



The University of Chicago  
Department of Statistics

MASTER'S THESIS PRESENTATION

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## **Market Neutral Portfolio Trading: A General Method Based On Fractional Cointegration**

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110 Eckhart Hall, 5734 S. University Avenue

### **ABSTRACT**

This paper uses fractional cointegration analysis to examine whether long-term equilibrium exists in the linear combination of some stocks. That is, we examine whether such equilibrium are characterized by long memory, short memory or mean reversion. This long-term equilibrium can be used to construct market neutral portfolio to make profit by a simple trading strategy. Moreover, this relationship is also employed to test Efficient Market Hypothesis, since cointegration between any variables, as shown by Engle and Granger(1987), has a valid Error-Correction Representation which implies weak market inefficiency. As to market neutral portfolio consisting of two stocks, called pairs trading, we used enumeration to find all the pairs which are fractionally cointegrated. Through our analysis, we find that it is hard to find a tradable cointegration relationship between two stocks. However, we can construct a cointegration portfolio consisting of more stocks to make profit from the long-term equilibrium. But, as the number of stocks of the cointegration portfolio increases, the enumeration method become impractical because the number of combination will exceed all computation power of any computer in this world. For solving such high dimension problem, we adopt the generic algorithm to find the most profitable market neutral portfolio. This paper indicates a general method to find the market neutral portfolio based on the fractional cointegration.

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