

Essential Beta: Global Growth Through Risk Parity

FQ Insight

by Ed Peters

Introduction

Essential Beta (EB) is an investment strategy designed to achieve equity like returns with balanced portfolio volatility and a low correlation to equities. It does so by selecting the liquid markets that are essential for growth over all phases of the business cycle and by marrying this with portfolio construction techniques that target true risk and capital diversification. Investors often confuse capital diversification with risk diversification; however, the latter is not necessarily the same as the former. Many growth-oriented, multi-asset portfolios contain a broad array of assets (capital diversification), but in the end the majority of these assets are tied to cyclical growth and, as a result, are highly correlated. They go up and down together over the business cycle. These efforts at “diversification” simply target volatility reduction, which may result in a portfolio that has lower risk than the primary cyclical growth element, common stocks, but still has a high correlation to that same asset class. Essential Beta, in contrast, has a significant allocation to counter-cyclical assets and thus achieves growth at a lower correlation to equities. It seeks to accomplish this by using a “risk parity” approach and by taking into account the dynamic nature of the business cycle. It uses other tools, such as tail-risk hedging techniques, to further limit downside risk. All assets are long-only and primarily exchange traded.

This paper describes the EB method for achieving the lofty goals of capital growth coupled with true risk and capital diversification. The methodology is based upon a number of tried-and-true techniques, implemented in novel ways. The result is an investment strategy constructed to participate in global economic growth and to hedge against global economic decline, inflation, and deflation. In short, EB aims to be a truly diversified, multi-asset portfolio constructed according to rules rather than forecasts.

Global Growth

When most investors think of growth they think of cyclical growth associated with assets that grow in line with the global economy. But just as these assets grow with the world economy, they decline during the inevitable periods of economic contraction. In EB, we have identified the essential markets for real (non-inflationary) cyclical growth as:

- 1) Large Cap Equities (Developed and Emerging Markets);
- 2) Small Cap Equities;
- 3) Real Estate or Property; and
- 4) High Yield Bonds

These markets were chosen for their liquidity, in addition to their cyclical growth attributes. However, we are faced not only with real economic growth, but also with inflationary growth. For this component, EB uses a basket of 20 commodities across all sectors of the commodity markets: Energy, Industrial Metals, Agriculture, Livestock, and Precious Metals.

All of these assets are known to grow, as well contract, with the global economy. By holding these assets for the “long term”, investors typically assume that the growth phases will be greater than the contraction phases so that, in the end, a positive rate of return will be realized.

Past performance is no guarantee of future results. Potential for profit is accompanied by possibility of loss. Commodities trading involves substantial risk of loss.

Figure 1 below shows that a portfolio comprised of these particular real and inflationary growth assets can outperform a cap weighted index of the stock market (the MSCI World Equity Index in local currency). The chart is the log plot of the growth of \$100.

FIGURE 1: LOG CUMULATIVE RETURN
Model Results (January 1988 - December 2011)



Source: First Quadrant, LP, Bloomberg LP

However, it can also be observed that the volatility of the cyclical growth portfolio is still at stock market levels. Typically, balanced managers (or diversified growth managers in the UK) add a diversifying asset such as intermediate government bonds and inflation linked bonds to lower the volatility. We can see in Table 1 that adding bonds (40%) to this portfolio of growth assets (60%) does indeed lower volatility, but it also lowers returns and maintains a high correlation to equities. If we examine the risk allocation, we find that over 90% of risk for this Diversified Capital Allocation Portfolio (DCA) is still tied to cyclical growth. The bonds have merely watered down the volatility and return, but have not diversified the risk. The bonds have too low a volatility compared with the cyclical growth assets to contribute meaningfully to the risk budget. However, we believe true risk diversification requires only a slightly different approach.

TABLE 1: DIVERSIFIED CAPITAL ALLOCATION (DCA)
Model Results (January 1988 - December 2011)

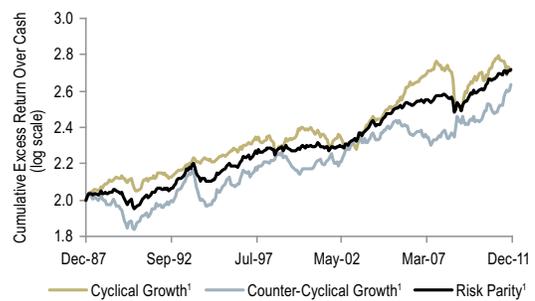
| | |
|-------------------------------|-----|
| Return | 8.5 |
| Risk | 9.6 |
| Sharpe Ratio | 0.5 |
| MSCI World Equity Correlation | 91% |

Source: First Quadrant, LP, Bloomberg LP

Basic Risk Parity: Balancing Risk across Asset Classes
When most investors think of bonds, they think of intermediate government bonds with maturities of 10 years or

sometimes longer terms of 30 years. Investors also think of bonds as being income generating, low volatility assets rather than assets related to capital gains. However, a deeper look at longer duration bonds reveals that they can generate significant capital gains, but they do so during periods of economic weakness as opposed to those of economic growth. As such, they can be considered a counter-cyclical growth asset. Perhaps more surprising, their long-run total return is comparable to that of equities. Below is a portfolio of synthetic 20-year duration zero coupon government bonds (Counter-cyclical Growth) plotted alongside the Cyclical Growth portfolio in Figure 1. Again, this is a log plot of the growth of \$100.

FIGURE 2: LOG CUMULATIVE RETURN
Model Results (January 1988 - December 2011)



Source: First Quadrant, LP, Bloomberg LP

The middle line on the chart is a portfolio that spreads risk equally across these two asset classes. We can see that by using long-duration bonds as a “counter-cyclical growth” asset, we now have a portfolio that has lower volatility, but also has the same cumulative growth as the cyclical growth portfolio. In addition, the correlation to equities has dropped to 61%, or an r-square of 37%. This is the basic risk parity approach to investing. That is, combining assets that have low correlation and attempting to equalize their risk contribution in the portfolio context. In this case, since both assets have the same risk, a 50/50 capital combination results also in 50/50 risk contribution.

Since the risk parity portfolio described above has the potential to deliver results superior to the traditional balanced approach, the question is why is the method so controversial? The answer lies in the bond exposure itself. Unfortunately, long-duration zero-coupon bonds are not available globally. They are only available in the US and in limited supply. As a result, in order to use bonds in this manner, we have to leverage intermediate government bond futures to achieve the correct duration, which synthetically creates the zero-coupon bonds we need. Leverage in this case means buy-

ing more in face value in futures contracts than there is in cash behind them. If government bonds have durations of about 7 years, then leveraging them 3:1 creates synthetic 21 year duration zero-coupon bonds. Note that these are exchange-traded so there are no liquidity or counter-party risks involved. Thus, the associated risks are not the kind of risks we would have while leveraging physical securities. However, the term “leverage” implies increased risk to many investors, even though similar techniques are also widely used in Liability Driven Investment (LDI) in order to achieve durations that match liabilities.

If we move beyond the leverage issue, we can clearly observe the benefit of this approach. The long-duration bonds not only have the capability to lower portfolio risk, like the intermediate bonds do, but they also have the capacity to supply a significant growth component to the portfolio. As a result, the portfolio can potentially grow over multiple parts of the business cycle. When assets have low correlations, risk balanced allocation has the ability to provide improved diversification without sacrificing returns, which in our model leads to a higher Sharpe ratio.

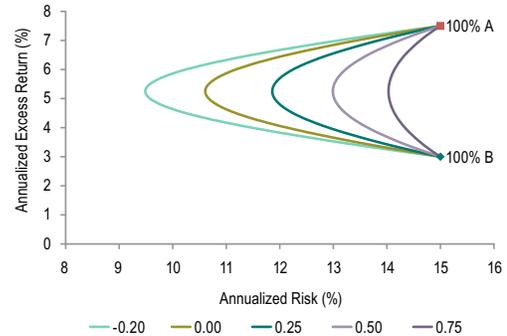
Essential Beta seeks to balance risk across assets classes as shown above. In addition, it also takes into account two other dimensions of risk balancing. EB looks for balancing risk within asset classes and also through time, taking into consideration that risk and correlations change over the business cycle.

Balancing Risk within Asset Classes

Risk balancing is a technique that is useful for more than combining stocks and bonds. Most investors use passive indices as default investments under the assumption that the indices are efficient. However, many research papers have shown that indices are not efficient. They merely offer a lazy solution, based on easily followed and easily understood rules, that appears to capture broad market trends. Essential Beta does not assume that the standard benchmarks are efficient and, as a result, they are not the strategy’s default starting points. Instead, we treat risk balancing as a more efficient way to create portfolios within the asset classes, as well as across asset classes. The benefits of risk balancing depend inversely on the correlation of the assets. Figure 3 illustrates the efficient frontiers for two hypothetical assets, labeled A and B, with the same risk and different expected returns. Each efficient frontier uses a different level of correlation. This chart illustrates that the lower the correlation between assets the more risk reduction we receive.

We can see that even with highly correlated assets there is some benefit to risk balancing. In Essential Beta, we risk balance within the three major asset classes: stocks, bonds

FIGURE 3: EFFICIENT FRONTIERS OF HYPOTHETICAL ASSETS



Source: First Quadrant, LP

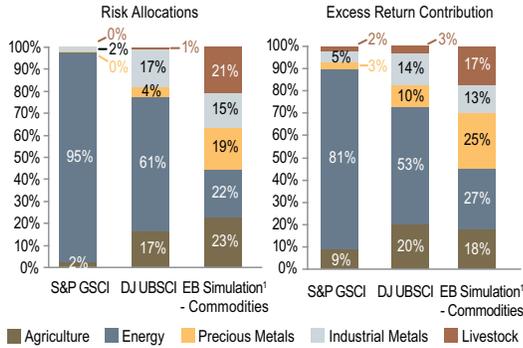
and commodities. In the case of developed market stocks and bonds, the benefits are small, but still statistically significant. However, within lower correlated assets such as emerging market equities and commodities, the benefits are both large and statistically significant.

We will use commodities to illustrate this point. EB invests in 20 commodities and risk balances within and across the primary sectors of Energy, Industrial Metals, Precious Metals, Agriculture and Livestock. The significance of risk balancing is that, in the long run, risk allocation and return attribution are significantly related. In Figure 4 (see page 4), we show the risk and return attribution for the Goldman Sachs Commodity Index (GSCI), the Dow Jones UBS Commodity Index (DJ UBSCI) and the balanced risk commodity sleeve inside an EB simulated portfolio (EB Commodities). We can see that EB Commodities has significantly improved diversification. In addition, as a stand-alone, EB Commodities simulation has a Sharpe ratio of 0.7 over this period vs. 0.1 for both the GSCI and the DJ UBSCI. Thus, we can see that risk balancing within commodities may have significant benefits from the portfolio efficiency perspective. Risk balancing within the equity and bond sectors also may have benefits, though they are more modest. Later, we will see how risk balancing within assets improves the overall Sharpe ratio of the portfolio.

Adapting to the Business Cycle: Risk Balancing Through Time

When evaluating risk, there is a final element that we believe must be incorporated. Market risk is not static. It changes over the business cycle. During periods of strong economic growth, cyclical growth assets have chronically low volatility. Conversely, during periods of high economic uncertainty, the volatility of cyclical growth assets is chronically high. These volatility regimes should be an important

FIGURE 4: BALANCING RISK WITHIN ASSET CLASSES
(January 1988 - December 2011)



Source: First Quadrant, LP, Northfield and Datastream

part of any investment strategy but they are particularly important to EB. In order to balance risk, we need to take into account long periods of high and low volatility. Figure 5 below shows the three-month moving average of the S&P VIX index, which is closely tied to the implied volatility of S&P 500 index options. When implied volatility is high, the cost of hedging equity portfolios is high, meaning that the market sees an increased downside risk to the stock market. Likewise, when the cost of hedging portfolios is low, the perceived downside risk to the stock market is low.

We can see that these periods of high and low volatility last for years and are tied to periods of economic expansion and contraction. The relationships between market regimes and the statistics behind the cyclical and counter-cyclical growth portfolios are depicted in Table 2.

We define the “Business Cycle” utilizing a combination of the JP Morgan Global PMI and global monetary policy. “Market Uncertainty” is defined by levels of implied volatility of index options and corporate bond credit spreads. This

TABLE 2: FQ MARKET RISK INDEX SCENARIOS
(Model Results (January 1988 - December 2011))

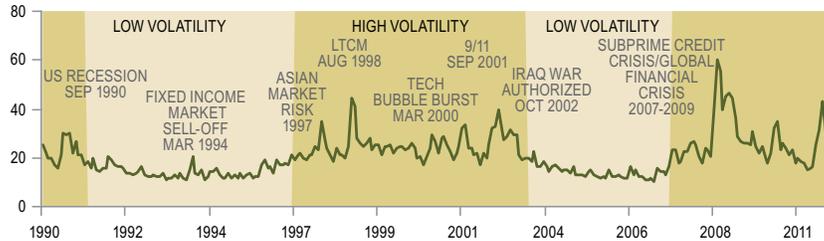
| | | Market Uncertainty | |
|---------|-------------------------------|--------------------------|-------------------------------|
| | | High | Low |
| Rising | Recovery | | Expansion |
| | Growth | Return: +19.1 Risk: 10.2 | Growth |
| | Counter-Cyclical ¹ | Return: +10.2 Risk: 13.2 | Counter-Cyclical ¹ |
| | Correlation: +2% | | Correlation: +8% |
| Falling | Contraction | | Slow-down |
| | Growth | Return: -3.4 Risk: 17.1 | Growth |
| | Counter-Cyclical ¹ | Return: +9.3 Risk: 14.5 | Counter-Cyclical ¹ |
| | Correlation: -10% | | Correlation: +4% |

Source: First Quadrant, LP, StyleAdvisor, Bloomberg

gives us four states by combining high/low economic growth and high/low market uncertainty. We can see that cyclical growth assets are most affected by this cycle. Returns and risk vary through the four quadrants. Counter-cyclical growth assets have more consistent risk over the periods. Also, the two asset classes have varying correlations over the cycle, ranging from +8% in the expansionary period to -10% in the periods of economic contraction. As a result, holding a static capital allocation causes the risk allocation to passively change over the business cycle, increasing risk budget to cyclical assets during periods of economic decline and decreasing risk exposure during periods of economic expansion. We believe this makes little sense.

In contrast, the Essential Beta methodology keeps the risk budget constant and changes the capital allocation, rather than the other way around. The breakdown of the EB risk budget by asset class is 42.5% stocks, 42.5% bonds, and 15%

FIGURE 5: THREE-MONTH MOVING AVERAGE OF THE VIX
(January 1990 - December 2011)



Sources: Chicago Board Options Exchange, First Quadrant, LP

commodities. This risk budget does not change over time. However, to achieve a stable risk allocation we must vary capital allocations over the business cycle. To determine what stage of the business cycle we are in, EB uses the proprietary FQ Market Risk Index (MRI), which determines the market state based upon four factors:

- 1) Implied volatility from a composite of VIX indices;
- 2) Corporate credit spreads;
- 3) The JP Morgan Global PMI (Purchasing Managers Index); and
- 4) Global monetary policy.

In general terms, we define periods when the VIX or credit spreads are high, or global PMI is low and global monetary policy is tight as a high macroeconomic risk environment. In those high risk environments, we find that cyclical growth assets do poorly and counter-cyclical growth assets do well. Conversely, if the VIX or credit spreads are low, or global PMI is high and global monetary policy is loose, we find that cyclical growth assets outperform counter-cyclical growth assets. We have previously documented this effect in our white paper “Using Volatility Regimes: The FQ MRI (Market Risk Index)” (Peters 2009b). The MRI is calculated systematically and has five levels of risk. Consequently, EB has five target portfolios, each designed to produce 9% return in each of the five regimes.

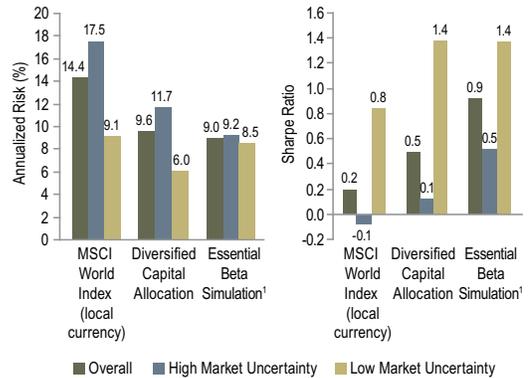
The potential result is not only a more stable ride for investors, but also an improvement in return since we are not passively taking more risk when we are not compensated for it or, conversely, passively reducing risk when we are. With a static capital allocation, we are cheating ourselves on both a risk-adjusted and total return basis. Implementing dynamic capital allocations, to keep risk budgets static, makes a lot more sense than maintaining static capital allocation. Figure 6 illustrates this effect.

On the left, we see overall volatility and volatility when the VIX is above and below its median for three portfolios. On the right, we can see the resulting Sharpe ratios. For the MSCI World Equity Index and the previously defined 60% stocks/40% bonds DCA portfolio, risk changes with the regimes. In addition, they achieve a positive risk adjusted return when risk is low and a flat return when risk is high. The EB simulated portfolio, on the other hand, has more stable risk in both regimes. Furthermore, it has a positive Sharpe ratio in both regimes, with only a modest increase in the low volatility regime. The analysis shows that adjusting for risk over time may result in risk stabilization and an improved return.

Tail-Risk Hedging

Table 2 (see page 4) points to an important attribute of

FIGURE 6: ANNUALIZED RISK AND SHARPE RATIO
(January 1988 - December 2011)



Sources: First Quadrant, LP; StyleAdvisor, Bloomberg LP, Global Financial Data (GFD)

bonds. In the high volatility/low growth phase of the business cycle, cyclical assets and counter-cyclical assets have a negative correlation. During a market panic, there is a natural flight-to-quality from risky asset, such as stocks and commodities, to government bonds. This indirect form of tail-risk hedging is almost too small to be measured when intermediate government bonds are used in a portfolio, such as the DCA. However, when long-duration bonds are used, this attribute becomes an important hedging tool.

During economic recessions when equity markets typically experience high volatility, bonds can serve three functions in a risk parity portfolio: risk reduction, tail-risk hedging, and counter-cyclical growth simultaneously. It is the leveraged allocation to bonds that allows them to demonstrate these characteristics in risk parity portfolios. However, during the expansionary low risk periods, when deflation risk is virtually non-existent, leveraged bonds may increase certain kinds of portfolio risk. While bonds in this environment continue to provide indirect tail-risk protection (against exogenous shocks, such as terrorist attacks) and reduce overall volatility, inflation expectations can increase the downside risk to bonds. We believe that there are more efficient and direct ways to hedge equity tails in such low risk times, specifically through equity index option strategies.

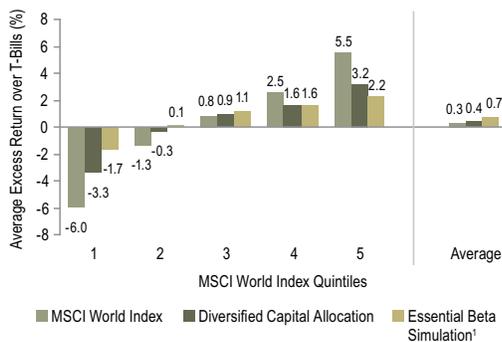
In previous FQ papers, we outlined a dynamic put-spread collar strategy that, coupled with a leveraged equity position, gave an equity-like return with smaller draw-downs than a traditional equity portfolio. We originally suggested that such a strategy would be a good place to park capital committed to private equity while waiting to be called - or to be used as an asset class in its own right. We have established

that incorporating such an option strategy in Essential Beta may allow us to deliver downside protection similar to that of a standard risk parity portfolio, without having to lever bonds during the expansionary, low volatility phases of the business cycle.

During the high volatility/low growth phase of the business cycle, when options are expensive, EB relies more on bonds and risk parity techniques to hedge against equity tail-risk. However, in the low volatility/expansionary phase of the business cycle, EB allocates more to options for tail-risk hedging and less to bonds since options are cheaper and bonds have more downside risk due to inflationary pressures. EB favors the assets which provide the most protection at a lower cost. What is more, the mix of bonds and options used for tail-risk hedging is determined by the MRI, which allows the whole approach to be integrated. The inclusion of this direct method of tail-risk hedging may result in Essential Beta's ability to reshape, in addition to diversify, risk. Therefore, EB can now manage risk across three dimensions: diversification, time, and tail-risk.

Figure 7 illustrates Essential Beta's ability to hedge tail risk. We used the MSCI World in local currency, the DCA portfolio and Essential Beta simulated returns starting in January 1988. The monthly returns were sorted from low to high using the MSCI returns as our base, then divided into quintiles. Quintile 1 shows the average return of the worst 20% of equity returns. We see that Essential Beta is able to offer significantly higher downside protection relative to the DCA portfolio. Conversely, quintile 5 shows the best 20% of equity returns and we can see that Essential Beta has similar upside potential. Essential Beta seeks to offer better downside protection, while participating in the upside, in order to deliver a better overall average return.

FIGURE 7: EQUITY TAIL-RISK REDUCTION (January 1988 - December 2011)



Sources: First Quadrant, LP, StyleAdvisor, Bloomberg LP

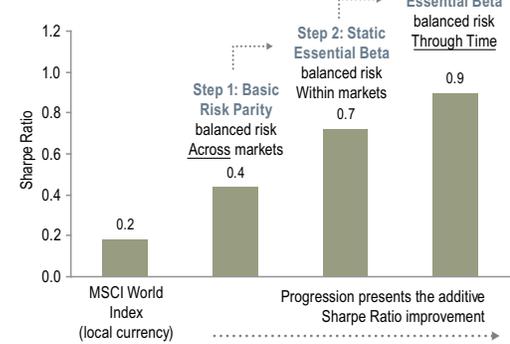
Improving the Sharpe Ratio

Essential Beta has the ability to improve the Sharpe ratio compared to traditional portfolio approaches as a result of approaching risk balancing from three perspectives:

- 1) Basic Risk Parity – risk balancing across markets;
- 2) Static Essential Beta – risk balancing within markets; and
- 3) Essential Beta – risk balancing through time and adding tail-risk hedging

Figure 8 below shows how each level of risk balancing improves the Sharpe ratio above the levels experienced by the MSCI World Equity Index from 1988 – 2011.

FIGURE 8: SHARPE RATIO BUILD CHART Simulation¹ (January 1988 - December 2011)



Sources: First Quadrant, LP, StyleAdvisor, Bloomberg LP

In addition, performance for the full period compares favorably to the Diversified Capital Allocation portfolio, as demonstrated in Table 3 below.

TABLE 3: PERFORMANCE STATISTICS (January 1988 - December 2011)

| | Essential Beta Sim | Diversified Capital Allocation | MSCI World Equity |
|----------------------------|--------------------|--------------------------------|-------------------|
| Return | 12.0% | 8.5% | 6.6% |
| Risk | 9.0% | 9.6% | 14.4% |
| Sharpe Ratio | 0.9 | 0.5 | 0.2 |
| Correlation With Equities: | 55% | 91% | — |
| Up Capture | 50% | 60% | — |
| Down Capture | 18% | 55% | — |

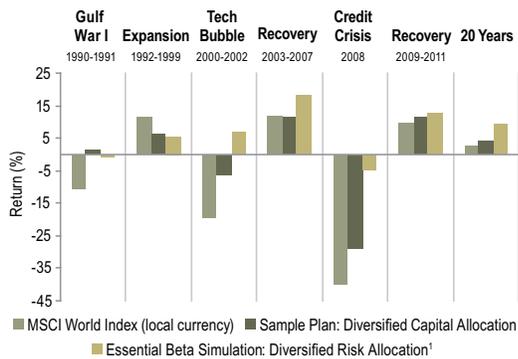
Source: First Quadrant, LP, StyleAdvisor, Bloomberg

The DCA model portfolio did quite well over the examined period, returning +8.5% per year at 9.6% risk for a Sharpe

ratio of 0.5 vs. the return of +6.6% per year at 14.4% risk for a Sharpe ratio of 0.2 realized by the MSCI World Equity Index. This reflects the superior growth characteristics of the DCA cyclical growth model portfolio. However, it can also be observed that the DCA had a 91% correlation with the MSCI World Index and a downside equity capture of 55% in the period in question. The Essential Beta simulated portfolio, on the hand, had a higher return of +12.0% at 9.0% risk for a Sharpe ratio of 0.9. Not only did it outperform the DCA portfolio, but it also did so at a lower correlation of 55% with the MSCI World Index and a downside equity capture of only 18%. Thus, EB simulation achieved a greater return with a lower dependence on equities fulfilling its return and diversification goals.

Finally, we examine how the three portfolios compare over past market scenarios. Figure 9 divides the period from January 1990 – December 2011 into historical scenarios. We can see that Essential Beta is able to generate impressive returns in all phases of the business cycle by participating in growth periods and preserving, or even growing, assets in periods of economic weakness.

FIGURE 9: ECONOMIC SCENARIOS
(January 1990 - December 2011)



Sources: First Quadrant, LP, StyleAdvisor, Bloomberg LP, Global Financial Data (GFD)

Summary

Essential Beta is an investment strategy that seeks to generate an equity-like return with lower volatility and a lower correlation to equities. In achieving these goals, the portfolio is designed to help investors realize their long-term growth goals without overreliance on common stocks. Most investment strategies attempt to achieve their growth goals with an eye on simply diversifying the capital allocation by investing in a large number of different investments. This effort is typically hampered by a heavy dependence upon

developed market equities or other investments that are highly correlated with equities. Essential Beta uses instead risk parity techniques, along with other forms of risk control, to deliver both capital and risk diversification. As a result, Essential Beta is a strategy that is designed to be internally diversified, but also diversifying relative to other likely complementary investments. This external diversification benefit derives from an approach that seeks to achieve its return goals in a different way than other investment strategies. However, it does so using liquid, primarily exchange-traded, instruments, and without a reliance on exotic derivatives or illiquid securities.

The assets in Essential Beta are those we deem “essential” to achieve growth in all phases of the business cycle. As such, we believe it may be an ideal investment strategy for institutions and individuals alike.



Endnotes

¹ Essential Beta simulation is supplemental information. Please see Simulation Disclosures: Essential Beta – Simulated Performance (Gross and/or Net of Fees) and Essential Beta Strategy Composite Information and Essential Beta Strategy disclosures found at the end of this presentation for information concerning this simulation, the live composite, and the effect of fees on the performance.

References

Darnell, M. Peters, E. and Ye, J. “Rethinking Beta” FQ Perspectives, January 2009

Darnell, M. “Tail Risk Hedging in Concept and Practice” FQ Perspectives, September 2010

Fannin, C. and Faulcon, G. “Slimming Your Tails: Constructing a Superior Tail-Risk Hedging Portfolio” FQ Perspectives, October 2010

Peters, E. “Using Volatility Regimes: The FQ MRI (Market Risk Index)” FQ Perspectives, September 2009b

Essential Beta – Simulated Performance (Gross and/or Net of Fees) *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. • 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 2012 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; 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. The simulation replicates the hypothetical return of TIPS between 1988 and 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 gross 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. **Market Impact on Returns:** Stocks, bonds, and commodities markets had exceptional performance from 2009-2011. The Essential Beta Strategy participated in these returns throughout the period by holding long positions within all three markets.

INDEX DEFINITIONS

The Dow Jones UBS Commodity IndexSM (DJ-UBSCISM) is a broadly diversified index that allows investors to track commodity futures through a single, simple measure. “Dow Jones Indexes” is a licensed trademark of CME Indexes. “Dow JonesSM”, “Dow Jones Indexes”, “DJ”, “UBS”, “Dow Jones-UBS Commodity Indexes”, “DJ-UBSCI” and all other index names listed are service marks of Dow Jones Trademark Holdings, LLC (“Dow Jones”) and UBS AG (“UBS AG”), as the case may be, and have been licensed for use by CME Indexes. “CME” is a trademark of Chicago Mercantile Exchange Inc.

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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 strategy is not managed to a specific benchmark but is compared to the benchmarks shown for illustrative purpose.

DEFINITIONS

Diversified Capital Allocation is a hypothetical plan used for illustrative purposes. It is composed 28% MSCI World Index (local currency), 11% Russell 2000, 11% MSCI Emerging Market Equity Index, 5% FTSE Nareit All REIT Index, 10% S&P GSCI, 5% BofA ML High Yield Master, 26% Citigroup World Government Bond Index (local currency), 4% TIPS – BofA ML US Inflation-Linked Treasury Total Return Index from March 1997 to present and internal estimates prior to March 1997. Figures based on monthly rebalancing and no transaction costs.

Cyclical Growth encompasses Essential Beta’s stocks, commodities and high yield. Counter-Cyclical Growth includes Essential Beta sovereign bonds and TIPS. Risk Parity is an equal weighted combination of Cyclical Growth and Counter-Cyclical Growth.

COMPOSITE INFORMATION

| 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 Essential Beta Strategy Assets ^{1,4,7} (Millions USD) | Actively Managed AUM ^{1,4,5} (Millions USD) | Total Firm Assets (Including Notional Values) ^{1,4,6} (Millions USD) |
|-----------------------------|--------------------|------------------|--|--|-----------------------------------|--------------------------|--|-------------------------------|---|--|--|---|
| 2009 (Mar-Dec) | +23.9% | +23.3% | - | - | <5 | - | 6 | 0.1 | 7,867 | 89 | 17,342 | 17,427 |
| 2010 | +18.1% | +17.8% | - | - | <5 | - | 277 | 3.2 | 8,558 | 380 | 18,713 | 18,789 |
| 2011 | +8.9% | +8.7% | - | - | <5 | - | 514 | 6.5 | 7,967 | 619 | 16,725 | 16,725 |
| 2012 (Jan-Jun) ² | +2.3% | +2.2% | 8.2% | - | <5 | - | 422 | 5.3 | 8,017 | 829 | 16,975 | 16,975 |

See additional disclosures for important information concerning this composite. 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, all actively 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 market values for fully funded portfolios and the notional values for margin funded portfolios 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. ⁷Includes other Essential Beta composite assets, including those based in foreign currencies.

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 1995-2011. 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. 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 dollar-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, 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. 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 the actual average-weighted management fee charged each portfolio in the composite. 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 2009-2011. The Essential Beta Strategy participated in these returns throughout the period by holding long positions within all three markets.

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