An Examination of Farmland Performance During Periods of Economic Turmoil

I. Introduction

The current investment environment for institutional investors is characterized by historically low interest rates, highly erratic equity markets, and an overwhelming sense of economic uncertainty, which is largely attributable to the prevailing political circumstances and the COVID-19 pandemic. As a result, now more than ever, investors are attempting to diversify portfolios and preserve capital by increasing their exposure to hard assets. While institutional investment in US farmland has grown from $2.3 billion to $11.7 billion over the past ten years, institutional ownership is estimated to only account for less than 2 percent of the total value of US farmland.

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The low rate of institutional ownership presents both opportunities and challenges for farmland investment managers. The opportunity to increase institutional ownership is straightforward, but the challenges, especially the need to inform investors about the full range of benefits associated with entering a seemingly complex asset class, are more difficult to overcome.

This article reviews the National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index, highlights the positive aspects of farmland returns within the context of a broader portfolio, and examines the historic performance of the asset class during periods of adversity.

II. Overview of NCREIF Farmland Index

The advent of the NCREIF Farmland Index in 1995 laid the foundation for establishing farmland as a credible asset class. Over the past decade, the index increasingly has been referenced in academic articles and leveraged by institutional investors seeking to enter the space or measure the relative performance of their farmland portfolios. The NCREIF Farmland Index now reports eight institutional farmland investment managers' performance and currently is comprised of 1,175 properties, which had a combined market value of just over $11.9 billion as of June 30, 2020. While the index has its shortcomings, such as its exclusive focus on U.S. farmland assets and its dependency on annual appraisals, it has nonetheless become the bellwether source of metrics for tracking and analyzing farmland investment performance.

III. Why Invest in Farmland?

Farmland assets have many unique and beneficial attributes. In addition to potentially garnering returns from capital appreciation, investors receive annual cashflows from lease payments and, or crop sales. Furthermore, with proper management, the productive life of farmland is infinite. As a long-duration asset, investors have often participated in the asset class to offset long-term liabilities.

As for its performance, farmland has historically generated low, double-digit returns, with lower variability than other traditional asset classes. Farmland returns also have correlated positively with inflation and have tended to rise during periods of high (above 6 percent) and medium (between 3 and 6 percent) inflation. Lastly, farmland returns tend to show negative or low correlation with the returns of traditional financial assets, such as equities and fixed income, which may help investors mitigate financial market volatility. The following provides more background and detail on the unique characteristics of farmland returns.

Attractive Risk-Adjusted Returns

Figure (1) displays various metrics for eight asset class return indices between 1991 and 2019. Column (8) shows how farmland posted the second-highest annualized return at 11.1 percent, and the second-lowest standard deviation of returns at 6.7 percent, during the 29-year period of analysis. The resultant coefficient of variation for farmland was the lowest of all eight indices, which indicates that farmland returns deviated the least amount from its mean return during the period, after adjusting for scale. Coupling the lowest relative return volatility with the second-highest annualized return, and the fact that farmland did not post a negative annual return from 1991 to 2019, supports the argument that farmland has provided investors with attractive risk-adjusted returns.

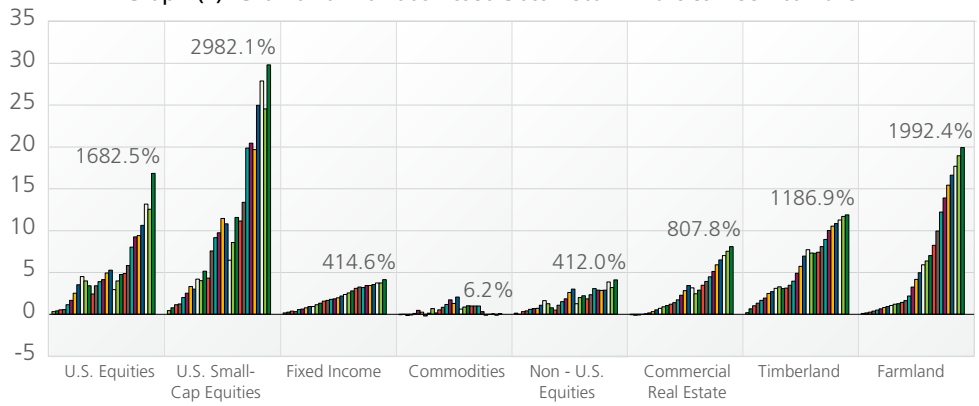
Figure (1) Return Metrics for Various Asset Classes from 1991 to 2019

	U.S Equities	U.S. Small-Cap Equities	Fixed Income	Commodities	Non - U.S. Equities	Commercial Real Estate	Timberland	Farmland
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Annualized Return	10.4%	12.5%	5.8%	0.2%	5.8%	7.9%	9.2%	11.1%
Standard Deviation	17.6%	20.5%	4.9%	24.7%	19.0%	8.0%	9.0%	6.7%
Coefficient of Variation	1.68	1.64	0.84	119.93	3.28	1.01	0.98	0.60
Minimum Return	-37.0%	-36.7%	-2.9%	-46.5%	-43.4%	-16.9%	-5.2%	2.0%
Maximum Return	37.4%	60.7%	18.5%	49.7%	38.6%	20.1%	37.3%	33.9%

Source: S&P, DFA, Bloomberg, MSCI, NCREIF

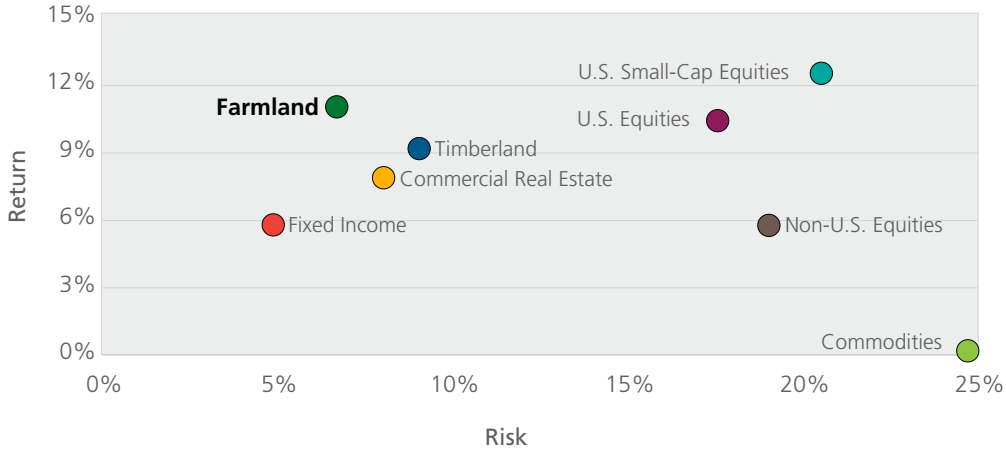
Graph (1) portrays the steady accumulation of farmland returns from 1991 to 2019, while Graph (2) depicts the annualized return and standard deviation of the eight asset classes in terms of risk and return.

Graph (1) Growth of Various Asset Class Return Indicies: 1991 to 2019



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

Graph (2) Historical Risk and Return of Various Asset Class Indicies: 1991 to 2019



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

Inflation Hedge

Policymakers' response to the coronavirus pandemic has been unprecedented, thus far. The US Congressional Budget Office (CBO) updated its budget outlook in September 2020. The CBO now projects the federal budget deficit to more than triple to $3.3 trillion in 2020, which it expects will cause the total amount of federal debt held by the public to increase to 98 percent of GDP in 2020, exceed 100 percent in 2021, and rise to 107 percent in 2023, the latter being the highest rate in U.S. history[1].

"I would expect the Committee to accommodate rather than offset inflationary pressures moderately above 2 percent, in a process of opportunistic reflation".

— Lael Brainard, Federal Reserve Board Governor

The Federal Reserve (Fed) cut rates to zero in mid-March and implemented more than a dozen emergency lending facilities. It also announced that it will begin employing an alternative monetary policy approach to achieve its statutory goals of maximum employment and price stability. Instead of continuing its public commitment to target an inflation rate of 2 percent, the Fed will target an average inflation rate of 2 percent over time. If inflation persistently runs below 2 percent for a period, the Fed will accommodate inflation over 2 percent for some time. Most Federal Open Market Committee members believe the 2 percent inflation target introduced in 2012 unintentionally placed downward pressure on inflation.

Low inflation and low inflation expectations prevent the Fed from raising its nominal policy rate, and further reductions to the current rate may be counterproductive. Therefore, the current low rate of inflation reduces the Fed's ability to use traditional monetary policy to combat economic disruptions.

Jerome Powell, the Chair of the Federal Reserve, also recently suggested that a robust job market can exist without causing excessive inflation. Therefore, it is likely that the Fed's estimate of the non-accelerating inflation rate of unemployment (NAIRU) will have less impact on future policy decisions. Such language guides households to no longer expect rate increases if projected unemployment falls below the Fed's estimate of NAIRU—unless inflation becomes problematic. As Lael Brainard, Federal Reserve Board Governor, said, "I would expect the Committee to accommodate rather than offset inflationary pressures moderately above 2 percent, in a process of opportunistic reflation".

Inflation may not be a significant near-term threat to the US economy. However, an indefinite continuation of the current low inflationary environment is not guaranteed, and some investors have begun contemplating measures to offset the possible adverse impacts that would accompany a bout of moderate to severe inflation.

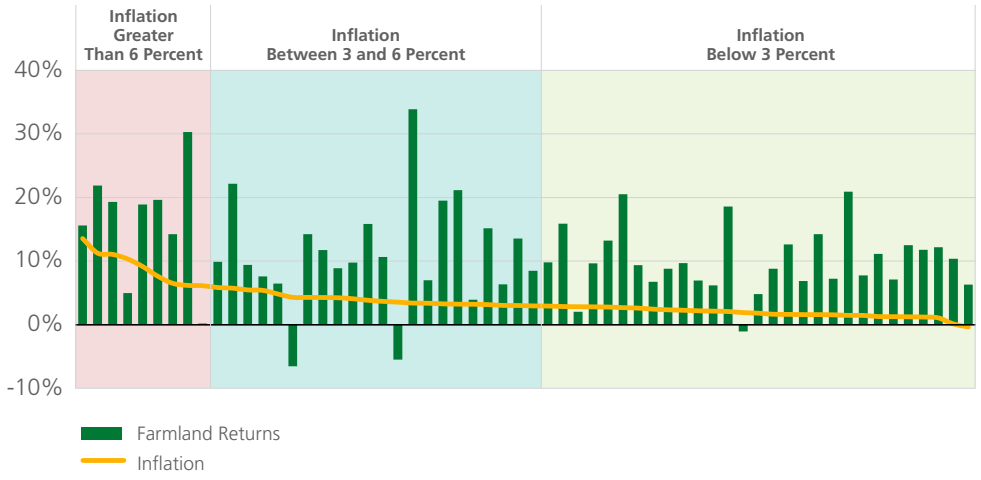
[1] *An Update to the Budget Outlook: 2020 to 2030*
https://www.cbo.gov/system/files/2020-09/56517-Budget-Outlook.pdf

Conceptually, farmland returns should correlate positively with inflation. An uptick in the general price of all goods and services in a country would erode the purchasing power of each unit of the country's currency. Suppose inflation reduces the value of the U.S. dollar (USD) relative to foreign currency. In this case, foreign consumers can buy relatively more agricultural products from U.S. producers with each currency unit. The price of commodities in U.S. dollars must rise even higher than the general rate of inflation to ration demand. Additionally, foreign agricultural goods would become relatively more expensive for domestic consumers, which would increase the price competitiveness of domestic agricultural producers, adding further support to domestic agricultural goods priced in USD.

Higher commodity prices can lead to expectations of higher future farm income and potentially increase the value of farmland capital. Inflation also can reduce real interest rates, which potentially lowers the rate at which landowners discount future farm income and effectively boosts farmland's present value.

In the past, farmland has generated returns that have positively correlated with inflation. However, the strength of the relationship appears to depend upon the level of inflation. For example, Graph (3) portrays annual inflation ranked from highest to lowest, and the corresponding year's farmland return from 1960 to 2019. The red area depicts farmland returns during years when inflation was high and exceeded 6 percent. The blue area shows farmland returns in years when inflation was moderate and between 3 and 6 percent. Lastly, the grey area portrays farmland returns when inflation was lower than 3 percent.

Graph (3) Annual US Inflation Sorted from Highest to Lowest and the Corresponding Annual Farmland Return: 1960 to 2019

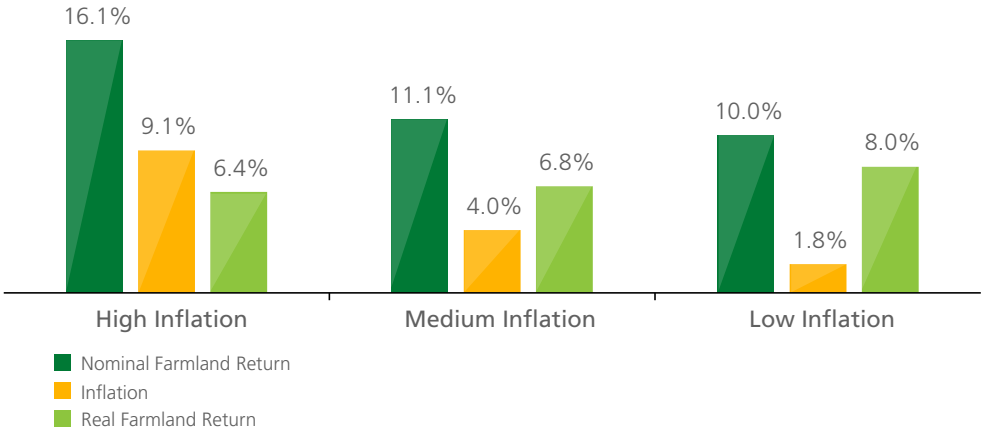


Source: Morningstar, NCREIF, and World Bank

Graph (4) displays average inflation, average nominal farmland returns, and average real farmland returns during high, medium, and low inflationary environments. The graph indicates that average nominal farmland returns exceed average inflation in each inflation category and average real farmland returns fall as inflation rises.

Graphs (3) and (4) lend credence to the argument that a positive association between farmland returns and inflation exists, and the correlation coefficient of 0.25 between the two variables in Graph (5) confirms that a moderate positive relationship occurred between 1960 and 2019. To further examine that relationship, the sample was divided into two 30-year periods.

Graph (4) Average Annual Farmland Returns During Periods of High, Medium and Low Inflation: 1960 to 2019



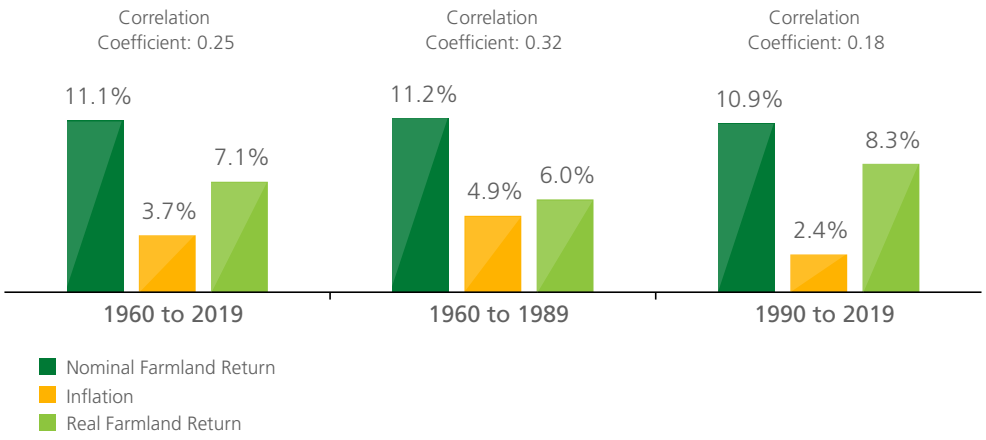
Source: Morningstar, NCREIF, and World Bank

Three features stand out when analyzing these time periods. First, nominal annualized farmland returns during the first period were only 30 basis points (bps) higher than nominal farmland returns during the second period. Second, annualized inflation in the first period was 250 bps higher than during the second period. And finally, the correlation coefficient between nominal farmland returns and inflation during the first period was 0.32, which is meaningfully stronger than the correlation coefficient of 0.18 in the second period.

In the past century, 16 of the top 25 highest recorded price increases, as measured by the Consumer Price Index (CPI), took place between 1968 and 1989, which the first period we analyzed wholly encompasses. The correlation coefficient between farmland and inflation during this 21-year period (from 1968 to 1989) was 0.44.

Inflation between 1960 and 1989 was materially higher as compared to the past 30 years. During the later period, farmland returns benefited from falling interest rates, a weakening dollar, strong export demand from growing emerging markets, and increased biofuel demand. These factors occurred when inflation was relatively low, which may account for the recent weakening association between farmland returns and inflation. Consequently, AgIS Capital expects farmland returns to outpace moderate and high inflation rates, which could become very useful in the wake of the recent monetary and fiscal policy actions that have been undertaken to stem the pandemic's impact on the US economy.

Graph (5) Annualized Farmland Returns and Inflation, and their Correlation Coefficient During Various Periods: 1960 to 2019

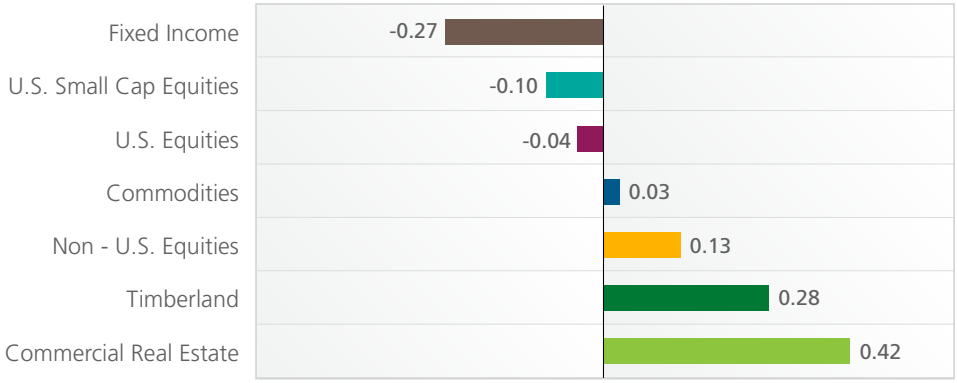


Source: Morningstar, NCREIF, and World Bank

Return Diversification

Finally, farmland assets have a well-documented history of generating returns that exhibit low or negative correlation with the returns of traditional, financial asset classes. For example, Graph (6) illustrates how farmland returns show a moderate negative correlation with fixed income, U.S. small-cap equities, and U.S. equities and a moderate positive correlation with commodities, non-U.S. equities, and timberland. Given its 29-year period of generating returns with low correlations, institutional investors should view farmland investment as a strategy for diversifying their portfolios.

Graph (6) Correlation Coefficients Between Farmland and Various Asset Class Indicies: 1991 to 2019



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

IV. Farmland Performance During Periods of Adversity

The NCREIF Farmland Index encompasses two full business cycles in which the economy expanded and contracted[2]. The first period began in March 2001 and ended in November 2001, while the second began in December 2007 and ended in June 2009.

The Early 2000s Recession (E2R)

The E2R was relativity mild in severity and short in duration. Real Gross Domestic Product (RGDP) fell 0.1 percent from December 2000 to September 2001. Unemployment rose from 4.3 percent in March 2001 to 5.5 percent in November 2001 and grew to 6.3 percent in 2003. Before the technical beginning of the recession, the Dow Jones Industrial Average (DJIA) achieved an all-time high of 11,750.3 on January 14, 2000, before falling 39.3 percent to 8,062.3 on September 21, 2001.

The 9/11 terrorist attacks exacerbated the impacts of the downturn. In response to economic conditions, the Federal Reserve Bank began lowering rates in January 2001, and then President Bush signed legislation cutting taxes in June 2001.

During the seven years beginning in 1999 and ending in 2005—a period fully encompassing the E2R—all asset classes posted positive returns from start to finish as illustrated in Figure (2) and Graph (7). However, Commercial Real Estate and Farmland were the only asset classes not to post at least one negative annual return. Returns for U.S. Equities (S&P 500) remained muted throughout the period, while U.S. Small Cap Equities significantly rebounded in 2003 and 2004. The period also encompassed the commodities super-cycle, which resulted in a 19 percent annualized return.

The farmland asset class posted 12 percent annualized returns during this period, in large part because of expanded ethanol consumption, falling interest rates, a weakening dollar, and growing demand for agricultural products from developing countries. By and large, farmland posted strong returns throughout the period and demonstrated an ability to generate strong returns during periods of economic turmoil.

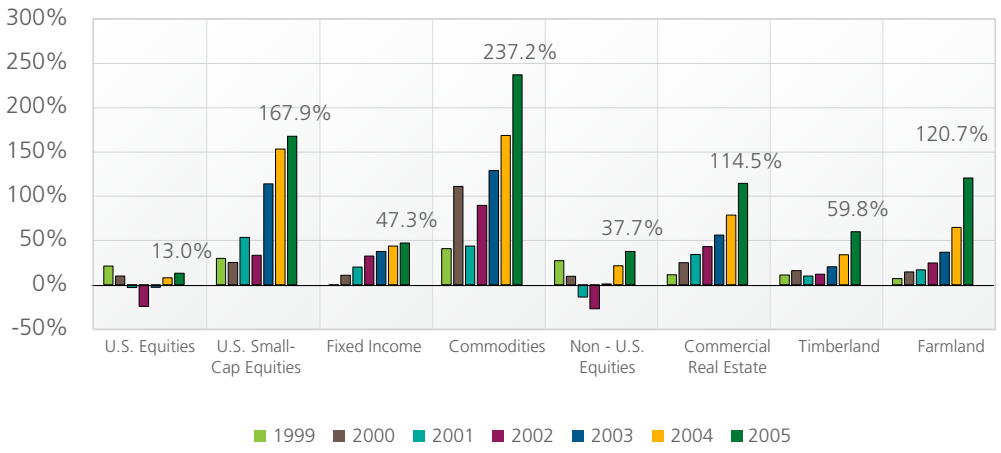
[2] *US Business Cycle Expansions and Contractions, NBER*
https://www.nber.org/cycles/cyclesmain.pdf

Figure (2) Return Metrics for Various Asset Classes from 1995 to 2005

	U.S Equities	U.S. Small-Cap Equities	Fixed Income	Commodities	Non - U.S. Equities	Commercial Real Estate	Timberland	Farmland
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Annualized Return	1.8%	15.1%	5.7%	19.0%	4.7%	11.5%	6.9%	12.0%
Standard Deviation	18.5%	24.4%	4.5%	26.4%	23.7%	4.6%	7.8%	11.0%
Coefficient of Variation	10.46	1.62	0.79	1.39	5.07	0.40	1.13	0.92
Minimum Return	-22.1%	-13.3%	-0.8%	-31.9%	-21.2%	6.7%	-5.2%	2.0%
Maximum Return	28.7%	60.7%	11.6%	49.7%	38.6%	20.1%	19.4%	33.9%

Source: S&P, DFA, Bloomberg, MSCI, NCREIF

Graph (7) Compounded Annual Returns of Various Asset Classes: 1999 to 2005



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

The Great Recession (GR)

In contrast to the E2R, the GR was severe and long-lasting. It technically began in December 2007 and lasted until June 2009, which made it the most prolonged technical, economic recession the US had experienced since the Great Depression, which ended in March 1933. Real GDP declined 4.0 percent from December 2007 to June 2009, while unemployment rose from 5.0 to 9.5 percent during the same period. Unemployment peaked at 10.0 percent during October 2009. The DJIA achieved an all-time high of 14,198.1 on October 11, 2007, before falling 54.4 percent to 6,470.0 on March 6, 2009. The Fed estimates average household wealth fell 20 percent during the slowdown.

In response to these economic challenges, the Fed used traditional policy actions. It began a series of federal funds rate reductions that decreased the policy rate from 5.25 percent in September 2007 to its effective lower bound of 0 to 0.25 percent in December 2008. The Fed also began using the Federal Open Market Committee to supply forward rate guidance to stem deflation and promote inflation expectations. The Fed additionally instituted nontraditional policy actions by introducing several new lending programs to increase liquidity and large-scale asset purchase programs to place downward pressure on long-term borrowing rates. Coupled with the Fed's monetary policy, Congress undertook several fiscal stimulus measures that resulted in approximately $682 billion of spending increases and $383 billion of tax cuts[3].

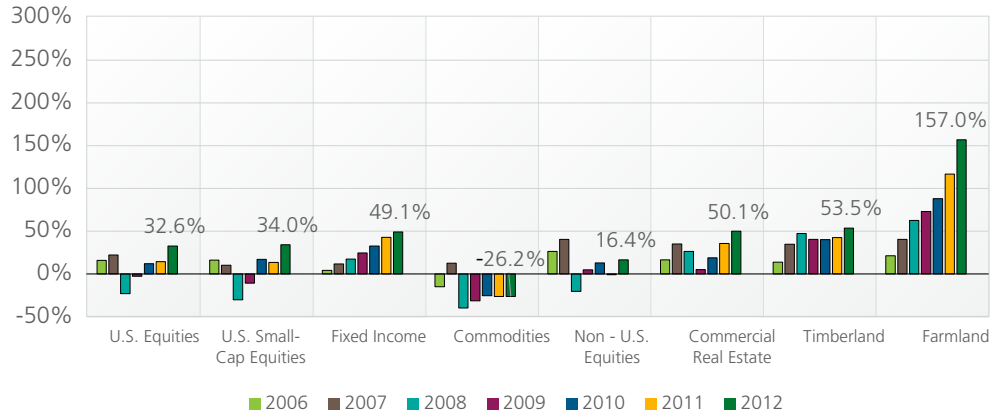
As illustrated in Figure (3) and Graph (8), all asset classes except commodities posted positive annualized returns during the seven years from 2007 to 2012. However, the only two asset classes not to post a negative annual return were fixed income and farmland. Notably, returns from U.S. Equities and U.S. Small-Cap Equities experienced significant declines in 2008.

Figure (3) Return Metrics for Various Asset Classes from 2006 to 2012

	U.S Equities	U.S. Small-Cap Equities	Fixed Income	Commodities	Non - U.S. Equities	Commercial Real Estate	Timberland	Farmland
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Annualized Return	4.1%	4.3%	5.9%	-4.3%	2.2%	6.0%	6.3%	14.4%
Standard Deviation	20.7%	23.8%	1.3%	24.9%	25.8%	13.1%	8.2%	5.2%
Coefficient of Variation	5.02	5.58	0.23	-5.85	11.78	2.19	1.29	0.36
Minimum Return	-37.0%	-36.7%	4.3%	-46.5%	-43.4%	-16.9%	-4.8%	6.3%
Maximum Return	26.5%	31.3%	7.8%	32.7%	31.8%	16.6%	18.4%	21.2%

Source: S&P, DFA, Bloomberg, MSCI, NCREIF

Graph (8) Compounded Returns of Various Asset Classes: 2006 to 2012



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

[3] *Blinder and Zandi (2010) How the Great Recession Was Brought to an End https://www.economy.com/mark-zandi/documents/End-of-Great-Recession.pdf*

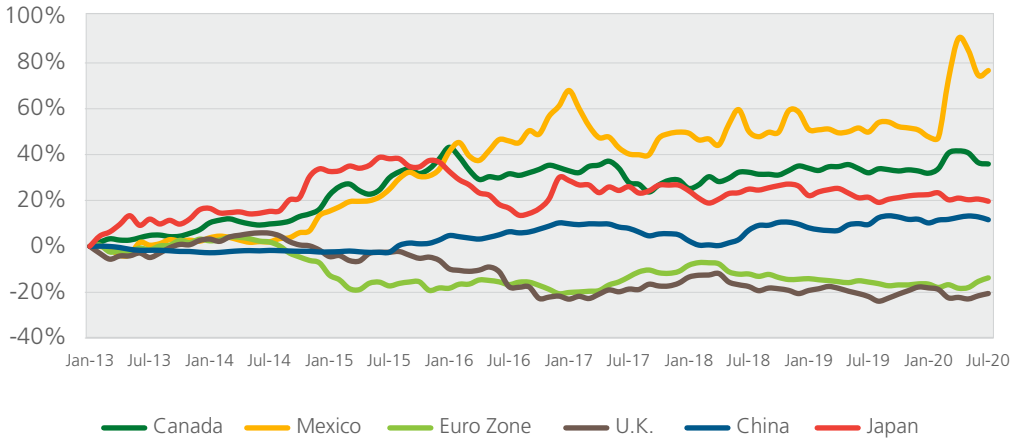
Farm Recession

The U.S. agricultural economy generated $137.9 billion of real net farm income in 2013, which was the highest level attained since 1973 when it posted $155.5 billion. Real net farm income then began trending downward until reaching a trough of $66.8 billion in 2016. This represented a 51.6 percent reduction from the peak in 2013, whereas in 2019, real net farm income was $94.5 billion. In the first quarter of 2020, the NCREIF Farmland Index posted its first-ever quarterly loss of 0.10 percent. However, second-quarter returns brought the total return in the first half of 2020 to positive 0.25 percent.

The U.S. agriculture economy has struggled since 2014. The appreciation of the US dollar has hindered U.S. agricultural exports since then, which has led to lower net farm income. Graph (9) illustrates how the currencies of the largest destinations for U.S. agricultural exports have weakened against the US dollar since 2013, with the British Pound and the Euro being notable exceptions. The strengthening of the USD has increased the relative cost of US agricultural exports and has driven many commodity prices lower.

Despite the downturn in the agricultural economy, the NCREIF Farmland Index still managed to post the third-highest annualized return among the eight asset class indices used in this report. However, recent returns over the last seven years were more tempered. Column (8) in Figure (4) shows farmland generated a total annualized return of 9.7 percent and the second-lowest coefficient of variation in absolute value during this period. Graph (10) displays the NCREIF Farmland Index's steady return growth during the downturn of the agricultural economy.

Graph (9) Change in Strength of Various Currencies Relative to the U.S. Dollar: 2013 to 2020, monthly



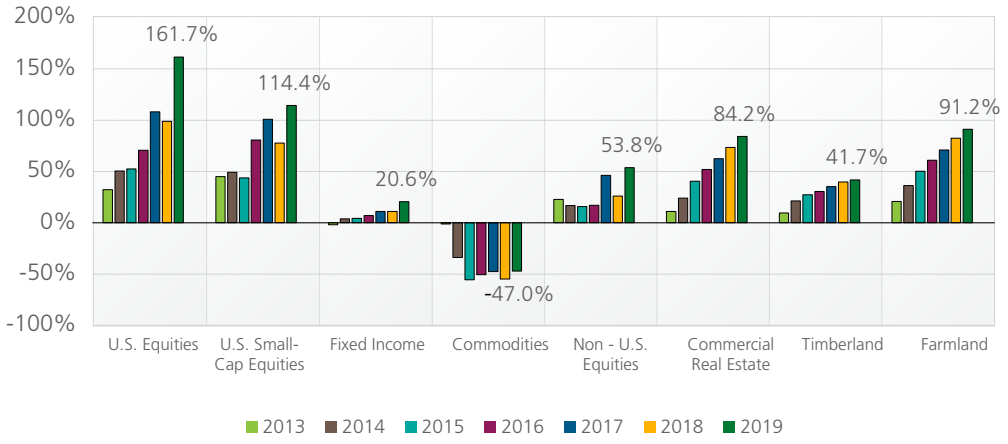
Source: USDA

Figure (4) Return Metrics for Various Asset Classes from 2013 to 2019

	U.S Equities	U.S. Small-Cap Equities	Fixed Income	Commodities	Non - U.S. Equities	Commercial Real Estate	Timberland	Farmland
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Annualized Return	14.7%	11.5%	2.7%	-8.7%	6.3%	9.1%	5.1%	9.7%
Standard Deviation	14.1%	19.3%	3.7%	20.6%	15.6%	2.8%	3.6%	5.6%
Coefficient of Variation	0.96	1.68	1.36	-2.37	2.47	0.31	0.70	0.57
Minimum Return	-4.4%	-11.6%	-2.0%	-33.1%	-13.8%	6.2%	1.3%	4.8%
Maximum Return	32.4%	45.1%	8.7%	17.6%	25.0%	13.3%	10.5%	20.9%

Source: S&P, DFA, Bloomberg, MSCI, NCREIF

Graph (10) Compounded Returns of Various Asset Classes: 2013 to 2019



Source: S&P, DFA, Bloomberg, MSCI, NCREIF

V. Wrap Up

Our analysis of farmland's performance over the past three decades brings to light many positive attributes of the asset class and its return profile. First, farmland generated attractive returns with low variability relative to other traditional asset classes during the period of analysis. Second, farmland returns have correlated positively with inflation, and it appears the positive relationship with inflation has increased as inflation has risen. Third, farmland returns exhibit negative to low-positive correlation with other traditional asset classes. Finally, farmland has a well-documented track record of performing well during periods of economic adversity.

Given these attributes, the recent slowdown in the agricultural economy, the current ramp-up of fiscal and monetary stimulus enacted to combat the coronavirus, and the Fed's strategic push to ramp up inflation, suggest that now may be an opportune time to invest in the farmland asset class.

Appendix (I) Return Citations:

The S&P 500 Total Return Index by Standard and Poor's (S&P) was used as a proxy for U.S. Equities. The U.S. Micro-Cap Portfolio – Institutional Class (DFSCX) by Dimensional Fund Advisors (DFA) was used as a proxy for U.S. Small-Cap Equities. Bloomberg Barclays U.S. Aggregate Bond TR USD by Bloomberg was used as a proxy for Fixed Income. The S&P GSCI Total Return USD Index by S&P was used as a proxy for Commodities. The MSCI EAFE Index by MSCI was used as a proxy for Non-US Equities. The NCREIF Property Index was used for Commercial Real Estate. The NCREIF Timberland Index was used for Timberland. The NCREIF Farmland Index was used for Farmland.

For the correlation coefficient between inflation and farmland returns from 1960 to 2019 the Morningstar Total Return Farmland Index was used as a proxy for farmland returns between 1960 and 1990 and the NCREIF Farmland Total Return was used for farmland returns between 1991 and 2019.

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