

Does Monopoly Exist in the Stock Market? Detection and Prevention of Trade-Based Market Manipulation

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Abstract³

It is common sense that monopoly exists in the goods market. Does monopoly exist in the stock market? This paper addresses this question in a preliminary manner. By comparison of competition in the stock market with that in the goods market and analyzing similarities and differences in achieving monopoly power between the two, we show conceptually that monopoly can be established in the stock market. Furthermore, it is the underlying power that enables market manipulation to succeed. Reviewing historical examples and contemporary litigation cases that have occurred in the stock markets of the United States, China, India, Japan, Hong Kong and other economies, demonstrates that market manipulation has been—and still is—chronic, frequent, and widespread in global stock markets. Occasionally it has been rampant, resulting in severe stock market crises. In order to find areas for daily detection and prevention of such systemic risk, we choose to focus on the accumulation-lift-distribution manipulation scheme, particularly the trade-based tactics in price-lifting. Meanwhile, this paper presents a full anatomy of an investor's trades during a given trading day and identifies nine variables that are at discretion of a large investor. A unified regulatory framework

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for detection and prevention, composed primarily of eight measures, is subsequently proposed based on the nine variables. The framework is expected to provide quantifiable, effective and inexpensive tools for daily operations of securities regulators. As such, this framework has the potential to be extended for regulatory measures in other financial markets.

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1. Does monopoly exist in the stock market?

Monopolies are common within the goods market, and exercise of monopolistic power is detrimental not only to competition and welfare, but also to fundamental values such as freedom of choice. History has repeatedly proved this point, and competitors repeatedly outcry for antitrust regulations. The resulting antitrust laws have been formally enacted since the implementation of the Sherman Act of 1890 (Motta, 2004).

Does monopoly exist in the stock market? Our paper addresses this question using a qualitative approach. Modeling is a subject of a separate project in our research series about regulating competition in the stock market.

We refer to monopoly power in the secondary stock market as the power that influences other investors' decisions; it makes a stock so attractive (unattractive) that others voluntarily purchase (sell) the stock according to the design of the monopolist. This definition of power is paraphrased from Joseph Nye's definition of soft power in political science (Nye, 2008). For our purpose, we consider only those monopolists who will be trading against the induced investors (*e.g.*, if he generates expectations of rising stock prices, he will sell the stock).

At its first approximation, it is not obvious how such monopoly could exist in the stock market, since there are numerous investors at any time, buying and selling on the same market, seemingly without interacting with one another besides the trade itself. In our paper we introduce an alternative approach to the stock market based on empirical examination and the current data over the last 80 years, in both developed and developing markets – especially data on market manipulation.

We view the secondary stock market as an institution that facilitates competition for trading profit. Each investor has seemingly the same chance to profit, and nobody is supposed to gain above risk-adjusted return in the long run (according to the strong form of the Efficient Market Hypothesis). However, hundreds of litigation cases and administrative orders as well as media reports in emerging stock markets, such as that of China, India, and Brazil, and developed equity markets, such that of the U.S., UK, Japan, Greece, Australia, and Hong Kong, examined in this paper, demonstrate clearly that there are practices, some legal and some illegal, over the last two decades that clearly violated fair competition for trading profit. In addition, the litigation cases from numerous countries through the decades clearly prove that there are cases of consistently high return, over longer term, obtained by market manipulators. Occasionally, large-scale market manipulation episodes can lead to and have resulted in stock market crises.

We call market manipulators those traders who successfully create an image of reality in the minds of the unsuspecting “induced traders,” and consecutively take advantage of those traders. There are two ways a manipulator can achieve such a result. One way is through his trading activity and, as such, generation of implicit information about the stock’s increased desirability and future higher-than-expected return. The other is through the generation and announcement of explicit news with price-sensitive content. For example, an investment “guru” announces that a particular stock has become a great buy right now. These two types of market manipulations were called trade-based and information-based manipulation, respectively, by Allen and Gale (1992). The intended result is the same: induced investors will trade according to the design of the manipulator,

and therefore are likely to incur losses in aggregate, while the manipulator profits. We call such a result an unfair competition and use of monopoly power.

1.1 Differences and similarities in competition between the stock and goods markets

In the financial sector, markets are fragmented and transient to the extreme. Competition for profit from trading stock X is a different market than the competition for profit from trading stock Y. The competition five minutes ago is a different one from that of five minutes later while trading the same stock X. The markets can be different even for trading the same stock X and at the same time if it is traded in two platforms or countries. Some externalities may exist and can be more influential at certain times. However, the extreme fragmentation and transient nature of markets that host the competition for trading profit is the first unique characteristic of the stock market from the point of view of the intensity of competition. Such distinction is based on studies of the international litigation cases. Very large profits can be gained in days, minutes, and even seconds in today's markets, trading a single stock, without affecting other stocks, by using manipulation tactics (Yan *et al.*, 2012a, b & c).

The second difference is that usually the competition for profit is not between large institutions, as we usually see in the goods market, as they compete for the business of the same market participants; *e.g.*, the same group of customers. Large traders in the stock market do not compete with each other in general. Large traders usually compete against small investors (whom large traders wish to turn into induced investors). This is because the market fragmentation in space, time, and investment products allows large traders to divide the markets among each other. This is particularly true in emerging markets such as that of Shanghai and Mumbai. They may collude, but such information is rare without insider reports. In some famous historical cases, one large trader tried to manipulate the same instrument as another large investor, but in the opposite direction. One typical case is the so-called "Harlem corner," in which Cornelius Vanderbilt cornered Daniel Drew in 1864 (Risjord, 2002). Albeit rare today, such clash of the titans can be particularly threatening to market stability.

The third difference is that, in the goods market, monopoly is often based on innovation, and in this sense monopoly can play a role in development. However, in the financial markets, monopoly power is not based on the technological innovation of the investors. The two types of manipulations are based on two types of resources that the manipulator needs to have. That is, for *trade-based manipulation*, the large investor needs to have a large sum of capital to build up a relatively dominant shareholding position in a particular stock for certain period of time – we call this a *concentration monopoly or quantity monopoly* (Yan *et al.*, 2012a). *Information-based manipulation* is the exercise of *information monopoly* (Yan *et al.*, 2012b). Information monopoly⁴ can exist without any effort of finding out the hidden truth about the corporation's performance. Information monopoly can exist even if the widely disseminated news or rumor is not even true. The key is that this information being generated, not necessarily discovered, by the manipulator.

The fourth difference is that, even though there is no barrier to entry to stock trading, there are *de facto* barriers to manipulation tools, such as large capital and access to credible mass media. In other words, anyone can buy and sell a stock that is listed on a stock exchange. What not everyone can do is amass the required relative dominant shareholding positions, an action that enables the investor to perform trade-based manipulation. Also, not everyone has access to credible information disseminators to a large community of investing public in order to perform information-based manipulation. Hence, having more investors investing does not eradicate the presence of monopolies in the stock market.

Is there any sign of learning or complaint on the side of the induced investors? We present international data that shows the number of market manipulation complaints in selected developed markets in the last decade, which demonstrate that the general sentiment that markets are manipulated is very familiar to a great number of investors. However, so far, such manipulative activities were vied in isolation and did not receive

⁴ Information monopoly is the power of inducement of price-moving information that is disseminated to a large number of investors by a credible media outlet.

appropriate attention from academic circles. Our research series is among the first to aim to fill such a major gap and link market manipulation data with monopolistic behavior.

In brief, understanding the uniqueness of the competition in the stock market, as described above, helps us to create basic concepts to explore whether monopoly can or cannot exist in the stock market.

Next, we investigate the similarity and difference between establishing a monopoly power in the stock market, from building up a monopoly position in the goods market.

1.2 Similarities and differences between establishing monopoly power in the stock and goods markets

Similarities and more outstanding differences between establishing monopoly power in the stock market and goods market are listed below:

- (1). Time. In the stock market, length of time regarding monopolies is much shorter in general. Becoming a monopoly in the goods market normally takes years. Obtaining monopolistic profit in the stock market can be accomplished in as little as weeks, days, minutes, or even seconds.
- (2). Simplicity. To become a monopolist in the goods market, the effort is multi-faceted, such as leadership and management; healthy and skillful workforce; innovative ideas; access to capital, equipment, and real estate; production; and marketing, as well as many other areas. To form a monopoly in the stock market, it is necessary to have only a large amount of capital, access to credible mass media, a few staff members, and in some cases advanced computer technology.
- (3). Investment options. In the goods market, a firm can attain monopoly over only one or few products. In the stock market, an investor can gain monopolistic profit over any stock

out of the thousands of stocks and numerous derivative instruments at a moment. Also, one investor can attain monopoly over multiple stocks at the same time.

(4). Two-way profitability. In the goods market, monopolistic profit is generated either by increased prices (if it is a monopolistic seller), or by declining prices (if it is a monopolistic buyer), but not by price changes of the same product in both directions. In the stock market, depending on the strategy, monopolistic profit can be made from either the rising or falling price of the same stock (as long as short-selling is not banned).

(5). Secrecy. In the goods market, monopolistic behavior is naturally exposed because prices have to be public. In the stock market, an investor's stock purchase and sale price, his trading strategies, his involvement with media and particular news releases, etc., are not exposed to other investors. This superior secrecy is crucial to attaining monopoly and maintaining a monopolistic position until the investment position is closed.

(6). Dynamic and transient market. In the goods market, once a monopolistic position is achieved over a particular product, the monopoly can hardly switch to a different type of product. In the stock market, once monopolistic profit is gained, the investor closes the monopolistic position. But he can switch to another stock to establish a new monopolistic position immediately after the previous monopoly. Actually, an investor can change between a monopolistic position and a non-monopolistic position numerous times during his investing career. A monopolist in the goods market can hardly behave thus, because the cost in becoming a monopolist is too high and the time it takes is too long. In the stock market, monopolistic behavior is always transient, exhibited only during a specific time period, and not continuously. This creates difficulty for law enforcement, which is basically *ex post*.

(7). Profit dependence on inducement. In the goods market, the monopoly sets the monopolistic price. In the stock market, the monopolist sets a higher price than his purchase price either by engaging in trade-based manipulation involving bid advances or performing information-based manipulation by inducing other investors who will bid up

the price. However, in either scenario, he needs to have induced sufficient buy volumes at the inflated price to distribute his previously-accumulated shares at excess profit.

(8). Predatory behavior. In the goods market, a monopolistic firm sets a very low temporary price, or “predatory pricing,” to drive out competitors. In the stock market, a monopolistic investor “shakes-out” other investors when he accumulates shares. This process essentially results in the exclusion of competition.

(9). Touting is similar to marketing. When a monopolistic investor engages in information-based manipulation, he touts the stock he has already held so other investors will be induced to buy the same stock and bid up the prices. Then he will sell the already-held shares to the induced traders. Touting is similar to marketing in the goods market. However, price is set by the firm before marketing in the goods market, while share price is set mainly by induced investors in the case of information-based manipulation. (There is also “trashing a stock” when the manipulator initiates shorting trades on that stock.)

(10). Legal risk. The goods market has antitrust enforcement. However, at the moment, there is still no antitrust law in stock trading. The closest legal risk is market manipulation. In addition, sell-side analysts are exempt from insider trading laws. Touting stocks is generally allowed, with some disclosure requirement which has virtually no impact on reducing market manipulation (Yan *et al.*, 2012b).

Overall, we conclude that it is much easier and more convenient to establish monopoly power in the stock market, relative to the goods market. There is no reason why large investors would not try to obtain monopolistic profits. Hundreds of the securities litigations examined in this paper reveal the varieties of monopolistic behavior in detected market manipulation cases.

We propose that market manipulation is essentially an exercise of monopoly power in a trading strategy. This is a fundamental contribution of our paper.

1.3 Regulatory proposals to prevent concentration monopoly and trade-based manipulation

Since the founding of the first, organized stock exchange in Amsterdam 400 years ago, no systematic economic research results on stock markets obtained by academics have been implemented in stock market regulation around the world with the aim of crisis prevention, investor protection, and stability improvement. The contemporary regulatory framework in stock markets worldwide is based primarily on the Securities Act (1933) and Securities Exchange Act (1934) passed after the Great Crash of the New York Stock Exchange. The virtue of the law-centered regulatory framework is that it enabled the post-war years to pass without major market-wide crisis in the U.S. and perhaps other developed markets. However, the financial market deregulation, financial instrument innovation, technological advances, and economic globalization since the 1980s have made the disclosure-oriented securities regulations insufficient in several ways. First, the regulations are not preventive, but *ex post*, making enforcement very difficult. Second, enforcement—once launched—is not very effective because the required proof of bad intent has frequently led to dropped prosecutions or settlements. Finally, the efficiency in the rare successful prosecution is low in terms of the personnel, time, and financial resources committed, not to mention the majority of unsuccessful prosecutions.

We propose that the powerful but ineffective law-centered approach should be complimented by a more prudent and accurate approach based on financial reality. It is imperative to have a thorough understanding of the monopolistic essence in market manipulation and other fraudulent market practices before devising effective, quantifiable—thus programmable—and efficient ways to detect and prevent such market misconduct. Combining the strengths of both current legal measures and the complimentary measures based on financial reality can enable securities regulators to conduct daily detective and preventive enforcement activities with a higher efficiency and improved outcome. Such a combination may substantially reduce systemic risk before it becomes uncontrollable.

This paper is one of the first attempts to explore such complimentary measures in detection and prevention of market manipulation in the spirit of antitrust. It focuses on trade-based market manipulation and aims to define effective, quantifiable, and inexpensive tools for daily enforcement. It focuses on the most popular trade-based manipulation strategy, the accumulation-lift-distribution scheme. In this scheme, the most crucial element is to induce numerous buy volumes after the share price has been substantially increased by using manipulation tactics so that the monopolistic trader can distribute his previously-accumulated shares. We start from the most fundamental reality—namely, an investor’s trades during a single trading day. The anatomy of an investor’s trades during a given trading day enables us to identify the variables that can be used in trade-based market manipulation. Hundreds of securities prosecution cases from regulatory agencies in the U.S., China, India, Japan, and Hong Kong are carefully examined to find the rationale underlying frequently used manipulation tactics, such as wash sale (or self-dealing), matched orders (or cross-dealing), advancing-the-bid, marking-the-close, and fake trading. The discovered rationale serves also as guidance to areas in which detection and prevention can be improved, in antitrust spirit, against the use of monopoly power in trade-based market manipulation. A unified regulatory framework for detection and prevention is subsequently proposed based on the nine variables identified from the investor’s trades during one trading day. The framework, composed primarily of eight proposals, is aimed to provide quantifiable and thus programmable, effective and efficient tools for daily operations of securities regulators to compliment the extant securities laws to improve their effectiveness in detection and prevention of market manipulation. These proposals are expected to carry the spirit of antitrust in the stock market, and thus help in the maintenance of fair and transparent perfect competition, and ultimately prevention of market-wide crisis.

The remaining of this paper is organized as follows. Section 2 reviews historical evidence exploring stock market manipulation, including several well-known contemporary cases from numerous countries. The hand-collected database that we present here from recent litigation cases are drawn from securities regulatory agencies in the U.S., China, India, Japan, and Hong Kong, clearly demonstrates that market

manipulation is widespread, chronic, frequent, and occasionally rampant. In addition, the database indicates the limited effectiveness of enforcement based on the existing legal framework. Section 3 identifies those variables that appear frequently in trade-based manipulation tactics by targeting an investor's trades during a given trading day. Dozens of prosecution cases from the aforementioned securities regulatory agencies are closely examined to determine the characteristics of frequently encountered trade-based manipulation tactics, which are detailed in Section 4. The examination uncovers several key areas for detection and prevention by securities regulators which form a unified regulatory approach presented in Section 5. Section 6 concludes the paper.

2. Can stock markets be manipulated?

Historically, especially prior to the regulatory framework implemented the Securities Act (SA) (1933), Securities Exchange Act (SEA) (1934), Glass-Steagall Act (1934), and Commodity Exchange Act (CEA) (1936), manipulation had been pervasive, chronic and occasionally so rampant to lead to frequent crises in financial markets (Pirrongo, 1995).

The U. S. stock markets enjoyed more stable development after the implementation of the SA (1933) and the SEA (1934). Since, according to Allen and Gale (1992), the legislature is disclosure-orientated, action-based manipulation is virtually eliminated and insider information- based manipulation is also greatly curbed. But how did this affect market manipulation based on trade and public information?

In 1688, De la Vega described a number of market manipulation tactics resorted to some of the largest individual or "pooled" large investor groups in the virtually unregulated Amsterdam stock exchange of the 17th century (De la Vega, 1688). Even though regulatory frameworks, technological innovations, and societal changes have rendered today's worldwide stock markets look different from the earlier Amsterdam stock exchange, the very fundamental nature of investors' interest in profit maximization

has not changed during the past 400 years. If anything, trading strategies have evolved to circumvent regulatory rules. A series of U. S. Congressional investigations, *i.e.*, the Hughs, Pujo and Pecora investigations (White, 1909; Sheldon, 1975; Pecora, 1939), searched for the causality of the financial panics of 1907, 1913 and 1929, respectively. Each investigation uncovered major forms of market manipulation such as bull pools, bear raids, wash sale, and matched orders (Thel, 1990).

The Great Crash of 1929 led to the modern regulatory framework the SA (1933) and the SEA (1934) for the U. S. stock exchanges. Most other markets in the world after their enactment followed suit of the U.S. (Allen and Herring, 2001). Since then, stock markets in developed countries have had more stable growth and fewer panics. Other markets, operating outside of the United States (the most developed market), such as Brazil (a typical emerging market) and Hong Kong (a new developed market), have experienced far more severe volatility measured by the frequency of the substantial market index drop during the last three decades. Table 1 illustrates this point by presenting the number of stock market index declines of more than 5 percent over consecutive trading days in Brazil, Hong Kong and the United States between 1987 and 2008.

Table 1. Number of stock market cycles with significant losses per year, in Brazil (BSVP), Hong Kong (HSI) and the United States (DJI) (1987-2008)

Year	BSVP	HSI	DJI
1987	23	5	5
1988	13	2	1
1989	16	3	1
1990	22	3	2
1991	23	2	0
1992	28	3	0
1993	9	3	0
1994	16	11	1
1995	19	3	0
1996	5	1	0
1997	12	11	1

1998	17	20	4
1999	7	4	1
2000	12	11	4
2001	15	11	3
2002	14	5	7
2003	3	1	0
2004	8	2	0
2005	6	1	0
2006	8	0	0
2007	7	6	1
2008	25	20	10
Total	308	128	41

A large drop in a stock market index for several consecutive days might indicate the presence of market manipulation, if the general market news cannot explain such a decline. Still up for questioning is whether or not some large investors continue to manipulate the U.S. and other markets to achieve substantial gains by generating extreme price volatilities, and, occasionally causing - even if unintentionally - a market index collapse.

2.1 Manipulation is frequent in U. S. markets

How have U. S. stock markets fared in the last three decades? According to Aggarwal and Wu (2006), of the 142 manipulation cases brought by the SEC between 1990 and 2001, about half included some form of trade-based market manipulation. Mei, Wu and Zhou (2004) presented empirical evidence from the SEC prosecution of 159 “pump-and-dump” manipulation cases between 1980 and 2002. Following the above empirical research, we created a hand-collected database from the SEC litigation documents. This database contains 394 enforcement actions, resulting in 252 civil actions and 142 administrative proceedings released from October 1, 1999 to September 30, 2009 (see Yan *et al.* (2012b) for more analysis). For the purpose of demonstration, we present in this paper 25 litigation cases selected from *SELECT SEC AND MARKET DATA FISCAL 2008* by the SEC (SEC, 2009). All manipulations occurred from 2001 to 2008. The 10(b)-5 rule based on SEA (1934) was violated among other violations cited in each

case under litigation. Out of the 25 sample cases, 21 included issuing false and misleading press releases, *i.e.*, and, as such, should be categorized as information-based market manipulation. Five cases involve trade-based manipulation, evidencing such manipulation tactics as matched orders or marking-the-close. The 25 cases are listed in Table 2.

Table 2. Twenty-five SEC litigation cases in market manipulation (2001-2008)

Litigation release number	Manipulator(s)	Target stock(s)	Manipulation period	Manipulation tactics including
LR-20341*	Zev Saltsman and Menachem Eitan	Xybernaut and Ramp	06/2001 - 12/2004	multiple nominee accounts, false statements, and wash sales
LR-20430	Anatoly Russ	AGG	08/23/2006 - 09/19/2006	matched orders
LR-20456	Dean A. Esposito, and other brokers	SCL Ventures and Weida C'munications	01/2004 - 05/2004	marking the close
LR-20616	Edgar E. Chapman	FCBG	01/2005 - 08/2005	matched orders and fake trading
LR-20712	Bruce Grossman and Jonathan Curshen	IBOT	06/2008 - 08/2008	matched orders
LR-20412	Rhea Laws and 4D Seismic, Inc.	4D Seismic	04/2006 - 11/2006	collusion and issuing false press releases
LR-20442	Daryn P. Fleming and Mathew C. Bruce	International Broadcasting	10/28/2005 - 01/13/2006	issuing false press releases
LR-20451	Strategic Management & Opportunity Corp., et al.	SMPP	02/2004 - 08/2004	issuing a series of materially false and misleading press releases
LR-20466	Mario A. Pino	BCIT	05/02/2005 - 07/13/2005	issuing false press releases
LR-20496	Ryan M. Reynolds, et al.	Beverage Creations	12/17/2007 - 03/10/2008	"pump and dump" scheme, promotional mailers and spam e-mail
LR-20499	Robert M. Esposito, et al.	Anscott	04/2003 -	disseminating false and

		Industries	07/2003	misleading newsletters and spam fax
LR-20519	CMKM Diamonds, Inc.	CMKM	01/2003 - 06/2005	false press releases through internet chat boards
LR-20530	SMSI, et al.	SMSI	01/2006 - 08/2006	issuing several false and misleading press releases
LR-20537	Paul S. Berliner	ADS	11/29/2007	drafting and disseminating a false rumor against ADS
LR-20555	Robert F. Gruder and Stinger Systems, Inc.	Stinger Systems	10/2004 - 03/2005	fraudulent material misrepresentations
LR-20620	GMC Holding Corp. and Richard Brace	GMC Holding	06/2005 - 03/2006	issuing false press releases
LR-20644	Mobile Ready Entertainment Corp. et al.	Mobile Ready	01/2007 - 07/2007	issuance of false and misleading press releases
LR-20645	Homeland Safety International, Inc. et al.	HSII (originally Sniffex)	10/2004 - 04/01/2006	collusion, a “pump-and-dump” scheme and issuance of false press releases
LR-20648	U. S. Sustainable Energy Corp., et al.	USSE	10/2006 - 02/2007	issuing false press releases
LR-20675	Dmitriy Butko	numerous stocks	10/19/2006 - 11/30/2006	“pump-and-dump” scheme
LR-20684	Francisco Abellan, et al.	GHLT	10/2005 - 06/2006	issuing false press releases in a “pump-and-dump” scheme
LR-20733	William Todd Peever and Phillip James Curtis	IHI, later merged in-SHEP	01/2002 - 06/2003	multiple nominee accounts and mass mailing of deceptive newsletters
LR-20745	Matthew A. Sarad, et al.	Telomole-ular	06/2006 - 09/01/2007	issuing false press releases
LR-20750	Stephen Michael Strauss	Chilmark	11/01/2006 - 12/11/2006	issuing false press releases
LR-20762	Rodedawg International Industries and Luis E. Pallais	RWGI	late 2005 - early 2007	issuing false press releases

* Shaded rows indicate that trade-based manipulation is involved.

2.2 Manipulation is occasionally rampant worldwide

How did other stock exchanges perform during the same time period?

Influential and crisis-causing market manipulations were cited, to the knowledge of the authors, in Latin America, Europe, Asia and Australia. The notorious manipulator Naji Robert Nahas triggered disastrous stock market crashes in both the Rio de Janeiro and Sao Paulo Stock Exchanges on June 9, 1989. Within ten trading days, the indices of both markets dropped 67 percent and 61 percent (local currency), respectively (Brooke, 1989a; Carvajal and Elliot, 2009). As part of his manipulation strategy, Nahas bought stock options and then forced the markets up by heavily buying and selling shares in trades that were actually between himself and his partners. Local stockbrokers estimated that, in the first half of 1989, half of the activity on the Rio exchange was created by Nahas and his associates. Nahas was indicted by the Brazilian government two months later (Brooke, 1989b).

Another stock market crisis, caused by Delta Securities, affected the Athens Stock Exchange on November 6, 1996. The difficulty came from a failed clearing of Delta's GRD 2.5 billion position. The crisis not only required passage by the Greek government an emergency legislative act for settlement, it also triggered the largest investigation in Greek history of exchange members and their practices. A large-scale stock manipulation scheme was discovered. The basic practice used by the manipulation scheme was matched orders. Delta Securities was a strategic manager of the manipulation scheme. Nineteen individuals were found to be involved in severe price manipulation practices, to have abused confidential information, and to have conducted artificial transactions. They were fined for a total of GRD 2 billion (USD 7.3 million) (IOSCO, 2000).

On March 1, 2001, Ketan Parekh, the so-called Bombay Bull, defaulted on nearly 30 million Indian Rupees position on the Calcutta Stock Exchange, which caused the

exchange to suffer a massive payments crisis that affected share prices across India. Following the default, Calcutta Stock Exchange officials had to draw over 500 million Indian Rupees from a special fund to cover losses; since then, the exchange has still been fighting to survive (Bhaumik, 2002). During the 8 trading days between March 1 and March 13, 2001, the indices of the top three stock exchanges of India, *i.e.*, National, Bombay, and Calcutta Stock Exchanges, dropped 17 percent, 17 percent, and 14 percent, respectively (GFD, 2009). After the comprehensive investigation by the Securities and Exchange Board of India (SEBI), Ketan Parekh and 17 other entities were indicted in 2007. Ketan Parekh was found to be the key person involved across the board in all dimensions of the stock market scam which first surfaced in March 2001. He was also the mastermind behind large- scale market manipulation of 9 stocks before the crash in the three major stock markets. The manipulative practices included self deals (*i. e.*, wash sales), cross deals (*i. e.*, matched orders) and market corners during the period from October 1999 to March 2001 (SEBI, 2007).

Other internationally known market manipulation cases include Nomura Securities' dual-market manipulation in the Australian stock and futures markets in 1996. Two Nomura manipulators had planned to discount 10 percent to 20 percent to the closing prices of more than 300 stocks on Australian Securities Exchange on March 28, 1996. The strategy had the potential to trigger a market wide crisis, but failed to be implemented by local brokers (SFA, 2000). Another well-known case took place in Hong Kong in 1998. It was called "double play" because both the stock and currency markets were being manipulated simultaneously by unknown speculators. Their activities almost caused a crisis, which was averted just in time by intervention by the Hong Kong Monetary Authority (Tsang, 1998; Corsetti, Pesenti and Roubini, 2001). The more recent schemes include Jerome Kerviel's fictitious trading in futures and cash of stock indices in European stock markets that led the French bank Société Générale to lose \$7 billion in January 2008. At the time, the amount was the largest single loss any bank had then suffered (Clark and Jolly, 2008). Winterflood, a market maker on the London Stock Exchange, was found to be playing a pivotal role in an illegal share ramping scheme by the UK's Financial Services Authority (FSA) in June 2008 and indicted the next year

(FSA, 2009). The offices of the German automaker Porsche were raided by federal prosecutors on August 20, 2009, probing the firm's alleged market manipulation of Volkswagen shares. The allegation was made by BaFin, the German financial regulator, to the prosecutor's office after investigating Porsche's attempt to gain control of Volkswagen. (Kirchfeld and Czuczka, 2009).

Each of the cases cited evidenced rampant market manipulations that had the potential to or actually resulted in stock market crashes or exchange settlement difficulties during the past three decades. How frequent and chronic are stock market manipulations in global markets in recent years?

2.3 Manipulation is chronic and frequent in global stock markets

Lang (2004) presented a detailed analysis of how institutions manipulated in concert the Hong Kong stock market in 2003. Khwaja and Mian (2005) found compelling evidence for a specific "pump-and-dump" manipulation scheme in the Karachi Stock Exchange. To study this further, we selected litigation or prosecution by five securities regulatory bodies in both developed and developing economies. In addition to the earlier referenced litigation cases brought by the U.S. SEC, there were 18 cases listed by the China Securities Regulatory Commission (CSRC) that occurred between 2000 and 2008 (CSRC, 2009) (12 cases feature large concentration of shareholding and fictitious trading (Table 3) while the other six cases involve exclusively fake trading (Table 15)); 13 cases from 1999 through 2007 prosecuted by Hong Kong Securities and Futures Commission (HKSFC) (HKSFC, 2009); 25 cases filed for prosecution by the Japan Securities and Exchange Surveillance Commission (JSESC) between July 1998 and June 2008 (JSESC, 2009); and 28 convicted or settled cases launched by the Securities and Exchange Board of India (SEBI) that span from 1999 through 2005 (SEBI, 2009). Nearly all of these 109 prosecution cases involve long manipulation strategies, *i.e.*, accumulation-lift-distribution or "pump-and-dump" strategies.⁵ These cases are selected as evidence of recent episodes

⁵ The scheme is characterized by three stages, a trilogy of *accumulation, lift and distribution* (Lang, 2004). The objective of the accumulation stage is to turn large wealth into a large number of shares at a reasonably low price while reducing the uncertainty in trading costs due to other investors' following. The essence of

of market manipulation in both developed and emerging markets. These cases, except for JSESC cases, are listed in the following tables and their selection criteria described below.

The 12 CSRC cases listed in Table 3 occurred between March 21, 2000 and July 20, 2006. Each case contains single or repeated manipulation schemes for multiple years, ranging from more than one year to more than five years. A large concentration (from 32.07% to 81.33% of tradable shares) and wash sale or matched orders were resorted to in each of these cases. The 12 cases all involve violation of Section 77 (formerly Section 71) of the Securities Act (2005), for the Prohibition of Securities Market Manipulation. At present, all of these cases have been closed and the manipulators disciplined, including being banned from stock market entry for time spans ranging from one year to life (CSRC, 2009). The 12 CSRC cases are listed in Table 3 according to the ascending order in concentration.

Table 3. Twelve CSRC prosecution cases in market manipulation (2000 - 2006)

Manipulator(s) / target stock(s)	Manipulation duration	Investment*	Concentration of tradable shares (%)	Self-dealing days (%)	Maximum of Vs / Vt (%)**	Days with trades (%)	Number of accounts
Hantang Securities / Tongfeng Electronics	09/20/2001 - 09/03/2004	RMB 0.26 BLN	32.07%	64.58%	61.81%	64.58%	1,645
Hantang Securities / Baihua Village	01/10/2003 - 09/03/2004	RMB 0.17 BLN	34.81%	64.72%	80.04%	64.72%	2,495
Xingan Securities /	08/26/2002 – 12/30/2005	43 MLN shares	44.21%	47.71%	not available	82.90%	1,766

this stage is to build up a dominant concentration of shares. It is at the lift stage that the manipulator seeks to achieve the large price impact by using one or multiple manipulation tactics. It is vividly described as “pump”. After the accumulation and lift stages have been executed, the remaining stage, distribution, or “dump”, is invoked to obtain the ultimate realized profit.

Sanjing Pharmaceutical							
Hantang Securities / Feida	07/22/2002 -	RMB 0.4					
Environmental	09/03/2004	BLN	59.26%	65.00%	75.60%	65.00%	4,294
Northern Securities / Taishan Oil	03/21/2000 - 12/30/2005	RMB 8.3 BLN	61.35%	52.70%	85.17%	86.70%	8,817
Hantang Securities / Nanfeng	01/14/2002 - 09/03/2004	RMB 0.57 BLN	63.11%	64.50%	79.92%	64.50%	1,696
Hantang Securities / Langchao	06/27/2002 - 09/03/2004	RMB 0.77 BLN	74.05%	79.70%	79.18%	80.64%	1,872
Hantang Securities / China Software	09/20/2001 - 09/03/2004	RMB 0.60 BLN	76.63%	59.82%	80.23%	59.82%	4,554
Hantang Securities / Hengda Group	09/26/2000 - 09/02/2004	RMB 0.7 BLN	79.48%	52.48%	95.79%	52.84%	2,296
Xianghe Holding, <i>et al.</i> / Sanmu Group	11/05/2001 - 01/31/2005	RMB 4.4 BLN	80.00%	85.60%	98.80%	97.80%	3,879
Southwest Securities / Zheda Wangxin	02/08/2001 - 09/20/2004	RMB 3.3 BLN	80.68%	30.60%	60.00%	62.12%	1,783
Cui Junshan / Jinde Fazhan	12/04/2000 - 07/20/2006	RMB 2.1 BLN	81.33%	64.58%	99.59%	97.71%	3,917

* Investment is either in RMB or in number of shares

** Vs is self-dealing volume and Vt total trading volume

We selected 13 prosecuted market manipulation cases that occurred between December 30, 1999 and May 17, 2007 at the Hong Kong Stock Exchange. Market manipulation is explicitly written in the title or text of each case. Nine cases involve marking-the-close. Five cases feature matched orders and/or wash sale. One includes fake trading. The selection is made from the enforcement news issued by the Hong Kong

Securities and Futures Commission (HKSF, 2009). The 13 HKSF cases are listed in Table 4 according to the ascending order in the maximum price change during manipulation.

Table 4. Thirteen HKSF prosecution cases in market manipulation (1999 - 2007)

Manipulator(s) / target stock(s)	Manipulation period	Manipulation tactics	Price change during manipulation
Wong Wei Yin Peter / SiS	05/18 and 20 and 06/09 and 15/2004	marking the close	10%
Wong Chi Kit / Yeebo	02/12/2001 - 03/09/2001	marking the close	14%
Chaw Chi Wai Ivan / VST	05/05/2005 - 08/26/2005	marking the close	14%
Cheung Wan Chiu / Innovis	02/08, 14 and 16 /2005	marking the close	16%
Chow Lung On / Tern	05/10/2002	matched orders	28%
Wong On Ching / Victory	09/2000	matched orders for marking the close	30%
{X}* / Tradeeasy	10/18/2002	marking the close	30%
Wang Fang / Fujian	12/30/1999	marking the close	37%
{X} / MUI	01/09/2003 - 05/21/2003	marking the close	60%
Chan Chin Yuen, et al. / ASH	08/01/2005 - 09/05/2005	matched orders	78%
Leung Kam Lai, William / 5 stocks	11/11/2005 - 03/21/2006	marking the close	80%
Stephen Lee Sing Wai / Essex	02/14/2003 - 03/31/2003	matched orders	120%
Yeung Fong Shiu / a derivative warrant of ICBC	05/17/2007	fake trading and wash sale	300%

* {X} means the name of the manipulator was not disclosed to the public.

All 28 SEBI cases were selected from the orders listed in 2009 press releases (SEBI, 2009). These cases actually occurred, however, from 1999 through 2005. At the

least, Regulation 4 (1995 / 2003), Prohibition against Market Manipulation, was violated in each case. Nearly all the cases (26) include matched orders and/or wash sales. Two cases involved the manipulation tactic of advancing-the-bid. They are listed in Table 5 according to the ascending order in price change due to manipulation.

Table 5. Twenty-eight SEBI prosecution cases in market manipulation (1999 - 2005)

Manipulator(s)/ target stock(s)	Manipulation period	Manipulation tactics	Daily volume (%)	Total price change (%)
Murari Lal Goenka / CIL	06/24/2005 - 11/7/2005	wash sales and matched orders	29%	5%
Porecha Global Securities Pvt. Ltd. and Shri Arun Porecha / MTL	10/23/2000 - 11/10/2000	matched orders	99.89%	15%
Tropical Securities & Investments Private Ltd. / DCM	03/14/2001 - 04/24/2001	wash sale	23.95%	21%
Shri Vasant H. Bissa / SLIL	01/02/2002 - 09/13/2002	wash sales and matched orders	51.60%	70%
Shri Vipul Bhagwandas Shah / GFL	07/31/2000 - 11/27/2000	matched orders and collusion	19.63%	89%
12 related entities / DFL	04/01/2001 - 06/28/2001	matched orders and collusion	50%	96%
P. Suryakant Shares and Stock Brokers Pvt. Ltd. / OMMML	04/08/2002 - 07/09/2002	matched orders	not available	135%
ASK Holdings Pvt. Ltd. / GIL	12/19/2002 - 01/17/2003	wash sale and collusion to unload large quantity	27.72%	195%
Chandrabhas R Kulkarni / HTL	11/16/1999 - 03/31/2000	circular trading*	90%	196%
Shri Minoo Pestonji / APL	08/02/2000 - 08/31/2000	wash sales and advancing the bid	not available	197%
Shyam Lal Sultania / NIL	04/25/2005 - 11/08/2005	matched orders	12.53%	238%
Ravi Vishnu Securities	11/06/2000 -	matched orders and	55%	316%

Ltd. / AOIL	12/29/2000	advancing the bid		
Shri Mahendra A. Shah / SCL	10/01/1999 - 01/04/2000	creating artificial volume and price rise	19%	448%
M. Bhiwaniwala & Co. / Bacchhat	03/01/2004 - 3/31/2004	matched orders	35%	562%
Pivotal Stoxare Ltd. / OTPL	11/01/1999 - 02/09/2000	collusion in price lifting to unload large quantity	25.46%	565%
Shri Tushar Jhaveri / EIL	06/26/2000 - 09/05/2000	wash sales	41%	635%
Mukesh Dokania & Co. / ACL	07/02/2001 - 10/15/2001	wash sales	50%	678%
Purshottam Lal Kejdiwal / BIL	06/09/2005 - 09/16/2005	wash sales	1.30%	702%
Ahilya Commercial Pvt. Ltd. / SLPL	04/21/2005 - 09/16/2005	wash sales and matched orders	13.38%	880%
Shyamlal Sultania / SPL	03/17/2005 - 07/14/2005	matched orders	12.55%	1067%
A. V. Shares & Stock Broking Private Ltd., et al. / GCML	06/17/2005 - 09/20/2005	matched orders	90.97%	1108%
EXV Finvest Pvt. Ltd. and two directors / MHL	01/01/2001 - 08/31/2001	matched orders	80%	1130%
S. Jhunjhunwala & Co. / TCL	01/01/2004 - 08/03/2004	wash sales and matched orders	28%	1270%
12 related entities / DFL	04/10/2002 - 08/31/2002	matched orders and collusion	75%	1345%
Sanchit Financial and Management Services Ltd / EIL	11/24/1999 - 02/11/2000	matched orders	not available	2400%
G. R. Industries & Finance Ltd. and partners / GRIFL	09/07/2004 - 02/28/2005	matched orders	83%	8410%
Dinesh Kumar Lodha / RFSL	02/16/2004 - 02/28/2005	matched orders	54.60%	11438%
Dhanlaxmi Cotex Ltd. / SIL	07/02/2001 - 01/02/2002	circular trading in price pegging**	> 21%	n/a

* Circular trading is equivalent to matched orders. We have, however, noted from a few SEBI cases that circular trading can also occur among more than two colluding parties.

** Several brokers from Dhanlaxmi Cotex Ltd. conducted circular trading for price pegging. This manipulation tactic is not for profit-making but for floating share prices for the public company to issue a large number of shares. It is called price pegging.

2.4 Prosecution rate of market manipulation is low

From July 1, 1998 to June 30, 2008, based on investors' complaints, the JSESC sought to prosecute 25 cases that had been investigated for market manipulation. Those cases were found in violation of Article 159, the Prohibition of Market Manipulative Acts, of the Financial Instruments and Exchange Act (2007). They are all listed in the JSESC Annual Reports (JSESC, 2009). Since no case reveals the name(s) of the manipulator(s) and given the lack of consistency in data presented in all the cases, we cannot construct a meaningful table out of them. Rather, the reader is referred to Table 6, which shows the ratio of prosecuted cases to the complaints in market manipulation.

Table 6. Ratio of JSESC cases filed for prosecution to total complaints citing market manipulation (1998 – 2008)

Business Year*	Market manipulation complaints	Cases filed for prosecution	Ratio of prosecution cases to complaints
1998	51	1	2%
1999	162	3	2%
2000	317	4	1%
2001	601	5	1%
2002	759	0	0%
2003	680	2	0.3%
2004	1,435	2	0.1%
2005	2,705	1	0.03%
2006	2,678	3	0.1%
2007	2,126	4	0.2%
Total	11,514	25	0.2%

*Business year begins on July 1 and ends on the June 30 of the following year.

Out of 11,514 public tips stating market manipulation, which were mainly trade based, only 25 were found through investigation and filed for prosecution during the ten year span from July 1, 1998 to June 30, 2008. That is a mere 0.2 percent. And, the rate of conviction can be even lower. One can develop a sense of how poor effectiveness and low efficiency regarding securities legislature and enforcement procedures can be. This is mainly because many non-rampant daily manipulations are difficult to detect and even harder to prosecute if pursued through legal procedural channels.

German securities regulator is said to be toothless. And the country's weak rules lead to few market manipulation convictions. For instance, 1,300 tips in 2008 ended up with 11 cases convicted, or a conviction rate of 0.8 percent (ANE, 2009). There were 6,000 complaints in year 2000 about manipulation in Canadian stock markets. How many of them were investigated? The convicted manipulator Marino Specogna questioned (Specogna, 2003).

In emerging stock markets, Goyal (2005) points out that it takes up to two years to settle a SEBI case in India, and the conviction rate is poor. In 2001-2002, 21 out of 111 cases were completed; the completion rate was 19 percent. The conviction rate is likely lower. Nageshwaran and Krithivasan (2004) argue that only 16 convictions were handed down out of total of 775 litigation cases in Malaysia in 2002. The conviction rate based on litigation is only 2 percent. Those low conviction rates from the regulatory agencies of both developed and emerging economies obviously justify non-legal measures for daily regulatory operations.

Other indicators such as how many years does it take to progress from complaint to conviction, what is the cost to cover all legal procedures, and how many human resources are involved in each case can be further calculated to measure the effectiveness and efficiency of the legal approach. We leave this work for future research.

The above cited empirical findings, which only detail instances reported, investigated and prosecuted, reveal that manipulation remains a chronic, frequent, and

occasional rampant issue facing stock markets in the twenty-first century. McGoun (2008) also argues that markets are indeed inherently manipulable. Chris Cook, former director of the International Petroleum Exchange in London, observes from the oil futures market that, “The market is the manipulation” (Cook, 2009). The far-reaching implications of these cases underscore the convicted Canadian stock market manipulator’s confession that manipulation of untold numbers of stocks occur every day (Specogna, 2003).

One fact, however, does remain clear: Every stock market can be manipulated under the current regulatory framework. Next we anatomize an investor’s trades during a trading day to understand the well-known tactics used in market manipulation and discover regulatory measures in detection and prevention.

3. Anatomy of an investor’s trades during a trading day

All seemingly unique manipulation tactics such as wash sale, matched orders, advancing-the-bid, marking-the-close and fake trading, seek the same objective, *i.e.*, to achieve the desired price impact. Therefore, going one step further, we suggest a practical framework that we have derived from careful study of the statistical and individual characteristics of prosecuted market manipulation cases in the five economies that provide these data online. The variables we propose provide the space to maneuver for the manipulator, often standing out in one, two or three of these variables simultaneously to induce more trades made by others, and for the manipulator to achieve his desired price. It is unlikely that any one manipulation tactic would be outstanding in every one of the variables. However, to our best knowledge, the prosecution cases do fit into the proposed framework. We use one trading day as the time horizon. The framework is as follows:

- (1) Total number of shares to be placed in each order, *i.e.*, order size.
- (2) Total number of orders. This measures the frequency of order

placement.

- (3) Trading direction of orders. This affects the number of orders to be placed and the net ownership of the shares at the end of the day.
- (4) The “distance” of the bid (ask) from the best bid (ask). This is the bid advance (ask depression). The advancing-the-bid manipulation tactic provides an excellent example of raising the bid advance to increase share prices.
- (5) Time interval between two consecutive orders. A negligible time interval between two orders of equal quantities is used in fictitious trading such as matched orders.
- (6) Timing, *i.e.*, when to place orders during the trading day. To place an order during the closing minutes of the trading day can result in tangible differences in the closing price. Marking-the-close shows the importance of timing in manipulation.
- (7) Full execution, partial execution, or full cancellation. Voluntary cancellation of placed buy orders near the best bid (or best ask for sell orders) raises questions regarding the genuineness of the trades.
- (8) More than one trading account. This is also a feature of fictitious trading.
- (9) Collusion with one or more investors. This is critical in matched orders or cross-dealing which is one type of fictitious trading.

These nine variables occur under the investor's discretion when one examines trade-based manipulation tactics only.⁶ However, there are many variables out of the manipulator's control. Market environmental variables, such as news from and actions taken by the issuing company, business media reporting, the sudden entry or exit of large volumes, and regulation change, are beyond the investor's expectation. Occasionally, sudden and large national and international news events, such as the breakout of war, epidemics, and natural disasters, can affect the entire market substantially. In this article, we limit our attention to the variables at an investor's full decision for trade-based market manipulation. Next we will present the details in some of the SEBI and CSRC prosecution cases and show how the caught manipulators use some of the nine variables in their manipulation tactics.

4. The manipulation tactics used in trade-based price-lifting

Out of the 109 prosecution cases drawn from five regulatory agencies, nearly all of 28 SEBI cases explicitly list price and volume data due to manipulation (Table 5). The average daily price impact in terms of the share price increase due to manipulation is thus calculated based on the manipulation period and price data.

Out of 28 SEBI cases, six have average daily price impact estimates smaller than 2 percent. They represent only 20.7 percent of the cases. Even though the estimates of the daily price impact include other investors' contributions, these percentages still provide an understanding that there is some degree of correlation between the estimates and the previous results obtained in the literature which are around 1% (Yan *et al.*, 2012c). At the same time, there are many estimates above 2 percent (79.3%) or even above 20 percent (14.29%). This outstanding abnormality warrants closer investigation. One particular interesting question arises. What are the essential variables behind the tactics used by the manipulators to achieve very large price impact?

⁶ The investor can release potentially price-moving information publicly to manipulate the share price up or down. But this is information-based manipulation and has been analyzed in Yan *et al.* (2012b)).

In the lift stage of an accumulation-lift-distribution scheme found in the majority (107) of the 109 prosecution cases, all manipulation tactics are directed towards marking up share prices in a relatively short time period. The manipulator can induce large buy quantities within short time durations so share prices are pushed up mainly by other investors. The manipulator can also create and sustain regularly and significantly rising prices. The purpose is to render a fast-rising stock very attractive so that the manipulator can quietly distribute his holdings when sufficient buy volumes of other investors flow in at the inflated price level.

During the lift stage of an accumulation-lift-distribution scheme or general price-lifting, several manipulation tactics are evident among the 109 prosecution cases. They fall into two main types, trade-based or information-based (Allen and Gale, 1992). Trade-based manipulation tactics are represented by fictitious trading that includes wash sale (self-dealing) and matched orders (cross-dealing), advancing-the-bid, marking-the-close, and fake trading. Trade-based tactics are often carried out with collusion or multiple nominee accounts. In the following, we will select dozens of typical cases from the 109 cases studied according to the trade-based manipulation tactics, *i.e.*, fictitious trading (wash sale and matched orders), advancing-the-bid, marking-the-close, and fake trading. Several cases studied involved more than one type of manipulation tactics.

4.1 Fictitious trading

Fictitious trading includes both wash sale and matched orders, with the former being self-dealing. The latter, matched orders, is cross-dealing and requires collusion or multiple nominee accounts. Whether self-dealing or cross-dealing, the essence is the same in that almost simultaneous trading of two opposite orders of the same quantity and at the same price is used in either type. In this sense, we do not specifically distinguish between wash sale and matched orders. Rather, we rely on figures drawn from fictitious trading in general.

Fictitious trading involves several of the nine variables. Two orders are placed almost simultaneously except when the stock is very thinly traded. The trading directions of the two orders are always opposite. The numbers of shares in the two orders are precisely or nearly equal. Most likely, advancing-the-bid is also included even though exceptions may exist. This is a crucial element that is often ignored by securities regulators. Without advancing the bid, how can share prices be lifted by a tangible 20 percent with only two fictitious trades of 200 shares each (see Table 10)? Since the bid of the buy order is equal to the ask of the sell order, it warrants instant execution. Depending on how heavy daily turnover is in the stock, single to multiple fictitious trades are both probable. The key is to effectively raise share prices within short time periods while not even one or a negligible number of costly shares are added to the already accumulated, less expensive shares. That is, net ownership in the traded stock ends up without any meaningful change.

Fictitious trading has most often been used by numerous manipulators in the selected CSRC and SEBI cases. In the HKSFC and JSESC cases, fictitious trading has also been frequently seen. Surprisingly, very few instances have been found in SEC cases. Table 7 lists seven CSRC cases with available data detailing fictitious trading.

Table 7. Seven CSRC cases that involve fictitious trading

Manipulator(s) / target stock(s)	Manipulation duration	Investment	Shareholding concentration (%)	Self-dealing trading days (% of total)	Maximum of Vs / Vt (%)	Days with trades (% of total)	Number of accounts
Hantang Securities / Hengda Real Estate	09/26/2000 - 09/02/2004	RMB 0.7 BLN	79.48%	52.48%	95.79%	52.84%	2,296
Hantang Securities / Nanfang	01/14/2002 - 09/03/2004	RMB 0.57 BLN	63.11%	64.50%	79.92%	64.50%	1,696

Shareholding							
Cui Junshan / Jinde Fazhan	12/04/2000 - 07/20/2006	RMB 2.1 BLN	81.33%	64.58%	99.59%	97.71%	3,917
Hantang Securities / Baihua Village	01/10/2003 - 09/03/2004	RMB 0.17 BLN	34.81%	64.72%	80.04%	64.72%	2,495
Hantang Securities / Feida Environmental	07/22/2002 - 09/03/2004	RMB 0.4 BLN	59.26%	65.00%	75.60%	65.00%	4,294
Hantang Securities / Langchao Software	06/27/2002 - 09/03/2004	RMB 0.77 BLN	74.05%	79.70%	79.18%	80.64%	1,872
Xianghe Holding, et al. / Sanmu Group	11/05/2001 - 01/31/2005	RMB 4.4 BLN	80.00%	85.60%	98.80%	97.80%	3,879

The seven CSRC cases in Table 7 show large concentration of share holdings, high trading frequency, and numerous nominee accounts pursuing fictitious trading. However, time intervals between matched fictitious trades are not available for any listed case. Daily price increase information is not available either. The lack of these data prevents us from further investigating these trades. However, the rampant usage of fictitious trading is evident.

In the following, we list five SEBI fictitious trading cases individually that presented price-lifting data due to manipulation. We highlight the key fictitious trading features by presenting selected details of the six SEBI cases. The time intervals between matched fictitious trades are examined first. The tactic, advancing-the-bid, frequently used in fictitious trading, derives from the price-lifting patterns seen in the two selected SEBI cases.

4.1.1 Time intervals between matched orders are negligibly short

○ Case 1. Order against M/s. Porecha Global Securities Pvt. Ltd. and Shri Arun Porecha (WTM/PS/IVD/ID-3/03/Sept/09) (released on September 18, 2009)

Large matched orders were observed between Arun Porecha (AP) and Porecha Global Securities Pvt. Ltd. (PGSPL) as well as between Jayant Amerchand Kalidas (JAK) and PGSPL. Table 4.2 shows the details. Special attention should be paid to the time intervals between matched orders.

Table 8. Time intervals of fictitious trades between PGSPL and AP as well as JAK

Date	Time	Member	Buy / Sell	Order size	Share price
10/23/2000	14:03:33	PGSPL	Sell	100,000	Rs. 96
10/23/2000	14:03:33	PGSPL	Buy	100,000	Rs. 96
10/24/2000	12:40:47	AP	Buy	100,000	Rs. 96
10/24/2000	12:40:47	PGSPL	Sell	100,500	Rs. 96
10/25/2000	13:21:30	PGSPL	Sell	100,000	Rs. 96
10/25/2000	13:21:31	JAK	Buy	100,000	Rs. 96
10/27/2000	11:57:59	PGSPL	Sell	200,000	Rs. 100
10/27/2000	11:58:01	JAK	Buy	200,000	Rs. 100
10/30/2000	12:12:24	JAK	Buy	100,000	Rs. 100
10/30/2000	12:12:24	PGSPL	Sell	100,200	Rs. 100
10/31/2000	13:30:31	PGSPL	Sell	100,000	Rs. 100
10/31/2000	13:30:33	JAK	Buy	100,000	Rs. 100
11/1/2000	15:18:10	JAK	Buy	100,000	Rs. 98.85
11/1/2000	15:18:12	PGSPL	Sell	100,000	Rs. 98.85
11/2/2000	12:22:30	PGSPL	Sell	100,000	Rs. 100
11/2/2000	12:22:31	JAK	Buy	100,000	Rs. 100
11/3/2000	14:30:55	JAK	Buy	100,000	Rs. 105
11/3/2000	14:30:57	PGSPL	Sell	102,500	Rs. 105
11/6/2000	11:28:10	AP	Buy	100,500	Rs. 107
11/6/2000	11:28:11	PGSPL	Sell	100,500	Rs. 107
11/7/2000	11:27:20	AP	Buy	100,000	Rs. 115
11/7/2000	11:27:20	PGSPL	Sell	100,000	Rs. 115
11/8/2000	14:36:41	JAK	Buy	100,000	Rs. 115
11/8/2000	14:36:41	PGSPL	Sell	100,000	Rs. 115
11/9/2000	12:34:41	JAK	Buy	100,000	Rs. 114.95
11/9/2000	12:34:42	PGSPL	Sell	100,000	Rs. 114.95
11/10/2000	12:49:32	PGSPL	Sell	100,000	Rs. 111

11/10/2000	12:49:34	JAK	Buy	100,000	Rs. 114.90
11/10/2000	12:52:39	PGSPL	Sell	99,900	Rs. 114.90
11/10/2000	12:52:40	JAK	Buy	99,900	Rs. 114.90
11/10/2000	12:53:46	PGSPL	Buy	99,900	Rs. 111
11/10/2000	12:53:47	JAK	Sell	99,900	Rs. 111

For all of the 16 pairs of matched orders, the time intervals fall between 0 and 2 seconds. In the seven sell-and-buy pairs, the order sizes are equal. In the nine buy-and-sell pairs, six order pairs have equal sizes, while the other three have marginally larger sell orders than buy orders. Regarding the transaction prices of the 16 pairs, 15 pairs have equal prices. In one scenario, the buying price is 3.5 percent higher than the selling price with the buy order being entered 2 seconds later than the sell order.

This prosecution case shows four aspects of fictitious trading. It always contains one buy order and one sell order. There is one pair where both the buyer and the seller are the same trader. The other 15 pairs are matched orders between two colluding brokers. The time interval between the two orders in any pair is negligibly short. It never exceeds 2 seconds. The quantities of the two orders, depending on which order is placed ahead of the other, are basically equal. The prices quoted and the actual execution prices are, in general, equal between the two orders in the 16 pairs.

○ Case 2. Order against M/s. Sanchit Financial and Management Services Ltd. (WTM/ TCN/160 / ID3/JAN/ 09) (released on January 22, 2009)

This case is comprised of equal order sizes and executed quantities in matched orders but with more diverse time intervals, ranging from 3 seconds to 44 seconds. These varying time intervals are still negligible since the stock is thinly traded. The two colluding parties are SFML and NAM (see Table 9).

Table 9. Time intervals of fictitious trades between SFML and NAM

Date	Time	Member	Buy / Sell	Order size*	Time interval
01/07/2000	14:50:10	NAM	Buy	500	
01/07/2000	14:50:23	SFML	Sell	500	13 sec
01/07/2000	14:50:49	NAM	Buy	500	
01/07/2000	14:51:03	SFML	Sell	500	14 sec
01/07/2000	14:51:34	NAM	Buy	500	
01/07/2000	14:51:48	SFML	Sell	500	14 sec
01/07/2000	14:52:02	NAM	Buy	300	
01/07/2000	14:52:09	SFML	Sell	300	7 sec
01/07/2000	14:57:46	NAM	Buy	1,000	
01/07/2000	14:57:49	SFML	Sell	1,000	3 sec
01/07/2000	14:58:36	NAM	Buy	800	
01/07/2000	14:58:47	SFML	Sell	800	11 sec
01/07/2000	15:15:46	SFML	Buy	2,000	
01/07/2000	15:15:49	NAM	Sell	2,000	3 sec
01/07/2000	15:16:51	SFML	Buy	1,600	
01/07/2000	15:17:11	NAM	Sell	1,600	20 sec
01/17/2000	13:44:46	NAM	Sell	900	
01/17/2000	13:45:30	SFML	Buy	900	44 sec
01/18/2000	11:32:36	NAM	Sell	1,500	
01/18/2000	11:32:54	NAM	Buy	1,500	18 sec

* All orders were executed in full as placed.

This case confirms the four aspects of fictitious trading discussed in Case 1. There is one self-dealing occasion made by NAM. The other trades consist of matched orders between the two colluding parties, SFML and NAM. The time intervals between the matched orders are generally negligible. They vary from 3 seconds to 44 seconds, with the majority being below 14 seconds. The share quantities of the two orders are exactly equal, regardless of whether a buy order is placed ahead of a sell order. The only missing link is that the prices of the matching orders are not provided by the court order. However, the prosecutor indicated that the quotes remain the same for the matched orders in all fictitious trading occasions.

4.1.2 Advancing-the-bid is involved in fictitious trading

○ Case 3. Order against M/s. Purshottam Lal Kejdiwal
(WTM/KMA/ERO/IVD/121/08/ 2009) (released on August 21, 2009)

The prosecuted broker, Purshottam Lal Kejdiwal (PLK), was manipulating the stock BIL by trading exclusively matched orders with another broker, Badri Prasad & Sons (BP), during the investigation period from June 9 to September 16, 2005. Table 10 lists selected transaction data.

Table 10 Fictitious trades with advancing-the-bid by PLK and BP in BIL

Date	Previous closing price (Rs.)	Opening price (Rs.)	Exchange volume	Broker volume	Price increase
08/31/2005	2.35	2.85	1,000	500	21.30%
09/01/2005	2.85	3.4	1,000	500	19.30%
09/02/2005	3.4	4.05	1,000	500	19.10%
09/09/2005	5.75	6.85	600	300	19.10%
09/12/2005	6.85	8.2	2,000	1,000	19.70%
09/13/2005	8.2	9.8	1,000	500	19.50%
09/14/2005	9.8	11.75	400	200	19.90%
09/15/2005	11.75	14.05	460	230	19.60%

This table clearly shows the price-lifting path taken through the execution of matched orders with the advancing-the-bid tactic being embedded. However, as in many other court orders examined, the prosecutor did not point out the importance of advancing-the-bid in generating price increases. There were no other investors in the stock except the two colluding manipulators. With orders ranging between 200 shares and 1,000 shares, the share price was pushed up at a daily average of 19.7 percent for a totality of 498 percent within just 8 trading days. The only explanation for these dramatic and consecutive price increases is the higher bid of each order over the previous closing price which is also the last traded price. This is a solid example of fast price increases due to fictitious trading with large bid advances in a thinly traded stock.

- Case 4. Order against M/s. S. Jhunjhunwala & Co.

(WTM/KMA/ERO/IVD/166/11/ 2009) (released on November 20, 2009)

The quote from the court order reads, “The order log would show that the Broker had placed orders on both the buy and the sell side for the same quantity and price (though price was higher than the previous days’ price).” This clearly evidences using the advancing-the-bid tactic in fictitious trading conducted by S. Jhunjhunwala & Co. (SJ) and his colluding partner in consecutively lifting up daily prices in the stock (TCL) (see Table 11).

Table 11. Advancing-the-bid in fictitious trading by SJ and partner in TCL

Date	Previous closing price (Rs.)	Opening price (Rs.)	Exchange volume	Broker volume*	Price increase
04/21/2004	74.5	77.9	100	50 (CD)	4.60%
04/22/2004	77.9	81.55	100	50 (CD)	4.70%
04/23/2004	81.55	85.1	24000	24000 (SD)	4.40%
04/26/2004	85.1	89.2	8000	8000 (SD)	4.80%
04/27/2004	89.2	93.45	8000	8000 (SD)	4.80%
04/28/2004	93.45	97.9	100	50 (CD)	4.80%
04/29/2004	97.9	102.6	5000	5000 (SD)	4.80%
04/30/2004	102.6	107.5	100	50 (CD)	4.80%

* CD means cross-dealing, or matched orders, and SD self-dealing or wash sale.

Details further add to the evidence presented in the paragraph quoted above from the court order. First, advancing-the-bid existed; particularly when there were only 100 shares in the daily volume in the stock while the share prices increased by the amounts from 4.6 percent to 4.8 percent. Second, it is certain that advancing-the-bid was applied by the manipulator and his colluding partner on each of the 8 consecutive trading days since there are no other investors. Third, because of the precisely matched orders in each of the fictitious trading occasions, the manipulator incurred no trading cost other than the

commissions but effectively lifted up the share prices by a daily average of 4.7 percent and in total 44.3 percent in 8 consecutive trading days.

- Case 5. Orders against M/s. Mukesh Dokania & Co.

(WTM/TCN/ERO/98/JAN/2009) (released on January 19, 2009)

The manipulator is Mukesh Dokania (MD). The issuing company is Ashika Credit Capital Ltd. (ACL). The manipulator bought 947,700 shares which is 50 percent of the total buy volume from July 12 to October 15, 2001. He sold 947,700 shares which is also 50 percent of the total sell volume. Table 4.6 lists the trading data during the investigation period from July 12 to October 15, 2001.

Table 12. Mixed fictitious trading with non-manipulative trading by MD in ACCL

Date	Buy quantity	Buy rate	Sell quantity	Sell rate	Price increase
July 12, 2001	90,000	Rs. 5.5	90,000	Rs. 5.5	0.0
July 13, 2001	90,000	Rs. 5.5	90,000	Rs. 5.5	0.0
July 16, 2001	6,000	Rs. 8.1	6,000	Rs. 8.1	Rs. 2.6 (47.3%)
July 17, 2001	100	Rs. 10.1	0		Rs. 2.0 (24.7%)
July 18, 2001	100	Rs. 10.4	0		Rs. 0.3 (3.0%)
July 19, 2001	101,000	Rs. 9.6	100,000	Rs. 9.6	- Rs. 0.8 (- 7.7%)
July 20, 2001	140,000	Rs. 9.6	140,000	Rs. 9.6	0.0
July 24, 2001	0		100	Rs. 12.0	Rs. 2.4 (25.0%)
July 25, 2001	55,000	Rs. 12.5	55,000	Rs. 12.5	Rs. 0.5 (4.2%)
July 26, 2001	0		200	Rs. 13.7	Rs. 1.2 (9.6%)
July 27, 2001	300	Rs. 14.3	0		Rs. 0.6 (4.4%)
July 30, 2001	150	Rs. 15.8	150	Rs. 15.2	Rs. 1.5 (10.5%)*
July 31, 2001	0		200	Rs. 16.6	Rs. 0.6 (3.8%)*
August 1, 2001	0		50	Rs. 17.5	Rs. 0.9 (5.4%)
August 2, 2001	100	Rs. 18.5	0		Rs. 1.0 (5.7%)
August 9, 2001	102,000	Rs. 20.3	102,000	Rs. 20.3	Rs. 1.8 (9.7%)
August 13, 2001	50	Rs. 24.0	0		Rs. 3.7 (18.2%)
August 14, 2001	91,500	Rs. 25.2	91,500	Rs. 25.2	Rs. 1.2 (5.0%)
August 21, 2001	50	Rs. 32.7	0		Rs. 7.5 (29.8%)
August 24, 2001	0		500	Rs. 37.7	Rs. 5.0 (15.3%)
August 27, 2001	75,600	Rs. 38.4	75,600	Rs. 38.4	Rs. 0.7 (1.9%)
September 3,	50,000	Rs. 39.9	49,750	Rs. 39.9	Rs. 1.5 (3.9%)

2001					
October 8, 2001	8,000	Rs. 39.0	8,000	Rs. 39.0	- Rs. 0.9 (-2.2%)
October 12, 2001	40,000	Rs. 43.7	40,000	Rs. 43.7	Rs. 4.7 (12.1%)
October 15, 2001	100,000	Rs. 42.8	100,000	Rs. 42.8	- Rs. 0.9 (-2.1%)
Total	949,950		949,050		Rs. 37.3 (678%)

* Calculation is based on the buy rate.

This is an actual trading log including both manipulative and non-manipulative trades. The price-lifting path is not particularly consistent, or uniform. But the eventual price increase of 678 percent in three months remains tremendous. This stock may not be thinly traded because the manipulator's buy volume of nearly one million shares is only 50 percent of the total buy volume.

In summary, fictitious trading involves more aspects than other known forms of long manipulation. Its effectiveness in price-lifting and efficiency in reducing trading costs are outstanding among all the manipulation tactics studied in this paper. Since fictitious trading relies on a multifaceted approach, one needs to understand these facets so corresponding detective measures can be proposed to monitor and prevent this form of stock price manipulation.

The first facet is advancing-the-bid. A large bid advance provides the key to achieving consecutive and dramatic price increases. Hence, focusing on detecting bid advances will yield one effective measure. Because the time interval between two matched orders in fictitious trading is always negligible, this presents another facet in fictitious trading governing the manipulation of liquid stocks. For manipulation of thinly traded stocks, the time interval, in theory, may not necessarily be very short. But since detection is far easier if a few investors are trading, surveillance may be sufficient to curb fictitious trading. In this scenario, a quick price increase due to a small number of orders being placed can automatically act as an effective basis for surveillance. The third facet may concern the equal or nearly equal quantities of matched orders in fictitious trading. This provides a solid basis for surveillance. If orders placed by one trader have been consistently matched nearly instantly, by his own or other investors' opposite orders, then

surveillance can readily generate a warning flag for regulators. Detection of no or a negligible change in net ownership can lead to regulation, too.

4.2 Marking-the-close and advancing-the-bid

Marking-the-close is often combined with advancing-the-bid. The distinction is that the former refers to advancing-the-bid at the closing minutes only.⁷ The uniqueness in marking-the-close is that it gives no time for the market maker or matching computer when placing large numbers of buy orders in a short time near the close. To ensure a higher opening price on the next trading day, the bid of each buy order has to be higher than the best bid in the stock. These orders will pile up and be rolled over to the next trading day. Thus the opening price will be effectively higher by generating an accumulation of buy orders at distinctively higher bids. Then the manipulator can sell all or part of the shares accumulated earlier at inflated prices the morning of the next trading day. This practice often causes the share prices to drop not too long after their peak in the morning. This explains many of the scenarios where share prices are marked up in the closing minutes of the market and the next day's opening prices are higher than the previous closing prices. For the first few minutes, the prices continue to rise. Very soon though, the prices peak and a sharp drop in their value follow.

Since marking-the-close is a special type of the advancing-the-bid manipulation, we list prosecution cases involving both tactics in the same table. We choose seven marking-the-close cases that have explicitly or implicitly indicated the closing price inflation out of 13 HKSFC cases. These are listed in Table 13.

⁷ Depressing-the-ask is used if the manipulator's intention is short manipulation. Then marking-the-close will feature a large number of sell orders near the close with the ask much lower than the best ask for the stock.

Table 13. Seven HKSFC cases involving marking-the-close and advancing-the-bid

Manipulator(s) /target stock(s)	Manipulation period	Number of orders (total number of shares)	Bid over market price	Price increase	Purpose
Wang Fang / Fujian	12/30/1999	13 consecutive buy orders at 100 shares (1,300 shares)	Not available	From previous closing price HK\$0.140 to HK\$0.192 (37%)	A higher year end closing price
Not disclosed / China Development	01/02/2002 - 03/07/2002	20 buy orders at 100 shares (2,000 shares)	2% - 23%	Not available	Sale on next trading days
Poon Lak To, Joseph / Pioneer Global	03/15, 23 and 27/2001	20 buy orders at 100 shares (2,000 shares) at each close	9% - 18%	Not available	Reducing margin deposit
Choi Kam Tui / Climax	07/04/2001 -09/21/2001	20 buy orders at 100 shares (2,000 shares) at each close	4% - 150%	Not available	Sale at higher prices
Not disclosed / SEEC	On a few days from 02/2002 - 03/2002	7 buy orders (2,000 to 4,000 shares)	6 - 8 spreads higher	Not available	Sale at higher prices next day
Not disclosed / MUI	01/09/2003 - 05/21/2003	20 buy orders at 100 shares (2,000 shares)	Higher than market price	Pushed up the closing prices by 8% to 60% higher than previous closing prices	Inducing other investors to buy the stock
Wong Wei Yin Peter / SiS	05/18 and 20 and 06/09 and 15/2004	Several buy orders at 100 shares	Higher than market price	Pushed up the closing prices by 8% to 10% higher than previous	Sale at higher prices next days

					closing prices
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There is one SEBI case that explicitly prosecutes advancing-the-bid manipulation. It has trade-by-trade data which are shown in Table 14.

Table 14. Trading costs incurred in advancing-the-bid manipulation

Manipulation period	Number of buy shares	Bid / Last traded price (Rs.)	Advance (Rs.)	Price increase (%)	Trading cost
On 08/16/2000 at 13:34:57	3,000	2.3 / 1.85	0.45	24.30%	1,350
On 08/21/2000 at 10:15:38	100	3.4 / 2.95	0.45	15.20%	45
On 08/22/2000 at 10:05:42	500	4.0 / 3.2	0.8	25.00%	400
On 08/28/2000 at 10:06:21	200	4.75 / 4.2	0.55	13.10%	110
On 08/30/2000 at 13:11:03	500	5.45 / 4.85	0.6	12.40%	300

Analysis of the cases listed in Tables 13 and 14 results in the following:

- (1) The order sizes for either advancing-the-bid or marking-the-close are not large because the manipulator does not want to risk increased trading costs. The size can be as small as 100 shares but buying even such a small number of shares consecutively can push up the share price dramatically, for instance, more than 37 percent (Case 1 in Table 13).
- (2) The bid advances can be from 4 percent to 150 percent higher than the market price.

- (3) Numerous consecutive small orders are seen near the close in Case 1.
- (4) Marking-the-close is locked in during the closing minutes, while advancing-the-bid can be employed any time during the trading day (Table 14).
- (5) Both marking-the-close and advancing-the-bid aim to increase share prices by placing small orders.

Marking-the-close can be used for short-term manipulation (Cases 2, 5 and 7 in Table 13). Another purpose is to reduce the margin deposit (Case 3 in Table 13). Doing so can also be used to mark up the closing price for the sake of improved performance of mutual funds during year-ends (Case 1 in Table 13), quarter-ends or month-ends (Carhart *et al.*, 2002; Hillion and Suominen, 2004; Comerton-Forde and Putniņš, 2009).

The interesting fact is that the general advancing-the-bid cases are very few among prosecution cases studied. This may be because manipulation by advancing-the-bid only incurs non-trivial trading costs. It is not as efficient as fictitious trading that includes advancing-the-bid.

4.3 Fake trading

Compared to the accumulation-lift-distribution scheme, a large concentration of shares may not be required in fake trading because the lift phase is carried out within a timeframe as short as minutes. Price increases raised by fake trading are as humble as single digit in percentage. Strictly speaking, illiquidity is not needed to induce following buyers. Fake trading cases listed in the six CSRC announcements evidence these considerations.

The essence of fake trading is that it uses repeated fake orders placed with each bid just a bit below or occasionally a bit above the best bid, but these placed buy orders are quickly canceled before execution. This is because only the top five bids next to the best bid are displayed by exchanges under the CSRC. The manipulator's objective is to create the appearance that multiple large buy orders have been entering the bidding process within a very short time period, for instance, within a couple of trading hours. The manipulator expects numerous buyers will follow his lead, so that the share prices will be raised in a limited increment, say 3 percent, within one or two trading days. Then the manipulator will distribute all or most of the shares bought before the first fake order, at a slightly inflated price. Even though the profit derived from successful execution of each manipulation scheme is limited, the time period needed to achieve such gains is extremely short. This scheme can be repeated numerous times in just a month or so after the initial scheme was carried out. The collective profits reaped from numerous repeated manipulations can be substantial. The above analysis is long manipulation oriented. Fake trading can also resort to short manipulation. In such cases, the process works in a manner opposite to the tactics employed by a long fake trading scheme. The six CSRC fake trading cases hand-collected are listed in Table 15.

Table 15. Six CSRC fake trading cases

Manipulator / target stock	Manipulation period	Number of fake orders	Number of fake shares	Price increase (RMB)	Price increase %	Numbers of Shares sold	Profit over time*
Mo Jianjun / South Express	02/16/2007, 11:11:13 – 11:27:40	4 buy orders	3,068,000	6.12 - 6.22	1.63%	153,700	RMB 21,518 over 16.5 minutes
Lu Daojun / 4-D Shareholdings	01/23/2008, 9:39:24 – 10:07:12	12 buy orders	3,300,000	9.29 - 9.74	4.84%	1,582,993	RMB 349,600 over one day
Zhang Jianxiong /ST	07/03/2008, 11:07:22 -	7 buy orders	5,130,000	4.91 - 5.68	15.70%	1,800,000	RMB 1,342,008

Raw Medicine	7/4/2008, 9:24:53						over one day
Mo Jianjun / Comprehensive Arts	03/09/2007, 10:50:54 – 11:20:44	10 buy orders	5,210,000	15.62 - 15.83	1.42%	154,900	RMB 32,529 over 30 minutes
Mo Jianjun / China Tungsten	03/26/2007, 14:16:27 – 14:54:51	11 buy orders	7,152,900	14.93 - 15.12	1.29%	243,400	RMB 43,812 over 38.4 minutes
Zhou Jianming /Datong Coal	06/26/2006 morning	61 buy orders	40,090,000	10.22 - 10.59	3.62%***	4,331,579	RMB 606,420 over one day

* For cases 1-3 and 6, no buying price or time period was given for the shares sold. Therefore, the profit made and time consumed is estimates based on the lowest bid placed by the manipulator. Also for cases 1-3, only one round of fake trading has been selected from each case for demonstration.

** Two accounts were used.

*** Estimate is based on the minimum and maximum bidding prices.

Analysis of the six fake trading cases listed in Table 15 leads to the following:

(1) Fake orders prove to be large. This is understandable because large order placement is needed to create the false impression of large volumes entering the bidding process. Therefore, large wealth is needed to generate repeated fake orders. In the six CSRC cases, funds used range from RMB18 million (\$2.6 million) to RMB400 million (\$58.8 million).

(2) Fake trading is linked to fast trading in order to realize the manipulator's objective to induce high demand in a short period of time. The highest frequency recorded was 12 orders (3.3 million shares) traded in 27 minutes, or 0.44 orders per minute. Put simply, fake trading is characterized by a short manipulation time period. Fake trading can be completed within half an hour, since price inflation can be as low as 1.29 percent, as noted in case 1. The longest time period noted was a little bit over one trading day, cited in case 2, in which the share price

rose 4.84 percent.

- (3) Fake orders are designed to be seen by other investors in order to create the false appearance of a continuously increasing high demand for the stock. In the six cases, the top five bids and the bottom five asks were displayed momentarily. Not one case involved a bid of a fake order outside the displayed bids and asks.
- (4) Fake trading aims to distribute early accumulated shares at slightly or largely inflated prices. In the six cases, price inflation varied from 1.29 percent over a span of just 16.5 minutes to 15.7 percent executed in less than one trading day.
- (5) This scheme bears zero cost, thus it is the least expensive among the studied forms of manipulation used to lift prices within a short period of time.

In summary, there are three elements that are found in a fake trading scheme. The first involves large orders. The second element is incomplete display. The third feature is high frequency in order placements. In other words, the time intervals between two consecutive orders need to be very short. These three elements suggest implications for the section regarding detection and regulatory proposals, to be discussed shortly.

5. Unified approach to detection and prevention

No matter how many varieties comprise trade-based manipulation tactics, each is about manipulating one or multiple of the nine variables listed earlier in this paper. A close examination of the studied prosecution cases reveal numerous lessons that can be converted into detective methods and preventive measures. Therefore, detective methods and preventive measures can be proposed based on the nine variables. The following eight proposals point to the areas to apply detection and preventive measures. That is,

they provide guidelines to stock market regulators. In some proposals, specific measures are given as examples.

- (1) Daily volume limit is one effective regulatory measure against all trade-based manipulation tactics. Volume-based price impact, particularly when intended for price-lifting, can be limited in most known scenarios to the regulators' need. In addition, large positions need to be detected and kept under surveillance. Their move has the potential to generate a high price impact or to induce a high price impact. The threshold of a large position depends on the quantity of the holding and the average daily turnover of the past month. In other words, the definition of a large position is a relative concept. Implementation is left for the regulators.⁸
- (2) To effectively regulate price-lifting by an unreasonably high bid (or a low ask aimed for price-depressing), we propose an adjustable limit band. That is, it limits both bid and ask so that they will fall within a band.

At any trading moment, there are best bid and best ask in one stock. The mid-point is then calculated as the average of the two. The “distance” of the best bid from the mid-point is half of the width of the bid-ask spread. The “distance” of the bid proposed by an investor from the mid-point can be calculated prior to placement. The ratio of the latter divided by the former can be used as the foundation of our proposed limit. Expressed mathematically, let us denote D as the “distance” of any bid, b , from the mid-point, M , and W as the width of the bid-ask spread. Thus $D = \text{Abs}(b-M)$. The preset limit is L . Then,

$$D/(W/2) - 1 < L,$$

and the acceptable bid range can be expressed as

⁸ For proposed measures regulating large concentration of share holding, see Yan *et al.* (2012a).

$$M - (W/2) \times (1 + L) < b < M + (W/2) \times (1 + L),$$

where $M + (W/2) \times (1 + L)$ is the maximum value of the allowable bid.

As a numerical example, let us consider that the best bid is \$9.99 and the best ask \$10.01. The mid-point is the average of the two, *i.e.*, $M = \$10$. Then $W = \$0.02$. If L is set as 1 percent, then $D < (\$0.02/2) \times (1+0.01) < \0.0101 . So any bid cannot exceed the range from \$9.9799 to \$10.0201. If any bid smaller than the best bid is not going to cause a concern in price-lifting or price-depressing, only the right hand side of (2) has to be followed. The trading system needs to reject any bid that exceeds or equals to the maximum.

For ask, the same range will be obtained. If any ask above the best ask is not a concern for price-depressing or price-lifting, then only the minimum value, $M - (W/2) \times (1 + L)$ needs to be observed in practice. That is, no ask is allowed to be smaller than or equal to the minimum. The trading system needs to reject any ask that is equal to or smaller than the minimum.

The regulator has the flexibility to adjust the value of L according to market conditions. If he needs a greater uptrend when he sees more buy volumes, then he may set L a bit higher. Fine tuning L is an important part of daily regulatory activities.

- (3) We propose that the time interval between two consecutive orders by any investor cannot be less than X minutes at any given time during a trading day. Of course, this limit can be adjusted by regulators according to their need. This measure reduces the trading frequency in an intensified fashion. It decreases greatly the probability of fictitious trading or fake trading, especially in a frequently traded stock. It also weakens marking-the-close effectively together with a daily volume limit and another measure to be proposed shortly.

(4) The next important variable to monitor and regulate is net ownership of shares at the end of the day. If B is denoted as the total buy volume in the stock by an investor during the trading day, and S as the total sell volume (positive only), we can use the ratio of Abs $[(B - S) / (B + S)]$ as a measure of the relative net ownership. If a daily minimum N ($0 < N < 1$) allowed by regulation is given, then

$$\text{Abs} [(B - S) / (B + S)] > N.$$

There are two scenarios to consider. One is if $B > S$. The other is if $B < S$. Let us look at the first scenario. Since $B - S > 0$, solving for B , one gets

$$B > [(1 + N) / (1 - N)] S.$$

By the same token, the second scenario yields

$$B < [(1 - N) / (1 + N)] S.$$

A numerical example can be examined by setting N as 50 percent. For the total buy volume exceeding total sell volume, the first inequality gives $B > 3 S$. Otherwise, the second inequality yields $B < S / 3$, or $S > 3 B$.

The daily minimum N cannot be too small, for instance, being close to 0, it will raise concerns regarding fictitious trading. N cannot be too large, for instance, being close to 1, because of the mathematical impossibility. Adjusting N between 0 and 1 is left for regulators.

(5) Because of proposal two discussed above, advancing-the-bid and depressing-the-ask are effectively prevented. Marking-the-close is left with order size and timing. If only market orders are allowed during the final 30

minutes of the trading day, then the problem of an intended pile-up of buy limit orders near the close is eliminated. Subsequently, manipulative price-lifting near the close is effectively curbed.

(6) The sixth variable concerns the genuineness of trading. This tests if cancellation of placed orders is too frequent or conducted for the purpose of display only. Displaying complete information would largely prevent fake trading.⁹ Complete information means the entire cycle of an order from placement to execution or cancellation. A sufficiently long time interval between two consecutive cancelled orders is another critical means to prevent fake trading. As an example, one hour can be set as the minimum interval between any two consecutive voluntarily cancelled orders. The daily volume limit ensures the number of total canceled shares will be below a certain value. Combined, these three measures will largely guarantee the genuineness of trading and prevent large-scale fake trading aimed at achieving share price manipulation.¹⁰

(7) The seventh variable is multiple accounts. This invites surveillance before any regulatory measures. The true identity requirement of an investor, whether individual or institutional, to open a trading account may reduce but cannot eliminate the problem. Devising a penalty for lending one's identity or trading account to an investor for the latter's self-dealing is another effective deterrence. The third means strives to detect self-dealing in actual transactions with multiple accounts. Proposals one to four above present effective measures to reduce fictitious trading to an acceptable frequency and scale if it cannot be completely eliminated. Therefore, both surveillance and regulation in multiple dimensions are needed to tackle the problem of multiple accounts.

⁹ The alternative is displaying no order placement information but information of executed volumes instead.

¹⁰ Some regulators may prefer to limit the number of cancelled orders per trading day. Then a quantitative measure can be made that requires each investor to have voluntary intraday cancellations up to three times, for example.

(8) The last variable in the approach is collusion. It also requires both surveillance and regulation. Collusion generally takes place between two or more large investors, sometimes including the issuing company and brokers. Since collusion can take place in numerous fashions, detection before trading is extremely difficult. However, surveillance of large limit orders can alarm regulators. If each of one investor's three large limit orders, for example, more than 10,000 shares, is matched with the same price within a very short time interval, this investor can be marked as a candidate for collusion regulation. If matched orders come from the same investor more than twice, then this investor can be considered as a colluding partner. This three-and-two rule, based on the timeframe of three consecutive trading days, can be applied to multiple colluding partners. This way, at least one manipulator out of the collusion can be detected. And, a warning or a more serious administrative order can be issued to the manipulator. Hence the effectiveness in the surveillance is measurable. On the regulation side, the proposals one, two, three and four are all applicable and effective.

Among the eight proposals comprising a unified approach, daily regulation of the total executed volume, the bid-ask spread size, the trading frequency and the net ownership are the core measures to ensure that an investor's trading activity is not manipulative. Proposals five and six prevent orders that do not aim at genuine trades. The other two deal with more than one trading account. And more surveillance is needed for the final two proposals. The eight proposals, acting independently or in combination, are effective, quantifiable and adjustable. They are unified because they are derived by looking at the nine variables at full disposal by an investor, rather than targeting one type of manipulation at a time. This approach gives a more complete picture and regulatory flexibility to securities regulators.

The anatomy of trading in a trading day serves the foundation for the eight proposals in the unified approach. The unified approach, the authors believe, will

effectively detect, prevent, and curb manipulations aiming to induce a large number of buy volumes and to generate an extraordinary price impact. The cost generated by implementing the eight proposals will be limited compared to the ultimate goal of prevention of crises, protection of investors, and enhancement of market stability. Above all, regulating price impact is an important construct in building fair, transparent and perfect competition in the stock market.

6. Concluding remarks and future research

The key finding in this paper is that market manipulation is essentially an exercise of monopoly power. Subsequently, antitrust spirit is carried to anatomize an investor's trades during any trading day. The nine variables of the trading activities of any investor (actually a large investor) provide a practical approach to the improved surveillance and regulation of stock markets in order to significantly reduce the possibility of manipulation-induced stock market crises as well as improve market stability and investor protection. Adopting this approach will enable quantifiable, thus programmable, measures for the daily detection and prevention of trade-based market manipulation with improved effectiveness and efficiency.

To make the proposed eight regulatory measures more completely and effectively implemented, each large investor needs to be monitored according to the nine variables proposed herein. Thus, surveillance should be extended to large positions and large orders. Yet coordinated small volumes need to be monitored as well, as do any sudden spikes or collapses in share prices.

Based on the selected prosecution cases, this paper has focused on price-lifting using trade-based manipulation tactics. Long manipulation, particularly the lift stage in the accumulation-lift-distribution scheme, received a more in-depth analysis. The general objective is to keep price impact well monitored and regulated. If appropriately implemented, the proposed measures will help move the secondary market one solid step closer to the ideals of fair and transparent perfect competition.

Future work includes modeling a stock market with a monopolistic trader and numerous retail investors to find out the conditions that can lead to systemic risk such as a crash in the market. This work has the potential to develop forecasting capacities for securities regulators. It is a separate project in our research series of regulating competition in the stock market.

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