



THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Pairs Trading Research, A Cointegration Approach

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ABSTRACT

Pairs Trading strategy is quite a popular market neutral statistical arbitrage strategy, which came from Morgan Stanley in 1980s. In this paper, I analyzed this classic trading strategy in three industry sectors: financial sector, energy sector and health care sector. In my research, cointegration introduced by Clive Granger in 1987 is a key idea. Both Johansen maximum eigenvalue test (1988) and Johansen trace test (1990) are used in pairs selection and vector error-correction model (VECM) and cointegrating vector are applied in calculating hedge ratios. Also, I modeled the stationary price spread with AR(1) assumption and calculated pre-set optimal trading boundaries based on first mean passage time of AR(1) model from Basak and Ho in 2004. Trapezoid integration rule was used as a numerical scheme in solving the corresponding integral equation for the first mean passage time. When comes to loss control, I combined first mean passage time and standard deviation of first passage time of AR(1) model with a tolerance parameter. I simulated the results with different tolerance parameters and compared the results with S&P 500 ETF as a market benchmark.

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