



Sustainability Research Synopsis

INFLATION BEHAVIOR AND REAL ASSETS

April 2016

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Sustainability is the strategic long-term management of resources. We believe sustainability drives economic value, portfolio advantage and alpha returns and intentional positive impact on our environment and community. Each of our real asset investment strategies and portfolios delivers on these macro-trends and economic advantages.

We build proprietary Equilibrium real asset strategies in three sectors:



We seek to generate institutional quality returns and sustainable alpha through our investment manager-operator teams that combine the asset management capability of sophisticated managers with the on-the-ground experience of world-class operators. Over the long term we believe the manager-operator teaming will deliver both superior risk management and returns.

Equilibrium is organized around four functions:

- **Innovate** unique investment products
- **Manage and operate** portfolios of productive real assets
- **Administer and structure** our portfolio to deliver transparency and value
- **Raise and scale** capital from institutional investors

With offices in San Francisco, Portland, and London, we are able to serve our investors, globally.

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Synopsis of Research on Inflation Behavior and Real Assets

Summary

One of the attributes of real assets is that historically they have provided investors with a hedge against inflation risks. Several investors have asked us to characterize and quantify the inflation hedging benefit of real assets. We are not economists, but we do have access to industry and academic research on this topic and specifically how it relates to agriculture. This document provides a synopsis of our research and a bibliography.

Key Conclusions:

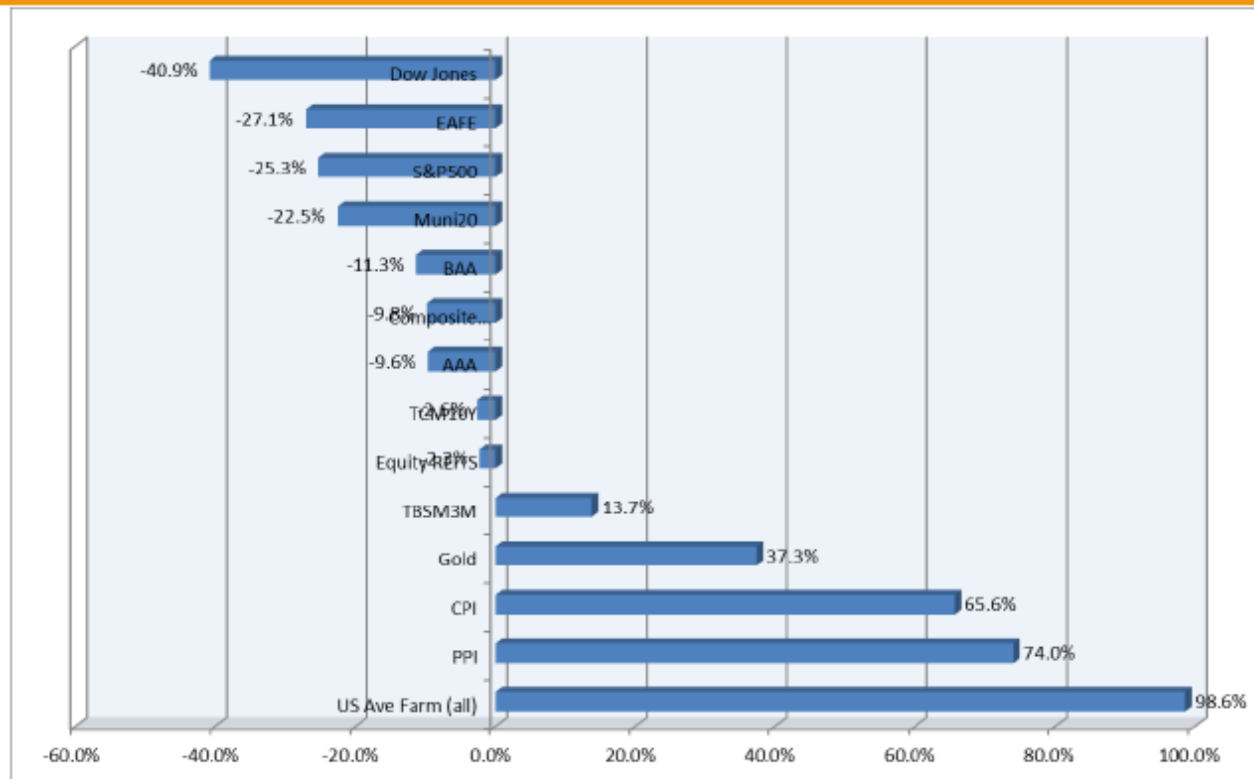
- All real assets perform well during periods of rising inflation.
 - ⇒ The value of these types of investments tends to rise with inflation because of the permanent and tangible nature of real assets.
 - ⇒ The physical resources, goods and services associated with real assets are often linked to inflation. For example:
 - ◆ Real Estate companies are able to raise apartment rents and commercial property leases during times of inflation.
 - ◆ Energy producers with power purchase agreements usually can increase prices based on a defined inflation metric, such as the CPI.
- Farmland provides significant inflation protection. Why?
 - ⇒ Food and other agricultural commodities are major components of inflation. Commodity prices usually rise with inflation, increasing the profitability and land value of farmland.
 - ◆ U.S. farmland total returns outpaced inflation during the 45-year period of 1970 to 2014. According to TIAA's Winter 2016 white paper, the average returns were 10.54% for 1970 to 2014 – more than double the Consumer Price Index (CPI) average of 4%. (See p. 6)
 - ⇒ Population growth globally and rising standards of living in some of the developing countries can be expected to continue to drive the demand for food, and by extension, farmland.
 - ⇒ Farmland is a finite resource. Notwithstanding continued effort to convert forestland and other acreage into farmland, constraints in terms of water, infrastructure, transport logistics and access to markets, among others, will limit practical availability of farmland.
- The statistics vary depending on the time frame, data sources and methodology, but there are numerous reports and studies which cite positive correlations between real assets and inflation. Here is a summary of the data from the reports and articles in this synopsis:

	<u>Timeframe</u>	<u># of Years</u>	<u>Positive Correlation with Inflation (CPI)</u>
⇒ <u>U.S. Farmland</u>			
◆ Professor Bruce Sherrick's analysis (See p. 4)	1970 to 2014	45	.656
◆ TIAA's analysis (See p. 6)	1970 to 2014	45	.65
◆ GMO's analysis (See p. 7)	1994 to 2013	20	.22
◆ Gladstone Land's analysis (See p. 8)	1960 to 1979	20	.63
	1980 to 1999	20	.32
	2000 to 2012	13	.30
	1960 to 2012	53	.33
◆ Verus' analysis (See p. 14)	10 yrs. as of 09-30-14	10	.16
◆ Aquila's & Brookfield's graphs (See pp. 16 & 18)	n/a (data as of 06-30-13)	?	.32 (estimate from graphs)
⇒ <u>U.S. Timberland</u>			
◆ Verus' analysis (See p. 14)	10 yrs. as of 09-30-14	10	.30
◆ Aquila's & Brookfield's graphs (See pp. 16 & 18)	n/a (data as of 06-30-13)	?	.56 (estimate from graphs)
⇒ <u>U.S. Real Estate</u>			
◆ Verus' analysis (See p. 14)	10 yrs. as of 09-30-14	10	.61
◆ Aquila's & Brookfield's graphs (See pp. 16 & 18)	n/a (data as of 06-30-13)	?	.39 (estimate from graphs)

Hedging Inflation with Farmland

- Graph from “Farmland Returns, and the Impact of Big Data,” by Bruce J. Sherrick, Ph.D., TIAA-CREF Center for Farmland Research, University of Illinois, Presentation at the PEI Agri Investor Forum – 2015, Chicago, IL, October 30, 2015 *Note: This report is not available online.*

Farmland: Low Equity correlation, positive CPI and Inflation effects



TIAA-CREF | (US Farmland 26 State Returns 3-year rolling holding periods, 1970-2014)
Center for Farmland Research

ILLINOIS

- Excerpts from “Private real assets: Improving portfolio diversification with uncorrelated market exposure,” TIAA Global Asset Management, Winter 2016 https://www.tiaa.org/public/pdf/A471121_627707-Private-Assets-White-Paper.pdf

⇒ “Diversification: Real assets are powerful diversifiers, with low or negative correlations to traditional stocks and bonds – and to each other (Exhibit 1). As private investments, they tend not to move in lockstep with traditional assets or commodities because they are relatively illiquid and not exposed to speculative trading in public markets.”

Exhibit 1: Correlations of real assets, commodities and REITs (1991–2015)

Real assets had low correlations to other asset classes—and to each other

Market Indexes	Stocks	Bonds	Private real assets			Public commodities and real estate		
	Russell 3000	Barclays U.S. Aggregate	NCREIF Real Estate	NCREIF Farmland	NCREIF Timberland	NAREIT	GSCI Agriculture	Timber proxy
Russell 3000	1.00	-0.03	0.23	0.02	0.17	0.55	0.22	0.62
Barclays U.S. Aggregate	-0.03	1.00	-0.26	-0.43	0.14	0.16	0.10	-0.11
NCREIF Real Estate	0.23	-0.26	1.00	0.40	-0.06	0.13	0.15	0.03
NCREIF Farmland	0.02	-0.43	0.40	1.00	0.18	-0.05	0.01	-0.13
NCREIF Timberland	0.17	0.14	-0.06	0.18	1.00	-0.02	0.11	0.01
NAREIT	0.55	0.16	0.13	-0.05	-0.02	1.00	0.21	0.65
GSCI Agriculture	0.22	0.10	0.15	0.01	0.11	0.21	1.00	0.17
Timber proxy	0.62	-0.11	0.03	-0.13	0.01	0.65	0.17	1.00

Data for the quarters ended 12/31/1991 through 9/30/2015. Indexes in the matrix represent the following markets: Russell 3000 Index—U.S. public equities; Barclays U.S. Aggregate Bond Index—U.S. investment-grade bonds; NCREIF Real Estate Index—privately-held U.S. commercial real estate; NCREIF Farmland Index—privately-held U.S. farmland; NCREIF Timberland Index—privately-held U.S. timberland; NAREIT Index—publicly-traded U.S. real estate companies; S&P GSCI Agriculture Index—a public index representing a range of agricultural commodities; and Timber proxy—a proxy Index created by TIAA that combines the S&P Global Timber and Forestry Index (2004–2015) with the returns of companies representing 4% or more of the index between 1991 and 2003.

Source: TIAA Global Asset Management

⇒ “Higher risk-adjusted returns: For the past two decades, real assets have provided similar or higher returns than stocks with much lower volatility, resulting in higher risk-adjusted returns, or Sharpe Ratios (Exhibit 2). Farmland and timberland also had higher risk-adjusted returns than bonds. Among publicly-traded counterparts, REITs and timber product companies also had similar or higher returns than stocks, but with greater volatility, resulting in lower risk-adjusted returns than private real assets.”

Exhibit 2: Performance of real assets, commodities and REITs (1991–2015)

Real assets had higher risk-adjusted returns versus other asset classes

	Stocks	Bonds	Private real assets			Public commodities and real estate		
	Russell 3000	Barclays U.S. Aggregate	NCREIF Real Estate	NCREIF Farmland	NCREIF Timberland	NAREIT	GSCI Agriculture	Timber proxy
Avg Annual Return	9.26%	6.32%	8.44%	12.10%	10.81%	13.19%	0.34%	8.96%
Std Deviation	17.38%	4.40%	8.67%	7.01%	10.06%	20.93%	20.29%	21.28%
Sharpe Ratio	0.36	0.75	0.63	1.30	0.77	0.49	-0.13	0.28

Data for the quarters ended 12/31/1991 through 9/30/2015.

Source: TIAA Global Asset Management

- **Excerpts from “Private real assets: Improving portfolio diversification with uncorrelated market exposure,” TIAA Global Asset Management, Winter 2016 (continued):**

⇒ “Inflation hedging: Real assets have provided a strong hedge against inflation for two reasons:

“1) Long-term returns have far outpaced the inflation rate; and

“2) Many commodities, such as foodstuffs and raw materials, are components of inflation measures, such as Consumer Price Index (CPI).

“So when inflation rises, commodity prices also tend to go up. Driven by global demand trends, rising commodity prices increase the profitability of farmland and timberland, causing land values to rise and providing a long-term hedge against inflation. Farmland's track record is illustrative. For the 45-year period, 1970 to 2014, farmland returns averaged 10.54% – more than double CPI's 4% average. Farmland's positive correlation with inflation – 0.65 – was higher than government bonds, gold or stocks, which were negatively correlated.”

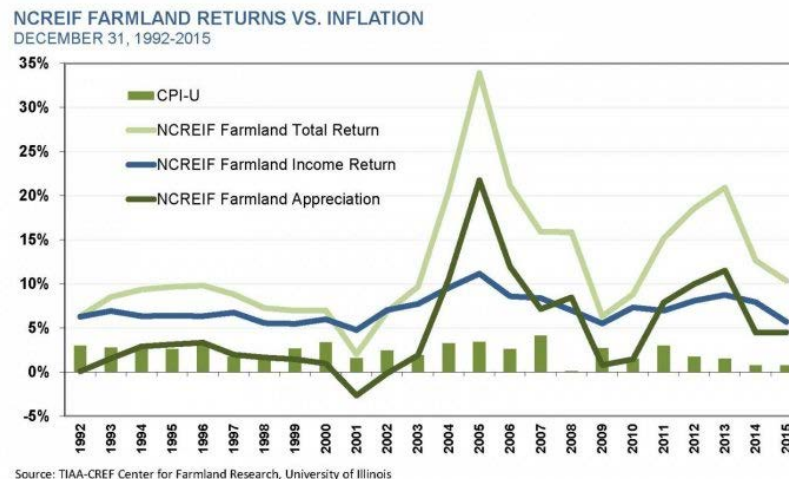
⇒ “Investment implications – and conclusions: Private real assets offer institutions compelling potential to enhance risk-adjusted returns, based on low correlations with other asset classes, and hedge inflation. As long-term investments, their benefits provide some compensation for their relative illiquidity. They can combine bond-like income from land leasing and equity-like returns from long-term appreciation in land values to hedge inflation. In sum, real assets can support asset-liability matching, with potential for improved long-term portfolio returns to meet future obligations – and lower volatility of returns to meet current liabilities.”

- **Excerpts from “Why Agriculture?” Westchester, a TIAA company, Q1-16 <http://www.wgimglobal.com/why-agriculture>**

⇒ “With excellent and stable long-term performance, farmland enjoys a unique position as an investment. It is an asset class that produces competitive returns for its investors, with less volatility than common stocks and corporate bonds. Farmland, including annual & permanent crops, has delivered an annual total return of over 11% over the last 20 years.

“The sector's stability stems from the fact that people's need for food is mandatory and non-cyclical. This asset class has an even greater positive outlook due to a growing worldwide demand for food – particularly grains and oilseeds such as corn, soybeans, and wheat – as populations increase. Rising standards of living in developing countries have led to the emergence of middle classes whose consumption of agricultural products produced by the developed world is increasing.”

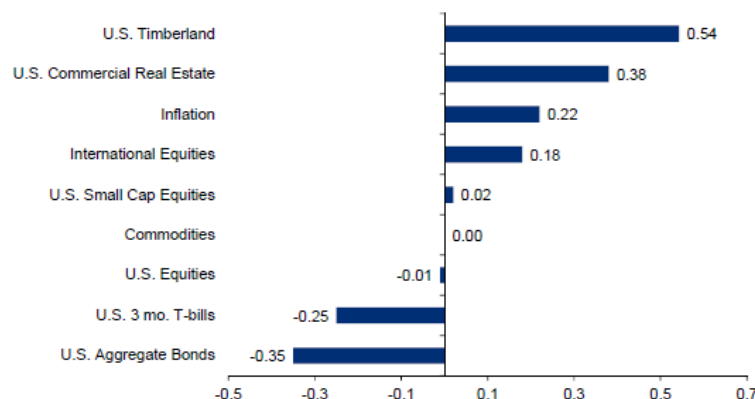
⇒ “Protection Against Inflation – Returns on farmland investments have historically outpaced inflation in a variety of market environments. The NCREIF Farmland Index's Total Return has ranged between double and triple the inflation rate since 1991 as the chart below shows.”



- Excerpts from “A Farmland Investment Primer,” by Julie Koeninger, Product Strategist for Timber & Agriculture at GMO, LLC, July 21, 2014 http://www.advisorperspectives.com/commentaries/gmo_072114.php

⇒ “Farmland is a real asset that combines solid investment fundamentals with the potential for attractive cash yields, inflation hedging, and consistent returns from biological growth. Furthermore, farmland total returns tend to be uncorrelated with financial asset returns, offering genuine portfolio diversification for institutional investors. While institutional ownership within the asset class has grown steadily over the past few years, it still accounts for less than 1% of total global agricultural land ownership, presenting significant opportunity for sustainable yield enhancement through targeted farmland investment in certain regions.”

U.S. Farmland Correlation with Other Asset Classes and Inflation
January 1994 - December 2013



Source: Morningstar, NCREIF

⇒ “Summary – Strong demand for farmland can be expected to continue in order to meet the increasing global demand for food, fiber, and energy, as well as to satisfy institutional investor demand for diversifying, inflation-hedging assets that produce a biological yield. Given the relatively fixed supply of land capable of supporting agriculture, an investment in farmland can reasonably be expected to both generate current income and increase in value over the long term. While a range of strategies is available, a disciplined, value-oriented approach that targets globally diversified farmland portfolios with a commitment to environmentally sustainable management practices offers the advantage of avoiding near-term regional ‘bubbles,’ while enhancing agricultural productivity and farmland value for the long term. ...”

- Excerpts from “Emerging Themes In Alternative Investments: Farmland As An Asset Class Part I,” by Glyndon Park, Gladstone Land, Seeking Alpha, September 1, 2014

<http://seekingalpha.com/article/2463295-emerging-themes-in-alternative-investments-farmland-as-an-asset-class-part-i?page=2>

⇒ “Farmland is a unique asset class demonstrating low correlations to traditional asset classes, and which performs well as inflation rises. Institutional investors seeking ‘shock absorption’ through alternative asset classes will likely increase allocations to farmland and continue to drive valuations higher. ...”

⇒ “From a portfolio point of view, farmland is a highly efficient asset class.

- ◆ “Historically low correlation suggests farmlands’ incremental returns are achieved with little additional portfolio variance.
- ◆ “Farmland performs well during periods of high inflation, and is desirable for many portfolios exposed to inflation from a factor risk perspective.”

- Excerpts from “Emerging Themes In Alternative Investments: Farmland As An Asset Class Part I,” by Glyndon Park, Gladstone Land, *Seeking Alpha*, September 1, 2014 (continued):

“Looking at the historical returns below, Farmland had total annualized returns of 11.1% from 1960-2012, compared to 9.5% and 7.7% for equities and corporate bonds respectively. Farmland outperformed stocks and corporate bonds comparatively during the twenty-year period of 1960-1979 on both an absolute and risk-adjusted basis. In the twenty-year period beginning 1980, characterized by declining interest rates, taming inflation, and higher stock prices, farmland underperformed handily, albeit with a much lower risk as measure by standard deviation. During the remaining years through 2013, farmland outperformed both stocks and bonds.”

Table: Historical Returns, Standard Deviations, and Correlations By Asset Class ¹

	1960-1979	1980-1999	2000-2012	1960-2012
Farmland				
Annualized Return	15.3%	5.7%	13.2%	11.1%
Standard Deviation	5.5%	5.4%	9.0%	7.7%
S&P 500				
Annualized Return	6.8%	17.9%	1.7%	9.5%
Standard Deviation	16.5%	13.1%	19.1%	16.9%
Corporate Bonds				
Annualized Return	3.9%	10.7%	9.0%	7.7%
Standard Deviation	7.4%	12.9%	5.0%	9.9%
Farmland Correlation Coefficient				
S&P 500	-.04	.08	.14	-.14
Corporate Bonds	-.02	-.53	-.32	-.39

⇒ “Inflation – Farmland has performed well in periods of inflation, a highly desirable investment characteristic where fixed return investments see real purchasing power greatly reduced. Farmland’s positive correlation is because:

- ◆ “Inflated commodity prices have a positive impact on farming income and farmland capital.
- ◆ “Declining relative currency value has a positive impact on farming exports.

“Farmland performed extraordinarily well in the higher inflation periods of the 1960-1979 sub-period, with an annual return of 15.3% and strong correlation to inflation, 0.63. As inflation declined through the 1980-1999 sub-period, performance and correlation declined yet remained positive. In the final sub period, farmland investment returns reverted higher even as inflation remained subdued, however correlation remained positive along the 1980-1999 sub-period, but well below the initial sub-period levels. ...”

Table: Farmland Returns, Inflation & Correlation Coefficient ²

	1960-1979	1980-1999	2000-2012	1960-2012
Farmland				
Farmland Return	15.3%	5.7%	13.2%	11.1%
Inflation	4.9%	4.0%	2.5%	4.0%
Correlation	0.63	0.32	0.3	0.33

¹ Hancock Agricultural Investor, Morningstar, NCREIF, and Bureau of Labor Statistics

² Hancock Agricultural Investor, Morningstar, NCREIF, and Bureau of Labor Statistics

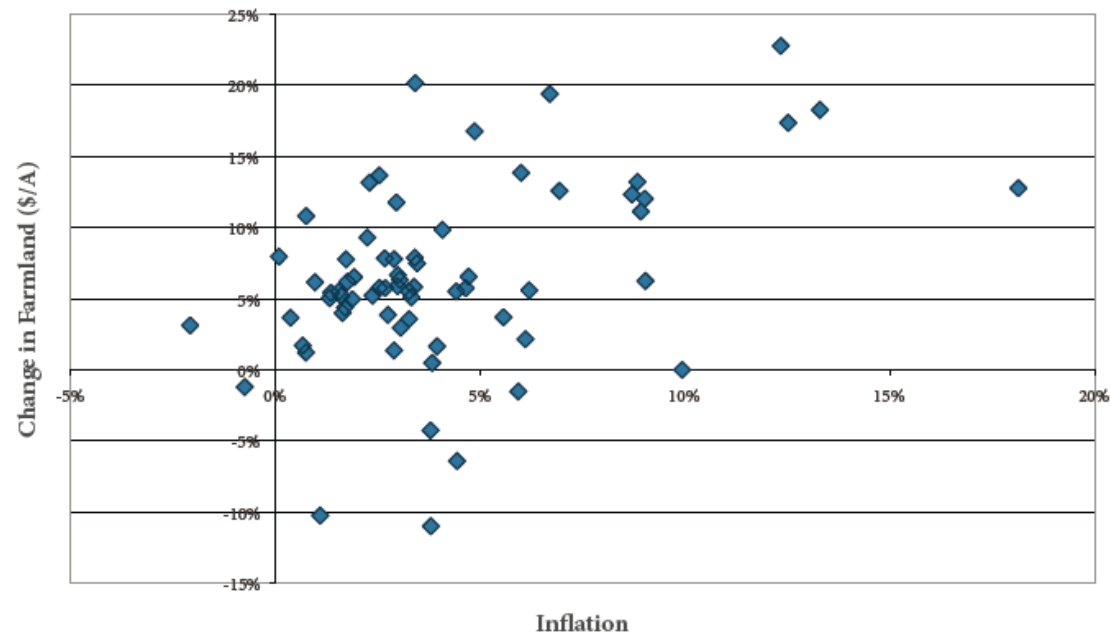
- Excerpt from “The Long Horizon Benefits of Traditional and New Real Assets in the Institutional Portfolio,” Woodcreek Capital Management, February 2010 <http://documents.mx/documents/wccm-real-assets-white-paper-final.html>

“Farmland and Inflation – ... Academics and practitioners have long considered the positive correlation of farmland and associated assets with the overall price level to be an important benefit of investing in farm related assets. ... While most research that brings up the relationship between the returns of farm related assets and inflation merely notes that there has been a historically positive relationship between farm asset and inflation, the primary economic arguments²³ for this to be so include:

- “1) Farm land is a tangible and scarce asset, with a use value to produce tangible goods;
- “2) Land used for row crop production can be seeded according to highest yielding crops, and therefore can capture price appreciation in particular agricultural sectors (such as food crops or biodiesel crops);
- “3) The price of farm land, particularly in specific regions, reflects the option to convert farm land to other uses (such as residential or commercial real estate);
- “4) Farm land generates a significant amount of cash flow, which is typically not the subject of significant multi-year price contracts, which lowers the inflation risk (in the same way as, *ceteris paribus*, a floating rate note has lower duration than a fixed coupon instrument); and
- “5) Increasing demand for agricultural product from developing economies is broadly linked to demand for other commodities that collectively may contribute to US price inflation.

“There is some empirical research, such as Moss [1997], which sets itself to the task of showing that inflation actually ‘explains’ changes in farm assets. Figure 20 presents a scattergram of annual changes in the price per acre of US Farm Land against CPI, gives some initial indication that, in fact, there does appear to be a long run relationship between the two quantities.”

Figure 20: Annual Changes in US Farmland Value Versus Inflation 1941 - 2008



Source: USDA, CRSP

- **Excerpt from “The Long Horizon Benefits of Traditional and New Real Assets in the Institutional Portfolio,” Woodcreek Capital Management, February 2010 (continued):**

“More detailed research on the return properties of farmland assets requires consideration of available data. Readily available data on farmland returns can be divided into two types: data that covers land value only (USDA Farm Land Value series [1913-present]), or data that covers all major sources of income associated with farmland, including agricultural proceeds (NCREIF Farmland Index [1992-present]). The Farm Land Value series has the advantage that it includes data from all 48 continental US states, and covers a wide range of macroeconomic cycles; the NCREIF data has the virtues of economic completeness and represents estimates of returns to actual investments, but is based on a relatively small number of properties and is only available since 1992. Therefore, we provide estimates based on both.

“We begin by estimating the inflation sensitivity of the value of Farm Land itself to inflation, for the long period 1941-2008. We estimate using two methods: 1) using the USDA Farm Land Value series for the US as a whole; and, in order to test the representativeness of that series,²⁴ and increase the statistical confidence of our estimates, we estimate the sensitivities 2) using pooled state by state information on Farm Land Value. The results are highly consistent, showing that farmland prices rise with both expected and unexpected changes in inflation.”

Figure 21: Sensitivity of Farm Land Value to Inflation (1941-2008)²⁵

	Expected Inflation	Unexpected Inflation
US	1.42	0.66
<i>Pval</i>	0.00	0.01
Pooled State-Level Estimate	1.39	0.65
<i>Pval</i>	0.00	0.00

Figure 22: Inflation Hedge Ratio for Farm Land Value

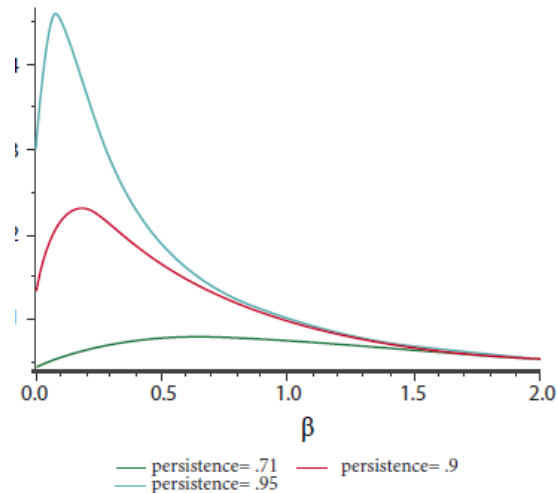
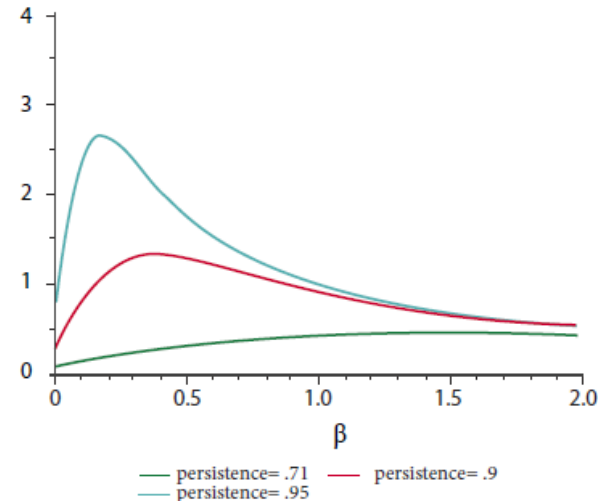


Figure 23: Inflation Hedge Ratio for Total Farm Returns



- **Excerpt from “The Long Horizon Benefits of Traditional and New Real Assets in the Institutional Portfolio,” Woodcreek Capital Management, February 2010 (continued):**

“Estimates based on these annual series parameterize our hedge ratio equation as $\beta > 0$, $\sigma\epsilon = 6.3\%$, and $\sigma\eta = 2.9\%$, and $\phi = .66$. For all values of $\beta > 0$ we have a positive hedge ratio for Farm Land values.

“We can also take advantage of the availability of state-by-state data on farm land values to ask: 1) is there any systematic relationship between sensitivity of farmland values to expected inflation and sensitivity to unexpected inflation? 2) are there some states which have farm land with more preferable inflation properties? The answer to 1) is ‘no’, as the correlation between state level sensitivity to expected inflation is near zero with its sensitivity to unexpected inflation. As to 2), we identify those states with above median sensitivities to both unexpected and expected inflation, and find: AL, CA, IA, IL, IN, MN, MS, NE, NM, OK, UT, WA, WI, WV, and WY. Interestingly, we find no East Coast states in this list (except WV).

“We next estimate the sensitivity of total farm returns from quarterly NCREIF data, available from 1992-2008. Because of the high level of persistence²⁶ in the NCREIF Farmland Index, which is likely in part due to the use of appraisal values, we estimate our sensitivities to expected and unexpected inflation allowing for ARMA errors. From this data, we have: $\beta > 0$, $\sigma\epsilon = 6.8\%$, and $\sigma\eta = 1.8\%$, and $\phi = .32$, with our point estimate of $\beta = .62$ ($p = .20$). These results are weaker, but largely consistent²⁷ with results for our long-horizon, farmland-only series, especially given the relatively benign macroeconomic environment for the period 1985-2007, which is known as the ‘Great Moderation’.²⁸

“Thus, based on general evidence, we find that farm land, and, to a lesser extent (due to limitations on data), farm land assets, offer institutional investors an investment asset with positive expected returns that may also function as a hedge against inflation risk.”

“23. We do not address academic arguments, such as that of Feldstein [1980], for the positive correlation between inflation and land prices. These arguments rely on highly stylized theoretical constructions – for example that land prices can be explained by the optimal actions of a single representative economic agent – which we do not believe to be robust.”

“24. There is a meaningful amount of heterogeneity in state-by-state returns to farmland—a principal components analysis indicates that the largest common factor explains 55% of return variation across states.”

“25. Pooled estimates are based on 1941-2003, since USDA state level data for 2003-2004 appears to include erroneous observations. Other estimation results given below that use state level data also use this date range.”

“26. An Augmented Dickey Fuller test of the null hypothesis that there is a unit root in the data cannot be rejected ($p = .53$).”

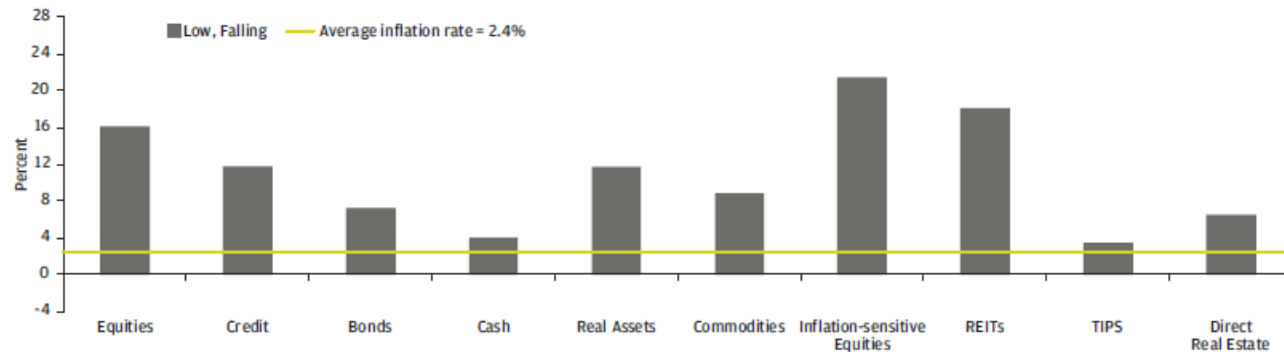
“27. In order to test the consistency between estimates derived from the USDA Farm Land Value index and the NCREIF Farmland index, we would reestimate the inflation sensitivities of the USDA index for the period, 1992-2008, for which the NCREIF index is available. However, since the USDA index is annual, this would leave only 16 observations upon which to base an estimate – far too few to have any reasonable level of confidence in the resulting estimates.”

“28. As we discuss in related research, since 1985, inflation has been relatively modest under the monetary policy regime that has become known as the ‘Great Moderation’. While inflation in the pre-1985 period was relatively volatile, it contained significant predictable components that could be captured and exploited using forecasting models with more complex economic and econometric structure. However, during the period of the Great Moderation, inflation volatility has decreased substantially, with the predictable components of inflation becoming far less significant.”

Other Relevant Reports on Inflation Behavior and Real Assets

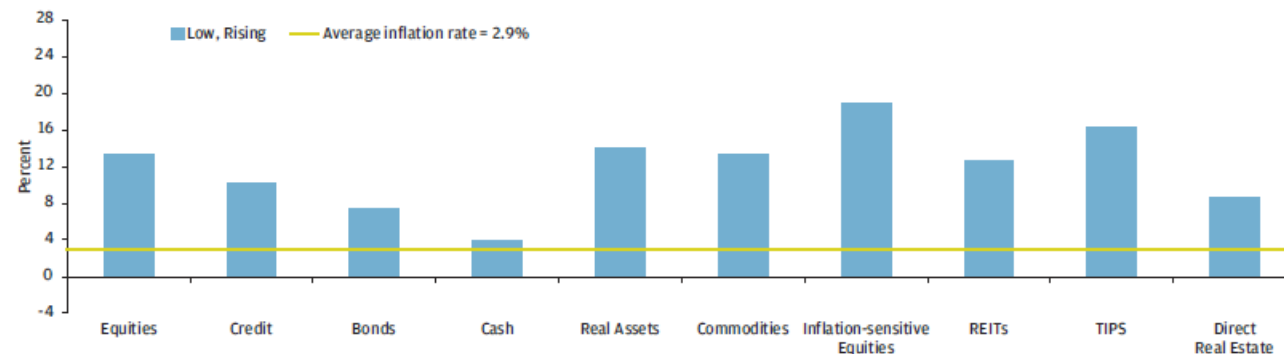
- Graphs from “Keeping It Real: Inflation Risks as an Asset Allocation Problem,” by Maddi Dessner & Katherine Santiago, J.P. Morgan Asset Management, March 1, 2012 <https://am.jpmorgan.com/no/institutional/keepin-it-real-article>

EXHIBIT 6: PERFORMANCE OF ASSETS IN LOW AND FALLING INFLATIONARY ENVIRONMENTS



Sources: Average annualized historical return from 1970 (or earliest available) through December 2011. Equities: Russell 3000 Total Return Index; Credit: Barclays Capital High Yield Index; Bonds: Citigroup U.S. Treasuries All Maturities; Cash: U.S. T-bills 3 month; Real assets: average annualized return of Commodities, Inflation-sensitive Equities, REITs, Direct Real Estate and TIPS; Commodities: Goldman Sachs Commodities Index (GSCI); Inflation-sensitive Equities: HSBC Mining Gold & Energy Index; REITs: MS REIT Index; TIPS: Barclays Capital Inflation Linked Index and TIPS back-tested historical returns estimated from backfilled index (see Appendix 2); Direct Real Estate: NCREIF Index. CPI headline inflation, Bureau of Labor Statistics from 1970 through December 2011. Threshold level between high and low inflation is set at 4% and rising (falling) is defined as the current year-on-year change greater than (less than) the year-on-year change three months prior.

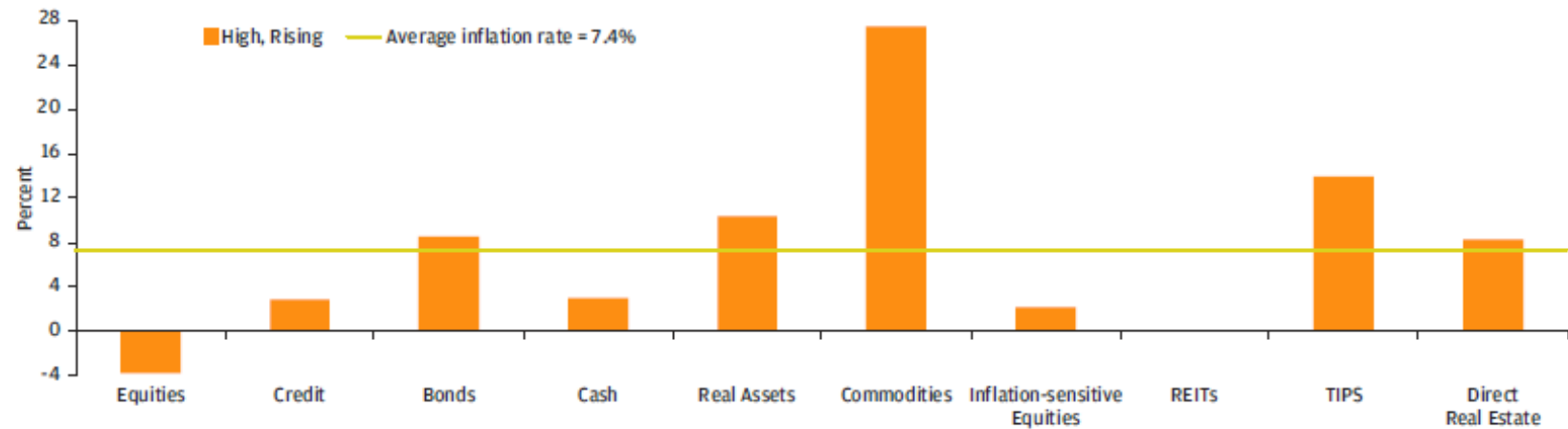
EXHIBIT 7: PERFORMANCE OF ASSETS IN LOW AND RISING INFLATIONARY ENVIRONMENTS



Sources: Average annualized historical return from 1970 (or earliest available) through December 2011. Equities: Russell 3000 Total Return Index; Credit: Barclays Capital High Yield Index; Bonds: Citigroup U.S. Treasuries All Maturities; Cash: U.S. T-bills 3 month; Real assets: average annualized return of Commodities, Inflation-sensitive Equities, REITs, Direct Real Estate and TIPS; Commodities: Goldman Sachs Commodities Index (GSCI); Inflation-sensitive Equities: HSBC Mining Gold & Energy Index; REITs: MS REIT Index; TIPS: Barclays Capital Inflation Linked Index and TIPS back-tested historical returns estimated from backfilled index (see Appendix 2); Direct Real Estate: NCREIF Index. CPI headline inflation, Bureau of Labor Statistics from 1970 through December 2011. Threshold level between high and low inflation is set at 4% and rising (falling) is defined as the current year-on-year change greater than (less than) the year-on-year change three months prior.

- Graphs from “Keeping It Real: Inflation Risks as an Asset Allocation Problem,” by Maddi Dessner & Katherine Santiago, J.P. Morgan Asset Management, March 1, 2012 (continued):

EXHIBIT 8: PERFORMANCE OF ASSETS IN HIGH AND RISING INFLATIONARY ENVIRONMENTS

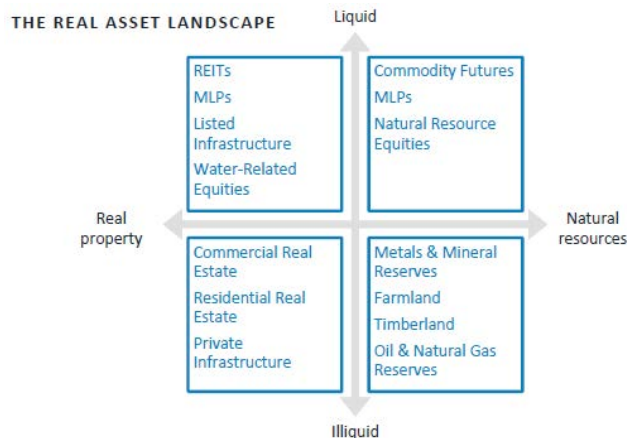


Sources: Average annualized historical return from 1970 (or earliest available) through December 2011. Equities: Russell 3000 Total Return Index; Credit: Barclays Capital High Yield Index; Bonds: Citigroup U.S. Treasuries All Maturities; Cash: U.S. T-bills 3 month; Real assets: average annualized return of Commodities, Inflation-sensitive Equities, REITs, Direct Real Estate and TIPS; Commodities: Goldman Sachs Commodities Index (GSCI); Inflation-sensitive Equities: HSBC Mining Gold & Energy Index; REITs: MS REIT Index; TIPS: Barclays Capital Inflation Linked Index and TIPS back-tested historical returns estimated from backfilled index (see **Appendix 2**); Direct Real Estate: NCREIF Index. CPI headline inflation, Bureau of Labor Statistics from 1970 through December 2011. Threshold level between high and low inflation is set at 4% and rising (falling) is defined as the current year-on-year change greater than (less than) the year-on-year change three months prior.

- Excerpts from “Real Assets Outlook,” Verus, May 2015 <https://www.verusinvestments.com/documents/20150514RealAssetsOutlook.pdf>

⇒ “Executive Summary

- “Inflation remains muted across the globe, and this trend will likely continue. However, because investors continue to face the risk of an unexpected inflation shock, we believe it is necessary to maintain portfolio exposure to real assets.
- “Real asset exposures can provide three key portfolio benefits: inflation protection, a differentiated source of return, and portfolio level diversification. Return and diversification benefits are somewhat independent from inflation protection benefits. ...”



	CPI	S&P 500	BC Agg	60/40 Portfolio	REITs	Listed Infrastructure	MLPs	Real Estate (NPI)	Timberland	Farmland	Commodities	Natural Resources	TIPS
CPI	1												
S&P 500	0.06	1											
BC Agg	0.06	-0.25	1										
60/40 Portfolio	0.07	0.99	0	1									
REITs	0.21	0.77	0.04	0.79	1								
Listed Infrastructure	0.19	0.86	0.04	0.88	0.75	1							
MLPs	-0.05	0.67	-0.03	0.69	0.53	0.74	1						
Real Estate (NPI)	0.61	0.26	-0.17	0.24	0.27	0.30	0.03	1					
Timberland	0.30	-0.11	0.05	-0.10	-0.15	-0.06	-0.28	0.32	1				
Farmland	0.16	0.10	-0.12	0.09	-0.03	0.06	-0.13	0.21	0.75	1			
Commodities	0.39	0.48	-0.15	0.47	0.40	0.55	0.52	0.27	-0.08	-0.11	1		
Natural Resources	0.27	0.70	-0.27	0.69	0.42	0.74	0.59	0.19	-0.02	0.05	0.79	1	
TIPS	0.31	-0.20	0.75	-0.09	0.02	0.10	0.08	0.05	0.01	-0.18	0.20	-0.04	1

Source: MPI, Bloomberg, 10-year correlations as of 09/30/14

⇒ “Farmland

- “Historical returns to farmland have been relatively high over the past two decades (12.7%) and particularly over the past decade (16.7%) as farmland has gained popularity among institutional investors.
- “The institutional market for farmland assets is small relative to other real assets. Of the total \$8 trillion market, less than 1% is institutionally-owned. ...”

5-YEAR FARMLAND RETURN VS. INFLATION ('93-CURRENT)



Source: Bloomberg, as of 12/31/14

Cumulative Returns

	1 year	3 year	5 year	7 year	10 year	15 year	20 year
NCREIF Farmland	12.6	17.3	15.1	13.9	16.7	14.1	12.7

Annual Returns















































































	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
NCREIF Farmland	33.9	21.2	15.9	15.8	6.3	8.8	15.2	18.6	20.9	12.6

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
NCREIF Farmland	9.6	9.8	8.8	7.2	6.9	7.0	2.0	6.9	9.7	20.5




Source: MPI, as of 12/31/14

- Excerpts from “Real Assets Outlook,” Verus, May 2015 (continued):

The Role of Real Assets

	Strategy	GDP sensitivity	Inflation sensitivity	Income orientation	Return enhancing	Risk reducing	Liquidity
Privately-traded real assets	Private real estate core						
	Private real estate value added						
	Private real estate opportunistic						
	Unlisted core infrastructure						
	Timber						
	Farmland / agriculture						
Publicly-traded real assets	TIPS						
	Commodity futures						
	REITs						
	MLPs						
	Listed infrastructure						
	Natural resources equity						
	Water equity						

Note: the summary above was determined using historical averages and correlations on a relative basis within each category,. It is important to note that investments within these asset classes are often heterogeneous and may possess different qualities and sensitivities (see Appendix for further details).

Magnitude	Low/None	Moderate	High
			

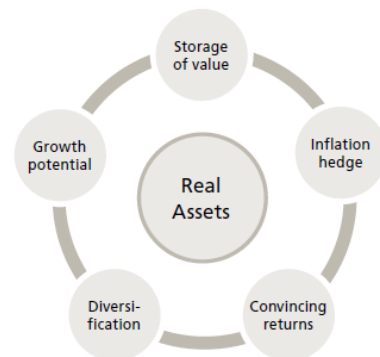
Source: “Real Assets Outlook,” Verus, May 2015

- Excerpts from “Real Assets – The New Mainstream,” Aquila Capital Investment GmbH, 2015

http://www.aquila-capital.de/sites/51bb1bb94603d65165000005/content_entry51dc08dc4603d6340000007d/54e1c3e9b58f6b67de00143a/files/Real-Assets_WhitePaper_english_final.pdf

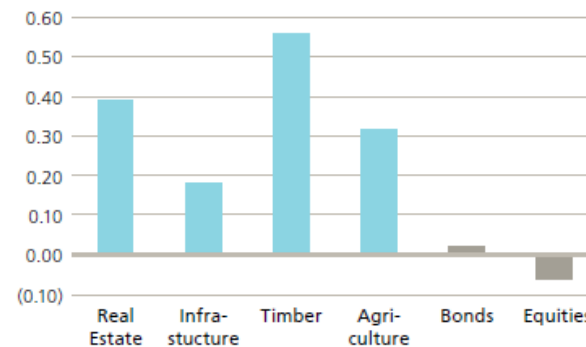
“Inflation Hedge – It is widely accepted that inflation surprises can have a significant impact on asset returns. Whilst many institutional investors have diversified their portfolios away from a simple 60/40 equity and bond allocation model, they often remain heavily allocated to both asset classes. Traditional asset classes such as bonds and equities have fared poorly as an inflation hedge in the past, with nominal bond returns especially vulnerable to inflationary pressures. Real assets, in contrast, have a proven record of being positively correlated with inflation, since they are investments in physical resources that represent the value of goods and services, which is often inflation linked. We believe that the attractive inflation-hedging properties of real assets deserve to make them an important component of a pension fund liability-matching portfolio.”

Key Benefits of Real Assets



Source: Aquila Capital Investment GmbH

Chart 12: Correlation of Different Asset Classes with Inflation



Source: Bloomberg, data as of June 30, 2013

Table 2: Performance of Real Assets in Different Inflationary Scenarios

Annualised Performance (%)												
	„Liquid Real Assets“				Real Assets						Tradtl. Assets	
	Commodities	REITs	TIPS	Senior Loans	Agriculture	Energy Sector	Natural Re-sources	Real Estate	Renewables	Timber	S&P 500	Barcl. US Agg
Inflation > 3.5 %	17.5	-2.5	8.1	0.7	15.8	20.6	27.3	13.1	35.7	21.4	8.9	4.2
Inflation 1.5 - 3.5 %	9.1	17.5	6.6	8	13.3	4.9	10.3	10.4	12.7	13	14.3	6.2

Ann. average performance during inflationary periods: ■ > 15 % ■ < 0 %

Source: IP Real Estate, 1992-2011

- Excerpts from “Real Assets – The New Mainstream,” Aquila Capital Investment GmbH, 2015 (continued):

Agriculture

Table 14: Key Statistics

Typical lifetime of an investment	5 – 10 years	
Cash return	4 – 8%	
IRR	10 – 15 % unleveraged pre tax (core)	
Correlation	Equities	Low
	Fixed Income	Low
	Inflation	High

Source: Aquila Capital Investment GmbH

Timber

Table 17: Key Statistics¹

Typical lifetime of an investment	10 – 25 years	
Cash return	2 – 5%	
IRR	5 – 7% (core)	
Correlation	Equities	Low
	Bonds	Low
	Inflation	Medium

Source: Aquila Capital Investment GmbH

Source: “Real Assets – The New Mainstream,” Aquila Capital Investment GmbH, 2015

- Excerpt from “Real Assets Investing from a Private Markets Perspective,” StepStone, May 2014 *Note: This report is not available online.*
 - ⇒ “Inflation Protection – Most real assets have the potential to provide a meaningful degree of inflation-linked pricing or revenues, or have cost pass-through arrangements that protect margins from the effects of inflation. This inflation linkage can be explicit, as is the case with many regulated utilities, public-private partnerships and commercial property leases, or it can be implicit, as is the case with some commodity-based assets in the energy, minerals, agriculture and forestry sectors.
 - “Explicit (direct) inflation linkage usually occurs where an asset’s regulatory or contract structure provides for pricing or revenue increases in line with a recognized inflation measure, such as a consumer or retail price index. It can also occur when an asset has an ‘off-take agreement’ that allows for the pass-through of input costs and embedded inflation. An example of explicit inflation linkage is a power purchase agreement between an electricity producer and a distributor or commercial customer, where the price received by the producer usually increases based on a defined inflation indicator, such as the Consumer Price Index.
 - “Implicit (indirect) inflation linkage arises from the fact that the real assets universe includes many of the underlying components of inflation indices (i.e., real assets are, or they provide, the production inputs that determine the cost of many goods and services). The essential nature of real assets also means that the price elasticity of demand is generally lower for real assets than for non-essential products and services. For this reason, modest inflation-related cost increases can usually be passed through to end users without any significant change in demand.
 - “In relation to commodity-based sectors such as energy, minerals, agriculture and forestry products, there is a clear long-term relationship between inflation and commodity prices.
 - “Real assets do not provide a perfect hedge for inflation, and there are limits to the degree that rising costs, due to inflation or other factors, can be passed through to end users without impacting demand. However, given the explicit and implicit inflation linkage provided by real assets, such investments can be a beneficial addition to investment portfolios.”

- **Excerpts from “Real Assets: The New Essential,” Brookfield Asset Management, November 2013**

https://www.brookfield.com/Global/42/img/content/File/marketing/private_funds/2013/BAM_WhitePaper_Nov_2013_F_PR.pdf

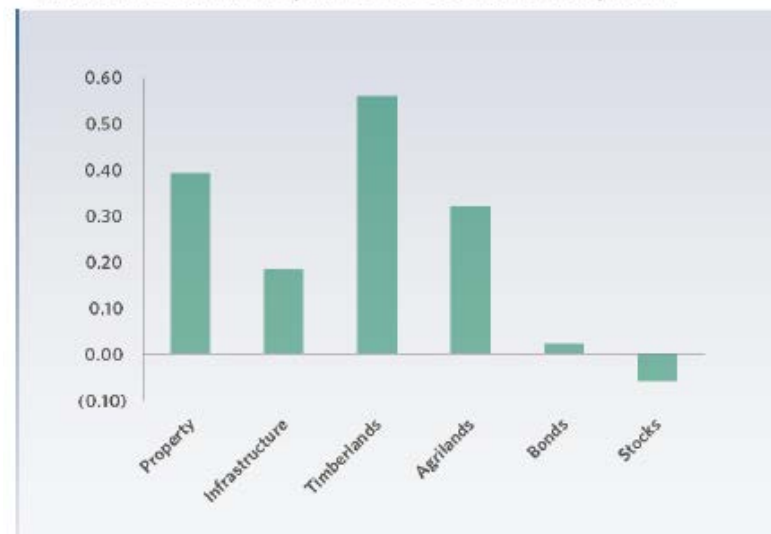
⇒ “Executive Summary – The current market environment is leading investors across the globe to seek an alternative to traditional equity and fixed income investments. Following a multi-year decline in interest rates and recent global financial upheaval, the ability to invest for yield has diminished and the outlook for growth has been generally subdued. With interest rates beginning to rise and the potential for inflation looming, investors are seeking a New Essential portfolio investment to help navigate the market cycles that lie ahead.

“Brookfield believes this pursuit of a new alternative is creating a secular shift toward increased investment in Real Assets. Importantly, we believe that Real Assets offer a relatively unique combination of yield, stability and growth that can provide downside protection as well as upside value creation. Over the course of Brookfield’s experience as an owner and operator of these assets and based upon an analysis of their historical performance, Real Assets have demonstrated a proven ability to enhance overall risk-adjusted returns across market cycles.

“Looking ahead, as investors recognize the benefits of Real Assets, we expect a meaningful shift in asset allocations to occur, which may rival the historic transformation of institutional investment from fixed income to equity securities. We expect this trend to accelerate materially over the course of the next decade, with allocations to Real Assets reaching 20% to 30% of portfolios by 2030, with some institutional investors allocating upwards of 50% to the asset class.

“Based upon recent investment trends and fundraising activity, we believe this transformation is underway and expect that it will continue to grow as investors recognize and appreciate the attractive, long-term benefits of Real Asset investment. Within the constraints of the current market environment and across future challenges, we believe Real Assets can generate compelling risk-adjusted returns, provide attractive capital appreciation and deliver important diversification benefits. Accordingly, as investors move beyond the ‘New Normal’, we expect Real Assets to emerge as the New Essential.”

Exhibit 15: Correlation of Asset Class Returns with Inflation



“Source: MSCI, Barclays, Bloomberg, NCREIF, S&P Dow Jones Indexes, U.S. Bureau of Labor Statistics; data as of June 30, 2013; represents the correlation of annualized returns for Property, Timberlands, Agrilands, Bonds and Stocks with historical Consumer Price Index over the duration of data available for each index; represents correlation of quarterly returns for Infrastructure with historical Consumer Price Index given the limited time series of data.”

- **Excerpts from “Real Assets: The New Essential,” Brookfield Asset Management, November 2013 (continued):**

⇒ “Hedge Against Inflation – With inflationary concerns on the rise, we believe Real Assets represent an attractive investment in long-lived, physical resources that tend to increase in value as land and input costs rise. Additionally, Real Asset revenue streams often respond favorably to higher inflation, as shorter term contractual revenues (i.e., one-year apartment leases) benefit from frequent resets while longer term lease structures (i.e., 30-year airport concessions) often include regularly scheduled rent escalations linked to inflation. Importantly, end-user demand tends to be relatively inelastic and often insulated from inflation, due to the essential nature of the goods and services provided by Real Assets. Indeed, demand often increases during inflationary periods, particularly when rising prices are spurred by economic growth and improving levels of employment and consumption. As a result of these various drivers, Real Asset returns tend to exhibit greater correlations with inflation than traditional investment alternatives.”

⇒ “Real Assets in a Rising Interest Rate Environment – Recent developments in global capital markets have led to the potential for rising long-term interest rates, which has brought to the forefront the question of Real Asset performance in a rising rate environment. ...

“We firmly believe that Real Assets are uniquely positioned to generate attractive performance across various market cycles, due to their generally stable, long-term, contractual revenue streams combined with considerable leverage to economic growth. During periods of higher nominal interest rates ..., we believe the increased revenues from these assets will more than offset any potential valuation decline from rising discount rates.

“In gaining an appreciation for the performance of Real Assets across varying cycles, it is essential to understand the impact of interest rates and inflation on each of the main value components of an investment.

- ◆ “First, Real Asset revenue streams are positively impacted by interest rates and inflation in several ways. Infrastructure and power assets tend to operate under regulated and contractual revenue agreements that span several decades. These agreements often contain either direct, explicit inflation linked revenue increases or revenue growth formulas that are derived from interest rates and/or inflation. The revenue streams derived from in-place commercial property leases also tend to perform favorably in an inflationary environment, as lease rolls lead to higher revenues while rising replacement costs lead to higher asset valuations.
- ◆ “Secondly, interest rates remain very low and fixed interest rate loans enhance equity returns as revenues increase. The economic effect of debt revaluations accrues to owners and can create meaningful embedded value. Long-term, fixed rate debt with a low coupon is beneficial in a rising interest rate and inflationary environment, due to the stable nature of the debt service payments relative to higher revenues.
- ◆ “Thirdly, Real Asset expenses tend to grow more slowly than revenues. While the revenue implications of rising interest rates and inflation tend to be positive, the impact of expense growth is often more subdued or passed on to end users. Additionally, Real Assets tend to require low sustaining capital expenditures, which helps to minimize overall expense growth.
- ◆ “Lastly, in anticipation of interest rate increases, capitalization rates for Real Assets did not decrease as much as fixed income yields in recent years. Asset valuations are generally based upon cash-flow projections discounted at an appropriate, risk-adjusted rate of return. This discount rate is, in turn, influenced by both the level of benchmark interest rates and the level of demand in the investment marketplace for the asset class. We expect that as bond yields rise, Real Asset capitalization rates will lag this movement, as they have maintained wider spreads to absorb interest rate increases.

“In summary, we expect Real Assets to produce positive and consistent performance and stable cash flows over the long term, irrespective of interest rates movements or capital market cycles. While short-term volatility will ebb and flow, Real Assets will remain the New Essential.”

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