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Institutions, Markets, and Influence Rents: Innovation and the U.S. Stock Exchanges

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Abstract
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Abstract

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Introduction

Research on co-optation and capture—the influence that firms may establish over the decision making of institutions—is the most commonly studied institutional manipulation strategy (Ahuja and Yayavaram, 2011: 1643). However, seeking an advantage over a direct competitor through a change in the rules is not always straightforward. In part, this is because rules apply to all firms in an industry. Thus, a change, like lower trade barriers, benefits not just the firm that lobbies for the institutional change but also its competitors (Baron, 1995). As such, an influence strategy for institutional manipulation does not exclusively favor the actor who lobbies for a change in the rules. While the under-provision of public goods—the positive outcomes of institutional manipulation that benefit the entire industry—is a coordination concern for collective action, the overprovision of public bads—the negative externalities that leave all market participants worse off—is a regulatory challenge of institutional change (Dixit 2009). As we submit in the current paper, public bads, in the form of unequal private gains and negative social impact that are unintended by regulators, can result from the complementarity in a firm’s influence strategy and its competitive strategy.

An institution may begin as incomplete—wherein the rules and structures governing value appropriation are either absent or insufficiently enforced to support value creation and appropriation—, but become captured—wherein robust rules and structures exist, yet the institution prioritizes private interests over the public’s interests—, as firms succeed at shaping the institution in their favor (North,
Our research examines such institutional change, as we build on an institution-based view of strategy with an analysis of the endogenization of institutional structure and functioning. As proposed by Ahuja and Yayavaram, an actor may increase the potential for private gain by altering the rules of the game. That is, “the very existence and functioning of institutions can themselves be a product of firm strategy pursued with the intent of generating rents from such activities” (Ahuja and Yayavaram, 2011: 1648). In analyzing the endogenization of institutional structure and functioning, we explore the interaction between competitive (market) strategies and influence (nonmarket) strategies, and examine how such interaction affects firm performance and social welfare.

We explore the complementarity in the competitive and influence strategies of a firm with a regulatory change that dramatically altered the U.S. stock trading industry. The distinct competitive strategies of the two stock exchanges—The New York Stock Exchange (NYSE) and the Nasdaq—made the rules of the game for governing economic interactions a strategic issue. The Nasdaq, which lobbied for a change in the trading rules, gained influence rents at the expense of the NYSE. Influence rents are “the extra profits earned by an economic actor because the rules of the game of business are designed or changed to suit an economic actor or a group of economic actors” (Ahuja and Yayavaram, 2011: 1631). The regulatory change, however, led to a degradation of the market for stock trading. The U.S. stock market is stable, well-developed and might seem an unlikely target of tampering. The market regulator, the Securities Exchange Commission (SEC), is long-standing and not known for capture or corruption. Yet, the Nasdaq influenced the regulatory change with an argument based on market efficiency where increased competition and technological progress would benefit the investors. The influence strategy of the Nasdaq appealed to the SEC with an innovation that promises to enhance market efficiency, thereby transforming an incomplete institution. The innovation is a central element of the competitive strategy of the Nasdaq. As a consequence of the complementarity in the influence and competitive strategies of the Nasdaq, the rules of the game changed in the Nasdaq’s favor, while the social impact of the change was negative.

Our research uses mixed empirical methods including case study and financial event study, and multi-disciplinary theoretical approaches including economics, law, and strategy. We contribute two pieces of empirical evidence on the performance implications of a firm’s influence actions. Such empirical evidence has been limited in the literature because obtaining appropriate data is difficult (Ahuja and Yayavaram, 2011: 1644). We show not only that the performance implications of a regulatory change depend on the competitive strategies, but also that the complementarity in competitive strategies and influence strategies can hurt social welfare, degrading the functioning of the market. As suggested by the
empirical evidence we uncover, a decline in the functioning of an institution can be a consequence of the complementarity in the competitive and influence strategies sought by a firm.

Antecedents in the Literature

While influence rent seeking is often studied in transition or early-stage development economies, the contemporary American institutional landscape, one of the world’s most advanced market economies with a relatively effective set of institutions, also provides vivid illustrations of all types of institutional manipulation strategies (Ahuja and Yayavaram, 2011: 1644). Two types of regulatory capture are observed: (1) Financial capture occurs when the regulator's motive is based on its material self-interest, manifesting in the forms of bribery, revolving doors, and political donations; and (2) Non-financial capture occurs when the regulator begins to think like the regulated industry through cognitive influence exerted by lobbying. Regulatory capture can also occur in more subtle ways (Dal Bó 2006, Hillman and Keim 1995, Pfeffer and Salancik 1978). Through normative influence, regulatory-agency decision making can be indirectly shaped by third-party actors who shield an agency from legitimacy threats, as suggested by the case of the U.S. Department of Agriculture’s approval of genetically modified organisms, where product assessments by powerful stakeholders and peer agencies influence product approval (Hiatt and Park, 2013).

The use of an influence strategy for institutional manipulation is driven by the nature of institutional costs (Dorobantu et al., 2017) and firm capabilities. The nature of institutional costs differs between incomplete institutions—institutional costs are symmetric and high for all involved—and captured institutions—institutional costs are asymmetric in that they are low for those who have captured the institutions but high for all others.¹ An institutional environment may be both incomplete and captured, in that, between institutions, the more incomplete the institutions, the higher the average institutional costs, and within an institution, the more extensive the capture, the larger the cost asymmetry. In captured institutions, firms are likely to pursue influence strategies. Firms with favored status would seek to preserve their status or to concentrate the benefits of such status among the favored (Hellman et al., 2003; Stigler, 1971). Firms without favored status, conversely, may be driven to pursue coalition strategies, collaborating among the non-favored in order to reduce their institutional costs or change the existing institutional structures. By contrast, in incomplete institutions, firms are likely to

¹ The difference between incomplete institutions and captured institutions reflects two alternate theories of the state (Acemoglu and Johnson, 2005; North, 1981). Incomplete institutions are consistent with a “contract theory” wherein a legal framework that enables exchange partners to contract with each other is provided by the state. By contrast, captured institutions are consistent with a “predatory theory” wherein the state is an instrument for transferring resources from one group to another.
pursue coalition strategies in order to reduce institutional costs for all parties, because institutional costs are symmetric and high for all firms in incomplete institutions (Jia, 2014; Kaufmann et al., 1993; Schuler et al., 2002).

While the research on nonmarket strategies suggest that firms are likely to pursue influence strategies in captured institutions and coalition strategies in incomplete institutions (Dorobantu et al., 2017: 129 Table 4), we explore an exception. As we explain in the section below, the institution is incomplete but not captured. The firm did not pursue a coalition strategy, forfeiting partnership as a solution to transform the incomplete institution.

An Empirical Study on the U.S. Stock Exchanges

Information Asymmetry in Stock Exchanges. Information asymmetry is one of the fundamental problems that institutions must solve in order for markets to thrive—along with power asymmetry, agreement consummation, individual incentives and collective action—any one of which can be attacked or subverted in various ways to favor one set of market participants over others (Ahuja and Yayavaram, 2011).

In stock trading, the classic problem of information asymmetry known as the “lemons” problem (Akerlof, 1970) arises because listing firms have more information about their business than investors. This information asymmetry between listing firms and investors can harm investors in several ways. As with used car sellers, Akerlof’s original setting, listing firms can overstate their value, e.g., through fraudulent reporting. A firm’s managers could also use insider information about the firm to profit from stock trades at the expense of other investors. If these problems are severe enough, investors avoid the market thus causing the market to fail.

The lemons problems can be addressed by a carefully designed platform (Hagiu, 2014). A stock exchange is a two-sided platform that brings together more than the buyers and sellers of a stock. One side of the market is the investors, who buy and sell a stock. The other side of the market is the listing firms that obtain capital from investors (Cantillon and Yin, 2011). For firms listing shares on an exchange for the first time, this is known as an “initial public offering”, but firms often issue additional shares in “seasoned offerings” when a fresh need for capital arises. As with classic two-sided platforms, there is a positive cross-elasticity of demand across the two sets of customers (Eisenmann et al, 2006; Rochet and Tirole, 2003): the more investors there are, the more easily listing firms can raise the capital they need, and the more firms listed on an exchange, the more choices investors have. Each side benefits from the other side.
Two U.S. Stock Exchanges. The NYSE and the Nasdaq are the two primary stock exchanges in the U.S., serving investors and listing firms. While other smaller exchanges exist, only the NYSE and Nasdaq list firms, with the smaller exchanges serving regional trading of exchange-listed stocks. Thus, just two firms comprise the full U.S. stock market. Together, the two firms formed a dual monopoly, with each exchange listing and dominating the trading of different sets of stocks. This market structure persisted since the founding of the Nasdaq in the early 1970s and only ended with the regulatory change we explain below. Both exchanges face the same institutional environment in that both are regulated by the SEC, which designs and implements government regulations. They also face the same competitive environment in that both compete for the same listing firms, because firms typically list on just one exchange, with only a handful are listed on both exchanges. Finally, they shared the same initial organizational form in that both were nonprofit member organizations. The NYSE was organized in 1792 as a member-owned firm (Michie, 1986) and the Nasdaq was formed by the National Association of Securities Dealers (NASD) as their Automated Quotation system (hence, NASDAQ).

Distinct Competitive Strategies. The two exchanges have distinct competitive strategies. The first distinct feature is owner incentive. The difference in owner incentive demarcates whether the exchange is designed to reduce information asymmetry. The NYSE is owned by underwriters (NYSE, 2006) who profit from obtaining capital for the listing firms. Underwriters must persuade investors that the information they disclose about the firm is true (Benveniste and Spindt, 1989). If an underwriter succeeds, investors pay a price that reflects the true value of the firm. But if an underwriter is only partly successful, investors may think that the information exaggerates the value of the firm and therefore offer to pay an amount less than the true value of the shares. This means less capital for the listing firm (and a higher cost of capital) and less in commissions for the underwriter. So, underwriters profit by solving the lemons problem. The better the solution, the more profit underwriters make. As such, the NYSE is designed to reduce information asymmetry. It adheres to strict listing requirements, often rejecting firms that meet the minimum standards, all in an effort to reduce information asymmetry.

By contrast, information asymmetry is heightened at the Nasdaq. It applies only the minimal listing requirements specified by the SEC. With its origin as an over-the-counter market, the Nasdaq used to allow the shares of any firm to be traded, including those that are not regulated by the SEC. As such, at the Nasdaq, the lemons problem is more severe. The owners of the Nasdaq are broker-dealers who participate in every investor transaction, buying from investors who wish to sell a stock and selling to investors who wish to purchase a stock. Broker-dealers thus profit from the difference in price between their buy and sell trades, which is known as the bid-ask spread. The larger the spread, the greater the profit for the broker-dealers, but the worse the price for investors. In short, broker-dealers profit at
investors’ expense, gaining when prices are volatile, for example. By contrast, the NYSE’s underwriter-owners profit more as the lemons problem, or information asymmetry, is reduced.

A second feature is mechanisms for trade execution. The mechanisms used by the NYSE and Nasdaq differ along several key dimensions including fragmentation, compulsion to trade, price matching, and orderliness, all of which have implications for the bid-ask spread. At the NYSE, a single agent handles all of the trades for a given listed firm. The agent matches buyers and sellers where possible, so that there is no bid-ask spread for the matched trades. When a match cannot be found, the agent is required, according to the NYSE “bid-up bid-down” rule, to buy from (sell to) the investor at a price within a narrow range of the most recent trade.

By contrast, the Nasdaq imposes a rule that requires each listing firm to engage at least three dealers, called market makers, to handle the trades of the listing firm’s stock. At first glance, this might seem to benefit investors by giving them multiple venues at which to transact, but in fact, fragmentation benefits market makers at investors’ expense. A single venue would concentrate all buyers and sellers into one marketplace, making a match more likely (resulting in a liquidity externality). Fragmenting liquidity has the opposite effect, increasing spreads and decreasing the likelihood of trading. Unlike NYSE specialists, Nasdaq market makers are not compelled to transact and would hesitate to trade if a paucity of orders meant having to hold costly inventory indefinitely until the next order came along. Illiquidity thus makes owning a particular stock costly for investors, which raises the cost of capital for the listing firm as investors demand a discount to compensate.

The third feature is the selection of firms that list on an exchange. The NYSE listed larger firms in terms of market capitalization, including all of the so-called blue chip firms that were considered stable, safe investments. By contrast, the Nasdaq was the home of riskier, smaller, younger firms, especially technology firms, including those that created the dot-com bubble. These distinct features of the Nasdaq’s and the NYSE’s competitive strategies are summarized and compared in Table 1.

Innovation and Regulatory Change: Transforming An Incomplete Institution. In 2007, Regulation National Market System (Reg. NMS) was implemented by the SEC. Prior to Reg. NMS, the “best price rule” required brokers to route trades to the venue with the best posted quote. A “better” price is defined as a higher price for investors selling stock and a lower price for investors buying stock, which results in a smaller bid-ask spread. Because of the NYSE’s incentives and mechanisms, described above, the NYSE

2 This high-end, low-end differentiation is not unique to stock exchanges—other platform industries exhibit this type of differentiation (Hagiu and Wright, 2015 a, b).
typically posted the best quotes, so the “best price rule” gave the NYSE a near-monopoly on trading with the vast majority of trades of NYSE-listed stocks taking place on the NYSE.

Reg. NMS relaxed the “best price rule”, so that brokers who wanted “immediate execution” were required only to compare among electronic venues. Brokers were permitted to exclude the NYSE from the quote comparisons on the grounds that the NYSE used a slow manual process. The speed with which computers execute trades was a feature of “the Big Board's main competitors, the Nasdaq Stock Market and a handful of Internet-based exchanges…[which] handle all trades electronically,” (Kelly, 2004a). The difference in speed between computerized systems and the NYSE’s manual process became increasingly noticeable in the period before Reg. NMS was finalized. “The idea hit home for floor broker Robert McCooey during a meeting late in July with an institutional trader in the Midwest. "Watch this," he told Mr. McCooey. Via computer, the trader sent an NYSE specialist an order for 1,500 shares of a stock. A minute passed. Impatient, the trader canceled the order. Then he tried again. After another excruciating 40 seconds, the order finally was filled. A similar trade on an electronic network could take a second or less,” (Kelly, 2004b).

The technological innovation in automated price comparison promises to enhance market efficiency, providing an opportunity to transform an incomplete institution. Institutions are incomplete because the state lacks the information or the ability to design institutions that are conducive to economic exchange (Ostrom, 1990), the old institutions become delegitimized without being replaced with more complete ones, and the technologies or preferences for certain rules do not yet exist to make the institutions complete (North, 1990). For the SEC, the technologies for faster trading exist, and a regulatory change to relax “the best price rule” is what it takes to transform the institution.

Influence Strategy and Influence Rent Seeking. The Nasdaq appealed to regulators on the basis of increased competition and technological progress, which they argued would benefit investors. Members of the Nasdaq as well as representatives speaking on behalf of the Nasdaq lobbied for a change in the rules of the game. For example, broker-dealers specializing in electronic trading, such as Madoff Securities headed by Bernie Madoff, lobbied hard for a rule that protected automated trading at the expense of the NYSE floor. Madoff himself testified at an SEC hearing arguing that the SEC should “require all ‘quoting’ market centers to employ an automated order execution facility for inter-market orders,” (Madoff 2004). Later, in Senate testimony, Nasdaq’s President and CEO also advocated for new rules, arguing that “the business of running a floor-based auction market is currently protected from competition by a set of SEC-mandated rules. These rules, which are relics of our past, have provided an extraordinary dividend to the intermediaries participating in these floor-based markets. The investing public and the industry are eager for change… So that investors can realize the full benefits of a truly
competitive market, the SEC should eliminate any trade-through\(^3\) restrictions for NYSE-listed securities.” (Greifeld, 2004). In his statement, Greifeld clearly targets the NYSE, which he portrays as antiquated and uncompetitive.

The Nasdaq’s arguments are evident in the SEC’s description of the rule change, which states, “Limit order users want a fast, efficient execution of their orders, not a slow, costly ‘satisfaction’ process that is provided by the existing trade-through provisions” (SEC 2005, 5). The “relic” argument also appeared in the SEC’s reasoning, which notes that “Congress intended the Commission to take advantage of opportunities created by new data processing and communications technologies” (SEC 2005, 6) and that “vigorous competition among markets promotes more efficient and innovative trading services” (SEC 2005, 12).

**Regulatory Capture.** Is there evidence that the SEC was ‘captured’ by the firms it is supposed to discipline? A regulatory agency, created to protect the public’s interest, is ‘captured’ when it prioritizes the interests of the industry it is supposed to be regulating, over the interests of the public. The literature suggests that the evidence is, at best, mixed, and largely anecdotal. The SEC was claimed to be subject to joint capture by the NASD and the NYSE in keeping out upstart competitors like Instinet (Woodward, 1998). Another claim made by Pritchard (2005) argues that the SEC has “dragged its heels in implementing the National Market System that Congress intended to replace the old cartel system.”

To the SEC’s defense, Hovenkamp (2003: 607) argues that, “there is little reason for thinking that the SEC is being so solicitous of market participants under its jurisdiction that it is ignoring the competitive implications of practices that it approves.” Hovenkamp (ibid) notes that the SEC has long enjoyed the benefit of the doctrine of implied immunity from antitrust, which requires the court to defer to the agency’s regulation of allegations of anti-competitive behavior by market participants. This “is sensible when the regulatory agency has jurisdiction over a practice, has a history of actually reviewing it, and is likely to take into account the concerns for competition that an antitrust court would ordinarily consider.” In other words, if there were sufficient concern for regulatory capture, the courts could lift that immunity. However, the courts have not done so in the 80-year history of the SEC.

A further claim of regulatory capture suggesting a “revolving door” between the SEC and entities that are regulated by the SEC was reported in a study by the Project on Government Oversight (POGO, 2013).\(^4\) However, the data indicated that most of the entities to which SEC alum gravitate are law and

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\(^3\) A “trade-through restriction” is a term of art that refers to the best price rule. The rule prohibits dealers from ignoring, or trading through, a better price to execute at a worse price.

\(^4\) The ‘revolving door’ phenomenon refers to a tendency of regulators to favor industry when they have an industry background or when they expect rewards in the form of future industry employment. Ahuja and Yayavaram (2011: 46).
accounting firms. The POGO report provides no evidence that those firms have succeeded in influencing SEC policy in one direction or another (Tai and Carpenter, 2014).

**Diverging Effects of a Regulatory Change: Evidence of Influence Rent.** Competitive strategies led to diverging effects of a regulatory change on the performance of the exchanges, even though a regulatory change is supposed to improve the rules of the game and level the playing field. Actors in the same industry facing the same regulatory change can experience diverging outcomes because they pursue distinct competitive strategies. The regulatory change made by the SEC resulted in a bias in favor of electronic trading venues such as the Nasdaq because the change allowed price comparison to omit quotes from the NYSE.

Before Reg. NMS, when brokers were required to compare quotes posted on different exchanges and send trades to the venue with the better quote, Nasdaq trades of NYSE-listed stocks would execute at the NYSE’s quote (or better). After Reg. NMS, the NYSE continued to use the manual process, matching orders where possible, but the Nasdaq began to transact at its own quotes rather than the NYSE’s. As a result, the spreads of NYSE-listed stocks that were traded on Nasdaq diverged from the spreads of the same stocks traded on NYSE.

We find empirical evidence that the gap in bid-ask spreads between the two stock exchanges diverged after the implementation of Reg. NMS. We analyze the Transaction and Quote (TAQ) data from the Center for Research in Security Prices (CRSP) and compare the gap before and after the regulatory change. Following the methodology commonly adopted in financial economics (e.g., Bessembinder and Kaufman 1997), we use a 30-day window before and after the implementation of Reg. NMS. As is typical in the analysis of financial events, the window size is chosen so that the effects of the event can be isolated from other large events that might occur within a longer time window. Also, we restrict our sample to 218 heavily traded NYSE-listed stocks so that shifts in trading volume during the event window, away from the NYSE to the Nasdaq, will not affect our estimation of the bid-ask spread gaps. If the share of trading shifts from the NYSE to the Nasdaq as predicted, the decrease in liquidity at the NYSE could cause spreads to increase. However, because “liquidity can obtain in fragmented trading, at least for the most active securities” (O'Hara 2004, 43), using only heavily traded stocks avoids the possibility of falling below a liquidity threshold.

1645) observe that, 'a question that is often raised is whether the U.S. practice wherein employees move back and forth between institutions and the firms they oversee (“revolving doors”) is effective or counterproductive (Dal Bó 2006). A hypothesis that has been often laid out is that the enforcement by the SEC is weak because many of the SEC employees today seek to make careers on Wall Street later, and hence they cannot be expected to enforce the laws too strictly. Threatening potential employers with jail time could scarcely be a smart career move.'
Using the daily TAQ data of the 218 stocks, we plot the difference between Nasdaq and NYSE bid-ask spreads before and after the implementation of the Reg. NMS (Figure 1). While the plot shows an average of the differences over 218 stocks, the gap between Nasdaq and NYSE appears to widen after Reg. NMS.

To assess whether the increase in spread gap is statistically significant, we use an elegant bid-ask spread estimator that is straightforward to calculate using the high and low sales prices for the day (Corwin and Schultz, 2012). We estimate the gap between Nasdaq and NYSE with the following regression:

\[
[S_{it,Nasdaq} - S_{it,NYSE}] = a_t + b_2After_t + e_{it}
\]

where the dependent variable, \(S_{it,Nasdaq} - S_{it,NYSE}\), is the difference in bid-ask spread at time \(t\) for stock \(i\) traded on both the Nasdaq and the NYSE. \(After_t\), which is our proxy of Nasdaq’s influence strategy, is 1, if time \(t\) is after Reg. NMS implementation. As reported in Table 2, the estimated coefficient of \(After_t\) is 0.035 (p-value=0.000), which means the gap between Nasdaq and NYSE in bid-ask spreads widened after Reg. NMS implementation.

To put the size of the estimated effect into perspective, we calculate the percentage increase of the gap. The estimated constant term, \(a_t\), is 0.022 cents (p-value = 0.000). So, before Reg. NMS, the gap between the two stock exchanges was 0.022 cents, suggesting that the bid-ask spreads at the Nasdaq were wider. This is likely because the NYSE frequently matched orders inside the quotes, resulting in narrower realized spreads. The same stock had different bid-ask spreads when the stock was traded at different exchanges. The larger the spread, the greater the profit for the Nasdaq broker-dealers, but the worse the price for the investors. This outcome violates the economic “law of one price”, in which identical goods are sold at the same price. After Reg. NMS, the gap between the two stock exchanges in their bid-ask spreads increased to \([0.022 + 0.035] = 0.057\) cents, widening by 160%, as shown in Figure 2. The widening gap is a consequence of the interaction between Nasdaq’s competitive strategy and its influence strategy. The regulatory change lobbied by the Nasdaq favored the Nasdaq, which used automated quotes, but hurt the NYSE, which matched orders manually.

----- INSERT TABLE 2 AND FIGURE 2 ABOUT HERE -----
Social Outcomes of Competitive and Influence Strategies. The interaction between Nasdaq’s competitive strategy and its influence strategy subsequently led to a degradation of the quality of the market for stock trading. The quality of the market has degraded in the sense that the NYSE’s share in trading volume of the NYSE-listed stocks has declined. Trades of NYSE-listed firms were increasingly routed to the Nasdaq, but the trades executed by the Nasdaq used prices that were worse for investors than those executed by the NYSE. A persistent decline in the NYSE’s share in trading volume suggests that the market degraded for a long period of time, as shown in Figure 3 from more than 80% to below 40% over the time period of 2004-2011.

----- INSERT FIGURE 3 ABOUT HERE -----  

The regulatory change led not only to a rapid decline in the NYSE’s share in the trading volume of the NYSE-listed stocks, but also a decline in the average trade size as investors had to search across trading venues to fill larger orders at the best possible prices (Arnuk and Saluzzi, 2012). In addition, Reg. NMS allowed a shift in trading of NYSE-listed stocks to the Nasdaq and other electronic exchanges, making even formerly stable, blue chip stocks subject to the same volatility as Nasdaq stocks. Before Reg. NMS, the unpredictability of high-frequency trading practices would not have affected NYSE-listed stocks because those stocks would have traded primarily on the NYSE, which uses the manual process described above. Furthermore, the price volatility of higher spreads harmed the listing firms that seek capital. Indeed, some have argued that the price instability generated by trading activity has caused firms to avoid initial public offerings (Driebusch and Gage, 2016).

The U.S. stock market was an efficient market but declined as a result of the interaction between Nasdaq’s competitive strategy and its influence strategy. Reg. NMS changed the rules of the game in far-reaching ways, ultimately degrading the functioning of the market. Market degradation weakens rivals like the NYSE but hurts the broader investing public, including both investors and listing firms.

Propositions Derived from the Empirical Evidence. We derive two proposition based on our empirical study on the U.S. stock exchanges. Highlighting an incomplete institution where the institutional costs are symmetric for all, the first proposition submits that the same regulatory change can lead to diverging outcomes for firms with distinct competitive strategies. The effect of the same regulatory change on firm performance is unequal. The complementarity in competitive and influence strategies is associated with more private gains. While the regulatory change benefits the rent-seeker, it degrades markets for all, as submitted in our second proposition.
Proposition 1: The complementarity in the competitive and influence strategies of a firm increases the firm’s private gains. While a rule change results from a firm’s influence strategy, the effect on firm performance of the rule change depends on the firm’s competitive strategy.

Proposition 2: The complementarity in the competitive and influence strategies of a firm has a negative impact on social welfare, affecting stakeholders. While a rule change results from a firm’s influence strategy, the effect on social welfare of the rule change may worsen because of the firm’s competitive strategy.

Discussion and Conclusion

Our empirical study of the US stock exchanges demonstrates that substantial degradation in the quality of the market can happen in a developed economy with stable institutions and a well-intentioned regulator. The complementarity in competitive strategy and influence strategy—and the consequences of influence rent seeking—seems to have been well understood by the Nasdaq, but not by the SEC.

Rather, the SEC failed to appreciate the difference in competitive strategy between the NYSE and Nasdaq, and hence the consequences of a change to the rules of the game. Nasdaq’s influence strategy was to appeal to the SEC on the basis of competition and technological progress, offering investors fast, electronic trades transacted at a displayed price to replace slower, manually satisfied trades transacted at an estimated price. Unlike industries in which competitors pursue similar strategies, the stock trading industry had two rivals competing with distinct strategies. The NYSE competed by solving the lemons problem of information asymmetry whereas the Nasdaq competed by heightening the problem. Yet, only the Nasdaq stood to benefit from a regulatory change favoring automated quotes, because automated quotes were a key part of Nasdaq’s competitive strategy.

The Nasdaq appealed to SEC’s deeply held conviction that competition for market services would make markets more efficient. The regulatory change indeed dented the near-monopoly that the NYSE had long held in the trading of NYSE-listed stocks. However, the decline in the NYSE’s share in trading volume of the NYSE-listed stocks, as we show in the case study, is, unfortunately, a negative outcome in social welfare. The regulatory change degraded the quality of the market for all, while benefiting the rent-seeker with influence rents.

Limitations

A single empirical case study has limitations in terms of generality and applicability, and our case study is no exception. For example, the market we study consists of just two firms that, together, list and trade all
publicly traded stocks in the U. S. This makes for a simple, tractable analysis in which two firms pursue opposing strategies. Other markets are likely more complex or nuanced. Our analysis is also straightforward in terms of the regulator, which is a single, long-standing entity known for integrity. Other important settings would certainly involve a mix of regulatory bodies and some possibility of capture. In short, the components of the theory that we bring together in our study—competitive strategy within an industry and opportunities for achieving influence rents—would likely vary considerably in other settings.

**Theoretical Implications**

The central thesis of our work focuses on the complementarity in competitive (market) strategies and influence (nonmarket) strategies, and the possible deleterious consequences of such complementarity. The thesis has implications for the endogenization of institutional structure and functioning. As observed by North (1990), an institution may begin as incomplete, but become captured, as firms succeed at shaping the institution in their favor. Adding to the general insight, the first proposition derived from our empirical study suggests that firms may use influence strategies to transform an incomplete institution. While the literature on nonmarket strategies suggests the use of coalition strategies in incomplete institutions where institutional costs are symmetric and all parties have the incentive to collaborate in filling gaps in the existing institutional structures that hinder them equally, we find the complementary use of influence strategies and competitive strategies by a firm, which turns the institutional costs asymmetric. The asymmetry in institutional costs does not necessarily mean that the regulator is corrupt. In fact, in the case of the U.S. stock exchanges, the unequal private gains and the negative social impact were not the intentions of the SEC. Yet, a technological innovation in automated price quotes for stock trading that initially promised to improve market efficiency ended up harming the interests of the investing public, which the SEC is created to protect. This finding adds to the scant empirical evidence on the performance implications of influence rent seeking, as we build on an institution-based view of strategy and highlight the complementarity in competitive and influence strategies.

The complementarity in competitive and influence strategies also adds to the stream of literature that shows firms with better resources and capabilities are more likely to transform institutions (Boddewyn and Brewer, 1994; Henisz and Zelner, 2003; Sawant, 2012). Firm size, age, diversification, and slack are associated with credibility and bargaining power, and thus the ease of influencing political actors (Hillman and Hitt, 1999; Hillman et al., 2004). A strong record of social responsibility is associated with legitimacy perceived by political actors, and thus the reduction of costs in effecting institutional change (Werner, 2015). In the case of the Nasdaq, its influence strategy led to a regulatory change because of the firm’s capabilities in convincing the SEC with the relevant information of the need for
modifying rules. More importantly, its influence strategy achieved influence rent because of the firm’s competitive strategy. The institutional costs became lower for the competitive strategy that benefited from automated price quotes, but higher for the one that relied on manual price matching. Using a firm’s competitive strategy to create an asymmetry in institutional costs is a novel addition to the literature, which has shown the asymmetry typically arising through lobbying for protective trade policies (Bonardi, 2004; Schuler, 1996) and regulatory barriers to competition (Dean and Brown, 1995; Maijoor and Witteloostuijn, 1996; McWilliams, Van Fleet, and Cory, 2002).

Policy Implications

The possible deleterious consequences of the complementarity in influence and competitive strategies have two policy implications. First, the complementarity negatively affected the performance of the rival that didn’t pursue an influence strategy or a political contestation. In the case of the NYSE, no countervailing strategy was attempted to reverse the SEC’s regulatory change. This is surprising because political contestation by the negatively affected party would provide the checks and balances, and this is one reason why the research seeking to assess the average effect of influence strategies on firm performance is inconclusive (Hadani and Schuler, 2013). Yet, the shift in trading volume from the NYSE to the Nasdaq was persistent, lasting many years beyond the window of the financial event study. The policy implication is the puzzle about the NYSE’s response and what the SEC can do about it. As mentioned earlier, the NYSE competed by solving the lemons problem of information asymmetry whereas the Nasdaq competed by heightening the problem. Why didn’t the NYSE appeal to the SEC, as a countervailing strategy, on the ground of solving the lemons problem of information asymmetry?

The second policy implication is the puzzle about the SEC’s unintended consequences. The regulator didn’t intend to prioritize the interests of the lobbying party over the interests of the public. Inadvertently, however, the investors as well as the listing firms ended up paying a higher price as a result of the regulatory change for trading their stocks when they use the Nasdaq. Despite the higher prices, the trading volume at the Nasdaq continued to surge, leaving the NYSE with less than half of the market share, and changing the industry structure. What can the SEC do to avoid unintended deleterious consequences like this?

References


NYSE Group, 2006, Proxy Statement of NYSE Group, Propsectus of NYSE Euronext, Inc., November, Schedule 14A filed with SEC.


<table>
<thead>
<tr>
<th>Features</th>
<th>Nasdaq</th>
<th>NYSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Broker-dealers</td>
<td>Underwriters</td>
</tr>
<tr>
<td>Profit model</td>
<td>Members facilitate investor trades. Buy low from sellers, sell high to buyers; “bid-ask spread” = high price-low price</td>
<td>Members charge firms a fee (usually a percentage of capital raised) for underwriting a stock offering.</td>
</tr>
<tr>
<td>Listing requirements</td>
<td>Originally, as an over-the-counter market, there were no listing requirements. Now, listing requirements are set by SEC.</td>
<td>Restrictive listing requirements. The NYSE can reject listing firms even if they meet the requirements.</td>
</tr>
<tr>
<td>Trading mechanism</td>
<td>A “dealer mechanism”, with dealers buying from and selling to investors.</td>
<td>An “auction mechanism” that batches orders, then matches buyers with sellers, and satisfies unmatched orders at a price “close to” last price.</td>
</tr>
<tr>
<td>Mechanism implementation</td>
<td>The listing firm identifies three or more competing market-makers who offer to trade its stock, but are not obligated to buy or sell.</td>
<td>NYSE hires and stringently regulates a monopoly specialist to handle all trades of a stock and to serve as buyer or seller of last resort.</td>
</tr>
<tr>
<td>Market outcome</td>
<td>Fragmented trading, higher volatility and spreads.</td>
<td>Orderly trading, lower spreads.</td>
</tr>
</tbody>
</table>
Table 2: Estimated Effect of Regulatory Change on the Spread Differential between the Two Stock Exchanges (Nasdaq spread – NYSE spread)*100 (cents)

Sample: 218 heavily traded NYSE-listed stocks

<table>
<thead>
<tr>
<th>Dependent Variable = Nasdaq spread – NYSE spread</th>
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<tbody>
<tr>
<td>After</td>
</tr>
<tr>
<td>0.035***</td>
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<tr>
<td>(0.007)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>0.022***</td>
</tr>
<tr>
<td>(0.004)</td>
</tr>
<tr>
<td>R2 (within)</td>
</tr>
<tr>
<td>0.002</td>
</tr>
<tr>
<td>R2 (overall)</td>
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<tr>
<td>0.002</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>13,080</td>
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</tbody>
</table>

(Standard errors are reported in parentheses)

Figure 1: Daily Gaps between Nasdaq and NYSE in Bid-Ask Spreads (cents) Before and After the Implementation of Regulation National Market System (Reg. NMS)

Day 0 = July 9, 2007
Institutions, Markets, and Influence Rents: Innovation and the U.S. Stock Exchanges

Figure 2: The Gap between the Two Stock Exchanges in their Bid-Ask Spreads Widened after the Implementation of Regulation National Market System (Reg. NMS)

![Graph showing the gap between Nasdaq and NYSE after the implementation of Reg. NMS](image_url)

The Gap between Nasdaq and NYSE Widened After the "Best Price Rule" was relaxed

<table>
<thead>
<tr>
<th></th>
<th>Before the implementation of Reg. NMS</th>
<th>After the implementation of Reg. NMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasdaq spread - NYSE spread</td>
<td>0.022</td>
<td>0.057</td>
</tr>
</tbody>
</table>

Figure 3: The Share of NYSE’s Trading Volume of NYSE-listed Stocks Declined, 2004-2011
(Source: NYSE)

![Graph showing the share of NYSE's trading volume](image_url)

Volume (NYSE) | Volume (total) | Share on NYSE

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