

The Implicit US Dollar Short in Commodity Returns

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FQ Perspective



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The standard approach to hedging the currency exposure in international assets focuses on the risk that the exchange rate involved will change over the holding period of the investment by adding or subtracting from total return in a random way. In the case of fully funded investment instruments, hedges are implemented through currency positions that match the value of foreign exposures. In the case of locally traded derivatives like futures or swaps, these currency hedges are embedded in most contracts. As long as we perceive local investment returns as largely unrelated to changes in exchange rates, this standard practice protects the portfolio from randomly fluctuating with the underlying currency.

The local return characteristics of some asset classes, however, can be driven by the exchange rate itself, a characteristic ignored by the standard approach. If future cash flows supporting the value of an investment are mainly driven by the local environment, there is no reason to believe that exchange rates have a direct impact on the local value of the investment. But returns can be significantly influenced when future cash flows are driven by decisions which are rational reactions to exchange rates.

Let us examine the main asset classes in Essential Beta ("EB") to see whether or not this effect is significant, by running a simulation of the EB strategy, which allows us to reach further back than merely relying on live results¹. Table 01 (next page) gives the correlations and betas between three-month rolling dollar returns and three-month rolling returns for each asset class in EB, from January 1st, 1987 through June 30th, 2015.² From this point forward when we refer to the "dollar" we mean the US dollar unless we state otherwise.

The largest exposure is clearly in commodities. What is it about the commodity market that creates this implicit short dollar exposure? The price discovery in commodities comes from three types of participants: producers, consumers and intermediaries. In general, intermediaries either attempt to profit from their views on short-term price changes, or attempt to passively capture a risk premium by providing insurance to commodity producers with long-only positions. In either case, intermediaries are managing the ride created by the economic forces driving consumption and production. Thus, we need to focus on consumers and producers to understand the underlying economic forces. To make the discussion concrete, let us address the oil market, since a similar reasoning can easily be applied to the remaining commodities. How do consumers and producers of oil react when the US dollar appreciates by, let's say, 10%?

For consumers and producers residing in the US, the appreciation of the dollar does not necessarily trigger a modification in economic behavior. When we consider countries whose

Commodities trading involves substantial risk of loss.

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

TABLE 01: CORRELATION AND BETA OF 3 MONTH EB RETURNS AND USD RETURNS
(JANUARY 1987 - JUNE 2015, SIMULATION)

	Static MRI=0 Portfolio		Static MRI=1 Portfolio		EB Portfolio	
	Correlation	Beta	Correlation	Beta	Correlation	Beta
Developed Market Stocks	5.4%	6.4%	5.3%	2.6%	10.3%	7.7%
Sovereign Bonds	-0.7%	-0.3%	-0.7%	-0.9%	-3.4%	-2.9%
Commodities	-38.4%	-32.9%	-41.1%	-18.2%	-38.7%	-22.3%
Small Caps	6.8%	3.7%	6.8%	1.7%	8.8%	2.9%
Emerging Markets	-11.1%	-4.3%	-11.1%	-4.3%	-11.1%	-4.3%
High Yield	-16.6%	-12.7%	-16.6%	-2.2%	-13.1%	-3.9%
REITs	-2.8%	-0.7%	-2.8%	-0.3%	1.9%	0.3%
TIPS	4.6%	1.1%	4.6%	4.5%	2.5%	1.9%
S&P500 Options	-6.2%	-5.1%	-6.2%	-1.5%	-10.4%	-4.3%
Eurostoxx Options	0.6%	0.2%	0.6%	0.1%	-4.6%	-0.6%
ESSENTIAL BETA	-18.4%	-44.6%	-11.7%	-18.5%	-15.2%	-25.4%

Sources: First Quadrant, L.P., St. Louis Fed, CRB, Datastream

currencies depreciated against the dollar, however, the economics change significantly when looking at commodities priced in US dollars. European consumers, for example, suddenly see that last gallon of oil to be 10% more expensive, in euro units, if the dollar price of oil stays the same. The appreciation of the dollar would trigger numerous adjustments, ranging from German families avoiding a drive to southern countries for a sunny vacation, to businesses reducing their truck fleets as rising fuel costs reduce profitability. The pricing pressure is clearly due to the oil price rise in their local currency. From the perspective of producers, let us consider a Canadian oil producer. Suddenly profitability increases even when using the same resources in terms of infrastructure, working capital and labor, since each unit produced is sold for 10% more Canadian dollars. The Canadian producer has an incentive to channel additional resources into the production of oil and further increase production. In forward-looking markets like commodities, the incentives to bring additional barrels into the market, even if it never happens,

would immediately bring bearish pressure on the price of oil. Thus, from the perspective of both consumers and producers, dollar appreciation creates a bearish pressure on the price, meaning dollar price, of oil. Similarly, the economic forces triggered with a depreciation of the dollar would bring bullish pressure.

Commodity prices adjust whenever exchange rate movements shift demand and supply across countries. Of course, commodity prices can also move without any changes in exchange rates – a growing world economy facilitates commodity price increases as worldwide demand increases. Hedging the implicit short dollar exposure would protect the portfolio against temporary demand and supply shifts across countries triggered by a change in the US dollar exchange rate. There is also a more intertemporal dimension that a US dollar hedge partially addresses. Other than exceptional conditions, a decrease in interest rates effectively brings future demand towards the present, which facilitates a rise in commodity prices. The number of investments that are perceived as returning more than the

TABLE 02: 3 MONTH ROLLING EB COMMODITY RETURNS AND USD RETURNS
(JANUARY 1987 - JUNE 2015, SIMULATION)

	Static MRI=0 Portfolio			Static MRI=1 Portfolio			EB Portfolio	
	Notional	Correlation	Beta	Notional	Correlation	Beta	Correlation	Beta
Agriculture	27.4%	-23.5%	-9.0%	15.0%	-23.5%	-4.9%	-19.3%	-5.4%
Energies	11.4%	-28.8%	-10.6%	4.0%	-28.8%	-3.7%	-26.5%	-6.3%
Precious Metals	12.9%	-25.1%	-6.5%	7.1%	-31.8%	-3.9%	-25.7%	-4.5%
Industrial Metals	7.5%	-32.1%	-6.8%	6.3%	-32.1%	-5.7%	-31.7%	-6.1%
COMMODITIES	59.2%	-38.4%	-32.9%	32.3%	-41.1%	-18.2%	-38.7%	-22.3%

Sources: First Quadrant, L.P., CRB

cost of capital increases. A firm's desire to carry inventories increases as funding becomes cheaper. Finally, the incentive to extract non-interest earning commodities decreases due to lower interest from sale proceeds. To the extent that the US leads these decreases in interest rates, with other countries lagging, dollar depreciations coincide with increasing commodity prices. Capital flows in search of better yields finance the demand brought from foreign countries due to the dollar depreciation. On the reverse side, bearish pressures on commodity prices occur with increases in US interest rates and US dollar appreciation.

The implicit dollar exposure is not as impactful on the remaining asset classes. Implicit currency exposures often cancel at the aggregate level if there is no single currency used to price all exposures inside a given asset class, as in the case of developed market equities or sovereign bonds. Also, they are less likely to occur if markets are not as globally integrated as commodities or if the implicit investment horizon is long enough so that short-term, temporary currency movements do not necessarily have much long-term impact.

Turning our attention back to our simulation analysis, when we look at each commodity separately, differences in correlations with the US dollar reflect the degree of segmentation in the international market. Natural gas, for example, has a -9.75% correlation versus -30.22% for

Brent oil, reflecting the fact that the natural gas market is not as globally integrated as the oil market. In general, agriculture commodities have lower correlations since demand for food is less price sensitive, as Table 02 shows.³

The implicit short dollar exposure causes persistent moves in the US dollar to induce symmetric persistent moves in commodity returns. This suggests that we can smooth the commodity ride through hedging techniques. Table 02 gives us a ballpark of the exposures – roughly half of the notional exposures in commodities, as captured by the beta against three-month rolling dollar returns. Accordingly, to remove the implicit short dollar exposure in commodities, a long dollar position is dependent on the MRI regime, ranging from 29.6% when the MRI is at 0.00, to 16.15% when the MRI is at 1.00.

As mentioned, the implicit short dollar exposure occurs as economics change in countries making decisions through currencies other than the US dollar. Why do we empirically find that the implicit short dollar exposure is “only” half as opposed to the full notional exposure? That is, why don't commodity prices decrease by the same percentage as the appreciation of the US dollar, on average, so that the adjustment completely eliminates any change in economic incentives by economies that are not US dollar-based? That would indeed be the expected finding if the relative size of US dollar-based economies, which includes economies

TABLE 03: UNHEDGED AND HEDGED PORTFOLIOS
(JANUARY 1987 - JUNE 2015, SIMULATION)

Commodities Gross	Standard Deviation	Information Ratio	Skew	Kurtosis
Daily - Unhedged	5.1%	0.42	-0.33	3.49
Daily - Hedged	5.0%	0.40	-0.30	2.99
Monthly - Unhedged	5.0%	0.44	-0.25	1.40
Monthly - Hedged	4.6%	0.44	-0.18	0.55
Yearly - Unhedged	5.5%	0.41	-0.39	-0.82
Yearly - Hedged	5.4%	0.39	-0.19	-0.12

Essential Beta Gross/Net	Standard Deviation	Information Ratio	Skew	Kurtosis
Daily - Unhedged	12.9%	1.29/1.24	0.27	20.13
Daily - Hedged	12.7%	1.29/1.24	0.31	21.05
Monthly - Unhedged	14.3%	1.19/1.14	-0.14	1.70
Monthly - Hedged	14.0%	1.20/1.15	-0.15	1.47
Yearly - Unhedged	15.0%	1.15/1.11	0.45	-0.23
Yearly - Hedged	15.3%	1.11/1.07	0.30	-0.29

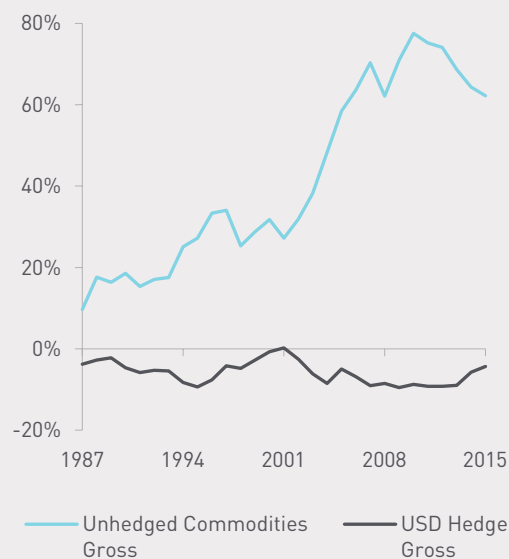
Sources: First Quadrant, L.P., St. Louis Fed, CRB, Datastream

that link their currencies to the US dollar, were negligible. On the other extreme, if the relative size of non-US dollar-based economies were negligible, we would not expect any significant short dollar exposure. Dollar appreciation induces bearish pressure on commodity prices as consumption decreases and production increases in non-US dollar economies. As commodity prices decrease, however, US dollar-based economies have themselves a change in incentives, towards an increase in consumption and decrease in production. This movement partially cancels the initial change since it is the exact opposite reaction of non-US dollar economies. Commodity prices adjust roughly halfway to US dollar movements as economies balance each other while adjusting.

Table 03 gives the simulated changes in skewness and kurtosis that illustrate a smoother

ride in the commodity portfolio when a hedge is applied. If returns were normally distributed, kurtosis and skewness would be zero. The more positive kurtosis readings indicate fat tails, and negative skew would indicate a tendency to more negative returns than positive. The monthly excess kurtosis of the commodity portfolio drops to 0.55 from 1.40. This smoother ride comes at almost no cost in terms of IR (or return per unit of risk). Exhibit 01 plots the cumulative yearly value added from commodities and the USD hedge from Table 04 (next page). We can identify five main periods. The good commodity performance from 1987 to 1995 coincided with a depreciation of the US dollar. Conversely, commodity returns struggled as the dollar appreciated from 1996 to 2001. The second positive commodity cycle occurs with the US dollar depreciation of 2002 to 2007. The dollar did not change significantly during 2008-2013, and neither did commodities overall. On the other hand, the 2014 dollar rally coincided with poor commodity performance.

EXHIBIT 01 - CUMULATIVE VALUE ADDED - UNHEDGE COMMODITIES AND USD HEDGE
(JANUARY 1987 - JUNE 2015)



Sources: First Quadrant, L.P., CRB

TABLE 04: ESSENTIAL BETA YEARLY PERFORMANCE
(JANUARY 1987 - JUNE 2015, SIMULATION)

	Unhedged				Hedged			
	EB Gross	EB Net	Commodities Gross	USD Hedge Gross	EB Gross	EB Net	Commodities Gross	USD Hedge Gross
1987	3.27%	2.67%	9.67%	0.00%	-0.51%	-1.11%	5.89%	-3.78%
1988	27.78%	27.18%	7.94%	0.00%	28.79%	28.19%	8.95%	1.01%
1989	16.82%	16.22%	-1.23%	0.00%	17.35%	16.75%	-0.69%	0.53%
1990	-1.00%	-1.60%	2.14%	0.00%	-3.43%	-4.03%	-0.30%	-2.43%
1991	39.10%	38.50%	-3.21%	0.00%	37.92%	37.32%	-4.38%	-1.18%
1992	31.54%	30.94%	1.76%	0.00%	32.08%	31.48%	2.30%	0.54%
1993	54.92%	54.32%	0.43%	0.00%	54.79%	54.19%	0.30%	-0.13%
1994	-4.65%	-5.25%	7.54%	0.00%	-7.50%	-8.10%	4.68%	-2.86%
1995	26.34%	25.74%	2.16%	0.00%	25.25%	24.65%	1.07%	-1.09%
1996	27.21%	26.61%	6.10%	0.00%	28.98%	28.38%	7.86%	1.77%
1997	19.05%	18.45%	0.78%	0.00%	22.46%	21.86%	4.19%	3.41%
1998	-4.41%	-5.01%	-8.77%	0.00%	-5.00%	-5.60%	-9.36%	-0.59%
1999	8.66%	8.06%	3.45%	0.00%	10.66%	10.06%	5.45%	2.00%
2000	-0.14%	-0.74%	3.02%	0.00%	1.89%	1.29%	5.05%	2.03%
2001	7.86%	7.26%	-4.56%	0.00%	8.87%	8.27%	-3.54%	1.01%
2002	8.78%	8.18%	4.61%	0.00%	5.97%	5.37%	1.80%	-2.81%
2003	28.84%	28.24%	6.40%	0.00%	25.26%	24.66%	2.83%	-3.57%
2004	36.23%	35.63%	10.03%	0.00%	33.82%	33.22%	7.61%	-2.41%
2005	26.01%	25.41%	10.21%	0.00%	29.57%	28.97%	13.77%	3.56%
2006	28.82%	28.22%	5.13%	0.00%	26.93%	26.33%	3.25%	-1.89%
2007	-0.78%	-1.38%	6.70%	0.00%	-2.96%	-3.56%	4.52%	-2.18%
2008	4.97%	4.37%	-8.19%	0.00%	5.48%	4.88%	-7.67%	0.51%
2009	17.64%	17.04%	8.86%	0.00%	16.65%	16.05%	7.87%	-0.98%
2010	30.56%	29.96%	6.59%	0.00%	31.31%	30.71%	7.34%	0.75%
2011	6.31%	5.71%	-2.39%	0.00%	5.85%	5.25%	-2.85%	-0.46%
2012	21.68%	21.08%	-1.06%	0.00%	21.70%	21.10%	-1.04%	0.02%
2013	9.27%	8.67%	-5.43%	0.00%	9.46%	8.86%	-5.24%	0.19%
2014	8.93%	8.33%	-4.33%	0.00%	12.20%	11.60%	-1.06%	3.26%
2015	2.12%	1.52%	-2.10%	0.00%	3.50%	2.90%	-0.72%	1.38%

Sources: First Quadrant, L.P., St. Louis Fed, CRB, Datastream

We can also see the potential benefit of a smoother ride by looking at the peak-to-trough drawdown in commodity returns, as illustrated below. Commodities have experienced four significant drawdowns since 1987. Hedging the implicit dollar exposure improves three of the four in the simulation, the exception being the relief rally following Gulf War I in oil and the dollar. Drawdowns can occur without any currency movements as a result of structural decreases in overall demand interest or increases in supply capacity, which are often corrected as demand recovers its strength, or infrastructure capital moves away from commodities production. However, the biggest drawdowns coincided with US dollar appreciation adding to the perceived imbalances between commodity demand and supply. When currency is the driving force behind the drawdown, hedging the implicit short US dollar exposure improves performance. Of course, as the currency hedge seeks to improve drawdowns, it may also reduce good performance

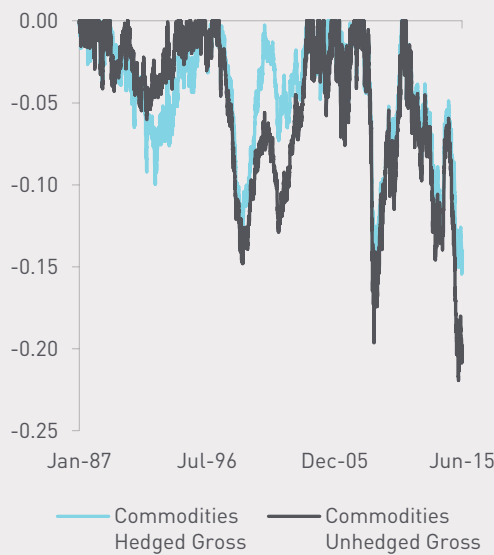
during dollar depreciations. That is a part of achieving a smoother ride. A smoother ride does reduce the risk in timing the entry and exit points for committing capital to an investment strategy.

In terms of implementation, efficient hedging would utilize currency futures since all the 6 currency pairs in the chosen currency basket are highly liquid.

The economic forces driving the implicit short dollar exposure in commodities are similar to the impact of exchange rates on the profitability of exporting and importing sectors in the economy. For example, as is well known by export-oriented industries, currency depreciations facilitate an increase in the quantity of exports, as well as in the price of exports. Foreign buyers perceive a reduction in their purchase cost. An equity position in an export-oriented company contains an implicit short currency exposure, unless the company hedges it. The implicit short dollar exposure in commodities works similarly, but with two main differences. First, a commodity exposure, through a future in standardized exchanges, is an exposure that targets the price of the commodity, as opposed to the profits of a company or industry. This means that an equity exposure is able to profit from an increase in profits due to higher quantities sold abroad even without price changes. In contrast, a commodity exposure creates a profit only when stronger demand increases prices. The second difference is the homogeneity achieved in standardized commodities. Outside commodities, products are not as easily perceived as being essentially the same when produced in different countries. Arbitrage is therefore much more obvious in commodities. As a result, prices adjust much faster in commodity markets.

The EB product, as a growth-oriented product, is not intended to have an explicit dollar bet. We find it appropriate, whenever feasible, to remove significant unintended currency exposures, to smooth the portfolio's ride. Some of the more difficult periods for cyclical growth assets (including commodities) typically coincide with

EXHIBIT 02 - DRAWDOWNS UNHEDGE AND HEDGED COMMODITY PORTFOLIOS (JANUARY 1987 - JUNE 2015, SIMULATION)



Sources: First Quadrant, L.P. CRB



a stronger dollar. We do plan to retain that return characteristic since it is deeply entrenched with the part of the international growth risk premium that EB is designed to capture. From that perspective, it is worth noting that a long dollar position tends to bring along some tail hedging that is usually achieved with either sovereign bonds or options. The main point, however, is independent of that asymmetry: when we hedge the implicit short dollar exposure, the overall growth risk premium may be captured to deliver a much smoother ride.



Endnotes

¹Essential Beta simulation is supplemental information to the live composite. Please see simulation disclosures and live composite table and disclosures located at the end of the paper for further information on simulation construction and the live composite.

²Dollar returns are based on the currency weights of the widely publicized US Dollar Index, with the exception of the 4.2% weight that the US Dollar Index allocates to Swedish krona being instead allocated to Australian dollar, due to the relative low liquidity of the Swedish krona currency market when compared to the Australian dollar currency market. Hence, dollar returns are based on the following basket: 57.6% euro, 13.6% Japanese yen, 11.9% pound sterling, 9.1% Canadian dollar, 4.2% Australian dollar and 3.6% Swiss franc.

³Although we can extend the presentation to any currency, we focus the presentation on the US dollar since the implicit short dollar exposure in commodities is not an intentional feature of the program. For example, when we do a similar analysis for other currencies, we find that EB is implicitly long the Australian dollar, but we consider that to be appropriate, and expected, for an investment product designed to capture growth risk premiums worldwide. We should point out that by looking at the US Dollar Index we are effectively looking at a developed market currency basket, with weights that are fairly close to GDP weights, without including currencies outside the developed world. The implicit short dollar exposure in commodities would again show up using that broader basket but focusing on developed market currencies has the double benefit of extra market liquidity and, since EB's emerging markets exposure is implemented with emerging market currency forwards, hedging that implicit exposure would effectively be cancelling the emerging market exposure that the program is intentionally designed to capture.



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” of FQ’s current proprietary model. • 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 makes adjustments where data availability, or data quality, prevents the historical replication of the current models. For example, the simulation uses equity indices as proxies for the physical equity securities component of the portfolio throughout the whole simulation period in order to go back further in time where data on the physical equities securities component was unavailable. • The simulation assumes that we adjust the risk and capital allocated to each sub-strategy on a daily basis after the close of each day, whereas live portfolios may not adjust the allocations exactly at that time due to intra-day market movement, lower rebalance frequency and risk regime shifts. • Options component of the simulation assumes a 3 month rolling cycle; whereas, live portfolios may roll options positions more or less frequently. • 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 ignores transaction costs whereas live portfolios’ transaction costs occur and are variable. • The simulation assumes all trading takes place once a day (on the close) whereas live portfolios may trade on the open and through several days. **Disclosures Specific to Essential Beta Simulation:** This simulation was created in July of 2015. 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”), Developed Market Sovereign Bonds, 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 targets overall portfolio risk allocations based on pre-determined indicators of market risk which may change over time. No reinvestment of gains or losses or external cash flows was assumed. A constant notional was assumed throughout the whole simulation period. **Disclosures Specific to Dollar Hedge in Commodities:** The dollar hedge is based on the following currency basket applied to half of the commodities sleeve of the portfolio: 57.6% Euro, 13.6% Japanese Yen, 11.9% Pound Sterling, 9.1% Canadian Dollar, 4.2% Australian Dollar and 3.6% Swiss Franc. **Investment Management Fees:** Simulated performance results presented are net of investment management fees and ignore trading costs. The FQ investment management asset-based fee schedule for this strategy, which is negotiable, is as follows for a 15% target risk portfolio: \$0-\$100 million, 0.60%; \$100-\$350 million, 0.525%; and more than \$350 million, 0.30%. Asset-based fees are charged incrementally. Simulated performance results net of investment management fees assumed an asset level \$0-\$100 million. **Market Impact On Returns:** Stocks, bonds, and commodities markets had several periods of exceptional performance during the simulation period. The Essential Beta Strategy participated in these returns throughout the period by holding long positions within all three markets. Table 04 provides an analysis of the years in which simulated returns were higher than the 15% risk target.

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 ^{1,4,6} (Millions USD)	Scaled Total Essential Beta Strategy Assets at 10% Risk ^{1,4,7} (Millions USD)	Total Firm AUM (Including Non-Strategy Assets at 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. 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.

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