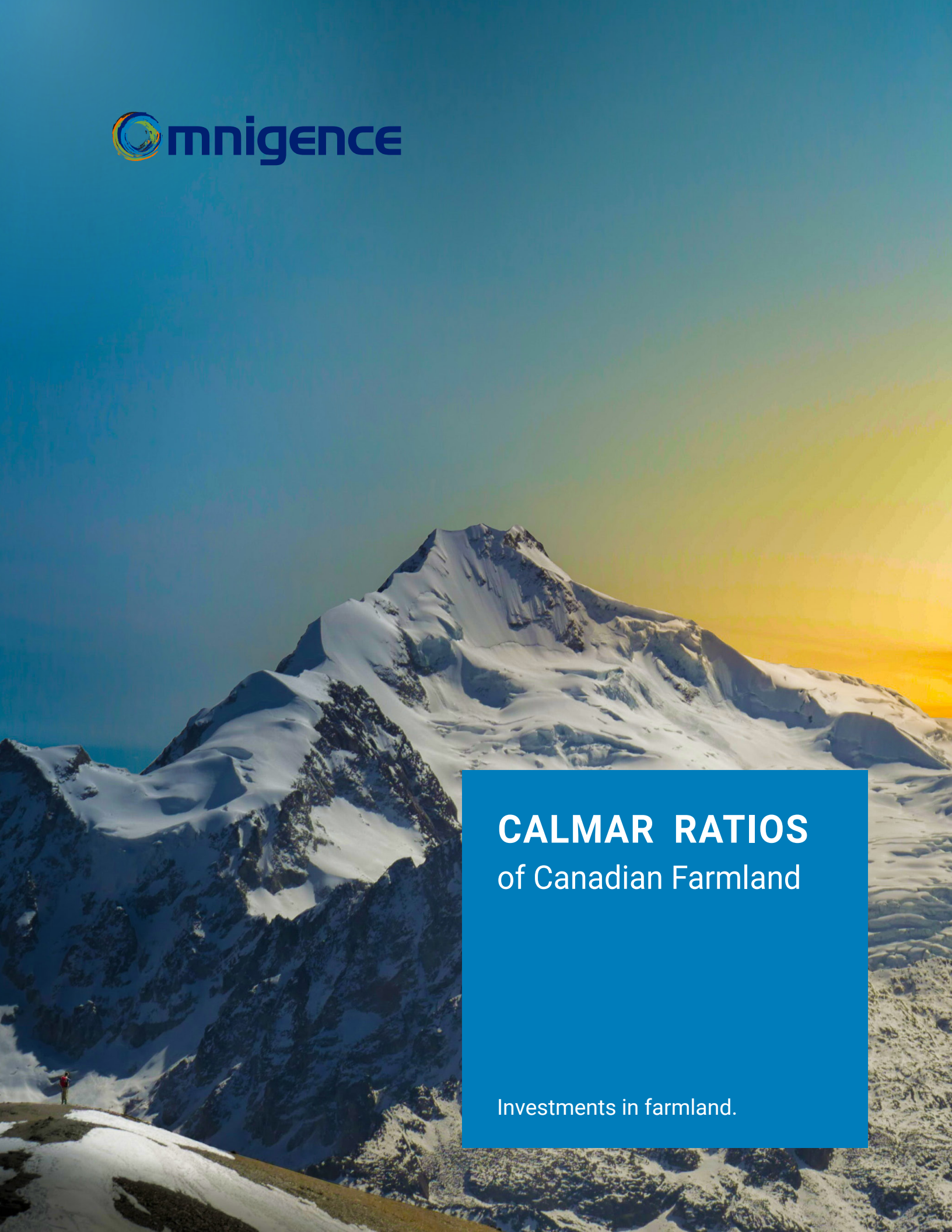

CALMAR RATIOS
of Canadian Farmland

Investments in farmland.

ABSTRACT:
Over the past 30 years, an analysis of the Canadian farmland investment market demonstrates that a farmland holdings would have produced Calmar ratios significantly higher than those generated by the S&P 500 during the same period.

KEYWORDS:
Canadian farmland, Alberta farmland, Saskatchewan farmland, Calmar ratio


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INTRODUCTION:
The Calmar ratio is an investment performance metric which sets the annualized return against the maximum recent drawdown. The ratio was created by Terry Young in 1991 and is usually measured across a 3-year window:

$$\text{Calmar Ratio} = \frac{\text{Annualized Return}}{\text{Maximum Drawdown}}$$

The construction of the ratio smooths out volatile returns, the denominator focuses on a key investor concern: what is the maximum loss if this investment is sold in a down market. The Calmar ratio is commonly used in the alternative investment industry, such as hedge funds and managed futures, as a way to assess how well an investment has performed relative to the amount of risk taken to achieve that performance. The higher the Calmar ratio, the better the risk-adjusted performance, as it indicates that the investment has delivered higher returns for each unit of risk taken on. One modification that is often done to the Calmar ratio is subtracting the risk free return from the underlying return time series, often we would like to compare the asset not to cash but to an alternative safe investment, this has the added benefit of introducing more negative returns in assets that are not achieving returns above the risk free rate. There is one other variation on the Calmar ratio, rather than using a three year window, the MAR ratio uses the same formula but for the entire time series. The MAR ratio therefor does not create a smoothed graph but rather a single metric to explain the series of returns.

DISCUSSION OF RESULTS:
Over the past 30 years, Canadian farmland has only had 1 year of negative returns. This return track record compares favorably to the S&P 500 which has had 5 years of negative returns over the same period. The lack of downside returns for farmland already suggests that ratios that adjust the return for risk taken will tend to favor farmland as an investment. Taking the MAR ratio for the past thirty years:

	Canada	SK	AB	S&P 500
MAR Ratio	2.74	0.54	1.06	0.3

We see that the MAR ratio for Canadian farmland is superior to the S&P 500 and this holds when we further dis-aggregate by province for Alberta and Saskatchewan. This result should not be surprising considering the large stock market downturns associated with the 2008 financial crisis; farmland, in contrast, kept growing through this period.

The Calmar ratio is normally calculated in a three year window, we can calculate this windowed function as a rolling average over the past thirty years. Following other Veripath research we are setting the risk-free rate at 3% over this period. It should be noted that in three year windows where there are no drawdowns, even after subtracting the risk free rate, the Calmar ratio cannot be calculated. The best way to compare the rolling Calmar ratio is across assets on a yearly basis.

	Canada	SK	AB	S&P 500
1993	-0.34	-0.36	-0.35	
1994	-0.24	-0.22	-0.03	1.92
1995	1.33	0.65	5.21	7.29
1996				9.85
1997				
1998		0.37		
1999		-0.21		
2000	2.00	-0.34		0.76
2001	-0.26	-0.34		-0.16
2002	0.63	-0.34		-0.40
2003	2.26	-0.20		-0.20
2004		0.41		0.02
2005		1.19		
2006		-0.31		
2007		0.70		
2008		9.89		-0.29
2009				-0.22
2010				-0.15
2011				12.06
2012				8.61
2013				14.50
2014				
2015				7.40
2016				3.55
2017				5.11
2018				0.85
2019				1.68
2020				1.52
2021				

This table shows that the S&P 500 has only outperformed farmland in one three year period, from 1993-1995, in any other three year window in the past thirty years, farmland would have been a better investment. Furthermore, the negative values imply that the risk free rate is higher than the asset return for that window, this happens regularly in the equities time series. The Calmar ratio shows that farmland is a more consistent risk adjusted investment when analyzed with the Calmar ratio.

REFERENCES:

- Aswath Damodaran, Historical Returns on Stocks, Bonds and Bills: 1928-2022: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html
- "Calmar Ratio: A Smoother Tool" by Young, Terry W., Futures
- Statistics Canada, CANSIM Database Table: 32-10-0047-01

APPENDIX:

Year	Canada	SK	AB	S&P 500
1991	0.01	-0.07	-0.04	0.30
1992	-0.02	-0.04	-0.02	0.07
1993	0.01	-0.01	0.02	0.10
1994	0.05	0.07	0.09	0.01
1995	0.09	0.10	0.14	0.37
1996	0.09	0.05	0.07	0.23
1997	0.10	0.05	0.10	0.33
1998	0.05	0.01	0.08	0.28
1999	0.03	0.00	0.05	0.21
2000	0.03	0.01	0.04	-0.09
2001	0.02	0.00	0.04	-0.12
2002	0.06	0.02	0.08	-0.22
2003	0.06	0.04	0.07	0.28
2004	0.06	0.03	0.08	0.11
2005	0.07	0.03	0.09	0.05
2006	0.07	0.03	0.08	0.16
2007	0.07	0.05	0.10	0.05
2008	0.12	0.13	0.15	-0.37
2009	0.06	0.12	0.03	0.26
2010	0.06	0.07	0.06	0.15
2011	0.07	0.13	0.05	0.02
2012	0.10	0.15	0.07	0.16
2013	0.14	0.21	0.11	0.32
2014	0.09	0.18	0.07	0.14
2015	0.08	0.11	0.08	0.01
2016	0.06	0.07	0.08	0.12
2017	0.08	0.09	0.08	0.22
2018	0.06	0.07	0.06	-0.04
2019	0.06	0.07	0.05	0.31
2020	0.05	0.06	0.06	0.18
2021	0.10	0.03	0.05	0.28

1970s Calmar Ratios

	Canada	SK	AB	S&P 500
1972	0.22	-0.35	0.31	
1973	7.45	0.47	2.28	0.12
1974		9.27		-0.29
1975				-0.19
1976				0.17
1977				1.34
1978				0.40
1979				0.25
1980				
1981				1.45
1982	2.92		2.02	1.53
1983	-0.07	0.78	-0.20	1.16
1984	-0.35	-0.19	-0.37	
1985	-0.36	-0.36	-0.37	

	Canada	SK	AB	S&P 500
Mean	0.06	0.06	0.07	0.13
Standard Deviation	0.03	0.06	0.04	0.17
StdDev Sharpe (Rf=3%, p=95%):	1.03	0.50	0.96	0.56

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