THE Frontier Line

Thought leadership and insights from Frontier Advisors

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A case for agriculture

Don't keep all your eggs in one basket

FRONTIER ADVISORS

Frontier Advisors

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Frontier's purpose is to enable our clients to generate superior investment and business outcomes through knowledge sharing, customisation, client empowering technology and an alignment and focus unconstrained by product or manager conflict.

AUTHOR

Martin Thompson

Senior Consultant

Martin Thompson is a Senior Consultant at Frontier, having joined the firm as an Associate in 2009. Martin provides consulting support to a number of clients and undertakes investment and manager research. Prior to joining Frontier, Martin worked at Starfish Ventures, an Australian venture capital fund manager focused on high growth life sciences, information technology and clean technology companies. Prior to this Martin has worked in technology commercialisation at the University of Melbourne, virology research at Murdoch University and undertook a PhD in cancer research at the University of Western Australia. Martin has a Master of Applied Finance through Macquarie University, a PhD in Molecular Cell Biology and a Bachelor of Science with first class honours.

Executive summary

Agriculture is a sector with considerable potential as an asset class; agriculture strategies can generate solid returns that are largely uncorrelated to the largest sectors within an investor's portfolio, notably equities. However, few investors have a significant exposure to the sector.

While the sector is potentially attractive, portfolio construction and manager selection is difficult. Frontier believes an agriculture portfolio should incorporate a high level of diversification in order to adequately manage the risks specific to the sector. However, implementing a highly diversified strategy is difficult because of the small and fragmented nature of the sector, with most managers investing small amounts of capital with limited or poor track records. For those investors willing to gain an exposure to the sector, we would suggest taking an opportunistic approach to making investments.

In the absence of investing in a wide range of different strategies, we suggest investing primarily in one or two diversified strategies with reputable managers.
These strategies would form the core of the configuration and other more concentrated strategies could be added, if wished, as smaller satellite exposures.

For clients with an interest in the agriculture sector, Frontier is happy to discuss both portfolio construction and potential strategies.

Background: The agriculture sector

Agriculture involves farming of plants, animals and fungi for a range of end purposes, including consumption, production of fibre, clothing and other goods.

Farming can be classified broadly into annual crop, permanent crop and livestock farming. Annual crops are planted and harvested annually (e.g. wheat) while permanent crops produce over multiple years (such as fruit trees). Livestock farming is looking after various animal species to produce outputs including meat, wool, milk and other products.

As distinct to farming, there are also agribusinesses. These are ancillary businesses to farming involving inputs into the production process or handling of the outputs, such as fertiliser, equipment, logistics, processing and distribution. These areas are sometimes called "post farm gate". For the purposes of this paper our focus is on farming as opposed to agribusiness. The investible assets within the agriculture sector are the land, permanent crops and potentially livestock and equipment. Assets are usually small, largely due to the capital constrained, owner-operator nature of many farms.

Characteristics of the institutional market

Size

Agriculture as an asset class is tiny relative to most others, such as equities, bonds or even infrastructure. Estimates for the size of the institutional agriculture market are around US$45 billion.

Beyond the institutional market, actual assets within the agriculture sector are much larger, with estimates of the non-institutionally held investible farmland globally at US$1.5 trillion. Agricultural production is also very large with The United Nations Food and Agriculture Organisation recording total gross production in 2016 for all agricultural commodities of US$4.7 trillion. It is unclear why there is such a discrepancy in size between the global institutional and non-institutional markets, but poor historical performance may be one factor.

Managers and strategies

Gaining an exposure to the agriculture sector is difficult as the institutional agriculture market is fragmented and there are relatively few managers with a proven track record. The largest investor in the space is TIAA (via its subsidiaries Nuveen and Westchester). TIAA holds agriculture assets in the high single billions. Beyond TIAA, capital held by individual investors drops off quite dramatically.

Table 1 outlines the agriculture managers Frontier has been covering over recent years. This is biased towards managers active in the Australian market, but there are a range of other managers globally.

The investment proposition offered by the managers highlighted in Table 1 is diverse. This is an outcome of numerous farmed products, numerous investment strategies (such as roll-ups, conversion to higher and better use, and vertical integration) and multiple geographies to consider. In many respects, agriculture is very private equity-like, given the wide variability of sectors, assets and strategies.

Frontier believes some of the potential within the agriculture sector arises from the large non-institutional asset base that may provide significant potential for additional value generation in the hands of the right investor.

Table 1: Agriculture managers and strategies

Manager	Strategies	Geographic focus
AgCap	Sustainable Agriculture Fund (exited) dairy focused strategy	Australia
Artesian Agriculture	"Agritech" focused strategy	Australia
Blue Sky Capital	BlueSky Strategic Australian Agriculture Fund	Australia
Challenger	Challenger Agricultural Fund	Australia
Duxton Asset Management	water trading strategies (including Duxton Water Limited and mandates) Duxton Agricultural Commodities and Equities Fund Duxton Global Agricultural Land and Opportunities Fund	Australia
Gunn Agri Partners	Gunn Agri Cattle Fund	Australia
Hancock	farmland mandates Hancock Timberland and Farmland Fund	US & Australia
Macquarie	Macquarie Pastoral Fund Macquarie Crop Fund	Australia
Sirona Capital	Sirona Farms and Food Fund	Australia
TIAA	TIAA Global Farmland fund series Nuveen Agribusiness fund series	US & Australia
QIC	QIC Beef Investment Vehicle	Australia

Investment structures

Agriculture fund structures include open-end and closed-end funds but closed-end private equity style funds are more common. Separately managed accounts (SMAs) may be an option as well.

The most appropriate approach will depend on what an investor wants to achieve and the size of their agriculture allocation. SMAs will typically give the most amount of control and tailoring but require considerable scale and concentration with a single manager.

Another approach some investors take is to invest directly into the sector, supported by internal resources. Direct investment has some attraction due to the limited manager universe, but still faces similar implementation challenges.

Fees

Fees in agriculture are generally high. Management fees are typically greater than 1% p.a. plus a performance fee. We expect an investor of scale to be able to negotiate better fee outcomes.

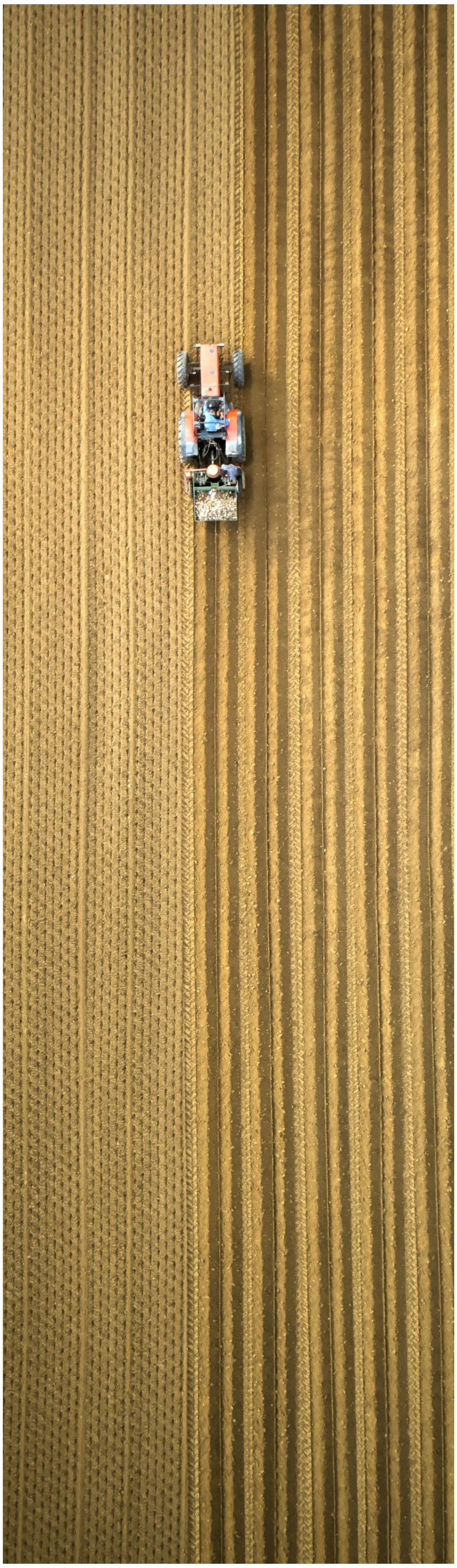
Return targets

The forward-looking return targets of most agriculture managers are around 10% p.a. gross of fees, regardless of the specific strategy or commodity being targeted. While this may be suitable for a lower risk, diversified strategy, we would expect a higher return target for more concentrated or risky strategies.

ESG

The level of focus on ESG varies considerably by manager, but environmental considerations are an area of focus for many managers. This includes remediation of low productivity land and weed clearing, as this makes sense from an asset sustainability and productivity standpoint. Some aspects of agriculture, for example, animal welfare, can be controversial. Investors will need to carefully consider ESG factors prior to making investments in the sector.

There is also some scope for agriculture strategies to address issues raised by the UN Sustainable Development Goals (SDGs). These include “restore degraded land and soil” covered by SDG 15 (Life on Land) and “ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production” covered by SDG 2 (Zero Hunger).



Agriculture performance characteristics

As an asset class, agriculture is attractive for inclusion in a portfolio as it has the potential to generate strong returns and improve a typical portfolio's overall risk profile.

Representative benchmarks used in our analysis in this section are outlined in Table 2.

Portfolio diversification benefits

Agriculture is a positive addition to a portfolio due to the low correlation it has with most other asset classes. Therefore, inclusion in a portfolio provides diversification and could improve total portfolio performance and reduce volatility.

Table 3 demonstrates the low correlation of returns between agriculture and other asset classes between 1996 and 2017.

The purpose of using calendar year returns is to reduce any impact of differing valuation methodologies on the correlations - listed sectors will be marked to market daily, while unlisted performance will be based on less frequent independent appraisals. Similarly low correlations are seen when analysing the data using other methods (such as quarterly returns and different periods).

Table 2: Representative sector benchmarks

Sector	Representative benchmark
Agriculture (Agri)	NCREIF Farmland Index
Agriculture commodities (AgC)	S&P GSCI Agriculture
Agriculture livestock (AgL)	S&P GSCI Livestock
Australian listed equities (AEQ)	S&P/ASX Accumulation 300 Index
Australian fixed interest (AFI)	Bloomberg AusBond Composite 0+ Years Index
Global fixed interest (OFI)	Barclays Global Aggregate Hedged
Global listed equities (OEQ)	MSCI World Ex Australia Net Div Local Currency
US unlisted property (Prop)	NCREIF All Property Total Return
Unlisted infrastructure (Infra)	Frontier Unlisted Infrastructure Benchmark

Source: Bloomberg, Datastream, NCREIF, Frontier

Table 3: Correlations of calendar year returns (1996 top 2017)

	Agri	AEQ	AFI	OFI	OEQ	Prop	Infra	AgC	AgL
Agri	1.00	0.15	0.01	-0.11	0.12	0.37	0.12	0.08	0.09
AEQ	0.15	1.00	-0.61	-0.34	0.79	0.13	0.09	0.24	0.36
AFI	0.01	-0.61	1.00	0.81	-0.53	0.02	0.20	-0.14	-0.08
OFI	-0.11	-0.34	0.81	1.00	-0.43	-0.07	0.00	0.16	-0.06
OEQ	0.12	0.79	-0.53	-0.43	1.00	0.21	0.18	0.16	0.30
Prop	0.37	0.13	0.02	-0.07	0.21	1.00	0.59	0.15	0.33
Infra	0.12	0.09	0.20	0.00	0.18	0.59	1.00	0.06	0.37
AgC	0.08	0.24	-0.14	0.16	0.16	0.15	0.06	1.00	0.11
AgL	0.09	0.36	-0.08	-0.06	0.30	0.33	0.37	0.11	1.00

To further illustrate the positive benefits of including agriculture investments in a portfolio, we have undertaken simulation estimates of historical performance of a diversified portfolio, both with and without the inclusion of a 5% allocation to agriculture.

As shown in Table 4, over the longer-term, inclusion of agriculture improves portfolio performance and reduces volatility with only a marginal increase in illiquidity. It also improves the Sharpe Ratio of the portfolio over all measured periods.

Return and volatility

Data on returns for institutionally held infrastructure investments is limited, with the key, widely used source being the US National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index.

The NCREIF Farmland Index is a reasonable representation of what an institutional diversified agriculture strategy could achieve in the US market. Assets included in the benchmark are US farmland properties held by institutional investors for investment purposes.

It should be noted that the NCREIF Farmland Index benefits from commodity and geographic diversification at levels much higher than an individual US-focused strategy would likely achieve.

Tables 5 and 6 demonstrate that over the long-term, United States farmland has performed strongly, outperforming all other sectors while exhibiting lower levels of volatility than equities.

Table 4: Portfolio performance with and without agriculture to 30 June 2018

	Return (% p.a.)		Volatility (%)		Sharpe Ratio	
	w/o Agri	With Agri	w/o Agri	With Agri	w/o Agri	With Agri
1 year	9.2	9.0	4.9	4.7	1.52	1.53
3 year	7.9	7.9	4.5	4.4	1.32	1.36
5 year	9.2	9.2	4.5	4.4	1.54	1.59
10 year	7.2	7.5	7.8	7.5	0.50	0.55
20 year	7.9	8.1	7.6	7.4	0.44	0.49

Table 5: Performance to 30 June 2018 (% p.a.) (local currency)

	Agri	AEQ	AFI	OFI	OEQ	Prop	Infra
1 year	6.5	13.2	3.1	1.9	10.8	7.2	10.9
3 year	7.6	9.1	3.4	3.8	8.6	8.3	11.3
5 year	10.2	10.0	4.4	5.0	11.1	9.8	11.3
10 year	11.7	6.3	6.1	6.9	7.3	6.2	9.5
20 year	12.4	8.9	5.8	7.0	4.9	9.2	11.3
1991 +	11.3	10.3	7.5	8.1	7.4	8.0	n.a.

Table 6: Volatility to 30 June 2018 (%)

	Agri	AEQ	AFI	OFI	OEQ	Prop	Infra
1 year	1.8	11.6	1.2	1.0	6.6	0.1	1.3
3 year	2.2	9.8	2.9	2.9	8.3	1.0	1.3
5 year	4.2	10.1	3.2	3.0	7.5	1.2	1.9
10 year	4.8	15.1	3.7	3.1	15.4	5.7	3.2
20 year	6.9	13.8	3.4	3.1	16.3	4.6	4.6
1991 +	6.0	13.2	4.4	3.5	14.9	4.5	n.a.

In contrast to the US, the Australia Bureau of Agricultural and Resource Economics and Sciences (ABARES) survey (Table 7 and Chart 1) indicates the performance of the Australian agriculture sector has been poor.

The largest farms in the survey did perform markedly better than average, most likely due to economies of scale, access to technology, and typically better asset management.

Stronger performance of the largest farms suggests institutional investors should be able perform better than the ABARES average, through accessing the factors that help larger farms outperform, as well as implementing strategies such as consolidation of smaller properties.

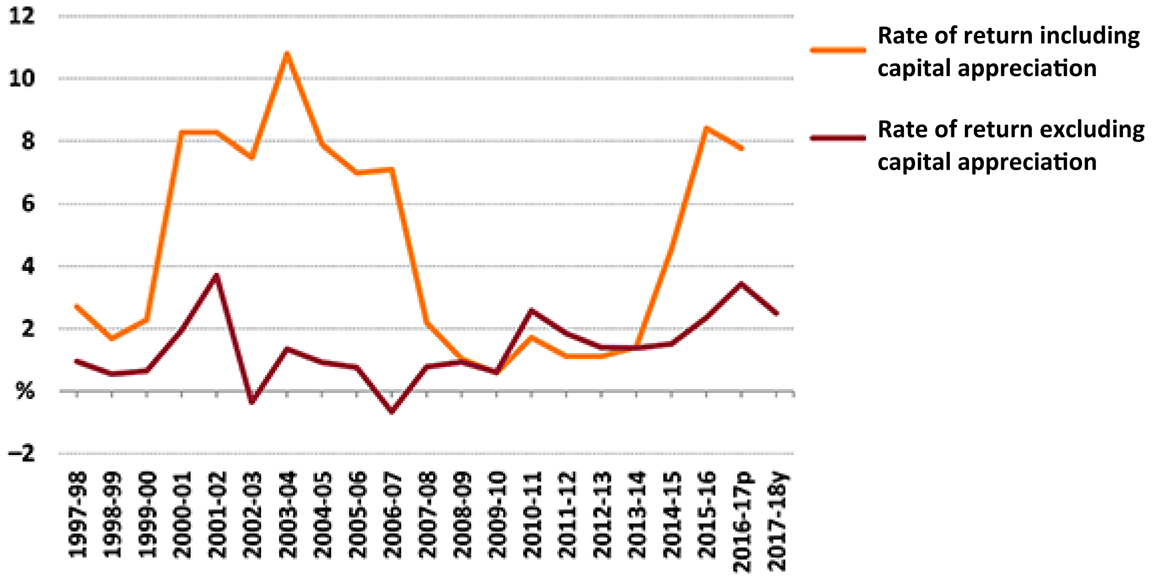
Table 7: : Rate of return to total capital (excluding capital appreciation) by industry and farm size, Australia, 2011–12 to 2017–18, average per farm

Industry	**Business size**[1]	**Five years ending 2015–16**	**2016–17 (preliminary estimate)**	**2017–18 (provisional estimate)**
		% p.a.	%	%
Wheat and other crops	Small	–0.5	0.6	0.7
	Medium	2.3	4.7	2.3
	Large	5.3	6.8	4.1
	Very large	8.1	9.1	6.0
Mixed live-stock-crops	Small	–0.5	0.8	1.1
	Medium	2.6	4.1	3.2
	Large	3.9	5.0	4.0
	Very large	9.2	4.6	4.4
Sheep	Small	–0.5	1.3	2.7
	Medium	2.3	3.9	6.0
	Large	4.6	5.6	7.1
	Very large	n.a.	n.a.	n.a.
Beef	Small	–0.7	0.3	–0.2
	Medium	1.7	2.8	3.2
	Large	2.0	3.8	4.0
	Very large	3.6	6.2	8.9
Sheep-beef	Small	–0.2	1.4	2.6
	Medium	1.8	3.2	4.4
	Large	3.4	5.1	6.5
	Very large	n.a.	n.a.	n.a.
All broad acre farms		1.7	3.4	2.5
Dairy	Small	0.0	–1.8	0.2
	Medium	2.2	1.9	3.8
	Large	4.3	2.7	4.1
	Very large	6.2	5.2	9.1
All dairy farms		2.6	1.3	3.1

Source: ABARES

[1]The categories of small, medium, large and very large have annual total value of sales of less than \$0.5 million, \$0.5 million to \$1 million, \$1 million to \$5 million and more than \$5 million respectively.

Chart 1: : Rate of return to total capital (excluding capital appreciation) by industry and farm size, Australia, 2011–12 to 2017–18, average per farm



p Preliminary estimates. **y** Provisional estimates.

Source: ABARES

Manager performance

Manager selection is extremely important in the agriculture sector due to few managers having a strong and demonstrated track record. Manager underperformance has historically been due to inexperienced teams, poor weather conditions (primarily drought) and poor strategy (e.g. lack of diversification).

Global managers (such as TIAA and Hancock) have generally outperformed their Australian counterparts. Both TIAA and Hancock run strategies diversified by geography and commodity type, with a high exposure to the US.

Risks

A notable characteristic of agriculture sector investments is exposure to a number of risks that are often binary in nature (e.g. weather) and difficult to manage. These are in addition to the usual risks associated with investing, such as interest rates and manager performance, further highlighting the importance of adequate diversification in the agriculture portfolio.

Some of the risks outlined in Table 8 can be hugely damaging and have a broad geographic reach. A notable Australian example was the ban on cattle exports to Indonesia that occurred in June 2011.

Such an event can affect the industry across a wide geographical area (such as the whole of the Australian continent). The impact can also last for an extended period of time, particularly in slower-growing animal sectors, due to the time for supply to respond to changing circumstances.

Another example of a major risk event was bovine spongiform encephalopathy (BSE or "mad cow disease"), that had broad impacts across multiple markets. This included the European Union banning imports of beef from the UK for ten years.

Table 8: Characteristic risks in agriculture

Risk	**Comment**
Commodity prices	Tends to be supply side driven Influences income and also input costs Introduces volatility to income
Environmental/weather	Such as fire, storms, flood, frost, drought, climate change
Sovereign/regulatory risk	For example, foreign ownership restrictions, export restrictions, subsidies, tariffs
Biological/pests, weeds and diseases	From weed control through to locust plagues or pathogen/ disease epidemics
Supply chain	Basic infrastructure needs to be in place to move product from farm to end consumer
Currency	Has an influence on commodity prices and influences competitiveness on global markets
Reputational	Some animal husbandry practices can be controversial

Implementation of an agriculture strategy

While Frontier believes agriculture as a sector is likely to be positive in a diversified portfolio, implementation is a key challenge. The two main difficulties we see are minimising the impact of risk events as outlined earlier, as well as identifying suitable ways to gain access to the sector.

Frontier believes diversification is vital to minimise the impact of significant risk events. Unless an investor makes a dedicated effort to invest across a range of strategies, we would recommend a product that at least incorporates diversification by agricultural product and preferably wide diversification by geography as well.

Where more concentrated strategies are of interest, we would recommend a core/satellite approach, with a diversified strategy as the core allocation and the focused strategies making up smaller satellite exposures.

Gaining access to the sector is challenging due to the limited number of managers with demonstrable capability to generate performance from the sector. We would recommend an initial focus on the larger managers such as TIAA, Hancock and Macquarie. These all operate different strategies, with both TIAA and Hancock operating diversified US focused strategies with some Australian exposures while Macquarie's strategies are more concentrated and Australia focused. Both TIAA and Hancock's strategies have potential as "core" allocations.

Separate mandates may be a viable approach for an investor willing to allocate a sizable level of capital to the agriculture sector. This will allow more tailoring of strategy and terms, though the diversification implications relative to a fund exposure should be considered.

Some investors have invested directly into the agriculture sector, supported by their own internal resources. We would apply similar principles of diversification to a direct program and would strongly recommend hiring specialist and experienced professionals from the agriculture sector to run such an internal strategy.

An implication of the risks and limited investible universe is that the agriculture sector should be relatively small within a portfolio. While a dedicated strategic asset allocation (SAA) could be implemented, we would suggest being pragmatic about filling such an allocation, accepting that finding suitable products will be difficult and take time.

Next steps & the final word..

There are several areas where further work could be done to support and strengthen the position put forward in this paper. Areas worth further investigation include:

- Further understanding the key drivers of agriculture returns
- Further explore the universe of potential agriculture managers globally, including the participants in the NCREIF Farmland Index