

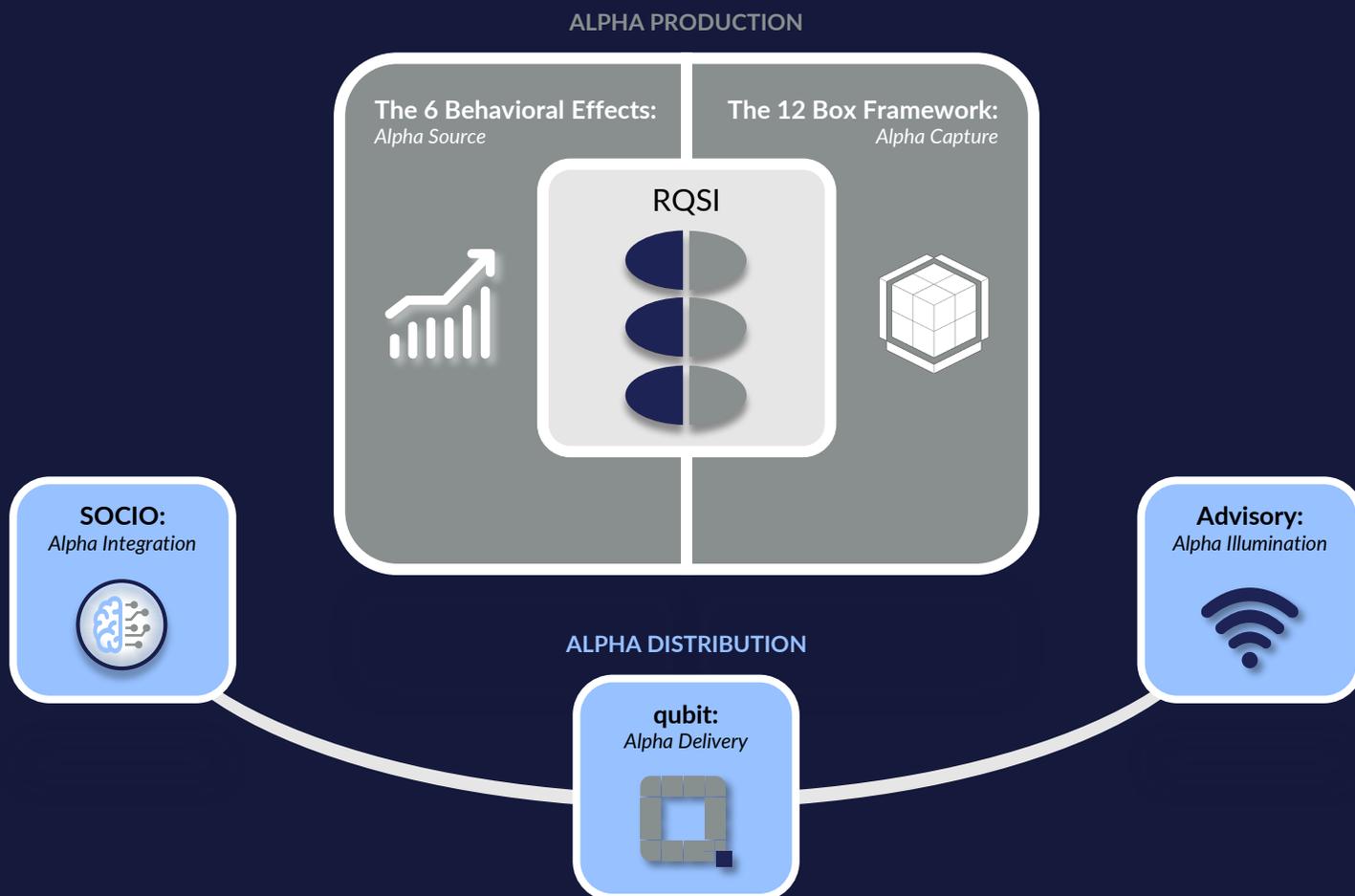


**RQSI**   
**ALPHA SOURCE**

# FOREWORD

Over the next few months, we will be sending out content to highlight the unique capabilities and expertise that RQSI brings to the table as an asset management firm.

The ultimate yardstick of any alternative manager is alpha. An alternative manager that fails to produce it is not worth discussing. However, when assessing how much true value a manager generates for investors, the simple calculation of alpha is not the end of the story given the multiplicity of other asset classes and products likely present in its investors' portfolios; all alpha is not created equally. Estimating the true quality of a manager like us requires understanding how alpha is both produced and distributed.



The sections of this graphic also serve as an outline of the content we will be releasing in this series:

- I. RQSI Firm Intro
- II. **The 6 Effects: Where we Seek alpha**
- III. The 12 Box Framework: How we Capture alpha
- IV. Qubit: How we Deliver our alpha
- V. SOCIO: How we Integrate our alpha
- VI. Advisory: How we Illuminate our alpha

# 01. CURRENT STATE OF LIQUID ALTERNATIVES

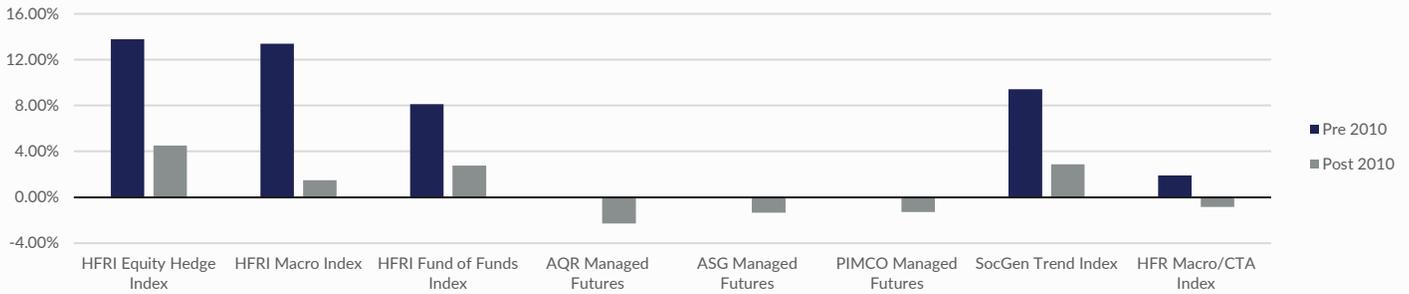
Investors must do something to counteract the inevitably high volatility of a post-Coronavirus world. With negative short rates and negligible long rates, bonds are not going to perform this function. A few years ago, liquid alternatives would have been the first player off the bench, but investors are reasonably reticent given the vast underperformance of most liquid alternative strategies. Liquid alts have failed to deliver on the value proposition that they sold to investors.

	Expectation	Current Reality
<b>Value Proposition</b>	<p>Returns are superior.</p> <p>The return stream provides diversification for your portfolio.</p> <p>Investors benefit from the expertise of the fund in ancillary ways.</p>	<p>Returns have been elusive.</p> <p>The return stream has produced too much Beta at the wrong times.</p> <p>Funds exist in a vacuum and investors gain no ancillary value.</p>
<b>Consequences</b>	<p>The Fund gets to have control over everything.</p> <p>Fees are high but justified.</p>	<p>The Fund is not earning this autonomy through its performance.</p> <p>Fees remain high in spite of decreased performance.</p>

The expertise of liquid alternative funds allows them to drive significant value for institutional investors, but the current reality of these possibilities has detached from the expectation.

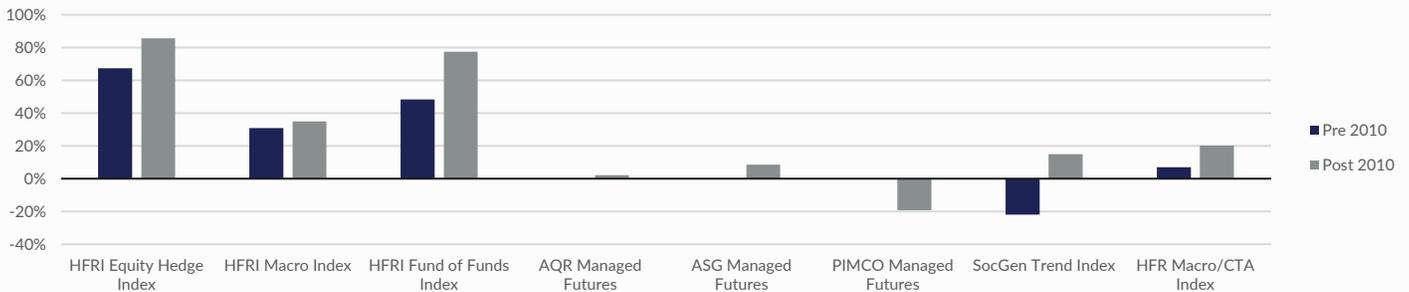
The Fund's value proposition justifies doing some things that are suboptimal for the investor; if the value proposition is not delivered, these details become unjustifiable.

Figure 1. Annualized Return of Major Liquid Alternative Indices and Mutual Funds\*



The Liquid Alternative industry has experienced a significant drop in returns amidst the longest Equity bull market in history (shown above in Figure 1), which could be somewhat logical. If liquid alts are meant to act as a hedge to an Equity portfolio then you would expect lower returns as the underlying creeps straight up. The counterintuitive part of the performance, however, is that these paltry returns have been accompanied by increasing correlation to the Equity market (shown below in Figure 2).

Figure 2. Correlation of Major Liquid Alternative Indices and Mutual Funds to S&P 500 Index\*



\*Calculated using monthly returns. AQR Managed Futures Mutual Fund began in January 2010. ASG Managed Futures Mutual Fund began in August 2010. PIMCO Managed Futures Mutual Fund began in January 2014. SocGen CTA Index began in January 2000. HFR Macro/CTA Index began in April 2003. All others began in January 1990.

Put simply, liquid alternative managers are doing an increasingly worse job. Diminishing returns (i.e. alpha decay) and a rising correlation to the S&P 500 are not unique to these few indices. The hedge fund industry as a whole has been susceptible to the same issues, making the term “hedge” a misnomer. As seen in 2008, many of these strategies have become equity market beta merely masquerading as alpha<sup>1</sup>. This has continued to be the case as global markets have recovered from the Great Financial Crisis of 2007-2009<sup>2</sup>. Even the more sophisticated strategies that managed to avoid the explicit beta problem end up replicating existing risk premia unintentionally<sup>3</sup>.

We believe a large driver of this disappointing performance is a lack of diversification caused by a failure to understand the true orthogonal essence of the strategy. Low returns and high correlation to traditional exposure are surface symptoms. Under the hood, this would be more appropriately diagnosed by looking at the covariance matrices of the core sources of return. The covariance matrix that defines a fund determine how much diversification will occur.

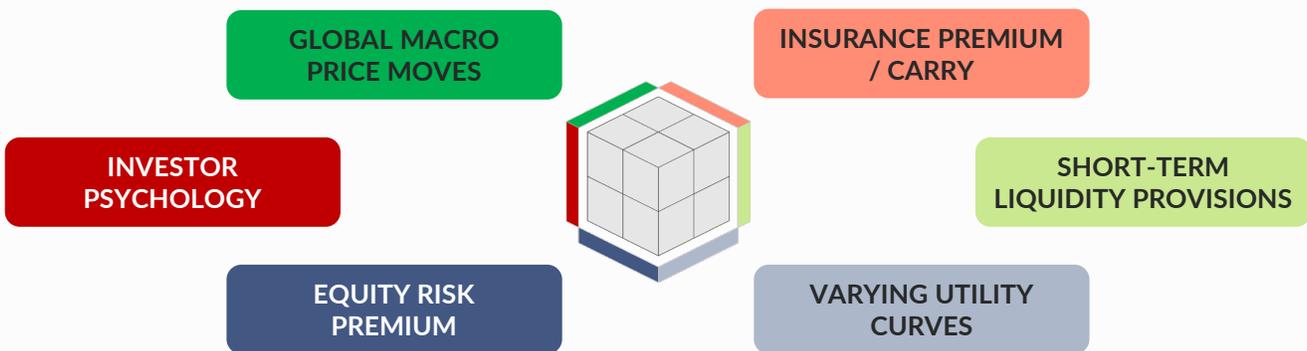
Diversification is widely known as “the only free lunch” in finance. As Harry Markowitz states in *Efficient Diversification of Investment*, “to reduce risk, it is necessary to avoid a portfolio whose securities are all highly correlated with each other. One hundred securities whose returns rise and fall in near unison afford little more protection than the uncertain return of a single security”<sup>4</sup>. Portfolio diversification is impossible if the core sources of return are not unique and orthogonal. In other words, a stable covariance matrix of uncorrelated components is, by definition, required to create a diversified return stream. This diversification provides staying power during inevitable periods of underperformance.

The “core sources of return” can be defined in any number of ways. Typical categories are asset class, time frame, and style, which are all no doubt important in evaluating a fund. Traditional labels like “long/short equity” and “global macro” can be highly misleading, though. A classic CTA strategy such as trend-following primarily makes money due to cognitive biases and economic cycles. However, trend-following can also profit from equity risk premium and generalized inflation, similar to a long/short equity strategy. Accordingly, these seemingly unrelated strategies can actually share critical underlying drivers of return – and the potential for risk alignment is high if one is not cognizant of the real return drivers of the portfolio. Similarly, asset class labels often become irrelevant during sell-offs when the short-term correlations of all financial assets spike; the long exposure of Equities and Commodities becomes almost identical and the diversification expected between the two disappears. Any definition of core sources of return that fails to produce stable correlations is incomplete; it implies a failure to understand the true orthogonal essence.

Durable strategies are able to produce diversification even during tumultuous market cycles because they base their allocations off of deeper, more meaningful categories than simple asset class or style definitions. The goal is to understand, isolate, and capture the desired idiosyncratic risk/return profiles, and eliminate those which don’t offer either distinctive value or diversification. By avoiding over-dependence on any one return driver, we can maximize the probability that our portfolio makes money with low volatility across a market cycle, “come what may”.

Steady returns require diversification. Diversification requires a stable covariance matrix. A stable covariance matrix requires understanding the orthogonal essence of the strategy. This paper will explain and give examples of the distinct underlying sources of return that compose the orthogonal essence of our portfolio.

**WE DON'T ALLOCATE DOLLARS TO ASSET CLASSES; WE ALLOCATE RISK TO ORTHOGONAL EFFECTS.**



# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

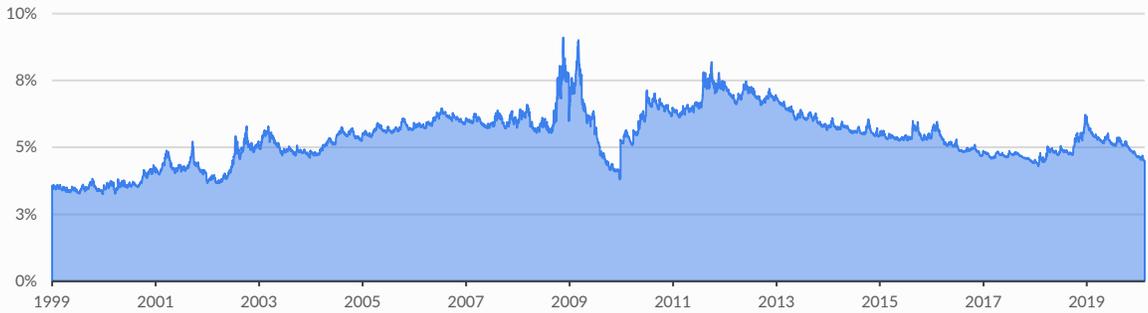
EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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**GROWTH**

There is a well-documented premium paid to investors for bearing the risk of equity ownership. Figure 3 presents the S&P 500's real yield since 1999. See our "Will the Stock Market go up?" White Paper for more info.

Figure 3. Real Yield of S&P 500. S&P 500 Earnings/Price (Bloomberg SPX\_T12EPS / SPX).



**YIELD**

The main source of value for Equity investments, and thus the premium that accompanies them, is corporate earnings and dividends, and their sustainability; this is the basis for our measurement of **Yield**. The risk-adjusted Yield in relation to short rates is our most reliable means of estimating the go-forward availability of the Equity Risk premium, as well as the relative attractiveness Stocks and Bonds.



**FEAR**



**INFLATION**

Economic activity is what actually allows profits to be able to rise. When economic activity is healthy and **Growth** is high, earnings will likely follow. Figure 4 shows the basic link between Equity returns and Growth.

Figure 4. US Quarterly GDP vs. S&P 500 Total Returns



**CARRY**



**TREND**



**SENTIMENT**



**REVERSION**

The relationship between Equity returns and economic activity, more specifically of the movement of macroeconomic variables, is far from straightforward. Translating macroeconomic data into an actionable read that can be used to trade Equities is complex. This complexity does not negate the simple fact that corporate earnings are ultimately tied to the growth of the economy and the two cannot sustain long-term disconnect.

The only true places in our portfolio that rely on the Equity Risk Premium are Growth and Yield. Yield is nearly a direct replication of the Equity Risk Premium. Growth is an attempt at guessing how the Equity Risk Premium will be affected by economic prospects. Our expectation is that Equity indices will experience a premium in the long-term, but can fade away in the shorter-term as a result of meager earnings or economic deceleration.

From a macro perspective, we see any subsequent factoring of the Equity Risk Premium past Yield and Growth as being faulty and unreliable. Our upcoming series "Will the Stock Market Go Up?" will explore our methods for estimating the short-to-medium term future reliability of the Equity Risk Premium and present a framework for deciding when and how to deviate from simple buy and hold Equity Exposure.



**CARRY**



**VALUE**



**DISPERSION**



**SEASONAL**

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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-  GROWTH
-  YIELD
-  FEAR
-  INFLATION
-  CARRY
-  TREND
-  SENTIMENT
-  REVERSION
-  CARRY
-  VALUE
-  DISPERSION
-  SEASONAL

The psychology of market participants produces most consistently profitable systematic trading strategies. Human beings have inherent cognitive biases. Many of these biases are well-documented by behavioral economics and the area of “prospect theory”, pioneered by Daniel Kahneman and Amos Tversky<sup>5</sup>. These biases can lead to systemic sources of return in the markets. In his book Evidence-Based Technical Analysis, David Aronson identifies many theories of cognitive bias and explains how they can play out in the markets. These biases can help explain returns associated with “momentum” strategies<sup>6</sup>. “Overconfidence,” “anchoring,” and “sample size neglect” are all examples of biases that tend to impede the discounting of new information in prices and can lead to returns associated with momentum or reversal trading strategies depending on context and time frame. Figure 5 shows many of the other cognitive biases that produce alpha opportunities.

Figure 5. The Wheel of Cognitive Misfortune\*



Of course, just because we can identify a cognitive bias does not mean we can extract return from the markets as a result. As access to data has improved, these anomalies have in many cases vanished and the space has become more competitive. Information access, computing power, and execution speed are not the barriers to entry they were years ago. Simple strategies that used to be consistent money-makers (for instance, owning stocks on the first day of the month) appear to no longer work. Therefore, we closely monitor in-sample performance of such strategies and are very cognizant of rates of alpha decay.

We capture 3 specific types of Investor Psychology effects: rational behavior, irrational behavior, and the response to both by the underlying forces of the market. The irrational side is **Fear**, which is equally defined by its corollary: greed. The rational side is **Sentiment**. Investor sentiment looks like: investors view inflation as risky so they flock to inflation-hedging assets, which is a rational response, but the prediction of inflation may have been errant in the first place. If humans weren't errant and irrational creatures, markets would behave in a purely efficient and predictable manner. Fortunately for us, we are a group of imperfect and selfish creatures. In response to that fact, the underlying forces of efficient markets are like the God of the Old Testament. When market participants act in opposition to His rules, He will rear his head harshly and brutally. In short windows, market participants are able to cause befuddling price moves with their erraticism and irrationality. But at some point, the market will step in and bring a flood to restore order. Fear and Sentiment attempt to capture the behavior of market participants and **Reversion** attempts to predict when the Flood will come.

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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GROWTH

Financial Markets, economic production cycles and shifting policy trends have an intricate interconnected mechanism, interacting with each other in both causal and resultant ways. The mechanism often becomes a “chicken or the egg” debate. Economic cycles are a logical outcome of the self-reinforcing nature of expanding and contracting economies. We can start at the top of a boom or the bottom of a bust just the same. Natural phenomena create the excesses of both extremes. As an economy is growing, labor is tight, wages are rising, industrial production expands, etc., typically demand for durable goods is also high; the entire cycle is in a positive feedback loop that propagates continued growth. At some point in this process, the economy begins to overheat. Wage rates and other input costs accelerate faster than prices can be increased, and the same level of durable goods demand is no longer required. Because the economy is nothing more than a web of human activity, it is susceptible to the same tendencies that we all are: burn out, exhaustion, motivation loss and eventually a need for a rest. When the cycle reaches this point, Central Monetary officials consider actions that force interest rates higher and find ways to withdraw liquidity. These actions coupled with higher prices and potentially satiated demand invariably leads to a slowdown. These boom cycles also typically create excesses in some part of the financial system that makes the economy prone to a rapid withdrawing of liquidity. Once an economy begins to contract, the same reinforcing effects that drove the economy upwards has a tendency to work in reverse, and a negative feedback loop begins. Eventually after years of tepid growth, employment, consumer spending and business investment, the cycle is preparing for a recovery. This natural phenomena, while not written as a clean playbook, plays itself out as many complex variables feed this natural cyclical activity; these cycles are less time-dependent than they are activity driven.



YIELD



FEAR



INFLATION



CARRY



TREND

Economic production cycles, or more specifically, economic **Growth**, is the ultimate governor and creator of Equity returns (as discussed earlier). For this reason, short-term economic acceleration or deceleration is frequently the underlying source of price fluctuations that we attempt to capitalize on by monitoring the movement of macroeconomic data. *See our White Paper on Growth for more info.*



SENTIMENT



REVERSION

**Inflation** is another important source of global macro price moves, though many institutions have been sold a false narrative about how to deal with it. If runaway inflation hits the market, yes, your nominal assets will get hurt. The Equity market will suffer because the underlying companies cannot increase the prices they charge customers fast enough to keep up with dwindling purchasing power – the so-called “Theory of Sticky Prices” (Mankiw 2002). The Bond market will get destroyed because positive Inflation erodes the real value of Bonds’ fixed payments (Ang 2014). On the flip side, real assets (i.e. Commodities) are liable to weather the storm and perform well in an inflationary state, all else equal. However, Inflation is a cyclical phenomenon and is expensive to protect from when you don’t need to. Having Inflation protection in your portfolio is unnecessary and counterproductive most of the time, but Inflation does lead to price fluctuations that we capture dynamically on a cyclical and tactical basis. *See our White Paper on Inflation for more info.*



CARRY



VALUE

Shifting policies across economic cycles and lags in these cycles across countries often start with logical decisions and results, which can in turn lead to positive feedback loops. The returns of financial assets often become entangled in these loops regardless of how rational the decisions are that investors must make to follow the loop. To illustrate the connection between the positive serial correlation of policy decisions, economic productivity and financial asset returns, take the continued rate cuts of the 2010’s and the subsequent Equity melt up. We capture this tendency via **Trend**. Trend-following strategies necessitate strong risk control; if you’re going to try to run with the herd, you have to be wary that a cliff is ahead.



DISPERSION



SEASONAL

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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GROWTH

Growth, Inflation and Trend all represent fairly direct relationships between the economy and the assets we trade; our final attempt at capitalizing on Global Macro Price Moves is done less directly with **Value**. Here's why it is less direct. Supply and demand is debatably the most fundamental economic concept, and this applies to Financial Assets just as much as it applies to widgets. Ideally, our strategy would account for a relationship as fundamental as this. But developing an accurate, forward-looking depiction of a commodity's production cycle and demand curve requires understanding an astronomical number of continuously changing inputs.



YIELD



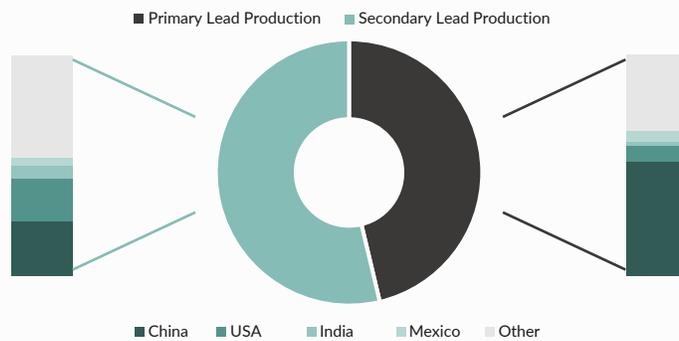
FEAR

Take Lead (Pb), for example. Internationally, the top 4 miners (China, Australia, United States, and Peru) account for over 75% of the total Lead mined each year. But less than half of the Lead produced even comes from mines. The majority comes from recycled batteries, and this majority has been growing over the last 20 years\*.



INFLATION

Figure 6. Primary and Secondary Lead Production of Major Industrial Economies



Your guess for how much lead will be produced from recycled Mexican batteries next quarter is as bad as ours. On the demand side, China dominates the consumption of Lead\*. On its rise from developing to developed country, however, China (and its consumption of Lead) is likely to experience many of the same evolutions that the US went through in the 20th century. In the 70's, approximately 250,000 tons of lead were added to gasoline each year (1/6 of the US's current lead consumption). China is still adding lead to their gasoline\*. If at some point this practice is discontinued, the demand for Lead will take a big hit, but predicting the rise of the Chinese EPA is not in our wheelhouse.

And lead is one of the more straightforward commodities; others are impacted by even more complicated factors:

- **Weather** – changes in weather patterns have a significant impact on the supply of agricultural commodities. Estimating future commodity supply necessitates predictions for weather.
- **Shelf life** – producers of agricultural commodities like wheat, soybeans, sugar, coffee, lean hogs, etc. are forced to take into account the perishable nature of their products when storing them. Estimating the impact on supply of perishing is necessary to have a holistic picture.
- **Replacement uses** – the demand for the corn in the last 15 years has grown as a result of the increased demand for ethanol, which relies on corn for its production. What will we be using corn for tomorrow?
- **Substitute products** – predicting the next innovation that will push an existing commodity by the wayside is not possible. When will developed economies ditch carbon-based fuels and embrace nuclear energy?

This isn't even an exhaustive list. Long story short, supply and demand are vital to pricing commodities, but trying to directly predict them is a fool's errand. Instead, we derive a continuously updating view of whether supply and demand are appropriately linked by comparing current prices to an estimated fair Value. This indirect measurement is buttressed by fail-safe constraints that protect us from extreme price movements created by major imbalances in underlying supply or demand figures. We will not try to claim this is a simple or inerrant method, but it is significantly more effective than the alternative.



CARRY



TREND



SENTIMENT



REVERSION



CARRY



VALUE



DISPERSION



SEASONAL

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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GROWTH

YIELD

FEAR

INFLATION

Insurance premium/carry is simply the positive return associated with owning assets that pay a known yield. In futures trading, the most prominent examples are Contango and Backwardation. Carry is relevant to long-term strategies in Equities, Bonds, Commodities, and Currencies, and accounts for a significant percentage of long-term returns in these asset classes<sup>7</sup>. If you are going to trade futures contracts, understanding the fundamental effect of Carry (and the equation shown above) on prices is non-negotiable. Whether or not you try to exploit the effect is a different question, but Carry (which is regulated by the formula shown below) is inextricable from pricing futures contracts across all assets, as shown in Figure 7 and 8.

$$F_t = S_t * e^{(r_f + u - y) * (T - t)}$$

Figure 7. Price of Gold Futures Contracts by Front Month (on March 16,2020)

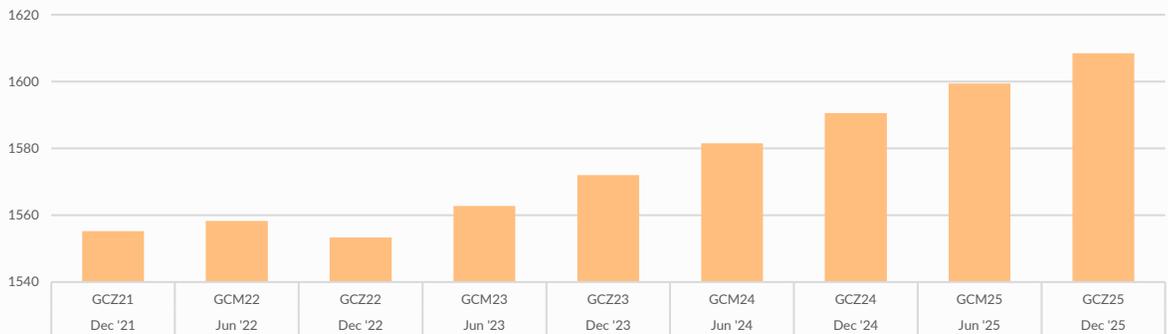


Figure 8. Price of Eurodollar Futures Contracts by Front Month (on March 16,2020)



CARRY

TREND

SENTIMENT

REVERSION

We attempt to exploit Carry in both directional and relative value trades. Mechanically, this can be achieved by selling a low-yielding asset and buying a high-yielding one, or simply rolling a particular futures contract to a more distant expiration date at a lower price. A couple minor caveats:

- We do not trade Equities directionally based on Carry. Isolating the effect of Carry on Equities (which is admittedly smaller in magnitude than in other asset classes) from simple Equity beta is extremely difficult. We are loathe to add Equity beta to our portfolio, especially when the potential gain is as small as the opportunity produced by directional Equity carry
- We do not trade Currencies on a Carry Relative Value basis. In one sense, Currency trades are inherently gauging relative value. Technically speaking, however, Currency trades only have one leg, which is why we consider our Carry Currency trades to be directional.

CARRY

VALUE

DISPERSION

SEASONAL

Yield is the only other place in our portfolio that captures an Insurance Premium, specifically the premium paid to fixed income investors for bearing interest rate risk and higher volatility.

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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GROWTH

YIELD

FEAR

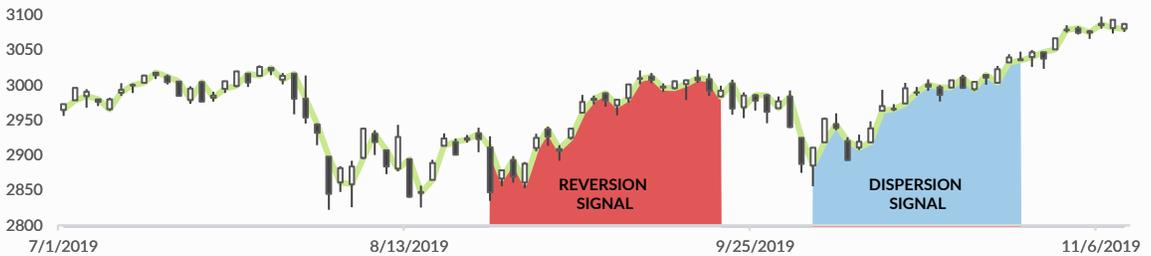
INFLATION

Short-term traders or market makers receive a premium for explicitly or implicitly providing liquidity to market participants by standing ready to buy or sell. The bid/offer spread is historically the market premium paid to explicit market makers, but short-term traders can selectively provide liquidity by entering the market at certain pre-defined times. This alpha source is conceptually similar to identifying V bottoms like the ones shown in Figure 9 but there are major differences. V bottoms are determined by the intersection of two factors with opposing frequencies: the underlying value of the asset (very long-term) and the greed and fear of buyers and sellers (very short-term). For this reason, predicting them is not reliable. Short-Term Liquidity Provisions, on the other hand, are much more straightforward to identify and happen at a much higher frequency.

We utilize our execution expertise in every trade we make, but it is particularly relevant when capturing this alpha source. Producing alpha by providing short-term liquidity requires seeing both the forest for the trees and the trees through the forest. The forest is the market conditions that produce the opportunities; these are identified by our trading models. The trees are the specific windows of illiquidity where orders have to be placed; these are identified by our trading algorithms.

We direct our trading algorithms to provide short-term liquidity most notably in two types of environments. First, a security mispriced relative to itself tends to experience **Reversion**. Second, one or more securities in an interrelated group mispriced relative to each other tend to experience **Dispersion**. The corresponding intraday liquidity patterns of securities under these conditions often lend themselves to alpha opportunities.

Figure 9. S&P500 Index Open-High-Low-Close (July 2019 - November 2019)

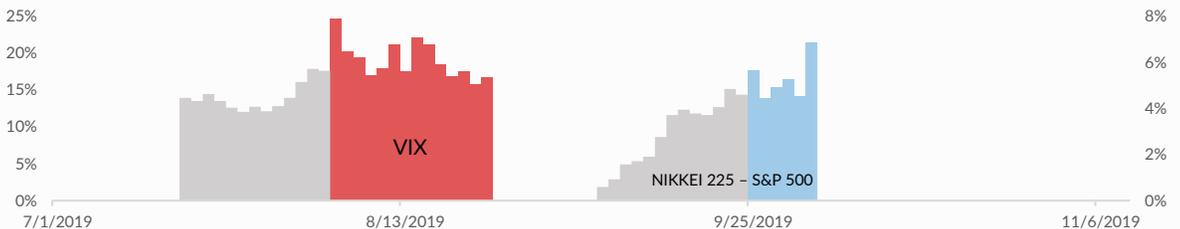


Neither Reversion nor Dispersion predict on which day V bottom will occur, but the conditions that lead to both phenomena can occur near V bottoms, like they did in the period shown in Figure 9.

Our Reversion strategies employ varying, often indirect methods. For example, the trading signal that led to a long S&P position in our portfolio on 8/22 came from a rise in the VIX, followed by a sharp pullback (shown in Figure 10). High Equity volatility corresponds to lower returns\*, so a buy signal during such a time implies an expectation of price reversal. This signal is a for instance; our Reversion signals come in many different forms.

Dispersion requires a more direct measurement. The S&P buy signal we got from Dispersion on 10/2 happened to coincide exactly with a V bottom, but it did not occur because we predicted a V bottom. Rather, the S&P500 price drop that lead to the V bottom coincided with a rally in the NIKKEI 225. The second series is Figure 10 shows how the widening short-term gap between the S&P and Nikkei led to our signal.

Figure 10. VIX, Difference between NIKKEI 225 and S&P 500 Cumulative Daily Returns



CARRY

TREND

SENTIMENT

REVERSION

CARRY

VALUE

DISPERSION

SEASONAL

# 02. THE 6 BEHAVIORAL AND ECONOMIC EFFECTS

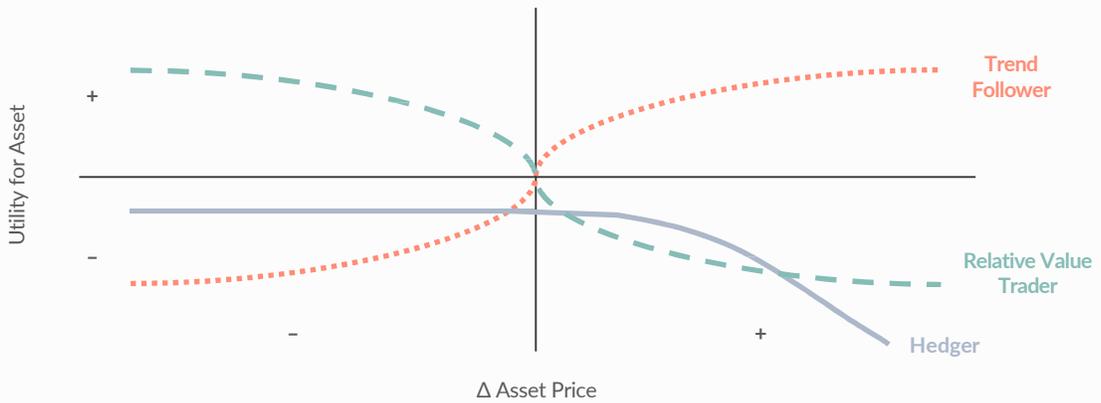
EQUITY RISK PREMIUM	INVESTOR PSYCHOLOGY	GLOBAL MACRO PRICE MOVES	INSURANCE PREMIUM / CARRY	SHORT-TERM LIQUIDITY PROVISIONS	VARYING UTILITY CURVES
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- GROWTH
- YIELD
- FEAR
- INFLATION
- CARRY
- TREND
- SENTIMENT
- REVERSION

Certain investors make decisions based on constraints and biases that are not solely dependent on the likelihood of an instrument to appreciate or depreciate. These decisions are often made in recognizable patterns, as not all investors view rising or falling prices in the same way, and these utility functions can vary at different times in a production cycle.

Figure 11 presents how three different types of investor – the Trend Follower, the Relative Value Trader, and the Hedger – have varying utility curves for an asset based on the asset's change in price. For example, a Trend Follower has positive utility when asset price is going up, while the Relative Value trader will have negative utility during that same time. These varying utility curves with varying frequencies create price imbalances on which we can capitalize.

Figure 11. Varying Utility Curves for Varying Investor Types.

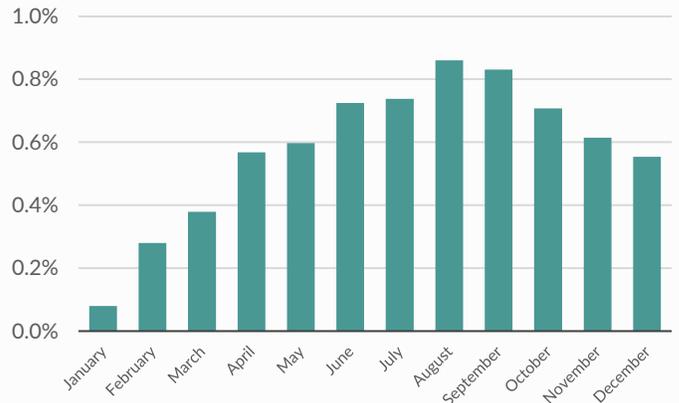


We attempt to capitalize on this relationship in 2 ways. First, the decisions made by price-agnostic traders produce discrepancies between the price of securities and the true Value of the underlying asset. Imbalances between Speculators and Hedgers produce our trading opportunities.

The patterns of these decisions, as well as the supply and demand of commodities, often manifest themselves in a **Seasonal** fashion (i.e. relative to a calendar year). Take Crude Oil as an example. The seasonality of Crude Oil is a very well-documented phenomenon. Crude Oil seizes almost all of its gains during the Spring, Summer and Fall, as shown in Figure 12 below.

The crucial aspect of capturing a pattern in price fluctuations, especially one so definitive and well-recognized, is to use creative ways to capitalize on it. We don't simply buy crude in March and hold it until September. All of our trading models that exploit seasonal patterns are executed on a relative value basis; they analyze the adherence of each instrument's current seasonal trends relative to established patterns and trade with the assumption that deviations from the generalizable trends will revert back. We effectively take Figure 11 and adjust the X axis to account for the expected seasonality of returns.

Figure 12. Cumulative Average Monthly Returns of Crude Oil

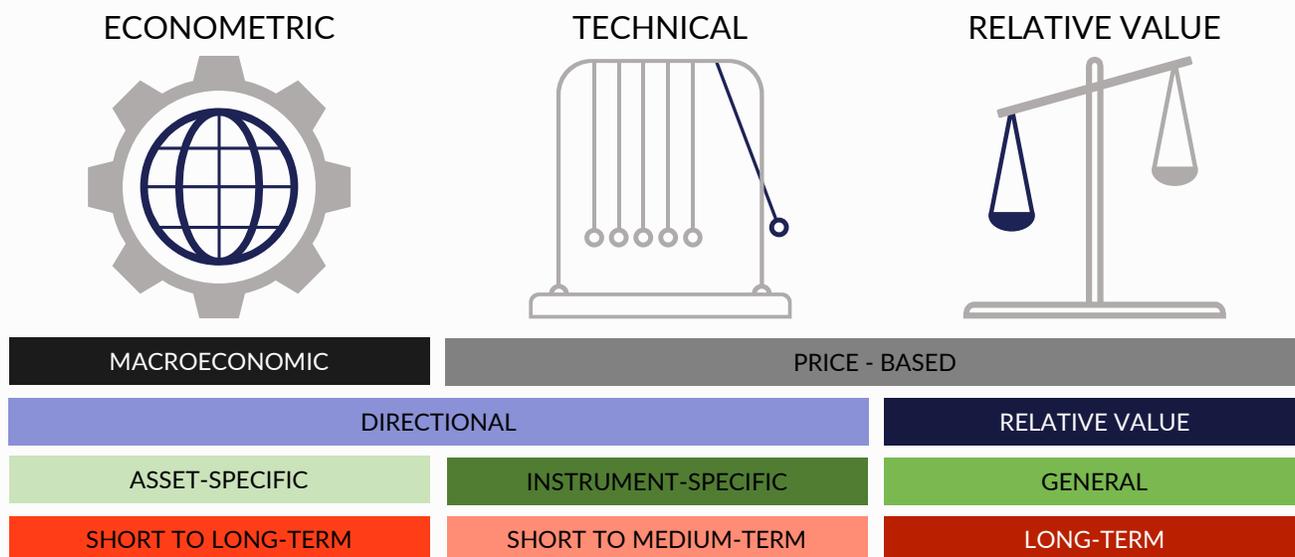


- CARRY
- VALUE
- DISPERSION
- SEASONAL

### 03. ADDITIONAL CONSIDERATIONS

The Six Effects outline our overall sources of return, but additional considerations must be made to translate these effects into actual trading models. We do not magically find a new model. Instead, we clearly articulate why an approach should work out of sample in the context of these behavioral biases and economic truths. We employ statistical methods, economic theory, and deep market knowledge to capture the alpha from these effects.

The types of trading models that we build fall generally into the 3 Silos below, as defined by four classifications: the data that is used to generate signals (Fundamental vs. Price-based), the way it allocates risk (Directional vs. Relative Value), the way that it trades (Asset-Specific vs. Instrument-Specific), and its timeframe.



The first distinction is blatantly straightforward. Econometric models rely predominantly on macroeconomic data. Technical and Relative Value models rely predominantly on price data.

The distinction between directional and relative value trading can be seen clearly in this context: relative value trading is an attempt to isolate a specific risk by trading in a way that factors out unwanted risk premia. Investors can structure their trades in different ways. For example, if an investor is bullish on the Nikkei, he can buy the Nikkei outright or he can buy the Nikkei and sell short another equity index. The use of the term “relative value” can be misleading, as Rishi Narang discusses in his book *Inside the Black Box*: “Most strategies called relative value have little to do with value investing”<sup>8</sup>. Relative value trading doesn’t necessarily “eliminate risk”, it may just better isolate exposure to risk or sources of return that the investor is willing to take, and represents an acknowledgement that there are other risk factors to which he is agnostic. Directional trading on the other hand takes risk on an outright basis.

Investment Opportunities are either instrument-specific, asset class-specific or general. We trade directionally (outright) in an instrument when an opportunity is instrument-specific and with a basket of related instruments when the effect is broader and asset-specific. Most Econometric effects are asset-based while most Technical effects are instrument-specific. Relative value trading is mostly capturing a general effect; it comes in both asset and instrument-specific forms.

The 6 Effects, by their very nature, force a certain time frame or holding period onto our trading models. In order to actually capture them, we have to adhere to the frequency consistent with the source of return. For example, trading models that attempt to take advantage of liquidity provision require a higher frequency. However, capitalizing on the Equity risk premium has much less stringent timeframe implications. A trading model’s holding period is relevant for differentiating sources of return and risk dependencies.

Building a portfolio with many sources of return can often lead to the counterintuitive result of allocating money to a model or effect that seems “sub-par” on an individual basis. It can be psychologically taxing for the investor to watch this effect within his portfolio struggle for periods of time. “Why did I trading commodities in Relative Value invest in this single effect with negative performance?,” the investor might ask. Or, even more often, “Why should we stick with Effect ABC when Effect XYZ is so much better.” But “better” is far from an absolute concept. Often, periods of a model’s or effect’s underperformance is the price we must pay for overall portfolio diversification when we need it most.

Our approach to liquidity and to diversification – the Six Behavioral & Economic Effects – is not a panacea; however, it is a highly transparent, dependable approach to delivering an understandable, liquid bespoke product that clearly meets defined client objectives. We will explore the 12 Boxes that capture them in a subsequent piece.

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