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Managing Seasonality in Agricultural Futures Markets

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Abstract

Agricultural futures markets differ from equity and other financial markets in important ways. One important difference is the implied seasonality in agricultural markets precipitated by the traditional seasonality in production (Gann, 1941; Williams and Noseworthy, 1977; Grushkow and Smith, 1980, Bernstein, 1997). This paper describes a method developed at Blackthorne Capital Management for improving the returns in strategies with exposure in the agricultural markets by analyzing the seasonality in returns. The approach relies on the identification of periods with higher and lower average returns, and the application of methods for deciding when to change the position sizes in specific markets on a seasonal basis.

Agricultural futures markets differ from equity and other financial markets in important ways. One important difference is the seasonality in agricultural markets precipitated by the traditional patterns of seasonality in production caused by weather and plant growth during the growing season (Sorensen, 2002). This paper describes a process used to examine trading strategies used in grain markets to determine if they are uniformly effective throughout the year.

One presumption might be that signals derived from prices or sentiment information would be equally effective during all times of the year. This presumption might be derived from the assumption that markets incorporate all available information in similar fashion regardless of the time of year, and that a strategy would be effective in a manner that is independent of when it is applied. This is an empirical question, however, and is easily subject to testing.

The following sections describe a test of Blackthorne Capital Management trading strategies on three agricultural futures markets (Soybeans, Soy Meal and Chicago Wheat). This test was performed to determine the effectiveness of the strategies during all months of the calendar year.

Comparing Monthly Returns

Data from trading models for three types of grain futures (Soybeans, Soy Meal and Chicago Wheat) were subjected to analysis by examination of monthly returns during each of the twelve months of the year. The test consists of aggregation of past dollar returns for the three markets of the strategies by calendar month and computation of average daily values during those months. This enables a comparison of the monthly values to reveal the effectiveness of the strategies by month. The results of that analysis are provided in Figure 1.

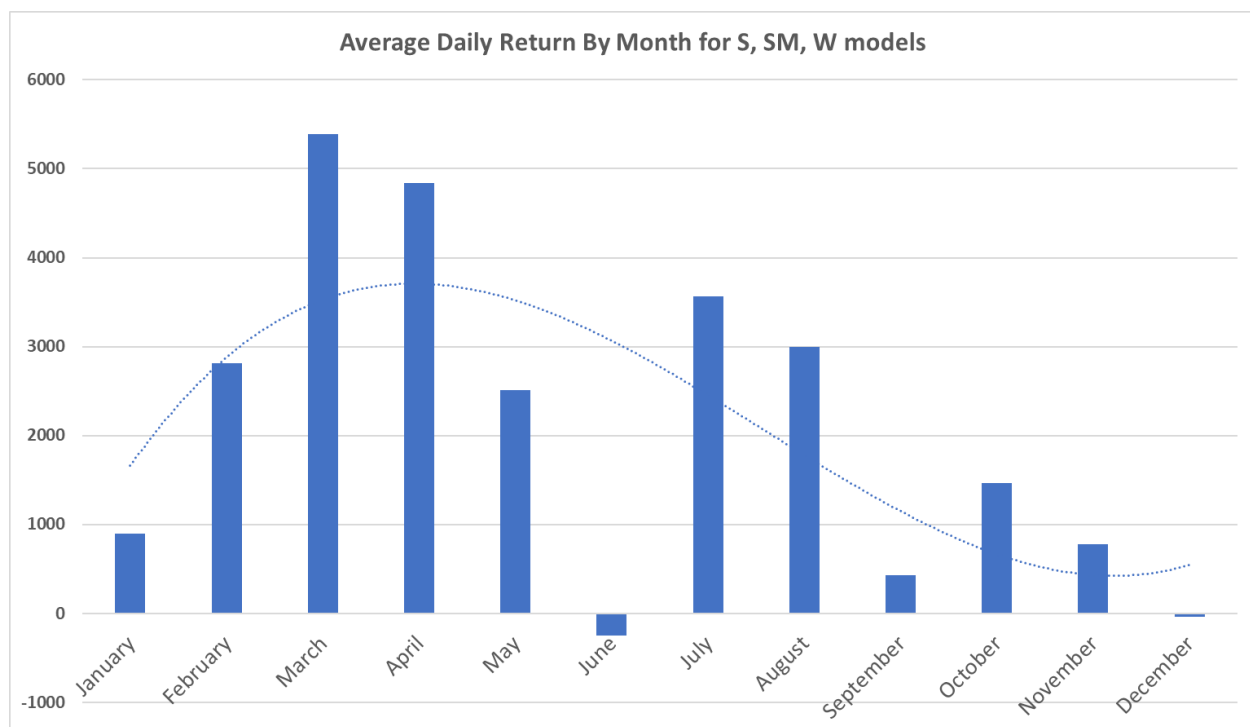


Figure 1: Average Daily Returns by Month for Soybeans, Soymeal and Chicago Wheat

The Figure shows significant differences in the dollar returns during most of the growing season for the grain crops versus the period after harvest and during the winter fallow period. This is illustrated by the fitted seasonal curve, which is also shown in Figure 1.

The seasonality in returns suggests limiting trading of the strategies in the identified markets to those months when the average returns are favorable. The next section provides results of a strategy to determine compare in-season and out-of-season returns.

Comparing Seasonal Returns

The aggregated daily returns for the three markets were divided into two separate subsamples by calendar months, and based on the patterns identified in the previous test. The first group consisted of the months February through August, the second group consisted of months September through January. The differences in average daily dollar returns for those two periods are given in Figure 2.

Average Daily Return for S, SM and W 2017-2020	
In Season	Out of Season
Jan 28th - August 31st	Sept 1st - Jan 27th
\$3,257.63	\$383.81

Figure 2: Average Daily Dollar Returns for Soybeans, Soy Meal and Chicago Wheat by Season

Sharpe ratios were calculated for the two samples in each of the three markets, and overall Sharpe ratios for the combined returns were calculated as well. These are given in Figure 3.

In Season vs. Out of Season Sharpe Comparison				
	W	S	SM	Sum (W, S, SM)
All Days	0.99	1.42	1.21	1.75
In Season Days	1.34	1.88	2.06	2.54
Out Of Season Days	0.26	0.37	-0.66	-0.03

Figure 3: In Season versus Out of Season Sharpe Ratios for Chicago Wheat, Soybeans and Soy Meal

Conclusion

There are notable differences in performance between the in-season and out-of-season season periods. We attribute the difference to the availability of supply-side information regarding the potential yield during the periods when the crops are in the field. Our response is to reduce or eliminate our positions during the non-growing-season period for those markets and strategies which are subject to the observed seasonality.

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