⊠연구논문

Quality Management in Self-Regulating Capital Market

Chul Hwan Ahn

Dept. of Applied Statistics, Sejong University

Abstract

Three essential components of self-regulating capital market includes trading, clearing and regulation. These three procedures have to be executed in accurate, prompt, and orderly way so that the markets can provide individual investors with confidence. In this study, we review these procedures and discuss how the quality service of them can be related to investor confidence. We will also discuss the details of regulatory process and especially how to monitor the stock price and volume for the detection of their unusual movements as the first procedure of regulation.

1. Introduction

Capital markets are essential to the growth of free enterprise and global economy. More countries seek to build their capital markets and form new exchanges and strengthen existing ones. By bringing together entrepreneurs and investors, capital markets make it possible to raise capital for a wide variety of productive purposes, including research and development, expansion, and the creation of new jobs and products. Self-regulating capital markets provide a fair and orderly way to raise capital in exchange of equity ownership.

A capital market depends on the confidence of those who participate in it. Obtaining the confidence of the investors is vital for capital market. Several years ago, the securities industry in U.S. found itself facing a veritable confidence crisis (Stamps 1990). Several highly publicized insider trading cases-the Ivan Boesky scandal being the most notorious – had badly shaken the trust of individual and institutional investors. Following the Ivan Boesky scandal and Black Monday, investors confidence in the stock market plunged to an all-time low. Many

showed no inclination to reenter the market.

In order for the stock market to thrive and to function efficiently, each side of a transaction must have confidence in the integrity and fairness of every transaction. Thus, all of the transactions traded in a capital market have to be monitored or regulated consistently and it becomes increasingly important.

2. Essential Components of Capital Market

Three essential components of a self-regulating capital market includes trading, clearing and regulation (ICASS 1992). Trading and clearing trades are obviously important processes of any capital market. Trading is the process of matching buy and sell orders taking place generally on a trading floor or by telephone. Clearing involves order accounting and settlement which balances the price and size of a transaction between market participants within an agreed on time. Regulation, the third component of a capital market, establish an environment in which these processes are possible. These three processes have to be done in an accurate, prompt, and orderly way so that the markets can provide individual investors with confidence that the markets are consistently and efficiently regulated for the transactions occurred in market place. In this study, we define quality processes in trading, clearing, and regulation and discuss how they can be achieved.

One of the important issues to be considered in self-regulating market are accuracy and promptness in trading and clearing. It includes the accurate matching of buy and sell orders and prompt settlement which balances the price and size of a transaction between market participants within an agreed on time. In our market the trading process was stopped from time to time in the past because of the unstableness of the trading computer system or because of the excessive amount of trading which was unexpected when the system was builted. We might need to predict the maximum volume of transactions which can occur in a short period of time for any security and increase the capacity of the current trading system accordingly. Regulation involves setting fair and consistent market rules, monitoring market activity to detect infraction of rules and enforcing its standards. The right regulatory role protects investors and preserves fair and orderly market. It starts with monitoring price and volume movement of all the securities traded in the exchange which is called stock watch. The stock watch is usually the first stage of surveillance, compared to the second stage of surveillance - detecting

insider trading. Depending on the exchanges some emphasizes the first stage, and others the second stage.

3. Regulatory Process

The regulatory process starts with stock watch which is the process of monitoring price and volume movement of all the securities traded in the exchange. An alert is generated if the movement of price or volume of any security compared to its pattern of history movement. When an automated alert is generated, a surveillance analyst performs a cursory review. If conditions appear unusual or a scan of various news sources indicates the need for intervention, analysts pursue the investigation further. They may then halt trading as well as conduct a routine review, which may eventually lead to a full investigation. The process may terminate when the need for a trading halt has been identified, when an investigation has been initiated, or when no further action is required. Obviously the vast majority of trades will not generate an alert. But, if there was false alert, thus alert but no violation then it will be considered as type I error. And if there was no alert which was indeed a violation, then it would be considered as type II error (Davis and Ord, 1990).

In developing quality stock watch, the obvious goal will be to reduce these two types of errors. According to Davis and Ord (1990), it is usual to have a relatively high false alerts because the existing statistical tests are based on fixed parameters applied to all securities. Such general criteria may be inappropriate for specific securities since changes that are extraordinary for some securities may be regular occurrences for others. They also said that fixed parameters appear most inappropriate for NASD (National Association of Security Dealers) securities since the market tiers in NASD range from the thinly traded to the National Market System securities, many of which would qualify for listing on the New York Stock Exchange. The inappropriateness of fixed parameters will also be true in Korea Stock Exchange (KSE) for the same reason because the securities traded in KSE have a huge variation in size. Another factor that makes fixed parameters inappropriate is market volatility. Program trading, essentially the use of a computer to generate trading orders, has had a profound effect upon market volatility. Although there is some question whether program trading has increased the frequency of unusual market volatility, it will increase the magnitude of the volatility (Vinella 1990).

To improve the effectiveness of the surveillance break parameters and better isolate true exception conditions, we have to use criteria that are security specific. In addition, we have to relate an individual security's activity to general market activity or to related industry activity since it is quite normal that the volume of particular security can be heavy if the market or the related industry's activity is strong.

In the case of price movement Davis and Ord (1990) used a form of capital asset pricing model (CAPM; Natenberg, 1988). We will modify their form by adding the time factor t as in (1).

$$r_{jt}^d \;=\; \alpha_j^d \;+\; \beta_j^d\, r_{mt}^d \;+\; \varepsilon_{jt}^d \tag{1}$$

where r_{jt}^d denotes some measure of the rate of return of security j at time t on day d, r_{mt}^d, the rate of return for the market index(m) at time t on day d, α_j^d, the risk-free rate of return on day d for security j, β_j^d, the market-related risk on day d for security j, often termed the beta, and ε_{jt}^d, the random error term.

The benefit of using the CAPM as a model for surveillance purposes is that the relative price movements for an individual security can reflect its expected response to overall market fluctuations. Now, we propose computing price parameters in two ways. The first method is to use the confidence interval for the future rate of return r_{jt}^d - the lower and upper limit for rate of return of security j at time t on day d given r_{mt}^d, the rate of return for the market index(m) at time t on day d. In statistical terms it is referred to as an prediction interval since it indicates the possible range of values for future rate of return of security j given the rate of return of market index. The second method is to perform the outlier test (Weisberg 1985, p. 116) on the future rate of return, r_{jt}^d. If the statistical test rejects the null hypothesis that it is not an outlier, the price movement of the security j may be regarded as an unusual movement, and a surveillance analyst should perform a cursory review along with the appropriate regulatory process.

We can also consider overlapping predictive regression (Fama and French, 1988) which models a rate of return, $r(t, t+k)$ earned by keeping a security from day t to t+k. It can be written as follows:

$$r(t, t+k) \;=\; \alpha_k + \beta_k\, r(t-k, t) + \varepsilon(t, t+k) \tag{2}$$

where $r(t-k, t)$ denotes a rate of return earned by keeping a security from day t-k to t, a_k, the risk-free rate of return, β_k, the market-related risk, often termed the beta, and $\varepsilon(t, t+k)$, the random error term. If the stock price follows a random walk, then the estimate of β_k will approaches to zero. Otherwise it will be far from zero. The price movement will be considered unusual if it lies outside the confidence interval constructed for $r(t, t+k)$. This model has been used for empirical analysis with monthly data and it turned out to be effective in the United States in forcasting holding period return of three to five years in the future.

There is a clear distinction between two approaches-capital asset pricing model (1) and overlapping predictive regression (2). The former is the econometric approach that the stock price can be explained by the movements of macro-economic variables, while the latter is the time series approach that the stock price can be explained by its own historical movement because the stock price itself reflects all the information which may affect the stock price.

In the case of volume movement we assume that log of daily volume(Y) follow normal distribution and propose computing volume parameters, VL(Volume Limit) as follows:

$$VL = y_\alpha + y_m(x_1, \ldots, x_n : y_1, \ldots, y_n) \tag{3}$$

$$\text{where } y_\alpha = [y \mid \Pr(Y < y) = 1 - \alpha].$$

In a form of VL, $y_m(x_1, \ldots, x_n : y_1, \ldots, y_n)$ represents a factor due to the effect of market movement, which will be a function of market activity $x_i's$ and previous volumes $y_i's$. We may have to find more appropriate distribution for the volume of individual security from the historical data, and determine the unusualness of volume movement from the distribution. It is hard to incorporate the effect of market or related industry's activity in volume movement. In KSE, a suitable distribution need to be found to fit well daily volume, even though taking log transformation of daily volume appears to follow normal distribution for some securities.

4. Conclusion

The quality management of a self-regulating capital market is essential to obtain the investors confidence. It involves the accuracy and promptness in trading and clearing, thus, the accurate matching of buy and sell orders and prompt settlement which balances the price and size of a transaction between market participants within an agreed on time. It also involves the right regulation which is to set fair and consistent market rules, monitoring market activity to detect infraction of rules and enforcing its standards. It starts with stock watch-monitoring price and volume movement. The quality of this process depends on how to make two types of errors as small as possible. We proposed a modified form of an capital asset pricing model in monitoring the price movement along with methods of computing price parameters, and it was compared to a method using overlapping predictive regression. One is the econometric approach that the stock price can be explained by the movements of macro-economic variables, and the relative price movements for an individual security can reflect its expected response to overall market fluctuations, while the other is the time series approach that the stock price can be explained by its own historical movement because the stock price itself reflects all the information which may affect the stock price. We need a series of controlled experiments to determine which approach is more appropriate in our stock market.

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