ИСПОЛЬЗОВАНИЕ СЕЗОННОГО И СРАВНИТЕЛЬНО-ИСТОРИЧЕСКОГО АНАЛИЗА В РАБОТЕ С ФЬЮЧЕРСНЫМИ СПРЕДАМИ

SEASONAL AND COMPARATIVE-HISTORICAL ANALYSIS TYPES IN RELATION TO FUTURES SPREADS

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Annotation

The futures spreads market can barely be called efficient. Thus, futures spreads trading requires the constant and active use of different types of analysis to make trading decisions. Despite the importance of this subject, research on it is very limited.

There are five basic types of analysis that can be used when working with spreads: fundamental, seasonal, technical, comparative historical, and regression–correlation.

This series of articles aims to extend the currently limited literature on the analysis of futures spreads. Its objectives are to consider in detail the possible practical application of all types of analyses to spreads, to assess the supplementary function of comparative–historical analysis, and to demonstrate the inefficiency of application of the regression–correlation analysis for practicing investors.

The series consists of four papers: the first article discusses fundamental analysis, the second paper deals with technical analysis, the third one covers seasonal analysis, explores comparative–historical analysis, critically examines regression–correlation analysis in relation to spreads, and the final paper of the series proposes a framework of co–integration of the four types of spreads analysis for the purposes of creating trading strategies and decision–making.

This paper is structured as follows: section one discusses use of seasonality analysis in working with futures spreads, section two deals with comparative–historical analysis, section three critically examines regression–correlation analysis in relation to spreads.

Keywords: futures spreads, seasonal analysis, comparative–historical analysis, regression and correlation analysis.

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Аннотация

Фьючерсный рынок спредов едва ли можно называть эффективным. Таким образом, торговля фьючерсными спредами требует постоянного и активного использования различных видов анализа для принятия торговых решений. Несмотря на важность этого вопроса, исследования этой темы очень ограничены. Есть пять основных видов анализа, которые можно использовать при работе с фьючерсными спредами: фундаментальный, сезонный, технический, сравнительно–исторический и регрессионно–корреляционный. Нашей серией статей мы стремились расширить в настоящее время ограниченное количество литературы по анализу фьючерсных спредов. Цель статей – подробно рассмотреть возможности практического применения всех видов анализа в работе с фьючерсными спредами, оценка дополнительной функции сравнительно–исторического анализа, и демонстрация неэффективности применения регрессионно–корреляционного анализа для практикующих инвесторов. Серия состоит из четырех статей. В первой статье рассматривается фундаментальный анализ, вторая статья посвящена техническому анализу, третья охватывает сезонный и сравнительно–исторический анализ, кроме этого, в ней критически рассматривается регрессионно–корреляционный анализ, и в четвертой статье предлагается алгоритм совместной интеграции четырех видов анализа с целью создания торговых стратегий и принятии решений.

Эта статья построена следующим образом: первая часть обсуждает использование сезонного анализа в работе с фьючерсными спредами, вторая часть посвящена сравнительно–историческому анализу, в третьей части критически рассматривается регрессионно–корреляционный анализ в применении к фьючерсным спредам.

Ключевые слова:

Фьючерсные спреды, сезонный анализ, сравнительно–исторический анализ, регрессионный и корреляционный анализ.

Use of seasonality analysis in working with futures spreads

Seasonal analysis is based on life processes and methods employed by statistical analysis (see Moore et al. [2006]; Bernstein [1990]). Essentially, when analyzing analogous historical periods, investors attempt to find recurring patterns, and if they identify the high recurrence of a certain behavior that prices previously exhibited, they assume that such behavior is likely to occur in the future (Moore et al. [2006]; Perchanok [2011a]). Hence, the longer the selected time span for analysis, the more credible the analysis pattern and, consequently, the more reasons to expect that this pattern will repeat itself in the future. This type of analysis is widely used in working with spreads; the possibility of its application has been studied by the following authors: Moore et al. [2006], Smith [2000], Ross [2006], Tolmasky and Hindanov [2002], Murray [2004, 2006], Carpenter and Levy [1998], Salcedo [2004] and Perchanok [2011a, 2011d].

In the case of spreads seasonality is much more pronounced. In reality, practically all spreads exhibit seasonali–

ty, beginning with gasoline and corn calendar spreads, where seasonality is a key determinant, and ending with interest rate spreads, which are less affected by seasonal influences (Moore et al. [2006]). The fact that spreads are much more prone to cyclic movements than outright futures positions is explained by the fact that spreads are less susceptible to speculative pressures and more driven by intrinsic, natural, production, and life processes.

Such an enviable regularity of spreads displayed from year to year allows investors to benefit when making investment decisions. Many investors even rely on seasonality and seasonal analysis as the key tool in their work with spreads. This makes sense, since movements of spreads, as mentioned earlier, have a good deal of logic behind them. However, we believe that one should not rely solely on this analysis when making trading decisions.

Seasonal analysis is based on the methods employed in statistical analysis. Essentially, when analyzing analogous historical periods, investors attempt to find recurring patterns, and if they identify the high recurrence of certain behavior exhibited by prices in the past, they assume that such behavior is likely to occur in the future (see Murray [2004]; Perchanok [2011a]). Hence, the longer the time span selected for analysis, the more credible the analysis of patterns is and, consequently, the more reasons there are to expect that this pattern will repeat itself in the future. In order for a pattern to be considered reliable, it should exhibit stability for at least three to five years.

Figure 1 shows that the platinum/gold spread displays a strong seasonal pattern, with the spread widening between January and May. This is primarily due to the difference in the demand growth cycles of these metals. In particular, starting from September to approximately the end of February the demand for gold is rising. This growth is driven by the requirements of the jewellery industry, which strives to meet the demand of the population during Christmas, Chinese New Year and autumn weddings in India. Such growth in the demand for gold makes the spread narrow. Starting in January, the industrial demand for platinum begins to grow; during the whole spring the price of this metal is rising, causing the spread to widen.

Despite the weakening of the influence of fundamental factors, the seasonality of this spread continues to influence it. The traditional pattern of widening in spring remained intact in 2012.

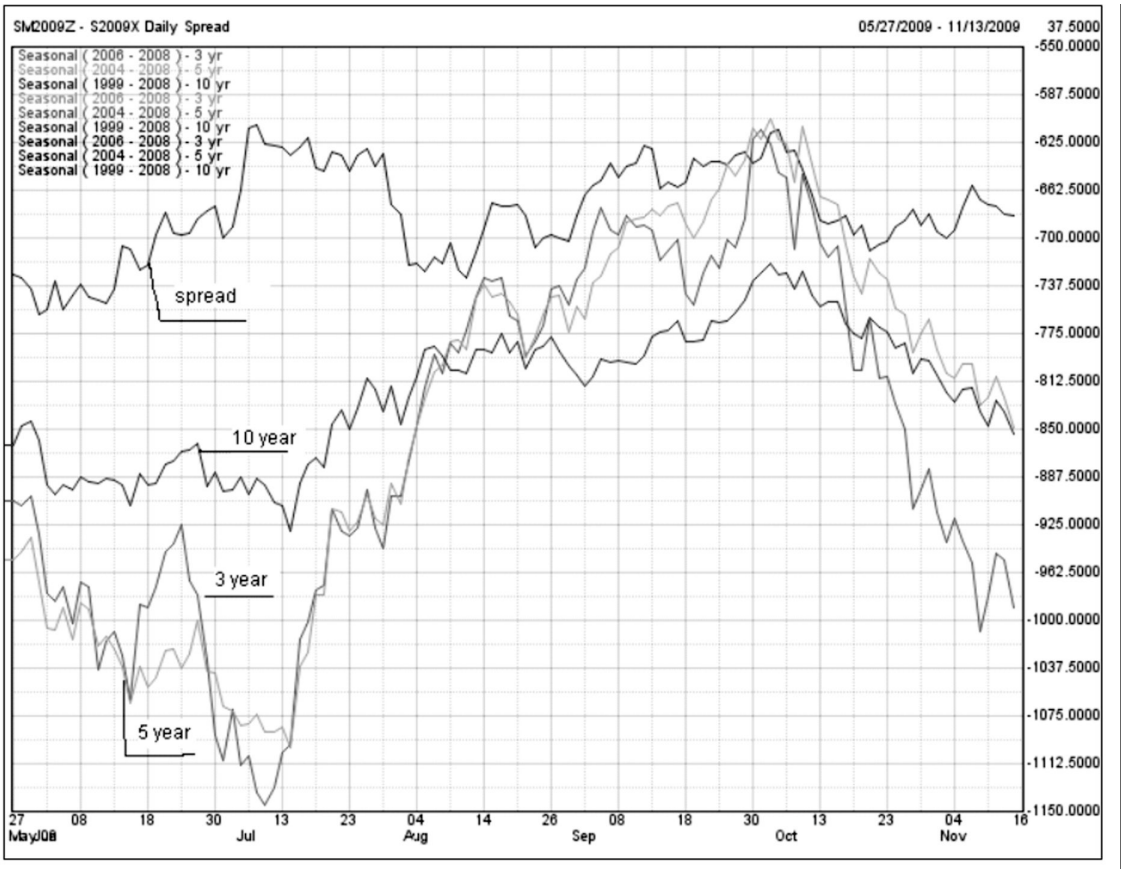
Figures 2 and 3 show the seasonal pattern of the soybean meal/soybean spread and a chart of the soybean meal/soybean spread, respectively.

Despite the fact that this spread exhibits a very strong seasonal pattern and tends to narrow in July–September, this did not happen in 2009. The spread in late July 2009 was already very narrow. It remained in a sideways trend till late September and thus did not follow its seasonal pattern. This is unlike in 2008 (Figure 2), when the spread narrowed from –1190 (in July) to –750 (at the end of September).

Whenever algorithmic software is used for seasonal

Source: Capitol Commodity Services Quotes and Charts

Figure 1. Seasonal Pattern of the PLJ/GCJ Spread for 15, 10, and 5 Years



Source: Capitol Commodity Services Quotes and Charts

Figure 2. Seasonal Pattern of the Soybean (December 2009)/Soybean Meal (November 2009) Spread for 10, 5, and 3 years

Source: Capitol Commodity Services Quotes and Charts

Figure 3. Seasonal Pattern of the Soybean Meal (December 2008)/Soybean (November 2008) Spread for 10, 5, and 3 Years

analysis, this analysis has a number of strategic limitations. In particular, seasonal patterns can rapidly change or disappear. Moreover, this often occurs with very steady seasonal cycles. As a rule, this happens due to the impact of significant fundamental factors. We can give the following example. For a long time, the U.S. remained the only major exporter of soy. Therefore, the seasonal cycle in the behavior of soy spreads was oriented toward the seasonality typical of the U.S. This concerned allocation of land for sowing, growing and harvesting crops, etc. In the late 1980s to the early 1990s, soybeans were offered in the market by Latin-American countries including Brazil, Argentina, Uruguay, and Paraguay. The aggregate output of these countries started to outweigh U.S. production. Since these countries are located in the southern hemisphere, their production cycle is different from that in North America. This factor caused huge changes in the behavior of soybean spreads and broke the previous seasonal patterns.

Another example is currencies and currency spreads. There were some credible calculations made for a number of currency spreads that provided some insight as to the presence of seasonal cycles. However, it is safe to say that even if such patterns did exist, they vanished after the 2008 financial crisis. This is explained by radical changes in the levels of refinancing rates in many countries across the world, which disrupted previously existing relationships and correlations. This can be demonstrated with the following example. For many years, the Swiss franc base rate has been close to zero, while the UK pound base rate was 5% prior to the 2008 crisis and 0.5% after the crisis. Thus, the difference in the base rates between the Swiss franc and the UK pound that had existed for decades disappeared within a few months. It would be logical to assume that such appreciable change has greatly impacted the existing relationships between currency exchange rates, and even more so the behavior of currency spreads. All of this shows that one should not rely solely on seasonal analysis when assessing the current situation. Seasonal analysis should be combined with other types of analysis to achieve adequate results from an evaluation of the current situation.

Use of comparative-historical analysis in working with futures spreads

Comparative-historical analysis is based on the assumption that, under similar circumstances (fundamental factors), futures prices or spreads should behave in a similar way. It suggests searching for situations in the past that are similar to the current one, tracing the behavior of prices in that historical period, and predicting the development of the current situation on this basis. Because of its supplementary function, this type of analysis is limitedly used in the work with spreads and therefore was not significantly highlighted in the literature. Attention to this type of analysis is given in the works of Smith [2000] and Perchanok [2011a].

It can be said that comparative historical analysis combines fundamental, technical, and seasonal analyses. First, we need to select a period in which to examine the behavior of prices and then compare fundamental data to find a configuration of fundamental factors most similar to the current one. After that, the investor can make an appropriate trading decision for the current window while considering the current spread value. This approach seems to be very sophisticated, as the emergence of similar configurations of fundamental factors is highly unlikely due to a large number of these factors. In this case, the investor should select one or two fundamental factors and search for data based on them. The danger is that, firstly, the "key" factors may be selected incorrectly, and secondly, the evaluation of the comparison results is subjective in nature, not to mention the fact that it is necessary to look through a fair amount of statistical information. Based on the above, we would say that such an analysis is both difficult to perform and impractical.

A simpler version of this analysis consists of analyzing charts for past periods. We would suggest the following sequence of steps: compare charts of the subject spread for several past years; if a chart or charts generally similar to the current one are found, compare the details of the current and found chart(s) to gain some insight into the possible behavior of the current spread. The comparison may involve a number of parameters. This simple algorithm allows someone to perform this analysis even with very limited experience.

Critics of regression and correlation analysis in relation to spreads

Regression analysis involves identifying the relationship between a dependent variable and one or more independent variables. A model of the relationship is hypothesized, and estimates of the parameter values are used to develop an estimated regression equation (see Markin [2006]; Prosvetov [2008]). Various tests are then employed to determine whether the model is satisfactory. If the model is deemed satisfactory, the estimated regression equation can be used to predict the value of the dependent variable based on values for the independent variables (see Theil [1971]; Chow [1983]).

Correlation and regression analysis are related in that both deal with relationships among variables. The correlation coefficient is a measure of the linear association between two variables. Values of the correlation coefficient are always between –1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of –1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (see Markin [2006]; Prosvetov [2008]). For simple linear regression, the sample correlation coefficient is the square root of the coefficient of determination, with the sign of the correlation coefficient being the same as the sign of b1, the coefficient of x1 in the estimated regression equation. Smith [2000] contributed to the study of this type of analysis in relation to spreads.

The authors believe that the use of regression-correlation analysis in practice is ineffective, and therefore refrained from in-depth study of it in relation to spreads. Below are the arguments for our position:

1. The aim of any analysis in trading is to assist in mak-

ing various trading decisions. However, the use of regression–correlation analysis for the average trader is complicated because it requires adequate mathematical apparatus. Although traders have sophisticated software, such analysis still requires very specific knowledge in order to operate the software effectively. The majority of practical traders do not have such a high level of knowledge in mathematics. As evidence would show, most textbooks on practical trading never mention this type of analysis (see Williams [1999]; Luca [2000]).

2. In short–term trading, application of this type of analysis is complicated by its very nature. It involves multiply steps: identification of the dependent and independent variables, creation of a hypothesized model of their relationship, estimation of the parameter values needed to develop an estimated regression equation, running of the various tests in order to determine if the model is satisfactory, application of the regression equation, and assessment of the results. Obviously, such analysis takes a very long time, and for an investor whose trading horizon is limited to a period of several months, it loses its relevance in analyzing the situation.

3. One of the features of correlation analysis is that it is impossible to isolate the influence of extraneous factors because they are either unknown or cannot be isolated. Therefore, the correlation method used to determine what would be the result of the relationship between the cause and the effect assumes that extraneous factors did not change or that the change does not distort the basic relationship. If such an assumption is appropriate for theoretical research, then in practice, changes in extraneous factors happen very quickly, and together with a high degree of volatility, a practical trader is unable to take these factors into account. If any of the above factors had a negligible impact on the situation at the current time, its influence could increase in the near future, and it would become one of the key factors. Since the use of this type of analysis requires a large sampling time, including 10– to 20–year–old data, the results of this analysis would be questionable, because in the past 10 years, the world has experienced significant changes due to globalization, which may not be reflected in the older data. Moreover, the recent events of 2008 changed the process of pricing in the future markets due to increased liquidity and the reduction of the refinancing rate to 0.

4. Neither regression nor correlation analyses can be interpreted as establishing cause–and–effect relationships (Markin [2006]). They can indicate only how or to what extent variables are associated with each other. The correlation coefficient measures only the degree of linear association between two variables (Prosvetov [2008]). Any conclusions about a cause–and–effect relationship must be based on the judgment of an analyst. Moreover, identification of the variables requires the use of other types of analysis that must be performed first in any case.

Thus, the regression–correlation analysis is, in our opinion, a tool for theoretical researchers. The rapidly changing situation and the high volatility do not offer adequate opportunity to apply this type of analysis in practical trading.

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