations and also in the benchmarks utilized[5].

In order to compare the value add of the signal-based rotation strategy we compare the performance of the rotation strategy versus a benchmark that is representative of the asset classes included in the rotation portfolio. For example, an asset class rotation considering Equity, Fixed Income, and Commodity should be compared to a benchmark tracking all of these asset classes (Figure 19), or a Size rotation (Large, Mid, Small cap) should be compared against a total market benchmark.

In Figure 19, both the TAARSS rotation strategy and the benchmark utilize the same ETFs; the only difference is the weighting (Figure 20) which is dictated by the signal for the TAARSS portfolio and for the target weights for the 50%/30%/20% Equity/Fixed Income/Commodity benchmark, respectively.

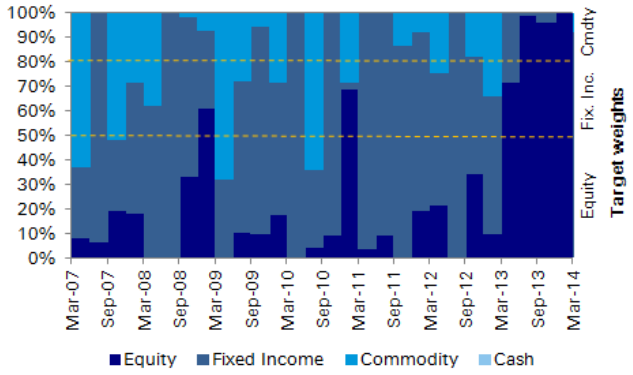
[5] We used the MSCI AC World Daily Net Total Return USD index for the prices of the ACWI ETF because ACWI was not listed until March 28th, 2008. However the ETF currently has enough liquidity and size, and has tracked its index closely since inception. We also used the MSCI AC Asia Pacific Daily Net Total Return USD index to represent the prices for the Asia Pacific regional exposure, because at the time of this writing there is no single ETF on that index; however this index can be tracked by combining two ETFs.

Figure 19: Asset Class Equity-Fixed Income-Commodity TAARSS Rotation vs. 50%, 30%, 20% benchmark – 7Y Performance with quarterly rebalancing



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices.

Figure 20: Asset Class TAARSS Rotation quarterly weights vs. Benchmark target weights

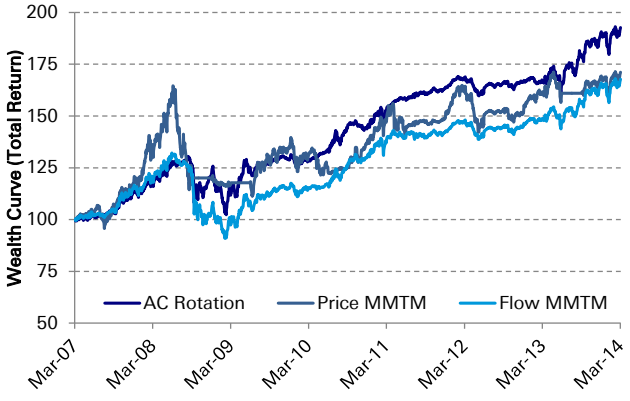


Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Actual TAARSS strategy and benchmark weights would actually fluctuate within each rebalancing period.

In addition to the comparison of TAARSS rotation portfolios versus a benchmark, we also wanted to examine whether the source of the signal strength was really in the novelty of our new methodology or if it is just another form of capturing the momentum anomaly. For this purpose, we compared our rotation strategy versus a pure price momentum strategy based on total returns, and another strategy following a pure flow momentum signal based on a flows-over-initial-assets calculation. For all three strategies we used the same calendar quarterly rebalancing and signal frequency calculation cycles, as well as the same ETFs. All of the portfolios were weighted based on their respective signals in a similar way than our TAARSS portfolio. The results suggest that there is more to our TAARSS strategy than just momentum, as our new TAA model outperforms both momentum strategies (Figure 21 & Figure 22).

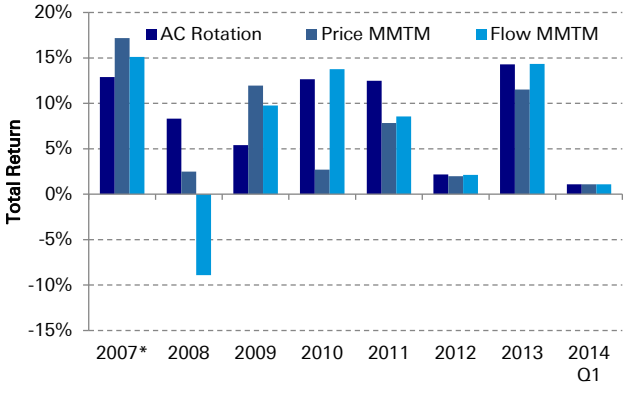
TAARSS is more than just momentum.

Figure 21: Asset Class Equity-Fixed Income-Commodity TAARSS Rotation vs. Price and Flow Momentum strategies



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices.

Figure 22: Asset Class TAARSS Rotation total annual returns vs. Price and Flow Momentum strategies



*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from March end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

The asset class TAARSS rotation portfolio not only proved to perform better in absolute terms, but it also displayed better risk-adjusted returns and smaller downside risk than the momentum strategies (Figure 23).

Figure 23: Full period performance comparison (7 year) – AC TAARSS rotation vs. Momentum strategies

Full Period Perf. Statistics	AC Rotation	Price MMTM	Flow MMTM
Annualized Return	9.82%	7.98%	7.67%
Ann. Std. Dev.	9.97%	13.59%	10.40%
Sharpe (RF=0%)	0.99	0.59	0.74
Max. Drawdown	-21.6%	-32.3%	-31.2%
Downside Deviation	8.07%	11.26%	8.13%
Sortino (T=0%)	1.22	0.71	0.94

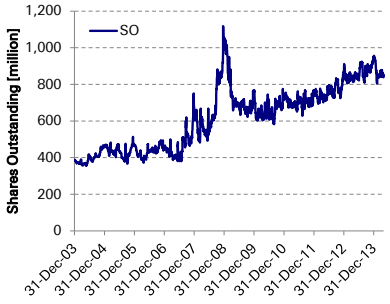
Source: Deutsche Bank, Bloomberrg Finance LP, FactSet. Note: Returns are based on total price returns.

Defining the right universe

An asset allocation-driven selection of ETFs provides a stronger signal

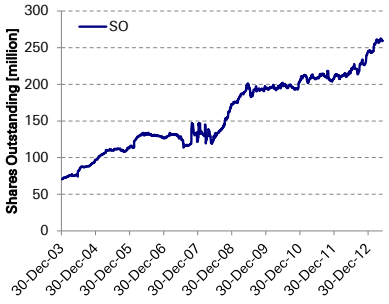
Although the initial results are quite satisfactory, we believe there is room for improvement based on the ETF sample used in the TAARSS calculation. Basically, given that some ETFs are utilized for multiple purposes we believe that there is noise associated with the flows driven by non-asset allocation activities such as risk hedging and cash management. Fortunately this behavior is concentrated in a very small[6] group of ETFs which we tend to refer to as pseudo-futures. Therefore an easy way to adjust for this noise would be to eliminate them from the sample; while a more sophisticated approach would be to apply an asset allocation factor to each product to adjust for the portion of the flows that is actually being driven by asset allocation decisions[7]. To illustrate the differences in flow patterns among products, Figure 24, Figure 25, and Figure 26 exhibit the shares outstanding historical patterns for SPY, IVV and VOO all of which are multi-billion dollar ETFs tracking the S&P 500 with very abundant liquidity.

Figure 24: The Pseudo future ETF - SPY



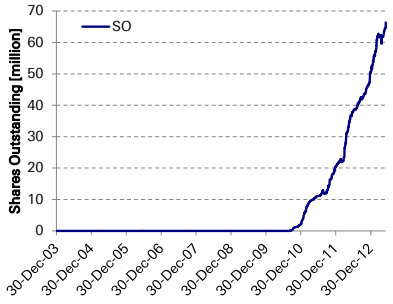
Source: Deutsche Bank, Bloomberg Finance LP.

Figure 25: Somewhere in the middle - IVV



Source: Deutsche Bank, Bloomberg Finance LP.

Figure 26: The asset allocation product - VOO



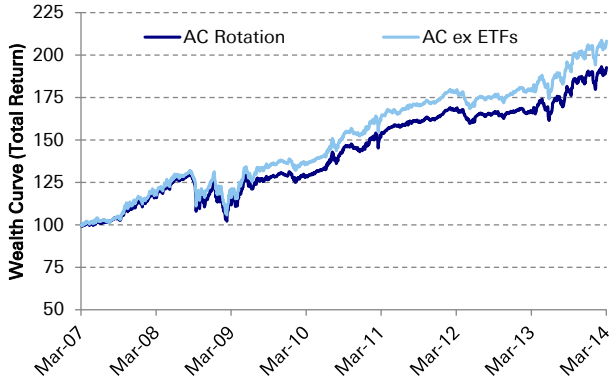
Source: Deutsche Bank, Bloomberg Finance LP. Note: ETF's inception date was Sep 9th, 2010.

[6] Although this group covers some of the most actively traded and largest ETFs in the market, they do not dominate the asset allocation trends in the market. Actually their popularity and size comes from the attention they receive from a bigger pool of investors which includes a higher exposure to non-asset allocator players.

[7] The work presented in our report titled "US ETF Holder Demographics: Understanding ETF Usage", published by Shan Lan and Sebastian Mercado on March 21st, 2012, [Deutsche Bank] could serve as a guideline to developed an asset allocation factor.

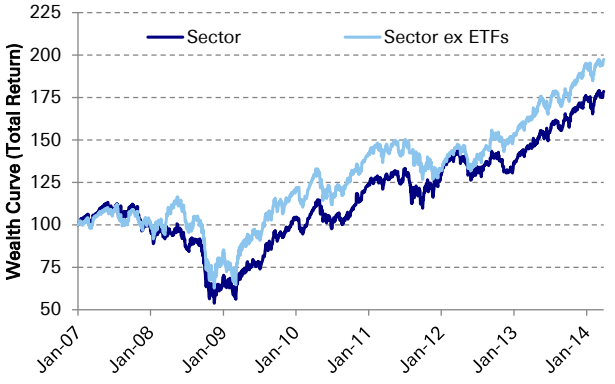
For the purpose of this report, we have taken the first approach which is to eliminate those ETFs with the highest non-asset allocation activity. More specifically, we noted that if we excluded SPY (SPDR S&P 500 ETF), IWM (iShares Russell 2000 ETF), and the nine Select Sector SPDR ETFs (XLY, XLP, XLI, XLE, XLF, XLV, XLB, XLK, and XLU) the strength of our signal experienced a significant improvement. Figure 27 and Figure 28 depict the improvement achieved by the quarterly asset class TAARSS rotation strategy, and the weekly US sector TAARSS rotation strategy. From this point onwards, all of our signals will be based on the new ETF sample excluding the above mentioned ETFs.

Figure 27: Asset Class TAARSS Rotation vs. Asset Class TAARSS Rotation excluding ETFs - Quarterly



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Excluded ETFs are: SPY, IWM, XLY, XLP, XLI, XLE, XLF, XLV, XLB, XLK, and XLU.

Figure 28: US Sector TAARSS Rotation vs. US Sector TAARSS Rotation excluding ETFs - Weekly



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Excluded ETFs are: SPY, IWM, XLY, XLP, XLI, XLE, XLF, XLV, XLB, XLK, and XLU.

When does an asset class become representative via ETF flows?

This is a very relevant subject for an asset class. Usually whenever a new asset class exposure comes to the ETF market there is an incubation period under which most of the growth is driven by product adoption and seasoning, both of which are not necessarily related to investors' asset allocation preferences and hence would be misleading if used in a flow-based signal.

We approach this issue from two angles. Firstly, the time we have chosen to start our backtesting (i.e. End of 2006) period was not selected randomly. Actually, we picked that point in time because based on our ETF industry research we believe that after that date the industry was mature enough in terms of products offered, size, asset classes covered, and asset allocation usage in order to provide meaningful asset allocation insights through ETF flow trends; while before that point in time we do not think that ETF flows could provide meaningful insights representative of investors' asset allocation preferences. This also implies that as the industry keeps growing, ETF flows should become even more representative of asset allocation preferences.

We believe that after the end of 2006 the ETF industry became more representative of asset allocation decisions.

Secondly, we have set an arbitrary seasoning period of 1 year and $500 million in assets for any new asset exposure launched into the ETF market, before we consider them in any rotations strategy. These conditions, however, do not have a major impact in the TAARSS rotation strategies presented in this report, as most of them are based out of very seasoned asset classes. These thresholds would be more relevant for some specific country, industry, or thematic exposures.

We have set an arbitrary seasoning period of 1 year and $500 million in assets for any new asset exposure.

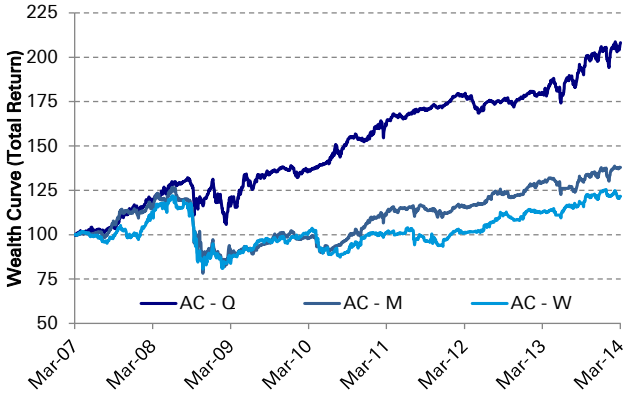
What are the right signal calculation and rebalancing frequencies?

Utilizing the right signal calculation and rebalancing frequencies are key to extract all of the value adding potential of the TAARSS. Our underlying principle is that asset allocation cycles are not necessarily based on fundamental or rational catalysts, but rather on multiple irrational investor behaviors. For instance, asset allocators may examine their high level asset allocation on a quarterly basis because that is the way strategist on both side of the street tend to think in terms of asset classes outlook. They may also revisit their asset allocation based on reporting requirements (e.g. quarterly in the US). Furthermore, as we get more granular in the asset class space we see that investors tend to move faster as the information flow at that level tends to be faster as well (e.g. countries, sectors, etc). Therefore the signal calculation and rebalancing frequency seek to find the right asset allocation behavior cycle driving investors' decisions.

The signal calculation and rebalancing frequency seek to find the right asset allocation behavior cycle driving investors' decisions.

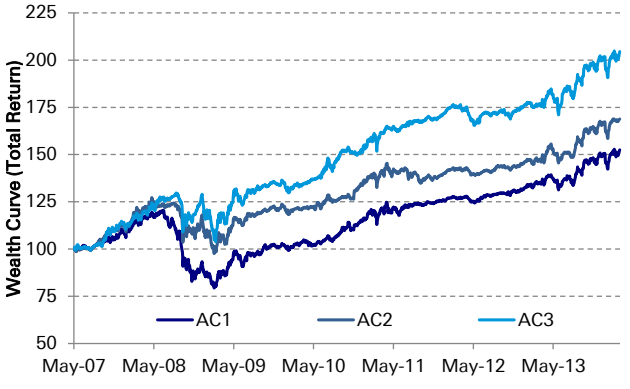
Our analysis showed that the right calculation and rebalancing frequencies depend mostly on the granularity level at which we are implementing the strategy. For example, the best frequency for a high asset class level rotation strategy is quarterly, more specifically following the quarterly calendar (March-June-September-December) cycle (Figure 29 & Figure 30). We should also add that a matching signal calculation and rebalancing frequency is also required in order to get the most out of our TAARSS (i.e. quarterly signal – quarterly rebalancing, or monthly signal – monthly rebalancing, etc.). Finally, we add that as we get more granular the signal and rebalancing frequencies do get faster. The next subsection provides the detailed analysis of all the rotation strategies examined in this report with their corresponding parameters and special considerations.

Figure 29: Asset Class TAARSS Rotation Quarterly (Q), Monthly (M), and Weekly (W) frequencies



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of March 2007.

Figure 30: Asset Class TAARSS Rotation quarterly frequencies under different quarterly cycles: (1) Jan-Apr-Jul-Oct, (2) Feb-May-Aug-Nov, (3) Mar-Jun-Sep-Dec.



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of May 2007.

Detailed analysis for Rotation Strategies

After analyzing different possible rotation strategies and their respective frequencies, we have selected 10 different strategies that have the potential to benefit from our TAARSS methodology. We present a summary of each of them along with their main attributes on Figure 31. We believe that one of the reasons why these strategies find value in our TAARSS is because they tend to

be natural asset allocation rotations that investors implement via ETFs given the maturity, granularity, and efficiency of the ETF candidates available; while other rotation strategies probably failed to deliver strong results because there are probably still other more efficient routes of implementation. An example of a rotation strategy that didn't deliver the expected results was the Term Structure rotation within rates, although ETFs offer enough granularity to invest in different places of the curve, we believe that these types of rotation strategies are probably implemented via derivatives rather than ETFs, and hence ETF flows do not provide much value for a rotation strategy.

Figure 31: Summary of rotation strategies implementable with TAARSS methodology

Asset Class	Rotation Strategy	Frenquency	Universe	Exposure	Benchmark
Multi Asset	Asset Class	Quarterly	All ETPs Ex SPY, IWM, 9 Select Sector SPDRs	Global Equities, US Aggregate Fixed Income, Broad Diversified Commodities	60/40, 50/30/20, Salient Risk Parity Index*
Equity	US Size	Monthly	All ETPs Ex SPY, IWM, 9 Select Sector SPDRs	Large Cap, Mid Cap, Small Cap	Russell 3000
Equity	Region	Monthly	All ETPs Ex SPY, IWM, 9 Select Sector SPDRs	North America, Europe, Asia Pacific, Latin America	MSCI ACWI**
Equity	Market	Monthly	All ETPs Ex SPY, IWM, 9 Select Sector SPDRs	US, DM ex US, EM	MSCI ACWI**
Equity	DM Country	Monthly	All ETPs	Australia, Austria, Canada, France, Germany, Hong Kong, Italy, Japan, Singapore, Spain, Sweden, Switzerland, UK	MSCI EAFE
Equity	US Style	Weekly	All ETPs	Growth, Value	Russell 1000
Equity	US Sector	Weekly	All ETPs Ex 9 Select Sector SPDRs	Cons. Discretionary, Cons. Staples, Energy, Financials, Industrials, Health Care, Materials, Technology, Telecom, Utilities	S&P 500
Fixed Income	Sector	Monthly	All ETPs	Corp IG, Corp HY, US Trsy, MBS, Inflation, Convertible, Senior Loan, Intl DM Debt, EM Debt, Municipal	Barclays US Agg
Commodity	Sector	Monthly	All ETPs	Gold, Div. Broad, Energy, Agriculture	DBIQ Optimum Yield Diversified Commodity
Commodity	Sector	Weekly	All ETPs	Gold, Energy, Agriculture	DBIQ Optimum Yield Diversified Commodity

*Represented by the Salient Risk Parity Index **Represented by the MSCI All Country World Daily TR Net USD index, all other benchmarks or components are represented by US-listed ETFs

Source: Deutsche Bank

In the next pages we provide detailed analysis and results for each of the rotation strategies summarized on Figure 31.

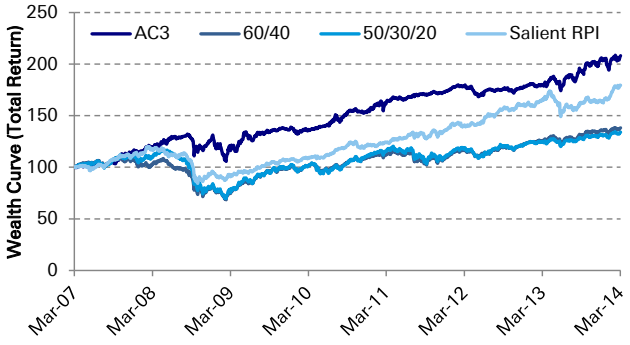
All of the rotation strategies present a performance improvement relative to their benchmarks. In general, the improvement comes in the form of higher absolute return, better risk adjusted return, and smaller maximum drawdown. A caveat should be made in relation to the three weekly rotation strategies presented; although they do exhibit signal strength, readers are reminded that backtesting calculations do not include transaction costs, therefore the actual cost implementation of the weekly strategies could remove part of the value added by the signal. The transaction cost impact shouldn't be too significant for the monthly and quarterly frequency models.

All of the rotation strategies present a performance improvement relative to their benchmarks, usually in the form of higher absolute return, better risk adjusted return, and smaller maximum drawdown.

Most of the benchmarks utilized are widely known or self-explanatory (e.g. 60%/40%). However we should add a few comments on the Salient Risk Parity Index. The Salient RPI is comprised of an equally risk-weighted portfolio of equities, commodities, global interest rates, and credit. It employs 46 futures contracts and 6 credit default swap indices. The index weights target a 10% standard deviation for the index as a whole. Unlike the other benchmarks used which are based on ETFs, this is not an investable product.

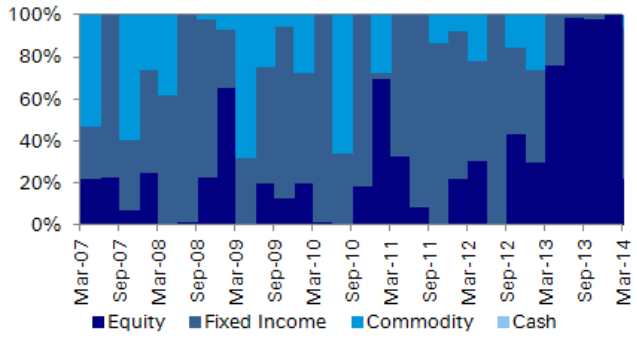
Multi Asset>Asset Class>Quarterly calendar rotation (AC3)

Figure 32: 7-Year cumulative performance



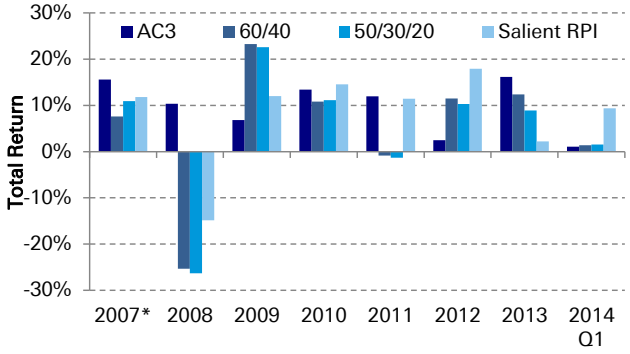
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of March 2007.

Figure 33: Signal-based quarterly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-quarter weights may vary based on price fluctuations.

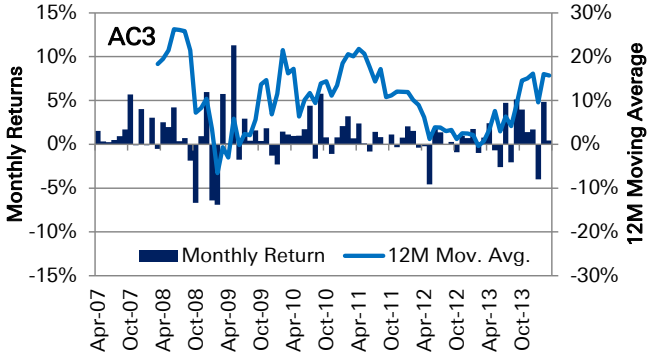
Figure 34: Annual & full period performance statistics – 7 Year



Full Period Perf. Statistics	AC3	60/40	50/30/20	Salient RPI
Annualized Return	11.05%	4.74%	4.27%	8.72%
Ann. Std. Dev.	9.98%	11.22%	12.21%	8.83%
Sharpe (RF=0%)	1.11	0.42	0.35	0.99
Max. Drawdown	-19.9%	-38.0%	-40.6%	-29.8%
Downside Deviation	8.07%	8.86%	9.87%	7.08%
Sortino (T=0%)	1.37	0.53	0.43	1.23

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from March end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 35: Monthly performance statistics

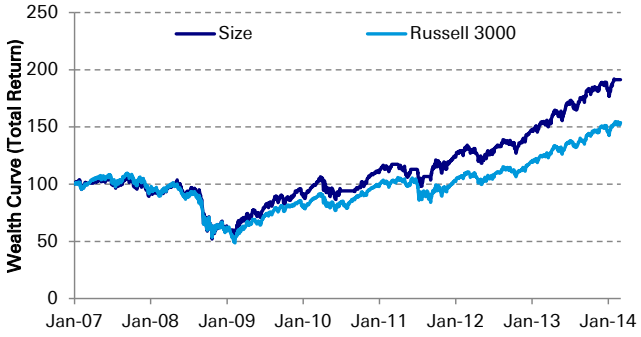


Monthly Statistics	AC3	60/40	50/30/20	Salient RPI
Avg. Return	0.91%	0.44%	0.42%	0.75%
Positive Months	61	49	49	58
Avg. Gain	2.05%	2.55%	2.73%	2.21%
Max. Return	11.30%	7.27%	8.53%	6.22%
Negative Months	23	35	35	26
Avg. Loss	-2.10%	-2.50%	-2.82%	-2.52%
Min. Return	-6.91%	-12.83%	-15.42%	-14.80%
Months in Cash	0	0	0	0
Std. Dev	2.77%	3.36%	3.70%	3.09%
Avg/Std. Dev.	0.33	0.13	0.11	0.24
Skewness	0.09	-0.86	-1.11	-1.99
Kurtosis	2.85	2.21	3.36	7.50

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

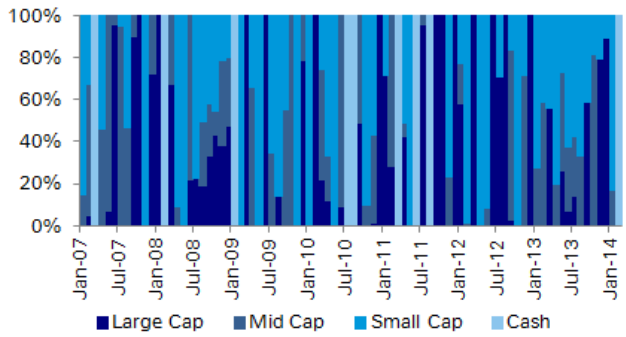
Equity>US Size>Monthly rotation (Size)

Figure 36: Full period cumulative performance



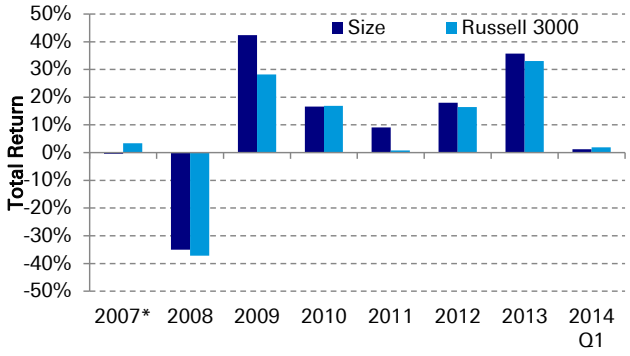
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of January 2007.

Figure 37: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

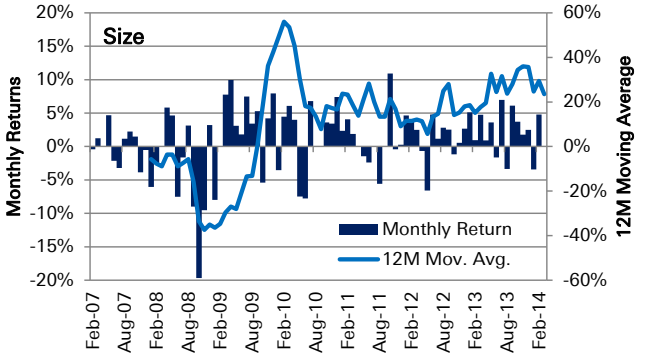
Figure 38: Annual & full period performance statistics



Full Period Perf. Statistics	Size	Russell 3000
Annualized Return	9.72%	6.34%
Ann. Std. Dev.	24.50%	23.18%
Sharpe (RF=0%)	0.40	0.27
Max. Drawdown	-51.1%	-55.6%
Downside Deviation	20.57%	18.74%
Sortino (T=0%)	0.47	0.34

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 39: Monthly performance statistics

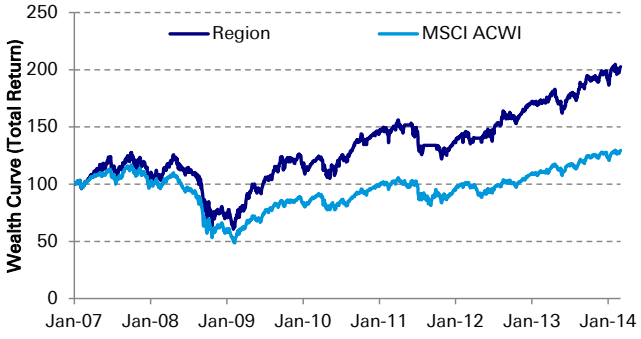


Monthly Statistics	Size	Russell 3000
Avg. Return	0.88%	0.63%
Positive Months	50	54
Avg. Gain	4.01%	3.67%
Max. Return	10.91%	11.16%
Negative Months	27	32
Avg. Loss	-4.63%	-4.49%
Min. Return	-19.66%	-18.77%
Months in Cash	9	0
Std. Dev	4.90%	5.03%
Avg/Std. Dev.	0.18	0.13
Skewness	-1.07	-0.82
Kurtosis	2.70	1.72

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

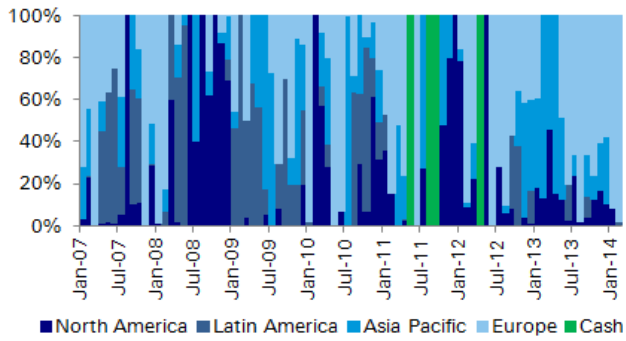
Equity>Region>Monthly rotation (Region)

Figure 40: Full period cumulative performance



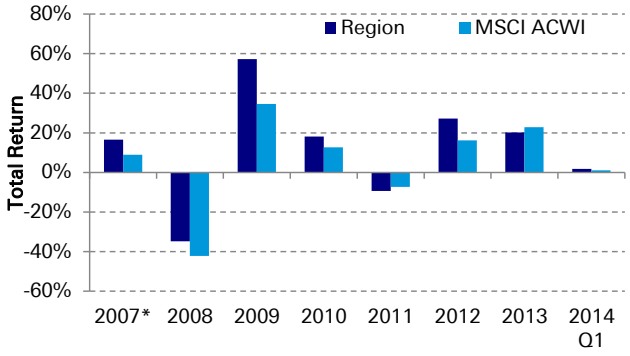
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of January 2007.

Figure 41: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

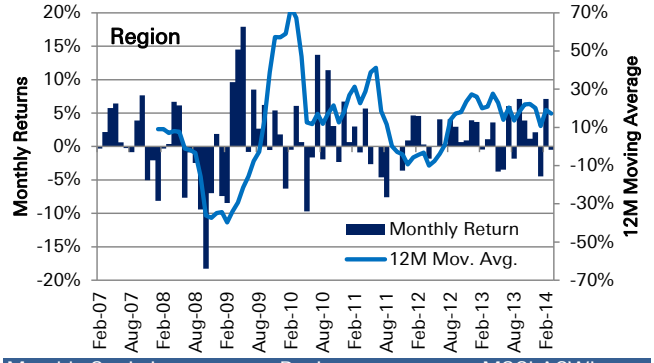
Figure 42: Annual & full period performance statistics



Full Period Perf. Statistics	Region	MSCI ACWI
Annualized Return	10.63%	3.76%
Ann. Std. Dev.	24.81%	19.87%
Sharpe (RF=0%)	0.43	0.19
Max. Drawdown	-52.5%	-58.4%
Downside Deviation	20.00%	15.91%
Sortino (T=0%)	0.53	0.24

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 43: Monthly performance statistics

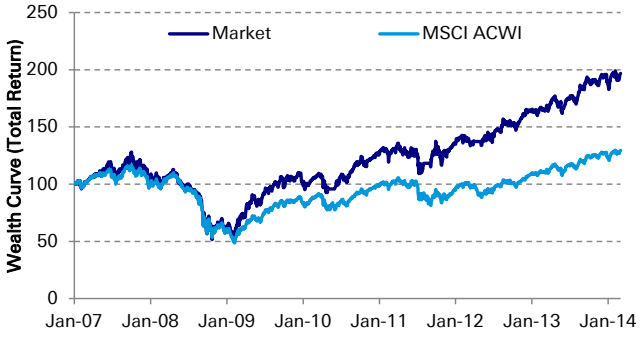


Monthly Statistics	Region	MSCI ACWI
Avg. Return	0.98%	0.45%
Positive Months	47	47
Avg. Gain	4.73%	4.19%
Max. Return	17.92%	11.80%
Negative Months	35	39
Avg. Loss	-3.93%	-4.06%
Min. Return	-18.29%	-19.82%
Months in Cash	4	0
Std. Dev	5.67%	5.46%
Avg/Std. Dev.	0.17	0.08
Skewness	-0.06	-0.76
Kurtosis	1.56	1.53

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

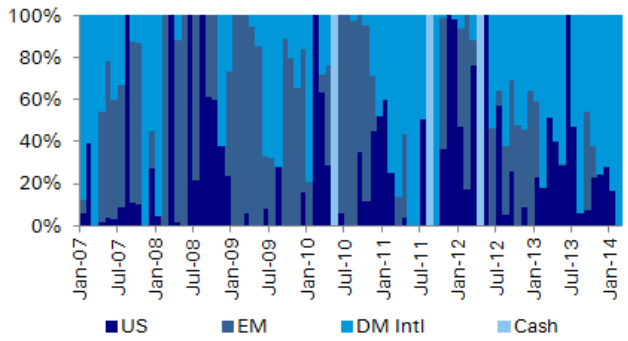
Equity>Market>Monthly rotation (Market)

Figure 44: Full period cumulative performance



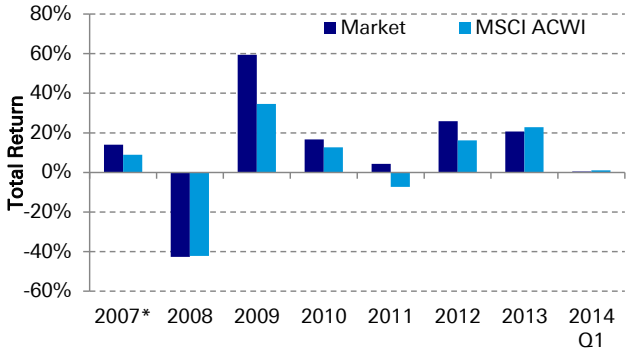
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of January 2007.

Figure 45: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

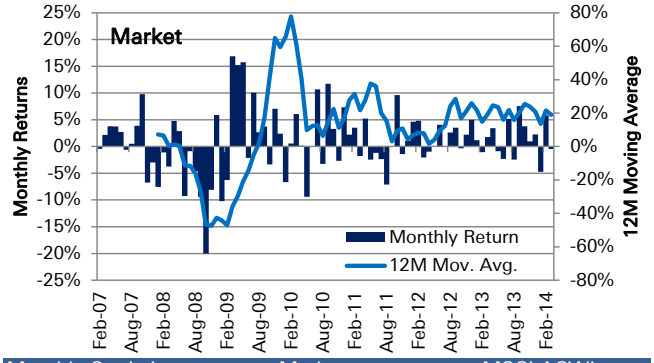
Figure 46: Annual & full period performance statistics



Full Period Perf. Statistics	Market	MSCI ACWI
Annualized Return	10.16%	3.76%
Ann. Std. Dev.	29.26%	19.87%
Sharpe (RF=0%)	0.35	0.19
Max. Drawdown	-59.7%	-58.4%
Downside Deviation	23.04%	15.91%
Sortino (T=0%)	0.44	0.24

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 47: Monthly performance statistics

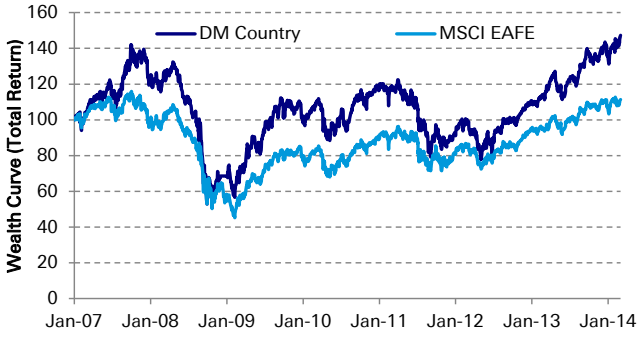


Monthly Statistics	Market	MSCI ACWI
Avg. Return	0.97%	0.45%
Positive Months	47	47
Avg. Gain	4.98%	4.19%
Max. Return	16.86%	11.80%
Negative Months	36	39
Avg. Loss	-4.19%	-4.06%
Min. Return	-20.02%	-19.82%
Months in Cash	3	0
Std. Dev	5.99%	5.46%
Avg/Std. Dev.	0.16	0.08
Skewness	-0.11	-0.76
Kurtosis	1.58	1.53

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

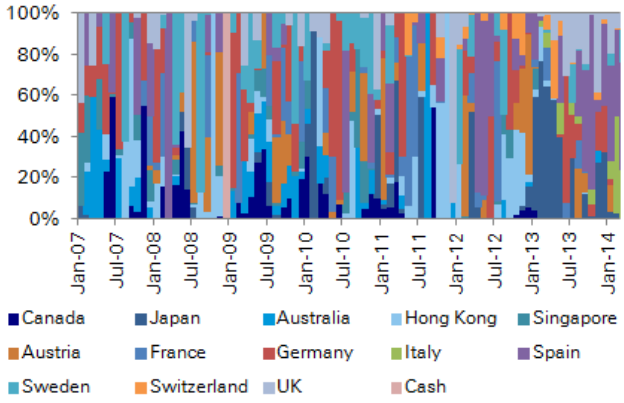
Equity>DM Country>Monthly rotation (DM Country)

Figure 48: Full period cumulative performance



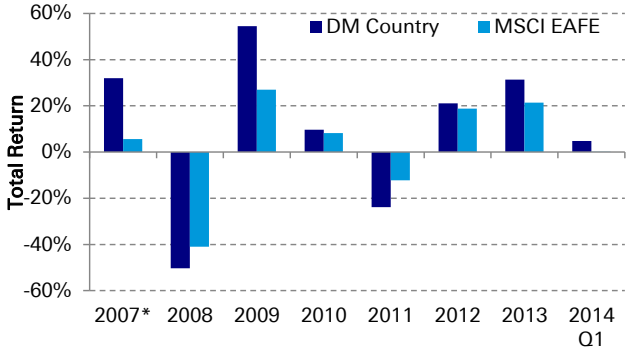
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of January 2007.

Figure 49: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

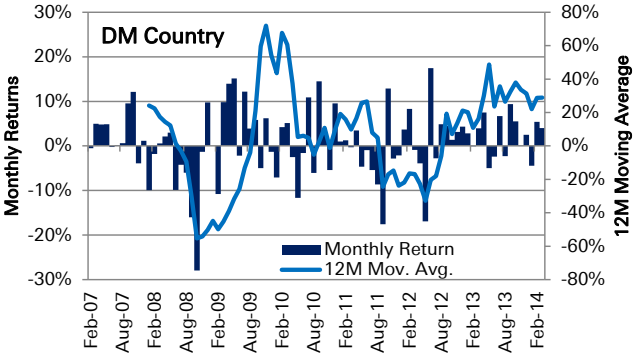
Figure 50: Annual & full period performance statistics



Full Period Perf. Statistics	DM Country	MSCI EAFE
Annualized Return	5.69%	1.55%
Ann. Std. Dev.	30.56%	27.98%
Sharpe (RF=0%)	0.19	0.06
Max. Drawdown	-63.6%	-61.0%
Downside Deviation	23.27%	21.46%
Sortino (T=0%)	0.24	0.07

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 51: Monthly performance statistics

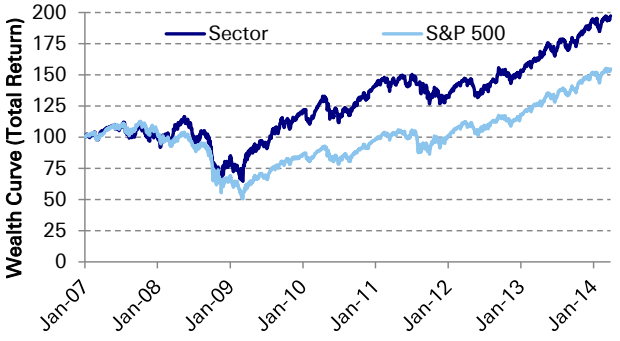


Monthly Statistics	DM Country	MSCI EAFE
Avg. Return	0.76%	0.32%
Positive Months	46	46
Avg. Gain	6.13%	4.76%
Max. Return	17.44%	13.19%
Negative Months	39	40
Avg. Loss	-5.55%	-4.79%
Min. Return	-27.93%	-20.83%
Months in Cash	1	0
Std. Dev	7.72%	6.17%
Avg/Std. Dev.	0.10	0.05
Skewness	-0.67	-0.57
Kurtosis	1.71	0.87

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

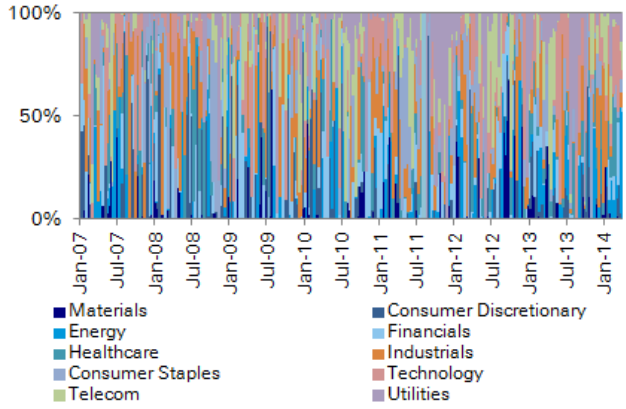
Equity>US Sector>Weekly rotation (Sector)

Figure 52: Full period cumulative performance



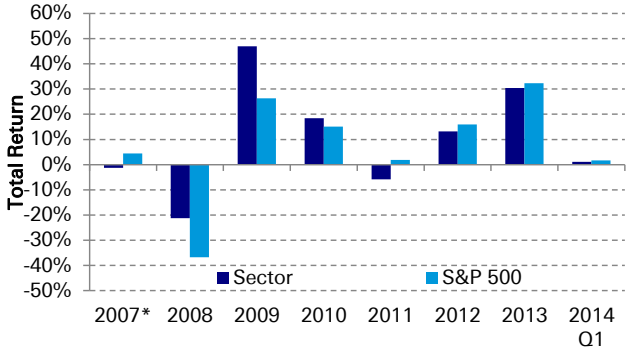
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins on January5th, 2007.

Figure 53: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

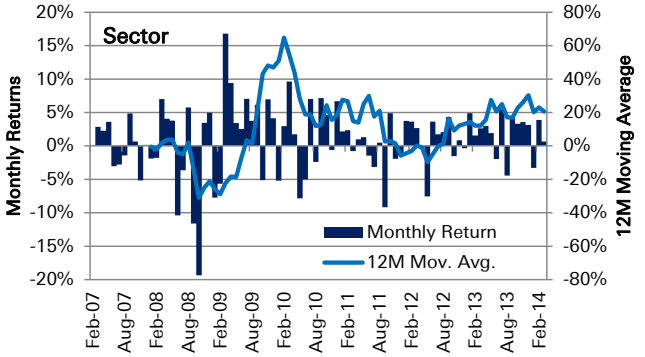
Figure 54: Annual & full period performance statistics



Full Period Perf. Statistics	Sector	S&P 500
Annualized Return	10.20%	6.44%
Ann. Std. Dev.	23.47%	23.05%
Sharpe (RF=0%)	0.43	0.28
Max. Drawdown	-46.1%	-55.2%
Downside Deviation	17.48%	18.56%
Sortino (T=0%)	0.58	0.35

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan 5, 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 55: Monthly performance statistics

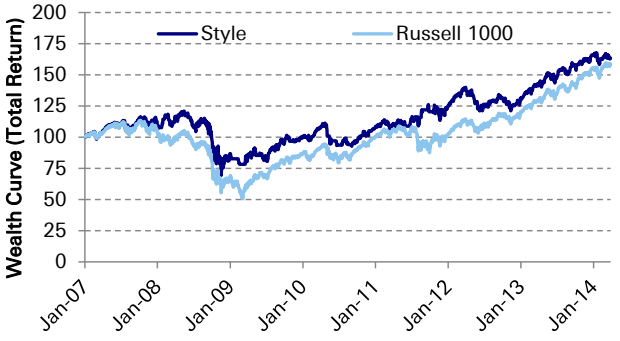


Monthly Statistics	Sector	S&P 500
Avg. Return	0.92%	0.60%
Positive Months	55	53
Avg. Gain	3.94%	3.61%
Max. Return	16.79%	10.91%
Negative Months	31	33
Avg. Loss	-4.43%	-4.23%
Min. Return	-19.35%	-16.52%
Months in Cash	0	0
Std. Dev	5.23%	4.85%
Avg/Std. Dev.	0.18	0.12
Skewness	-0.75	-0.72
Kurtosis	2.53	1.09

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

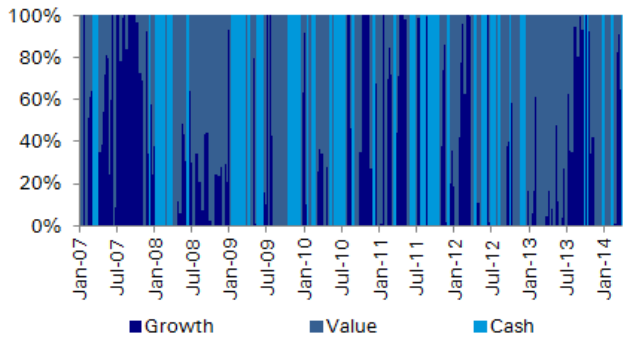
Equity>US Style>Weekly rotation (Style)

Figure 56: Full period cumulative performance



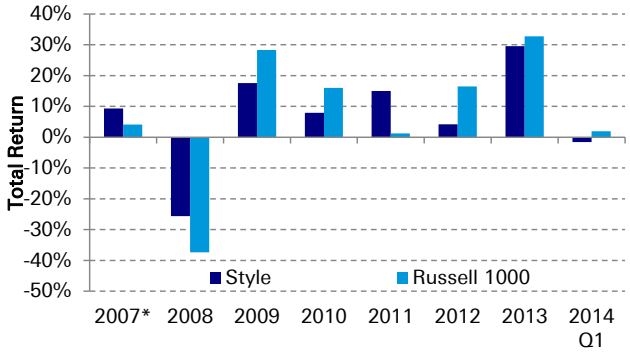
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins on January5th, 2007.

Figure 57: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

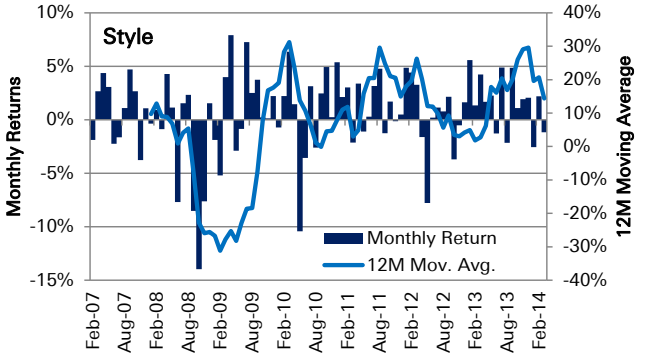
Figure 58: Annual & full period performance statistics



Full Period Perf. Statistics	Style	Russell 1000
Annualized Return	7.27%	6.84%
Ann. Std. Dev.	20.52%	22.60%
Sharpe (RF=0%)	0.35	0.30
Max. Drawdown	-42.6%	-55.4%
Downside Deviation	18.44%	18.36%
Sortino (T=0%)	0.39	0.37

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from January5th, 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 59: Monthly performance statistics



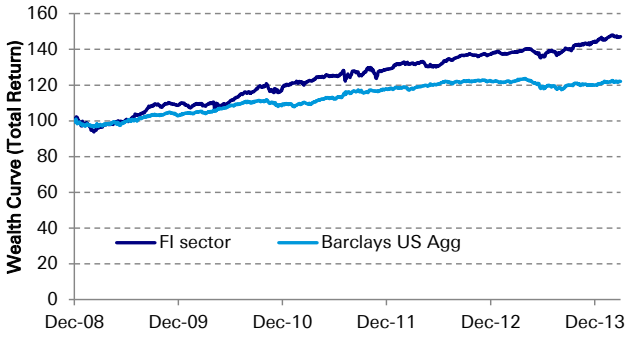
Monthly Statistics	Style	Russell 1000
Avg. Return	0.62%	0.64%
Positive Months	56	54
Avg. Gain	2.77%	3.63%
Max. Return	7.91%	10.97%
Negative Months	30	32
Avg. Loss	-3.40%	-4.41%
Min. Return	-13.96%	-17.13%
Months in Cash	0	0
Std. Dev	3.85%	4.94%
Avg/Std. Dev.	0.16	0.13
Skewness	-1.19	-0.75
Kurtosis	2.31	1.19

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

Fixed Income>Sector>Monthly rotation (FI sector)

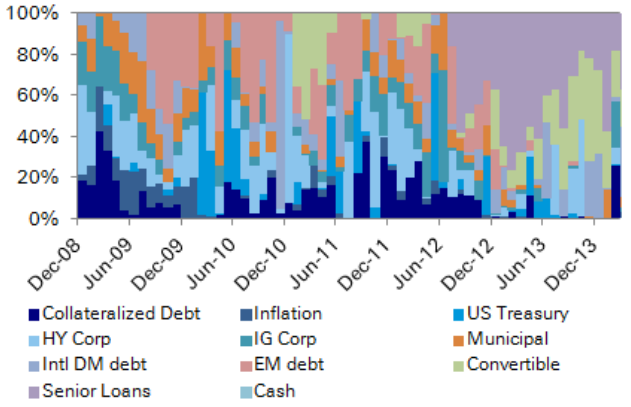
Data is provided since the end of 2008 because a fixed income sector rotation was not viable before that date due to the small number of sectors available via ETFs.

Figure 60: Full period cumulative performance



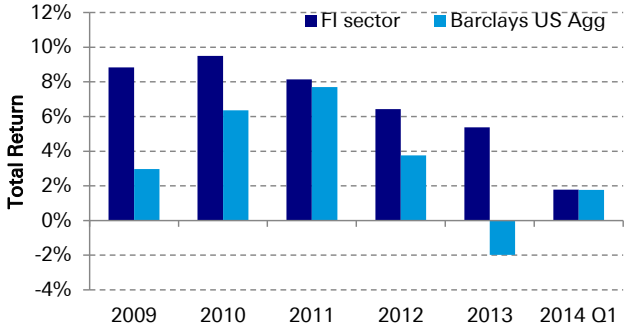
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of December 2008.

Figure 61: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

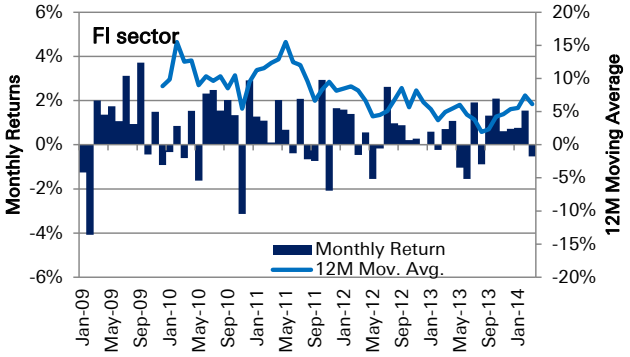
Figure 62: Annual & full period performance statistics



Full Period Perf. Statistics	FI sector	Barclays US Agg
Annualized Return	5.67%	2.89%
Ann. Std. Dev.	5.26%	4.02%
Sharpe (RF=0%)	1.08	0.72
Max. Drawdown	-8.3%	-5.1%
Downside Deviation	4.40%	2.78%
Sortino (T=0%)	1.29	1.04

Source: Deutsche Bank, Bloomberg Finance LP, FactSet.. Note: Performance is based on total return prices.

Figure 63: Monthly performance statistics

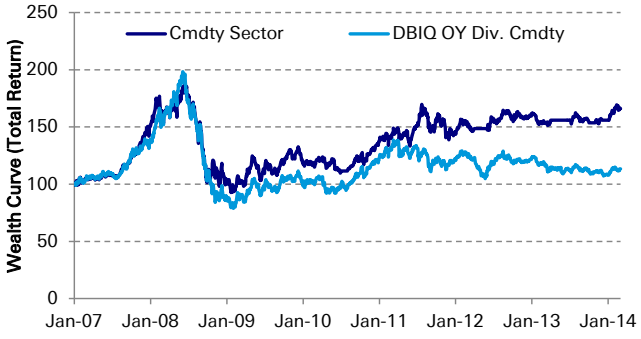


Monthly Statistics	FI sector	Barclays US Agg
Avg. Return	0.63%	0.32%
Positive Months	42	41
Avg. Gain	1.48%	0.84%
Max. Return	3.72%	1.77%
Negative Months	21	22
Avg. Loss	-1.08%	-0.65%
Min. Return	-4.07%	-2.00%
Months in Cash	0	0
Std. Dev	1.50%	0.92%
Avg/Std. Dev.	0.42	0.35
Skewness	-0.62	-0.66
Kurtosis	0.70	0.12

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

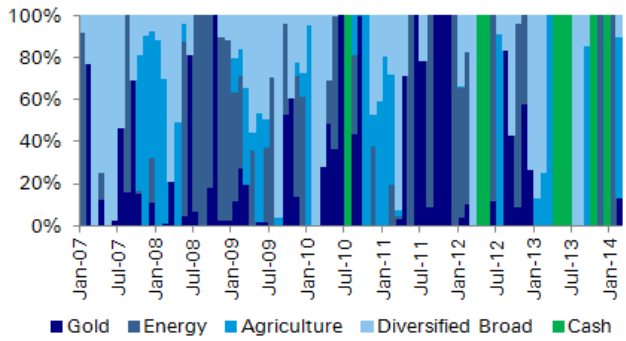
Commodity>Sector>Monthly rotation (Cmdty Sector)

Figure 64: Full period cumulative performance



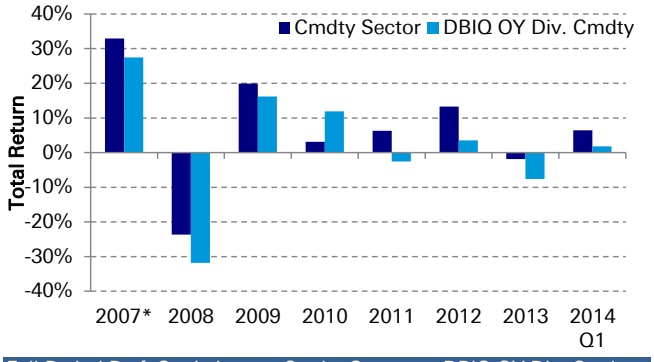
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of January 2007.

Figure 65: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

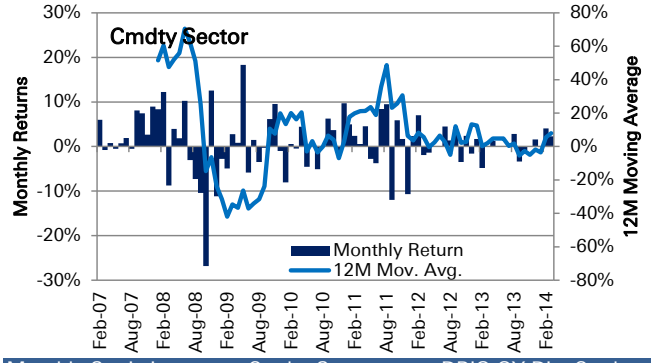
Figure 66: Annual & full period performance statistics



Full Period Perf. Statistics	Cmdty Sector	DBIQ OY Div. Cmdty
Annualized Return	7.52%	1.80%
Ann. Std. Dev.	21.44%	21.76%
Sharpe (RF=0%)	0.35	0.08
Max. Drawdown	-51.1%	-60.3%
Downside Deviation	16.45%	15.98%
Sortino (T=0%)	0.46	0.11

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from Jan end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 67: Monthly performance statistics

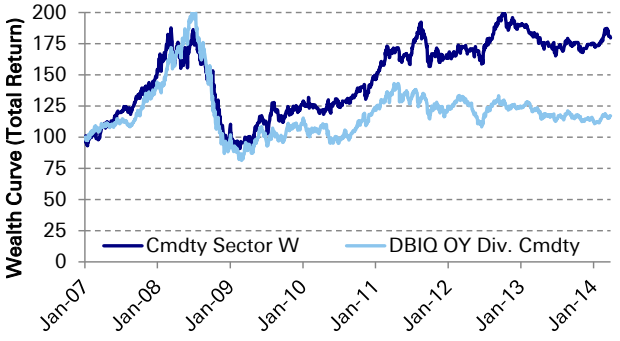


Monthly Statistics	Cmdty Sector	DBIQ OY Div. Cmdty
Avg. Return	0.79%	0.34%
Positive Months	47	42
Avg. Gain	4.74%	4.98%
Max. Return	18.34%	16.27%
Negative Months	31	44
Avg. Loss	-4.98%	-4.08%
Min. Return	-26.81%	-25.08%
Months in Cash	8	0
Std. Dev	6.27%	6.19%
Avg/Std. Dev.	0.13	0.06
Skewness	-0.82	-0.86
Kurtosis	3.96	2.82

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

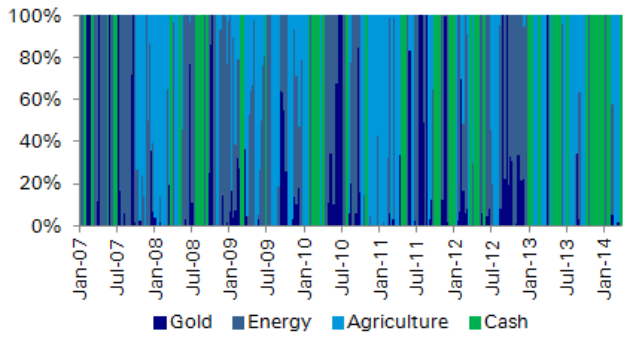
Commodity>Sector>Weekly rotation (Cmdty Sector W)

Figure 68: Full period cumulative performance



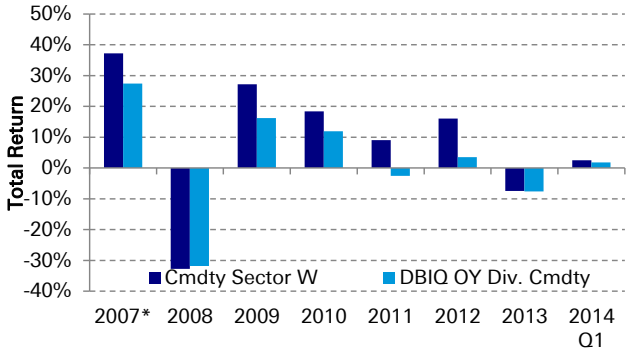
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins on January5th, 2007.

Figure 69: Signal-based monthly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-month weights may vary based on price fluctuations.

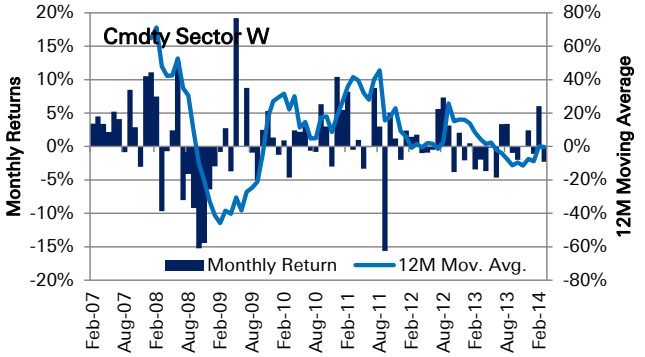
Figure 70: Annual & full period performance statistics



Full Period Perf. Statistics	Cmdty Sector W	DBIQ OY Div. Cmdty
Annualized Return	8.74%	2.29%
Ann. Std. Dev.	21.86%	21.80%
Sharpe (RF=0%)	0.40	0.11
Max. Drawdown	-51.7%	-60.3%
Downside Deviation	17.30%	15.94%
Sortino (T=0%)	0.51	0.14

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from January5th, 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 71: Monthly performance statistics



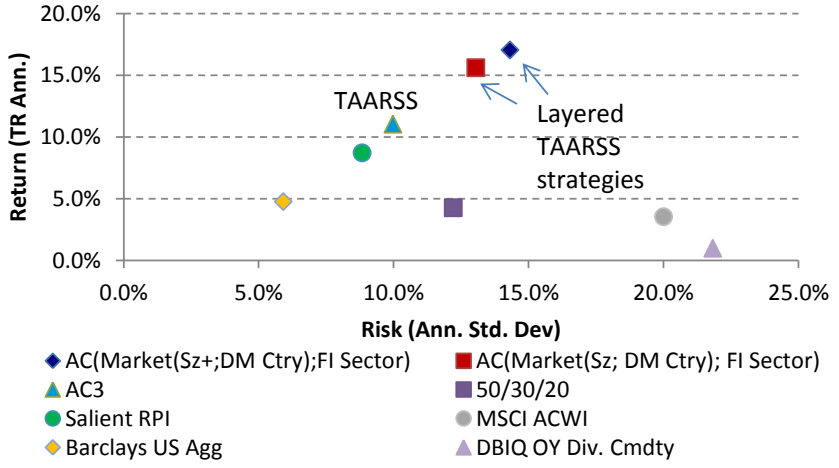
Monthly Statistics	Cmdty Sector W	DBIQ OY Div. Cmdty
Avg. Return	0.85%	0.34%
Positive Months	46	42
Avg. Gain	4.75%	4.98%
Max. Return	19.21%	16.27%
Negative Months	40	44
Avg. Loss	-3.64%	-4.08%
Min. Return	-15.61%	-25.08%
Months in Cash	0	0
Std. Dev	5.74%	6.19%
Avg/Std. Dev.	0.15	0.06
Skewness	-0.18	-0.86
Kurtosis	1.75	2.82

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

Implementing the Signal

Our TAARSS methodology is very versatile and can be implemented in multiple ways. In general, most of the implementation ideas would seek to take advantage of the relative strength of the asset classes as indicated by the signal. Investors can build core portfolios around it or they could use it for implementing tactical trades as satellite positions. Some examples of portfolio implementations are: direct rotation strategies, layered rotation strategies, and enhanced rotation strategies using levered ETFs. Tactical trades could also be implemented based on TAARSS z-scores. Figure 72 presents a summary of the risk return profile of some of the rotation strategies along with other common benchmarks.

Figure 72: Risk/Return profile of asset class TAARSS rotation strategies



Source: Deutsche Bank, Bloomberg Finance LP, FactSet

Direct rotation strategies

This is basically the implementation of the strategies described on Figure 31 as presented in the previous section. The current weights for each rotation strategy are provided in Figure 73. Only quarterly and monthly rotation strategies are provided. Quarterly strategies are as of end of Q1 2014, while monthly strategies are as of the end of April 2014 valid for Q2 and May 2014, respectively.

Our TAARSS rotation strategies say overweight fixed income during Q2. Within fixed income favor convertible bonds and intl DM debt during May. Also for May, within equities prefer broad EM and Europe at a market and region levels, respectively; in the US prefer Large Cap, and in the DM outside the US favor Spain and Italy. Finally within commodities stay in the sidelines in May.

Figure 73: Current allocation for direct rotation TAARSS quarterly and monthly portfolios

Quarterly Rotations	
Asset Class	2014 Q2
Global Equities	21.6%
US Agg. Fixed Income	72.1%
Broad Div. Cmdty	6.3%

Commodity Monthly Rotations	
Sector	May 2014
Gold	0.0%
Div. Broad	0.0%
Energy	0.0%
Agriculture	0.0%
Cash	100.0%

Equity Monthly Rotations	
US Size	May 2014
Large Cap	99.3%
Mid Cap	0.7%
Small Cap	0.0%

Region	May 2014
North America	6.4%
Europe	93.6%
Asia Pacific	0.0%
Latin America	0.0%

Market	May 2014
US	2.7%
DM Intl	23.4%
EM	74.0%

DM Country	May 2014
Australia	6.2%
Austria	0.0%
Canada	3.8%
France	10.4%
Germany	0.0%
Hong Kong	0.0%
Italy	17.6%
Japan	0.0%
Singapore	3.3%
Spain	49.9%
Sweden	0.0%
Switzerland	8.8%
UK	0.0%

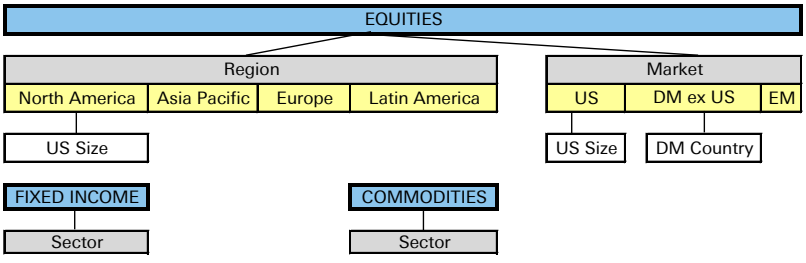
Fixed Income Monthly Rotations	
FI Sector	May 2014
Corp IG	1.0%
Corp HY	0.8%
US Trsy	2.5%
MBS	1.8%
Inflation	0.0%
Convertible	41.8%
Senior Loan	0.3%
Intl DM Debt	35.3%
EM Debt	1.9%
Municipal	14.7%

Source: Deutsche Bank, Bloomberg Finance LP.

Layered rotation strategies

Layered rotation strategies combine different portfolios in order to build a nested structure that would help boost returns through more targeted exposures. For example, instead of implementing the equity allocation of the asset class rotation strategy with a global equity ETF, we could use a TAARSS regional rotation strategy or a market rotation strategy. Strategies can be combined as indicated in the chart in Figure 74.

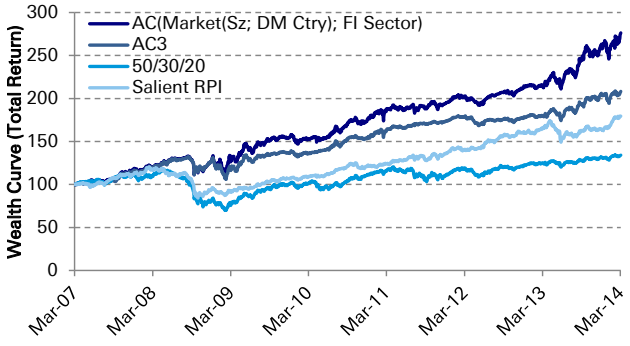
Figure 74: Possible layering of rotation strategies



Source: Deutsche Bank

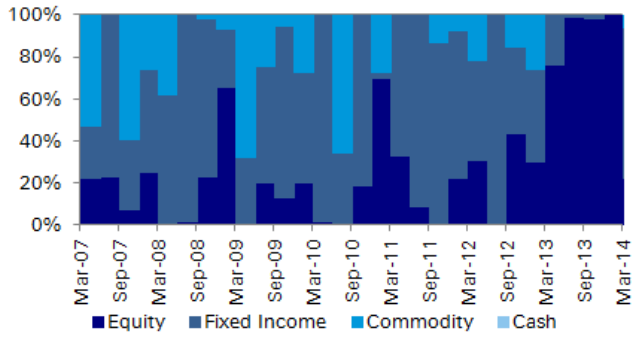
As mode of example, we present the asset class rotation strategy (AC3) implemented using a market rotation for the equity allocation. In turn, the market rotation uses a US size rotation and a DM country rotation to implement the US and the DM ex US allocations of the strategy, respectively. Furthermore we use a fixed income sector rotation to implement the fixed income allocation of the asset class rotation. In sum, we have the following structure: AC(Market[US Size; DM Country; EM]; FI Sector; Commodity). We provide detailed performance metrics for the layered strategy in Figure 75 through Figure 78. The layered strategy takes on more risk, but more than compensates for it by improving the absolute return and the Sharpe ratio, and decreasing the maximum drawdown of the AC3 strategy.

Figure 75: 7-Year cumulative performance



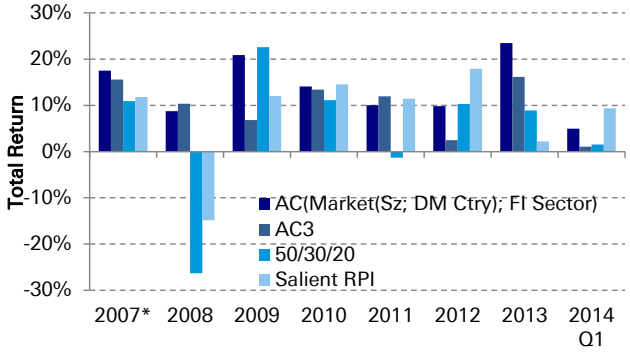
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of March 2007.

Figure 76: Signal-based quarterly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-quarter weights may vary based on price fluctuations.

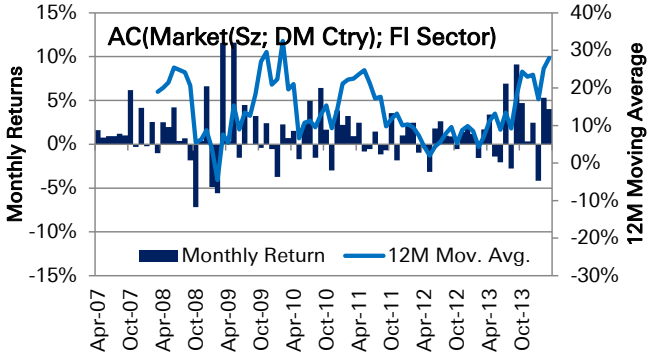
Figure 77: Annual & full period performance statistics – 7 Year



Full Period Perf. Statistics	AC(Market(Sz; DM Ctry); FI Sector)	AC3	50/30/20	Salient RPI
Annualized Return	15.62%	11.05%	4.27%	8.72%
Ann. Std. Dev.	13.05%	9.98%	12.21%	8.83%
Sharpe (RF=0%)	1.20	1.11	0.35	0.99
Max. Drawdown	-17.6%	-19.9%	-40.6%	-29.8%
Downside Deviation	10.07%	8.07%	9.87%	7.08%
Sortino (T=0%)	1.55	1.37	0.43	1.23

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from March end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 78: Monthly performance statistics



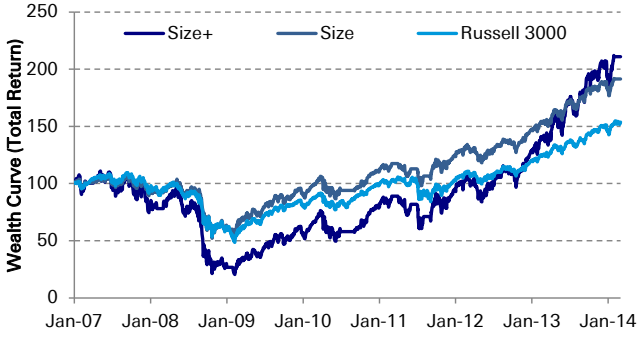
Monthly Statistics	AC(Market(Sz; DM Ctry); FI Sector)	AC3	50/30/20	Salient RPI
Avg. Return	1.27%	0.91%	0.42%	0.75%
Positive Months	55	61	49	58
Avg. Gain	2.95%	2.05%	2.73%	2.21%
Max. Return	11.61%	11.30%	8.53%	6.22%
Negative Months	29	23	35	26
Avg. Loss	-1.91%	-2.10%	-2.82%	-2.52%
Min. Return	-7.17%	-6.91%	-15.42%	-14.80%
Months in Cash	0	0	0	0
Std. Dev	3.27%	2.77%	3.70%	3.09%
Avg/Std. Dev.	0.39	0.33	0.11	0.24
Skewness	0.58	0.09	-1.11	-1.99
Kurtosis	1.71	2.85	3.36	7.50

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

Enhancing returns with leverage ETFs

The concept is very simple. We take one of the TAARSS rotation strategies and instead of using the non-levered ETFs we use leveraged ETFs. For example, let's take the US Size rotation strategy (Size). If instead of the SPY, MDY, and IWM for large, mid, and small cap exposures we use the 2x levered versions SSO, MVV, and UWM, we boost both the returns and the volatility of the rotation strategy significantly (Figure 79 & Figure 80). However, the real value comes when we use this approach combined with a layered strategy.

Figure 79: Full period cumulative performance



Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of Jan 2007.

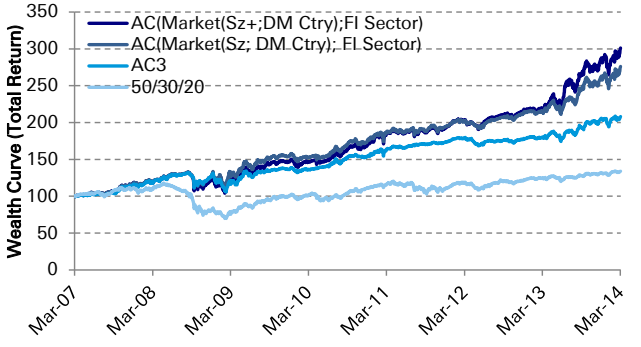
Figure 80: Full period performance statistics

Full Period Perf. Statistics	Size+	Size	Russell 3000
Annualized Return	11.25%	9.72%	6.34%
Ann. Std. Dev.	48.61%	24.50%	23.18%
Sharpe (RF=0%)	0.23	0.40	0.27
Max. Drawdown	-81.6%	-51.1%	-55.6%
Downside Deviation	40.76%	20.57%	18.74%
Sortino (T=0%)	0.28	0.47	0.34

Source: Deutsche Bank, Bloomberg Finance LP, FactSet.. Note: Performance is based on total return prices.

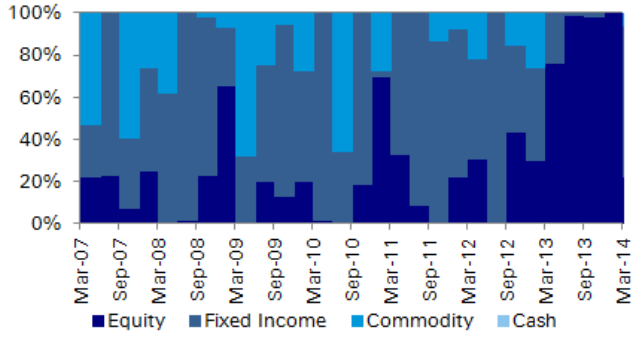
Using the layered strategy of the previous example: AC(Market[US Size; DM Country; EM]; FI Sector; Commodity) and adding Size using levered ETFs (Size+) we get: AC(Market[US Size+; DM Country; EM]; FI Sector; Commodity). This enhancement improves the return of the strategy without affecting significantly the risk profile of the original layered strategy. Figure 81 to Figure 84 present the full details of the new enhanced layered strategy.

Figure 81: 7-Year cumulative performance



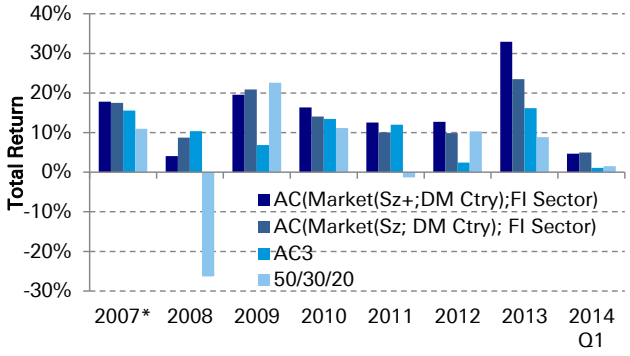
Source: Deutsche Bank, Bloomberg Finance LP, FactSet. Note: Performance is based on total return prices. Data begins at the end of March 2007.

Figure 82: Signal-based quarterly allocations %



Source: Deutsche Bank, Bloomberg Finance LP. Note: reflects rebalancing weights only, actual intra-quarter weights may vary based on price fluctuations.

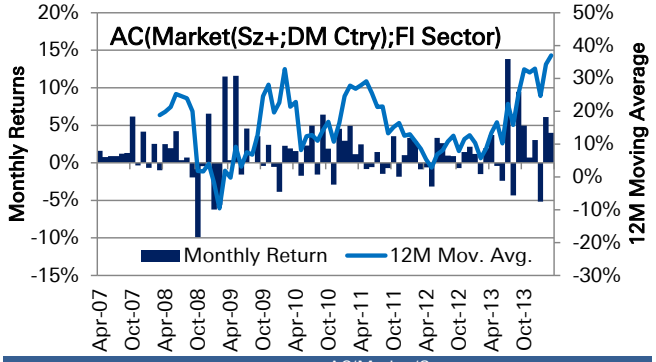
Figure 83: Annual & full period performance statistics – 7 Year



Full Period Perf. Statistics	AC(Market(Sz+;DM Ctry);FI Sector)	AC(Market(Sz; DM Ctry); FI Sector)	AC3	50/30/20
Annualized Return	17.06%	15.62%	11.05%	4.27%
Ann. Std. Dev.	14.31%	13.05%	9.98%	12.21%
Sharpe (RF=0%)	1.19	1.20	1.11	0.35
Max. Drawdown	-21.5%	-17.6%	-19.9%	-40.6%
Downside Deviation	11.15%	10.07%	8.07%	9.87%
Sortino (T=0%)	1.53	1.55	1.37	0.43

*Source: Deutsche Bank, Bloomberg Finance LP, FactSet. *2007 performance is from March end 2007 to Dec end 2007. Note: Performance is based on total return prices.*

Figure 84: Monthly performance statistics



Monthly Statistics	AC(Market(Sz+;DM Ctry);FI Sector)	AC(Market(Sz; DM Ctry); FI Sector)	AC3	50/30/20
Avg. Return	1.39%	1.27%	0.91%	0.42%
Positive Months	55	55	61	49
Avg. Gain	3.27%	2.95%	2.05%	2.73%
Max. Return	13.85%	11.61%	11.30%	8.53%
Negative Months	29	29	23	35
Avg. Loss	-2.18%	-1.91%	-2.10%	-2.82%
Min. Return	-9.89%	-7.17%	-6.91%	-15.42%
Months in Cash	0	0	0	0
Std. Dev	3.74%	3.27%	2.77%	3.70%
Avg/Std. Dev.	0.37	0.39	0.33	0.11
Skewness	0.47	0.58	0.09	-1.11
Kurtosis	2.24	1.71	2.85	3.36

Source: Deutsche Bank, Bloomberg Finance LP, FactSet

Standalone tactical trades

Another way to implement the signal is by investing in the strongest TAARSS values within the universe of coverage. For this purpose we provide a normalized ranking (z-scores) for all the asset classes that can be implemented as part of the monthly rotation strategies. Figure 85 presents the latest rankings as of the end of April 2014.

Figure 85: Normalized monthly TAARSS rankings for May 2014

Investment Segment	Ranking	Direction
Spain	4.44	Positive
Italy	1.42	Positive
Convertible	0.94	Positive
Intl DM Debt	0.76	Positive
France	0.75	Positive
Switzerland	0.60	Positive
Australia	0.35	Positive
EM	0.32	Positive
Municipal	0.18	Positive
Canada	0.13	Positive
Singapore	0.09	Positive

Equity
Fixed Income
Commodity

Investment Segment	Ranking	Direction
Austria	-2.80	Negative
Germany	-0.60	Negative
Japan	-0.59	Negative
Gold	-0.57	Negative
UK	-0.54	Negative
Asia Pacific	-0.42	Negative
Small Cap	-0.42	Negative
Agriculture	-0.41	Negative
Hong Kong	-0.39	Negative
Latin America	-0.27	Negative
Inflation	-0.26	Negative
Sweden	-0.23	Negative
Diversified Broad	-0.23	Negative
Energy Cmdty	-0.23	Negative
Mid Cap	-0.23	Negative
Senior Loans	-0.22	Negative
Large Cap	-0.21	Negative
US	-0.21	Negative
Corp HY	-0.20	Negative
North America	-0.20	Negative
Corp IG	-0.20	Negative
MBS	-0.18	Negative
EM debt	-0.17	Negative
US Treasury	-0.16	Negative
DM Intl	-0.05	Negative

Source: Deutsche Bank, Bloomberg Finance LP. Rankings calculated as of the end of April 2014

Possible improvement areas for future research

- **More rotation strategies**: As more asset classes mature and become more representative through ETFs, there is potential to expand the number of rotation strategies. For example, factor rotation, income rotation, and industry rotation strategies could be areas to explore in the future.
- **Exit strategy**: In many occasions a flow trend can begin to lose momentum in between rebalancing periods, we believe that in such situations an exit trigger can be developed in order to book profits without having to wait until the end of the calculation period.
- **Apply asset allocation factor adjustment**: an ETF asset allocation factor could be developed in order to have an even cleaner read on investors' asset allocation preferences.

*The primary author of this report, **Sebastian Mercado**, wishes to acknowledge the contributions made by **Paolo Cabaleiro**, employee of Evalueserve, a third-party provider of offshore research support services to Deutsche Bank.*

Appendix 1

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Equity rating key

Buy: Based on a current 12- month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus pro-jected dividend yield) , we recommend that investors buy the stock.
Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock
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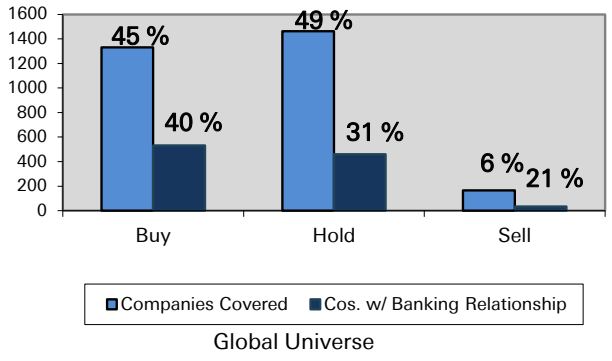
Notes:

1. Newly issued research recommendations and target prices always supersede previously published research.
2. Ratings definitions prior to 27 January, 2007 were:

Buy: Expected total return (including dividends) of 10% or more over a 12-month period
Hold: Expected total return (including dividends) between -10% and 10% over a 12-month period
Sell: Expected total return (including dividends) of -10% or worse over a 12-month period

Equity rating dispersion and banking relationships



Global Universe

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