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NATURAL CAPITAL

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Why farmland now?

A store of value during economic uncertainty and inflationary periods

Joseph Villani
Farmland Portfolio Manager

Ben Martin
Farmland Portfolio Analyst

SUMMARY

- Considered a safe haven investment, farmland has proven to be a reliable store of value through times of economic tumult including the COVID-19 pandemic — exhibiting durable valuations, attractive levels of income and low volatility while being uncorrelated to competing assets.
- Financial yields from farmland are inherently tied to food prices, which generally increase with inflation and have been supported by stable supply-demand dynamics. Thus, farmland investments can be expected to remain a strong hedge against rising inflation.
- Now is a compelling time to invest in farmland due to imminent productivity gains from the implementation of new technologies introduced in the agricultural space and the associated influence on farmland returns.

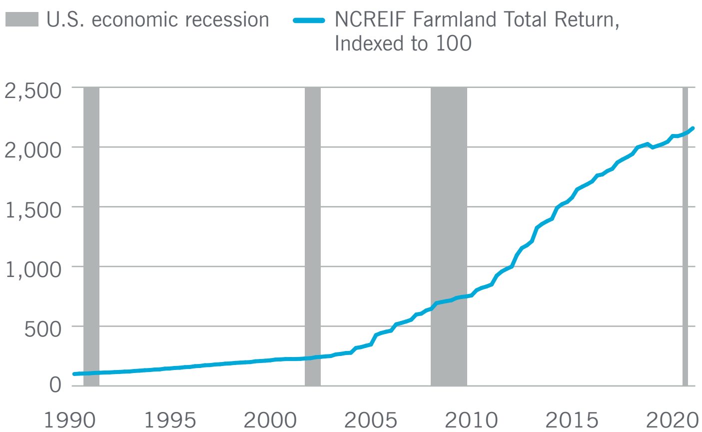
WHY FARMLAND NOW

Financial markets remain volatile given limited visibility and uncertainty related to the pace of economic activity. This uncertainty has been exacerbated by major supply chain disruptions leading to rising inflation. Investors have reacted by retreating towards safe haven investments such as U.S. treasuries (where yields have declined below 1%), gold and certain stable currencies (e.g. the U.S. dollar). Farmland can provide some attractive characteristics to a traditional portfolio, such as:

Store of value

Farmland investments can provide a compelling alternative to traditional safe haven asset classes. Farmland has a history of exhibiting unique value durability and income levels through uncertainty and economic downturns. Exhibit 1 shows farmland total returns as measured by the NCREIF Farmland Index through periods of economic recessions in the U.S. This shows that farmland has a history of preserving capital during periods of economic downturn. The fundamentals driving farmland returns are driven by long-term structural trends such as population growth that are uncorrelated to broader economic cycles. Both the 2008 financial crisis and the COVID-19 pandemic highlight the role farmland investments can play in a diversified portfolio. While many sectors across the global economy experienced negative consequences, agricultural producers were relatively profitable during these periods, resulting in strong producer margins and higher agricultural land values.

Exhibit 1: Farmland's resilience to the economic cycle

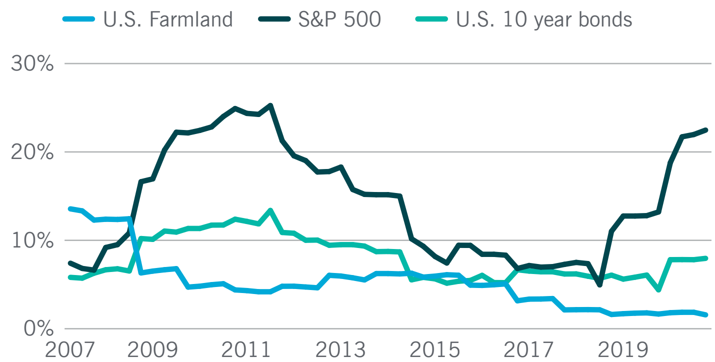


Source: Macrobond, NCREIF, data to September 2021

Low volatility of returns

Farmland returns are substantially less volatile than traditional market indices and asset classes. Exhibit 2 shows the rolling twelve-month volatility of U.S. farmland relative to U.S. equities and U.S. 10-year bonds. Farmland volatility has been consistently low and below that of both U.S. equities and U.S. bonds. This low volatility can in part be explained by the more illiquid nature of the asset class, but also because the underlying demand for the output from farmland, food, is inelastic and remains consistent throughout the year and economic cycles.

Exhibit 2: Annualized volatility of select assets versus farmland

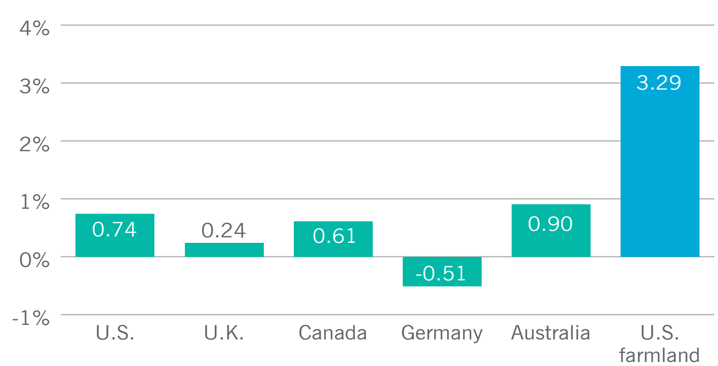


Source: NCREIF, Bloomberg, data to December 2020

Alternative source of income

Even before COVID-19, financial volatility and low bond yields have been driving investors to find investments with strong income returns elsewhere. This fact, coupled with the low cost of borrowing — also a product of the low interest rate environment— has significantly increased investor demand for real assets, including farmland. Exhibit 3 shows farmland's trailing twelve-month income return relative to 10-year government bond yields around the world. Despite income returns from farmland declining in recent years, as investor interest has resulted in capital appreciation that in certain cases has outpaced the asset's earnings potential, the income yield remains attractive relative to fixed income assets.

Exhibit 3: 10-year government bond rates relative to U.S. farmland yield



Source: NCREIF, Bloomberg, data to 31 December 2020

Inflation hedging characteristics

With rising inflation concerns globally, farmland can provide a hedge against inflation in a portfolio. Farmland returns are highly correlated to inflation, making the asset class a good store of value during inflation periods. Over the past 50 years, farmland returns have delivered a positive spread over inflation, averaging 6.1% above inflation, as shown in Exhibit 4. Rising soft commodity prices which influences inflation indices result in higher farm incomes, which in turn leads to higher land values.

Technology implementation driving farmland returns

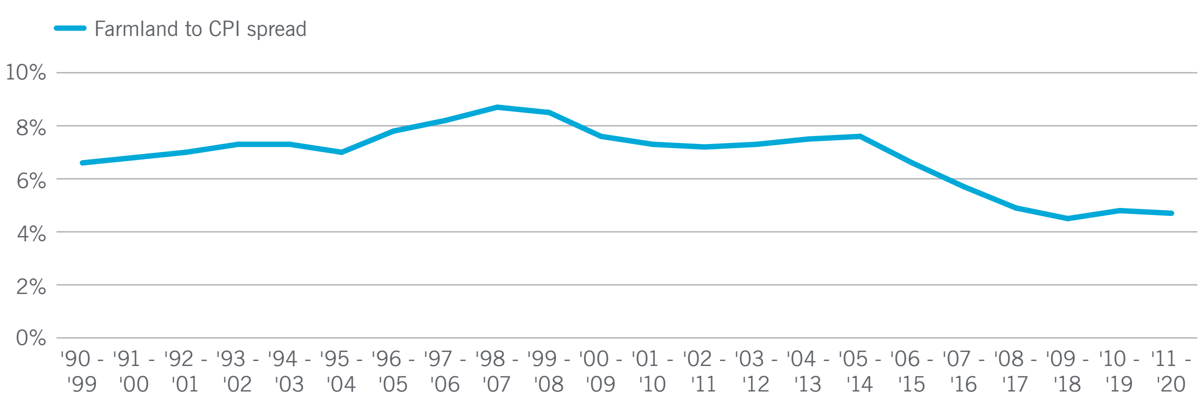
Independent of the benefits farmland offers to portfolios, it is a compelling time to invest in agriculture due to rising productivity and rising farm income potential as new technologies are implemented.

According to the USDA Economic Research service, U.S. agricultural output grew at 1.49% per year between 1948 and 2011. During the same period, there was negligible growth in input use of 0.07% per year. Hence, the growth in output over this 63-year period is attributed to productivity gains. Measured by total factor productivity (TFP), or output per unit of total inputs, U.S. agricultural TFP increased at a rate of 1.42% per year over this period.

Yet, increasing productivity further, or doing more with less, is all but imminent as farming becomes more digitized and as new technologies are brought to market. Just like the Green Revolution before it, the Data Revolution is likely to see a significant, sustained lift in agricultural TFP. There is an abundance of new technologies being introduced such as gene editing, sensors, robotics, drones, artificial intelligence, predictive analytics, smart irrigation, farm management software and online marketplaces.

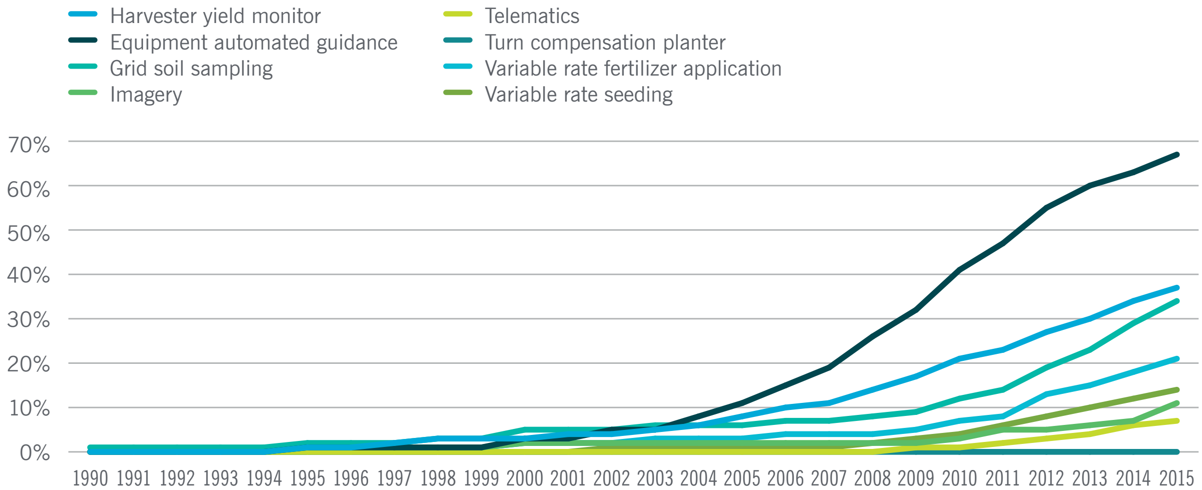
Such technologies can reduce input costs by providing spatial data that can optimize crop management practices. In addition to reducing input costs, precision agriculture technologies can also increase yields. This is achieved through yield mapping with GPS during harvest and adjusting input placement with variable rate technology the following season. Since these technologies have the potential to reduce costs and increase yields, they inherently influence farm profitability. However, there is a lag between the introduction of technology and subsequent adoption before it impacts productivity and returns. This is driven by annual planting of crops providing one window per year to adopt new technology and the learning curve for farmers to integrate new technology. Exhibit 5 highlights the various new technologies being implemented by U.S. row crop farmers (using Kansas as an example) and the rate of current adoption. The ongoing adoption of these technologies will continue to improve farm returns in the years to come.

Exhibit 4: Decade farmland return to CPI spread



Source: BLS, USDA, TIAA Center for Farmland Research's U.S. Ag 31 State Farmland Index, data to December 2020

Exhibit 5: Row crop technology adoption rates among Kansas producers



Source: Kansas State University Department of Agricultural Economics, data as of 2015

Aside from on-farm technologies that provide information on management practices, there are several innovations taking place across the agricultural value chain. Marketplaces connecting farmers directly to suppliers or customers without a middleman also have the potential to reduce costs or increase the price received for crops, respectively. Further, improvements in seed research and development have the potential to increase yields and reduce costs. Specifically, CRISPR gene editing technology has many potential applications such as preventing the spread of disease in crops. This technology allows for the acceleration of traditional crop variety development in terms of time and speed to market. Both factors will likely lead to increased availability of competing seed varieties and reduced costs compared to current seed trait offerings.

Agricultural technologies have and will continue to drive productivity in agriculture. Nuveen's goal to partner with entrepreneurial tenants expected to be early adopters of new technologies will drive bottom-line benefits to investors. As farming enters a paradigm of producing higher yields with less inputs and more data, farmland will secure its status as an investment with strong financial metrics and future upside.

CONCLUSION

The current financial environment highlights that now more than ever is an attractive time for investors to diversify their portfolios into safe haven assets that protect against uncertainty and inflation. Several factors make now a great time for investors to seek farmland investments, these include:

- Farmland's ability to act as a store of value during economic downturns and inflationary periods.
- Farmland's low volatility and strong income producing capabilities relative to other investment classes.
- The adoption of technology across the agricultural chain which is anticipated to improve farmer profitability and enhance farmland investment returns.

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