STOCK-MARKET LAW AND THE ACCURACY OF PUBLIC COMPANIES’ STOCK PRICES

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It is well understood that when public companies’ stock prices are more accurate, corporations are better governed and capital is allocated more efficiently—thereby increasing social welfare. But many believe that those who produce accurate stock prices are unable to capture the full benefits of their efforts, meaning that market forces alone will fail to generate an optimal level of stock-price accuracy. For these reasons, scholars and lawmakers have examined the extent to which securities law can and should be used to enhance price accuracy. Indeed, improving price accuracy is thought to be one of the principal aims of the corporate disclosure, fraud, and insider-trading laws that compose the traditional core of securities law. Yet very little attention has been given to the effect of stock-market law—that is, the law that governs the markets in which stocks are traded—on stock-price accuracy.

This Article examines a set of stock-market laws that dictates how stocks are traded in the contemporary stock market. The Article shows that these rules affect the level of price accuracy that the market generates, and argues that stock-market law can be modified to increase that level. Accordingly, it provides a framework to help regulators determine whether using this previously unidentified way to improve price accuracy is socially desirable.

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INTRODUCTION

It is widely believed that society is better off when the prices of public-company stocks are more accurate. When these prices more accurately reflect firms' actual values, the argument goes, the agency costs associated with the separation of corporate ownership and control are reduced and society is more likely to allocate its scarce capital in an economically efficient manner—thereby generating more wealth. But many believe that those who produce accurate stock prices are unable to capture the full benefits of their work—so that market forces alone will not generate the socially optimal level of stock-price accuracy. Scholars and regulators have therefore examined how securities law can enhance stock-price accuracy. Yet, these efforts have overwhelmingly focused on the disclosure, fraud, and insider-trading rules that make up the conventional core of securities regulation—all of which center on the firms that issue stocks as well as those with whom they are affiliated. And, very little attention has been given to whether stock-market law—that is, the law that governs the market in which stocks are traded—influences the accuracy of public companies' stock prices.

This Article examines the securities laws that govern contemporary stock trading. More specifically, it looks at a set of stock-market rules that requires exchanges to remain open to all traders, but allows off-exchange trading platforms to determine which traders can and cannot access them. The Article shows that these rules result in the market generating a lower level of stock-price accuracy than it otherwise might—and argues that stock-market law can therefore be modified to enhance the production of accurate stock prices. Accordingly, the Article offers changes to stock-market law that may well result in the market generating a higher level of stock-price accuracy as well as the real-economy benefits that generally flow from it—and provides a framework to help lawmakers determine whether those alterations are socially desirable.

The activity of informed traders is widely thought to confer a valuable benefit on society by improving the accuracy of stock prices. These traders are those—such as sophisticated banks, hedge funds, and private equity funds—who buy and sell stocks based on information about a company's

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1 See Regulation National Market System Rule 610(a), 17 C.F.R. § 242.610(a) (2005) (prohibiting “national securities exchange[s] [from] . . . prevent[ing] or inhibit[ing] any person from obtaining efficient access” to the offers to buy and sell stocks that are posted on the exchanges).

2 See Regulation Alternative Trading System Rule 301(b)(5), 17 C.F.R. § 242.301(b)(5) (1997); Concept Release on Equity Market Structure, Exchange Act Release No. 34-61358, 17 C.F.R. § 242, at 72 (“As [trading systems] that are exempt from exchange registration, [off-exchange trading platforms] are not required to provide fair access [to all traders] unless they reach a 5% trading volume threshold in a stock, which none currently do[es]” and that “[a]s a result, access to . . . [these platforms] . . . is determined primarily by private negotiation.”).
actual value that has not yet been incorporated into market prices. They seek to profit by using their superior information to buy underpriced stocks or sell overpriced ones. And as a byproduct of this profit-motivated trading, they help generate stock prices that are more accurate—and the social benefits that arise out of them. For these reasons, and because of the concern that these traders’ profits alone will not reflect the full benefits to which their price-correcting trading leads, much of securities regulation is thought to be justified by the desire to encourage informed traders to engage in their valuable work.\(^3\)

Yet the securities laws that dictate which trading platforms can and cannot discriminate among traders leads informed traders to be less incentivized to conduct their work. This set of stock-market laws provides off-exchange platforms with the legal ability to exclude certain traders. And, these platforms use this ability to target uninformed traders—like retail investors and index-driven mutual funds—and exclude informed ones. Further, the ability to exclude leads the platforms to provide services that are—relative to those provided by exchanges—less attractive to informed traders. For these reasons, off-exchange trading—trading that now composes almost 40% of all reported transactions—is theoretically dominated by uninformed traders. And, by necessity, exchange trading—trading that makes up the remaining 60% or so of all transactions—is therefore associated with a higher ratio of informed traders to uninformed ones than it otherwise might. Other investors who trade on exchanges—namely, those who operate businesses that provide liquidity services by allowing all other traders to buy and sell stock on demand—fear the impact of this higher proportion of informed trading because of the losses that they will no doubt incur to informed traders. As a result, they seek to minimize those losses, and they do so by altering the prices that they provide on exchanges—chiefly, by posting inferior ones. Facing these altered prices, informed traders have fewer profitable trading opportunities. Accordingly, their motivation to produce and impound information into stocks’ prices—that is, their incentive to improve stock-price accuracy—is less strong than it otherwise might be, and stock prices are therefore less accurate than they otherwise might be. Stock-market law can of course intervene to—at a minimum—lower the ratio of informed traders to uninformed ones on exchanges. Thus, there is reason to believe

\(^3\) See, e.g., Zohar Goshen and Gideon Parchomovsky, The Essential Role of Securities Regulation, 55 Duke L. J. 712, 715 (2006) (asserting that the essential role of “securities regulation is . . . to facilitate and protect the work of inform[ed] traders.”).
that changes to stock-market law would improve the accuracy of public companies’ stock prices.

For these reasons, lawmakers concerned about the accuracy of public companies’ stock prices should consider reforms to stock-market law that are likely to bring about enhanced price accuracy. After all, there is reason to believe that the law could intervene in several ways to encourage exchange liquidity providers to alter their prices in a manner that provides informed traders with more profitable trading opportunities—and therefore more reason to engage in their price-correcting work. For example, a mandate that all stock trading take place through exchanges would give liquidity providers comfort that exchanges will have a far lower ratio of informed traders to uninformed ones—and would therefore presumably lead them to provide informed traders with prices that are, among other things, superior. Or, altering stock-market law to impose a fee on public companies to fund the traders that provide liquidity services in their stocks would very likely accomplish the same end. Accordingly, stock-market law presents regulators with a previously unappreciated mechanism for achieving one of the principal goals of securities regulation: enhancing stock-price accuracy.

To be sure, it is possible society is currently producing the socially optimal level—or even too high a level—of stock-price accuracy. After all, a significant body of existing securities regulation—including the rules that require firm disclosure and those that prohibit fraud and insider trading—already pursues that objective. To the extent that the proposals examined here fail to generate welfare benefits—namely, those arising out of yet higher levels of price accuracy—that justify the costs necessary to achieve them, they should of course not be pursued. Nevertheless, there is good reason to think that changes to stock-market rules are warranted. For one thing, the costs associated with at least the exchange-trading mandate envisioned here is likely far smaller than policymakers might suppose. Perhaps more importantly, however, even if markets currently produce a perfectly optimal level—or too high a level—of stock-price accuracy, changes to stock-market law may enable regulators to achieve that level at a lower cost than the current one associated with the extensive and burdensome rules that make up the existing core of securities regulation.

The remainder of this Article proceeds as follows. Part I provides background on the production of accurate stock prices. Part II examines contemporary stock trading and how it is influenced by the stock-market
rules examined here. Part III explores the implications of that influence on
the level of stock-price accuracy generated by society, argues that
lawmakers can modify stock-market law to improve price accuracy and
should consider doing so, and provides a framework that will enable them
to determine whether those modifications are socially desirable.

I. THE ACCURACY OF STOCK PRICES

Stocks have actual values, and their market prices reflect those values
with varying levels of accuracy. Moreover, these prices are thought to
become more accurate when informed traders generate and use actual-
value information to purchase stocks that they believe are underpriced and
sell ones that they think are overpriced. And scholars have encouraged
lawmakers to value this price-correcting work because when stock prices
better reflect their actual values, they contend, society reduces corporate
agency costs and improves the economic efficiency with which it allocates
its scarce capital—thereby increasing social welfare.

Section A describes the notion of “accurate” stock pricing. Section B
then provides an overview of the process in which actual-value
information is produced and incorporated into stock prices, thereby
increasing their accuracy. Lastly, Section C reviews the scholarly
consensus as to the social benefits that result when stock prices are
increasingly accurate.

A. The Concept of “Accurate” Stock Prices

Despite common conceptions, stocks have actual values: at any given
time, they are worth the present value of the future cash flows that their
holders will receive. For example, if the holder of a share of stock who
will hold the share over the stock’s lifetime expects to be entitled to a total
of three payments of $3.33, then—without considering the time value of

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4 See, e.g., Merritt B. Fox, Shelf Registration, Integrated Disclosure, and
Underwriter Due Diligence: An Economic Analysis, 70 VA. L. REV. 1005, 1013-14
(1984) (discussing the concept of a stock’s actual value); Marcel Kahan, Securities Laws
and the Social Cost of “Inaccurate” Stock Prices, 41 DUKE L. J. 977 (1992) (defining the
closely related concept of a stock’s fundamental value as “the best estimate at any time,
and given all information available at such time, of the discounted value of all
distributions (such as dividends, liquidation, and merger distributions) accruing to a
stockholder who continues to hold the stock.”).
money and the risk associated with anticipated cash flows down the line—the stock’s actual value is more or less $10 per share.

Stocks’ market prices may of course reflect these actual values to varying degrees. When those prices are closer to actual values, they have a higher degree of accuracy. Conversely, when they are farther from those values, they have a lower degree of accuracy. For example, if the market’s assessment of the stock’s value from the above example was $10 per share, it would be accurately priced. If it was instead $11 per share, it would be inaccurately priced—and if it was instead $12 per share, it would be even more inaccurately priced.

Notably, stock prices are inherently susceptible to inaccuracy. Ex ante, humans can only imperfectly estimate the amount of future cash flows to which an owner of stock will be entitled, the timing of those cash flows, the risks associated with them, and more. Nevertheless, when they have more and better information about these determinants of stocks’ actual values, they are better able to predict those values. Thus, the degree to which stock-market prices provide an accurate assessment of actual values—that is, the level of stock-price accuracy—is a function of the amount and quality of information about stocks’ future cash flows and the present values of those cash flows that is produced and incorporated into stock prices.

B. The Production of Accurate Stock Prices

The production of accurate stock prices is commonly thought to depend on—among other things—the amount and quality of information about stocks’ actual values that is produced by informed traders and their affiliates. Informed traders—such as some subset of the universe of investment banks, hedge funds, private equity funds, and actively

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5 See, e.g., Fox, supra note 4, at 1013 (“A [security’s] price is relatively accurate if it is relatively close, whether above or below, to [the] security’s actual value. When a price has a high expected accuracy, on average the deviation of the price from the actual value is small.”).

6 See id. at 1013 (“The ‘actual value’ of a security at a given point in time . . . cannot be determined until some point in the future, after the security has paid out its last distribution. . . . In the case of a share of common stock, that future point would be after the date of the issuer’s dissolution.”); id. at 1010 n.16 (“A real world investor, using the imperfect knowledge available to him must guess what its actual value is.”).
managed mutual funds—are those that buy and sell stocks based on information as to their actual values that is not yet incorporated into their market prices.\(^7\) These market participants are incentivized to produce more and better actual-value information because they are often able to use it to earn trading profits.\(^8\) More precisely, they are motivated to produce information that indicates that the market has inaccurately priced a stock because they can use that information to buy stocks that are priced inaccurately low or sell stocks that are priced inaccurately high.\(^9\) And, when they use their information to buy an underpriced stock or sell an overpriced one in sufficient quantities, they place enough upward or downward pressure, respectively, on its market price to cause that price to better reflect their information.\(^10\) Thus, stock prices become increasingly accurate as a byproduct of informed traders’ profit-motivated trading.

It is important to note that informed traders will only invest in the production of information as to stocks’ actual values and impound it into their prices if they expect to earn revenues that exceed their costs. The main source of informed-trader revenue comes in the form of trading profits. As such, the more revenue these traders expect to earn via profitable trades, the higher their incentive to produce actual-value information and impound it into market prices. And conversely, the less such revenue they expect to garner, the lower that information production-and-incorporation incentive. Accordingly, the extent to which stock prices will be accurate is significantly determined by the amount of trading profits that informed traders expect to realize.

C. The Social Benefits of Accurate Stock Prices

For some time, securities law scholars have contended that when stocks’ market prices are closer to their actual values, society governs

\(^7\) See generally infra Part II.A. (describing the three broad types of stock traders).

\(^8\) See generally RICHARD A. BREALEY, STEWART C. MYERS, & FRANKLIN ALLEN, PRINCIPLES OF CORPORATE FINANCE 38 (11th ed. 2013); Goshen & Parchomovsky, supra note 3, at 714.

\(^9\) See Goshen & Parchomovsky, supra note 3, at 726 ("[I]nformed traders detect discrepancies between [a stock’s] value and [current market] price based on the information they possess. They then trade to capture the value of their informational advantage.").

corporations and allocates capital in a manner that generates higher overall levels of wealth.\textsuperscript{11}

1. Corporate Governance

Conventional economic theory asserts that society generates more wealth when—assuming that externalities are controlled—publicly traded corporations maximize their own values. Economists reason that firms’ maximize their values when they maximize their profits; that firm revenues are a measure of the wealth they add to society; their costs are an indicator of the wealth they take away from society; and firm profits—that is, their higher revenues minus their lower costs—therefore represent the net wealth gains they provide to society. Accordingly, members of society want firms to maximize their values so that society has more wealth—wealth that it may ultimate distribute as it sees fit.

Shareholders also want the firms they own to maximize their own values. Indeed, value maximization—which maximizes shareholder investment returns—is generally the only goal on which the long line of diverse shareholders of publicly traded companies can find common ground.\textsuperscript{12}

However, for the overwhelming majority of public firms, the main decisions that determine whether or not the firm will in fact maximize its profits fall not within the domain of society or shareholders, but within that of corporate managers—agents whose interests often diverge from those of their shareholder principals. As a result of this conflict, both society and shareholders suffer wealth losses in the form of well-known corporate agency costs—costs that generally arise out of managers failing to further the social and shareholder goal of maximizing firm values.\textsuperscript{13}

\textsuperscript{11} See, e.g., Fox, supra note 4, at 1013-14 (discussing the social benefits of enhanced stock-price accuracy).

\textsuperscript{12} Brealey, Myers, & Allen, supra note 8 ("[S]tockholders can all agree on the goal of value maximization.").

\textsuperscript{13} See, e.g., Adolf Berle, Jr. & Gardiner C. Means, The Modern Corporation and Private Property (1932) (providing the seminal articulation of the agency problem that flows from the separation of ownership from control in publicly traded corporations). These agency costs are also composed of the wealth losses attributable to those costs incurred by society and shareholders associated with monitoring and constraining managers. See Brealey, Myers, & Allen, supra note 8, at 13.
Reducing corporate agency costs is one of the principal aims of modern corporate law. Toward that end, corporate law has generated a wide range of agency-cost-reducing governance devices. Traditional governance devices include those relating to board supervision, shareholder voting, and fiduciary duties. The supervision of management by a board with independent directors—which is required by SEC-approved exchange listing requirements for most publicly traded firms—reduces these costs by ensuring that a small group of individuals can better monitor (and increase) the extent to which managers are maximizing firm profits on shareholders’ behalf. The right to vote on the election of directors and a variety of other firm decisions—a franchise that is conferred by state corporate law—ensures that shareholders will have some degree of control over the extent to which the firms they own maximize their values. Lastly, fiduciary duties—also instituted by state corporate law—are imposed on managers, thereby reducing agency costs by legally obligating managers to work with both care for, and loyalty to, shareholders and their firm-value-maximizing interests.

Corporate law has also facilitated the reduction in agency costs via blockholder activism and stock compensation. Blockholder activism—that is, the situation in which outside traders acquire significant blocks of a company’s stock so that they have both the economic incentive and the power to influence corporate management—takes place within a highly regulated legal framework. Such activism is thought to reduce agency costs because blockholders—large shareholders whose profit margins increase when the profit margins of the firms they target increase—are financially incentivized to take actions to reign in agency costs. Stock compensation—that is, pay for managers in the form of company stock and related forms rather than cash—has also been highly influenced by the law. This form of compensation is thought to reduce agency costs because with their fortunes tied to those of the firm owners and society, managers

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are encouraged to place the goal of firm value maximization over competing personal goals.\textsuperscript{17}

The effectiveness of all of these agency-cost-reducing devices, however, is widely thought to depend on the extent to which stock prices are accurate. For the boards and shareholders that wield corporate-governance devices, increasingly accurate stock prices are believed to better communicate the extent to which management is in fact maximizing firm profits.\textsuperscript{18} For this reason, scholars teach that when boards and shareholders can rely on these prices for such information, they can better use corporate-law tools to reduce agency costs. For example, stock prices that are accurately high relative to a firm’s book value or relative to the stock prices of similarly situated firms communicate to boards and shareholders that management is better maximizing firm value, while prices that are accurately low relative to these measures signal the opposite. Further, higher levels of stock-price accuracy also improve the functioning of effective blockholder activism and stock-based compensation. For example, when stocks’ prices better reflect their actual values, managers place a higher value on company stock, thereby reducing agency costs by allowing firms to compensate managers with interest-aligning stock in lieu of straight salary—and doing so without having to pay excessive premiums to get the managers to accept compensation in this riskier form.\textsuperscript{19} Thus, scholars generally agree that when public companies’ stocks are more accurately priced by the market, boards and shareholders are better able to use a variety of corporate-governance devices to reduce agency costs—thereby leading society to produce more wealth.

2. Capital Allocation

Conventional economic theory also holds that society generates more wealth when it allocates its scarce capital in an economically efficient

\textsuperscript{17} See generally Steven Shavell, Risk Sharing and Incentives in the Principal and Agent Relationship, 10 Bell J. Econ. 55 (1979); Michael C. Jensen & William H. Meckling, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, 3 J. Fin. Econ. 305, 308-10 (1976).

\textsuperscript{18} See, e.g., HARRIS, supra note 10, at 211 (“Informative stock prices provide shareholders with useful information about how well their managers are performing.”).

\textsuperscript{19} See Fox, supra note 4, at 1022 (“The higher the expected accuracy of a firm’s share price, [the less risk it poses to a manager and therefore] the more willing a manager will be for a large portion of his compensation package to be share price based.”).
manner—that is, when it allocates a larger amount of capital to more promising endeavors and a smaller amount to less promising ones. Scholars assert that when stocks’ prices more accurately reflect the actual value of the cash flows to which their holders will be entitled, firms with superior projects are able to access more of society’s capital than they otherwise might, and those with inferior ones are only able to access less of it. When stocks’ prices are accurate, these scholars reason, companies with larger expected profits have—all else equal—higher prices than those with smaller ones. As a result, they have a lower cost of capital—because, for example, they can sell a given portion of their company in exchange for a larger amount of money. They therefore are able to access more capital to pursue their superior projects. Likewise, when stocks’ prices are accurate, firms with smaller expected profits have—all else equal—lower stock prices than those with superior ones. As a result, they have a higher cost of capital because, for example, they are only able to trade ownership rights to a given portion of their company for a smaller amount of money. As a result, they are able only to access less of society’s capital to pursue those inferior projects. Accordingly, when stocks’ prices are accurate, firms with superior prospects—that is, those with higher actual values—will generally draw more capital and firms with inferior ones—that is, those with expected future cash flows that have a lower present value—will draw less.

Of course, these scholars also assert that the reverse is true when stock prices are relatively less accurate. Stock prices that do not accurately reflect firms’ fundamental values can lead companies with superior prospects to nevertheless have difficulty raising enough capital to pursue their projects and the associated superior returns. They can also lead those with inferior projects to be able to raise more capital than society should allocate to their projects and the associated inferior returns. Accordingly, these scholars teach that inaccurate stock prices lead society to allocate capital less efficiently than it would if those prices more precisely reflected their fundamental values.21

20 See generally Friedrich Hayek, The Use of Knowledge in Society, 35 THE AMERICAN ECON. REV. 519 (1945); see also Goshen & Parchomovsky, supra note 3, at 720 (“Accurate pricing is essential for achieving efficient allocation of resources in the economy.”).
21 See, e.g., Fox, supra note 4, at 1017 (“If the market prices of securities are inaccurate, a misallocation of resources for real investment can occur.”).
Lastly, higher stock-price accuracy is thought to increase—and lower stock-price accuracy is thought to decrease—the extent to which society allocates its capital efficiently in another way. The predominant source of funds for new real investment in the economy is internally generated firm capital, and the biggest effect of poor corporate governance is the misuse of this capital. When stock prices are accurate, boards and shareholders are better able to use corporate-governance tools discussed in the immediately preceding Section to limit the extent to which managers misuse these funds. Thus, the corporate-governance benefits of enhanced stock-price accuracy are also thought to improve the efficiency with which society allocates its scarce capital.

This initial Part has recited consensus views relating to accurate stock pricing. These broadly accepted understandings motivate a large amount of securities law and commentary. However, those laws center on corporate stock issuers and those with whom they are affiliated. And, the likely ability of regulators to improve stock-price accuracy by altering the law governing the market in which stocks are traded has gone undetected. In building to the conclusion that there is strong reason to believe that regulators can improve stock-price accuracy by reforming stock-market law, Part II examines trading in the contemporary stock market—and shows how the set of stock-market rules examined here affects it.

II. TRADING IN THE CONTEMPORARY STOCK MARKET

Through the end of the twentieth century, the overwhelming majority of all public-company trading took place on the floor of the New York Stock Exchange. 22 However, enormous changes in the industrial organization of the stock market have resulted in trading in the market for exchange-listed public-company stocks now occurring almost entirely

22 The NYSE was able to maintain its dominance throughout that century, in part, by prohibiting its members from trading stocks anywhere else. See New York Stock Exchange Rule 390. Securities professionals would have faced serious impediments to conducting a successful stock-trading business should they be barred from trading on the dominant exchange. The extent to which exchange-listed stocks were traded away from the Big Board was therefore limited in terms of both its sophistication and scope. However, in 1979, the SEC prohibited exchanges from preventing their members from transacting at other exchanges. And, in 2002, in the face of mounting SEC pressure, the NYSE repealed its member-limitation rule altogether—paving the way for the emergence of robust off-exchange competition from highly sophisticated off-exchange trading platforms. The SEC now proscribes exchanges from restricting where their members transact. See Securities Exchange Act Rule 19c-3, 17 C.F.R. § 240.19c-3.
through two types of electronic trading platforms: exchanges, through which a little over 60% of all trading takes place, and off-exchange platforms, through which the other 40% occurs.23 The trading-platform access rules require exchanges to remain open to all traders, but allow off-exchange platforms to pick which traders can and cannot trade through their trading systems. The off-exchange platforms theoretically use their legal ability to discriminate among traders to target uninformed traders and exclude informed ones. And, the legal ability to restrict access also presumably leads these platforms to offer services that are—relative to those provided by exchanges—less attractive to informed traders. For these reasons, as a matter of theory, off-exchange trading is dominated by uninformed traders. And, because such a large amount of trading now goes through these platforms that are dominated by uninformed traders, trading at the exchanges involves a far higher ratio of informed traders to uninformed ones than it otherwise might.

Section A describes the universe of stock traders who buy and sell stocks in the contemporary stock market. Section B then details the two types of trading platforms through which almost all stock trading now occurs. Lastly, Section C describes how the trading-platform access rules alter stock trading at each of the two types of trading platforms.

A. Stock Traders

Those that buy and sell public-company stocks in the contemporary stock market can be broken down into three broad types: informed traders, uninformed traders, and professional liquidity-providing traders.24 Among other varying traits, each type trades stocks based on distinct motivations.

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24 This simplified description of stock traders draws from a fuller model described in a seminal treatise on market microstructure—a branch of economics focused on the
1. Informed Traders

Informed traders are the traders introduced earlier that produce accurate stock prices. Once again, these traders are those who purchase and sell stocks based on information as to companies’ actual values that is not yet reflected in their market prices. They specialize in using firm-specific and market-wide information to identify when stocks’ market prices are higher or lower than their actual values—buying when they encounter underpriced stocks and selling when they find overpriced ones.

This group of traders is composed of institutional traders, including some subset of the universe of investment banks, hedge funds, private equity funds, and actively managed mutual funds. It is also thought to be made up of some small subset of the universe of the individuals that buy and sell stocks through retail brokerage accounts.

Importantly, relative to uninformed traders, informed traders generally trade in and out of stocks frequently. On one end of the informed-trader spectrum, traders—such as a subset of “high-frequency” traders that is thought to be trading based on actual-value information—enter and exit positions with the help of computer algorithms within as little as two milliseconds. On the other end of the spectrum, traders—like private equity funds and activist hedge funds—hold stocks for much longer periods. However, even these longer-term informed traders generally enter and exit stock positions more frequently than uninformed traders do.

2. Uninformed Traders

In contrast to informed traders, uninformed traders are the market participants that buy and sell stocks for reasons other than those based on new actual-value information. Most commonly, they invest in stocks to store wealth for future consumption. As such, most of these market

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forces at play between buyers and sellers in markets—authored by a former Chief Economist of the SEC. See Harris, supra note 10. A more detailed description would delineate sub-types, and describe traders as operating to varying degrees across them.

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25 See generally supra Part I.B.

26 See Goshen & Parchomovsky, supra note 3, at 714.
participants’ trading is driven by the motivation to accumulate, adjust, or liquidate aspects of their desired portfolio of stocks.  

Like informed traders, uninformed ones come in the form of both individuals and institutions. With regard to the former, scholars, regulators, and the trading industry generally assume that the overwhelming majority of individual traders—commonly referred to as “retail” traders—do not trade on the basis of superior information.  

With regard to the latter, many institutional traders—such as index-driven mutual funds, pension funds, and insurance-companies—are also widely known to be pursuing diversified portfolios of securities and not trading based on unique new information about stocks’ underlying values.

Crucially, unlike informed traders, the majority of uninformed traders trades in and out of individual stocks only infrequently. Indeed, a large portion of uninformed traders is made up of what are often referred to as “buy and hold” investors—that is, investors that purchase a number of stocks for their stock portfolio, and then hold them over sustained periods of time more easily calculated by years or even decades than milliseconds or even months. For example, index-driven mutual funds often accumulate a diversified portfolio of stocks, trading only in a limited number of circumstances—such as when they add a newly listed stock to their investment portfolio.

3. Professional Liquidity-Providing Traders

Lastly, professional liquidity-providing traders are those that operate as intermediaries between other stock traders in a manner that allows those other traders to buy and sell in—at a minimum—a relatively quick timeframe. These professional traders typically maintain an inventory of shares for a large selection of public companies’ stocks that allows them

27 See generally HARRIS, supra note 10, at 177-78 (describing these traders’ wealth-storing motivation as well as a host of other extra-informational trading motivations).

28 See, e.g., Christine A. Parlour & Uday Rajan, Payment for Order Flow, 68 J. FIN. ECON. 379, 411 (2003) (“Retail[-investor] order flow is widely believed to be uninformed.”).

to supply their liquidity services. Thus, this third group of traders is
effectively the contemporary version of traditional market makers,
securities dealers, specialists, and the like that supplied liquidity services
to traders in far smaller numbers of stocks.

Professional liquidity providers supply their service to other traders by
executing their orders to buy and sell securities at, respectively, “ask” and
“bid” prices. The ask prices are those at which these professionals are
willing to sell stock from their inventories to those seeking to buy stock in
a relatively quick timeframe. As such, ask prices represent those at which
other traders can buy stock quickly. The bid prices are those at which
these traders are willing to buy stock for their inventories from traders
seeking to sell stock quickly. Bid prices therefore represent those at which
other traders can sell stock in a small timeframe. For example, if a
liquidity provider is executing traders’ buy orders at ask prices of $12 per
share and traders’ sell orders at bid prices of $8 per share, then an investor
can procure the stock by paying $12 per share to the liquidity provider, or
sell the stock by accepting $8 per share from the liquidity provider. 30

Critically, liquidity providers will not supply their services unless they
can earn revenues that outweigh their costs. Their main source of revenue
is derived from maintaining a spread between their bid prices and ask
prices—that is, these market participants are only willing to buy stock at
bid prices that are lower than the ask prices at which they are willing to
sell stock. This spread allows them to buy stock from trader sell orders at
their lower bid prices and sell stock to trader buy orders at their higher ask
prices, earning the difference between the two on each, in industry
parlance, “roundtrip” transaction. For example, if a liquidity provider buys
stock for its inventory of shares from a trader at its $8 per share bid price,
and then sells from that inventory to another trader at its $12 per share ask
price, then the liquidity provider makes $4 per share bought at $8 and sold
at $12. As such, the primary goal of those in the liquidity-provision
business is to determine the ask and bid prices that will allow them to
maintain a two-sided flow of trader sell and buy orders so that they can

30 For expositional reasons, I use whole-number examples of ask and bid prices. For
a more realistic description of these prices today, one may simply multiply the examples
that I use by .01, and then add some dollar amount. Thus, the example in the text would
involve an ask price of, say, $34.12, and a bid price of $34.08.
complete as many roundtrip transactions as possible.\textsuperscript{31} And for this reason, their trading motivations are very different from information-based ones of informed traders\textsuperscript{32} and the investment-based ones of uninformed traders.

Moreover, as a general matter, professional liquidity providers’ place their ask prices above the market’s current assessment of the stock’s actual value, and their bid prices below that market value—with each spaced out equidistantly from that value.\textsuperscript{33} For this reason, there is generally a difference between, on the one hand, the prices at which traders can purchase and sell stocks quickly and, on the other, the market’s valuation of those stocks. For example, if the market currently assesses a stock’s actual value to be $10 per share, liquidity providers might execute traders’ buy orders at their best (lowest) ask prices of $12 per share, and their sell orders at their best (highest) bid prices of $8 per share. The buyer therefore must pay $2 more than the stock’s current market value to procure the stock quickly, and the seller thus must be willing to accept $2 less than that value to sell in a small timeframe.

Notably, the size of the delta between the market’s assessment of a stock’s actual value and these ask and bid prices dictates the quality of the prices received by the traders that transact against them. Bid and ask prices that are closer to that market assessment are—from the traders’ perspective—superior, while such prices that are farther away from that market valuation are inferior. For example, traders that pay another liquidity providers’ $13-per-share ask price in the above example would receive an inferior price, and those that paid yet another one’s $11-per-share ask price would receive a superior one.

Professional liquidity providers thus provide traders with a valuable service: they allow them to transact in a relatively fast timeframe. However, the ability to trade quickly comes with a caveat: those that buy from liquidity providers must pay liquidity providers’ ask prices, and

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{31} See, e.g., HARRIS, supra note 10, at 401 ("[Liquidity providers] simply try to discover the prices that produce balanced two-sided order flows.")
\item \textsuperscript{32} See, e.g., id. at 277 ("[Liquidity providers] tend to . . . not know much about . . . the fundamental values of the instruments that they trade."); Goshen & Parchomovsky, supra note 3, at 725 ("[Liquidity providers] . . . do not invest as much time and effort in collecting and analyzing this information [as informed traders’ do].").
\item \textsuperscript{33} See HARRIS, supra note 10, at [\#32] ("[Liquidity providers] . . . set their bids below fundamental values and their offers above them.").
\end{itemize}
\end{footnotesize}
those that sell to them must accept their bid prices—prices that are, to some degree, inferior to current market-assessments of stocks’ actual values.

B. Stock Trading Platforms

Almost all stock trading today takes place at one of two types of highly sophisticated electronic trading platforms: exchange platforms and off-exchange ones. Each type features unique characteristics that determine how public-company stocks are traded.

1. Exchange Trading Platforms

Contemporary exchanges—such as the well-known New York Stock Exchange and NASDAQ Stock Market—are electronic trading systems that operate continuous auctions in which liquidity providers post legally binding price quotes. More precisely, these exchange liquidity providers post firm ask price quotes—which allow other traders to purchase stocks from them at the quoted price on demand. And they display binding bid price quotes—which permit other traders to sell stocks to them in return for the quoted price immediately with certainty. Indeed, traders today may submit immediately executable buy and sell orders to one or more exchanges simultaneously and expect to transact even large quantities of shares against liquidity-provider quotes in less than one millisecond—that is, in a tiny fraction of the time required for a blink of an eye.

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34 Traders are of course allowed to buy and sell stocks from each other without accessing a trading platform. However, because of the benefits of trading-platforms—including those relating to minimizing search costs and counterparty default—all but a small fraction of stock trading occurs through these platforms. See generally HARRIS, supra note 10, at 6.


36 Currently, there are 13 trading platforms that are registered as stock exchanges. Such exchanges must be approved by the SEC. See Securities and Exchange Act Section 6, 15 U.S.C. § 78f (1934). And even after initial agency approval, these trading platforms are heavily regulated. See, e.g., id. Section 19, 15 U.S.C. § 78s (requiring exchanges procure SEC approval before changing their trading rules).

37 See Concept Release, supra note 2, at 16 ("The registered exchanges all have adopted highly automated trading systems that can offer extremely high-speed . . . order
Of paramount importance, trading at exchanges centers around more than simply these best liquidity-provider ask and bid quotes. At the threshold, exchange liquidity providers are of course not willing to post legally binding offers to the marketplace for infinite numbers of shares at their best ask and bid prices. For this reason, they quote a limited number of shares at those prices—and they then quote successively inferior ask and bid prices (both of which are also good for a limited number of shares only). When traders exhaust the finite quantity that is firmly posted at those best prices, they must then trade at the next-best available price—and when the number of shares at that next-best price is exhausted, they must then transact at the next level of quoted prices, and so on. For example, assume again that exchange liquidity providers' best (lowest) ask price quotes are $12 per share. These liquidity providers may be quoting only 10,000 shares at that best ask price, another 10,000 shares at a next-best ask price of $13 per share, another 10,000 shares at an even higher next-best ask price of $14 per share, and so on. A large investor seeking to buy, say, $10 million of the stock immediately with certainty would therefore—for this reason among others—pay an average per-share execution price that is far higher than simply $12.

Stock exchanges and the liquidity providers that post quotes on them thus provide traders with a valuable service above and beyond that provided by professional liquidity providers more generally: they allow traders to transact immediately with certainty against firm liquidity-provider quotes. However, the ability to trade on demand at exchanges comes with an even more significant version of the caveat associated with the services provided by the larger universe of liquidity providers: stock buyers must pay exchange liquidity providers’ ask prices, and stock sellers must accept their bid prices—prices that are, as a general matter, at least nominally inferior to those received by traders at off-exchange trading platforms.

responses and executions. Published average response times . . . have been reduced to less than 1 millisecond.
38 See generally infra Part II.B.
2. Off-Exchange Trading Platforms

Off-exchange trading platforms are electronic trading systems at which liquidity providers facilitate the execution of orders to buy and sell stocks at prices that reference those contemporaneously quoted at exchanges. By law, these off-exchange transactions must occur at ask and bid prices that are at least as good as the best ones then displayed on exchanges nationwide. And, by practice, they generally occur at prices that are at least nominally superior to those quotes.

Off-exchange platforms come in many forms across a wide spectrum. At one end of that spectrum, liquidity providers operating on these trading systems—or the trading platforms themselves—execute investor orders at prices that essentially match the best ones posted on exchanges. The traders that transact at these platforms also generally receive a nominal improvement on the exchange price—typically a mere hundredth of a penny ($0.0001). For example, suppose once again that exchange liquidity providers’ are posting best (lowest) ask quotes of $12 per share. In this situation, a trader’s buy order that is executed at one of these off-exchange platforms would transact at a slightly better (lower) price of $11.9999 per share—they thereby allowing the investor to purchase the stock at a $0.0001-per-share discount on the exchange price.

In the middle of the off-exchange spectrum are trading platforms that facilitate trade execution that entails much more substantial improvement on exchange price quotes. To continue the previous example, if the best (lowest) ask for a stock on exchange platforms is $12 per share, then these platforms may execute traders’ orders to buy stock at a significantly better (lower) ask price of $11.00 per share.

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39 A large portion of the universe of these platforms has been referred to as “internalizing” platforms because they grew out of the practice in which broker-dealers transacted their customers’ orders within their organization. See generally HARRIS, supra note 10, at 514, 162. That term is now anachronistic because the manner in which these platforms function has greatly expanded over the past decade or more. Further, a large portion of off-exchange trading systems are labeled “dark pools,” ostensibly because they allow liquidity providers to provide bid and ask prices without openly displaying them—that is, “in the dark.” However, that term provides an inaccurate impression of trading these platforms.

40 The professional liquidity provider operating at these trading platforms is often the platform itself or one of its affiliates.

Lastly, at the far other end of the off-exchange spectrum are trading systems that help traders' transact at the midpoint between the best exchange ask and bid quotes. Market participants' orders that are routed to these trading platforms therefore execute at what is generally the stock's current market value. Indeed, some of these platforms cross traders' buy and sell orders against each other at that price—allowing traders to provide liquidity directly to each other, and thereby removing professional liquidity-provider intermediation from the trading process altogether.\footnote{See, e.g., O'Hara, supra note 23 at 463 tbl. 1.}

C. The Effect of the Trading-Platform Access Rules

The set of rules that requires exchanges to remain open to all traders while allowing off-exchange trading platforms to select the traders that can access them alters the trading environment associated with each in a significant way.

1. Effect on Off-Exchange Trading

For two reasons, the legal ability to determine which traders they will and will not allow to access their trading systems has—as a matter of theory—resulted in off-exchange trading being dominated by uninformed traders.

First, off-exchange platforms presumably use their legal ability to discriminate among traders in order to target uninformed traders and exclude informed ones. In the moments after uninformed traders buy or sell stocks, stock prices are generally stable. This price stability allows those that supply liquidity services to uninformed traders to buy from some of them at their lower bid prices and sell to others of them at their higher ask prices. For this reason, liquidity providers generally earn revenue when they supply their services to uninformed traders because they earn the difference between their ask and bid prices on each paired bid purchase and ask sale.\footnote{See generally supra Part III.A.} Accordingly, off-exchange platforms—and indeed all trading platforms—presumably target uninformed traders because they can earn revenue by either supplying these traders with

\footnote{See generally supra Part III.A.}
liquidity services or charging others for the right to do so on their platforms.\textsuperscript{44}

At the same time, there is strong reason to believe that off-exchange platforms use their legal discretion to deny access to their platforms in order to exclude informed traders.\textsuperscript{45} In contrast to the moments after uninformed traders buy and sell stocks, immediately after informed traders transact, prices generally move.\textsuperscript{46} And, these price changes often occur so quickly\textsuperscript{47} that those that provided liquidity services to the informed traders get stuck having bought a stock for their inventory that was overvalued, or having sold one that was undervalued. For this reason, providing liquidity services to informed traders is generally a losing proposition.\textsuperscript{48} Liquidity providers—who, relative to informed traders, have little information about stocks' actual values\textsuperscript{49}—thus face a well-known adverse-selection problem: they may be targeted by informed traders that know more than they do about the actual values of the stocks they are trading, leading them

\textsuperscript{44} Evidence supports the theory that these trading platforms are indeed targeting uninformed investors. For one thing, the SEC found that nearly 100% of immediately executable orders from individual traders—who are presumed uninformed, see \textit{supra} note 28 and accompanying text—are routed to these platforms by their stockbrokers. See Concept Release, \textit{supra} note 2, at 21 ("A review of the order routing disclosures required by Rule 606 of Regulation [National Market System] of eight broker-dealers with significant retail customer accounts reveals that nearly 100% of their customer market orders are routed to [off-exchange trading platforms]."). For another, exchanges have recently filed applications with the SEC requesting permission to operate off-exchange platforms that explicitly target retail investors and exclude institutional ones. See, \textit{e.g.}, Order Granting Approval to Proposed Rule Changes Adopting NYSE Rule 107C to Establish a Retail Liquidity Program for NYSE-Listed Securities, Exchange Act Release No. 34-67347 (July 3, 2012) (approving such an off-exchange platform to be operated by the New York Stock Exchange).

\textsuperscript{45} To be sure, off-exchange platforms will, at times, have difficulty identifying—and therefore excluding—informed traders. However, these platforms have plenary access to their customers' trading performance—and not unlike a casino, can exclude repeat winners. The platforms may also exclude traders by targeting other traders—that is, by only granting access to those traders with whom they have familiarity.

\textsuperscript{46} See \textit{supra} Part I.A.2 (explaining how informed-trader buying and selling activity generally places upward and downward, respectively, pressure on prices).

\textsuperscript{47} See \textit{generally infra} Part III.A.

\textsuperscript{48} See \textit{HARRIS, supra} note 10, at 299 ("[I]nformed traders choose the side of the market on which they trade, and the [liquidity providers] end up losing money to them.").

\textsuperscript{49} See \textit{supra} note 32 and accompanying text.
to incur costs in the form of trading losses. For example, an informed trader may have information indicating that liquidity providers' $8 bid prices are overpriced by $3—that is, that the actual value of the stock is more likely to be $5 per share, yet the trader can sell it in return for $8. The trader therefore sells a large number of shares to various liquidity providers in return for $8 per share. Market prices for the stock then immediately adjust downward in response to the large selling activity. As a result, the liquidity providers that bought the shares from the informed trader at $8 per share have to—in order to maintain their target inventory of shares—unload those shares. But, they are only able to do so at market prices that are now in the $5 range. Thus, the liquidity providers lose approximately $3 per share transacted because they bought shares from the informed trader for $8 per share at what were then the best (highest) bid prices in the market, and then—after market prices adjusted downward—were only able to sell those shares to the market in return for more like $5 per share.

Second, the legal ability to discriminate among traders also results in trading at these platforms being dominated by uninformed traders because it results in a significant portion of informed traders preferring to complete its trading at exchanges. Inherent in the legal ability to select which traders they will and will not welcome is the ability to select which trader orders they will and will not transact. Off-exchange liquidity providers generally want to execute only an even two-sided stream of buy and sell orders that allows them to earn the difference between their higher ask prices and lower bid prices. They therefore have an incentive to execute only orders that will allow them to maintain a flow of trader orders that is at least somewhat balanced, and to avoid providing liquidity services against large one-sided buying or selling interest. As a result, they will often not execute orders from even those traders to which they grant access—let alone execute those orders with certainty within a millisecond as exchanges do. In fact, these platforms often reject the trader orders they receive. As a result, traders and their brokers must route their orders to other off-exchange platforms—with orders commonly going through

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50 For the seminal work identifying and measuring this adverse-selection cost, see Lawrence R. Glosten & Paul R. Milgrom, Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders, 14 J. FIN. ECON. 71 (1985).
51 See supra note 31 and accompany text.
several such platforms in succession.\textsuperscript{52} Indeed, orders are often routed to several such platforms before ultimately being sent to exchanges for guaranteed execution. Thus, the legal ability to select which investors they will and will not allow to access their trading systems results in these trading systems providing liquidity services that entail, at a minimum, some material time delay—and, at a maximum, no execution whatsoever. Accordingly, the legal ability to pick and choose traders—and therefore to select specific trader orders—also results in off-exchange platforms operating in a manner that provides traders with relatively little speed and certainty value.\textsuperscript{53}

Speed-and-certainty value is of special concern to informed traders. Informed traders of course profit based on an information asset: information as to stocks’ actual values that is not yet incorporated into their market prices. However, the value of this asset generally depreciates over time. And, for three reasons, the time period over which it loses its value is often small. First, slow trade execution by the initial investor to procure information risks that other traders will have time to discover the information and trade on it first, thereby causing prices to reflect that information before the initial trader can profit based on it.\textsuperscript{54} Second, when information is known by the corporate issuer of a stock, but has not been made public by that issuer, the issuer may at any time make it public via disclosure or other means—thereby greatly reducing, or eliminating

\textsuperscript{52} See Robert A. Bright, Dennis Dick, and Diane Anderson, Untitled SEC Comment Letter, (Mar. 24, 2010); Robert P. Bartlett, III & Justin McCrary, Shall We Hagggle in Pennies at the Speed of Light or in Nickels in the Dark? How Minimum Price Variation Regulates High Frequency Trading and Dark Liquidity (unpublished manuscript, 2013, on file with the author).

\textsuperscript{53} Further, the off-exchange platforms that cross traders’ orders against each without the intermediation of a professional liquidity provider, see supra note 42 and accompanying text, require corresponding, opposite-side orders in order to facilitate a trade. Orders submitted to these platforms therefore are associated with an especially low level of execution speed and certainty. Moreover, these platforms often execute transactions only after negotiations between the parties have taken place. Such negotiations introduce a lack of anonymity that allows potential counterparties to take steps to ensure that they are not trading with informed traders.

\textsuperscript{54} See, e.g., Zohar Goshen & Gideon Parchomovsky, On Insider Trading, Markets, and “Negative” Property Rights in Information, 87 VA. L. REV. 1229 (2001) (“Because [informed traders] operate in a competitive environment to maximize the return on investment in information, the [informed trader] who first obtains nonpublic information will have to process the information to the market as quickly as possible, lest she be beaten by other [informed traders].”).

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altogether, the value of the information to an informed trader who had procured it earlier.\textsuperscript{55} Third, and perhaps most importantly, slow and uncertain execution risks that an informed trader's own transactions themselves will alert the rest of the market to its information before it can capture sufficient trading profits.\textsuperscript{56} As such, many informed traders place a high premium on the ability to transact quickly with certainty. In fact, for these traders execution speed and certainty are often more important than even the quality of the prices they receive.\textsuperscript{57} Accordingly, to maximize the profits that they earn based on their depreciating asset, even those informed traders that are able to access off-exchange platforms often prefer to complete their trading at exchanges.\textsuperscript{58}

Thus, the legal ability to discriminate among traders theoretically results in off-exchange trading being dominated by uninformed traders for two reasons: off-exchange platforms use the ability in order to target uninformed traders and exclude informed ones, and the ability also leads these platforms to provide services that are—relative to exchanges—less attractive to informed traders.

2. Effect on Exchange Trading

The trading-platform access rules—as a matter of theory—also have a significant impact on exchange trading. Because these trading platforms

\textsuperscript{55} Once the information is publicly disclosed, any trader that is able to analyze its import can trade on it. Further, liquidity providers themselves may analyze this publicly disseminated information and adjust their market prices accordingly.

\textsuperscript{56} See e.g., Adam Clark-Joseph, Exploratory Trading (unpublished manuscript on file with the author); see generally infra Part III.A.4 (explaining how liquidity providers adjust their price quotes—and therefore market prices—in response to large trading activity within as little as a millisecond).

\textsuperscript{57} See O'Hara, supra note 23, at 463 ("For some traders, [execution] speed is more important than [the inferior prices often associated with bid-ask] spread[s].")

\textsuperscript{58} Of course, some subset of the informed-trader universe will nevertheless want to conduct a portion of its trading at off-exchange platforms. For example, many activist hedge funds and private equity funds have relatively longer time horizons and information that they believe does not depreciate quickly. They will therefore likely meet some of their trading needs at both exchanges and off-exchange platforms via smaller trades over a sustained period. And, even those with informational assets that depreciate more quickly will often attempt to achieve their speed and certainty goals by sending their orders to both exchanges and off-exchange platforms simultaneously for at least a millisecond when they begin trading.
must welcome all traders, they contain a mix of both informed and uninformed traders. However, almost 40% of all trading now occurs through off-exchange platforms. And that trading is dominated by uninformed traders. With so many uninformed traders now transacting away from exchange platforms, trading through exchanges entails a far higher ratio of informed traders to uninformed ones than it otherwise might.

Moreover, this ratio has been growing—and there is reason to believe that it will continue to grow. The portion of all trading attributable to off-exchange platforms has risen at an impressive clip in the years since the NYSE repealed its rule that effectively led to the overwhelming majority of all trading taking place on its floor. In fact, just six years ago, less than 15% of all trading occurred through off-exchange trading platforms. Today, once again, almost 40% of all trading takes place via these systems. And, with almost 100% of immediately executable individual-trader orders already having migrated to off-exchange platforms, one would think that these platforms would now target the uninformed traders that are still buying and selling stocks on exchanges—that is, the remaining portion of uninformed institutional investors that has not yet migrated all of its trading off-exchange. Indeed, the percentage of off-exchange trading that is thought to be attributable to institutional investors has grown from about 5% of all trading in 2008 to over 15% today—and if off-exchange platforms are generally able to engage in spread-earning transactions with uninformed institutional investors, then they have the incentive to work toward further increasing this percentage.

This Part has detailed how stocks are traded in the contemporary stock market—theorizing that a set of stock-market rules is resulting in trading at off-exchange platforms being dominated by uninformed traders, and trading at exchanges therefore entailing a far higher ratio of informed traders to uninformed ones than it otherwise might. In the next Part, I build on these theories by showing that the trading-platform access rules—by leading exchange liquidity providers to alter their price quotes and

59 See supra note 23.
60 See supra note 22 and accompanying text.
61 See, e.g., Rosenblatt Securities, supra note 23.
62 See supra note 44.
63 See generally supra Part II.C.1 (discussing the incentive for off-exchange platforms to target uninformed traders).
often relegating informed traders to transacting against those quotes—
affect one of the core concerns of securities law: the degree to which
public companies' stock prices reflect their actual values.

III. IMPLICATIONS FOR THE ACCURACY OF STOCK PRICES

Stock-market law has generally escaped the attention of those who
have long praised the social benefits of enhanced stock-price accuracy and
expressed skepticism as to the ability of market forces alone to produce
optimal levels of stock-price accuracy. Yet, the law governing the market
in which stocks are traded may have significant implications for the level
of stock-price accuracy generated by society. For one thing, as articulated
in this Part, it is likely that the altered exchange trading environment that
results from the trading-platform access rules reduces the incentive that
spurs informed traders to engage in their price-correcting work—and
therefore results in the stock-market generating lower levels of stock-price
accuracy than it otherwise might. And, there is reason to believe that
stock-market-law changes could address this altered environment in a
manner that leads the market to generate higher levels of stock-price
accuracy.

Section A explains how the higher ratio of informed traders to
uninformed ones associated with exchange trading leads exchange
liquidity providers to alter their price quotes. Section B then shows why
these modified price quotes are likely resulting in society generating lower
levels of stock-price accuracy than it otherwise might. Section C then
argues that stock-market law can be modified in a manner that would lead
to higher levels of price accuracy—and provides a framework for
regulators to consider whether those modifications would be socially
desirable. Finally, Section D provides a roadmap for future empirical work
attempting to measure the effect of the trading-platform access rules on
stock-price accuracy.

A. Effect on Exchange Liquidity Provision

The heightened ratio of informed traders to uninformed ones that
results from the stock-market rules examined here alters the exchange
trading environment in a manner that—in the first instance—elicits a
response from exchange liquidity providers. Like all liquidity providers,
exchange liquidity providers generally incur trading losses when they
supply their services to informed traders. In fact, these liquidity providers are especially concerned with the costs imposed by informed traders for two reasons. First, when they post their quotes, those quotes must—by law—be firm. Second, and also by law, any trader may access those firm quotes. To maintain a business with revenues that at least equal their costs, these vulnerable liquidity providers must therefore be particularly aware of how to offset the costs imposed by informed traders.

The main way in which exchange liquidity providers offset these costs is by garnering revenues via spread-earning transactions with uninformed traders. These liquidity providers aim to buy at their lower bid prices from some uninformed traders, and sell at their higher ask prices to others. And if they have enough of those buy low and sell high transactions with these traders, they earn revenues sufficient to cover their losses to informed traders.

Moreover, exchange liquidity providers are able to increase the chances of garnering sufficient revenues to cover their losses to informed traders by minimizing those losses. And the main way in which they minimize those losses is by altering their price quotes. Specifically, they alter their quotes in two main ways: by posting inferior price quotes and by lowering the threshold that triggers their adjustments of those quotes.

Inferior quotes reduce the extent to which informed traders will spot profitable trading opportunities—and therefore decrease the extent to which informed traders will impose trading losses on liquidity providers. For example, imagine again that the market currently assesses the value of a stock to be $10 per share, that exchange liquidity providers are providing best (lowest) ask quotes of $12 per share, and that informed traders’ have information that leads them to conclude that the stock is actually worth $17 per share. If these traders buy the stock at $12 per share from the liquidity providers, then they will profit at the liquidity providers’ expense. However, if the liquidity providers instead were quoting inferior

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64 See supra note 48 and accompanying text.
65 See supra note 35 and accompanying text.
66 See generally supra Part II.C.2; see supra note 1 and accompanying text.
67 See Glosten & Milgrom, supra note 51, at 72; see Harris, supra note 10, at 299 (stating that exchange liquidity providers seek “to recoup from uninformed traders what they lose to informed traders.”).
68 See generally Harris, supra note 10, at 6, 298.
$18-per-share best ask prices and $2-per-share best bid prices, then these traders would not impose trading losses on the liquidity providers. Accordingly, when liquidity providers anticipate incurring losses to informed traders, they decrease the extent of those losses by quoting inferior prices.

Of paramount importance, exchange liquidity providers do not merely decrease the costs imposed by informed traders by quoting inferior best (lowest) ask quotes and best (highest) bid quotes. Instead, they also decrease these costs by altering the number of shares that they are willing to trade at those prices as well as the number that they are willing to trade at their successively inferior quoted prices. For example, the liquidity provider that increased its best (lowest) ask quote from $12 per share to $18 per share may also decrease the share quantity that it posts at its new $18 best (lowest) ask quote from 15,000 to 10,000—and the number of shares at each successively inferior (higher) ask price by similar amounts. Or, it may quote inferior prices without increasing its best (lowest) ask quote at all—instead opting to keep it at $12 per share, albeit quoting a mere 1,000 shares at that quote, another 1,000 at $13 per share, and so on.

And, exchange liquidity providers decrease the costs imposed by informed traders in the second way mentioned above: by altering the sensitivity of their quote-adjustment trigger. Liquidity providers of course alter their price quotes in response to the information that they glean from trading activity and more. Indeed, it is these liquidity-provider alterations that result in informed traders’ information being absorbed into market prices. And in today’s market, these price changes occur literally within a millisecond of trading activity. For example, suppose again that exchange liquidity providers are posting best (lowest) ask quotes of $12 per share, and that they observe net buying against ask quotes in the market for 30,000 shares over one millisecond. After observing that buying activity, they may increase their best (lowest) ask quotes up by $4 to $16 per share in order to protect themselves from incurring losses to informed traders. But, if they instead wanted to provide themselves with even more protection, they may instead update their quotes upward after observing only 10,000 shares of net buying in that time period.

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69 See generally supra Part II.A.3 (describing these aspects of exchange liquidity providers’ quotes).
70 See generally supra Part I.B (describing the process in which actual-value information is incorporated into stocks’ market prices).
Crucially, however, the trading-platform access rules lead to a trading environment on exchanges in which the main source of revenue for exchange liquidity providers is far smaller than it might otherwise be. Those rules of course result in large numbers of uninformed traders completing their trading needs through off-exchange platforms rather than exchanges. To ensure that they have revenues that exceed their costs despite this lower level of revenue, exchange liquidity providers must take steps to further reduce their costs—including, of course, their main one: the one imposed by informed traders. They do so by bolstering their price-quote defenses—that is, by quoting inferior prices and reducing the trading-activity thresholds that trigger their adjustments of those quotes. Thus, the trading-platform access rules theoretically lead to inferior prices and more sensitive quote-adjustment triggers on exchanges.

71 Indeed, a parallel work in progress in financial economics provides preliminary empirical support for the proposition that the growth of off-exchange trading is—by taking away a disproportionate amount of uninformed traders from exchanges—causing exchange liquidity providers to quote inferior prices. See generally Hatheway, Kwan, & Zheng, supra note 23. Moreover, financial economists have empirically demonstrated that previous diversions of far narrower sets of uninformed traders away from far narrower sets of liquidity providers caused those liquidity providers to quote inferior prices. See David Easley, Nicholas M. Kiefer, & Maureen O’Hara, Cream-Skimming or Profit-Sharing? The Curious Role of Purchased Order Flow, 51 THE JOURNAL OF FINANCE 3 (1996) (“Since the orders diverted [away from the New York Stock Exchange and to regional exchanges] are the [informationally] ‘least risky,’ an adverse selection problem arises with respect to the remaining order flow [that goes to the New York Stock Exchange]. This, in turn, dictates that prices on the NYSE will worsen to reflect the change in order composition.”); Mark J. Ready, The Specialist’s Discretion: Stopped Orders and Price Improvement, 12 Rev. Fin. STD. 5 (1999) (evidencing that the New York Stock Exchange specialized liquidity providers were using their privileges to transact against uninformed traders, leaving external liquidity providers that posted quotes on the exchange to face a higher ratio of informed traders to uninformed ones than they might otherwise have faced, and therefore causing them to quote inferior prices).

72 Financial economists have shown that price quotes on exchanges now adjust so quickly and by so much that traders cannot complete large trades in short time periods without moving those quoted prices away from their own interest. See Clark-Joseph, supra note 57; Pierre Collin-Dufresne & Vyacheslav Fos, Do Prices Reveal the Presence of Informed Trading?, 35 fig.3 (work in progress) (Aug. 31, 2012), available at http://ssrn.com/abstract=2023629 (“[T]he empirical evidence suggests that rapid accumulations without significant price impact will be difficult for all but the highest liquidity stocks.”).
B. Effect on the Production of Accurate Stock Prices

The theoretical effect of the trading-platform access rules on the exchange trading environment has—in the second instance—special import for informed traders and the extent to which they will produce accurate stock prices.

Informed traders—once again—will only engage in their price-correcting work when they can earn trading profits.\(^{73}\) And to earn those profits, they of course must bring in trading revenues that surpass their costs—including considerable ones, such as those relating to the procurement and analysis of actual-value information. Informed traders therefore must often trade in large quantities to realize revenues sufficient to offset these high costs.\(^{74}\)

However, in the contemporary stock market, informed traders are—to some significant extent—relegated to transacting against firm liquidity-provider quotes on exchanges. For one thing, these traders are often excluded by off-exchange trading platforms.\(^{75}\) For another, a large portion of even those that are able to access off-exchange platforms prefers to transact on exchanges.\(^{76}\) And, the quotes that they face on exchanges are presumably altered in two ways: they are inferior and more sensitive to net buying and selling activity. Both of these alterations—by liquidity-provider design—decrease informed traders’ profits. For these reasons, the trading-venue access rules theoretically result in informed traders spotting fewer profit opportunities than they otherwise might.

When informed traders expect to be able to earn a lower amount of trading profits, they will invest less in the production of information about firms’ actual values that has not yet been incorporated into their stock prices. As a result, a lower amount of actual-value information will be produced—and therefore a lower amount will be incorporated into stock prices. Accordingly, as a matter of theory, the rules that require exchanges to host all traders, but permit off-exchange platforms to discriminate

\(^{73}\) See generally supra Part I.B.

\(^{74}\) See HARRIS, supra note 10, at 290 (stating that “informed traders like to acquire large positions in order to maximize their profits”).

\(^{75}\) See generally supra Part II.C.1.

\(^{76}\) See generally supra Part II.C.1.
among traders are resulting in the stock market generating lower levels of stock-price accuracy than it otherwise might.

Further, these stock-market rules permit the continued growth of off-exchange trading—a growth that has been considerable and fast. And, there is reason to believe that this growth trend will continue.\textsuperscript{77} If this migration of uninformed traders to off-exchange trading platforms continues to grow, then the trading-platform access rules will result in the stock market generating even lower levels of stock-price accuracy than it currently does. And if that migration passes a certain threshold, the market’s current pricing mechanism—that is, the process in which informed traders use their information to buy and sell stock from exchange liquidity providers—may fail altogether as liquidity providers are forced to alter their price quotes more and more to minimize the costs that informed traders impose on them.

Thus, even though securities regulations has—as one of its principal aims—sought to enhance stock-price accuracy, aspects of the law governing the market in which stocks are traded are presumably resulting in society generating less stock-price accuracy than it otherwise might. And, these facets of stock-market law may soon lead to even lower levels of price accuracy.

C. Improving Stock-Price Accuracy Through Stock-Market Law

There is reason to believe that policymakers can alter stock-market law to improve the accuracy of public companies’ stock prices. For example, either an exchange-trading mandate or a subsidy for exchange liquidity providers—both of which are described in this Section—would likely alter the trading environment associated with exchanges in a manner that would enhance stock-price accuracy. However, society of course wants an optimal level of stock-price accuracy. And, despite the advantages of the reforms to stock-market law explored here, each also has important drawbacks. Thus, this Section explores the two ways in which lawmakers may very well be able use stock-market law to improve stock-price accuracy—while also offering a framework for determining whether using them is socially desirable.

\textsuperscript{77} See generally supra Part II.C.2.
1. Requiring All Trading to Be Conducted via Exchanges

Policymakers are likely to be able to enhance stock-price accuracy by mandating that all stock trading be conducted through exchanges. If all trading took place on exchanges, then exchange liquidity providers would face a markedly higher ratio of uninformed traders to informed ones than they currently encounter. As a result, they would have more opportunities to offset the losses imposed by informed traders by completing spread-eating transactions with uninformed traders. Assuming healthy competition in the exchange liquidity-provision business, these liquidity providers would respond by posting superior price quotes and increasing the threshold that triggers their price-quote adjustments. In this trading environment, informed traders would have more opportunities to profit on their information. For this reason, there would be a larger incentive for the production of actual-value information—and, ultimately, improved stock-price accuracy.

a. Form. The exchange-trading mandate could take the form of a general prohibition on sophisticated trading platforms that do not post firm quotes and allow all traders to access them. Such a broad prohibition would only apply to the trading of the exchange-listed equity securities that are the subject of this Article. Further, even for those publicly traded stocks, the mandate would be limited to a prohibition on trading at the current types of sophisticated off-exchange trading platforms—and would not affect the ability of private parties to negotiate agreements to buy and

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78 The liquidity provision business is generally considered competitive for at least large- and medium-sized company stocks that are commonly held by mutual fund investors and others. See Chris Concanon, supra note 30. Due to a relatively recent trading-rule change, any trader may act as a liquidity provider on exchanges, attempting to accomplish a portion of its trading needs patiently over time by purchasing stocks at market bid prices and selling them at market ask prices—thereby avoiding the inferior prices associated with other liquidity providers’ bid-ask spreads while also providing a liquidity service for other traders that seek to transact immediately. See Regulation National Market System Rule 604, 17 C.F.R. § 242.604 (2005). Thus, professional liquidity providers face competition—for at least these stocks—from not only each other, but also from a large number of informed and uninformed traders.

79 In 1975, Congress granted the SEC broad powers to promulgate and revise stock-trading rules to develop and improve a national market system for the trading of exchange-listed equity securities. See generally Securities Exchange Act Section 11A, 15 U.S.C. § 78k-1 (1975). This rulemaking delegation may allow the SEC to impose the exchange-trading mandate.
sell blocks of stock with each other. Lastly, policymakers could of course adopt this measure in whole or in part, with the degree of its impact on price accuracy turning on the breadth of the mandate adopted.

b. Social Benefits. The primary benefit of mandating that all stock trading be conducted on exchanges would be the improvement in corporate governance and capital allocation that would result from higher levels of stock-price accuracy. In addition to these price-accuracy-based benefits, the exchange-trading mandate would also lower trading costs for the uninformed traders who currently transact via exchanges. Over 60% of all trading still takes place at exchanges, and much of that trading is still attributable to uninformed traders. These uninformed traders now face the same inferior prices and hair-trigger price-quote adjustment thresholds that informed traders now face at exchanges. However, if all trading instead took place on exchanges, these traders would share in the benefit of superior pricing and less sensitive quote-adjustment triggers. Accordingly, the exchange mandate would have a significant social benefit in addition to the one relating to enhanced stock-price accuracy—that is, some portion of uninformed traders would pay lower trading costs than it currently pays.

b. Social Costs. Requiring that all stock trading occur on exchanges may entail at least two notable costs. First, the exchange-trading mandate may eliminate important benefits that traders currently receive as a result of competition and innovation among trading platforms as well as private ordering. To be sure, the entities that currently operate off-exchange trading platforms have produced innovation that benefits traders.

Mandating that all trading occur on exchanges, however, would not necessarily deprive traders of these important benefits. With all traders trading on exchanges, exchanges will have greater reason to compete for the business of uninformed retail and institutional traders. Today, of course, exchanges have less reason to innovate in this way, because a large portion of uninformed trading is occurring at off-exchange platforms. We can expect, however, that requiring all trading to take place on exchanges will give exchanges powerful new motivations to provide innovations that these traders will value—and that this cost is therefore lower than it first appears.

80 See generally Part I.C.
Similarly, to some extent, under current law private ordering dictates where and how particular stock trades are executed. Whether an individual’s trade will, for example, be executed at one off-exchange platform or another is dictated by market forces. And a rule requiring those trades to be completed through exchanges, rather than off-exchange platforms, would certainly change those market dynamics.

But for two reasons this objection does not show that such a rule would allow less room for private ordering in stock trading than current law does. First, as this Article has shown, the existing economics of stock trading are not dictated solely by markets. Rather, current law heavily influences those economics. More importantly, however, this objection does not acknowledge the possibility that, in a world requiring all stock trading to be conducted on exchanges, there will be substantial competition among exchanges for traders’ business. So long as exchanges engage in meaningful competition, we can expect private ordering to continue to play a meaningful role in stock trading—even if the law requires all such trading to occur on exchanges.  

Second, mandating that all stock trading occur on exchanges may increase trading costs for some portion of the traders that currently transacts through off-exchange platforms. On the surface, off-exchange platforms appear to lower trading costs for the traders whose orders are routed to them. After all, these platforms provide traders with the prices that are at least nominally better than those quoted on exchanges nationwide. And, they also often offer traders “size improvement”—that is, trade execution at a single price for an entire order even when the size of that order exceeds the number of shares quoted at that best price on exchanges. If the law were changed to mandate that all stock trading

\[81\] Of course, inter-exchange competition is also limited by law. See supra at note 16 (noting that exchanges must be approved by the SEC before they begin operating and that the SEC must approve all exchange trading-rule changes once they begin operating). Thus, perhaps the SEC should—in conjunction with any exchange-trading mandate—be more flexible in its exchange requirements in an effort to encourage exchange competition.

\[82\] See supra Part II.B.2.

\[83\] Those associated with the off-exchange platforms that are focused on individual retail investors have urged the SEC to recognize the benefit that their size improvement provides. See, e.g., Christopher Nagy & John S. Markle, TD AMERITRADE SEC Comment Letter (Apr. 21, 2010) (“[The best quote on an exchange] generally does not
must occur on exchanges, it would of course eliminate these platforms, and these traders therefore would likely not receive these benefits.

The value of these benefits for traders, however, is not as substantial as it might initially appear. Indeed, they may not provide a large portion of these traders with any net trading-cost benefit relative to a market where all trading took place on exchanges. At the threshold, the “price improvement” offered by off-exchange platforms is, at best, nominal. Further, the “size improvement” that they provide is relevant only to those investors whose orders exceed the number of shares quoted on exchanges. Finally, and perhaps most importantly, because a substantial portion of these platforms essentially match the best (highest) bid quote prices and best (lowest) ask quote prices generated by liquidity providers on exchanges, the traders who currently transact via off-exchange platforms may actually face better prices if all trading occurred via exchange platforms. Recall that price quotes on exchanges now reflect the higher ratio of informed traders to uninformed ones that result from the trading-platform access rules—and that this higher ratio leads to inferior price quotes on exchanges. As such, off-exchange platforms may be charging a substantial portion of off-exchange traders prices that are inferior to the ones that they would receive through exchanges in a market where all trading occurred on exchanges. Thus, relative to a market in which all trading took place on exchanges, these platforms provide traders with less of a trading-cost benefit than they appear to provide at first glance—and large portions of off-exchange traders may even receive better prices in a market where all trading took place on exchanges.

contain much size at the [quoted] price and generally is far less than the [TD Ameritrade’s] average [retail] client order-size of 1,500 shares.”).

84 See, e.g., Nagy & Markle, supra note 87 (“The [typical off-exchange platform focused on retail investors] immediately executes [retail-investor] order[s] [at a price that is] slightly better than the best [quoted] price in the market (usually by .0001 [per share.])”); Karrie McMillan, Investment Company Institute SEC Comment Letter (Apr. 21, 2010) (“We question whether providing price improvement to [retail-investor] orders in, for example, increments of hundredths of a penny is providing meaningful price improvement.”).

85 See generally supra Part III.A.

86 For the same reasons, traders who currently transact at off-exchange platforms may be able to find a large number of shares at the best prices on exchanges in a market where all stock trading took place on exchanges. See supra Part III.A (discussing how liquidity providers quote a smaller number of shares than they otherwise might because so many uninformed traders are now transacting through off-exchange platforms).
Further, even if uninformed traders were forced to transact on exchanges, they would not always have to transact against exchange liquidity providers’ price quotes. In contrast to informed traders, uninformed traders place a relatively low value on execution speed and certainty. By definition, these traders are not transacting based on some depreciating informational asset relating to a delta between current market values and actual values that could change at any moment. Instead, before their transactions take place, as far as they know, stock prices during that next interval of time have a more or less 50/50 chance of increasing or decreasing. Accordingly, whether their orders to buy and sell pieces of their stock portfolios are executed in one millisecond, one hour, or even one week is largely—before the transaction—irrelevant to these traders.

By law, such patient traders are now able to complete their trading needs by providing liquidity services to other stock traders on exchanges—that is, all market participants are able to act as liquidity providers on exchanges. As such, these traders can, and often do, meet some portion of their trading needs by providing liquidity services to other traders—that is, they complete their trading needs by posting bid price quotes and ask price quotes against which other traders will transact rather than themselves by buying against liquidity providers’ ask quotes and selling against liquidity providers’ bid quotes. In different words—specifically, in industry vernacular—they transact by “making liquidity” rather than “taking liquidity.” By so doing, these uninformed traders would not only avoid paying any spread cost whatsoever to an exchange liquidity provider, but they would actually be buying at the best (highest) bid prices in the market and selling at the best (lowest) ask prices in the market. Indeed, large traders that are not under heavy time pressure to complete their trading interest now routinely transact in this manner. Thus, uninformed traders will often be able to meet their trading needs by buying at prices—specifically, at bid prices—that are lower than the market’s current assessment of the stock’s actual value, and selling at prices—specifically, ask prices—that are higher than that assessment.

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87 See generally supra Part II.C.1.
88 For one of the seminal works on this concept, see Eugene F. Fama, The Behavior of Stock Market Prices, 38 JOURNAL OF BUSINESS 34 (1965).
89 See supra note 78.
90 Purchasing and selling stocks via quotes rather than transacting immediately via paying liquidity providers’ quoted prices has its own risk, including adverse-selection by informed traders. It also presents the risk of non-execution as market prices move in the opposite direction of the best quoted price, thereby leaving the trader to transact at a
Lastly, traders amortize their trading costs over the lifetime of an investment. And, once again in contrast to informed traders, a large portion of uninformed traders are composed of “buy and hold traders” that holds stocks over sustained periods of time. For these traders, whatever higher trading costs do result from an exchange-trading mandate may impose only a small burden.

2. Subsidizing Exchange Liquidity Provision

Another way in which lawmakers could attempt to use stock-market law to enhance price accuracy would be to leave the trading-platform access rules and off-exchange platforms in place, but to impose a subsidy to support exchange liquidity provision. In this Subsection, I offer a framework for regulators considering this alternative—and identify both important advantages and disadvantages to such a policy that require further study.

a. Form. The subsidy could come in the form of required public-company payments to the exchange liquidity providers that post the most competitive quotes in their stocks. Specifically, the payments would be distributed as a per-share rebate each time one of these liquidity providers’ standing quotes executes against an incoming order. Suppose, for example, that two liquidity providers on an exchange quote ask prices for 10,000 shares of the same stock. One posts a superior (lower) ask price of $10.59, and the other posts an inferior (higher) ask price of $10.69.

worse price than if it had simply transacted at a price associated with a price quote and purchased the stock immediately. Lastly, to the extent that uninformed traders transact via quotes on exchanges in a world in which all trading takes place through exchanges, all liquidity providers will garner lower revenues than they otherwise might—and therefore, to some degree, provide prices that are inferior and quote-adjustment triggers that are more sensitive to trading activity.

91 See supra Part II.A.1 (stating that informed traders enter and exit stock positions far more frequently than uninformed traders).

92 I am grateful to Merritt B. Fox for raising this possibility in response to earlier drafts of this Article.

93 Once again, the SEC currently has explicit broad legal authority to regulate stock-trading rules. See supra note 79. If that grant of rulemaking authority would allow the SEC to impose a fee on exchange-listed firms to subsidize the production of accurate stock prices, then no new congressional action would be needed to implement a subsidy funded in this way.
Suppose, too, that a trader submits an incoming buy order that seeks to transact immediately against the best (lowest) ask prices for 10,000 shares of that stock. In this example, then, the liquidity provider quoting the more competitive $10.59 ask price would complete this transaction, but the liquidity provider offering to sell the shares at $10.69 would not. In this way, the proposed subsidy would encourage liquidity providers to offer the most shares at the best possible prices in order to capture the maximum payment from the subsidy.

a. Social Benefits. Such a subsidy would incentivize exchange liquidity providers to post superior price quotes with less sensitive adjustment triggers—likely leading to larger profit opportunities for informed traders and therefore a higher level of stock-price accuracy. The benefits of this approach are thus the same as those that would arise out of the exchange-trading mandate—that is, the benefits that flow from the better corporate governance and capital allocation associated with higher levels of stock-price accuracy. These benefits, like those of exchange-trading mandate, would also include reduced trading costs for the uninformed traders who currently transact on exchanges.

b. Social Costs. Although offering liquidity providers a subsidy funded through a fee on public companies has these advantages, lawmakers should examine at least three key disadvantages to this approach before implementing it. First, and most obviously, to the extent that public firms produce goods and services in competitive markets, we can expect these fees to lead to increased costs, and therefore increased prices, for those goods and services. In this way, the fees would impose a social cost in the form of marginal lost opportunities for consumers to transact with these firms.

Second, imposing a fee on publicly traded firms would, on the margin, dissuade some companies from listing their shares on U.S. exchanges. Although the exact marginal effect would be unclear—particularly in light of the already-substantial costs associated with going public—policymakers should examine whether imposing such a fee might meaningfully impair the ability of private firms to raise public capital. Those concerns deserve particular attention in light of the well-documented costs when companies are deterred from raising equity capital—including depriving society of the reduced costs of capital that firms with public equity generally experience and the projects that those lower costs enable.
Finally, to the extent that exchanges in the United States impose these fees but exchanges in foreign jurisdictions do not, some companies—both foreign and domestic—may be more inclined to list their shares only on foreign exchanges. While it is unclear whether this result would even be problematic from a social point of view, U.S. regulators would doubtless want to consider this effect when contemplating imposing a fee of this kind.

However, considerations of fairness militate in favor of funding the subsidy through a fee on public firms. After all, these companies and their stockholders derive a large amount of the corporate-governance and capital-allocation benefits that the subsidy would generate. Moreover, enhancing stock-price accuracy through fees imposed on these firms is consistent with the core of securities law. Mandatory disclosure laws, for example, impose costs on firms in order to give investors the information necessary to ensure accurate stock prices. And laws prohibiting fraud require firms to expend substantial resources to ensure the accuracy of their disclosures so that investors can rely on them when determining stocks’ actual values. Thus, funding the subsidy through a fee on public firms would impose the fee on a major beneficiary of the improvements that would flow from the fee and is consistent with longstanding securities law.

3. Reexamining Disclosure, Fraud, and Insider-Trading Laws

As noted earlier, even if regulators now have a new way to improve accuracy, they may find that it is socially undesirably to use it because they believe that society already has an optimal level—or even too high a level—of stock-price accuracy. However, they should still consider the reforms described here because society may be able to obtain its current level of stock-price accuracy at a lower cost by using this new tool rather than the well-recognized existing tools of disclosure, fraud, and insider-trading laws—that is, society may be able to obtain a higher ratio of benefits to costs by modifying stock-market law while reducing extensive

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95 See, e.g., Goshen & Parchomovsky, supra note 3, at 716.
and burdensome aspects of now-operative disclosure, fraud, and insider-trading rules aimed at improving stock-price accuracy.

The core securities laws aimed at improving the accuracy of public companies stock prices generally impose costs on society. Mandatory disclosure laws, for example, impose costs on firms in order to give traders information necessary to ensure accurate stock prices.\textsuperscript{96} Laws prohibiting fraud require firms to expend substantial resources to ensure the accuracy of their disclosures so that traders can rely on them when determining stocks’ actual values. And, laws that limit insider trading impose law-enforcement costs on society to—in the view of some commentators\textsuperscript{97}—ensure a competitive informed-trader market that will best underwrite efficient markets. Thus, to the extent that these costly laws are justified based on the price-accuracy benefits to which they lead, lawmakers should consider whether they may be able to achieve a better cost-benefit ratio—essentially get more bang for their buck—in a novel manner: adopt one of the two modifications laid out here while also reducing some burdensome aspects of disclosure, fraud, and insider-trading laws.

Both the benefits and costs discussed here deserve consideration before regulators require all stock trading to occur through exchanges or subsidize exchange liquidity provision via a fee imposed on firms. Nevertheless, there is reason to think that these regulatory changes would in fact lead to a higher level of stock-price accuracy. Moreover, such improvements to the current level of stock-price accuracy may have benefits that outweigh their costs. And, even if further increases to that current level would not lead to benefits that outweigh the costs necessary to achieve them, regulators may find that they want to use this new means for enhancing stock-price accuracy instead of some aspects of the existing means that have been deployed toward that end.

D. Future Empirical Study

The impediment to higher levels of stock-price accuracy posited here should be the subject of empirical study—and that work should examine at least three key sets of issues.

\textsuperscript{96} See, e.g., id. at 716.
\textsuperscript{97} See generally Goshen & Parchomovsky, supra note 55.
1. The Extent to Which Off-Exchange Trading Is Dominated by Uninformed Traders

At the threshold, empirical work that seeks to identify the traders that are transacting through off-exchange platforms is in order. Once again, some portion of the almost 40% of all trading that is conducted through off-exchange platforms is of course attributable to the subset of informed traders that prefers to complete some of its trading at these platforms and is able to access them. The larger the portion attributable to uninformed traders, the larger the effect on stock-price accuracy posited here. The smaller that portion, the smaller that effect.

It is therefore important to know how that 40% breaks down—that is, how much of it is attributable to uninformed traders and how much is attributable to the informed ones that are able to access them and that prefer to transact on them. To date, data on the traders that transact at off-exchange platforms would be challenging to procure. For one thing, no rule has required off-exchange platforms to disclose the identity of those that trade on them. For another, institutional stock traders appear to closely guard their strategies for executing their trades. However, a recently promulgated SEC rule that requires the stock-trading industry to construct a “consolidated audit trail” that will identify traders and the trading platforms at which their orders are transacting should provide this data in the not too distant future.

2. Magnitude of Effect on Exchange Price Quotes

Empirical study should also of course examine the degree to which increasing activity at off-exchange trading platforms has been affecting exchange liquidity providers’ price quotes. Such study should examine not simply the extent to which growth in off-exchange trading is associated with a lower quality of the prices relating to the best (lowest) ask price quotes and best (highest) bid price quotes, but also the extent to which it is associated with a smaller number of shares quoted at those best quotes as well as at successively inferior next-best ask and bid prices. And, empirical work in this area should also consider the extent to which off-exchange trading is affecting the sensitivity of exchange quote revisions in response to one-sided trading. Specifically, it should examine whether

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98 See supra note 58.
exchange liquidity providers have lowered the net-buy and selling thresholds that trigger their revisions of their price quotes.

3. Variation Based on Firm Type

Lastly, empirical study of these effects—and the ultimate effects on stock-price accuracy and its social benefits—might want to consider the extent to which they vary for different types of firms. For example, smaller firms are—as a general matter—less closely followed by informed traders and their affiliates. For this reason, there is heightened concern about the extent to which their stock prices are accurate. Thus, the effect of allowing an increase in the overall concentration of informed traders on exchanges—as the law currently permits—may be more significant relating to smaller firms than larger firms. Accordingly, evaluation of the rules analyzed here should carefully distinguish between the stocks of different types of firms—namely, smaller firms versus larger firms.

This Part has demonstrated that stock-market rules are theoretically resulting in society generating lower levels of stock-price accuracy than it otherwise might. Given the value that has been placed on enhanced stock-price accuracy and the concern that absent legal intervention, accurate stock prices will be under-produced, the final Part immediately below proposes two alternative ways in which policymakers could alter the law governing stock trading to enhance stock-price accuracy—and sets forth a welfare-based framework for determining whether adopting either is socially desirable.

CONCLUSION

For decades, securities law has been motivated by the view that accurate stock prices convey valuable social benefits relating to corporate governance and capital allocation—yet will be under-produced absent legal intervention into market forces. However, the implications of stock-market law for the production of accurate stock prices have gone unnoticed.

This Article has demonstrated that a set of stock-market rules relating to trading-platform access results in the stock market generating a lower level of price accuracy than it otherwise might—thereby failing to provide society with benefits of improved corporate governance and capital allocation that it otherwise might. Because the law mandates that all
traders be allowed to buy and sell stock at exchanges, but allows off-exchange platforms to decide which traders can and cannot access their trading systems, off-exchange trading is dominated by uninformed traders, and exchange trading entails a far higher ratio of informed traders to uninformed ones than it otherwise might. In response to the concern that they will be unable to bring in enough revenue to cover the costs that informed traders impose on them, liquidity providers on exchanges alter their price quotes—both by providing inferior quotes and by lowering the trading-activity thresholds that trigger their adjustments of them. Facing these altered quotes, informed traders will have lower expected trading profits. For this reason, these valuable traders will invest less in the production of information about firms’ actual values—and inaccurate stock prices will go uncorrected more often than they otherwise might.

Building on this theory, this Article has shown that lawmakers may be able to enhance stock-price accuracy by modifying stock-market law. In particular, the Article has considered whether policymakers should mandate that all trading occur on exchanges or impose a fee on firms to subsidize exchange liquidity provision. But the Article has also recognized—and identified—the costs that would be associated with these reforms. In so doing, it provides a framework for determining whether these legal reforms would have social benefits—namely, those relating to improved stock-price accuracy—that outweigh their costs.

While these policy implications reflect important considerations for regulators, this Article has merely scratched the surface of what can be learned through close examinations of the law that governs the market in which stocks are traded. More precisely, the Article has shown that stock-market law can have implications that go far beyond trading minutia to influence the degree to which publicly traded companies’ stock prices reflect their actual values—and that therefore may reverberate throughout the real economy.