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Does Simple Pairs Trading Still Work?

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Abstract

Despite confirming the continuing downward trend in profitability of pairs trading, this study found that the strategy performs strongly during periods of prolonged turbulence, including the recent global financial crisis. Moreover, alternative algorithms combined with other measures enhance trading profits considerably, by 22 bps a month for bank stocks.

Pairs trading is a relative value arbitrage in equity markets and is particularly attractive to hedge funds that seek to profit from temporary price deviations between stocks of close economic substitution. The scant research on this topic is mostly confined to seminal works that have documented economically and statistically significant, albeit declining, profits (on the order of 1 percent a month) from the use of a very simple pairs trading rule. This remarkable success has not been subjected to independent scrutiny, unlike other well-documented anomalies, such as momentum trading.

We re-examined and expanded evidence on pairs trading in the U.S. market by using an extended dataset covering July 1962–June 2009. We confirmed a continuation of the declining trend in profitability over time, with the mean excess return for the portfolio of the top 20 pairs dropping precipitously, from 0.86 percent a month for 1962–1988 to 0.37 percent for 1989–2002 and to just 0.24 percent for 2003–2009. Although the literature suggests that this decline is the consequence of increased competition within the growing hedge fund industry, which competes away the same opportunities, careful analysis shows that not to be the case in pairs trading. We argued that pairs trading is essentially a risky arbitrage; thus, its performance depends on not only the state of market efficiency but also the degree of arbitrage risks facing arbitrageurs. These risks encompass fundamental risk, noise-trader risk, and synchronization risk, all of which work to prevent or delay arbitrage or to inflict losses on arbitrageurs. Using a simple attribution analysis, we were able to show that the "market efficiency" story, in which the hedge fund factor is just one component, is only partly to blame for the decline. Instead, we found that the worsening arbitrage risks facing pairs traders contribute up to 70 percent of the drop in profits.

We also found that pairs trading performed particularly strongly during recent periods of prolonged turbulence, namely, the 2000–02 bear market and the 2007–09 global financial crisis. Although this finding seems counterintuitive, the increase in arbitrage risks during these periods of panic was outweighed by a corresponding decrease in market efficiency. Thus, some arbitrageurs have overcome worsening arbitrage risks to successfully exploit mispricings that appear to be abundant in such turbulent periods.

We further proposed alternative algorithms that incorporate two additional pair-matching criteria: industry homogeneity and historical frequency of reversal in the price spread (in addition to the conventional price spread metric). Homogeneity involves matching securities within the same and narrowly defined industry groups to ensure close substitution by classification and lower divergence risk. To some extent, this metric can be viewed as a first step toward incorporating a fundamental aspect in pairs trading, which is traditionally a technical concept. Reversal frequency, computed as the number of zero crossings by the normalized price spread, measures how frequently two securities crossed each other in the past. A high number of zero crossings signifies a "track record" of frequent mispricings within a pair that were successfully corrected by market participants. When combined with the SSD and homogeneity metrics, this track record measure has been found to enhance trading profits considerably, by 22 bps a month for bank stocks.

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