

*4<sup>th</sup> Annual*  
*U.S. AGRICULTURAL LAND*  
*AS AN INVESTMENT PORTFOLIO*  
*CONSIDERATION*  
*2010*

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## **ABSTRACT**

U.S. agricultural land has an approximate market value well in excess of two trillion dollars, which alone should justify consideration for inclusion in investment portfolios. Statistically, the returns on aggregate U.S. agricultural land are not different from those for U.S. equities. However, the variance of returns on agricultural land is statistically smaller. The much larger variance on stock market returns means that the higher apparent returns on stocks may be due to chance rather than being real. Covariance between the two should be assumed to be zero. If that condition is true, it would mean that the effective diversification of portfolios is improved by replacing U.S. equities with U.S. agricultural land.

Portfolios comprising U.S. agricultural land and equities were constructed for the calendar period 1949-2009. Substituting agricultural land for equities improved the return-risk characteristics of portfolios. These results suggest that U.S. agricultural land may be inefficiently priced, and a market portfolio constructed void of U.S. agricultural land is also not efficient. Investors, particularly those of size, should replace U.S. equity investments with an investment in U.S. agricultural land.

Test of the total returns on U.S. crop land and pasture land versus U.S. equities were also performed. Results were similar to those above. Investors can significantly improve the efficiency of their portfolios, in a mean-variance framework, by adding either crop land or pasture land.

Initial research was established on returns provided by crop land by individual states. Twenty-three states with agricultural exposure of interest were considered in this effort. Preliminary conclusion is that cash yield may be a predictor of future total returns. The twenty-three states are ranked by cash yield for investors.

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## **Introduction**

Investing in commodities has become fashionable in the past decade, and will likely remain so in the decade ahead. With the Chinese and Indian economies on growth tracks, the demand for commodities, of all kinds, has increased dramatically. That demand will continue to expand in the decade ahead.

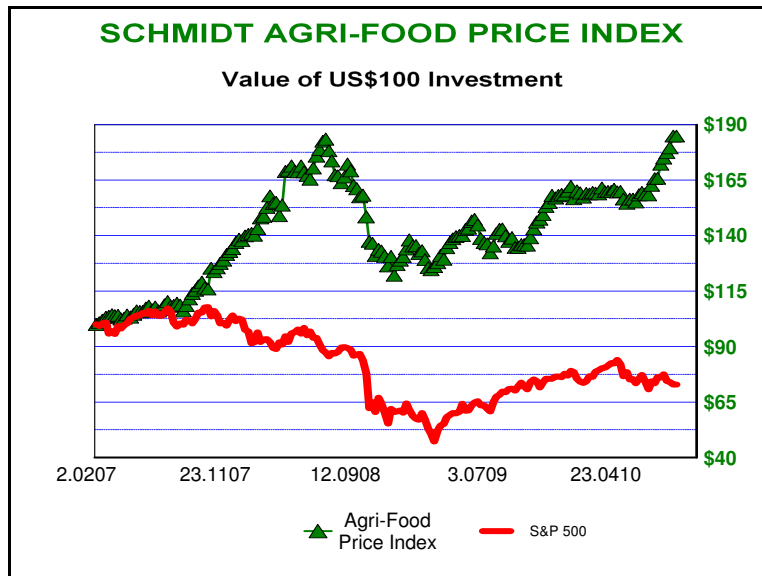
Total consumer income has been rising rapidly in China and India. Together, these two nations will have a billion middle class consumers within a decade. That development would result in a base of middle class consumers twice the population of North America. Their impact on global consumption of all types is multiplicative, growth in demographic cohort times growth in income. Never in the history of mankind has a prosperity-based consumption base of this size been created.

In particular, this massive income demographic shift is causing a change in consumption patterns. Higher incomes translate directly into consumption of a greater quantity of foods and of foods higher up the value chain, or what might be referred to as higher quality foods. Quality being measured by the inputs necessary to create those foods.

A growing preference, as incomes rise, for the consumption of meats over the consumption of grains is readily apparent. That shift magnifies the demand for grains. To produce a pound of meat requires more than a pound of grain. On average, that shift in consumption requires far more than four pounds of grain to produce a pound of meat. Therefore, a shift of consumption of one pound of grain to one pound of meat actually causes total grain consumption to rise by more than three pounds.

Higher demand for human consumption of Agri-Foods is combining with emergence of biofuels. Biofuel production from grains is further increasing total demand for Agri-Food. Many now recognize that paying a domestic grain farmer makes more economic sense than paying a foreign despot for oil.

That higher demand is meeting up with an inelastic Agri-Food supply. As a consequence, Agri-Food prices have moved higher across the entire spectrum in recent years. As the Agri-Food Price Index portrays in the chart below, Agri-Food commodity prices have recently moved to a new high. That positive environment, unlike any experienced in peace time, has made Agri-Food commodities more accepted as having a role in an investment portfolio.



Commodities had been mistakenly considered a homogenous asset class by naive investors. Commodities is actually comprised of three sectors, each with different economic drivers. Those sectors are:

Energy: Oil, natural gas, coal, etc.

Minerals: Iron, platinum, gold, etc.

Agri-Food: Corn, rice, wheat, canola, pork etc.

As part of the commodity asset class, prices of agricultural investments have also benefitted from the economic expansion taking place in BRICA, Brazil, Russia, India, China, and ASEAN. Commodity investments, of all kinds, have become a more recognized part of the market portfolio. Institutional investors have moved into the Agri-Food sector in both direct and indirect ways. However, a move by the Commodity Futures Trading Commission, CFTC, to more rigidly enforce

position limits may shift the focus of investors more to direct investments, such as agricultural land, away from indirect methods, such as commodity futures.

An important component of the agricultural investment sector is agricultural land. Regardless of the agricultural commodity, land and water are essential to production. Importantly, agricultural land is one of the two practical means of gaining exposure to Agri-Food. Few portfolio management systems can handle a direct investment in the physical commodities, such as corn or hogs, as storage issues become dominant.

The price of that essential farm land has clearly benefitted from the growing demand for Agri-Food. According to the United States Department of Agriculture(USDA) data, the average price of farmland has appreciated at a 7.0% compound annual rate over the past 10 years versus about -2.2% per year for the S&P 500.

Importantly, those agricultural land returns were produced with a variance of returns less than one third that of equities. If variance can be assumed to be a measure of total risk, U.S. agricultural land has less total risk than equities. On the surface, U.S. agricultural land appears to have produced a higher return with less risk, if risk is measured by variance of returns.

With the total value of U.S. agricultural land now well in excess of two trillion dollars, the investment value is well established. Any asset class of that size has a justifiable position in the market portfolio. A market portfolio void of exposure to U.S. agricultural land cannot be rationally justified, and would likely be inefficient. Given the size of the agricultural land market sector, investors should not be overlooking a substantial asset class, agricultural land, in establishing asset allocation.

A myopic approach to asset allocation that considers only equities, fixed income, or some real or synthetic replication of them has long been considered in need of change, and has been. Agricultural land has a role in the modern investor's portfolio if for no other reason than the size of the asset class demands recognition as an important component of the market portfolio. Portfolios void of

agricultural lands are not efficiently modeled.

We will in this issue be considering five aspects of U.S. agricultural land values.

- ◆ Comparison of returns on aggregate U.S. agricultural land with returns on U.S. equities for the period 1949-2009.
- ◆ Comparison of total return on U.S. crop land versus total return on U.S. equities for the period 1976-2009.
- ◆ Comparison of total return on U.S. pasture land versus total return on U.S. equities for the period 1976-2009.
- ◆ Continue the exploration of regional return differences that was initiated in 2009.
- ◆ Exploration of state differences in returns on U.S. crop land is initiated with this issue.

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