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## **Factor Optimized Canadian Farmland Portfolio:**

**Provincial Allocation  
Breakdown**

2020

## ABSTRACT:

Based on the filtered results from a weighted matrix of return factors, a non-acre weighted portfolio of Canadian row crop farmland can be constructed for investors. Following this matrix approach can provide superior features to following a simplistic 'raw acre weighted' approach.

## KEYWORDS:

Canadian farmland, productivity adjusted land prices, inflation, factor analysis.

## INTRODUCTION:

There are many different factors that may lead a plan to allocate to farmland within their portfolios. Among them are diversification benefits, up-down return asymmetry, volatility, inflation insurance, and productivity discounts.

It is well known that farmland is a strong portfolio diversifier because it has low or negative correlation with most traditional asset classes – this is the case over both long, and perhaps more importantly, short time horizons (ie. it hedges trending and episodic risks). Farmland can also compliment an investment in real estate or infrastructure because while it is also inflation protecting, stores value and offers a stream of income, it has diversifying risk-and return drivers.

Farmland, timberland, real estate, and infrastructure are not perfectly correlated and as such are not substitutes for one another when constructing portfolios. Granted, farmland is often allocated alongside or within timberland silos. However, it is not unreasonable to expect some rotation pressure out of timber given declining demand for newsprint and, perhaps, a skew to farmland weightings given the relative value proposition.

While few plans have a formal farmland allocation because of its unique features it can be considered for inclusion in a natural resource allocation, a real assets allocation and even within a real estate or infrastructure allocation. Plans may also want to consider using farmland as part of a liability-hedging allocation due to the fact that it has real return bond features.

Once the high-level portfolio construction details have been considered, the challenge becomes deploying capital – there are a limited number of experienced managers, and there are regulatory and market liquidity considerations. For example, in Canada farmland ownership is provincially, rather than federally regulated and therefore ownership rules vary by province. For example, Manitoba and Saskatchewan restrict institutional and foreign land ownership while British Columbia, Alberta and Ontario take a less onerous approach.

Despite the varied regulatory landscape, it is possible to navigate the various provincial frameworks and build investment structures that are acceptable to regulators and that meet investor return parameters. Having an investment manager who understands how and where to invest is important in the Canadian farmland space.



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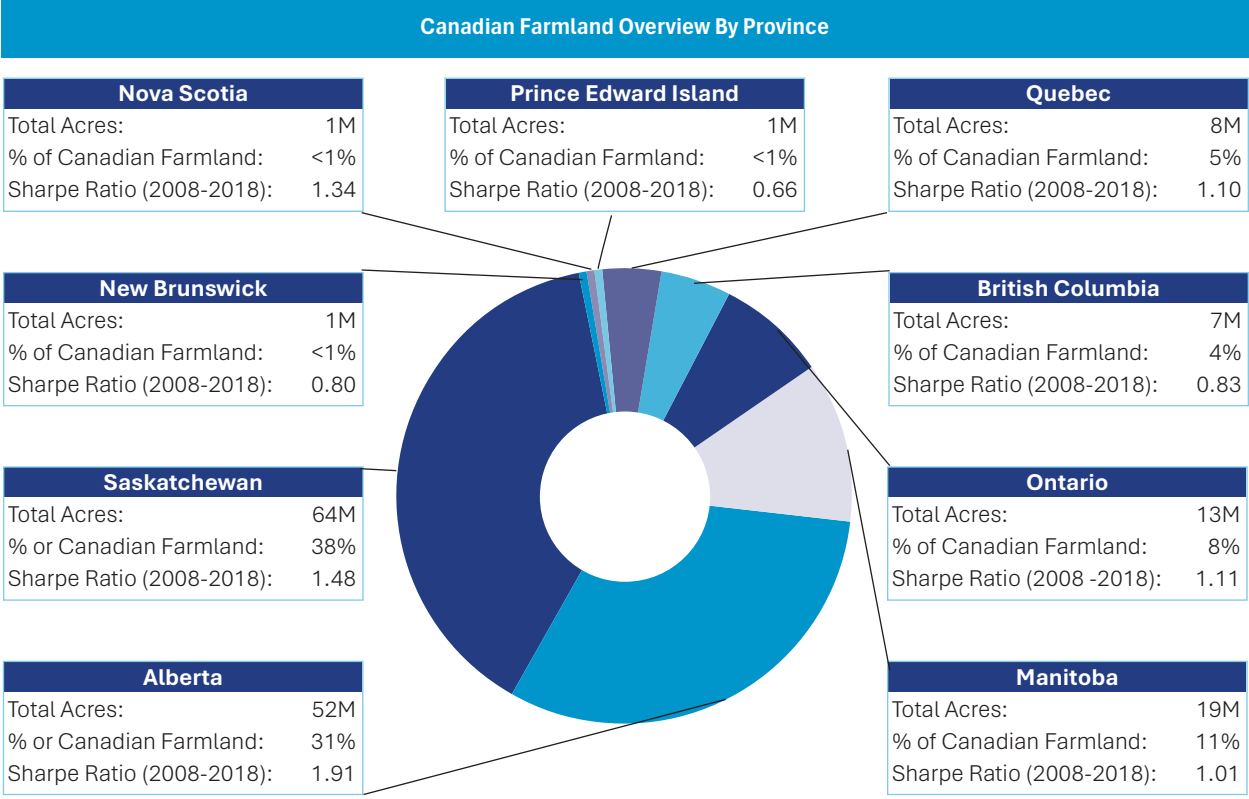
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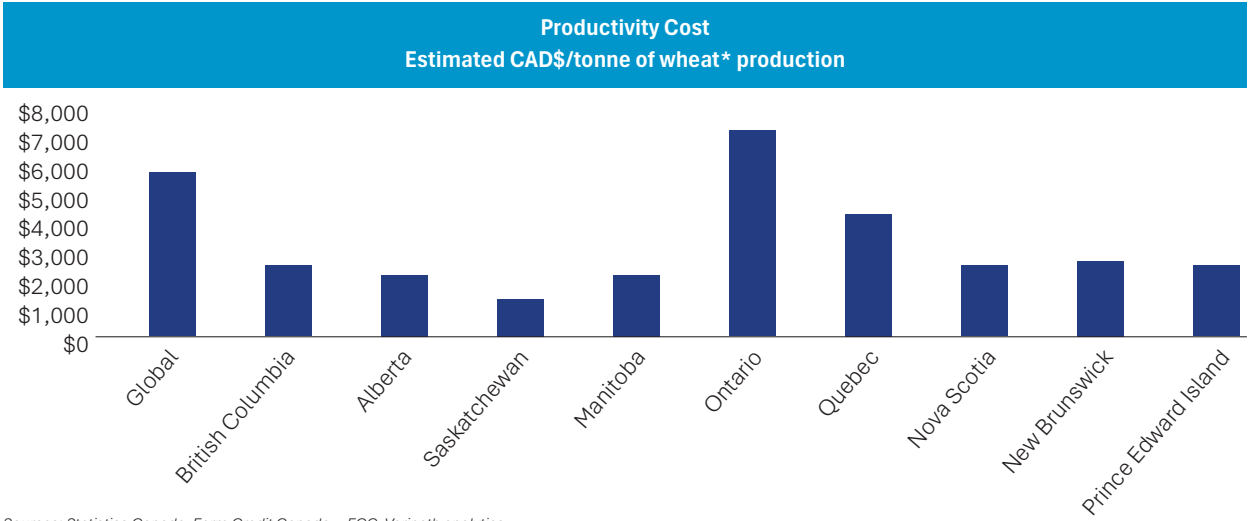


## SOURCE DATA AND ANALYSIS:

| Provincial Regulations      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BRITISH COLUMBIA</b>     | No restriction on institutional or foreign ownership. Uses of land in the Agricultural Land Reserve are regulated by the Agricultural Land Commission.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>ALBERTA</b>              | <p>Canadian citizens, permanent residents, and Canadian-incorporated companies under Canadian control (51%) are not affected by institutional or foreign ownership regulations.</p> <p><i>Foreign Ownership of Land Regulations, Alta Reg 160/ 1979</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>SASKATCHEWAN</b>         | <p>Non-residents and foreign entities can own up to 10 acres of Saskatchewan farmland. Entities that are partially foreign owned but controlled by Saskatchewan residents or their farming corporations can own up to 320 acres. Saskatchewan Farmland prohibit institutional farmland ownership.</p> <p><i>The Saskatchewan Farm Security Act, SS 1988-89, c S-17.1, The Saskatchewan Farm Security Regulations, RRS c S-17.1 Reg 1</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>MANITOBA</b>             | <p>Legislation in Manitoba allows institutional and foreign persons and entities to acquire up to 40 acres of farmland unless the Manitoba farmland securities board grants an exemption or unless the farmland is purchased for the purpose of generating wind power for sale to Manitoba Hydro. Only the following persons may purchase land in Manitoba unrestricted:</p> <ul style="list-style-type: none"> <li>• Canadian citizens and permanent residents;</li> <li>• corporations controlled by Canadian farmers and their families;</li> <li>• municipalities, local government districts, and governmental agencies;</li> <li>• private corporations and other entities that are 100% Canadian-owned;</li> <li>• individuals who establish to the satisfaction of the Manitoba Farm Lands</li> </ul> <p>Ownership Board that they intend to become permanent residents or Canadian citizens within two years of acquiring the interest in farmland.</p>                                                                                                                                             |
| <b>ONTARIO</b>              | Agricultural land-use planning in Ontario is governed by the 2005 Provincial Policy Statement, issued under the Planning Act. Neither the policy statement nor the legislation restricts investment in agriculture land in Ontario. The Minister of Agriculture is required by statute to review the policy statement every five years. At present there are no expected policy changes concerning institutional or foreign ownership of agricultural land.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>QUEBEC</b>               | <p>A corporation or other legal person is deemed to be a Quebec resident if a majority of shares or interests are owned by Quebec residents; a majority of its directors are resident in Quebec; and it is not directly or indirectly controlled by non-residents. In considering an application for a purchase of farmland by a non-resident, the Commission will grant an authorization if:</p> <ul style="list-style-type: none"> <li>• the land concerned is not suitable for the cultivation of soil or the raising of livestock; or</li> <li>• the non-resident intends to settle in Quebec and will live in Quebec for three out of the next four years and will become a Canadian citizen or permanent resident at the end of that period.</li> <li>• The amendments have also introduced an annual limit on the number of hectares that can be purchased by non-residents. The Commission may only authorize 1,000 hectares of farmland to be acquired, per year, by foreign corporations or persons not intending to settle in Quebec, although it may examine additional applications.</li> </ul> |
| <b>PRINCE EDWARD ISLAND</b> | Provincial Land Protection Act. No legislation prohibiting institutional ownership.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>NOVA SCOTIA</b>          | No legislation governing farmland ownership.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>NEW BRUNSWICK</b>        | No legislation governing farmland ownership.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



Sources: Statistics Canada, FCC, Veripath analytics – Risk Free Rate = 3%



Sources: Statistics Canada, Farm Credit Canada – FCC, Veripath analytics

## PORTFOLIO CONSTRUCTION CONSIDERATIONS:

**Raw Acre Weighted:** A simplistic portfolio built purely to represent raw provincial acreage numbers would be:

| Province     | Percentage | Total Arable Acres |
|--------------|------------|--------------------|
| Saskatchewan | 39%        | 64M                |
| Alberta      | 31%        | 52M                |
| Manitoba     | 11%        | 19M                |
| Ontario      | 8%         | 13M                |
| Quebec       | 5%         | BM                 |
| B.C.         | 4%         | 7M                 |
| NS           | 1%         | 1M                 |
| NB           | 1%         | 1M                 |
| PEI          | 1%         | 1M                 |
| Total        | 100%       | 166M               |

Source: Statistics Canada, Farm Credit Canada – FCC, Veripath analytics

Assuming a raw acre weighted approach is not going to be followed, what other factors should investors overlay in order to drive portfolio construction of Canadian farmland and what would the portfolio look like post this analysis. We have identified several key factors which we believe have a disproportionate impact on returns and then weighted them using a matrix approach.

**Hypothetical Portfolio Based on Preferred Portfolio Parameters:** Ignoring each individual province's farmland regulatory framework our model creates the following portfolio based on our matrix (Appendix A):

|                  |     |
|------------------|-----|
| Saskatchewan     | 44% |
| Alberta          | 37% |
| Manitoba         | 8%  |
| Ontario          | 6%  |
| Quebec           | 3%  |
| British Columbia | 2%  |
| PEI              | 1%  |

AB is 19% more heavily weighted than it would be in a simplistic raw acre weighted portfolio due to stronger productivity adjusted prices and risk adjusted returns compared to most all other provinces.

This modified portfolio leaves a reasonable investable universe within Canada.

### Canada = 166M acres

(All in cultivated acres)

|                |      |
|----------------|------|
| US             | 390M |
| Brazil         | 170M |
| Australia      | 120M |
| European Union | 70M  |
| Argentina      | 36M  |
| Uruguay        | 2M   |

Source : US Department of Agriculture, Savills, Trading Economics

## CONCLUSION:

We believe that constructing a Canadian farmland portfolio using a matrix approach provides superior features to following a simplistic 'raw acre weighted' approach. Canada is host to one of the most diverse range of farmland soil types of any country.

## Factor Breakdown

| Weighting (0-5)                          |                                                                                  |     | AB              |     | ON    |      | MB    |       | SK   |      | QC   |      | NS   |      | NB   |      | BC   |      | PE   |      | NL        |  |
|------------------------------------------|----------------------------------------------------------------------------------|-----|-----------------|-----|-------|------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--|
|                                          |                                                                                  |     | Yes             | Yes | Yes   | Yes  | Yes   | Yes   | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes       |  |
| 5                                        | Average productivity adjusted wheat pricing (<\$2,500/tonne )                    | 5   | 5               | 0   | 5     | 5    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 4                                        | Average productivity adjusted wheat pricing (\$3,500/tonne =< X =<\$2,500/tonne) | 4   | 0               | 0   | 0     | 0    | 4     |       |      |      |      |      |      |      |      |      |      |      |      |      |           |  |
| 0                                        | Average productivity adjusted wheat pricing ( > \$3,500/tonne)                   | 0   | 0               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 3                                        | Farmland sharpe ratio (>0.75, <=1.25)                                            | 3   | 0               | 3   | 3     | 0    | 3     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 3    |           |  |
| 4                                        | Farmland sharpe ratio (>1.25, <=1.5)                                             | 4   | 0               | 0   | 0     | 4    | 0     | 4     |      |      |      |      |      |      |      |      |      |      |      |      |           |  |
| 5                                        | Farmland sharpe ratio (>1.5)                                                     | 5   | 5               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 3                                        | Correlation to inflation (1970s = >0.3, <=0.4)                                   | 3   | 3               | 3   | 3     | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3         |  |
| 4                                        | Correlation to inflation (1970s = >0.4, <=0.5)                                   | 4   | 0               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 5                                        | Correlation to inflation (1970s = > 0.5)                                         | 5   | 0               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 5                                        | Up/down ratio (< 1 down year in last 25 years)                                   | 5   | 5               | 5   | 5     | 5    | 5     | 5     | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5         |  |
| 4                                        | Up/down ratio (< 3 >= X down years in last 25 years)                             | 4   | 0               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 3                                        | Up/down ratio (> 3 down years in last 25 years)                                  | 3   | 0               | 0   | 0     | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 2                                        | Raw acre size as a percent of Canada total (>5%)                                 | 2   | 2               | 2   | 2     | 2    | 2     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 2                                        | Market turnover (>\$2B pa)                                                       | 2   | 2               | 2   | 0     | 2    | 0     | 2     | 0    | 0    | 0    | 0    | 0    | 0    | 2    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 1                                        | Percent operators also cash renters (>50%)                                       | 1   | 1               | 0   | 0     | 1    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 3                                        | Annual growth in average farm size (>1%)                                         | 3   | 3               | 0   | 0     | 3    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| 2                                        | Farm leverage (<20%)                                                             | 2   | 2               | 2   | 0     | 2    | 2     | 2     |      |      |      |      |      |      |      |      |      |      |      |      |           |  |
| 1                                        | Crop composition (field crops >75%)                                              | 1   | 1               | 1   | 0     | 1    | 0     | 1     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0         |  |
| (A)                                      | Raw Score                                                                        | (A) | 29              | 18  | 18    | 28   | 19    | 12    | 8    | 10   | 8    | 11   |      |      |      |      |      |      |      |      | 161 (C)   |  |
| (B)                                      | Raw Acres                                                                        | (B) | 52              | 13  | 19    | 64   | 8     | 1     | 1    | 7    | 1    | 0.07 |      |      |      |      |      |      |      |      | 166.1 (D) |  |
| Matrix adjusted acre weight              |                                                                                  |     | (A/C x B/D)     |     | 0.06  | 0.01 | 0.01  | 0.07  | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 (E)  |  |
| Simple acre weighted portfolio (% acres) |                                                                                  |     | (B/D)           |     | 31.3% | 7.8% | 11.4% | 38.5% | 4.8% | 0.6% | 0.6% | 4.2% | 0.6% | 0.0% |      |      |      |      |      |      |           |  |
| Matrix adjusted portfolio (% acres)      |                                                                                  |     | (A/C X B/D)/(E) |     | 36.5% | 5.7% | 8.3%  | 43.4% | 3.7% | 0.3% | 0.2% | 1.7% | 0.2% | 0.0% |      |      |      |      |      |      |           |  |
| Target Market Size (millions acres)      |                                                                                  |     | 166             | 52  | 13    | 19   | 64    | 8     | 1    | 1    | 7    | 1    | 0.07 |      |      |      |      |      |      |      |           |  |



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