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The re-discovery of real assets

Real assets, such as real estate, commodities and infrastructure, may improve portfolio performance for many investors. While historically a typical storage of wealth and currently a material portion of the global economy, real assets are currently underrepresented in many portfolios. As a collection, real assets diversify each other and an equity/bond mix, and they offer the potential for attractive levels of return. Adding real assets to an existing equity/bond mix may materially improve the ability of a portfolio to dominate inflation over the long term.

"…A third source of risk might be added, namely, a possible adverse change in the value of the monetary standard which renders a money-loan to this extent less secure than a real asset; though all or most of this should be already reflected, and therefore absorbed, in the price of durable real assets."
– John Maynard Keynes, 1936

EXECUTIVE SUMMARY

In this paper I discuss marketable real assets—real estate investment trusts, collateralized commodities futures and listed infrastructure. While this collection of real assets is not complete, it does demonstrate the diversification qualities expected from real assets. I also discuss inflation-linked bonds, which exhibit attractive diversification properties as well, even though they are not, by the definition below, real assets, nor do they have the same levels of expected returns.

Real assets offer potential return levels and potential diversification benefits that bode well for their inclusion with equities and bonds in a portfolio. Until recently, many investors found it difficult to acquire real assets, due to, among other things, illiquidity and investment minimums. The current liquidity levels and availability of marketable real assets makes their inclusion possible for a broad swath of investors.

RE-INTRODUCTION OF REAL ASSETS

Since the beginning of recorded human history, goods and services have been exchanged and wealth has been created and stored. As economies grew more complex, the need to facilitate bartering among producers of highly specific goods and services led to the introduction of money— a medium of exchange. In addition to facilitating exchange, money also measures and stores value. Money allows us to gauge our net worth and provides the

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liquidity we need to conduct transactions ranging from simple to complex. While money has many virtues, it also has a major flaw—its value erodes over time as the prices for goods and services rise.

The growth and storage of wealth has a long history as well. Prior to the Industrial Revolution, wealth was defined by the possession of land,[1] food stocks (domesticated animals or agricultural potential), mineral rights (mines), skills or intellect. While stocks, bonds and private holdings in business have a very long history as well, in more recent times the storing of wealth has relied increasingly on equity holdings (shares or stock) in businesses or on debt holdings (and their associated cash flows). To be more precise, the arena in which investors define and hold wealth has shifted from the "real" economy to the "financial" economy.

My, how times have changed…or have they?

The latest idea in investing circles seems to be an old one—holding more wealth in real assets, which have more recently been underrepresented. Real assets are defined as goods with non-monetary value that may be traded for other goods with non-monetary value (Ankrim and Hensel, 1992).[2] In many cases, we think of a real asset as being something tangible, such as a building, a barrel of oil or a bridge. But real assets may include intangibles as well, such as skills—certainly, labor may be half of a barter—or intellectual property.

Among modern, market-listed (or "marketable") securities, real assets often include real estate investment trusts (REITs), collateralized commodities futures (CCFs) and listed infrastructure. As will be discussed below, the combination of these three has a unique flavor to contrast that of equity exposure. Yet real assets may also be extended to private investing in real estate, timberland, farmland and infrastructure, any of which might further diversify a portfolio of stocks and bonds.[3] As investors rediscover real assets, they highlight underrepresentation in financial indexes, diversification, return levels and inflation protection as attractive features. The collection of marketable real assets is available for investors seeking to improve portfolio diversification; other real assets may become more liquid in the future as well.

The paper proceeds as follows: First, I define real assets more explicitly and provide information on how to invest in them. To give the reader more information on each of the three marketable real assets discussed in the piece, I have included two appendixes with selected details on the real asset universes and their current market environments. Second, I discuss the role real assets can play in protecting investors from the ills of inflation and make the case that inflation-linked bonds are not real assets, even though they have other attractive properties. Third, I lay out the case for real assets as an attractive addition to a liquid portfolio. Ultimately, we will see that a combination of REITs, CCFs and listed infrastructure has historically offered diversification, handsome return levels and improved inflation protection at the portfolio level—a track record that bodes well for real assets' inclusion.

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[1] ". . . well into the nineteenth century. Land was the most important source of income in western Europe and object of investment . . ." Kindleberger, 1993, Ch 10.

[2] Other definitions include: www.Investopedia.com – Physical or identifiable assets such as gold, land, equipment, patents, etc. They are the opposite of a financial asset. Real assets tend to be most desirable during periods of high inflation. www.BusinessDictionary.com – Actual, tangible asset (such as valuable antique or art, buildings, coins, commodity, machinery and equipment, stamp collection) as opposed to financial assets (such as bonds, debentures, shares).

[3] Real assets may be extended to include other categories, such as intellectual property (which may be accessible via patent financing or patent trading), shipping, pipelines, freight, water and areas not yet accessible via listed markets.

RE-DEFINING REAL ASSET CATEGORIES

While it is still possible to acquire physical assets, such as tracts of land, for growing and storing wealth, the ability of investors to do so in a liquid fashion is greatly enhanced by share-based investing. While share-based investing is not a new concept, it has certainly proliferated dramatically in more modern times. The evolution of commodities and securities exchanges as well as the listing of various infrastructure assets has furthered the development of real asset investing, just as it has in all other areas. These listed markets allow investors with a variety of wealth levels and investment objectives—from individuals to the largest institutions—to allocate to real assets with a great range of highly liquid instruments.

The three real asset vehicles most easily accessed in share-based liquid markets are real estate investment trusts (REITs), collateralized commodities futures (CCFs) and listed infrastructure. Both real estate and infrastructure are offered through private funds as well.

REITs—as represented by the FTSE EPRA NAREIT Global Real Estate Index (FTSE EPRA NAREIT or EPRA NAREIT)—are income pass-through structures that allow investors to own shares in large-property assets, including commercial office structures, residential (e.g., apartment or retirement) buildings and retail properties. The legal structures of REITs require, among other things, that a specified percentage of the rental income generated from these properties be passed through to the owners.

Collateralized commodities futures—as represented by commodity indexes such as the Dow Jones-UBS Commodity Index Total Return (DJ-UBS)—are essentially a series of front-month futures contracts replaced prior to expiry by the next contract. A standard index assumption is that the underlying collateral is invested in U.S. Treasury bills. The replacement of these contracts is called the “roll” and is essentially an insurance premium for providing security to commodities market participants.[4]

Listed infrastructure is a collection of infrastructure assets—such as power transmission and distribution systems, toll roads, seaports, airports, railways, pipelines, water distribution and communications systems—that have found their way onto equity exchanges. Their arrival on exchanges may result from IPOs by private infrastructure funds, breakups of integrated utility or transportation systems, or simply corporations representing infrastructure going public. Listed infrastructure securities tend to be mature assets rather than development projects, which are more appropriate to private infrastructure. Similar to real estate properties, mature infrastructure assets often are cash flow–rich and offer high yield. Listed infrastructure indexes include the S&P Global Infrastructure Index and the UBS Global Infrastructure & Utilities Index, which we employ for the analysis below.[5]

In Appendix I, these categories, along with their private counterparts, are described in some detail.

Active vs. Passive in Real Assets

All of the simulations and exhibits in this paper utilize index data. While indexes are great for illustrative purposes and give investors a good idea of how asset classes behave, those

[4] The roll return will be positive when a commodity futures term structure is in *backwardation* and negative when it is in *contango*. For a thorough discussion of the components of commodities returns, see Gorton and Rouwenhorst (2005). For more discussion on the topic of collateralized commodities futures, see Kayser (2009).

[5] For a discussion of what comprises the listed infrastructure universe, see Babson (2008). The data below is UBS Global Infrastructure & Utilities Index from October 1997 through November 2001 and S&P Global Infrastructure Index from December 2001 through March 2009. The S&P Global Infrastructure Index has an inception date of December 2001.

skilled in selecting securities or in evaluating the securities-selecting skills of investment managers may prefer actively managed portfolios.

For each of the real assets reviewed above, active management has potential for adding value over standard benchmarks. In the case of real estate, Russell has a long history of identifying managers with strong security-selection skills. In the case of commodities, active managers may benefit from trends, identify fundamentals that can result in positive or negative impacts down the road, avoid negative roll yield ("contango") and capture a variety of other inefficiencies. In the case of infrastructure, active managers may produce a purer exposure to listed infrastructure than benchmarks using securities that have infrastructure exposure but that are not infrastructure assets per se. While these other securities may be completely legitimate investments, they will not reflect the real asset nature that characterizes a purer infrastructure portfolio. Because skilled managers may outperform their benchmarks for a variety of reasons, real assets may be an area where active management is particularly useful.[6]

RE-FLATION[7] AND REAL ASSETS

The presence of housing, food, transportation and energy in price indexes may lead investors to believe that a strong relationship exists between real assets and inflation.[8] I examine this assumption in the sections below. First, we will see that a high correlation between real assets and inflation—even unexpected inflation—cannot be expected, nor has it been realized. Second, we will examine the role for inflation-linked bonds (ILBs) in a real asset portfolio. The discussion of how to achieve real, inflation-dominating returns at the portfolio level is covered in the next section.

The Meaning of "Real"

In a monetary context, "real" is something that can be measured in purchasing power rather than in nominal terms.[9] Such a definition allows for two consistent usages that have different implications. First, we think of "real return," which is that portion of an investment return (e.g., the growth of some portfolio of assets) that outpaces inflation. This real return may be expressed as:

Equation 1

Real return ≈ nominal return – inflation.

Second, we think of "real assets" as those having value in the absence of a monetary system.[10]

So then, what is the relationship between a real return and a real asset? Ultimately, real returns need to be positive over the long term if the value of a portfolio is to grow consistent with the investor's goals. Because real assets have value *in the absence of a monetary system*, there is a general belief that owning real assets will *preserve* monetary value, i.e., that real assets should meet and/or beat inflation over the long term.

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[6] While active management is very attractive in all areas of real assets, the analysis below is restricted to published index data. I prefer to take a conservative approach in simulating returns without the benefit of excess return.

[7] "Inflation" generally refers to a rising price level, often proxied by a composite price index such as the Eurozone Consumer Price Index (Euro CPI) or the U.K. Consumer Price Index .The term "reflation" was recently highlighted in a piece by Cavalieri and Greer, 2008, and refers to a rising rate of inflation. While other definitions may exist, we use re-flation in the Cavalieri and Greer sense.

[8] This relationship is explored below.

[9] www.dictionary.com definition of "real," ninth entry relating specifically to money.

[10] See again footnote 2.

It has often been said that an ounce of gold was the price of a fine suit in the Middle Ages. Today, a fine suit is also roughly equivalent in price to an ounce of gold; so, is this not evidence that real assets can provide inflation protection? Yet a 500-year horizon would be a long one to impose.

Referring back to Equation 1, we see that real return is the *difference* between nominal return and inflation. Such a definition quickly demonstrates that real return may not be necessarily linked to inflation but is actually *independent* of inflation. Similarly, while nominal assets necessarily suffer from the existence of inflation, real assets may, in some cases, such as commodities, be a root cause of long-term inflation.

CPI and real assets

The Eurozone Consumer Price Index (Euro CPI) is a composite of country level price levels comprising all countries using the Euro as a currency and some that do not. When it is broken out by expenditure as of the 2008 Edition of the European Price Statistics publication (2008), housing and housing related expenses comprise some 22% of Euro CPI and transportation another 15%. When broken out by commodity versus service dominated sectors, the split is roughly 50/50.[11] Given the similarities between "housing" and "real estate," "transportation" and "infrastructure" and "commodities" and "collateralized commodities futures," one might take from the construction of Euro CPI that real assets should have a strong influence on Euro CPI levels. While cost-push inflation has been experienced in the past, many factors influence Euro CPI, such that a correlation between real assets and Euro CPI is only +0.12 and with unanticipated Euro CPI -0.23.[12] For the same sample period, the Euro CPI's correlation with the FTSE All World Europe Equity Index is -0.12 and with the Barclays Capital Global Aggregate Bond Index (BarCap Agg), -0.07. Therefore, in comparison to financial and nominal assets, real assets may look pretty good, though +0.12 (and -0.23, as real assets correlate to unanticipated inflation in particular) is far from a "hedge."

So why is the correlation between Euro CPI and real assets not higher? Many things influence price levels, including actions by reserve banks globally; individual fiscal policies of member nations; labor productivity; and the prices of inputs, such as commodities. So while over long periods of time, real assets may have some relationship with inflation, short-term inflation matching may be elusive. More important than short-term, month-to-month correlation is the ability of a portfolio to outpace inflation over the long term.

Outpacing inflation

The ultimate goal of a portfolio is to provide positive real return over the long term—return that surpasses the erosion of value that results from inflation and that enhances the terminal wealth of the investor. So here we are, back to the word "wealth" again. How do real assets help the investor realize that positive real return over the long term?

[11] The information on the Euro CPI comes from European Price Statistics: An Overview (2008). Because the Euro CPI is a composite of several country CPI numbers, the exact breakdown by commodity exposure and service exposure is difficult to extrapolate—for example, energy is buried in transportation and housing without further details on subcomponents.

[12] I calculated a 0.12 correlation of Euro CPI with a basket of marketable real assets from January 1994–June 2009. As well, I calculated annual correlations (July–June 12-month periods to constitute a year) for the same sample period and found a correlation of 0.32. When removing the July 2008-June 2009 12 month period from the sample, the correlation turns negative at -0.11. From this I conclude that correlations are highly sensitive to sample period—such sensitivity is the result of comparing a highly stable series such as inflation with a highly volatile series such as real assets. Investors should exercise caution when relying on correlation analysis of this nature. The measure of unanticipated inflation is a first difference of month-on-month Euro CPI. The real asset basket is identical to the one used in the analysis below—30% FTSE EPRA NAREIT, 40% DJ-UBS, 30% S&P Global Infrastructure Index (December 2001–March 2009) and UBS Global Infrastructure & Utilities Index (October 1997–November 2001).

Exhibit 1: Hit rate[13] of various indexes over Euro CPI + 3%: January 1994-June 2009 (Annualized rolling returns, in euros)

	EPRA NAREIT	DJ-UBS	S&P Listed Infra	FTSE AW Europe	BC Euro ILB*	BC Global Agg	RA	60/40	60/40 + RA
Rolling 3-year	72%	62%	73%	63%	58%	48%	78%	60%	64%
Rolling 5-year	81%	72%	85%	43%	65%	46%	84%	37%	44%
Rolling 10-year	88%	87%	93%	72%	100%	57%	93%	67%	72%
Jan. 94–Aug. 08	100%	100%	100%	100%	100%	0%	100%	100%	100%
Jan. 94–June 09	0%	0%	100%	0%	100%	0%	100%	0%	0%

* From January 2000

Past performance is not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

DJ-UBS = Dow Jones UBS Commodities Index

S&P Listed Infra = S&P Global Infrastructure Index (December 2001–June 2009) and UBS Global Infrastructure & Utilities (January 1994–November 2001).

FTSE AW Europe = FTSE All World Europe Index.

ILB = Barclays Europe Inflation-Linked Bond Index.

BC Global Agg = Barclay Global Aggregate Bond Index

RA = Real Assets Mix = 30% FTSE EPRA/NAREIT Equity REITs Index + 40% Dow Jones-UBS Commodity Index Total Return + 30% S&P Global Infrastructure Index

60/40 = 30% FTSE All World Europe Index + 30% MSCI World Index ½ Currency Hedged + 40% Barclays Capital Global Aggregate Bond Index

60/40 + RA = 80% 60/40 + 20% RA

In Exhibit 1, we see how various indexes do outpace inflation over longer periods of time. We observe that real assets, as a collection, generally performed better than inflation-linked bonds over this particular sample period in their ability to provide consistent real return over inflation. In addition, using real assets with a balanced 60/40 bond/equity portfolio improved the outperformance rate in the three-, five- and ten-year sample periods.

Using Inflation linked bonds in a Real Assets Portfolio

So what about mixing inflation-linked bonds (ILBs) with real assets? Going back to Equation 1, we can see that inflation will surely destroy the real value of a bond and its coupon. ILBs address this destruction of value by varying the principal and the associated coupon[14] with the CPI. Are ILBs real assets?

Hedging with Inflation-Linked Bonds

Because ILBs are designed to beat inflation, investors naturally expect to hedge inflation by use of them. Individual ILBs vary with inflation and will, indeed, beat inflation. Therefore, it may be possible for an investor to purchase a particular ILB to match a particular set of known cash flows perfectly to inflation and realize a small real return as well. Returning to Equation 1, we see that the real return is the difference between nominal return and

[13] Hit rate is defined as the percentage of periods of outperformance.

[14] Which pays a fixed rate of interest on the varying principal.

inflation. In the case of ILBs, that real return is explicitly defined for each bond. Thus, different ILBs will offer different *real returns*, depending on maturity date, vintage and issuance.[15]

Because of this variation, a *portfolio* of ILBs will have a correlation with inflation of less than one. In the case where an investor has material turnover in the fund, as with a mutual fund, it may be that the real return of a portfolio of ILBs is not correlated to inflation. In other words, the presence of many ILBs with various maturity dates, vintages and issuances may distort the relationship we expect to see with inflation.

To illustrate an extreme: A basket of all issued ILBs exhibits a monthly correlation to CPI of 0.10.[16] Therefore, investors with high cash flows who use ILBs may experience return volatility, because the real return dominates the inflation linking. Remember that beating inflation is a long-term objective, not a month-to-month objective. As illustrated in Exhibit 1, the basket of ILBs indeed outpaced inflation very well over three-, five- and ten-year sample periods.

Inflation-Linked Bonds as real assets?

Whether ILBs are real assets is debatable. Indeed, ILBs provide some fixed "real" return. In addition, an individual ILB can preserve the real value of some portion of wealth for its tenure. However, ILBs *do not have value in the absence of a monetary system*, which is part of our understanding of real assets.

Ultimately, the inclusion of ILBs or any other inflation-linked bonds in a real asset strategy is a matter of investor taste. Any investor using a basket of ILBs in a real asset portfolio should keep three things in mind. First, the good news is that ILBs are a great diversifier to equities. Second, month-to-month correlation of a basket of ILBs to inflation may be low. Third, while the real return of an individual ILBs is fixed, its expected return may be low (in the same range as any other government bond).[17] Therefore, the attractive expected return levels associated with the real assets reviewed above do not apply to ILBs.[18]

REINSTITUTING A REAL ASSETS EXPOSURE

In several ways, real assets may be a healthy addition to a portfolio dominated by financial or nominal assets such as stocks and bonds. First, real assets may be currently underrepresented in investor portfolios. Second, we show below that real assets have offered modest correlations and good diversification to stocks and bonds. Third, we show below that real assets have exhibited attractive return levels—similar to the return levels associated with a stock/bond mix.[19] Finally, as shown in Exhibit 1, while real assets may not provide a one-to-one inflation hedge, their addition to a stock/bond mix may materially improve the ability of a portfolio to *dominate* inflation over the long term.

For the purposes of this paper, we restrict our analysis to *marketable* real assets— REITs, listed infrastructure and collateralized commodity futures (CCFs). The benefit of using marketable real assets is that we have monthly data of traded indexes that may be used in

[15] Several countries and some corporations issue inflation-linked bonds. The real return would vary by issuer.

[16] The basket of all ILBs is represented by Barclays Europe Inflation-Linked Bond Index returns, sample period January 2000–June 2009.

[17] ILBs are not well suited to active management. The investor should not assume an excess returns in considering ILBs.

[18] It should be noted that ILBs may provide real returns of 4% or higher in some time periods. Indeed, ILBs represented something of a "safe haven" during the recent market decline. Realized returns can differ dramatically from expected returns in times of economic stress.

[19] Correlations over January 1994–June 2009: Real Asset Mix to FTSE AW Europe 0.73, Real Asset Mix to BarCap Global Agg 0.06. Real Asset Mix historical returns in Exhibits 4 and 5. Real Asset Mix expected returns in Exhibit 6.

the portfolios of a variety of investor types, from the most sophisticated institutional clients to retail investors restricted by protocols such as UCITS.[20]

Underrepresented Asset Classes

Real assets, once a primary source and storage of wealth, are woefully underrepresented in investors' portfolios. Equity investors may have a smattering of REITs and a small chunk of listed infrastructure in their portfolios, with no commodities, save some indirect exposure through equities of companies with energy or mining exposures (virtually no exposure to grains or other agriculture commodities).[21] Yet, as observed in Exhibit 2, real assets comprise a material portion of our economy, with real estate, commodities and infrastructure each representing multi-trillion-dollar industries globally. That all assets *should be* represented in investor portfolios was established by Richard Roll in his famous 1977 critique of the capital asset pricing model (CAPM).[22] Because of the Roll Critique, the investment industry now is moving toward accepting the importance of introducing all asset classes into portfolios for completeness and diversification. Yet the Roll Critique also highlights the inaccessibility of some asset classes and the reality that determining appropriate weights is a material issue.[23]

How many individuals can own a farm, a commercial building, a tract of timberland, a bridge, a toll road or an electrical grid?

Marketable real assets

Until the liquidity and diversification potential of real assets became more widely available in listed markets, many of the more traditional illiquid and bulky investments were unattainable for the typical investor. While many can invest in real estate to the extent that they can buy a home, such an investment is rarely diversifiable, nor is it liquid. Moreover, how many individuals can own a farm, a commercial building, a tract of timberland, a bridge, a toll road or an electrical grid? Now that we have REITs, CCFs and listed infrastructure assets, some of this dilemma can be addressed. Unfortunately, many real assets—such as timberland, intellectual property, skill, pipelines and farmland—are largely out of reach for the typical investor. Though not numerous, timberland REITs are available on listed exchanges. Perhaps more methods for including such assets in one's portfolio are on the horizon through Royalty Trusts, REIT-like structures, master limited partnerships, closed-end funds or other means.

Relative size of various asset classes

Addressing the appropriate weight of real assets in a portfolio is still an issue. In Exhibit 2, we can see some relative sizes of the markets in our analysis. Measuring the "size" of real asset markets can be difficult, compared to equity or bond markets.

Indeed, these markets are estimated to be sizable and, according to Roll, investors should strive to own them; however, the appropriate weights in one's portfolio are still a matter of judgment.

The use of 40% CCFs, 30% REITs and 30% listed infrastructure for a real asset mix is somewhat arbitrary. I conducted several optimizations, including maximum return, minimum risk and one minimum correlation to equity, only to discover that the resulting simulated portfolios were largely similar. Because CCFs offer the lowest correlations to equities of the

[20] For details on Undertakings for Collective Investment in Transferable Securities (UCITS), a European protocol for retail investors, see http://www.fsa.gov.uk/Pages/library/index.shtml.

[21] The REITs and listed infrastructure holdings in equity indexes may not be included in actively managed funds; active equity managers may avoid these securities as they seek to outperform their benchmarks.

[22] CAPM was introduced 1964–1966 separately by Sharpe (1964), Lintner (1965) and Mossin (1966). Their analyses were restricted to equity securities and cash. Roll established that owning the "market portfolio" was not to be restricted to equities.

[23] Russell's suite of strategic advice to clients includes the addition of both marketable and private real assets.

three marketable real assets, they are emphasized slightly more to improve diversification.[24] In the analysis below, the allocation to real asset is 20%. I use this allocation to highlight the impact of real assets on a 60/40 mix—it is not intended as a guideline for investors.[25]

Exhibit 2: Size of various asset classes

As of December 31, 2008

Index/market	Information on size
Russell Global Index (equities)	> €21 trillion
Barclays Capital Global Aggregate Index (bonds)	> €19 trillion
Global real estate market†	> €18 trillion
Global REITs market	~ €850 billion
Open interest for CCFs‡	~ €200 billion
Proven oil reserves††	> €31 trillion
Listed infrastructure‡‡	> €1.7 trillion

Indexes are unmanaged and cannot be invested in directly.

† LaSalle Investment Management (2009).

‡ Bloomberg.

†† BP estimates as of end 2007. Energy comprises 34% of DJ-UBS.[26]

‡‡ Keating (2008). Much of the world's infrastructure is owned publicly (by governments).

Diversification

The most important characteristic of real assets is their ability to diversify equity exposure in a portfolio. Real assets, as a group, diversify equities, yet real asset subcomponents can also diversify each other. To illustrate the benefits of diversification via real assets, I include correlation analyses, historical simulations and a "capture ratio" analysis below. In all of these exhibitions, real assets are shown to diversify equities and an equity/bond mix.

It is worth noting that all of the analyses, for the remainder of this section, include data beginning January 1994 and going through June 2009, but also included is analysis limited to the period ending August 2008.[27] Exhibiting the restricted sample period implies a belief that the period August 2008 through June 2009 (hereinafter called the illiquidity crisis) is an anomalous time. As very well stated by de Martel and Kneafsey (2009), the current crisis is a reflection of investors' flight to quality and an extreme demand for liquidity. Because these two factors permeate all asset classes, they are a valid explanation for current return patterns, but not a signal that diversification does not exist. The sample period including the

[24] Correlations over January 1994 through June 2009, in euro: FTSE EPRA NAREIT to FTSE AW Europe 0.66, DJ-UBS to FTSE AW Europe 0.36, S&P Global Infra to FTSE AW Europe 0.73. Correlations over January 1994 through August 2008: FTSE EPRA NAREIT to FTSE AW Europe 0.67, DJ-UBS to FTSE AW Europe 0.32, S&P Global Infra to FTSE AW Europe 0.72.

[25] In adding real assets to a 60/40 mix, I reduce the mix to 80% of the portfolio and supplement with 20% real assets. Investors should consult with asset allocation specialists in choosing what combination of assets and weights are most appropriate.

[26] BP estimates global proven reserves in barrels. As of the end of 2007, BP estimates 1237.9 billion barrels globally. Our U.S. Dollar estimate is calculated conservatively at U.S $35 a barrel.

[27] January 1994 is the beginning of the FTSE All World Europe Index. The Barclays Europe Inflation-Linked Bond Index begins in January 2000, however, such a short period of analysis seems lacking. Therefore, the analysis is inclusive of 1994-1999 though that period does not have inflation-linked bonds. For the 1994-1999 period, I substitute the Barclays Global Aggregate Bond Index for the Barclays Europe Inflation-Linked Bond Index only in the Real Asset + ILB series. All other analysis involving ILB is inclusive of the period starting January 2000.

illiquidity crisis can help you understand the effects of acute crisis on portfolios, while the remainder of the sample period will help in developing expectations for the future in the absence of crisis.

Correlation analysis

As noted above, to simulate a real asset portfolio we combine the following historical indexes: the FTSE EPRA NAREIT at a 30% weight; the DJ-UBS at a 40% weight; and a composite of the S&P Global Infrastructure Index from its inception in December 2001, then backfilled with the UBS Global Infrastructure & Utilities Index to January 1994 at a 30% weight. The diversification benefits of real assets may be observed from historical correlations and simulation. In Exhibit 3(a), we observe the historical correlations of the collection of nominal, financial and real assets discussed above with a mix of 40% stocks and 60% bonds. In Exhibit 3(b), we observe the same collection of indexes compared with Euro CPI.

We can observe from both panels of Exhibit 3 that correlations, amongst asset classes and relative to inflation, have not changed materially in recent times.

In Exhibit 3(a), equities' dominance of a 60/40 portfolio is quite apparent. The low correlations of real assets, and CCFs in particular, is noteworthy as well. In the next subsection, we may observe directly the benefits of adding real assets to a 60/40 mix.

Exhibit 3(a). Correlations of various markets to portfolio of 30% FTSE All World Europe Index, 30% MSCI World Index ½ Hedged, 40% Barclays Capital Global Aggregate Bond Index (BarCap Agg)

Sample period	BC Global Agg.	FTSE AW Euro	MSCI World	EPRA NAREIT	DJ-UBS
July 04–June 09	0.58	0.95	0.89	0.61	0.24
July 99–June 09	0.62	0.96	0.93	0.59	0.32
Jan. 94–June 09	0.70	0.97	0.94	0.64	0.38
	S&P Infra	**Real Assets**	**ILBs**	**RA + ILBs**	
July 04–June 09	0.72	0.63	-0.11	0.59	
July 99–June 09	0.66	0.63	-0.23	0.60	
Jan. 94–June 09	0.73	0.70		0.69	

Exhibit 3(b). Correlations of various markets to Euro CPI

Sample period	BC Global Agg.	FTSE AW Euro	MSCI World	EPRA NAREIT	DJ-UBS
July 04–June 09	-0.23	-0.10	-0.07	-0.03	0.30
July 99–June 09	-0.08	-0.12	-0.08	-0.01	0.25
Jan. 94–June 09	-0.08	-0.12	-0.09	0.02	0.23
	S&P Infra	**Real Assets**	**ILBs**	**RA/ILBs**	
July 04–June 09	-0.02	0.13	-0.10	0.11	
July 99–June 09	0.03	0.13	-0.07	0.12	
Jan. 94–June 09	0.00	0.12	-0.07	0.11	

Data in euros and is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

MSCI World = MSCI World Index ½ Currency Hedged

FTSE AW Europe = FTSE All World Europe Index

S&P Listed Infra = S&P Global Infrastructure Index (December 2001–June 2009) and UBS Global Infrastructure & Utilities Index (January 1994–November 2001).

ILBs = Barclays US Government Inflation-Linked Bond Index.

RA = Real Assets Mix = 30% FTSE EPRA/NAREIT Equity REITs Index + 40% Dow Jones-UBS Commodity Index Total Return + 30% S&P Global Infrastructure Index

RA/ILBs = 75% RA + 25% ILBs

Historical simulation

In Exhibit 4, we observe that adding 20% in real assets to a 60/40 improved the return experience over the sample periods. Over these periods, the portfolio-level volatility is lower as well. The illiquidity crisis, however, materially diminished the beneficial impact of having added real assets to 60/40. Because the illiquidity crisis was a time of dramatic decline for many asset classes (including stocks and the marketable real assets included in this analysis), the low correlations we had observed historically were not experienced. Ultimately, gold and Treasury bonds were the only marketable assets that did not experience significant decline during the illiquidity crisis. In light of such an historic quarter, I devote the last section of this paper to a discussion of current market conditions and expectations for the future.

In Exhibit 4, I show simulated portfolios. In sample period 3, we can observe how dramatic the illiquidity crisis was, and how the high correlations that ensued during that period can increase volatilities and erode the benefits of diversification.[28] In both sample periods, the addition of real assets to the 60/40 mix increases returns, lowers risk and raises the Sharpe Ratio.

[28] Sample period 4 illustrates well the benefits of diversification in a non-event time period. In setting expectations for forward-looking relationships, sample period 4 may be useful.

Exhibit 4: Simulated portfolios with and without real assets

Sample Period Jan. 94 - June 09	Real Assets (RA)	RA/ILBs	60/40	60/40 + RA	60/40 + RA/ ILBs
Annual return	5.68%	6.07%	4.57%	4.87%	4.95%
Standard deviation	12.77%	10.98%	13.34%	12.59%	12.13%
Sharpe Ratio*	16%	23%	8%	11%	11%
Sample Period Jan. 94 - Aug. 08					
Annual return	8.47%	8.17%	5.51%	6.17%	6.11%
Standard deviation	11.45%	10.07%	13.27%	12.40%	12.16%
Sharpe Ratio*	42%	44%	14%	20%	20%

*(Index returns less three-month LIBOR) divided by standard deviation.

ILBs = Barclays Europe Inflation-Linked Bond Index.

RA = Real Assets Mix = 30% FTSE EPRA/NAREIT Equity REITs Index + 40% Dow Jones-UBS Commodity Index Total Return + 30% S&P Global Infrastructure Index

60/40 = 30% FTSE All World Europe Index + 30% MSCI World Index ½ Currency Hedged + 40% Barclays Capital Global Aggregate Bond Index

60/40 + RA = 80% 60/40 + 20% RA

RA/ILBs = 75% RA + 25% ILBs

Calculations using data in euros.

Capture ratio analysis

The return simulations reveal that real assets offer diversification to 60/40 portfolios. In the capture ratio analysis below, we examine how much equity downside or upside is captured by various real assets. Curiously, we note that real assets, while offering attractive absolute return levels, seem to capture much equity downside and little equity upside. For example, EPRA/NAREIT captures some 96% of MSCI World ½ Currency Hedged downside but only 51% of its upside, DJ-UBS captures 72% of the downside and only 12% of the upside, and Global Listed Infrastructure 87% of the downside and 34% of the upside. For the same sample period, the correlations of MSCI World ½ Currency Hedged to the real asset are 0.74, 0.39 and 0.73 respectively.

This particular effect is markedly different in Europe than in the U.S. This difference suggests a currency effect that European investors should understand. While there is a diversification benefit to real assets, the European investor should not presume that real assets offer a strong downside protection to portfolios but rather a downside "softening."

Exhibit 5: Capture ratios of equity market losses

Sample period January 1994 through June 2009

	EPRA/ NAREIT	DJ-UBS	S&P Global Infra	Real assets (RA)	RA/ILBs
MSCI World Index ½ Currency Hedged					
Down capture ratio	96%	72%	87%	86%	81%
Up capture ratio	51%	12%	34%	26%	18%
FTSE All World Europe Index					
Down capture ratio	92%	68%	84%	82%	76%
Up capture ratio	16%	5%	15%	10%	7%

S&P Global Infra = S&P Global Infrastructure Index (December 2001–June 2009) and UBS Global Infrastructure & Utilities
Index (January 1994–November 2001).

ILBs = Barclays Europe Inflation-Linked Bond Index.

RA = Real Assets Mix = 30% FTSE EPRA/NAREIT Equity REITs Index + 40% Dow Jones-UBS Commodity Index Total Return + 30% S&P Global Infrastructure Index

RA/ILBs = 80% RA + 25% ILBs

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

Return Levels of Real Assets

In addition to providing diversification to equity and bond asset classes, real assets have had attractive return levels. From the perspective of the Russell strategic planning assumptions, the 10-year expectation of real asset is as noted in Exhibit 6[29] along with historical returns and standard deviations.

Exhibit 6: Russell Strategic Planning Assumptions (5- and 20-year horizon) and historical returns

	Russell Strategic Planning Assumptions – December 2008		Historical performance January 1994–June 2009	
	10-year Return	Standard Deviation	Return	Standard deviation
60/40	5.2%	n/a	4.57%	13.34%
DJ UBS	5.8%	22.6%	4.78%	15.55%
Global Property	4.8%	16.7%	3.93%	18.22%
Global Listed Infra.	n/a	n/a	7.01%	13.99%
Inflation	2.1%	2.0%	1.99%	0.52%

[29] For information on Russell strategic planning assumptions methodology, see Goodwin and Murray (2007). The numbers in Exhibit 6 are weighted averages of Russell strategic planning assumptions.

Information is based on Russell Capital Markets Research (December 2008). Assumptions are updated regularly and current data may differ.

Please note all information shown is based on assumptions. Expected returns employ proprietary projections of the returns of each asset class. We estimate the performance of an asset class or strategy by analyzing current economic and market conditions and historical market trends. It is likely that actual returns will vary considerably from these assumptions, even for a number of years. References to future returns for either asset allocation strategies or asset classes are not promises or even estimates of actual returns a client portfolio may achieve. The assumptions do not take fees into consideration and all returns are assumed gross of fees. Asset classes are broad general categories which may or may not correspond well to specific products. Additional information regarding Russell's basis for these assumptions is available upon request. Opinions and estimates offered constitute our judgment and are subject to change without notice, as are statements of financial market trends, which are based on current market conditions. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The views and strategies described may not be suitable for all investors.

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

Please see additional disclosures at the end of this document on strategic planning assumptions.

The Russell strategic planning assumptions demonstrate the similarity between an equity and bond mix and a real asset mix on the return scale. The return expectations are high enough to make real assets an attractive addition to a 60/40 mix. Similarly, we observe from historical data that real assets *would have been* incrementally positive to returns and negative to volatility. Diversification need not come at the expense of returns.

Real assets diversify not only an equity and bond mix, but also each other. A collection of real assets dominates any single real asset in terms of return for risk and makes a very attractive addition to a portfolio of equities and bonds. Such an addition has the effect of preserving expected returns, lowering volatility and improving a portfolio's ability to dominate inflation over the long term.

Exhibit 7: Correlations among real assets

Sample Period January 94–June 09	EPRA NAREIT	DJ-UBS
DJ-UBS	0.34	
S&P Infra	0.70	0.41
Sample Period January 94–August 08	**EPRA NAREIT**	**DJ-UBS**
DJ-UBS	0.28	
S&P LI	0.65	0.36

S&P Infra = S&P Global Infrastructure Index (December 2001–June 2009) and UBS Global Infrastructure & Utilities Index (January 1994–November 2001).

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

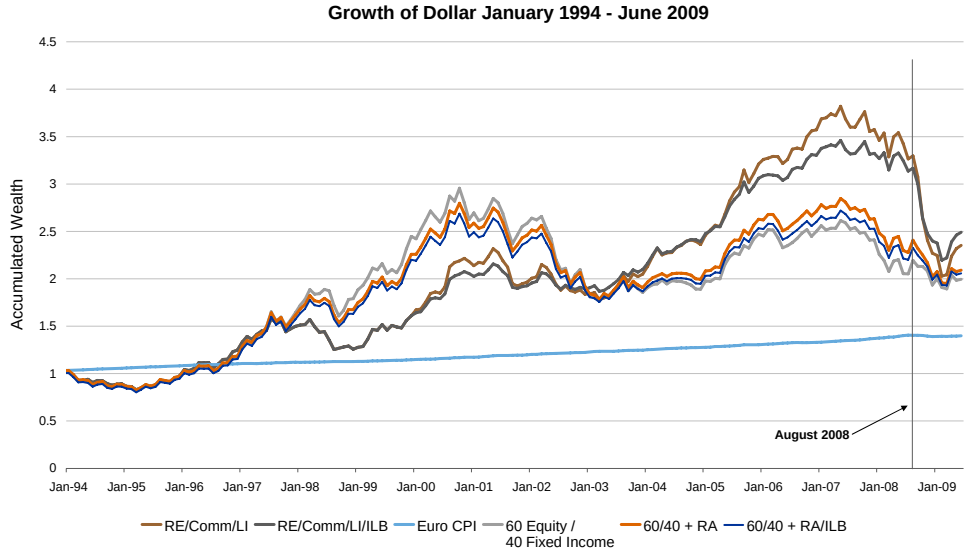
Inflation Protection

Meeting the challenge of inflation is the job of the whole portfolio, not just one component. It is not enough that real assets correlate to inflation; the entire portfolio needs to outpace inflation. As noted above, adding a diversifying collection of real assets to the 60/40 mix has potential to reduce the volatility that could threaten a portfolio's ability to provide positive real return over the long term. In Exhibit 8 we observe the growth of the price level in Europe (Euro CPI) over the sample period January 1994 to June 2009. Inflation was

modest[30] over that sample period, and we see that all three portfolios, 60/40, 60/40 + RA and 60/40 + RA/ILBs indeed outpaced inflation. We also note that volatility is somewhat reduced and the ending surplus over inflation is greater with added real assets or real assets with ILBs. It is not surprising that as of August 2008, illustrated in Exhibit 8 with a vertical line, the surplus for all portfolios was more substantial, as was the benefit of adding real assets. As noted above, the period ending August 2008 is potentially more indicative of future behavior than the period ending June 2009.

Exhibit 8: Growth of Euro Consumer Price Index and various portfolios (in euros)

Sample period January 1994–June 2009



RA = Real assets mix = 30% FTSE EPRA NAREIT + 40% DJ-UBS + 30% Listed Infra.

ILBs = Barclays Europe Inflation-Linked Bond Index.

RE/Comm/LI/ILBs = RA/ILBs = 75% RA + 25% ILBs

Euro CPI = Eurozone Consumer Price Index

60/40 = 30% MSCI World Index ½ Currency Hedged + 30% FTSE All World Europe Index + 40% Barclays Capital Global Aggregate Bond Index

60/40 + RA = 80% 60/40 + 20% RA

60/40 + RA/ILBs = 80% 60/40 + 20% RA/ILBs

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

RE-CAP ON REAL ESTATE, COMMODITIES AND INFRASTRUCTURE

Investors are showing increased interest in the sources of wealth that have represented value for centuries. As we have seen, real estate, commodities and infrastructure are the primary liquid, listed real assets available to many investors. While others may be yet unattainable, these three currently underrepresented asset classes have very attractive features, including diversification and return potential, that lead to better inflation protection

[30] Approximately 0.14% annualized over the sample period.

in a portfolio. Investor interest in real assets is well founded. Moreover, active management of real assets may improve nicely over the index analysis presented above. Active managers may be better able to hold positions, improve diversification and add materially to the returns achievable in the real asset space.

Sophisticated investors should manage expectations for real assets' inflation-hedging potential, because, again, meeting the inflation challenge is the job of the entire portfolio. Through the benefits of low correlations and attractive return profiles, real assets will enhance a portfolio's overall ability to dominate inflation.

Investors are also well advised to diversify real assets—doing so is likely to reduce volatility while preserving potential return levels. In the analysis above I have included a 20% allocation to real assets; a 20% allocation to real assets implies 6% real estate, 8% commodities and 6% listed infrastructure.

Investors better able to tolerate illiquidity may expand their allocation to include private real estate, private infrastructure and a range of other real assets not covered in detail here. Whether the typical investor in real assets can move beyond REITs, CCFs and listed infrastructure remains to be seen. Yet these three are a good start, by offering new and attractive options for investing in the wealth of ages and potentially a good source wealth for the future.

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APPENDIX I – OVERVIEW OF REAL ASSETS

REAL ESTATE INVESTING

Private Real Estate (contributed by John Mancuso)

Compared to its listed counterpart, private real estate is an illiquid asset class. Market conditions dictate overall liquidity in the universe, and extended periods of time may lapse with little or no transaction activity. Within private real estate, liquidity can vary, depending on the structure of an investment portfolio. Separate accounts and closed-end funds directly hold assets, so investor liquidity is determined by the ultimate realization of specific assets. Alternatively, open-end funds are designed to provide investors with regular contribution and redemption windows, though they may also experience periods wherein investor cash flows are suspended due to illiquid market conditions.

With an estimated global market capitalization of € 18.7 trillion,[31] private real estate has become a mainstay in institutional portfolios over the past 20 years, and it merits attention from various types of investors. The attractions of private real estate include the potential for competitive returns, diversification, low volatility and inflation hedging.

Strategies vary considerably in private real estate due to the breadth and depth of markets, property types and investment structures present in the universe. Typically, strategies fall into one of the following three categories.

Core

A core strategy will seek to invest in fully leased commercial properties by use of low amounts of leverage (0-40%). Approximately 70-80% of the total return from core real estate investment is derived from current income, which tends to generate a yield of 6-8%. Investors can access core strategies through separately managed accounts, open-end funds (i.e., those with regular liquidity periods), or closed-end funds. Management fees for core investments differ by structure and geography, but are typically charged as a percentage of net assets (approximately 90 to 135 basis points in the U.S.), and in certain cases there is an incentive component.

Value-added

Strategies of this type involve assets that could potentially become core, but that have some identifiable, curable defect or deficiency. The business plan for a value-added asset would typically provide for an exit to a core buyer once the transaction is completed. The asset could have a substantial amount of current or near-term vacancy; need cosmetic refurbishment to bring it up to market standards; be in an area undergoing gentrification, allowing for an upgrade of the overall tenancy; or be in a development that is fully entitled and substantially pre-leased. Current income is a smaller component of total return (usually up to 50%) and a moderate amount of leverage is applied (30–60%). Investors can access this strategy through separate accounts or open-end funds, but the majority of value-added strategies are structured as closed-end funds. Fees for value-added portfolios usually include a base component, expressed as a percentage of net assets, and an incentive component. Overall fee loads for value-added portfolios typically range from 150 to 300 basis points.

Opportunistic

Opportunistic portfolios are at the high end of the risk/reward continuum and can include a wide variety of strategies. Examples of opportunistic strategies include distressed debt,

[31] Year-end 2008 according to LaSalle Investment Management (2009). p. 44.

speculative development, emerging markets and entity-level investing. Current income is not a significant component of total return and high levels of leverage are usually applied (50–75%). Opportunistic investing is almost exclusively done in a closed-end fund format. Fee structures include a base management fee, charged on committed capital during the investment period and on net invested equity during the remainder of the fund's life, and an incentive component. Fee loads for opportunistic funds can range from 300 to 500 basis points or more.

REITs (contributed by Adam Babson)

By investing in real estate securities, investors can get exposure to the distinctive advantages of property assets—low correlations with other asset classes, potentially strong income returns and reduced volatility—without having to take on the liquidity risk necessitated by private investment structures. Listed real estate investment also facilitates ease of diversification across geographies and sectors, allowing investors to build a fully diversified global real estate portfolio with relatively small capital outlays. The opportunity set for investors is quickly growing larger, as the REIT structure continues to gain acceptance globally (REIT adoption is pending in several countries), and real estate operating companies are sprouting up in the developing economies to fill the burgeoning demand for property development and management.

Real estate securities are publicly traded companies whose value is derived from ownership, development and management of property. While there are several corporate structures for public real estate companies, the vast majority utilize the real estate investment trust (REIT) structure. To date, this structure has been adopted in 19 countries. There are several requirements for a company to qualify for the REIT structure, though there is some degree in variation from country to country. The requirements usually limit the amount of non-real estate businesses a REIT can own, and, most notably, require that the REIT distribute a significant portion of its taxable income (in the U.S., 90%) to shareholders annually in the form of dividends. As a result, REIT dividend yields are typically on the order of four times higher than those of general equity investments. While some REITs (of the mortgage variety) provide debt financing to real estate owners, the vast majority are equity owners. Non-REITs included in the global universe include property developers and real estate operating companies.

The advantages of real estate securities relative to private real estate investment include lower explicit fees,[32] greater liquidity (via daily pricing, rather than appraisal-based valuation), transparency and greater divisibility, all of which facilitate ease of diversification across geographies, sectors and risks. Disadvantages include higher correlations to major asset classes, inability to add value through active management at the property level, higher (nominal) volatility and reduced access to emerging markets and niche sectors.

From a risk-return standpoint, real estate securities are viewed to be attractive complements to existing stock and bond portfolios. This is largely because their dividends, which are based on revenues that are derived from tangible assets—namely, commercial real estate properties—feature relatively stable income streams from leasing activity.

Universe

At year-end 2008, the European Public Real Estate Association (EPRA) calculated that the global listed real estate universe consisted of 1,465 companies, representing €850 billion in market cap. The FTSE EPRA NAREIT Global Real Estate Index, which has emerged as the consensus benchmark used by most managers in the space, had 263 constituents as of year-end 2008, with a free float market cap of €250 billion. The index does not presently

[32] Other fees may be hidden.

include emerging market listings, although many of the companies listed in developed markets (notably Hong Kong operating companies) have material property-level exposure in developing markets. The stocks in the index are in three main regions: North America, Europe and Asia-Pacific, with floating market cap exposures of 42%, 16% and 42%, respectively. The property-type sectors include office, retail, residential, industrial, specialty, self-storage, lodging/resorts, healthcare and diversified.

Investment styles

In contrast to broader equities, where there are discrete investment styles—such as value, growth, GARP, etc.—there is a fairly narrow range of approaches to investing in the real estate securities space, with most managers using a common set of valuation metrics in their company models. As a result, managers' investment approaches tend to vary, largely on the basis of the emphasis placed on certain metrics, including price/net asset value (the difference between a company's stock price and the estimated value of the assets it owns), dividend yield, debt ratios, and discounted cash-flow analysis (based on estimates of net operating income, which is often referred to as adjusted funds from operations, or AFFO, because of the adjustments analysts must make to translate GAAP accounting data into traditional real estate metrics). There is a bit more variation in geographic focus and strategy, as some managers invest in emerging markets and others restrict investment to OECD[33] countries; some assemble "staple-together" global portfolios composed of fully diversified regional portfolios (often with each managed by separate portfolio managers), while others run more concentrated "best ideas" portfolios that are frequently benchmark-unaware.

Manager fees for global real estate securities range from 60 to 100 basis points, depending on the nature of the strategy and risk, excess return objectives (concentrated, "high alpha" products tend to carry higher fees).

All global real estate securities managers offer daily liquidity.

Infrastructure Investing

Infrastructure is a collection of essential assets and services with monopoly status and steady cash flow.[34] Infrastructure assets fall into five primary categories: transportation systems (toll roads, bridges, airports, seaports, rail lines, mass transit, ferry service, pipeline, etc.); energy storage, transmission and distribution (electrical grids, smart grids, pipelines, oil storage, etc.); water (clean water provision, wastewater management, etc.); communications (cellular phone towers, land lines, satellites, etc.); and social infrastructure (schools, hospitals, prisons, government facilities, etc.).

Infrastructure projects may be massive undertakings. Because these projects involve such massive financial commitments, many, particularly in the United States are funded by governments as public projects. In Europe and Asia, private funding overseen by government bodies is far more commonplace.[35]

Throughout history, infrastructure has been provided by both private and government means. The Roman and Inca aqueducts were community- or government-sponsored, and the troll under the bridge in children's fairy tales is perhaps a relic of a private endeavor to maintain a bridge. The U.S. telecommunications system was funded by a private firm, AT&T, while in Europe and Australia, government entities were the funders. As of this

[33] Organization for Economic Co-operation and Development

[34] Monopoly status is not essential for an asset to be considered infrastructure; however, monopoly or near-monopoly status is generally part of an infrastructure specialist's criteria in selecting assets for purchase.

[35] The Obama administration's current stimulus plan notwithstanding.

writing, the current U.S. presidential administration is leaning on infrastructure repair and development as an important component of fiscal stimulus, while many states have recently "unloaded" expensive toll roads to private consortiums.

Also recent is the carving out and acknowledgement of infrastructure as a unique and defined collection of assets. Infrastructure has now found its way into both direct means and listed vehicles.

Infrastructure is classified as a real asset because the underlying assets are physical, with real use to a functioning economy—much like real estate. Infrastructure has elements of property investing, of real usage commanding a fee, of inflation protection due to index-linked fees,[36] and of diversification to financial assets that are highly correlated with market conditions. Infrastructure is the wheels and grease of a functioning economy. Inflation protection and diversification from financial assets will be more prominent in direct infrastructure.

Direct (private) infrastructure

One method for funding infrastructure in the marketplace is through direct (or private) infrastructure funds. These direct funds are generally closed-end limited partnerships devoted to infrastructure projects, possibly along a theme such as region, asset maturity or asset category. Limited partnerships first formed in Australia in the 1980s, when the state of New South Wales sold a toll road to a private consortium led by Macquarie Bank, and in Britain, when Margaret Thatcher pushed through sweeping legislation to privatize a majority of railways, some aspects of the Underground, water, gas, electricity and telecommunications. The hallmark of private infrastructure is large projects involving some element of improvement and/or development. The assets that will be attractive to private investors will have monopoly status (often guaranteed by the government), provide essential services and potentially offer steady and increasing cash flows.

These limited partnerships have much in common with private equity and private real estate partnerships. The areas of similarity are in fee structures (often 2% management fees with 20% share of profits[37]), tenure, co-investment opportunities, liquidity terms and the use of IRR as well as cash-on-cash return-calculation methods. Similar to private real estate, direct infrastructure is expected to offer some inflation protection, especially when asset-usage fees (such as tolls on bridges) are tied to price levels.

While similarities exist, direct infrastructure has some notable differences from private equity or private real estate. First, private equity or private real estate might have dozens of assets in each fund, yet a direct infrastructure fund may be able to support only five to eight projects. The sheer size of infrastructure projects pushes minimums for infrastructure funds to high levels. Often a fund will require a minimum investment of € 7 million or more. Thus, gaining diversification among projects can be difficult for all but the largest investors.

Because infrastructure assets often possess a government-guaranteed monopoly and provide essential services, cash flows are often extremely predictable. These predictable cash flows may induce high credit ratings and result in very reasonable borrowing costs. On the flip side, heavy government involvement may spell close scrutiny on investor returns, potentially resulting in more modest returns than what might be associated with other private markets. Because infrastructure assets provide essential services, economic ups and downs may have limited impact on cash flows. Direct infrastructure funds may therefore offer better diversification potential than other private funds.

[36] It should be noted that in the U.K., the index used may be Retail Prices Index, which may limit effectiveness with regard to inflation hedging.

[37] Return in excess of hurdle—usually 8%.

These direct funds have proliferated in recent years, and the assets they are gathering have also increased as large investors (such as pension funds and endowments) seek to add direct infrastructure to their portfolios. Some sources report upwards of 90 funds raising capital globally, with an average target of €2.1 billion implying upwards of €1.9 trillion of current investments in private infrastructure.[38] The proliferation of direct funds is meeting up with increased supply as cash-strapped governments and municipalities seek to unload costly assets.[39] The current economic conditions have tightened credit markets for many asset classes globally. However, the steady cash flows and government-guaranteed monopolies of infrastructure assets seem to keep credit open to infrastructure financing deals. That said, the competition among banks for financing such deals is reduced, so the spreads charged to infrastructure investors may be larger than in the past. Current leverage levels are hovering around 50–60%, whereas they may have been higher in the past.[40]

Listed Infrastructure (contributed by Adam Babson)

Investing in infrastructure allows investors to get exposure to the diversification advantages offered by tangible, long-lived assets with steady cash-flow streams. A low utilities mix of global listed infrastructure had a 0.06 correlation with Barclays Capital Global Aggregate Bond Index, a 0.29 correlation with the Ibbotson Associates Global ex-U.S. Bond Composite, a 0.73 correlation with FTSE AW Europe Index and a 0.73 correlation with MSCI World Index ½ Currency Hedged.[41] Annualized returns in euros over this period (for the same low-utilities mix) totaled 7.01%, with annualized standard deviation of 13.99%. Listed infrastructure vehicles allow investors to get this exposure without having to take on the liquidity lockup of ten years or more required by private infrastructure investments, and also offer greater transparency, lower fees and greater ease of diversification across sectors and geographies.

Listed infrastructure comprises a universe of publicly traded securities issued by companies that own and/or operate infrastructure assets. While there is, as yet, no industry consensus on exactly how broad the listed infrastructure universe should be, there are several characteristics held in common by stocks that meet a conservative definition of infrastructure. Namely, these stocks, like unlisted infrastructure, feature steady cash flows derived from tangible, long-lived assets with semi-monopolistic pricing power—a function of the high fixed costs and, by extension, high barriers to entry associated with infrastructure construction. Many of the assets are involved in the transportation of commodities or people. Because such services are vital to the fluid, effective functioning of societies, demand for infrastructure assets is highly inelastic.

The distinction between publicly traded and private infrastructure is akin to that between listed and unlisted real estate: listed vehicles offer much greater liquidity and transparency and tend to have lower management fees than private equity investments. Moreover, diversification across regions and sectors may be more easily effected through listed investment, as investors are not obliged to concentrate their allocations in a handful of large assets. Listed infrastructure companies often have lower levels of leverage than unlisted vehicles and feature straightforward tax structures. These advantages are offset in part by a higher correlation to broader equities, a higher level of volatility relative to unlisted assets

[38] Because so much infrastructure is not on the market (because it is publicly owned or sitting in existing funds), this is a very low estimate of market size. Indeed, the publicly owned infrastructure in the U.S. alone would be a multiple of the $2.7 trillion quoted above, which comes from Benham (2008).

[39] JPMorgan Q32008 report.

[40] Preqin Infrastructure Review, 2008.

[41] Idzorek Armstrong (2009). For details on the listed infrastructure mixes used, see the Ibbotson study. Sample period 1990–2007.

and reduced access to “greenfield” investments (assets in development), which tend to be owned by unlisted interests.

Universe

The S&P Global Infrastructure Index comprises 75 companies distributed across three industry groupings and 24 countries. As of December 31, 2008, the index had approximately 44% in utilities, 39% in transportation and 17% in energy (a subset of the utilities universe described above). At the geographic level, the largest weights are the U.S. (22%), Germany (10%), France (10 %), Spain (9%) and Australia (8%). Based strictly on GICS industry classification, the universe—in its broadest incarnation—can be defined as comprising 1,200 stocks.

Investment styles

While listed infrastructure investment manager styles can’t be as elegantly defined as those of broader equities managers—with factor exposures clearly delimiting a growth or value approach—there is a degree of variation, based largely on the approach to universe definition taken by the manager. A few managers have decided to take a conservative view of the space, considering for portfolio inclusion only stocks with the most stable cash-flow patterns and lowest correlations to broader equities. This philosophy is founded on the belief that listed risk exposures should be comparable to what an investor could obtain by getting exposure to “core” private infrastructure. This approach tends to favor the lower beta sectors, such as airports and seaports, toll roads and some of the utilities transmission and distribution companies.[42] On the other end of the spectrum, some managers operate under a much less constrained definition of the space, with a “thematic” view of what constitutes infrastructure and, as a result, a much larger opportunity set. As with real estate securities, there is also some variation in the approach to investing from a geographic perspective: some managers restrict investment to Organization for Economic Co-operation and Development (OECD) countries, while others are willing to take material exposure to emerging economies.

Manager fees for global real estate securities range from 50 to 100 basis points, depending on the nature of the strategy and risk/excess return objectives. All global listed infrastructure managers offer daily liquidity.

Commodities Investing

Commodities are attractive for investors due to their diversification potential,[43] healthy return experience[44] and potential for active return. Similar to currencies commodities, futures markets have a large collection of participants, consumers, producers and indexers, proliferating exploitable inefficiencies that active managers may capture (Baldridge, Meath and Myers, 2000). In addition, commodities are real assets. In other words, commodities returns *should* exhibit low correlations in the future, due to the fundamental differences, such as demand and supply conditions for physical commodities, between equities and commodities markets and market participants. Commodities futures offer exposure to a material segment of the global economy that is absent from many portfolios. Similarly to

[42] Some subsectors—such as power generation—may be ignored altogether by “orthodox” investors looking to minimize volatility and correlations to global equities, while other sectors that are only indirectly related to infrastructure—such as mobile telecom companies—may be included by “thematic” investors looking for enhanced returns.

[43] A 0.23 correlation of DJ-UBS to the Russell 3000 from October 1997 through December 2008, and an 0.08 correlation to the BarCap Agg over the same period. Data in euros.

[44] A 7.61% annualized return over the 10-year period ending December 2008, based on the DJ-UBS Index. Data in euros.

other real assets listed in the main body of this paper, commodities may be noted for their ability to provide some inflation protection for investors.

Commodities indexes

The most typical method for getting commodity exposure is via a commodities index product. Well-known commodities indexes include the DJ-UBS, the Standard and Poor's Goldman Sachs Commodity Index, the Rogers International Commodities and the Reuters/Jeffries CRB. The size of the futures market may be "measured" in a variety of ways. From publicly available data published by Bloomberg LP and the U.S. Commodity Futures Trading Commission, one can extrapolate roughly $300 billion in commodities futures open interest as of December 2008. To put this in the context of the actual size of the commodities market, consider that the same extrapolation would suggest an open interest of $115 billion in oil-related commodities. Yet BP (June 2008) published that proven reserves of oil globally stood at approximately 1,332 billion barrels at the beginning of 2008. At US$ 35/barrel as at December 2008, this estimate suggests a market at € 31 trillion for oil alone. How to take the futures open interest and translate it into an estimate of its proportion of the global economy is beyond the scope of this paper, but $300 billion may be a fraction of the market.

These indexes differ along several dimensions. First, these indexes differ by the number and type of commodity markets they cover. DJ-UBS, which is used in the main body of the paper for all analysis, covers 19 markets.[45] Second, these indexes differ in how they weight the various markets they include. However, energy tends to be a dominating component of several indexes, including DJ-UBS, which has a 2009 target of almost 14% in crude oil alone. The weighting methodology of DJ-UBS includes production, liquidity and caps on individual sectors.

Because holding physical commodities may be impractical, investors often access commodities via collateralized commodities futures (CCFs). CCFs are often divided into four main groupings—agriculture, livestock, industrial/precious metals and energy. Agriculture commodities include corn, wheat, sugar, cotton and coffee. Agriculture is further broken out by some index providers into grains and softs (everything besides grains). Livestock commodities include live cattle, pork bellies, lean hogs, fat hogs and even greasy wool. Metals include zinc, copper, iron, palladium, gold, silver and platinum; index providers often make the distinction between industrial and precious metals. Energy has several subcomponents, such as WTI (West Texas Intermediate Crude—a particular grade of crude oil), heating oil and gasoline.

How to invest in pork bellies

A CCF has three return components – spot, roll and collateral management. The "spot" price is the current (or near-term) price of a commodity. The CCF investor purchases a futures contract (often the front month contract) and replaces that futures contract as it nears expiry, when its price converges to the spot price. By purchasing commodities exposure in this way, the investor gets approximately the spot price (with some variation, due to the difference between futures and spot) and what is termed the "roll." The roll is the gain or loss experienced by replacing a futures contract with a new futures contract prior to expiry. If the roll produces a positive return, the commodity is said to be in *backwardation*. Conversely, if the roll produces a negative return, the commodity is described as being in *contango*.

The third component of a CCF return is collateral management. Recall that commodities exposure is gained through futures, which means the investor must post some margin with

[45] Natural gas, crude oil, gasoline, heating oil, live cattle, lean hogs, wheat, corn, soybeans, soybean oil, aluminum, copper, zinc, nickel, gold, silver, sugar, cotton, coffee.

a prime broker, but is not required to post the full value of the contract. If the investor is required to post 10–20% which is to sit in a margin account, then 80–90% of the value of the exposure is uninvested. The investor may choose to put that 80–90% in Treasuries, short-term cash or any other liquid investment that will be available to meet margin calls. The most typical arrangement is to invest in Treasuries, and all commodities indexes assume such an arrangement. If the collateral goes into in short-term cash, some additional return may be gained via exposure to duration, sovereignty or credit. In recent years, credit exposure proved unprofitable, and Treasuries have gained popularity among commodities investors.

Manager universe

Commodities exposure may be gained via swaps, exchange-traded products (such as exchange-traded funds, commodities and notes), index futures, or through more active means. The least active approach to commodities investing is *enhanced indexing*. Enhanced indexers may utilize “smart” timing on futures rolling, seek out the most attractive futures contract or enhance collateral with a cash-plus strategy. More active managers may take macro bets on individual commodities, avoid contango in front month contracts by moving out on the term structure, play calendar spreads or regional anomalies, avoid unattractive commodities altogether or follow trends. Active managers could be long-biased to capture beta with some added alpha, long-neutral to avoid contangoed markets altogether and long/short to take full advantage of macro bets and trends. Managers who focus primarily on trends in commodities and other futures markets are called commodities trading advisors, or CTAs.

The current universe of enhanced index managers consists of ten or more. Active long-biased managers with a heavy beta component and long-neutral managers number roughly two dozen. While enhanced index managers *will* have daily liquidity and pricing and fees in the 30 to 50 basis point range, active managers *may* offer daily liquidity or be more restrictive with fees in the 50 to 125 basis point range. The collection of fully active long/short and CTA managers is extremely large, possibly in the hundreds. The more active a fund is, the lower the liquidity and the higher the fees will be—with managers often charging 100 to 200 basis points as well as 20% of profits. Because daily pricing and daily liquidity are possible in this space, commodities investing may be available to everyone from the largest institutions to retail investors. However, obtaining some less-liquid products will only be possible for and attractive to more sophisticated investors.

APPENDIX II – CURRENT MARKET CONDITIONS

THE CURRENT ENVIRONMENT FOR INVESTING IN REAL ASSETS

Private Real Estate (contributed by John Mancuso)

The financial crisis is having a material impact on private real estate assets across the globe. Debt capital is nearly impossible to obtain, resulting in a virtual standstill in the transaction market. Due to the appraisal-based system used to determine private real estate values, returns tend to lag public market trends. In the current environment, the sharp sell-off in equity markets, including public real estate, has filtered through to private real estate to varying degrees in different markets due to differences in local appraisal standards. The United Kingdom, with a 36% decline in value observed from the peak, was the first market to reprice, whereas other markets, including the U.S. and parts of continental Europe and Japan, are only beginning to see meaningful value declines. The near-term outlook is negative as the U.S. recession and global economic slowdown reverberate through global real estate markets, which will likely result in continued price declines. Over the longer term, real estate should become better positioned as the global economy recovers, capital markets conditions stabilize and more attractive valuations become available.

REITs (contributed by Adam Babson)

As we move further into 2009, we expect an onslaught of bad news on the economy and real estate markets across the globe, further reinforcing negative sentiment in the REIT sector. We don't anticipate credit markets to assist much in providing debt financing to help distressed owners of real estate; as a result, we see the equity markets providing the capital for refinancing. It is reasonable to expect that IPOs of private real estate portfolios could occur in the next 12 to 18 months, particularly if REIT share prices move to a premium to NAVs. Ultimately, as the underlying real estate market moves into a recovery stage, many publicly traded real estate stocks will be well positioned to take advantage of those opportunities and deliver solid earnings growth. However, the timing of such a decisive recovery remains highly uncertain, and there aren't any obvious catalysts for reversing sentiment in the near term. In the meantime, global diversification, relatively attractive dividend yields (even with possible dividend cuts) and share prices trading well below net asset values should help establish a floor to buffer against additional substantial share-price declines.

Globally, refinancing risk is likely to remain high. Many REITs have cut dividends or opted to pay a portion of dividends in stock so as to preserve cash. Analysts expect that such measures will be embraced by additional companies over the course of the next year as a means of financing near-term debt payments. Companies with the best balance sheets and "dry powder" may be in a position to acquire assets at very attractive terms later in the year as forced selling occurs among distressed owners.

Private Infrastructure (contributed by John Osborn)

Private infrastructure has been more insulated from the events of late 2008 than its listed counterpart. On the supply side, the prospects for private infrastructure are quite good, with a variety of factors—including financing costs, declining tax revenues, listed market disruptions and a smaller pool of buyers— resulting in more assets becoming available at attractive prices. JP Morgan (2008) expects the current higher cost of financing to induce a wave of refinancing at some future time as debt markets stabilize, which would then further boost returns for private infrastructure. On the management side, some funds have

experienced difficulty as a result of recent events in debt markets. Such difficulties among some players will inevitably result in shuffling that will improve the positions of others.

Some big questions remain. For example, how will valuations be impacted by the current environment? (Given the infrequency of appraisals, valuations are likely to decline slowly over the course of a year.) Will government stimulus plans crowd out private capital, or will public/private partnerships become a boon for private infrastructure investors?

Listed Infrastructure (contributed by Adam Babson)

After a further decline in share prices at the close of 2008, infrastructure sectors continue to trade at or near historically low valuations. Operating performance for infrastructure assets, in aggregate, continues to be robust, though highly levered companies have been sold off during the credit crisis and debt financing is not readily available. Sectors with lower GDP correlations, such as toll roads, have held up best during the global economic crisis, while those with higher correlations, such as airports, have suffered.

Infrastructure stocks are trading at attractive prices, and we believe now is potentially a good time to invest. So then, what is the relative positioning of private versus listed infrastructure? It is entirely possible that the downturn in equities has positioned listed infrastructure very well. Given that enterprise value and Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) ratios for unlisted infrastructure assets are significantly higher than those for similar assets in listed space, listed may indeed be as attractive as private infrastructure, or more so.

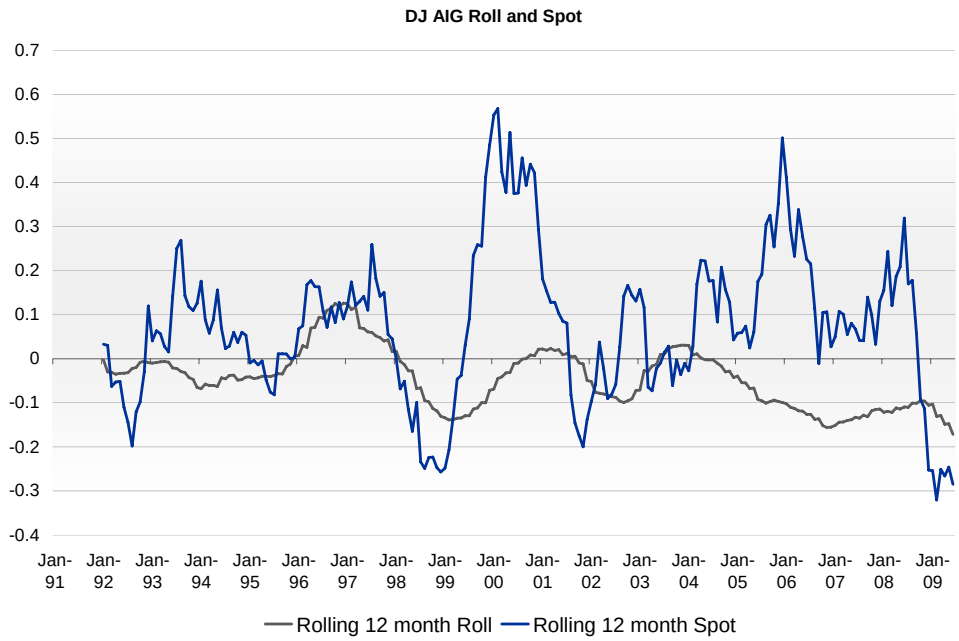
Commodities (contributed by Lee Kayser)

While 2008 showed us some of the steepest declines in the history of commodity markets, 2009 has brought with it some indications of stability and a sense that prices are renewing their relationship with market fundamentals. The primary opportunity looking forward to 2009 relates to the relative valuations we see across commodity sectors. Many commodities are trading at well below their global marginal cost of production figures, and investors reacted to current prices by adding to their long positions in early 2009.

As we can see in Exhibit 9, return drivers in commodity markets continue to be highly volatile, and spot and roll returns alternate in their contribution to total returns at the index level. Active managers should be able to capitalize on this dynamic by adjusting specific commodity over/underweights, as well as their curve positioning and roll timing, to capture the returns available from spot and roll yield.

Exhibit 9: Rolling 12-month spot and roll yield returns for the Dow Jones-UBS Commodity Index Total Return (%). Reported in Euro.

Periods ending February 1992–June 2009



Past performance is not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

A Meltdown in Review

The final illiquidity crisis demonstrated that low correlation does not mean negative correlation and certainly is not a guarantee. De Martel and Kneafsey (2009) note that a flight to quality and extreme liquidity demand were factors in all asset classes and that rising correlations were the result, in spite of underlying fundamentals that make such high correlations unsustainable. In other words, marketable real assets suffered the same fate as equities and credit markets, but such similarities are not sustainable, and diversification among asset classes is still both valid and appropriate.

That having been said, a few tidbits of good news can be gleaned from this research. First, portfolios with real assets would not have done worse than portfolios without them, and in less volatile time periods would have done better. Second, real assets may now be more in line with fundamentals. Third, the potential for investors to diversify into real assets is still there, and doing so may materially improve their portfolio performance over the long run. Combined, these indications bode well for real assets as a strategic allocation.

APPENDIX III – SELECTED EXHIBITS FROM THE PERSPECTIVE OF A UK INVESTOR

All figures in this appendix using data in sterling and relative to UK CPI.

For the Exhibits to follow, please note:

S&P Infra = S&P Global Infrastructure Index (December 2001–June 2009) and UBS Global Infrastructure & Utilities Index (February 1991–November 2001).

DJ-UBS = Dow Jones UBS Commodities Index

EPRA NAREIT = EPRA= FTSE EPRA NAREIT Index.

RA = Real assets mix = 30% FTSE EPRA NAREIT + 40% DJ-UBS + 30% Listed Infra.

Gilts = FTSE Gilt Index.

RE/Comm/LI/Gilts = RA/Gilts = 75% RA + 25% Gilts

UK CPI = UK Consumer Price Index

60/40 = 30% MSCI World Index ½ Currency Hedged + 30% FTSE All Shares Index + 20% Barclays Capital Global Aggregate Bond Index + 20% FTSE Government All Stock

60/40 + RA = 80% 60/40 + 20% RA

60/40 + RA/Gilts = 80% 60/40 + 20% RA/Gilts

BC Global Agg = Barclay Global Aggregate Bond Index

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

Exhibit UK1: Hit rate[46] of various indexes over UK CPI – February 1991-June 2009 (Annualized rolling returns)

	EPRA NAREIT	DJ-UBS	S&P Listed Infra	FTSE All Shares	BC Global Agg	RA	60/40	60/40 + RA
Rolling 3-year	77%	73%	75%	67%	61%	78%	71%	85%
Rolling 5-year	76%	73%	97%	66%	65%	91%	62%	96%
Rolling 10-year	99%	100%	100%	83%	75%	100%	84%	100%
Jan. 94–Aug. 08	100%	100%	100%	100%	100%	100%	100%	100%
Jan. 94–June 09	100%	100%	100%	100%	100%	100%	100%	100%

[46] Hit rate is defined as the percentage of periods of outperformance.

Exhibit UK 3(a). Correlations of various markets to portfolio of 30% FTSE All World Europe Index, 30% MSCI World Index ½ Hedged, 40% Barclays Capital Global Aggregate Bond Index (BarCap Agg)

Sample period	BC Global Agg.	FTSE All Share	MSCI World	EPRA NAREIT	DJ-UBS
July 04–June 09	0.33	0.87	0.97	0.81	0.33
July 99–June 09	0.37	0.91	0.97	0.71	0.31
Feb. 91–June 09	0.54	0.90	0.96	0.73	0.41
	S&P Infra	Real Assets	RA + Gilts		
July 04–June 09	0.89	0.81	0.80		
July 99–June 09	0.73	0.71	0.70		
Feb. 91–June 09	0.77	0.76	0.77		

Exhibit UK 3(b). Correlations of various markets to UK CPI

Sample period	BC Global Agg.	FTSE All Share	MSCI World	EPRA NAREIT	DJ-UBS
July 04–June 09	-0.16	0.18	0.11	0.04	0.13
July 99–June 09	-0.09	0.16	0.07	0.03	0.08
Feb. 91–June 09	-0.04	0.09	0.03	0.06	0.06
	S&P Infra	Real Assets	RA + Gilts		
July 04–June 09	0.05	0.09	0.07		
July 99–June 09	0.15	0.10	0.09		
Feb. 91–June 09	0.08	0.08	0.08		

Exhibit UK 4: Simulated portfolios with and without real assets

Sample Period Feb. 91-March 09	Real Assets (RA)	RA/Gilts	60/40	60/40 + RA	60/40 + RA/ Gilts
Annual return	8.7%	8.54%	8.06%	8.25%	8.20%
Standard deviation	12.84%	10.36%	9.99%	10.08%	9.67%
Sharpe Ratio*	20%	24%	20%	22%	22%
Sample Period Feb. 91–Aug. 08					
Annual return	9.05%	8.68%	6.51%	7.07%	6.98%
Standard deviation	10.67%	8.16%	9.08%	8.86%	8.48%
Sharpe Ratio*	31%	36%	10%	16%	16%

*(Index returns less three-month LIBOR) divided by standard deviation.

Exhibit UK 5: Capture ratios of equity market losses

Sample period February 1991 through August 2008

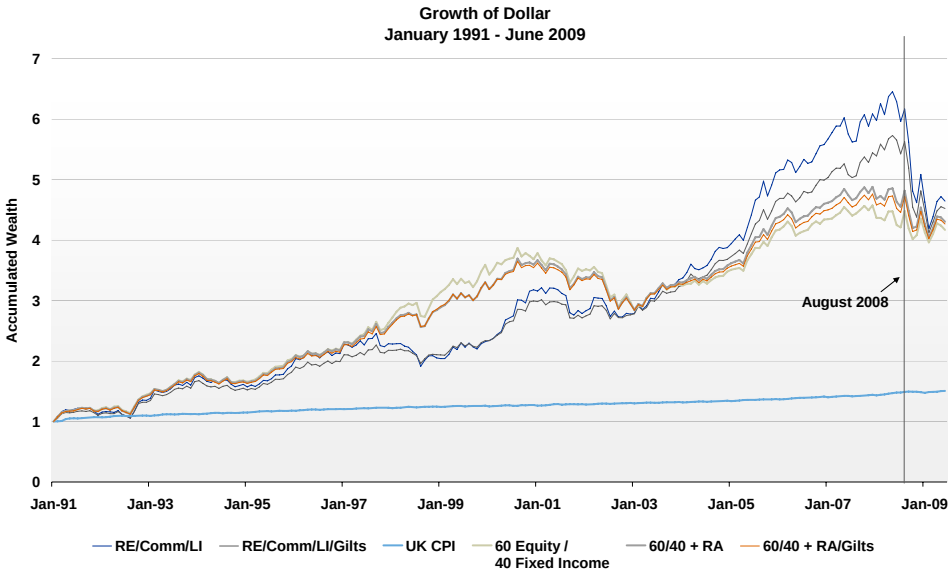
	EPRA/ NAREIT	DJ-UBS	S&P Global Infra	Real assets (RA)	RA/Gilts
MSCI World Index ½ Currency Hedged					
Down capture ratio	94%	70%	86%	84%	73%
Up capture ratio	46%	9%	35%	23%	10%
FTSE All Shares Index					
Down capture ratio	96%	68%	82%	83%	72%
Up capture ratio	64%	10%	37%	28%	12%

Exhibit UK 7: Correlations among real assets

Sample Period February 91–June 09	**EPRA NAREIT**	**DJ-UBS**
DJ-UBS	0.36	
S&P Infra	0.70	0.45
Sample Period February 91–August 08	**EPRA NAREIT**	**DJ-UBS**
DJ-UBS	0.30	
S&P LI	0.64	0.41

Exhibit UK 8: Growth of UK Consumer Price Index and various portfolios

Sample period January 1991–June 2009



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Infrastructure investments seek total return from both capital appreciation and current income through investments in a global portfolio of securities of infrastructure-related companies. The equity investments are mainly common stocks, but may also include other types of equities, such as preferred or convertible stocks, or equity securities of real estate investment companies (REITs). These investments are subject to stock market risk. Because the investments are concentrated in infrastructure-related securities, they have greater exposure to the market, economic, regulatory, political and other risks affecting such entities than a portfolio invested in a broader range of industries. Investing in foreign securities, particularly in emerging markets, presents additional political, economic and market risks, as well as currency fluctuations. Infrastructure investments may also focus on certain geographic regions, thereby increasing them to developments in a particular region. Derivatives may be more volatile and less liquid than traditional securities and the portfolio could suffer losses on its derivative positions. All of these factors may result in a greater share price volatility.

The risk of loss in trading commodities can be substantial. You should therefore carefully consider whether such trading is suitable for you in light of your financial condition. In considering whether to trade or to authorize someone else to trade for you, you should be aware of the following:

> If you purchase a commodity option, you may sustain a total loss of the premium and of all transaction costs.
>
> If you purchase or sell a commodity future or sell a commodity option, you may sustain a total loss of the initial margin funds and any additional funds that you deposit with your broker to establish or maintain your position. If the market moves against your position, you may be called upon by your broker to deposit a substantial amount of additional margin funds, on short notice, in order to maintain your position. If you do not provide the required funds within the prescribed time, your position may be liquidated at a loss, and you will be liable for any resulting deficit in your account.
>
> Under certain market conditions, you may find it difficult or impossible to liquidate a position. This can occur, for example, when the market makes a "limit move."
>
> The placement of contingent orders by you or your trading advisor, such as a "stop loss" or "stop limit" order, will not necessarily limit your losses to the intended amounts, since market conditions may make it impossible to execute such orders.
>
> A "spread" position may not be less risky than a simple "long" or "short" position.
>
> The high degree of leverage that is often obtainable in commodity trading can work against you as well as for you. The use of leverage can lead to large losses as well as gains.

Off-market transactions: In some jurisdictions, and only then in restricted circumstances, firms are permitted to effect off-exchange transactions. The firm with which your adviser deals may be acting as your adviser's counterparty to the transaction. It may be difficult or impossible to liquidate an existing position, to assess the value, to determine a fair price or to assess the exposure to risk. For these reasons, these transactions may involve increased risks. Off-exchange transactions may be less regulated or subject to a separate regulatory regime.

Non-U.S. commodities transactions: Some trading strategies include the use of commodities that are sole in non-U.S. markets. If your transactions are executed on markets located outside the United States, including markets formally linked to a United States market, those markets and the transactions executed in those markets may be subject to regulations which offer different or diminished protection from those offered with respect to transactions executed in the United States. Also, United States regulatory authorities may be unable to compel the enforcement of the rules of regulatory authorities or markets in non-U.S. jurisdictions where your transactions may be effected.

Trading on non-United States exchanges and contract markets involves certain risks not applicable to trading on United States exchanges and is frequently less regulated. For example, some exchanges my not provide the same assurances of the integrity of the marketplace and its participants as U.S. exchanges. In addition, some non-U.S. exchanges are “principals’ markets” in which performance is the responsibility of the individual with whom the trader has dealt; it is no the responsibility of the exchange or a clearing association. Finally, trading on foreign exchanges is subject to the risk of changes in the exchange rate between the United States dollar and the currencies in which the contracts are settled.

PRINCIPAL RISK FACTORS

Commodity trading is speculative and volatile. Commodity interest prices are highly volatile. Price movements for commodity interests are influenced by, among other things: changing supply and demand relationships; weather; agricultural, trade, fiscal, monetary and exchange control programs and policies, international political and economic events and policies, changes in national and international interest rates or inflation, labor activity, crop disease, the purchasing and marketing programs of different nations, currency devaluations, activities of market participants such as hedgers and speculators and emotions of the marketplace. Disruptions in production facilities or supplies of physical commodities may increase price volatility. The supply and demand for physical commodities are influenced by the various economic sectors that require such commodities (e.g., global and domestic industrial, transportation, packaging and construction/building sectors). In addition, governments from time to time intervene, directly and by regulation, in certain markets, particularly those in currencies and interest rates. Such intervention is often intended to influence prices directly. None of these factors can be controlled by an adviser and no assurance can be given that an adviser’s Hill's advice will result in profitable trades for a participating customer or that a customer will not incur losses.

Commodity trading is highly leveraged. Commodity prices are highly leveraged. Because of the low margin deposits which are required in a commodity futures trading account, a high degree of leverage is obtained. Accordingly, a relatively small price movement in a commodity futures contract may result in immediate and substantial losses to the account.

Commodity trading may be illiquid. It is not always possible to execute a buy or sell order at the desired price, or to close out an open position, due to market illiquidity. Such illiquidity can be caused by intrinsic market conditions or it may be the result of market conditions (e.g., illiquidity) and/or the operation of the rules of certain markets (e.g., the suspension of trading in any contract or contract month because of price limits or "circuit breakers") may increase the risk of loss by making it difficult or impossible to effect transactions or liquidate/offset positions. This may increase the risk of loss.

Further, normal pricing relationships between the underlying interest and the future, and the underlying interest and the option may not exist. This can occur when, for example, the futures contract underlying the option is subject to price limits while the option is not. The absence of an underlying reference price may make it difficult to judge "fair" value.

Options. Transactions in options carry a high degree of risk. Depending upon the type of option (i.e., put or call) the extent to which the value of the options must increase for a position to become profitable, taking into account the premium and all transaction costs, can be substantial. If the option is on a future, the futures position with be associated liabilities for margin. If the purchased options expire worthless, the positions will suffer a total loss will consist of the option premium plus transaction costs. If the a trading strategy contemplates purchasing deep-out-of-the-money options, you should be aware that the chance of such options becoming profitable ordinarily is remote. Selling ("writing" or "granting") an option generally entails considerably greater risk then purchasing options. Although the premium received by the seller is fixed, the seller may sustain a loss well in excess of that amount. The seller will be liable for additional margin to maintain the position if the market moves unfavorably. The seller will also be exposed to the risk of the purchaser exercising the option and the seller will be obligated to either settle the option in cash or to acquire or deliver the underlying interest. If the option is on a future, the seller will acquire a position in a future with associated liabilities for margin. If the option is "covered" by the seller holding a corresponding position in the underlying interest or a future or another option, the risk may be reduced. If the option is not covered, the risk of loss can be unlimited. Certain exchanges in some jurisdictions permit deferred payment of the option premium, exposing the purchaser to liability for margin payments not exceeding the amount of the premium. The purchaser is still subject to the risk of losing the premium and transaction costs. When the option is exercised or expires, the purchaser is responsible for any unpaid premium outstanding at that time.

Trading decisions may not attempt to keep commission costs down. Commodities trading programs can average a substantial number of trades in any given timeframe. Commission to equity costs range depending on commission cost. On any particular account, however, this will further depend on any additional commissions, NFA an exchange fees and exchange rates.

An FCM Might Fail. Under CFTC regulations, FCMs are required to maintain customers' assets in a segregated account. If a participating customer's FCM fails to do so, the customer may be subject to a risk of loss of the funds on deposit with the customer's FCM in the event of bankruptcy. In addition, under certain circumstances, such as the inability of another customer of the FCM or the FCM itself to satisfy substantial deficiencies in such other customer’s accounts, a participating customer may be subject to a risk of loss of the funds on deposit with the customer's FCM. In the case of any such bankruptcy or customer loss, a participating customer might recover only a pro-rata share of all property available for distribution to all the FCM's customers. The customer’s adviser will not be held liable for the loss of client funds resulting form failure of the FCM.

Strategic Planning Assumptions - Key limitations

Russell capital market forecasts are adjusted periodically, typically twice a year in January and July. Actual experience may be different.

This analysis assumes a static portfolio asset allocation is maintained. Forecasting represents predictions of market prices and/or volume patterns utilizing varying analytical data. It is not representative of a projection of the stock market, or of any specific investment.

consultants on whom they rely for investment advice specific to their own circumstances.

This hypothetical example is for illustration only and is not intended to reflect the return of any actual investment. Investments do not typically grow at an even rate of return and may experience negative growth.

There are no assurances that the investment goals and objectives stated in this material will be met.

The information, analyses and opinions set forth herein are intended to serve as general information only and should not be relied upon by any individual or entity as advice or recommendations specific to that individual entity. It is not intended to constitute legal, tax, securities, or investment advice, nor an opinion regarding the appropriateness of any investment, nor a solicitation of any type. Anyone using this material should consult with their own attorney, accountant, financial or tax adviser or

On 11/3/08, Barclays Capital announced the rebranding of its unified family of indices under the "Barclays Capital Indices" name. The rebranding changes the name of the index from "Lehman Brothers" to "Barclays Capital".

Dow Jones UBS Commodities Index^{SM} is a broadly diversified index that allows investors to track commodity futures through a single, simple measure. The index is composed of futures contracts on physical commodities. As the index has grown in popularity since its introduction in 1998, additional versions and a full complement of subindexes have been introduced. Together, the family offers investors a comprehensive set of tools for measuring the commodity markets.

The Barclays Capital US Aggregate Bond Index (formerly Lehman Brothers US Aggregate Bond Index) is a benchmark index composed of US securities in Treasury, Government-Related, Corporate, and Securitized sectors. It includes securities that are of investment-grade quality or better, have at least one year to maturity, and have an outstanding par value of at least $250 million.

Barclays US Government Inflation-Linked Bond Index: A part of the Barclays family of global inflation-linked bond indices, the Barclays US Government Inflation-linked Bond Index (US TIPS) measures the performance of the TIPS market. Inflation-linked indices include only capital indexed bonds with a remaining maturity of one year or more.

Russell Global ex-U.S. Index measures the performance of the world's largest investable securities, based on market capitalization, excluding securities in the Russell 3000®. The index includes approximately 7,000 securities and covers 61% of the investable global market.

Standard and Poor's Goldman Sachs Commodity Index is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment. Individual components qualify for inclusion in the S&P GSCI^{TM} on the basis of liquidity and are weighted by their respective world production quantities.

Rogers International Commodities is a composite, USD based, total return index, designed by Jim Rogers on July 31st, 1998. It was designed to meet the need for consistent investing in a broad-based international vehicle. The index is calculated from 36 commodities from 11 international exchanges. The list of commodities is subject to change by the RICI Committee. In general, a commodity will be considered fit to be included in the index if it plays a significant role in worldwide (developed and developing countries) consumption. Consumption is measured via tracking international import/export patterns. If one particular commodity is being traded on more than one international exchange, the most liquid contract globally, in terms of volume and open interest combined, is then selected for inclusion in the index.

Reuters/Jeffries CRB: The history of the Reuters/Jefferies-CRB Index dates back to 1957, when the Commodity Research Bureau constructed an index comprised of 28 commodities that made its inaugural appearance in the 1958 CRB Commodity Year Book. Since then, as commodity markets have evolved, the Index has undergone periodic updates to remain a leading benchmark for the performance of commodities as an asset class. The Index was renamed the Reuters/Jefferies-CRB Index in 2005 when it underwent its tenth and most recent revision - as the collaborative effort of Reuters, the global information company, and Jefferies Financial Products, LLC - to maintain its continued accurate representation of modern commodity markets.

Russell 3000® Index measures the performance of the largest 3,000 U.S. companies representing approximately 98% of the investable U.S. equity market. This index is constructed to provide a comprehensive, unbiased, and stable barometer of the broad market and is completely reconstituted annually to ensure new and growing equities are reflected.

FTSE EPRA/NAREIT Equity REITs Index is an index, with dividends reinvested, representative of tax-qualified REITs listed on the New York Stock Exchange, American Stock Exchange and the NASDAQ National Market System.

The DJ-AIG is composed of futures contracts on physical commodities. The DJ-AIG is composed of commodities traded on U.S. exchanges, with the exception of aluminum, nickel and zinc, which trade on the London Metal Exchange (LME).

The S&P Global Infrastructure Index (LI) includes 75 large, liquid infrastructure stocks from around the world. Up to one-fifth of the constituents are emerging market stocks with a liquid, developed market listing (NYSE ADRs, LSE GDRs or Hong Kong listings of Chinese stocks).

UBS Global Infrastructure & Utilities (GI&U) UBS has developed a group of 85 global indices that provide price and accumulation data for listed infrastructure and utilities companies. These indices provide a price and accumulation index benchmark against which performance can be tracked on an intra- and inter-sector basis. The UBS Infrastructure and Utilities index series is calculated daily by S&P, and is available at no cost to users, including published index attributes. Index data is available from Bloomberg, IRESS and Reuters.

Specific sector investing such as real estate can be subject to different and greater risks than more diversified investments. Declines in the value of real estate, economic conditions, property taxes, tax laws and interest rates all present potential risks to real estate investments. Fund investments in non-U.S. markets can involve risks of currency fluctuation, political and economic instability, different accounting standards and foreign taxation.

Non-U.S. markets entail different risks than those typically associated with U.S. markets, including currency fluctuations, political and economic instability, accounting changes, and foreign taxation. Securities may be less liquid and more volatile.

Bond investors should carefully consider risks such as interest rate, credit, repurchase and reverse repurchase transaction risks. Greater risk, such as increased volatility, limited liquidity, prepayment, non-payment and increased default risk, is inherent in portfolios that invest in high yield ("junk") bonds or mortgage backed securities, especially mortgage backed securities with exposure to sub-prime mortgages.

Please remember that all investments carry some level of risk, including the potential loss of principal invested. They do not typically grow at an even rate of return and may experience negative growth. As with any type of portfolio structuring, attempting to reduce risk and increase return could, at certain times, unintentionally reduce returns.

Diversification and strategic asset allocation do not assure profit or protect against loss in declining markets.

Indexes and/or benchmarks are unmanaged and cannot be invested in directly. Returns represent past performance, are not a guarantee of future performance, and are not indicative of any specific investment.

First used: August 2009