



Detecting insider trading: The theory and validation in Korea Exchange

Young S. Park^{a,*}, Jaehyun Lee^b

^a Graduate School of Business, Sogang University, Seoul, Republic of Korea

^b National Pension Research Institute, National Pension Service, Seoul, Republic of Korea

ARTICLE INFO

Article history:

Received 11 November 2008

Accepted 28 January 2010

Available online 4 February 2010

JEL classification:

G14

G28

D82

Keywords:

Insider trading

Surveillance

ARMA

ABSTRACT

This paper provides an empirical basis for identifying insider transactions by deriving a theoretical model, which incorporates the relationship between insider transactions and time series of stock returns. Thus, this model enables us detecting insider transactions by applying stock return time series. We show that when there is an insider transaction in the market, time series can be derived as an ARMA(1,1) process having closed solution coefficients. For validation of the model, we test publicly released insider transactions and reverse takeover events using the minute-by-minute stock price data. The selected events show higher pass rate of the detection criteria than the current detection system which shows that our model produces smaller Type II error than the existing post transaction-based cumulative abnormal return model.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

Currently Article 188-1 and Article 188-4 of the Securities and Exchange Act in Korea, likewise other countries, prohibit transactions using undisclosed information. Although not all insider transactions are illegal, if any return is gained from a transaction by an insider who acquired certain business information prior to its disclosure date, such a transaction is an illegal transaction in violation of the 'Act on Prohibition of Using Undisclosed Information.' Therefore, detection of abnormal transactions, which usually involves insider transactions, is important from the viewpoint of protecting the general investors. However, the model used by Korea Exchange for the detection work is based on a post-transaction, cumulative abnormal return (CAR) model, which is limited in detecting abnormal transactions involving insider transactions.

Detection based on CAR model can be supported from empirical evidences about whether abnormal return (AR) can be realized using information in a stock market and whether information superiority can exist in a specific group. Seyhun (1986) discovers that insiders can gain abnormal return (AR) after buy and sell actions. Lakonishok and Lee (2001) and Aktas et al. (2008) show similar results that insider transactions are informative whether they are legal or not. Also, there are studies focused on transactions suspected of insider trading. Meulbroek (1992) concludes that transactions, which were judged as illegal insider trading ex-post, are conducted

using insider information. Gosnell et al. (1992) analyzes the bankruptcies, which occur between 1985 and 1987, and check whether insiders sell their stocks before bankruptcies or whether abnormal returns exist after such sell actions. This study reveals that insider sell actions of stocks are significant in unlisted companies and there are negative ARs. Seyhun and Bradley (1997) investigates 407 bankruptcies announced during 1963–1992 and discover that insiders sell their stocks prior to bankruptcies and buy them after the events. Choi and Ko (2002), Park and Chung (2007), Lee et al. (2009) study the evidences from Korean market and Szakmary et al. (2010) studies using commodity futures market data.

For capturing analytic property of stock return time series embedded in insider trading, we need the theoretical background of insider trading. Since Kyle (1985) introduces a method of modeling the stealth transactions using insider information, numerous researchers have applied this method on various studies of insider trading. Kyle (1985) derives the optimal stealth strategy under the circumstance where insider buy and sell actions are hidden from the market. Huddart et al. (2001, hereinafter HHL) proves theoretically by modifying the Kyle model that there can exist a mixed strategy for insiders when insider transactions are exposed with a time lag of one period based on IT progress and improvements in the disclosure system. HHL (2001) theoretically proves that a positive return can still be realized through insider trading, although such return gained is reduced by half when insider transactions are exposed, that is, insider information is disclosed to the market, because information superior traders can dissimulate exposure of their information through strategic actions. Here,

* Corresponding author. Tel.: +82 2 705 8711; fax: +82 2 705 8519.

E-mail addresses: yspark@sogang.ac.kr (Y.S. Park), jaehyunlee@nps.or.kr (J. Lee).

HHL (2001) concludes that an optimum strategy exists not as a pure strategy but as a mixed strategy. However, Brunermeier (2005) presents a different view by showing that a mixed strategy does not exist. HHL (2001)'s argument is that the market depth is infinite (that is Kyle $\lambda = 0$) when no mixed strategy exists. However, Brunermeier (2005) model shows the existence of a pure strategy by proving that Kyle λ is not zero because multiple information superior traders having long-term information exist. Daher and Mirman (2006, 2007), and Wang et al. (2009) extend Kyle model by employing two types of insiders – real sector insiders (managers) and financial sector insiders (owners). The existence of multiple insiders and competitions among them is more realistic and interesting topics of recent theoretical works. However, these models are not yet developed for multi-period models which can be used in detection model. Our focus is not on competition among information superior traders but on time series property when an insider having an exclusive position trades.

The purpose of this study is to analyze the characteristics of stock return time series in the existence of insider transactions that use undisclosed information and to establish a theoretical and empirical basis for detection of insider transactions. The reason for our interest in stock price time series is that stock price time series is available for anyone to observe and analyze, past stock prices are the result of past transactions of investors, and such buy and sell actions depend on information available to investors. So, we consider the time series of stock return to be informative to detect insider transactions before the specific disclosure date of very important event. However, as mentioned above, there are no existing studies that derive insider transactions in the form of a stock return time series and develop a detection methodology. Most studies about detecting insider trading rely on either data mining techniques or basic statistical models of event studies. This study develops a stock return time series model that describes the relationship between insider trading and the stock prices, derives detection criteria and thereby permits us to evaluate the validity of our model.

This study consists of the following. Section 2 explores current detecting systems in Korea Exchange. In Section 3 we model insider transactions in terms of stock return time series and investigate its characteristics. In Section 4 we describe the insider transaction detection model using time series derived in Section 3. During this process we analyze the effectiveness of detection criteria through simulation. In Section 5, we apply the detection model to specific events of disclosed transaction dates of major shareholders with high propensity for hiding their transactions and of reverse takeover events, to assess the effectiveness of the established detection criteria. Finally, Section 6 presents our conclusions.

2. Insider trading and surveillance rule in Korean market

2.1. Status of relevant regulations and the surveillance procedure in Korea Exchange

Currently, Article 188-1 and Article 188-4 of Korea's 'Securities Exchange Act' prohibit transactions using undisclosed information

Table 2
Distribution of unfair transactions by type (Unit: %). Source: FSS

	2003	2004	2005	2006
Price manipulation	47.7	41.7	38.3	31.7
Insider transaction	12.6	16.2	21.3	23.1
Share change	19.2	17.0	23.4	22.6
Other	20.5	25.1	17.0	22.6

and of price manipulative nature. Based on these regulations, Market Oversight Commission was formed as a subordinate agency of Korea Exchange in September 2004, whereupon the Commission has been conducting monitoring, investigation and analysis of listed stocks, futures and options, their price offers, as well as pertinent information, disclosures, rumors and media reports, to detect abnormal transactions. Detected securities are monitored for a set period of time in accordance with certain criteria established by Korea Exchange, so that, in case indications of any abnormal transaction are found, the investigation team conducts tracking and investigation on such an item. The following is the market surveillance procedure of the Market Oversight Commission.

- (1) Detection of abnormal transactions: In case the price or trading volume of a security, future or option item either rises or drops in excess of specified trading detection criteria established using the statistical model based on past prices and trading volumes, the item is identified as an abnormal transaction item.
- (2) Monitoring: An item identified as an abnormal transaction item is monitored for a specified period of time in terms of its price level, trading volume, trading pattern, transactions and price offers are analyzed, and their concentration and frequency of trade are investigated.
- (3) Request for inquiry disclosure: Daily trading status is monitored so that, in case an abnormal transaction is detected, stock price varies above a specified level, or there is a rumor or media report that can impact investors' judgments significantly, such a case is notified to appropriate oversight agency for an inquiry disclosure.
- (4) Request for preventive measure: The Commission requests pertinent trading company or brokers for preventive measures based on early identification of symptoms of an abnormal transaction.
- (5) Notification for tracking investigation: The Oversight Commission requests the investigation team to conduct a tracking investigation. If abnormal trading is identified based on the investigation, the Financial Supervisory Service (FSS) is then notified.

Based on the data of FSS dated 22nd January 2007, the rate of abnormal trading is higher in the KOSDAQ market, whereas price manipulative transactions are decreasing while the share of insider transactions, which is the subject of study here, is increasing steadily (see Tables 1 and 2).

Table 1
Market oversight performance, 2006. Source: FSS

Category	2005			2006		
	Preventive measures	Tracking investigations	Total	Preventive measures	Tracking investigations	Total
Stock exchange	478	107	585	306(-36.0)	58(-45.8)	364(-37.7)
KOSDAQ market	282	182	464	444(+57.4)	236(+29.7)	680(+46.6)
Futures market	71	98	169	169(+138.0)	47(-52.0)	216(+27.8)
Total	831	387	1,218	919(+10.6)	341(-11.9)	1,260(+3.4)

Number in parentheses is the change rate relative to the previous year (Unit: %).

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات