

Agriculture: Ripe for Institutional Investment

Agriculture offers a range of investment options capable of fulfilling numerous portfolio objectives. In meeting one of society's most fundamental needs, investments in "Ag" can come in many forms. The sector's diversity and resiliency have been on full display during various economic downturns, including those arising from the efforts to respond to Covid-19. In this way, Ag is not unlike infrastructure and real estate. The inexorable demand for food stands in stark contrast to other sectors, which have suffered since governments have put in place policies to stanch the pandemic's deleterious effects.

Although we find the rationale compelling for investing in Agriculture, several historical barriers have made it difficult for institutional investors to deploy capital at scale. In the last 15 years, however, the sector has made several inroads to becoming a realistic investment option for large, sophisticated investors. There are more managers that can provide access to the space and more vehicles for doing so: Secondaries and co-investments are becoming common. What has been a highly fragmented sector is seeing greater consolidation. The combined effect of these factors, in our opinion, translates into an attractive opportunity for investors and a natural extension of LPs' existing real-asset portfolios. In other words, Agriculture is ripe for institutional investment.

INTRODUCTION TO AGRICULTURE

As seen in **Figure 1**, we use the term *Agriculture* to describe four categories of investments:

- » **Farmland:** Leased and operated farmland and associated biological assets and equipment used primarily to produce crops and animal products.
- » **Agri-Infrastructure:** Leased and operated irrigation, intensive production, storage, and logistics assets.
- » **Agribusiness:** Businesses involved in the provision of goods and services that support the Agriculture supply chain (e.g., farming inputs, agronomy services, marketing and processing agricultural commodities).
- » **Agri-Technology:** Businesses that develop the technological solutions to enhance productivity, quality, and environmental outcomes across the entire supply chain.

Because each of these categories embodies varying degrees of real-asset and operational intensity, investors can use Ag to meet an array of risk and return objectives.

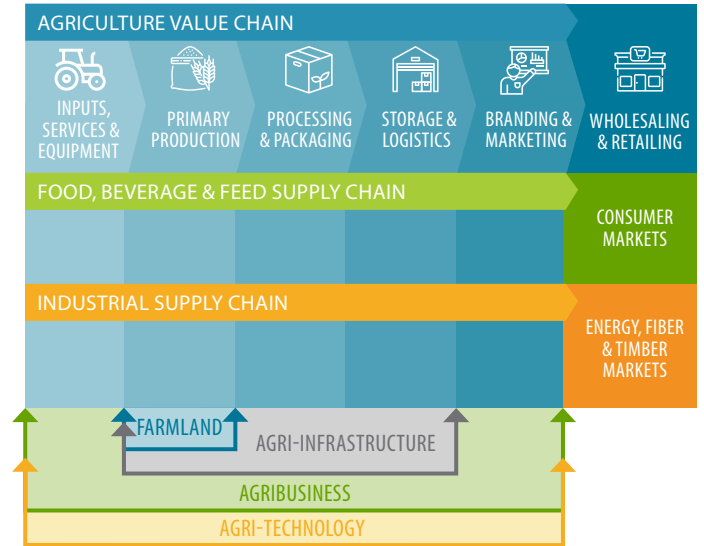
WHY SHOULD INVESTORS CONSIDER AG?

While each category offers different portfolio attributes, the sector as a whole revolves around a supply chain fulfilling the essential need to provide food, beverage, feed, and other industrial feedstocks for society. Unlike many other goods that we can live without, the need for sustenance is absolute. This resilient demand over the short, medium and long run provides the basis for Agriculture’s investment traits (**Figure 2**).

ATTRACTIVE LONG-TERM INDUSTRY FUNDAMENTALS

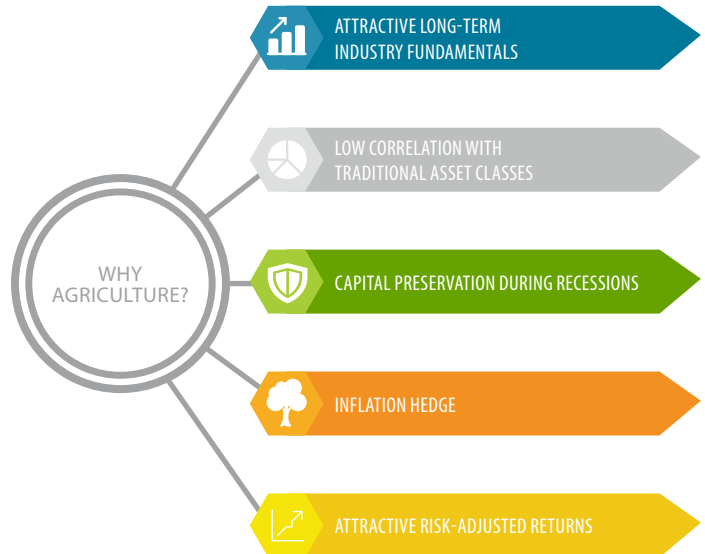
Agriculture involves the production of grains and oilseeds, dairy, meat, fruit, nuts, vegetables, and fiber that are consumed by humans and animals or used in industrial applications. Demand growth for these goods is a function of population

FIGURE 1 | AGRICULTURE VALUE CHAIN



Source: StepStone Group.

FIGURE 2 | AGRICULTURE VALUE PROPOSITION



For illustrative purposes only.

HOW DOES AGRICULTURE FIT WITHIN AN ESG INVESTMENT FRAMEWORK?

To invest responsibly in Agriculture is to account for a variety of risk and return factors—how certain inputs are used, greenhouse gas (GHG) emissions, biodiversity, and rural and regional employment.

Agriculture employs nearly 900 million people, representing 1 in 4 workers globally,¹ the majority of whom work in developing markets or poorer regional communities. This highlights the important role and opportunity for Ag to help improve social equity.

While there remains significant opportunity for improvement, Ag has been making considerable progress toward reducing its environmental footprint in developed markets. America's beef industry is able to produce the same amount of beef with 36% fewer cattle relative to 1975. Simply by adopting better practices, the global cattle industry has the potential to reduce GHG emissions by an additional 30%, the equivalent of taking 463 million vehicles off the roads.²

Precision Agriculture—which refers to the use of GPS, robotics, sensors, and other technologies to increase crop and livestock yields and cut waste—exemplifies the alignment of operational, financial, and environmental objectives that characterize Ag as a whole. A study by the Virginia Polytechnic Institute and State University found that Precision Ag nearly doubled fertilizer efficiency and increased yields by 10%.³

By customizing their exposure to Ag, investors have the potential to achieve an array of financial and non-financial objectives, ranging from responsible to high impact investment strategies.

¹ World Bank. 2020. *Employment in agriculture*.

² National Cattlemen's Beef Association. 2019. "US Cattle Production Sustainability Overview."

Vehicle estimate based on estimated average passenger vehicle emissions of 4.6 tons per year by the United States Environmental Protection Agency.

³ Goff, Lauren. 2018. "Precision Agriculture's Impact on Nutrient Management in Agronomic Crops."

growth, rising incomes, and dietary trends. Supply growth, on the other hand, depends on the availability of land and water, growing conditions, and the application of technology to keep pace with demand growth.

Structural Demand Growth

- » **Population growth**—The world’s population is expected to reach 9.7 billion by 2050.⁴ While overall population is expected to grow approximately 0.9% per year, the middle class, which constitutes 42% of the global population, is expected to grow to 63% by as early as 2030 (Figure 3). The associated increase in incomes is expected to drive demand for calories 0.2% above the rate of population growth, resulting in the need for 30% more calories by 2030 compared with 2017.
- » **Income effect**—Rising incomes result in greater consumption of all food groups including high-calorie foods like meat and dairy. As illustrated in Figure 4, the shift in preferences also has a multiplier effect on the demand for agricultural products: The production of animal products requires material amounts of grains and oilseeds. GDP growth also supports greater demand for feedstocks for industrial uses such as biofuel and fiber production.

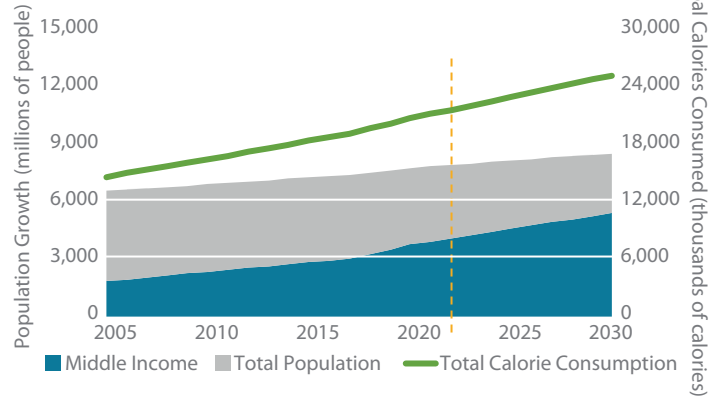
Constrained Supply

- » **Arable land and water**—The availability of farmland and water is diminishing owing to urbanization and population growth. Arable land per capita is expected to continue to shrink at a rate of 0.7% per year between 2015 and 2030 (Figure 5).
- » **Production yields**—The growth rate of production yields for key grain crops has decelerated during the past 30 years. While still positive, productivity growth has stabilized around half of what it was between the 1960s and 1980s (Figure 6).

LOW CORRELATION WITH TRADITIONAL ASSET CLASSES

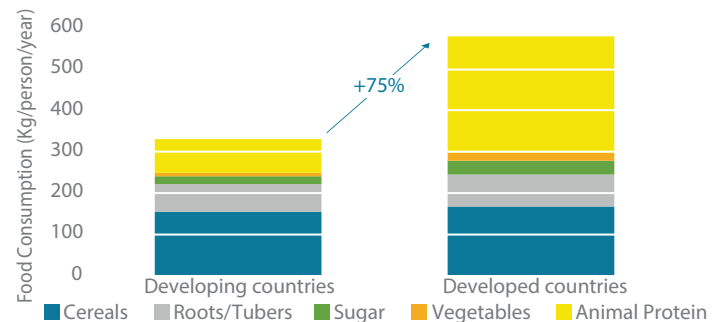
Ag’s profits depend on production—a function of growing conditions and productivity innovations—and demand, which

FIGURE 3 | POPULATION AND CALORIE GROWTH



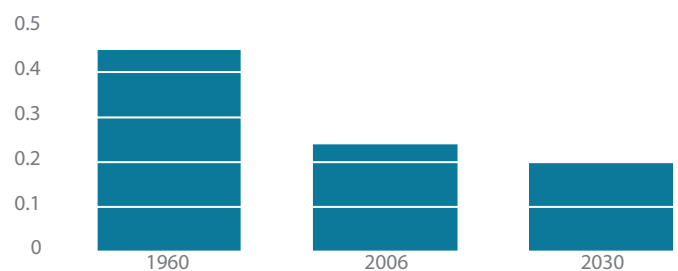
Source: UN Food and Agriculture Organization, 2019; Brookings Institution, 2017; StepStone analysis.

FIGURE 4 | INCOME EFFECT ON FOOD DEMAND



Source: UN Food and Agriculture Organization, 2019; Brookings Institution, 2017; StepStone analysis.

FIGURE 5 | ARABLE LAND (HECTARES PER PERSON)



Source: UN Food and Agriculture Organization, 2019.

⁴ UN Department of Economic and Social Affairs. 2019. “World Population Prospects.”

is mostly a function of inelastic food consumption. Because demand is generally stable throughout the economic cycle, returns from farmland, a proxy for Ag, show a relatively low correlation to other asset classes such as bonds and equities, as illustrated in **Figure 7**. Consequently, Agriculture has the potential to increase portfolio diversification and reduce overall portfolio volatility.

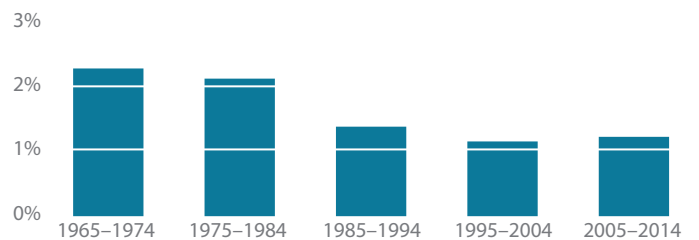
CAPITAL PRESERVATION

Because of Ag’s vital importance, and the longevity of most farmland assets, Agriculture investment returns display strong resilience to fluctuations in economic and financial market cycles. **Figure 8** shows farmland investments have generated a positive return in each of the last 29 years. They have also demonstrated their ability to better preserve investor capital through economic cycles relative to other sectors. This is most evident in the wake of the GFC, when equities and real estate experienced considerable volatility and periods of negative returns.

INFLATION HEDGE

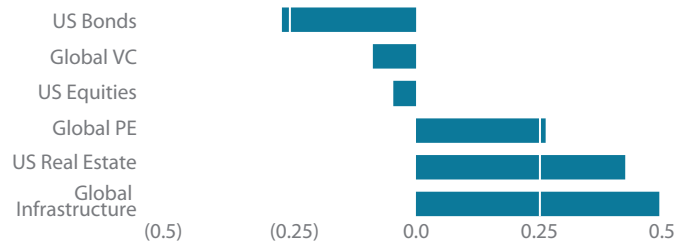
Agriculture primarily produces consumer staples—a key component of consumer price indices. This linkage between farmland returns and inflation bears out in US Department of Agriculture data, which imply a correlation coefficient of

FIGURE 6 | AVERAGE ANNUAL GROWTH RATES FOR MAJOR CROP YIELDS



Source: UN Food and Agriculture Organization, 2012 & 2018; StepStone analysis.

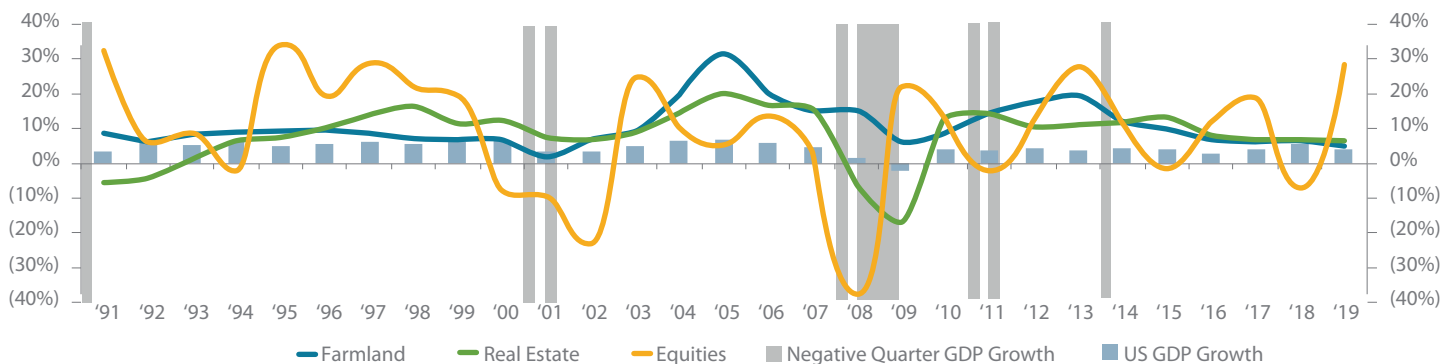
FIGURE 7 | CORRELATION OF AGRICULTURE RETURNS (1991–2019)



Source: Bloomberg, December 31, 2019.

Note: US Bonds = Barclays US Aggregate Bond Index; Global VC = Burgiss Venture Capital; US Equities = Russell 3000 Index; Global PE = Global Primary Buyouts; US Real Estate = NCREIF Real Estate Index; Global Infrastructure = Burgiss Infrastructure Growth.

FIGURE 8 | CAPITAL PRESERVATION THROUGH MARKET CYCLES



Source: Bloomberg, December 31, 2019.

Note: Farmland = NCREIF Farmland Index; Real Estate = NCREIF Real Estate Index; Equities = Russell 3000 Index.

0.57. As illustrated by **Figure 9**, farmland returns have tended to increase during periods of elevated inflation—particularly during the 1970s. Consequently, Agriculture investments are considered a natural inflationary hedge for portfolios.

ATTRACTIVE RISK-ADJUSTED RETURNS

While investors are often concerned with return volatility arising from Ag-specific risks, analysis of historical data suggests the risk level (as measured by standard deviation) is no worse when compared with other asset classes. This is supported by analysis of historical Sharpe ratios, which shows that US farmland, a proxy for Agriculture, offered the greatest reward for risk ranked alongside other sectors, as illustrated by **Figure 10**.⁵ Although Agriculture-specific risks may include commodity price cycles and production seasonality, a well-constructed Ag portfolio balances these risks with stable demand over long periods and limited volatility correlated with other parts of an investment portfolio.

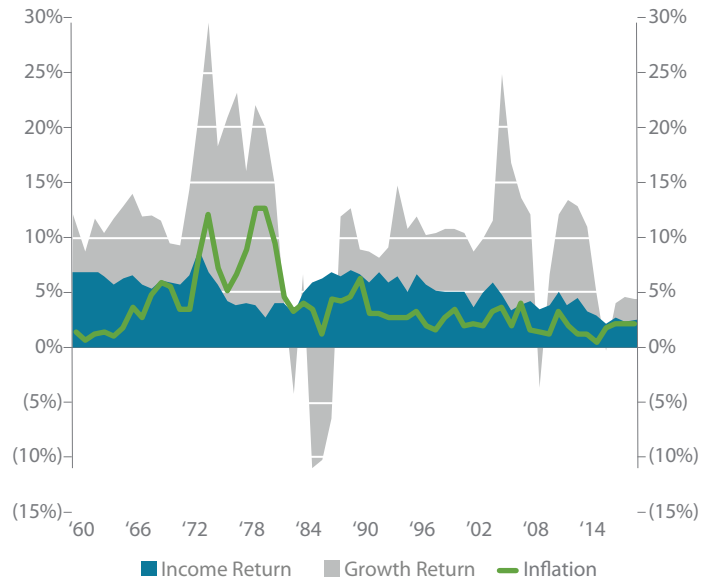
EXPECTED RISK AND RETURNS FOR AGRICULTURE INVESTMENTS

The primary institutional Agriculture investment strategies are farmland and agribusiness, which are the focus of this analysis. There are, however, opportunities to invest in the other two categories, and infrastructure may form part of a farmland investment.

AGRICULTURE RETURNS

Agriculture returns vary in absolute terms as well as in the relative contribution from income generation and capital appreciation based on the category of investment. Even between farmland types, returns can vary materially owing to a combination of factors. Annual crop returns, as represented by the NCREIF Farmland index, have the lowest return profile, having generated total returns of 8.7% with 45% attributable to income and 55% to capital appreciation

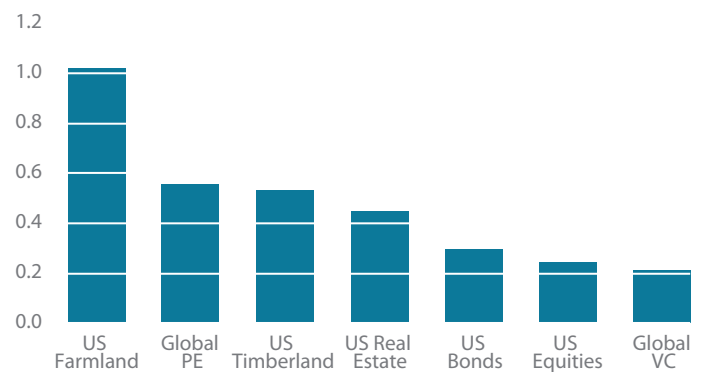
FIGURE 9 | INFLATION PROTECTION (1960–2019)



Source: USDA, StepStone analysis.

Note: Income return = Return to operators + Interest; Growth Return = growth in land value per acre.

FIGURE 10 | SHARPE RATIOS (1991–2019)



Source: Bloomberg, December 31, 2019.

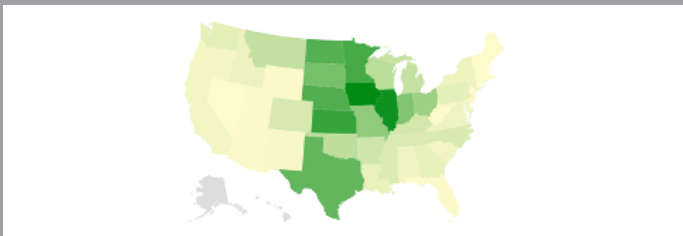
Note: US Farmland = NCREIF Farmland Index; Global PE = Global Primary Buyouts; US Timberland = NCREIF Timberland Index; US Real Estate = NCREIF Real Estate Index; US Bonds = Barclays US Aggregate Bond Index; US Equities = Russell 3000 Index; Global VC = Burgiss VC.

⁵ Sharpe ratios measure an asset's return per unit of volatility.

FARMLAND

Farmland investments can include various sub-sectors, spanning crops to livestock and dairy. For the most part, institutional investors have focused on annual and permanent crops. There are several differences between the two, including where and how they are grown, how they are managed, and what risks and returns they offer.

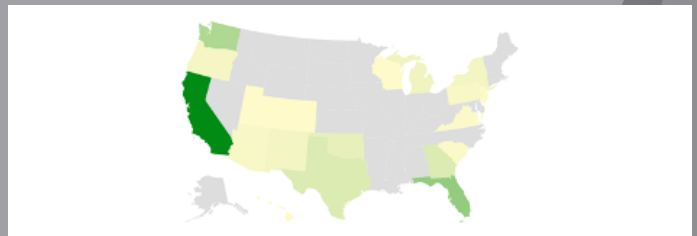
Annual Crop Acreage by State



Source: USDA National Agricultural Statistics Service, December 31, 2019. Includes soybeans, corn, cotton and wheat.

Annual crops, as the name implies, are planted and harvested yearly. They include row crops like corn, soy, wheat, and rice, as well as specialty crops such as vegetables, melons, fodder, and organics. The annual crop sector is predominantly characterized by lower margins, stable consumption growth, and commoditized markets.

Permanent Crop Acreage by State



Source: USDA National Agricultural Statistics Service, December 31, 2019. Includes almonds, apples, avocados, cherries, grapefruit, table grapes, lemons, olives, oranges and related citrus, peaches, pecans and pistachios.

Permanent crops include trees, vines, and shrubs that are planted and then, after an interval of time, produce a crop annually for 30 years or more, depending on crop type. Permanent crops include both fruits and tree nuts. Fruit and nut crops are characterized by higher operating margins, higher demand growth, and more distinct markets.

AGRIBUSINESS

Agribusiness refers to the parts of the Agriculture supply chain that reside beyond the “farm gate.” This includes businesses that service farmers and the supply chain more generally, store and handle farm produce, and add value to raw commodities to produce ingredients, finished goods or industrial products. Agribusiness can also extend to branded food and beverage companies whose operations involve upstream activities as part of a vertically integrated business model. Agribusiness has a broad range of operating margins and demand profiles, connecting local production with domestic and international markets. Agribusiness may be considered private equity-like in terms of risk-return profile, but it still exhibits the low correlation with financial markets that you would expect from Ag owing to the sector’s supply and demand characteristics.

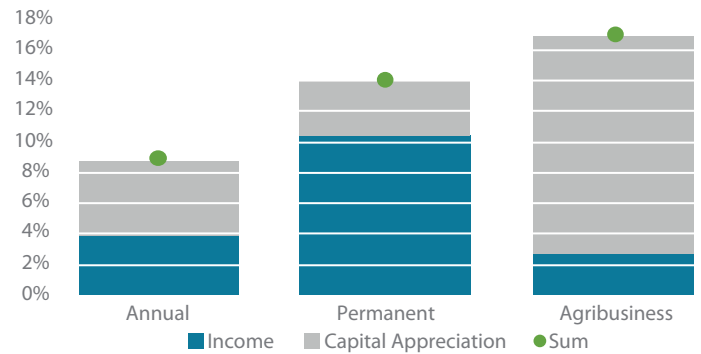
(Figure 11). Agribusiness has delivered the highest returns of 16.9%, of which only 16% is attributable to income with 84% driven by capital appreciation. This reflects the private equity-like strategy typically pursued by managers active in the agribusiness sector, as well as the benefit of leverage. NCREIF Farmland returns, however, are unlevered, and managers typically apply less than 30% of leverage.

The underlying variability in annual income is best illustrated by Figure 12. Annual crops have shown a more stable income profile compared with permanent crops. This is because in effect 100% of revenues are derived from rent, given the leased nature of the annual crop index. This stands in stark contrast to the permanent crop subindex where leases account for just 18% of properties by value. The remaining 82% is owner operated with revenues generated from harvest sales, which are subject to varying degrees of operational, commodity-price, and production risks. The income premium for permanent crops reflects both the higher proportion of operated properties versus leased properties, as well as the higher income profile of permanent crops given the material proportion of value tied up in finite-life biological assets that typically do not appreciate over the life of the asset and must be replaced at the end of their useful lives.

As shown in Figure 13, annual crops have demonstrated a higher level of variability in capital growth than in income. Although key annual crop prices have experienced a sustained trough since mid-2013, capital appreciation has grown at a positive, albeit slower, rate. This speaks to the resilience of farmland and highlights its defensive nature, reflecting the illiquidity that comes from sentimental attachment to the property, the synergistic value from assembling closely located farmland holdings, and the long-term investment horizons of farmland owners who tend to sell only as a last resort given how hard it can be to replace valuable parcels of land.

Capital growth for permanent crops has been more variable compared with annual crops. Although both types of crops are subject to the commodity-price cycle, differences between their life cycles translate to differences in production yields, profits, and farmland values. Unlike annual crops, which are harvested every year, permanent crop yields increase as plantings mature, then taper off as they reach the end of their useful lives, similar to aging infrastructure. A cycle of reinvestment, income generation, and capital appreciation ensues.

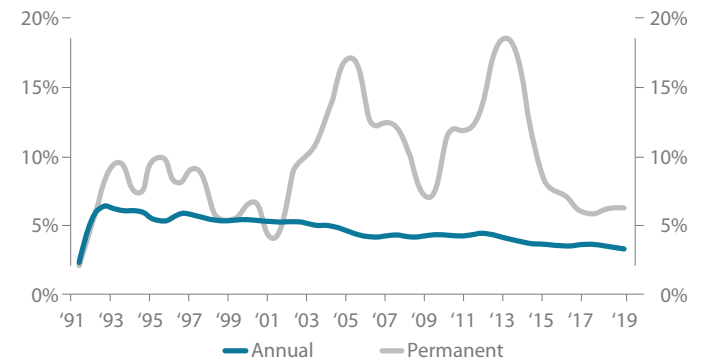
FIGURE 11 | RETURN CONTRIBUTION BY SUB-SECTOR



Source: Bloomberg and StepStone Private Markets Intelligence, as of December 31, 2019.

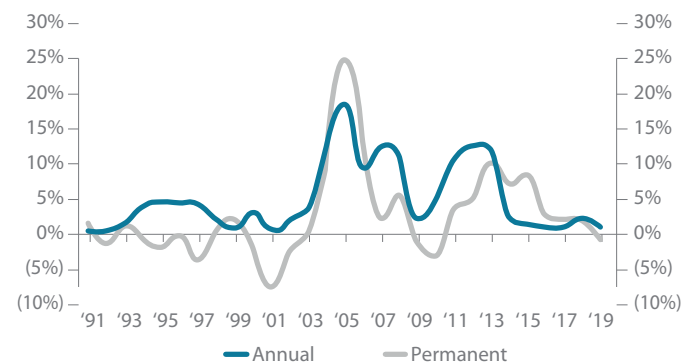
Note: Annual and Permanent Crops = NCREIF Farmland Index; Agribusiness = StepStone Agribusiness Index of GP realized investments.

FIGURE 12 | INCOME RETURNS



Source: NCREIF Farmland Index.

FIGURE 13 | CAPITAL GROWTH RETURNS



Source: NCREIF Farmland Index.

KEY RISK AND RETURN DRIVERS

Agriculture’s returns are fundamentally a function of the cash flows generated from agricultural assets and the required rate of return (read: the capitalization rate) for different segments of the sector. Still, whether using the discounted cash flow methodology or the income valuation methodology, we believe three fundamental factors drive sector-level profitability (and returns): commodity prices, production volumes, and productivity.

- » The long-term growth rate of commodity prices is important to long-term revenue and profit growth. But because commodity prices tend to follow cycles and do not grow in a straight line, they are often the greatest driver of short-term returns.
- » Production volume trends, owing to farmed area and production yield growth, directly translate to farming revenues and underpin agribusiness activity through the entire supply chain.
- » Enterprise-level productivity growth, measured using total factor productivity (TFP), incorporates the efficiency to increase outputs relative to inputs through operational practices and technology adoption, reflecting the cost of production and productivity gains.

Commodity Prices

A key component of agricultural profitability is the prevailing market prices for individual crops or products. As shown in **Figure 14**, food and soft-commodity prices have grown over the long run. Between 1969 and 2019, the FAO Food Price Index, which tracks a basket of international commodities, grew at

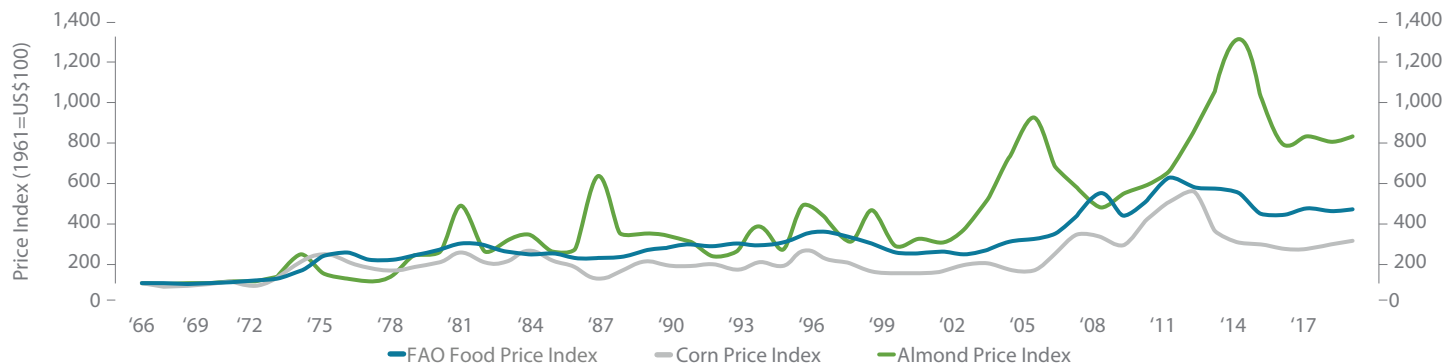
2.9% per year; corn and almond prices grew by 2.1% and 4.0% respectively over the same period. Figure 14 also highlights periods of significant volatility and price depreciation. Changes in production, mostly due to weather conditions, and the resultant market supply tend to account for most of this price volatility. By contrast, consumption growth tends to be more stable and inelastic; however, individual products can face material changes in demand due to consumer trends, government demand subsidies, and trade barriers.

In assessing the practical implications for underwriting, it is essential to view the relevant commodity price cycle over the short, medium, and long run, as well as the outlook for key end markets. The combination of historical price regression and futures curves may offer an objective methodology for estimating a long-term forward price curve; however, many products do not have sophisticated financial markets and lack the data necessary for this approach. When historical pricing or futures curve data are scant, investors might look at the price of imports, the cost of substitute products, or the marginal cost of production; they might also build demand and supply models to assess the short-, medium-, and long-term outlook for prices. These options, however, become increasingly complicated and require extensive industry networks, especially when evaluating prices on a global scale.

Production Trends

Production trends are a function of both farmed area and production yields. Whereas farmed area is usually fixed, especially in developed markets, there is often scope to shift between farming activities for any particular farmland. This

FIGURE 14 | FAO FOOD PRICE INDEX & SELECT COMMODITY PRICES



Source: USDA National Agriculture Statistics Service, UN Food and Agriculture Organization, NCREIF Farmland Index 2019.

PERMANENT VS. ANNUAL CROPS

A major difference between annual and permanent crops is the flexibility to rotate between crop types depending on prevailing market conditions. For this reason, annual crops are generally considered to be lower risk. While this may be the case for farms that have the ability to rotate between annual crops with materially different end markets (e.g., between grains and vegetables or fodder crops), major row crop prices tend to have a high level of correlation with one another compared with permanent crop prices, which can offset the benefits of this crop optionality, as demonstrated in **Figure 15**. Consequently, developing a portfolio of investments that are diversified across sub-sectors, countries, and end markets is a typical approach to mitigating individual product price or market risk.

FIGURE 15 | REAL REVENUE CORRELATION, CPI-U ADJUSTED PRICES RECEIVED (1997–2017)

Current Internal Rating		Cherries	Olives	Apples	Wine Grapes	Almonds	Oranges	Peaches	Peaches (GA)	Corn	Soybeans	Wheat	Potatoes	Onions
Permanent	Cherries													
	Olives	18%												
	Apples	46%	61%											
	Wine Grapes	30%	58%	85%										
	Almonds	39%	19%	63%	56%									
	Oranges	33%	-14%	24%	35%	47%								
	Peaches	24%	41%	66%	73%	41%	13%							
	Peaches (GA)	4%	-6%	24%	22%	26%	22%	66%						
Annual - Row Crops	Corn	62%	-31%	-26%	-46%	-15%	-8%	-33%	-2%					
	Soybeans	77%	-7%	16%	11%	27%	39%	-8%	6%	74%				
	Wheat	44%	-42%	-29%	-43%	-1%	19%	-62%	-27%	77%	68%			
Annual - Specialty	Potatoes	43%	26%	16%	28%	6%	49%	32%	-11%	-10%	3%	-15%		
	Onions	-23%	30%	-10%	29%	-8%	6%	34%	-37%	-26%	-3%	-41%	4%	
	Alfalfa	57%	-36%	19%	-9%	56%	41%	-19%	-1%	48%	50%	70%	-1%	-65%

Source: USDA National Agricultural Statistics Service, International Farming Corporation analysis.

is an ever-present trend in Agriculture, where farmers are continually seeking to put farmland to its highest and best use, whether that be converting from pastoral livestock to annual cropping, or from annual cropping to permanent cropping. These trends, which tend to be slow moving, must be understood to grasp the production outlook for any given product.

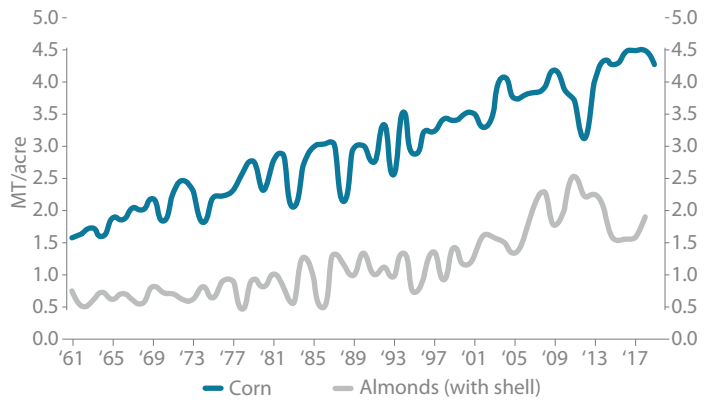
The other factor upon which volume depends is productivity yield growth. Seasonal volatility notwithstanding, production yields for corn, the largest annual crop by farmed area and value in the US, have grown at 1.1% per year since 1961, as shown in **Figure 16**. Almonds, the largest permanent crop in the US by area, have seen production yields grow at a CAGR of 1.7% over the same time period. Better genetics, disease treatments, technological innovation, and farming practices have all contributed to this long-term increase in yields.

The combination of evolving farming practices and productivity growth is a key reason corn, almonds, and agricultural volumes as a whole have increased over the years. Diversifying your portfolio across different products and production regions is a common strategy for mitigating production volatility risk. In addition to showing how corn and almond yields have grown over time, **Figure 16** also illustrates the point that unfavorable conditions for one product can be offset when conditions for another product are more favorable. For example, between 2009 and 2012, corn yields fell by 25%, whereas almond yields increased by 25%.

Productivity Growth

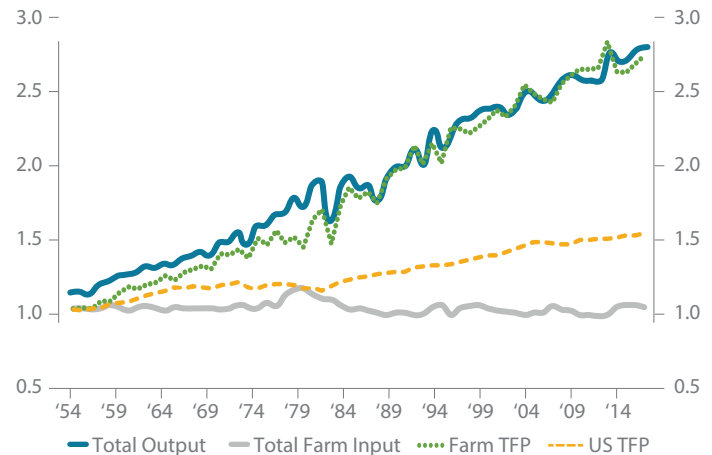
The ability to produce more only represents a single factor of productivity and may not be enough to ensure steady profit growth. In all likelihood, profit growth requires efficient use of inputs such as fertilizer, chemicals and sprays, fuel, labor, and capital. Between 1954 and 2017, US agricultural output grew at a CAGR of 1.61% while inputs grew at 0.06%. This implies the TFP grew at a CAGR of 1.55% as shown in **Figure 17**. In other words, Agriculture has shown it can produce more using essentially the same level of inputs, which reinforces sustained growth in cash flow generation across the Agriculture sector. That the broader US economy's TFP grew at a rate of 0.69% only serves to underscore one of Ag's key competitive advantages: the potential to generate competitive returns over the long run.

FIGURE 16 | CORN & ALMOND YIELDS



Source: USDA National Agricultural Statistics Service; UN Food and Agriculture Organization.

FIGURE 17 | US TFP GROWTH



Source: USDA, January 2020.

In summary, the key factors of commodity price growth, production trends, and TFP collectively drive revenue and margin growth—all of which underpin long-term returns for Agriculture investments. Commodity price cycles are the primary driver of short-term return volatility. While it is difficult to forecast prices, investors should be mindful of how prices compare with their long-term sustainable levels given the implication for returns in the short to medium run. Periods of price deflation typically precede periods of low returns, and vice versa.

A NATURAL EXTENSION FOR REAL ESTATE AND INFRASTRUCTURE INVESTORS

A common consideration for investors new to Agriculture is where to start. Should an Ag program be seeded through an existing real estate or infrastructure allocation or through a new natural resources allocation? The right answer involves tailoring of investment strategies to align with these allocations.

For example, an Agriculture strategy that focuses on leased farmland will generate returns comprising rental income and capital appreciation as you would expect from real estate. However, Ag has the additional benefits of low vacancy and default rates, which in the US both approach 0% for high-quality managers. Ag also has the benefit of federally backed crop insurance, which ensures farmers can pay rent regardless of how much income they earned.

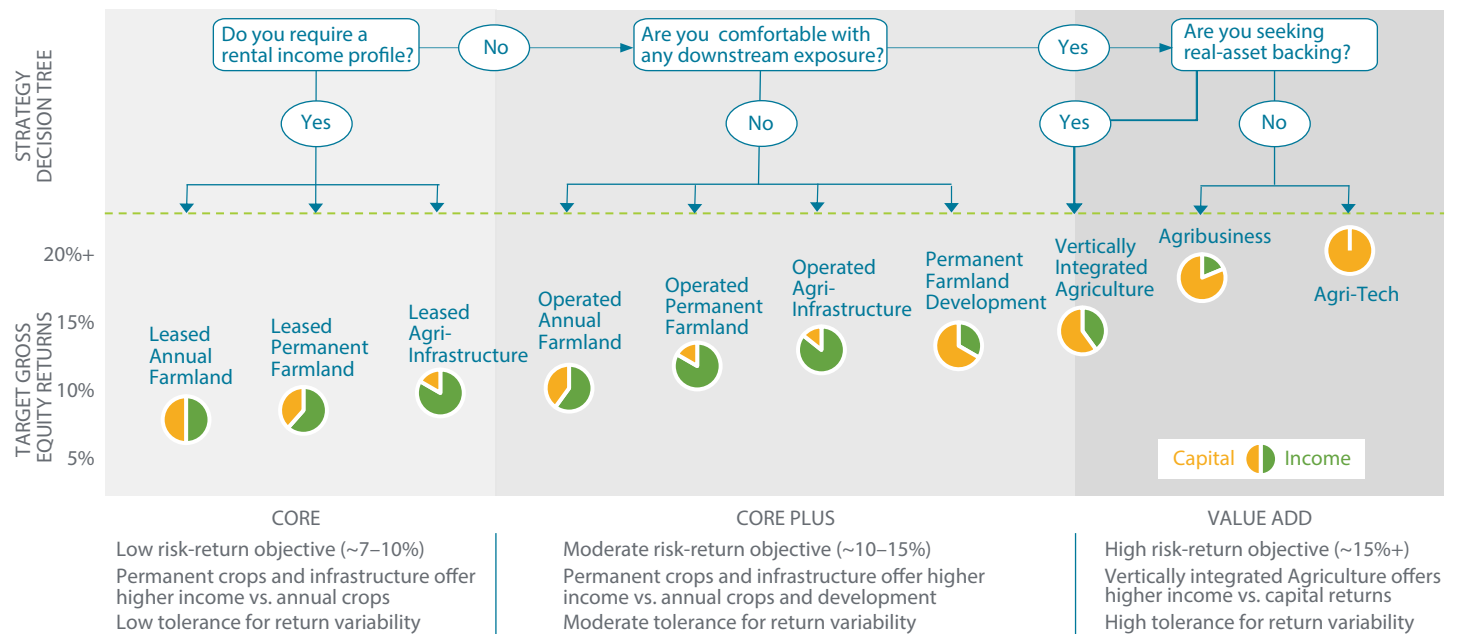
On the other hand, an Agriculture strategy that focuses on permanent crops is expected to generate high levels of income returns as you would expect from infrastructure; vertical integration has the potential to enable contracted revenues, which are also a hallmark of infrastructure.

In both cases, Ag offers the portfolio-level traits investors have come to expect from real estate and infrastructure, such as real-asset backing and a hedge against inflation. Ag’s defensive traits, however, are more pronounced: The need for sustenance is unyielding. These characteristics lie very much at the heart of Agriculture’s ability to preserve capital during periods of economic turbulence including the Covid-19 pandemic.

DEVELOPING AN AG INVESTMENT PORTFOLIO

While Agriculture remains a relatively nascent sector for institutional investment, the level of penetration has advanced greatly. Since 2009, fund manager AUM has increased from US\$3 billion to US\$33 billion.⁶ The options available for deployment have increased significantly. Investors have the option to partner with managers to invest across specific strategies and sub-sectors within Agriculture, as shown in **Figure 18**. Investors will also need to carefully consider which vehicle is most suitable for their team and organization, including the appropriate balance of investment governance

FIGURE 18 | AGRICULTURE INVESTMENT DECISION TREE



For illustrative purposes only.

⁶Preqin, December 31, 2019. Includes unrealized value and dry powder. Preqin data are continuously updated; historical values subject to change.

and liquidity, allocation scale (to achieve diversification across the portfolio), and the level of internal expertise and resources available for implementation. This will require investors to decide on the use of primary funds, fund secondaries, co-investments and separately-managed accounts (SMAs), the merits of which are shown in **Figure 19**. It is important to highlight that SMAs are typically used to either:

- » Replicate farmland primary fund offerings with potentially enhanced structural characteristics (i.e., governance, liquidity); however, this requires significant scale (US\$200+ million) in order to achieve desirable portfolio diversification; or
- » Access vehicle strategies (i.e., fund secondaries and co-investments) where investors need greater internal sector expertise and/or resources in order to execute on these more active opportunities, which involve more complex due diligence and shorter investment timelines.

PRIMARY FUNDS

As shown in **Figure 20**, there is a broad range of GPs active in the Agriculture sector. The industry has matured to the point that investors can access specific strategies and sub-sectors through targeted commitments to quality fund managers. That nearly 50 GPs are raising (or expected to do so) in 2020 underscores two things: the number of readily available options for investors to customize their portfolios and the amount of capital Agriculture needs. This includes several managers that offer farmland SMAs and are able to develop tailored large-scale portfolios; however, this requires a sizable commitment to achieve the same level of diversification that traditional fund investments can provide.

Given the broad risk-return profile offered by agriculture, investment strategies can be customized to achieve vastly

FIGURE 19 | VEHICLE INVESTMENT STRATEGIES

Option	Primary Funds	Fund Secondaries	Co-Investments	Direct	SMAs
Summary	Commitments to commingled closed or open-ended funds	Secondary purchase of commitment to commingled closed or open-ended funds	Investment alongside GPs / LPs in select assets & companies	Invest directly in assets & companies	Tailored asset & company investment plan
Governance					
Liquidity					
Ease of Due Diligence					
Typical Investment (\$M)	10–250	10–50	10–50	100+	Strategy Dependent
Minimum Allocation (\$M)	10+	50+	50+	500+	100+
Benefits	Broadest range of manager options Offers a highly diversified investment exposure Enables access to co-investment deal flow	Access seeded & fully invested portfolios that help mitigate blind pool risk and fund J-curve Discounts potentially enhance returns	Investment level selection supports returns & portfolio optimization Negligible J-curve Typically attracts lower fees & carry	Maximum level of governance, liquidity & strategy customization Negligible J-curve Lowest management cost option at scale	Investment level governance, and potentially liquidity Enables higher value add strategies for expertise & resource-constrained teams
	Very Strong Strong Moderate Weak Very Weak				

For illustrative purposes only.

VERTICALLY INTEGRATED AGRICULTURE

While analysis of Agriculture returns highlights the annual income volatility that can be associated with commodity price cycles, volumes dependent on growing conditions, market access and government policy, there are investment strategies beyond leasing and diversification that are able to mitigate these risks.

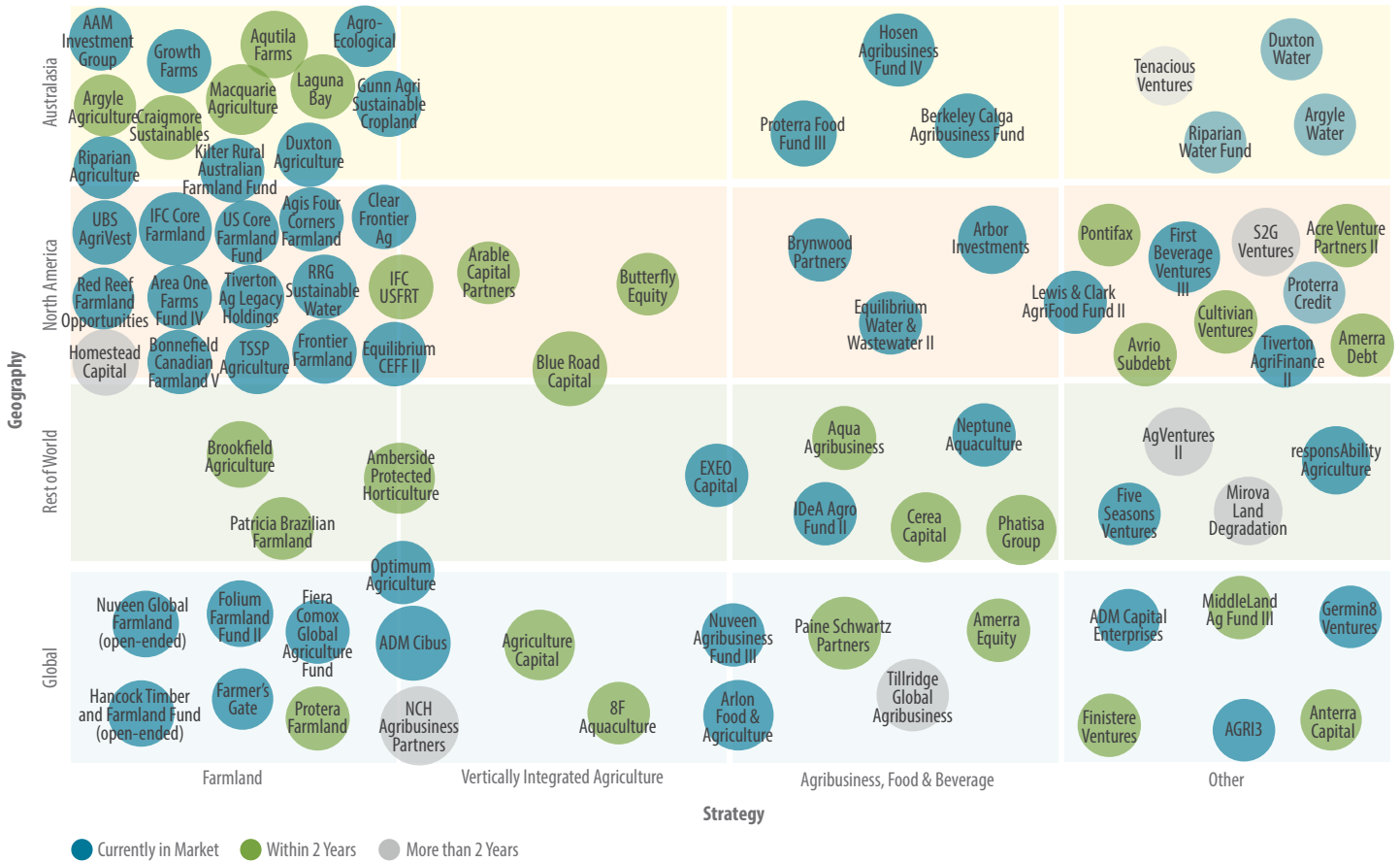
Vertically integrated business models offer an interesting hybrid strategy that combines farmland and agribusiness, thereby linking production, processing and distribution activities disintermediating the supply chain. This model can have numerous benefits to stakeholders involved in the value chain:

- » Customers may achieve improved reliability, traceability, and consistency of supply that enhances their own efficiency and product marketability; and
- » Producers may achieve increased margins through disintermediation, lower price volatility and greater volume certainty through contractual protections, and enable greater control over operational outcomes.

By moving closer to the end consumer, vertically integrated business models can potentially de-commoditize agricultural investments extending into contractual business-to-business relationships that more closely resemble retail pricing dynamics. The benefits of this become clear when comparing the volatility of commodity prices with that of retail. For example, according to 2020 USDA data, over the last three years, raw conventional milk prices had a standard deviation of 8.8%; retail conventional milk's was 2.5%.⁷

⁷ USDA Economic Research Service and USDA National Agricultural Statistics Service. 2020.

FIGURE 20 | AGRICULTURE MARKET MAP



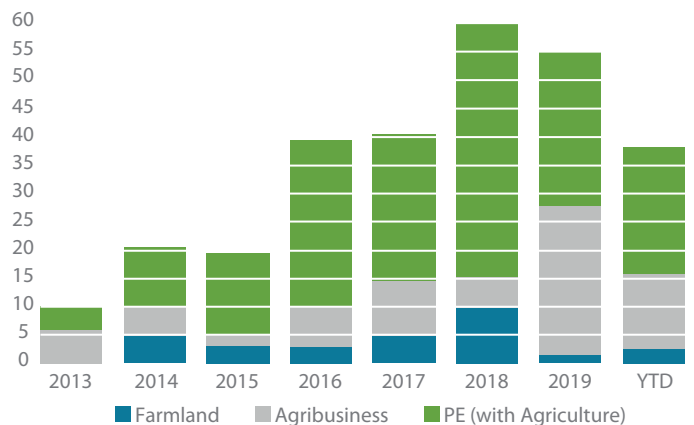
Source: StepStone. Manager references are for illustrative purposes only and do not constitute investment recommendations. Size of circle denotes fund size.

different objectives. Whether a strategy seeks to achieve high real-asset backing, a fixed yield, high yield, low commodity price volatility, high total returns, or any combination thereof, all objectives can be met using some combination of managers that target different investment structures, sub-sectors, and business models.

SECONDARIES

While the range of primary fund options in Agriculture is now quite diverse, the sector has also matured to the point that investors can consider tactical strategies. As has been observed with other asset classes, as the value and tenure of assets under management increase, so too do opportunities to purchase secondary interests in funds. As seen in **Figure 21**,

FIGURE 21 | SECONDARY DEAL FLOW (#)



Source: StepStone as of July 31, 2020.

the number of secondary opportunities has grown to the point that investors can build a strategy around this opportunity set.

Secondaries offer attractive relative value, with seeded or fully invested portfolios that help to mitigate the J-curve effect and blind pool risk. They also offer the potential for enhanced returns through discounts, which can be significant owing to limited investor demand and broker knowledge in the sector.

CO-INVESTMENTS

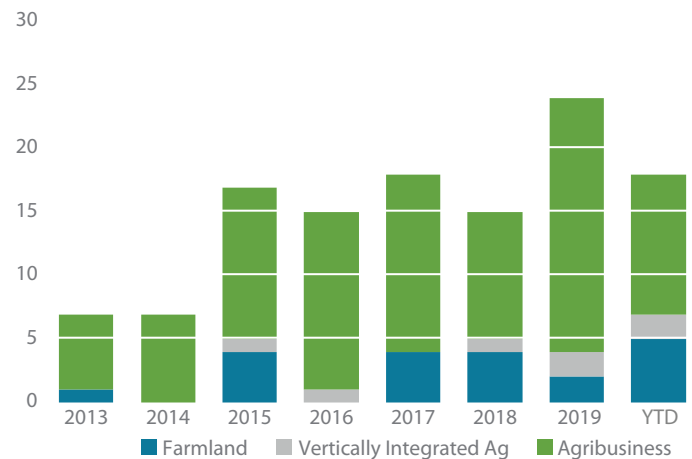
The co-investment trend that has taken hold across private markets is also emerging in Agriculture. StepStone has observed a steep change in deal flow in the last two years, particularly with managers targeting large or vertically integrated operations as well as agribusiness (Figure 22).

Co-investments present an attractive value proposition relative to fund investments. As is the case with private equity and direct lending, co-investments can be deployed quickly and are often offered on a lower fee basis—both of which help to mitigate the J-curve effect. Because co-investments are offered by managers of varying sizes and specialties, they provide investors an opportunity to broaden their deal funnel and optimize their portfolios.

CONCLUSION

The investment thesis for Ag is straightforward: Food is essential. Yet LPs have several alternatives for investing in the space, each of which has its own risk and return profile.

FIGURE 22 | CO-INVESTMENT DEAL FLOW (#)



Source: StepStone as of July 31, 2020.

The combination of these factors creates an investment opportunity that can offer LPs the flexibility to achieve a range of investment objectives. Whether seeking outsize returns or protection from systemic shocks, Agriculture can play an important role in investors' portfolios. It is a natural extension of an existing real-asset program.

The sector has also matured. There are more managers that can provide access to the space and more vehicles for doing so: Secondary and co-investment deal flow has grown significantly. We believe Agriculture has reached a critical point and is ripe for institutional investment.

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The Firm creates customized portfolios for many of the world's most sophisticated investors using a highly disciplined, research-focused approach that prudently integrates fund investments, secondaries and co-investments.

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