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# Testing of Short Sale Hypotheses on NYSE

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**Abstract**

The purpose of this paper is to investigate the validity of short sale hypotheses in the NYSE in the period 1990–2015. The short sale has been regulated in the U.S. market from the 1930s by so called up-tick rules and other legal acts. The aim of this regulation was to prevent short sellers from adding to the downward momentum when the price of an asset was already experiencing sharp declines. During 1990s the short sale regulations changed for several times. In this paper the short sale determinants are investigated using variables that correspond with short selling hypotheses in the period from 1990 to 2015. As short sale regulation has changed during that period these determinants are also observed in particular sub-periods represent different legal regulations of short selling activity.

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*Keywords:* short sale hypotheses; panel regression; NYSE; regulation

## 1. Introduction

Short selling allows traders to borrow and sell a stock without actually owning it. To close a short position, traders must buy back the stock in the future and realize gains or losses based on the difference between selling and buying price. Advocates of short selling offer several benefits, such as efficient pricing in stock markets or incorporation of negative information in prices. Critics of short selling argue that short sellers may hammer a stock´s price below its fundamental value. These predatory short selling practices are one of the reasons why short selling was prohibited or limited for several times.

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In the past two decades there is an increase of short selling activity in the equity market. In the NYSE and the NASDAQ from 1988 to 2002, the annual growth rate of short interest in both equity markets ware more than 20 percent per year (Kot, 2007).

Using 1990–2015 data of short selling from NYSE the aim of this paper is investigate determinants affecting short selling level and whether there is any difference in short-sellers motivations among different short selling regulation environment.

## 2. Related Literature

The motivations of investors for short selling are summarized in four hypotheses – Trend Hypothesis, Overpricing Hypothesis, Arbitrage Hypothesis and Taxation Hypothesis with minority importance. There exists number of studies on short selling in recent years. An examination of overpricing hypothesis as a reason for short sale can be found in following studies: Dechow, et al. (2001), Desai et al. (2002). Boehmer et al. (2005) and Asquith et al. (2005) investigate relation between short sale restriction and stock prices. Trend Hypothesis as a motivation for short sale is investigated e.g. by Jagadeesh & Titman (1993), with Arbitrage Hypothesis deal Brent et al. (1990) or Arnold et al. (2005).

Trend Hypothesis (1) (also known as Following the Trend Hypothesis) according that short sellers close their positions if the stock prices have been increasing in the past short term. Jagadeesh & Titman (1993) demonstrate that the stocks with high (low) rate of returns at the horizon from 3 to 12 months are repeating this high (low) rate of return at the horizon of next 3 to 12 months. Overpricing hypothesis (2) that expects that investors have inside information and if they expect that the stock is overprice the short selling is a way how to capitalize it. Diamond and Verreichia (1987) point out that short sale is an expensive transaction and short sellers trade only if they expect that the price will significantly decrease as a compensation for this costs and risks. Dechow et al. (2001) emphasize the relation between low level of fundamentals factors and a level of short selling. The aim of these studies is to analyze the information contents of short selling and suggest trading strategies based on information intercorporate in short selling Arbitrage Hypothesis (3) argues that short sellers participate in overpricing between a stock and convertible security. High correlation between an instrument and instrument that is going short is demanded. And (4) Taxation Hypothesis that has only limited impact on short interest nowadays because of elimination of opportunity to defer capital gain tax if investor shorting securities. (Arnold et al., 2005). As the main authors that deals with short selling determinants may be referred Brent et al. (1990), Dechow et al. (2001), Angel et al. (2003), Desai et al. (2002) or Kot (2007). Brent et al. (1990) analyze short selling motivation based on three above mentioned hypotheses. They find that short interest follows a seasonal pattern that is weakly consistent with tax hypothesis. Further stocks with high betas and the existence of convertible securities or options tend to have higher level of short interest.

Dechow et al. (2001) document that short sellers open positions in stock of firms with low ratios of fundamentals (like earnings or book value) to market value and close their positions at the ratios mean-revert. They also point out the importance of transactions costs in decision making process of short sellers. Angel et al. (2003) examine the frequency of short selling in stocks listed in NASDAQ and analyzed stock characteristics. They get that short sale is more common among stocks with high returns than stocks with weaker performance and further actively traded stocks are more shorted. Short selling also depends directly and positively on stock price volatility. Desai et al. (2002) examines the relationship between the level of short interest and stock return on the NASDAQ. They find out that heavily shorted stocks experience significant negative abnormal returns with the respect to the market, size, book-to-market and momentum factors. The higher level of short interest is a stronger bearish signal. Kot (2007) finds that short-selling activity is positively related to arbitrage opportunities and hedging demand, and negatively related to previous short-term returns. Deev &Linnertova (2014) analyzed short selling activity with ETFs because ETFs short interest is 10 times higher than short interest with common stocks. Recent analysis of short sale is focused on repeated analysis of short sale constraints. This topic became important during the financial crisis when particular governments reaccepted short sale limitations that have been relaxing during last 20 years. For example Mohamand et al. (2015) investigate the ban on the short-selling of specified financial-sector stocks in September 2008 introduced by The UK's Financial Services Authority. Grullon et al. (2015) investigate impact of Regulation SHO that relaxes short-selling constraints on a random sample of U.S. stocks to test whether capital market frictions have an effect on stock prices and corporate decisions. Hasan (2015) investigates whether such selling activity before the 2008 short ban reflected