IMPROVING INVESTMENT DIVERSIFICATION: IS FARMLAND AS GOOD AS GOLD?

Marvin J. Painter

Edwards School of Business and The Wilson Centre for Entrepreneurial Excellence
University of Saskatchewan, Canada

Abstract

An analysis of Canadian farmland risk and return on investment shows that a Farmland Real Estate Investment Trust (F-REIT) and gold would have significantly enhanced portfolio performance over the past 35 years. Investors who desire low risk portfolios would not have benefited from an F-REIT or gold investment. However, investors in the medium risk category could have improved the financial performance of their portfolios by including an F-REIT investment rather than gold. The financial gains from F-REIT result from a level of risk that is lower than gold, REITs and stocks, an expected yield that is greater than for bonds, and a low correlation with other financial asset returns. The benefit for the agricultural market is that F-REITs inject new equity by purchasing land from retiring farmers and leasing to farmers who want to expand. The benefit for the non-farmer investor and institutional investors is improvement in overall portfolio financial performance. F-REITs can add value to a portfolio by being a hedge against inflation, diversifier and stabilizer, and by providing safety of principal. It is better than gold in some respects, including lower overall risk, less risk of price fluctuation, shorter price cycle (gold has a very long price cycle where it may take years to get back to a price it is currently at), and provides an annual dividend.

Keywords: investment portfolio performance, farmland real estate investment trust

Subtheme: Business and Finance

The worldwide recession in 2008 caused the evaporation of wealth due to declining residential and commercial real estate values and a stock market meltdown. The government policy response to the recession has been Keynesian fiscal pump priming, with governments around the world spending billions on government projects. The result is that some governments have grossly over-extended their debt positions, with some countries in Europe having Debt to GDP ratios of 120% and even the United States, long considered the world's pillar of fiscal prudence, having a Debt to GDP ratio of over 80%. The current worry is that the high government debt ratios are not sustainable and will push the world back into another recession. This fear and uncertainty has been felt in the traditional financial markets such as the bond, real estate and stock markets. Because of this uncertainty, average investors around the world are open to looking at different investment options for their retirement savings. There has been a flight to gold and safe investments like bonds but interest bearing financial assets offer very low interest rates which can barely keep up to inflation inside a tax-deferred retirement account and fall far behind on an after-tax basis. If higher inflation does materialize, interest-bearing assets will perform poorly as interest rates increase to combat inflation. Mutual funds have become the choice investment vehicle because they are managed money where individual investors don't have to make many investment decisions. Diversification and asset allocation have become key words for investors and it has become much easier to achieve international diversification and asset sector flexibility within families of mutual funds. The financial industry can provide not only geographic diversification but also diversification across asset types (treasury bills, bonds, stocks, gold, options, futures, currencies, etc.) and industries or sectors. Choosing the right mix of geographic, industry and sector, and asset types (debt/equity balance) is of key importance in achieving the targeted financial performance over an investment horizon. Residential and commercial real estate represents a significant percentage of world asset value and

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has been an important component of investment portfolios, either through Real Estate Investment Trusts (REITs) or direct investment in real estate.

Some of the investment qualities attributed to gold are also usually attributed to farmland investments, such as good hedge against inflation, low or negative correlation with other financial assets, and safety of principal. Farmland is an important real estate investment asset but it has not been easily available to average investors. That may be changing. Hancock Agricultural Investment Group is a US $1.3 billion farmland investment fund, managing 210,000 hectares in US, 1,000 hectares in Canada and 6,000 hectares in Australia (this is available to institutional investors only at this time). Bonnefield Canadian Farmland Fund, located in Ottawa, Ontario, was launched with a public offering in May, 2010 and holds a diversified Canadian farmland portfolio. Agcapita is a Canadian farmland fund based in Calgary, Alberta. Assiniboia Capital Corporation, located in Regina, Saskatchewan, is publicly available for investment, was founded in 2005 and now manages 90,000 hectares of Canadian farmland.

As average farm size grows, farmers need more sources of equity financing as not all growth can be financed with debt. Over 50% of farmland in Canada and the United States is now leased by farm operators and the demand for leased land is growing as average farm size continues to increase (Painter 2005 and Painter 2006), which points to a growing demand for farmland equity investment. But leasing alone may not provide enough equity. There are very few farmland real estate investment trusts (F-REITs) available in the world that offer liquidity and marketability like bonds, REITs, or stock markets and even if F-REITs become readily available, the average investor needs to know whether they are a good mix in their investment portfolios. Therefore, the main questions in this paper are (a) what are the risk-return characteristics of F-REITs compared with gold, (b) what is the impact on portfolio performance when an F-REIT and/or gold is added to the portfolio, and (c) is F-REIT a better diversifier than gold? A diversified Canadian F-REIT and gold are assessed to determine their impact on the financial performance of a well-diversified international investment portfolio.

Background

Markowitz developed the idea of efficient investment, which sought to combine the right assets into a portfolio such that it would dominate any other investment or portfolio for that given risk level. The result was an efficient frontier of dominant or efficient portfolios spanning the risk spectrum. The most important aspect of efficient investment is that the total risk of a portfolio will almost always be less than the sum of the risks of the individual assets held. Tobin and Treynor added to this with the two-fund separation theorem by including the risk-free asset in the mix, producing the Capital Market Line (CML). This improved and simplified the investment decision because now all efficient portfolios were some combination of the tangency portfolio (market portfolio) and the risk-free asset. Now investors only needed to choose what percentage they wanted invested in safe risk-free assets and what percentage in the risky market portfolio. CML efficient investment portfolios were those that provided the highest return for a chosen level of risk, or conversely, the lowest risk for a chosen level of return. This led to the development of the Capital Asset Pricing Model (CAPM) by Sharpe, which applied efficient investment theory to individual asset pricing. Since all investors would only hold efficient portfolios, they should only be concerned about that portion of an asset's risk that is added to the total risk of a well-diversified portfolio, called systematic risk, as opposed to the portion of the asset's risk that is diversified away when included in the portfolio. An asset could have a high total risk level, but if most of that risk is diversified away within an efficient portfolio, then it would add little risk to the overall portfolio and would be considered a low-risk asset.

Figure 1 illustrates the concept of efficient investment. The efficient frontier (Markowitz) represents all those investments that dominate on a risk-return basis when the risk-free asset is not included in the mix. When the risk-free asset is added to the choice set, the Capital Market Line (Tobin and

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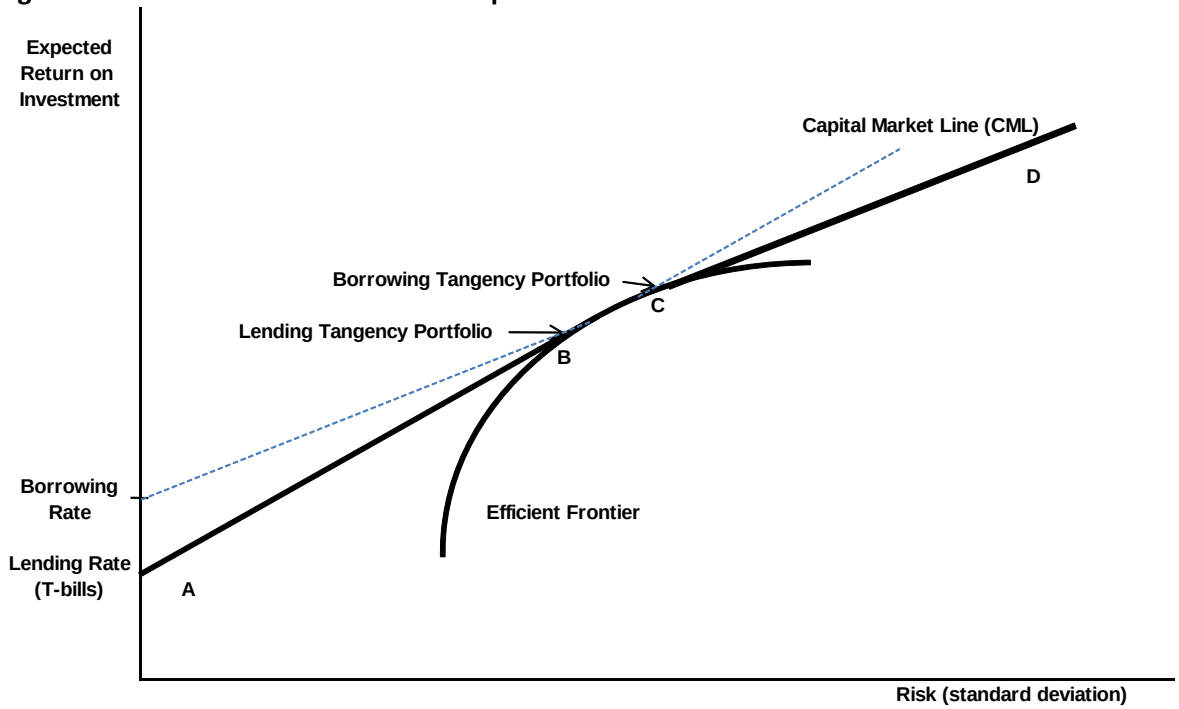
Treynor) becomes the efficient set of investment opportunities, where every investment on the CML is a combination of the risk-free asset and the tangency portfolio. Each investor mixes the risk-free asset and the market (tangency) portfolio to achieve the desired level of risk, which maximizes the expected return for that chosen level of risk. In Figure 1, the borrowing rate for investors is also added, which means there are two tangency portfolios, making the efficiency frontier ABCD. Selection of a portfolio on this frontier would be the result of an individual investor's risk-return preferences. A portfolio between B and C is a standard diversified portfolio without borrowing or lending (usually considered the market portfolio). Between A and B is where the investor reduces the amount invested in the market portfolio and transfers some funds into a risk-free investment. Between C and D, the investor expands the market portfolio investment by borrowing.

Figure 1: Efficient Investment and the Capital Market Line



A number of studies have assessed farmland investment efficiency. Peter Barry (1980) applied the CAPM to farmland in eleven different regions in the United States and found that farmland added very little risk to a diversified portfolio of stocks and bonds because most of farmland risk is diversifiable (unsystematic risk). Kaplan (1985) found that farm real estate had two favourable attributes: high total return and low correlation with other assets, which meant that including farmland in a portfolio added a high return asset with very little risk added. Moss, Featherstone and Baker (1987) as well as Lins, Kowalski and Hoffman (1992) and Ruebens and Webb (1995), assessed efficient portfolios using US financial assets and farmland and concluded that the addition of farmland to stock and bond portfolios improved portfolio performance. Painter (2000) assessed Saskatchewan (Canada) farmland and found that it improved portfolio performance, especially at medium levels of risk. Bigge and Langemeier (2004) found that Kansas farmland's low level of systematic risk meant that farmers could improve overall portfolio performance with investment in the stock market. Libbin, Kohler and Hawkes (2004) suggest that farmers could improve financial performance by investing in financial assets and/or paying down their debt liabilities. Painter (2006) found that the financial gains from Canadian farmland investment result from a low level of risk with an expected yield that is greater than for bonds and low correlation with other financial asset returns. Painter and Eves (2008) assessed farmland investments in United States, Canada, New Zealand and Australia and found that the low and negative correlation of farmland yields with stocks and bonds made it a good candidate for portfolio diversification. Painter (2010) found that a Canadian Farmland Real Estate Investment Trust fared well in an efficient international investment portfolio. These studies suggest that both farmer and non-farmer investors could potentially

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improve their long-term financial performance by diversifying farmland and financial assets in their investment portfolios.

Discussion of Results

Financial returns are calculated for each of the choice assets for the study period 1972-2009. The choice set of assets includes T-bills, long term bonds, Canadian Farmland Real Estate Investment Trust (F-REIT), Gold, United States REITs, and stock markets in Australia, Canada, Japan, United States, Europe, Hong Kong, and the World Stock Market Portfolio. Table 1 provides average annual investment yields for the choice set of assets. The important risk and return characteristics can be summarized as follows:

- income yields and risk on F-REITs are very similar to dividend yields and risk on stock markets.
- Capital gain yields and risk on F-REITs are lower than for stocks, putting the total yield and risk for F-REIT in between bonds and stocks.
- The total REIT yield is almost entirely from the income yield. Also, the risk level associated with the income yield on REITs is higher than for dividends while the risk level associated with REIT price movements is slightly lower than the price risk for most stock markets.
- Gold yields are the opposite of REIT yields in that there is no income yield at all – the yield is entirely from price movements. The gold yield is slightly higher than F-REITs but the risk is almost three times that of an F-REIT, making the gold risk similar to stock market risk.

The investment attraction of F-REIT appears to be reasonable investment yield with relatively low risk, as indicated by the lower coefficient of variation (standard deviation/yield: risk per unit of return) on F-REIT than on stocks, gold and REITs.

Table 1: Average Annual Investment Yields for T-bills, Long Bonds, F-REIT, Gold, REITs and Stock Markets (1972 – 2009)

	Income/Div Yield		Cap Gain Yield		Total Yield		Coefficient
	Avg Yield	Std Dev	Avg Yield	Std Dev	Avg Yield	Std Dev	Of Variation
T-bills	N/A	N/A	N/A	N/A	5.1%	0.0%	N/A
Long Bonds	N/A	N/A	N/A	N/A	6.1%	2.9%	0.48
Borrowing	N/A	N/A	N/A	N/A	7.9%	0.0%	N/A
Real Estate:							
F-REIT	2.7%	0.7%	7.4%	9.1%	7.1%	9.4%	1.36
REITs	8.9%	2.7%	0.3%	20.4%	9.1%	21.8%	2.40
Gold	0.0%	0.0%	8.7%	26.6%	8.7%	26.6%	3.06
Stock Markets:							
Canada	2.6%	1.0%	6.9%	22.4%	9.5%	22.8%	2.40
Australia	3.2%	1.2%	6.4%	26.6%	9.6%	27.6%	2.88
US	2.4%	1.1%	6.1%	18.3%	8.5%	18.7%	2.20
Japan	1.2%	0.8%	7.8%	33.6%	9.0%	34.1%	3.79
Europe	3.1%	1.0%	7.1%	22.1%	10.1%	22.7%	2.25
World	2.4%	0.9%	6.4%	18.4%	8.8%	18.8%	2.14
Hong Kong	4.1%	1.7%	9.7%	46.6%	13.8%	47.7%	3.46

The other attraction of F-REIT is its low and/or negative correlation with bonds, stocks, and REITs, which gives it significant diversification advantages for an investment portfolio. Table 2 illustrates the correlation coefficients between the choice assets. Some important implications are as follows:

- F-REIT is negatively correlated with REITs as well as with every stock market and has very low correlation with T-bills and bonds.

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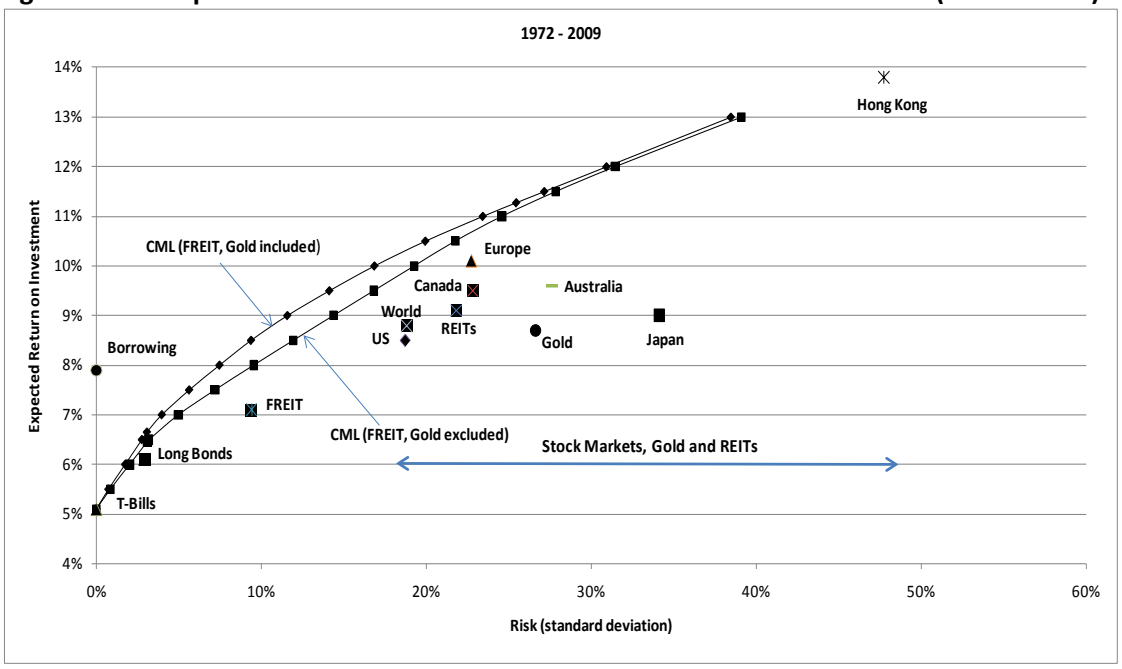
- Gold is also negatively correlated with many stock markets, REITs and both T-bills and bonds, implying that it has significant diversification benefits as well.
- F-REIT has high positive correlation with gold, implying that F-REIT and gold may be interchangeable as diversifying agents in portfolios.
- Diversifying across stock markets alone does not appear to be efficient, based on the relatively high correlation with each other.

Table 2: Correlation Matrix for the Choice Set of Assets (1972 – 2009)

	T-b	L B	**F-REIT**	Gold	REIT	Can	Aus	US	Japan	Europe	World	HK
T-bills	1.0	.94	**.11**	-.09	.05	-.16	-.17	.10	.04	-.03	.04	-.04
L Bonds		1.0	**.04**	-.09	.12	-.17	-.14	.14	.14	.01	.09	-.01
F-REIT			**1.0**	**.53**	**-.12**	**-.06**	**-.10**	**-.15**	**-.17**	**-.23**	**-.23**	**-.02**
Gold				1.0	-.19	.11	.23	-.25	.10	-.12	-.10	.12
REITs					1.0	.47	.52	.57	.16	.40	.52	.44
Can						1.0	.79	.66	.43	.63	.74	.59
Aus							1.0	.60	.44	.70	.77	.64
US								1.0	.34	.77	.88	.53
Japan									1.0	.46	.65	.58
Europe										1.0	.89	.53
World											1.0	.64
HK												1.0

The combination of reasonable return, low total risk and low correlation makes F-REIT attractive for an internationally diversified investment portfolio. But is an F-REIT necessary if gold can provide the same diversification benefits? The E-V model was applied to the choice set of assets to produce efficient portfolios and the Capital Market Line (CML). Figure 2 illustrates the two kinked CML's and shows that there would have been significant improvement in portfolio performance over the study period had F-REIT and gold been included, but it appears that the improvement would only occur mainly in the medium to high risk categories. The next section addresses the question of whether the portfolio improvement is from adding gold or F-REIT, or both to the portfolio.

Figure 2: The Capital Market Line with and without F-REIT and Gold Included (1972 – 2009)



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Tables 3, 4, and 5 provide a comparison of the portfolio compositions for five different asset choice scenarios, as follows:

1. T-bills, Long Bonds, F-REIT
2. T-bills, Long Bonds, REITs, Stocks
3. T-bills, Long Bonds, Gold, REITs, Stocks
4. T-bills, Long Bonds, F-REIT, Gold, REITs, Stocks
5. T-bills, Long Bonds, F-REIT, REITs, Stocks

Scenario 1 is where the assets to choose from are limited to T-bills, long bonds and F-REIT (farmland and debt securities only – this represents many farmers). Scenario 2 allows the investor to choose from debt securities, REITs and stock markets, but not farmland or gold (this represents many non-farmer investors). Scenario 3 is the same as 2 but adds gold. Scenario 4 allows investors to choose from all the choice assets, including gold and F-REIT. Scenario 5 includes all choice assets except gold. The EV model is used to calculate the most efficient portfolios for each scenario so as to compare the risk-return performance. This allows us to compare the performance when F-REIT, gold, or both are included or not. Table 3 compares performance in the low risk category (6% annual return on investment - ROI), Table 4 the medium risk (8% ROI), and Table 5 the high risk (10% ROI). The main performance measure is the coefficient of variation, which assesses the amount of risk in the portfolio for the chosen ROI – the lower the coefficient of variation, the better the return per unit of risk taken.

In Table 3 (low risk efficient portfolios), the scenario 1 portfolio (debt securities and farmland only) is the weakest. This implies that farmers who put all their wealth into farmland investment and bonds could improve financial performance by considering other assets such as stocks, gold and REITs (this implies owning less farmland and leasing more, hence a greater need for F-REITs). The scenario 2 efficient portfolio (bonds, stocks, REITs – most non-farmer investors) did not perform much better. Scenario 3 (bonds, stocks, REITs, gold), scenario 4 (bonds, stocks, REITs, F-REIT, gold) and Scenario 5 (bonds, stocks, REITs, F-REIT) efficient portfolios performed best. Most of the financial performance improvement can be attributed to F-REIT as opposed to gold because F-REIT enters the efficient portfolios at 8%-10% weighting while gold only enters at 1%-3%. This suggests that for investors who desire low risk portfolios, F-REIT is an asset they should consider rather than gold because F-REIT itself is a much lower risk asset and it is expected to provide a dividends yield whereas gold is not. However, it is important to note that the low risk efficient portfolios are dominated by low risk bonds.

Table 3: Comparison of Low Risk Portfolios under Five Scenarios (1972-2009)

Portfolio Performance for Low Risk Category (6% Investment Yield)					
Scenario:	**1**	**2**	**3**	**4**	**5**
Investment Yield	6%	6%	6%	6%	6%
Risk (std deviation)	2.2%	2.0%	1.9%	1.7%	1.8%
Coef of Variation	**.37**	**.34**	**.31**	**.29**	**.29**
Portfolio Weights:					
T-Bills	23.6%	34.6%	40.3%	42.9%	42.0%
Long Bonds	64.3%	59.4%	51.0%	42.4%	42.8%
F-REIT	12.1%	-	-	8.1%	9.6%
Gold	-	-	2.9%	1.0%	-
REITs	-	0.1%	1.2%	0.8%	0.6%
Stocks	-	5.8%	-	-	-

In Table 4 (medium risk efficient portfolios), F-REIT shows up very prominently. Scenario 1 assets do not earn a high enough yield to achieve the desired 8%, even if 100% of the portfolio is F-REIT.

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Comparing scenarios 1 and 2 with 3, 4, and 5, it appears that return per unit of risk can be significantly enhanced with the addition of F-REIT and gold. However, given gold's higher risk level, it is not nearly as prominent as F-REIT, although gold's inclusion in scenario 4 along with F-REIT does produce the most efficient portfolio amongst the five scenarios. In scenario 3, gold is part of the choice set but F-REIT is not. When comparing scenarios 3, 4 and 5, improvement occurs in scenario 4 by adding both gold and F-REIT but it can be seen that almost the same improvement occurs in scenario 5 by adding F-REIT alone and not gold. Therefore, at the medium risk level, F-REIT seems to be a reasonable replacement for gold in achieving superior portfolio performance results.

Table 4: Comparison of Medium Risk Portfolios under Five Scenarios (1972-2009)

Portfolio Performance for Medium Risk Category (8% Investment Yield)					
Scenario:	**1**	**2**	**3**	**4**	**5**
Investment Yield	7.1%	8%	8%	8%	8%
Risk (std deviation)	9.3%	9.5%	8.1%	7.5%	7.6%
Coef of Variation	**1.31**	**1.19**	**1.02**	**0.93**	**0.95**
Portfolio Weights:					
T-Bills	-	-	-	-	-
Long Bonds	-	55.1%	44.9%	19.9%	14.4%
F-REIT	100.0%	-	-	38.6%	51.2%
Gold	-	-	17.3%	7.4%	-
REITs	-	10.9%	14.3%	11.3%	9.8%
Stocks	-	33.9%	-	-	-

In Table 5 (high risk efficient portfolios), F-REIT does not play an important role. In scenario 4 when both F-REIT and gold are in the choice set, F-REIT is not chosen at all. Indeed, scenarios 3 and 4 are identical efficient portfolios because adding F-REIT to the choice set added no improvement. This is mainly because F-REIT is not offering a high enough yield to improve the performance.

Table 5: Comparison of High Risk Portfolios under Five Scenarios (1972-2009)

Portfolio Performance for High Risk Category (10% Investment Yield)					
Scenario:	**1**	**2**	**3**	**4**	**5**
Investment Yield	n/a	10%	10%	10%	10%
Risk (std deviation)	n/a	19.3%	16.8%	16.8%	18.1%
Coef of Variation	**n/a**	**1.93**	**1.68**	**1.68**	**1.81**
Portfolio Weights:					
T-Bills	n/a	-	-	-	-
Long Bonds	n/a	8.8%	-	-	-
F-REIT	n/a	-	-	-	25.8%
Gold	n/a	-	27.6%	27.6%	-
REITs	n/a	24.9%	19.5%	19.5%	11.4%
Stocks	n/a	51.3%	-	-	-

It appears that the biggest advantage of F-REIT is at the risk level where many investors choose to be – medium risk. The average stock market portfolio (World portfolio, US stocks) usually has a standard deviation of 18% - 20%. When medium risk investors combine stocks, bonds and real estate, they might typically end up with a portfolio risk level of 9% - 12%, which is where F-REIT can increase financial performance by lowering the risk to 7% - 8%, without sacrificing return. Investors looking for low risk-low return or high risk-high return portfolios will likely not be interested in F-REIT.

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Conclusions

Can investors improve financial performance by adding a farmland real estate investment trust and/or gold to their investment portfolios? This study shows that for the period 1972 – 2009, financial performance was significantly improved with the addition of F-REIT and gold to a portfolio of traditional investments of T-bills, bonds, stocks and REITs. A Canadian F-REIT is considered relatively low risk, enters the efficient portfolios at low to medium risk levels and adds the most financial improvement to medium risk portfolios. Gold is a higher risk asset with no dividend yield but because of its low correlation with other assets, it is able to reduce portfolio risk and adds the most financial improvement in high risk portfolios.

Is farmland as good as gold? The results indicate that in low risk portfolios, neither farmland nor gold will improve performance because both have too much risk. In medium risk portfolios, F-REIT provides more financial improvement than gold. Many medium risk investors would hesitate to invest in gold because it has no dividend yield and is high risk. However, F-REIT does offer a dividend yield and is much lower risk, making it more attractive to medium risk (average) investors. For high risk portfolios, farmland is not as attractive as gold because it simply cannot offer a high enough return.

What are the implications for investors? For current farmland investors, including farmers, it implies that they should own REITs, stocks and bonds to complement their farmland investment holdings, and possibly gold if they want a higher risk portfolio (most farmers do not). Farmers might consider leasing instead of buying more farmland when they expand their farm operations (this is already happening as observed by the high proportion of farmland that is leased in Canada and the US). As the number and size of F-REITs expands, retiring farmers will have additional potential buyers (bidders) for their farmland. For institutional investors, F-REITs can be part of the overall family of funds that are made available to their retail investor clients. Large pension funds can consider the diversification benefits of holding F-REITs as part of their portfolios. The main benefits for the agricultural market is that F-REITs inject new equity by purchasing land from retiring farmers and leasing to farmers who want to expand. The main benefit for the non-farmer investor and institutional investors is improvement in overall portfolio financial performance.

In summary, F-REITs can add as much, if not more value to a portfolio than gold, in terms of being a hedge against inflation, diversifier and stabilizer, and providing safety of principal. It is better than gold in some respects, including lower overall risk, less risk of price fluctuation, shorter price cycle, and provides an annual dividend.

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March2011 - ISBN 978-92-990056-6-8 www.ifmaonline.org - Congress Proceedings