

# Chapter 13

## Firm Size Transmission Effect and Price–Volume Relationship Analysis During Financial Tsunami Periods

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### ABSTRACT

*Investors attend importance to forecast the price of financial assets, thus, the factors affecting the stock price are usually the focus of financial research in the field, in which the most important factors to scholars are firm size transmission effect and price-volume relationship. In this study, the analysis of these two items in the Taiwan stock market is conducted. The results indicate that the firm size transmission effect is almost significant, and the reversal phenomenon also exists. However, before the financial tsunami, the firm size transmission effect does not significantly exist; this result also indirectly proves the directional asymmetry of the market returns, proposed by McQueen, Pinegar, and Thorley (1996). For price and volume relationship, big cap index reveals that volume leads to price before the financial tsunami, and small cap index appears that price leads to volume in 2010.*

### 1. INTRODUCTION

Recently, along with the diverse developments of investment practical applications, investment analysis has become one of the most important topics in financial analysis. On the other hand,

the investors take the return of investment seriously, thus, the exploration of the impact factors between the firm size transmission effect and price volume relationship becomes the most important attentions for financial researchers.

Supply and demand of the market simultaneously deciding equilibrium price and quantity is

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the basic concept of economics. The price analysis of the asset will also consider the message of volume in the same time. Ying (1966) clearly indicates that it isn't a very complete analysis if price or volume is studied separately. Because price and volume are joint products of market mechanism, any complete analysis should take these two variables into account to provide real market conditions and possible responses. Some theories regarding price and volume relationships are proposed. Clark (1973) proposes the mixture of distributions hypothesis, Copeland (1976) provides sequential information arrival model to discuss the price and volume relationships. Both of them claim that price and volume should have positive relationships.

Osborne (1959) is the pioneer to provide empirical study regarding price and volume relationships, in which, he finds that the variance of changes of stock price and the square root of numbers of the transactions are positive proportional. He does not directly explore price and volume relationships, but the results lead to the discussion of price and volume relationships. Previous researches are mainly focused on the same period of price and volume relationships. After the mid-1980s, the causality of price and volume are gradually taken seriously. Most of these discussions claim price and volume relationships are positive proportional, such as Granger and Morgenstern (1963), Godfrey et al. (1964), Ying (1966), Crouch (1970), Clark (1973), Epps and Epps (1976), Epps (1977), Wood et al. (1985), Harris (1987), Karpoff (1987), Jain and Joh (1988), Bessembinder and Seguin (1992), Basci et al. (1996), and Cooper (1999).

However, the price and volume relationships with positive proportional relationships imply that we can make the one of them to predict the other variable. It initiates another study of the causality of price and volume that mainly focuses on the analysis of lead lag relationship between volume and price (or price and volume), such as Jaffe and Westerfield (1985), Harris (1987), Smirlock and

Starks (1985), Eun and Shim (1989), Hamao et al. (1990), Jarrow (1992), Fendenia and Grammatikos (1992), Campbell et al. (1993), Hiemstra and Jones (1994), Theodossiou and Unro (1995), Chiang and Chiang (1996), Brennan et al. (1998), Kumar et al. (1998), Martens and Poon (2001), Wang and Cheng (2004), Baker and Stein (2004), Leigh et al. (2004), Mazouz (2004), How et al. (2005), Cheuk et al. (2006), and Gebka et al. (2006). Some of the scholars conclude that price influences volume, and some conclude that volume influences price, and, of course, some conclude that two way feedback relationships of price and volume. Although the results are different, it supports that the price and volume relationships existed.

Size effect has been first proposed by Banz (1981) and Reingnanum (1981). They indicate that, after making risk-adjusted, small-size-firms have higher return than big-size-firms. The phenomenon will be supported by other scholars via different research methods, such as Brown et al. (1983), Keim (1983), Schultz (1983), Stoll and Whaley (1983), Barry and Brown (1984), Ma and Shaw (1990), Fama and French (1992), and Huang (1997), all their studies verify size effect. Why exists size effect? Many of the researchers attempt to learn different perspectives to propose a variety of explanations. The most famous is the multi-factor model, proposed by Fama and French (1992, 1993, 1995, 1996, 1998) and Lakonishok, Shleifer, and Vishny (1994), that claims the variables of the firm size and the book to market equity have been the prediction variables of the return. He and Ng (1994) conclude that the return of the small stocks portfolio is overvalued in the early period because the sample does not include unlisted, under being merged and acquired companies. Bhardwaj and Brooks (1993) propose dual beats theory which claims that systemic risk in the bull market and bear market is not the same, i.e., the  $\beta$  value of small-size-stocks in the bull market is much higher than the bear market; the systematic risk of a large-size-share in the bull market is smaller than it in the bear market. Eventually,

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