

Essential Beta and Inflation Regimes

August 2015



ED PETERS
Partner, Investments



BRUNO MIRANDA PhD
Director, Investments

Massive monetary stimulus since the 2008 Global Financial Crisis (GFC) has raised fears that high inflation will be the natural result of central bank policies. While it is debatable whether high inflation is inevitable, there has been increasing concern that risk parity strategies would underperform in the rising interest rate environment that typically accompanies higher inflation.

Since inception, Essential Beta (EB) has had a real return target of CPI + 6% (at 10% target risk). The goal is to generate a real return that participates in global economic growth while hedging against inflation and deflation as well as global economic decline. Many multi-asset risk allocation portfolios state the same goal. It is common for such portfolios to hold assets for growth, inflation and deflation but to equally risk weight them. The equal weighting basically admits that the manager does not have a current outlook for growth, inflation and deflation. It is assumed that holding assets for all scenarios in a passive equal weighting will take care of all of them in a “set it and leave it” manner. EB, on the other hand, is designed to anticipate the changes in the market cycle and allocate assets in a way that maximizes growth but also hedges against inflationary and deflationary pressures before they occur.

For instance, unlike a typical risk parity manager, EB does not leverage bonds during the expansionary, resilient phase of the market cycle but, instead, tilts towards diversified growth and inflation-hedging assets. Bonds are used for diversification and tail-risk hedging in combination with option-hedging strategies. However, in the recessionary, fragile phase of the market cycle, EB shifts to a risk parity format

as deflationary or disinflationary risks grow by leveraging bonds and reducing dependence on options. This dynamic approach to the business cycle hedges the risks which are most likely at these two different phases of the cycle.

Given the current concerns about inflation and rising interest rates, we thought it might be helpful to review how EB achieves its real growth objective in both inflationary and deflationary periods dynamically through the FQ Market Risk Index (MRI). We will also discuss how the MRI has a high inflation dimension. The high inflation indicator has not been extensively discussed in the past, but it appears the time has come for that discussion.

First, we will examine inflation properties and then detail how EB targets the different types of inflation.

Inflation Regimes

One interesting property of inflation is that it experiences regimes. Assets behave differently in these regimes. However, many assets which are considered inflation hedges do poorly not only in deflationary environments, but also in very high inflation environments. So merely categorizing assets as “inflation hedges” is overly simplistic.

As presented below, we can classify inflation into three basic regimes with two sub-regimes.

Past or simulated performance is no guarantee of future results. Potential for profit is accompanied by possibility of loss.



These inflation ranges are for modern developed markets since we have seen many emerging economies experience inflation rates much higher than the ones below.

- 1) Low Inflation: less than 2% (the typical central bank target is 2%)
- 2) Moderate Inflation: 2% to 6%
- 3) High Inflation: Greater than 6% (the historical upper quartile)
 - a) Moderate High: 6% to 8%
 - b) Very High: Greater than 8% (the historical upper decile)

Looking at the level of inflation through regimes is quite different than looking at the trend in inflation. For instance, while inflation has some visible impact on the risk of bonds, when inflation is rising from 2% to 3%, the volatility and risk of most other asset classes is not much different from when inflation rises from 3% to 4%. However, as inflation rises from 7% to 8%, the risk structure of the markets relative to one another changes dramatically as we will see below.

Four causes of Inflation

There are four causes of inflation which are generally associated with the inflationary regimes:

- 1) Low inflation: falling or stagnant demand
- 2) Moderate inflation: increased demand
- 3) High or Very High inflation: overly easy monetary policy (the literal printing of money)
- 4) Scarcity or oversupply: exogenous supply shocks such as the weather, war, or innovation

Unfortunately, many investors think of inflation in simplistic terms as merely rising prices, ignoring the underlying causality. For instance, there is a tendency to confuse inflation due to scarcity (push inflation) and inflation due to increased demand (pull inflation). While both push and pull inflation experience a supply/demand imbalance, their causality is different, which explains their different nicknames. Pull inflation usually happens during expansion when demand for products increases which, in turn,

leads to higher demand for materials driving up prices. Occasionally, demand will increase due to innovation, but usually demand is tied to the business cycle. Push inflation occurs when prices rise due to scarcity or falling supply while demand remains unchanged. Scarcity is usually caused by an exogenous shock, such as the weather for agricultural commodities, or a political event, such as war in the Middle East in the case of oil. Push inflation is not usually predictable, while pull inflation can be anticipated with the market cycle. The causality is important in order to determine which inflation-hedging assets are most effective. We should also mention that very high inflation has historically been caused by monetary policy (see Peter Bernholz, "Monetary Regimes and Inflation," Elgar 2006), which is possibly behind the current anxiety about higher future inflation.

Real Assets and Inflation

Multi-asset portfolios that are "inflation aware" typically hold a basket of inflation-linked bonds (TIPS), commodities, gold, property (REITs) and natural resource stocks (See Morningstar, "The Real Deal," 2011). Each of these assets is considered an inflation hedge. However, as Table 01 (next page) illustrates, different assets react differently and generate different returns in the various inflation regimes since the cause of inflation in each regime is different. The real return of each asset class in Table 01 is calculated by subtracting the annualized Consumer Price Index for All Urban Consumers (CPI-U) from the annualized total return of each asset from 1975 to 2014, a period of 40 years. Since most funds have regular equities and bonds in their portfolios, we have included the MSCI World Equity Index and the Citi World Government Bond Index (WGBI).

As we can see, the inflation-hedging assets all do well and outperform the broader stock and bond indices when we experience moderate inflation. Gold is the exception. While gold does have a positive real return, it lags the other assets in most inflation regimes. Moderate inflation covers over half the period, and real

TABLE 01: REAL RETURNS BY INFLATION REGIME
(JANUARY 1975 - DECEMBER 2014, SIMULATION)

Inflation Level	CPI-U Range	Average CPI-U	Real MSCI	Real WGBI	Real TIPS	Real Basic Material Stocks	Real REITs	Real Commodities	Real Gold
Low (9 Yrs)	<2%	1.3	9.1	6.4	1.3	5.5	6.1	-19.1	0.1
Moderate (24 Yrs)	2%<infl<6%	3.4	10.2	5.9	5.0	13.8	13.6	12.1	2.3
High (7 Yrs)	>6%	9.1	2.7	-2.3	-1.0	1.2	7.1	-5.7	13.3
Overall (40 Yrs)		3.9	8.6	4.6	3.1	9.8	10.8	2.0	3.7
Very High (4 Yrs)	>8%	10.9	5.3	-5.4	-1.9	1.5	7.6	-5.6	27.8
Stagflation (1981)		8.9	-10.3	-6.9	-1.9	-14.9	0.8	-24.6	-37.8

Sources: St. Louis Fed database, Global Financial Data, Datastream

DEFINITIONS: CPI-U is the Consumer Price Index All Urban Consumers. "MSCI" is the MSCI World Index (local currency). "WGBI" is the Citigroup World Government Bond Index (local currency). "TIPS" is the hypothetical return of treasury inflation protected securities through the combination of ten-year interest rates and the 12-month trailing CPI prior to March 1997 and the BofA ML US Inflation-Linked Treasury Index from March 1997 to present. "Basic Materials Stocks" is the S&P 500 Basic Materials Sector Index. "REITs" is the FTSE NAREIT All REIT Index. "Commodities" is the Bloomberg Commodity Index Total Return. "Gold" is the gold bullion New York spot gold price. "Real" indicates the deduction of inflation by subtracting the CPI-U from annualized total return of each asset class.

assets generate high real returns when inflation is bounded by 2% to 6%. In low inflation periods, regular stocks and bonds offer higher real returns than all the inflation-hedging assets. Commodities are down significantly, and gold is flat. During periods of high inflation, only REITs and gold outperform stocks. Commodities lose value again, and TIPS have a negative real return.

Why is this? Moderate inflation is typically pull-type inflation, and all of the assets except gold benefit from increased demand. However, high inflation is generally due to excessively easy monetary policy. Hence, gold performs better. In low inflation periods, deflationary pressures reduce asset values, particularly for inflation-hedging assets. Bonds do well as falling inflation pushes down yields, making them the ideal deflation hedge.

Finally, let us briefly discuss stagflation. During stagflation, high inflation and a recession occur simultaneously. Prior to 1981, economists thought such a situation was impossible. Theory stated that as the economy grows, prices increase due to demand; and when the economy shrinks, prices fall due to oversupply and lack of demand. In 1981, we experienced rising prices

and a declining economy for the first time, and the term "stagflation" was born. As Table 01 demonstrates, in the stagflation year of 1981, all the assets had negative real returns except REITs which managed to eke out a modest positive return. Gold is typically thought of as an inflation and uncertainty hedge. Yet, gold generated significant negative real and nominal returns in 1981. These numbers may be distorted by the bursting of the gold bubble in 1980, but the history is still sobering.

In the context of inflation regimes, traditional inflation-hedging assets work about half the time, but will largely underperform standard stock and bond indices when inflation is either low or high. As a result, the effectiveness of the inflation hedge will depend upon which type of inflation we combat. We want to use the right asset for the right job.

Essential Beta Real Return Properties

Within each inflation regime, we can identify both the fragile and resilient market uncertainty regimes anticipated by the Market Risk Index (MRI); in the past, we have only discussed the MRI in the context of the low to moderate inflation

regime. That is, the resilient and fragile market uncertainty periods we showed in previous research (see Ladekarl, Peters, and Miranda, "Anticipating Fragile and Resilient Markets" FQ Perspectives 2015) also exist in the three inflation regimes. We can have high inflation and resilient markets, or high inflation and fragile markets. The same would be true for the low and moderate inflation regimes.

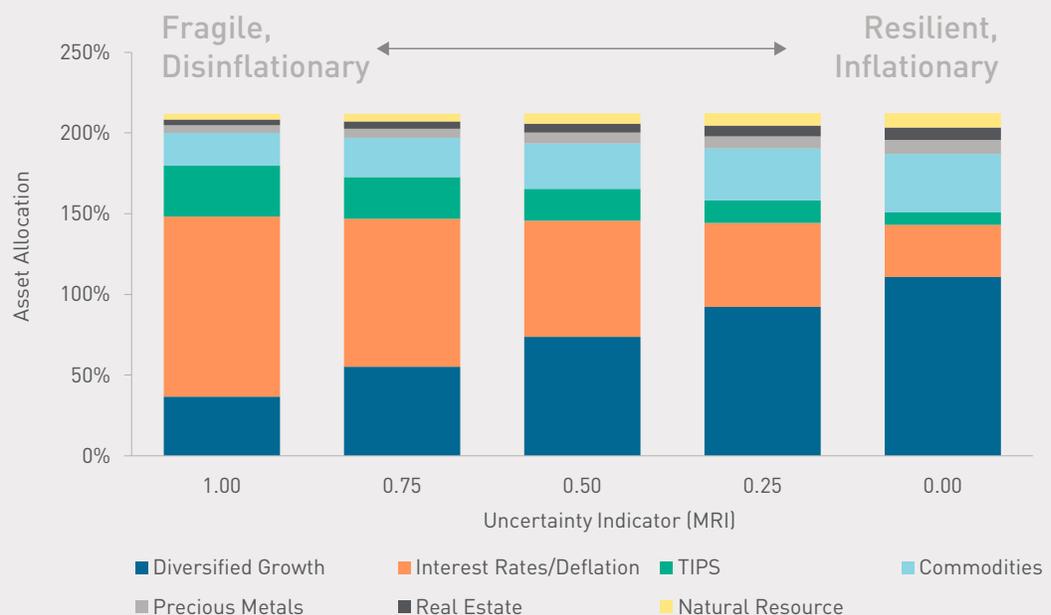
In moderate and low inflation, EB allocates assets as pull inflation ebbs and flows. The fragile market environment (when the MRI=1.00) occurs when deflationary risks are high. On the other hand, during resilient markets (when the MRI=0.00), inflation is usually the worry. EB has all of the traditional inflation-hedging assets within its structure. It deploys them to optimize the current threat, whether it is low, moderate, or high inflation, based upon the macro environment rather than holding them static. We can group EB's assets into three buckets: (1) Diversified Growth (developed market stocks, small cap stocks, emerging market growth and high yield bonds), (2) Deflation Hedges (sovereign bonds), and (3) Inflation Hedges (natural resources stocks, REITs, TIPS, commodities, precious metals). In Exhibit 01, we show the allocation to

these different sectors over the five MRI regimes for moderate and low inflation. We can see the shift from Diversified Growth and Inflation Hedges when the MRI=0.00 to Deflation Hedges when MRI=1.00.

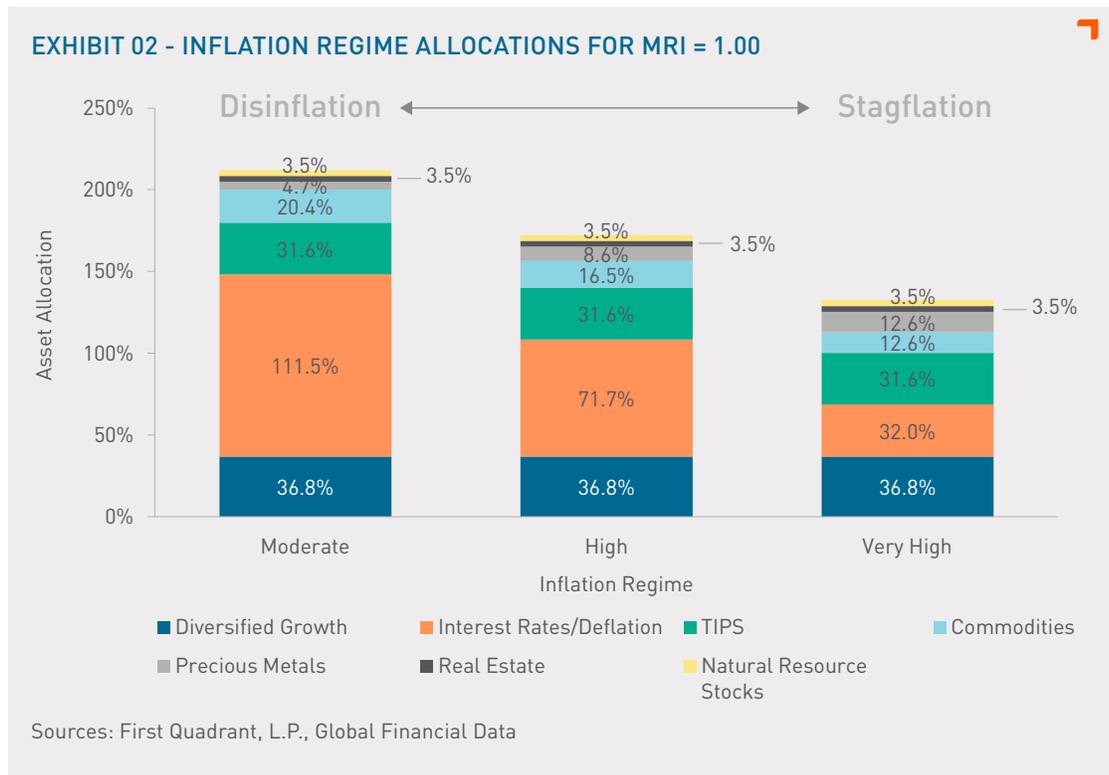
There is another dimension to the MRI for high inflation. This expected inflation indicator is a combination of the University of Michigan Inflation Expectations Survey, the Survey of Professional Forecasters, and the breakeven inflation rate from 5-year TIPS. As inflation rises, bond volatility rises as well until it reaches equity-like levels at very high inflation. In 1981, for instance, the 10-year US T-Note experienced 14% annualized volatility, and the correlation with equities rose to 60%. As a result, we introduced a separate covariance structure and asset allocation for high inflation. Since bond volatility is at equity levels and the correlation increases across assets, leverage is reduced to low levels. Exhibit 02 (next page) shows the EB asset allocation in the fragile market environment for the three inflation regimes.

As the inflation indicator moves from a deflationary environment to stagflation, the allocation to commodities and sovereign bonds decreases while gold and TIPS become half of

EXHIBIT 01 - MODERATE INFLATION REGIME ALLOCATIONS



Sources: First Quadrant, L.P., Global Financial Data



the commodity and bond allocation, respectively. Total leverage decreases dramatically. A similar set of risk allocations exists for the other four MRI regimes when MRI=0.00, 0.25, 0.50 and 0.75.

Table 02 compares the returns of EB with a basic risk parity (BRP) portfolio and a portfolio we call diversified capital allocation (DCA) over the inflation regimes. BRP is a combination of the MSCI World Index, the Citi World Government Bond Index (WGBI), inflation-linked bonds (TIPS) and the Bloomberg Commodity Index with risk weights of 42.5% stocks, 34% WGBI bonds, 8.5% TIPS and 15% commodities. BRP is representative of static risk parity portfolios that

contain a basket of assets to hedge the leveraged bond position against inflation. DCA has a capital allocation of 28% MSCI World Index, 11% Russell 2000 small cap stocks, 11% emerging market stocks, 5% NAREIT Index, 10% Bloomberg Commodity Index, 28% WGBI and 7% TIPS. DCA is representative of a diversified growth portfolio that also contains a basket of inflation hedging assets. Please note that EB prior to 1988 does not include options. Some EB assets were substituted or simulated prior to 1988 since they did not exist at that time.

In this chart, we can see the advantage of the objective-oriented approach used in EB

TABLE 02: RETURNS BY INFLATION REGIME¹
(JANUARY 1975-DECEMBER 2014, SIMULATION)

Inflation Level	CPI-U Range	CPI-U	Essential Beta Simulation Gross	Essential Beta Simulation Net	Basic Risk Parity	Diversified Capital Allocation
Low (9 Yrs)	<2%	1.3	11.1	10.7	8.8	2.0
Moderate (24 Yrs)	2%<infl<6%	3.4	20.8	20.4	17.0	11.9
High (7 Yrs)	>6%	9.1	10.2	9.8	5.4	8.5
Overall (40 Yrs)		3.9	16.8	16.4	13.2	9.1
Very High (4 Yrs)	>8%	10.9	11.0	10.6	4.0	11.1
Stagflation (1981)		8.9	0.2	-0.2	-10.2	-2.2

Source: St. Louis Fed, Global Financial Data, Datastream



for choosing the right assets for the right job. When the environment has more deflationary pressures, EB leverages bonds as a deflation hedge. In periods of expansion, EB shifts to a more growth-oriented, inflation-hedging position. During the low and moderate inflation regimes, EB is consistently expected to be the better performer. In the high inflation period with rising interest rates, basic risk parity is the worst performer in line with common criticisms of risk parity. EB, however, shifts to a high inflation stance and emphasizes inflation-hedging assets even in the fragile period so that EB again has better expected performance. This becomes even more prominent in the very high state where the leveraged bonds are a drag on basic risk parity performance despite the presence of commodities and TIPS to hedge inflation. DCA does poorly in low inflation because it lacks a significant exposure to sovereign bonds, the prime deflation hedging asset. It does better than basic risk parity in high inflation, though DCA still trails EB, which also has a growth-oriented, inflation-hedging asset allocation. In very high inflation, DCA is the best performer by a small margin.

In the stagflation year of 1981, all three strategies did poorly since all assets were either down or turned in negative real performance as we saw in Table 01. EB had flat performance, but that was significantly better than basic risk parity and also better than DCA.

So we can see that EB's dynamic process which takes into account both inflation and

market uncertainty regimes is designed to can adapt to multiple scenarios in order to generate real growth.

Summary

Inflation is a multi-dimensional problem, and it requires a flexible solution. Basic risk parity is generally not adequately hedged for high inflation even with the addition of a basket of inflation-hedging assets. Typical diversified strategies, like the DCA portfolio illustrated here, do not take deflationary pressures into account except through a modest allocation to sovereign bonds.

The Essential Beta methodology examines the macro environment through the MRI, which measures both the market uncertainty and inflation regimes and determines the asset mix most likely to deliver a real return of 6% given existing market conditions. We believe this conditional, scenario-based approach to multi-asset allocation has the best chance of achieving real growth in both inflationary and deflationary environments. So while there is concern about a rise in inflation, it is also possible that the current disinflationary environment will continue. EB is designed to cope with both inflation and deflation in a flexible, dynamic manner.



Endnotes

¹Simulation is supplemental to the live composite. Please see the Essential Beta – Simulated Performance (Gross of Fees) disclosure as well as the live composite and disclosures provided.



Essential Beta – Simulated Performance Unless otherwise noted, performance figures do not reflect the deduction of investment advisory fees. These fees are described below. The returns shown will be reduced by the advisory fees and any other expenses the advisor may incur in the management of an investment advisory account. Simulated performance is no guarantee of the future results in a live portfolio using the strategy. Potential for profit is accompanied by possibility of loss. **General Disclosures:** Hypothetical or simulated performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading. Also, since the trades have not actually been executed, the results may have under or over compensated for the impact, if any, of certain market factors, such as lack of liquidity or positions need to be rounded based upon contract size when futures trades are being executed. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. Further, backtesting allows the security selection methodology to be adjusted until past returns are maximized. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. Unless otherwise noted, performance returns for one year or longer are annualized. Performance returns for periods of less than one year are for the period reported. Simulations are constructed on the basis of historical data and based on assumptions integral to the model. The simulated performance in this presentation will differ from live performance that would have been experienced using the strategy during that time period for the following reasons: • The simulated performance was derived from the “backtesting” or the retroactive application of FQ’s current proprietary model as of June 2012. • Prior to 1988, substitutions were made for a few assets because they did not exist during that time period. For example, the Bloomberg Commodity Index was used as a proxy for commodities and stock index futures were proxied by the actual index before 1982. • The simulated performance includes the use of TIPS throughout its history; however they were not available until 1997. A live portfolio managed before 1997 would not have included TIPS. • The simulation assumes that we adjust the risk and capital allocated to each sub-strategy on a monthly basis after the close on the last day of each month, whereas the live product may not adjust the allocations exactly at that time due to intra-month market movement and risk regime shifts. • The simulation assumes that the strategy and sub-strategy guidelines are constant through the life of the portfolio, whereas, the guidelines for live portfolios may have changed over the life of each portfolio. • The simulation assumes fixed transaction costs whereas live portfolio transaction costs will be variable. • The simulation uses a synthetic long duration zero coupon bond for each bond country allocation. The cash return for the synthetic bond can vary by broker. • The simulation assumes all trading takes place once a month (on the last day of the month) whereas live portfolios may trade often during the month. **Disclosures Specific to Simulation:** This simulation was created in June of 2015 and updated every month end or quarter end. The simulation is constructed with the goal to diversify risk in a portfolio by strategically allocating risk to several sub-strategies/asset classes including, without limitation: Developed Market Equities; US Small Cap Equities; Emerging Market Equities; Emerging Market Currencies; Real Estate Investment Trusts (“REITS”); Diversified Commodities; US Treasury Inflation-Protected Securities (“US TIPS”), Long Duration Zero Coupon Synthetic Bonds (“Synthetic Treasuries”), High Yield, and Options, which was incorporated from 1988 onward. The simulation replicates the hypothetical return of TIPS prior to 1996 through the combination of ten year interest rates and the 12 month trailing CPI. From 1997 onward actual TIPS returns were used. The simulation assumes Synthetic Treasuries are created by using futures on various developed country sovereign bonds. The simulation additionally attempts to balance risk relative to country and sector weightings. The simulation targets overall portfolio risk allocations based on pre-determined indicators of market risk which may change over time. All income is reinvested monthly, no external cash flows are assumed. **Investment Management Fees:** Simulated performance results presented are net of investment management fees and trading costs. The FQ investment management asset-based fee schedule for this strategy, which is negotiable, is as follows: \$0–\$100 million, 0.40%; \$100–\$350 million, 0.35%; and more than \$350 million, 0.20%. Asset-based fees are charged incrementally. For example, a \$200 million dollar portfolio will be charged .40% for the first \$100 million and 0.35% for the next \$100 million. Incentive fee arrangements are available and negotiable. **Market Impact on Returns:** Stocks, bonds, and commodities markets had exceptional performance from 2009-2012. The Essential Beta Strategy participated in these returns throughout the period by holding long positions within all three markets.

Essential Beta Strategy	Total Return Gross	Total Return Net	Composite 3-Year Standard Deviation Gross (Annualized)	Benchmark 3-Year Standard Deviation (Annualized)	Number of Portfolios ⁴	Composite Dispersion (%)	Total Composite Assets ^{3,4} (Millions USD)	% of Firm Assets ⁴	Total Firm Assets ⁴ (Millions USD)	Total Beta Strategy Assets ^{1,4,6} (Millions USD)	Scaled Total Essential Beta Strategy Assets at 10% Risk ^{1,4,7} (Millions USD)	Total Firm AUM (Including Notional Values) ^{1,4,5} (Millions USD)
2009 (Mar - Dec)	+23.9%	+23.3%	-	-	<5	-	6	0.1	7,867	89	80	17,342
2010	+18.1%	+17.8%	-	-	<5	-	277	3.2	8,558	380	369	18,713
2011	+8.9%	+8.7%	-	-	<5	-	514	6.5	7,967	619	609	16,725
2012	+8.1%	+7.9%	7.7%	-	<5	-	565	7.2	7,891	1,222	1,259	17,104
2013	-1.5%	-1.7%	8.7%	-	<5	-	555	5.7	9,702	1,982	2,205	17,284
2014	+4.2%	+4.0%	9.7%	-	<5	-	577	5.0	11,522	3,272	3,842	23,092
2015 (Jan - Jul) ²	-1.5%	-1.6%	9.5%	-	<5	-	568	5.5	10,410	2,936	3,383	22,552

See additional disclosures for important information concerning this composite and the effect of fees. ¹Supplemental Information. ²All Performance and AUM data is preliminary. ³Includes market values for fully funded portfolios and the notional values for margin funded portfolios, all actively managed by First Quadrant. ⁴At End of Period Reported. ⁵Includes market values for fully funded portfolios and the notional values for margin funded portfolios, including both active mandates and those with both active and passive components, all managed by First Quadrant and non-discretionary portfolios managed by joint venture partners using First Quadrant, L.P. investment signals. First Quadrant is defined in this context as the combination of all discretionary portfolios of First Quadrant, L.P. and its joint venture partners, but only wherein FQ has full investment discretion over the portfolios. ⁶Includes other Essential Beta composite assets, including those based in foreign currencies, scaled to a 10% risk level. ⁷Includes other Essential Beta composite assets, including those based in foreign currencies, scaled to a 10% risk level.

Essential Beta Strategy Past performance is no guarantee of future results. Potential for profit is accompanied by possibility of loss. **GENERAL DISCLOSURES:** First Quadrant, L.P. claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. First Quadrant, L.P. has been independently verified for the period 1995-2014. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm’s policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The Essential Beta Strategy composite has been examined for 2010. The verification and performance examination reports are available upon request. First Quadrant (“FQ” or the “Firm”) is defined as the combination of all discretionary portfolios of First Quadrant, L.P. and its joint venture partners, but only wherein FQ has full investment discretion over the portfolios. First Quadrant L.P. is a registered investment adviser and is an affiliate of Affiliated Managers Group, Inc. A complete list and description of the Firm’s composites is available upon request. **COMPOSITE DETAILS:** Composite Description: (Creation Date: March 2010) The portfolios in this composite invest in the Essential Beta strategy targeting an 8-10% tracking error. The strategy seeks to provide long-term market returns through exposure to essential markets in order to participate in global economic growth. The strategy includes exposure to global equity, global sovereign bonds, and commodities primarily through futures contracts, and may also use Exchange Traded Funds (ETFs) and physical securities when liquid futures contracts are not available or are illiquid. The strategy will also include exposure to commodities and Treasury Inflation Protected securities (TIPS) to hedge against inflation. This strategy has the discretion to invest in exchange-traded or over the counter derivatives, including but not limited to, futures, options on futures or the underlying indices, and total return swaps. Portfolios in the composite have a target risk level of between 8% and 10%, which is balanced among the asset classes. This is a total return strategy which is not managed against any benchmark or universe. Presenting the composite returns with no benchmark demonstrates clearer accountability by removing the distortions caused by blending strategy specific total and benchmark returns. **Portfolio Criteria:** There is no minimum balance requirement for a portfolio to be included in a composite. The strategy utilizes leverage at FQ’s discretion. The returns presented reflect this leverage. **Calculation Methodology:** Valuations and returns are computed and stated in U.S. dollars. One portfolio within the composite (March 2009 through March 2010) used the daily valuation method to calculate the time-weighted monthly portfolio return while the other portfolio (February 2010 to present) uses a time-weighted rate of return formula to calculate the monthly return. Annual portfolio returns are calculated by linking the monthly returns. The dispersion of a composite is calculated using the asset-weighted standard deviation formula. Only portfolios managed for the full calendar year are included in the dispersion calculation. Where a composite contains five or fewer portfolios for a full year, a measure of dispersion is not statistically representative and is therefore not shown. The three-year annualized standard deviation measures the variability of the composite and the benchmark returns (if applicable) over the preceding 36-month period. The standard deviation is not presented for periods in which 36 months of historical composite returns are not available. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request. **Derivatives:** The underlying investment process composing this composite uses derivative instruments in both long and short positions to achieve desired returns. Derivatives are financial instruments whose value is derived from another security, an index or a currency. Futures contracts are derivatives that specify a purchase or sale of an asset at a specified price on a specified date in the future. Forward contracts are derivatives that allow the purchase or sale of currency in the future at a currently agreed-upon rate of exchange. Total return swaps are a financial contract that transfers both the credit risk and market risk of an underlying asset. There is a risk that a derivative may not perform as expected, thereby causing a loss or amplifying a gain or loss for a portfolio. With some derivatives there is also the risk that the counterparty may fail to honor its contract terms causing a loss for a portfolio. **Investment Management Fees:** Performance results presented net of investment management fees are based upon actual portfolio investment management fees charged to each portfolio within the composite, and are net of any performance-based fees. These net of fee results also reflect the effect of any negotiated fee arrangements, which are different than FQ’s fee schedule. All performance results presented include trading commissions. The FQ investment management asset-based fee schedule for this strategy, which is negotiable, is as follows: \$0–\$100, 0.40%; \$100–\$350, 0.35%; and more than \$350, 0.20%. Asset-based fees are charged incrementally. For example, a \$200 million dollar portfolio will be charged 0.40% for the first \$100 million, and 0.35% for the next \$100 million. **Market Impact on Returns:** Stocks, bonds, and commodities markets had exceptional performance from 2009-2012. The Essential Beta Strategy participated in these returns throughout the period by holding long positions within all three markets.



Index Definitions

Bloomberg Commodity Index (Total Return) formerly the Dow Jones-UBS Commodity Index Total Return, reflects the returns on a fully collateralized investment in Bloomberg Commodity Index which is a broadly diversified index composed of futures contracts on physical commodities. The index currently has 22 commodity futures in seven sectors. No one commodity can compose less than 2% or more than 15% of the index and no sector can represent more than 33% of the index as of the annual weightings of the components. Bloomberg is a trademark and service mark of Bloomberg Finance L.P., a Delaware limited partnership, or its subsidiaries. All rights reserved.

Bloomberg is a trademark and service mark of Bloomberg Finance L.P., a Delaware limited partnership, or its subsidiaries. All rights reserved. The **Citigroup World Government Bond Index (WGBI)** represents the broad global fixed income markets and includes debt issues of US and most developed international governments, governmental entities and supranationals.

Standard and Poor's/Citigroup Indices are proprietary data of Standard & Poor's, a division of The McGraw-Hill Companies, Inc. All rights reserved. The **FTSE NAREIT® ALL REITs Index** is a market capitalization-weighted index that includes all tax-qualified real estate investment trusts (REITs) that are listed on the New York Stock Exchange, the American Stock Exchange or the NASDAQ National Market List. NAREIT® is a trademark of NAREIT.

The **MSCI World IndexSM** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. The MSCI World IndexSM is a registered trademark of Morgan Stanley Capital International.

The **MSCI Emerging Markets Index** is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets. The MSCI Emerging Markets Index consists of the following 21 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey. MSCI and its brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions.

All MSCI data is provided 'as is'. The products described herein are not sponsored or endorsed and have not been reviewed or passed on by MSCI. Neither MSCI, its affiliates, nor any MSCI data provider ("MSCI Parties") makes any express or implied warranties or representations with respect to such data (or the results to be obtained through the use thereof) and the MSCI Parties expressly disclaim all warranties of originality, accuracy, completeness, merchantability, or fitness for a particular purpose with respect to such data. Without limiting any of the foregoing, in no event shall any of the MSCI Parties have any liability of any direct, indirect, special, punitive, consequential, or any other damages in connection with the MSCI data or the products described herein. Copying or redistributing the MSCI data is strictly prohibited.

BofA Merrill Lynch US Inflation-Linked Treasury IndexSM is an unmanaged index that tracks the performance of US dollar denominated inflation-linked sovereign debt publicly issued by the US government in its domestic market. BofA Merrill Lynch Indexes are service marks of BofA Merrill Lynch.

The **Russell 2000® Index** measures the performance of the small-cap segment of the U.S. equity universe. The Russell 2000 is a subset of the Russell 3000® Index representing approximately 10% of the total market capitalization of that index. It includes approximately 2000 of the smallest securities based on a combination of their market cap and current index membership. The Russell 2000 Index is constructed to provide a comprehensive and unbiased small-cap barometer and is completely reconstituted annually to ensure larger stocks do not distort the performance and characteristics of the true small-cap opportunity set. Russell Investments is the owner of the trademarks, service marks and copyrights related to its indexes. Russell Investments is a trade name and registered trademark of Frank Russell Company, a Washington USA corporation, which operates through subsidiaries worldwide and is part of London Stock Exchange Group.

Russell 2000® Index is a trademark of Russell Investments. Russell Investments is the owner of the trademarks, service marks and copyrights related to its respective indexes.

The **S&P 500® Basic Materials Index** comprises those companies included in the S&P 500 that are classified as members of the GICS® materials sector.

The **S&P GSCI®** provides investors with a reliable and publicly available benchmark for investment performance in the commodity markets. The S&P GSCI is widely recognized as the leading measure of general commodity price movements and inflation in the world economy. The S&P GSCI is proprietary data of Standard & Poor's, a division of The McGraw-Hill Companies, Inc. All rights reserved.

The **S&P 500® Basic Materials Index** and **S&P GSCI®** are proprietary data of Standard & Poor's, a division of The McGraw-Hill Companies, Inc. All rights reserved.

CPI-U and Inflation: Consumer Price Index All Urban Consumers: All Items - The Consumer Price Index for All Urban Consumers: All Items (CPIAUCSL) is a measure of the average monthly change in the price for goods and services paid by urban consumers between any two time periods. It can also represent the buying habits of urban consumers. This particular index includes roughly 88 percent of the total population, accounting for wage earners, clerical workers, technical workers, self-employed, short-term workers, unemployed, retirees, and those not in the labor force.

This material is for your private information. The views expressed are the views of First Quadrant, L.P. only through this period and are subject to change based on market and other conditions. All material has been obtained from sources believed to be reliable, but its accuracy is not guaranteed.

FIRST QUADRANT, L.P. | 800 E. COLORADO BLVD. SUITE 900, PASADENA, CALIFORNIA 91101
MARKETING SERVICES INFO@FIRSTQUADRANT.COM | OFFICE 626 683 4223 | WEB FIRSTQUADRANT.COM
Copyright © by First Quadrant, LP, 2015, all rights reserved.