

MANDATORY DISCLOSURE AND INDIVIDUAL INVESTORS: EVIDENCE FROM THE JOBS ACT

COLLEEN HONIGSBERG
ROBERT J. JACKSON, JR.
YU-TING FORESTER WONG*

ABSTRACT

One prominent justification for the mandatory disclosure rules that define modern securities law is that these rules encourage individual investors to participate in stock markets. Mandatory disclosure, the theory goes, gives individual investors access to information that puts them on a more equal playing field with sophisticated institutional shareholders. Although this reasoning has long been cited by regulators and commentators as a basis for mandating disclosure, recent work has questioned its validity. In particular, recent studies contend that individual investors are overwhelmed by the amount of information required to be disclosed under current law, and thus they cannot—and do not—use that information to analyze the companies that they own.

Using a recent change in the law that allows firms to disclose less information before their initial public offering (“IPO”), we examine whether reduced disclosure leads to less trading by individual investors. Our results show that, immediately following the IPO, individual investors are less likely to trade in the stocks of the firms that provide less disclosure—but that this difference disappears after two weeks of trading. Our findings have important implications for the lawmakers now examining whether, and how, to change the mandatory disclosure rules that have served as the basis of federal securities law for generations.

* Colleen Honigsberg and Yu-Ting Forester Wong are Ph.D. Candidates at Columbia Business School. Robert J. Jackson, Jr. is Professor of Law and Co-Director of the Ira M. Millstein Center on Global Markets and Corporate Ownership at Columbia Law School. We thank Lucian Bebchuk, Edwige Cheynel, Zohar Goshen, Scott Hirst, Alon Kalay, Shail Pandit, Richard Squire, and workshop participants at the 2015 Annual Meeting of the American Accounting Association, Columbia Law School, and Harvard Law School for helpful comments. We are also grateful to Abraham Lowenstein for exceptional research assistance.

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INTRODUCTION

Mandatory disclosure is the cornerstone of federal securities law.¹ One oft-cited justification for requiring disclosure² is that it is necessary to provide individual investors with equal access to securities markets.³ But whether the mandatory disclosure rules we have today actually achieve this goal is theoretically ambiguous and hotly debated. Some argue that disclosure facilitates individual investor participation in securities markets by reducing information asymmetry among different types of investors—that is, by leveling the playing field between sophisticated institutional shareholders and individual investors.⁴ More recent work, however, has suggested that individual investors suffer from “disclosure overload”—and that increasing the amount of information disclosed under federal securities law does not benefit these investors, who are unable to extract relevant information from increasingly complicated securities filings.⁵ But

1. The Securities Act of 1933 requires that all companies register non-exempt securities prior to their sale, a process that requires the company to disclose significant information about its financial performance and governance for the years preceding the sale. After the firm has provided this information and sells its securities, the Securities Exchange Act of 1934 then requires ongoing, periodic disclosures relating to the firm’s financial performance and governance. *See generally* Securities Act of 1933, 15 U.S.C. §§ 77a–mm (2014); Securities Exchange Act of 1934, 15 U.S.C. §§ 78a–pp (2014).

2. For the seminal work describing the economic basis for a system of mandatory disclosure, see John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 VA. L. REV. 717 (1984).

3. *See, e.g.*, Michael H. Sutton, *Financial Reporting in U.S. Capital Markets: International Dimensions*, 11 ACCT. HORIZONS 96 (1997).

4. *See, e.g.*, Brian J. Bushee et al., *Open Versus Closed Conference Calls: The Determinants and Effects of Broadening Access to Disclosure*, 34 J. ACCT. & ECON. 149 (2003); Bevis Longstreth, Comm’r, U.S. Sec. & Exch. Comm’n, Remarks to the Eighth AICPA National Conference for CPAs in Industry: The SEC’s Role in Financial Disclosure (Apr. 29, 1983), available at <https://www.sec.gov/news/speech/1983/042983longstreth.pdf>.

5. *See, e.g.*, Alastair Lawrence, *Individual Investors and Financial Disclosure*, 56 J. ACCT. & ECON. 130 (2013) (showing that individuals are more likely to invest in, and to earn higher returns from, firms with clearer and more concise disclosures); Brian P. Miller, *The Effects of Reporting Complexity on Small and Large Investor Trading*, 85 ACCT. REV. 2107 (2010) (finding that individuals are less likely to trade in companies with complex disclosures). In light of these concerns about “disclosure overload,” in 2013, the US Securities and Exchange Commission (“SEC”) issued a lengthy report reviewing the effectiveness of mandatory disclosure rules in the United States. U.S. SEC. & EXCH. COMM’N, REPORT ON REVIEW OF DISCLOSURE REQUIREMENTS IN REGULATION S-K (2013) [hereinafter SEC REPORT]. And the SEC has since announced a rulemaking project to reform the rules governing mandatory disclosures for US public firms, see Keith F. Higgins, Dir., Div. of Corp. Fin., U.S. Sec. & Exch. Comm’n, Disclosure Effectiveness: Remarks Before the American Bar Association Business Law Section Spring Meeting (Apr. 11, 2014), available at <http://www.sec.gov/News/Speech/Detail/Speech/1370541479332>, and issued a concept release raising more than 300 questions regarding how any such reform should proceed, see Concept Release on Business and Financial Disclosure

there is surprisingly little empirical evidence on whether and how the quantum of information required to be disclosed under federal securities law actually affects individual investor participation in securities markets.⁶

In this Article, we provide evidence on the effects of disclosure on individual investors from a unique setting provided by a recent law: the Jumpstart Our Business Startups Act of 2012 (“JOBS Act”).⁷ The JOBS Act allows certain firms conducting an initial public offering (“IPO”) to provide fewer disclosures to investors.⁸ This setting allows us to provide unique insights into the relationship between mandatory disclosure rules and individual investor participation for two reasons. First, most firms that conduct an IPO after the passage of the JOBS Act are allowed to provide reduced disclosure in one or more different areas in which disclosure is typically mandated;⁹ this provides variation that allows us to study how individual investors respond to varying levels of disclosure. Second, because investors generally have limited information about firms before an IPO, disclosure is especially relevant to investors at the IPO stage.¹⁰ Thus, our setting provides a unique opportunity to test the importance of mandatory securities disclosures to individual investors at a time when securities law is an important source of information—indeed, sometimes the only source of information—for those investors.

Our evidence shows that reducing the information that firms are required to disclose before an IPO leads to a statistically and economically significant decrease in individual investor participation in the IPO. Importantly, however, this effect is substantially reduced during the week of trading following the IPO—and disappears completely after two weeks. Our findings are consistent with theory predicting that individual investors who are at an informational disadvantage to other investors will be less likely to participate in securities markets. But our evidence also shows

Required by Regulation S-K, Exchange Act Release No. 33-10064 (Apr. 13, 2016), *available at* <https://www.sec.gov/rules/concept/2016/33-10064.pdf>.

6. For rare exceptions, see generally, e.g., Lawrence, *supra* note 5; Miller, *supra* note 5.

7. Pub. L. No. 112-106, 126 Stat. 306 (2012).

8. *Id.* § 102.

9. See, e.g., *id.* § 102(b)(1)(A) (permitting an “emerging growth company” to present only two, rather than three, years of audited financial statements in its IPO registration statement).

10. Individual investors are thought to be at an especially significant information disadvantage prior to the IPO because, among other reasons, Regulation Fair Disclosure (“Regulation FD”) does not apply to firms that are not yet public. See *infra* Part I.B. Regulation FD is an SEC rule designed to prevent selective disclosure—that is, to prevent firms from providing information to a select group of favored investors instead of making the information available to the public at large. Under Regulation FD, when a company discloses material nonpublic information to certain individuals or entities, like stock analysts, the company must make the information publicly available to all potential investors. See Regulation FD, 17 C.F.R. § 243.100 (2015).

that, while this disadvantage can be addressed by mandating disclosure, such mandates are not the only mechanism available to address these information asymmetries.¹¹

Our findings have important implications for the regulators now considering the costs and benefits of proposed changes to the disclosures currently mandated by federal securities law.¹² In particular, the evidence indicates that policymakers concerned about the effects of such changes on individual investors might turn their focus to firms that are already public—rather than firms at the IPO stage, where the effects of reduced disclosures are likely to be largest for individual investors. Our findings also suggest that lawmakers should emphasize experimental approaches to modifying the law in this area—as the SEC has done in the past—so that regulators and researchers can better understand the effects of these changes on investors of all kinds.

The remainder of the Article proceeds as follows. Part I provides theoretical background on the relationship between mandatory disclosure rules and individual investors' participation in stock markets. Part II provides empirical evidence that individual investors participate less in the IPOs of firms that disclose less under the JOBS Act—but that this effect disappears during the two weeks of trading that follow the offering. Part III describes the implications of our findings for lawmakers and commentators. Part IV concludes.

I. MANDATORY DISCLOSURE AND INDIVIDUAL INVESTORS

Ever since the passage of the Securities Act of 1933 and the Securities Exchange Act of 1934, commentators have offered myriad justifications for the federal laws that require public corporations to disclose certain information to investors.¹³ In this Article, we study one frequently cited

11. See Longstreth, *supra* note 4, at 7.

12. See Higgins, *supra* note 5 (discussing the SEC's current efforts to revise the current disclosure requirements in order to make securities filings more effective); see also Concept Release on Business and Financial Disclosure Required by Regulation S-K, *supra* note 5, at 6 (noting that the Commission is currently "assess[ing] whether [its disclosure rules] continue to provide the information that investors need to make informed investment and voting decisions and whether any of [the SEC's] rules have become outdated or unnecessary").

13. See, e.g., Coffee, *supra* note 2 (arguing that mandatory disclosure is necessary for capital markets to function efficiently, since the benefits of disclosure are diffuse, but the costs are borne by the firm, so that firms will not provide the efficient level of disclosure without regulation); see also Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1051 (1995) (arguing that mandatory disclosure rules reduce agency costs by giving investors the information they need to "police" firm management).

justification for mandatory disclosure laws: that mandatory disclosure is beneficial because it entices individual investors to participate in securities markets.

This claim has been hotly debated for decades, with commentators emphasizing two objections. First, observers dispute whether individual investors should be encouraged to participate in equities markets at all. As we explain in Part I.A below, some have argued forcefully that social welfare might be enhanced by excluding—or at least discouraging—individual investors from participating in stock markets. Despite these arguments, however, securities regulators today emphasize individual investor participation as an important policy objective of modern securities law.¹⁴

Because regulators continue to pursue mechanisms for encouraging individual investors to participate in stock markets, in Part I.B we consider whether, in fact, providing individuals with more information about public companies encourages them to invest. Significant recent work has questioned that notion, arguing that, because individuals are unable to process the overwhelming quantum of information provided in modern securities disclosures, mandatory disclosure rules likely have little effect on individual investor participation in markets. As we explain below, although some previous work has attempted to examine that claim empirically, in this Article we use a rare setting to evaluate the relationship between mandatory disclosure and individual investor participation in modern stock markets.

A. The Optimal Role of Individual Investors in Modern Stock Markets

Virtually since the conception of the modern federal securities regulation apparatus, policymakers have argued that the protection of individual investors should be among its principal goals.¹⁵ The legislative history of both the 1933 and 1934 Acts themselves suggest that Congress

14. See, e.g., Mary Jo White, Chair, U.S. Sec. & Exch. Comm'n, Protecting the Retail Investor (Mar. 24, 2014), available at <https://www.sec.gov/News/Speech/Detail/Speech/1370541226174> ("The retail investor must be a constant focus of the SEC—if we fail to serve and safeguard the retail investor, we have not fulfilled our mission.").

15. For a discussion of this issue in two of the Nation's leading securities casebooks, see STEPHEN J. CHOI & A.C. PRITCHARD, SECURITIES REGULATION 12 (2d ed. 2008) ("At various points [throughout securities law], we . . . see regulatory schemes intended to protect ordinary small investors from the big players."); JOHN C. COFFEE, JR. & HILLARY A. SALE, SECURITIES REGULATION 2 (12th ed. 2012) ("Historically, the securities markets have long been thought to be affected with a special public interest.").

intended both statutes to serve that objective.¹⁶ Nor is the notion antiquated. Current SEC Chair Mary Jo White has frequently worried that today's securities regulation regime may not give individual investors sufficient protection.¹⁷

Recent scholarship, however, has argued forcefully that individual investor protection should not be the central goal of securities regulation. For example, Zohar Goshen and Gideon Parchomovsky have persuasively argued that the objective of securities law should be to maximize social welfare, and that to do so, lawmakers should design securities regulation for sophisticated institutional investors rather than individuals.¹⁸ More recently, finance scholar Luigi Zingales has suggested that regulators should *discourage* individual investors from participating in securities markets because protecting this relatively small group of unsophisticated investors causes a significant increase in regulatory costs—without offsetting social-welfare benefits.¹⁹

By contrast, some commentators have urged that individual investor participation produces significant efficiency benefits. For example, a group of economists recently argued that individual traders enhance market efficiency by providing an important source of liquidity.²⁰ Indeed, there is significant empirical evidence that individual investors are contrarian—that is, that they tend to invest against the tide of general

16. *See, e.g.*, H.R. REP. NO. 73-85 (1933) (surveying the decade of securities activity that followed World War I and concluding that the stock market volatility that occurred during that decade “spelle[d] tragedy in the lives of thousands of individuals who invested their life savings, accumulated after years of effort, in . . . worthless securities”).

17. *See, e.g.*, Interview by Steven Bochner, Chair, Sec. Regulation Inst., with Mary Jo White, Chair, U.S. Sec. & Exch. Comm’n (Jan. 26, 2016), *available at* <https://www.sec.gov/news/speech/securities-regulation-institute-keynote-white.html> (noting that individual investors, when it comes to IPOs, “may get very excited from an article or a blog and invest their money, and so you worry about them not getting sufficient or accurate information”).

18. *See, e.g.*, Zohar Goshen & Gideon Parchomovsky, *The Essential Role of Securities Regulation*, 55 DUKE L.J. 711 (2006) (arguing, based on a theoretical market model, that securities laws would be most efficient if they were designed for sophisticated institutional investors); *see also* HOMER KRIPKE, *THE SEC AND CORPORATE DISCLOSURE: REGULATION IN SEARCH OF A PURPOSE* 14 (1979) (“[T]he SEC overestimates the average investor’s ability to master the complexities of the financial picture of the typical issuer . . . and therefore has failed . . . to understand that its disclosure documents can be used effectively only by professionals.”).

19. *See* Luigi Zingales, *The Future of Securities Regulation*, 47 J. ACCT. RES. 391, 417 (2009) (suggesting that individual investors should be nudged out of equities markets so that securities laws can be designed for efficiency rather than investor protection).

20. *See, e.g.*, Ron Kaniel et al., *Individual Investor Trading and Stock Returns*, 63 J. FIN. 273, 274 (2008) (“[T]he contrarian tendency of individuals leads them to act as liquidity providers to institutions that require immediacy.”); Qin Wang & Jun Zhang, *Individual Investor Trading and Stock Liquidity*, 45 REV. QUANTITATIVE FIN. & ACCT. 485, 486 (2015) (“We find striking evidence that individual investor trading has a significantly positive effect on stock liquidity.”).

market movements. These contrarian tendencies, some have argued, play an important role in market dynamics: because individual investors often take the other side of large institutions' trades, they significantly improve liquidity.²¹

Despite the decades-long academic debate over *whether* securities law should seek to encourage individual investors to participate in securities markets, policymakers today consistently contend that doing so is among their principal regulatory objectives.²² Thus, in the next Part, we turn to a second question: *how* the law can best encourage individuals to invest in securities markets. In particular, we examine current debates over whether mandatory disclosure rules do, in fact, encourage individual investors to participate in today's stock markets.

B. Individual Investors and Mandatory Disclosure

The claim that mandatory disclosure rules encourage individuals to invest in securities markets rests on the premise that such rules "level the playing field" between individuals and more sophisticated retail investors. Individual investors, the theory goes, benefit more from mandatory disclosure than institutional players because, while more sophisticated investors might have other sources of information about a firm, individual investors must rely upon securities filings for details about the firms that they own. More recent work, however, has argued that modern securities filings include such an overwhelming amount of information that mandating more disclosure is unlikely to encourage individuals to invest. Instead, under this competing view, individual investors are likely to be overwhelmed by the volume of information in modern securities disclosures and, thus, will not use that information in making their investment decisions.

1. Disclosure and "Leveling the Playing Field"

For decades, the SEC has argued that extensive mandatory disclosure rules are necessary to entice individual investors to participate in securities markets. In 1983, for example, one Commissioner famously remarked that "[m]andatory disclosure fosters investor confidence by ensuring all

21. See, e.g., John M. Griffin et. al., *The Dynamics of Institutional and Individual Trading*, 58 J. FIN. 2285 (2003); Mark Grinblatt & Matti Keloharju, *The Investment Behavior and Performance of Various Investor Types: A Study of Finland's Unique Data Set*, 55 J. FIN. ECON. 43 (2000); Mark Grinblatt & Matti Keloharju, *What Makes Investors Trade?*, 56 J. FIN. 589 (2001).

22. See *supra* note 14 and accompanying text.

investors of equal access to corporate information,” noting that “[i]nvestor confidence comes from the knowledge that the information is equally available to all—large *and* small.”²³

The intuition for why mandatory disclosure spurs participation by individual investors is twofold. First, because investors are more likely to participate when they know more about a company, securities disclosures are a way to ensure that individuals receive information about public firms. Although institutional investors have access to the disclosures as well, the information may provide a particular benefit to individuals, because large institutions generally have access to other sources of information.

Second, even if individuals do not learn more about public companies from mandatory disclosures than they otherwise might, previous work has shown that individual investors are more likely to participate in markets when they are assured that they have *equal* access to information. The reason is intuitive: if a more informed investor is willing to buy (or sell) a security at a given price, a relatively uninformed investor taking the other side of that trade can rationally conclude that the price she is paying to sell (or buy) the security may be a losing proposition.²⁴

Longstanding empirical work provides significant support for the idea that more disclosure encourages individuals to participate in securities markets. For example, one study found that the companies that hold “open conference calls”—meaning that all investors, as opposed to only a subset of investors or only financial analysts, are allowed to participate in the conference call—have greater levels of individual investors.²⁵ Notably, substantial evidence also indicates that *equal* access to information, rather than merely more information, drives participation. For example, individual participation increased after Regulation FD—the SEC regulation intended to reduce information asymmetry among different types of investors—went into effect.²⁶ Importantly, the increase in

23. See Longstreth, *supra* note 4, at 7.

24. See *id.*

25. Bushee et al., *supra* note 4, at 177–78.

26. See Chiraphol N. Chiyachantana et al., *The Impact of Regulation Fair Disclosure on Information Asymmetry and Trading: An Intraday Analysis*, 39 FIN. REV. 549 (2004); see also Christian Leuz & Peter Wysocki, *The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research* 24–25 (Eur. Corp. Governance Inst., Working Paper No. 306/2016, 2015), available at <http://research.chicagobooth.edu/~media/7628D551E7424DC08524879103870C12.pdf> (describing empirical evidence demonstrating that increased corporate disclosure can mitigate information asymmetry between informed and uninformed investors by reducing the opportunities for investors to become privately informed). For a discussion of Regulation FD, see *supra* note 10.

individual participation was attributable to the fact that information was now available to all investors equally, not to an increase in the total amount of information available.²⁷

We note that the risk that individual investors will be less informed than large institutions is particularly pronounced at the IPO stage—the setting we study here. The reason is that Regulation FD does not apply prior to the IPO, thus allowing management to disclose information to institutional investors that is not publicly available.²⁸ The risk that individual investors face in this context was powerfully demonstrated in the aftermath of Facebook’s recent IPO. Following disappointing returns on the first few days of trading, it was revealed that Facebook’s management informed financial analysts prior to the IPO that future earnings were expected to be less robust than originally predicted. However, only select clients such as financial analysts—and not the general public—were informed of the update.²⁹ While Regulation FD would have prohibited such selective disclosure if it had applied, Facebook disclosed the information prior to the IPO, and its disclosures thus fell outside the scope of Regulation FD.

2. Disclosure and “Information Overload”

Notwithstanding substantial evidence that increasing the level of disclosure will enhance individual investor participation in stock markets, other work has argued that more disclosure will *discourage* individuals from investing. The reason is that today’s securities disclosures arguably provide *too much* detail on public companies, making it impossible for individual investors, with limited analytical resources, to make meaningful use of the disclosed information.

Significant psychology research has shown that when individuals are presented with extensive information about a particular decision, they become more likely to rely on heuristics than systematic evaluation, decreasing the quality of information processing—and decisions.³⁰

27. See Chiyachantana et al., *supra* note 26, at 560.

28. See Selective Disclosure and Insider Trading, 65 Fed. Reg. 51,716, 51,725 (Aug. 24, 2000) (codified at 17 C.F.R. pts. 240, 243, 249) (“[W]ith limited exceptions, Regulation FD as adopted does not apply to disclosures made in connection with a securities offering registered under the Securities Act.”).

29. See Shayndi Raice et al., *Inside Fumbled Facebook Offering*, WALL ST. J. (May 23, 2012, 11:00 AM), <http://www.wsj.com/articles/SB10001424052702304019404577420660698374718>.

30. See generally JOHN W. PAYNE ET AL., *THE ADAPTIVE DECISION MAKER* (1993); John W. Payne, *Contingent Decision Behavior*, 92 PSYCHOL. BULL. 382 (1982); John W. Payne et al., *Adaptive Strategy Selection in Decision Making*, 14 J. EXPERIMENTAL PSYCHOL. 534 (1988). For important

Consistent with that notion, studies on individual investors and financial disclosures have suggested that individuals may be unable to effectively process the information public companies provide under today's securities laws; for example, empirical work has suggested that individuals are less likely to invest in firms with greater financial complexity.³¹

Indeed, some recent work goes even further, arguing that more extensive mandatory disclosure rules *disadvantage* individual investors because of the greater information-processing capabilities of institutional shareholders.³² Empirical work has shown that institutional investors are better able to process financial disclosures than individual shareholders,³³ raising the possibility that mandatory disclosure rules provide a disproportionate benefit to certain sophisticated investors. Because these sophisticated investors are better able to interpret the information provided under mandatory disclosure rules, the argument goes, these rules have the unintended consequence of *increasing* information asymmetry between institutional investors and individual shareholders.³⁴

These concerns have led commentators and lawmakers alike to wonder whether existing disclosure rules disadvantage individual investors by requiring firms to provide an overwhelming amount of information in securities filings. For example, former SEC Commissioner Troy Paredes has argued in these pages that today's mandatory disclosure rules may be counterproductive, leading investors who are overwhelmed with information to make worse investment decisions than they otherwise might.³⁵ And the SEC's own recent study of its mandatory disclosure rules repeatedly suggested that some disclosure requirements have produced

recent work describing the implications of these insights for disclosures mandated throughout the law, see OMRI BEN-SHAHAR & CARL E. SCHNEIDER, *MORE THAN YOU WANTED TO KNOW: THE FAILURE OF MANDATED DISCLOSURE* (2014); Ryan Bubb, *TMI? Why the Optimal Architecture of Disclosure Remains TBD*, 113 MICH. L. REV. 1021 (2015).

31. See Miller, *supra* note 5, at 2107.

32. See, e.g., Charles M. C. Lee et al., *Spreads, Depths, and the Impact of Earnings Information: An Intraday Analysis*, 6 REV. FIN. STUD. 345 (1993). Additional information can also exacerbate information asymmetry if the additional information complements the information set held by some—but not all—investors.

33. See, e.g., Alan Guoming Huang et al., *Institutional Trading Around Corporate News: Evidence from Textual Analysis* (May 30, 2014) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2336069.

34. See Robert E. Verrecchia, *Essays on Disclosure*, 32 J. ACCT. & ECON. 97, 172 (2001) (describing instances in which greater disclosure may exacerbate information asymmetry among investors).

35. See Troy A. Paredes, *Blinded by the Light: Information Overload and Its Consequences for Securities Regulation*, 81 WASH. U. L.Q. 417, 419 (2003).

“lengthy, technical disclosure[s]” that are not useful to individual investors.³⁶

The more general debate over *whether* the law should encourage individual investor participation in markets is unlikely to be amenable to systematic empirical analysis.³⁷ However, the competing hypotheses described above about *how* mandatory disclosure rules affect individual investor behavior are empirically testable. On the one hand, if these rules benefit individual investors, we would predict that a decrease in the quantum of disclosure required by the law would lead to less individual investor participation in markets. On the other, if individuals do indeed suffer from “disclosure overload,” we would expect that a decrease in the information required to be disclosed under securities law would have no effect—or might even increase—individuals’ willingness to invest. In the next Part, we provide the first empirical evidence testing these competing theoretical predictions.

II. DATA AND EMPIRICAL RESULTS

As explained in Part I, lawmakers are now debating how the law can best facilitate individual investor participation in modern markets—and, in particular, mandatory disclosure rules as a policy mechanism for doing so. Would increasing the required disclosures under federal securities law overwhelm individual investors, leading them to exit stock markets? Or would requiring more information in securities filings assure individuals that they are on a level playing field with more savvy institutional players, enhancing individual investor participation? In this Article, we use evidence from the recent passage of the JOBS Act to provide the first-ever empirical study of these questions.

The evidence shows that the reduction in mandatory disclosure that occurred under the JOBS Act led to a reduction in trading by individual investors, suggesting that individuals prefer to receive more information under these disclosures rather than less.³⁸ Importantly, however, the data

36. See SEC REPORT, *supra* note 5, at 101. In fact, the Director of the SEC’s Division of Corporation Finance—which oversees, among other things, many of the SEC’s disclosure mandates—recently stated that the division is reconsidering those rules in light of the “growing concern about disclosure overload” that may lead “an individual investor [to] feel overloaded—and a bit overwhelmed—with information.” Higgins, *supra* note 5.

37. See, e.g., Zingales, *supra* note 19 (noting that preventing individual investor participation in securities markets would have the distinct disadvantage of making measuring the social-welfare effects of such participation methodologically infeasible).

38. See *infra* Part II.E.

also indicate that these differences in individual investor trading disappear relatively quickly after the company's IPO—within two weeks.³⁹ Thus, our findings suggest that, while a decrease in mandatory disclosure might initially reduce individual investor participation—particularly at the IPO stage—other information-generating activities, such as active trading of the company's stock, might entice individuals to continue to invest in public companies.

A. *The JOBS Act*

The JOBS Act was signed into law on April 5, 2012, with the stated purpose of increasing “American job creation and economic growth by improving access to the public capital markets for emerging growth companies.”⁴⁰ Specifically, Congress intended to provide smaller, growing companies with cheaper access to capital.⁴¹ To reduce the costs associated with IPOs, the Act created a new class of companies, Emerging Growth Companies (“EGCs”), which may provide reduced disclosures in their securities filings in connection with their IPOs.⁴² The primary requirement for qualifying as an EGC is that the company must have less than \$1 billion in total revenue in its most recently completed fiscal year.⁴³

1. *Reductions in Disclosure Available to EGCs*

Provided that they do not lose their EGC status, EGCs may provide reduced disclosure for the first five years following their IPO.⁴⁴ These reduced disclosures typically relate to one of four areas of the firm's finances and governance.⁴⁵ First, EGCs may choose to provide two (rather than three) years of historical audited financial data.⁴⁶ Second, EGCs are not required to produce the internal controls report required by Section

39. *Id.*

40. Jumpstart Our Business Startups Act, Pub. L. No. 112-106, pmb1., 126 Stat. 306, 306 (2012).

41. Indeed, Congress's intent is demonstrated by the name of Title II of the JOBS Act: “Access to Capital for Job Creators.” *Id.* § 201.

42. *See id.* § 102.

43. *See id.* § 101(a).

44. *See id.*

45. For a discussion of all reduced disclosures available to EGCs, see *id.* § 102. For more detail, see U.S. SEC. & EXCH. COMM'N, JUMPSTART OUR BUSINESS STARTUPS ACT: FREQUENTLY ASKED QUESTIONS, <https://www.sec.gov/divisions/corpfin/guidance/cfjjobsactfaq-title-i-general.htm> (last modified Dec. 21, 2015) [hereinafter FREQUENTLY ASKED QUESTIONS].

46. JOBS Act § 102(b)(1)(A); see also FREQUENTLY ASKED QUESTIONS, *supra* note 45.

404 of the Sarbanes-Oxley Act of 2002.⁴⁷ Section 404 requires that management and an outside auditor provide an assessment of the firm's internal controls in a special report.⁴⁸ Third, EGCs can elect to provide less disclosure regarding their executives' pay; specifically, they can disclose historical compensation data for three (rather than five) executives for the previous two (rather than three) years.⁴⁹

Finally, EGCs can choose to pursue a "confidential" IPO process, in which the company privately submits its registration statement to the SEC instead of filing it publicly.⁵⁰ In a non-confidential filing, potential investors can view the registration statement as soon as the company has filed it, and can view the back-and-forth process between the SEC and the company, which can reveal important information.⁵¹ In a confidential filing, the draft registration statements are instead released as exhibits to the final registration statement when it is made publicly available.⁵² From the company's perspective, a confidential filing is beneficial because it allows the company to have more control over the timing of its IPO announcement—a crucial component of IPO success.⁵³

2. *Previous Work on the JOBS Act*

Prior literature on the JOBS Act has largely focused on whether the Act has, in fact, reduced the costs of going public for the EGCs that took

47. JOBS Act § 103.

48. Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, 116 Stat. 745 (codified as amended in scattered sections of 15, 18, 28, and 29 U.S.C.). The implementation of Section 404 is associated with increased reliability of reported financials and fewer intentional misstatements. See Ziv Singer & Haifeng You, *The Effect of Section 404 of the Sarbanes-Oxley Act on Earnings Quality*, 26 J. ACCT., AUDITING & FIN. 556 (2011). However, it has also increased audit fees significantly, particularly for smaller firms. See Peter Iliev, *The Effect of SOX Section 404: Costs, Earnings Quality, and Stock Prices*, 65 J. FIN. 1163, 1166 (2010).

49. JOBS Act § 102(a). These disclosures are required by 17 C.F.R. § 229.402.

50. JOBS Act § 106. All securities filings made in connection with the company's registration statement must be made public no later than twenty-one days prior to the company's "road show." A "road show" is when the company's managers and financial advisors present the company to potential buyers in order to generate interest in the company's securities. See Conditions to Permissible Post-Filing Free Writing Prospectuses, 17 C.F.R. § 230.433(h)(4) (2016).

51. For example, the SEC forced Groupon to revise its initial registration statement because it used non-standard accounting principles. Upon completion of all revisions, total revenues in the first half of 2011 decreased from roughly \$1.5 billion to \$688 million. See Alexia Tsotsis, *Groupon IPO Shares Pop 40% on First Trade, Debuts at \$28 with a \$17.8B Market Cap*, TECHCRUNCH (Nov. 4, 2011), <http://techcrunch.com/2011/11/04/groupon-ipo-shares-pop-40-on-first-trade-debuts-at-17-8b-market-cap/>.

52. JOBS Act § 106(a); see also *infra* note 63 (describing how these filings can be obtained).

53. See Tim Loughran & Jay R. Ritter, *Why Don't Issuers Get Upset About Leaving Money on the Table in IPOs?*, 15 REV. FIN. STUD. 413, 433–37 (2002).

advantage of the reduced disclosures allowed under the Act. While several studies have so far found that the Act had no effect on the direct costs of going public—like underwriter, legal, and accounting fees⁵⁴—several studies have found that the JOBS Act has increased the indirect costs of going public. For example, recent work shows that, relative to comparable non-EGC firms, EGCs suffer greater IPO underpricing⁵⁵ and stock-price volatility in the period following the IPO.⁵⁶ These findings suggest that the Act may have had the unintended consequence of raising the cost of capital for EGC firms.⁵⁷

As to whether the Act achieved its goal of facilitating small firms' ability to raise capital, the early literature is mixed. One study found that the Act led to an increase in US IPO volume, with the bulk of that growth driven by firms with high disclosure costs—suggesting that the JOBS Act achieved its goal of encouraging such firms to go public.⁵⁸ Another study, however, suggested that there has not been a general increase in IPO growth since the passage of the Act.⁵⁹

To our knowledge, no previous work has attempted to use the JOBS Act to evaluate the relationship between mandatory disclosure and individual investor participation. Rather than focusing on the effect of the Act on the companies themselves, we focus on the effect of the law on the companies' investor bases. Because the Act reduces the amount of information required to be disclosed by federal law at a moment when individual investors might most fear that they are at an information deficit relative to institutional shareholders—at the IPO stage, when Regulation FD does not apply—it offers a unique setting in which to test the effects of securities law on different types of investors. In particular, in the Parts that follow, we use the Act to study the relationship between mandatory disclosure rules and individual investor participation.

54. See Susan Chaplinsky et al., *The JOBS Act and the Costs of Going Public* (Oct. 4, 2015) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2492241.

55. See *id.*; see also Mary E. Barth et al., *The JOBS Act and Information Uncertainty in IPO Firms* 4 (Stanford Univ. Graduate Sch. of Bus., Research Paper No. 14-26, 2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2465927; Sudip Gupta & Ryan D. Israelsen, *Hard and Soft Information: Firm Disclosure, SEC Letters, and the JOBS Act* (Kelley Sch. of Bus., Research Paper No. 2014-34, 2015), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2473509.

56. See Barth et al., *supra* note 55, at 18–20.

57. See Chaplinsky et al., *supra* note 54, at 12–19 (finding that potential IPO growth was limited to two industries, biotech and pharmaceuticals, that have limited immediate growth prospects).

58. See Michael Dambra et al., *The JOBS Act and IPO Volume: Evidence That Disclosure Costs Affect the IPO Decision*, 116 J. FIN. ECON. 121 (2015) (measuring disclosure costs by research intensity and industry concentration).

59. See Chaplinsky et al., *supra* note 54, at 6.

B. Descriptive Statistics

We began by examining each of the registration statements for all firms that held their IPO after the JOBS Act went into effect.⁶⁰ There were fifty-four firms that conducted IPOs from December 8, 2011, through April 5, 2012 (the period during which the JOBS Act was applied retroactively), and 345 firms that conducted an IPO from April 5, 2012 (the day the JOBS Act was passed), through April 16, 2014.⁶¹ We pulled the registration statements⁶² from the SEC's EDGAR database for each of these filings and hand-collected data from each firm's registration statement to determine whether the firm utilized any of the modifications available under the JOBS Act.⁶³

The descriptive statistics for these companies are provided in Tables I and II. Table I indicates that the vast majority of firms that held an IPO during the period we study are EGC-eligible—that is, they are permitted under the Act to provide less information to investors in advance of their IPO than firms that are not EGCs. The table shows the number of firms that would have been eligible for EGC status—the firms with less than \$1 billion in revenue in the fiscal year immediately prior to their IPO—relative to the number of IPOs for each year from January 1, 2007, through April 16, 2014. Out of the 941 total IPOs, 829 had less than \$1 billion in revenue. This indicates that the JOBS Act altered the disclosure rules applicable at the IPO stage for the vast majority of firms that go public.

60. We specifically examined all firms that conducted an IPO from December 8, 2011, through April 16, 2014. To create this list, we used Thomson Reuters's SDC database. To obtain accounting information, such as the value of each company's total assets, we merged the data from the Thomas Reuters SDC database with the Compustat database. Compustat, which contains financial data for all companies listed on US stock exchanges from 1926 through the present, is available through Wharton Research Data Services. See WRDS, <http://wrds-web.wharton.upenn.edu/wrds>.

61. These data are available from the authors upon request.

62. The registration statement is Form S-1 for US firms and Form F-1 for foreign firms. If the registration statement was unavailable, we dropped the observation. We also removed all real estate investment trusts.

63. To determine whether the firm opted out of Section 404, provided fewer years of financial data, or provided fewer years of compensation history, we examined each company's registration statement. We began with the original filing, but also reviewed all amendments prior to the IPO date to update the original coding as necessary. To identify confidential filers, we searched for the three ways a firm can file a confidential registration statement with the SEC. These three options are as follows. First, the firm can file a Draft Registration Statement ("DRS") in EDGAR. Second, companies can request confidential treatment by sending an email to the SEC. Third, companies can request confidential treatment by sending a request through the mail.

TABLE I: DESCRIPTIVE STATISTICS

		Number of IPOs	Num. IPOs < \$1B in Revenue in Prior FY	Percentage EGC Eligible
Pre-JOBS Act	Jan. 1, 2007–Dec. 31, 2007	224	202	90%
	Jan. 1, 2008–Dec. 31, 2008	55	48	87%
	Jan. 1, 2009–Dec. 31, 2009	51	43	84%
	Jan. 1, 2010–Dec. 31, 2010	108	97	90%
	Jan. 1, 2011–Dec. 8, 2011	101	94	93%
JOBS Act Retroactive	Dec. 9, 2011–Apr. 5, 2012	57	51	89%
JOBS Act in Effect	Apr. 6, 2012–Dec. 31, 2012	83	70	84%
	Jan. 1, 2013–Dec. 31, 2013	200	167	84%
	Jan. 1, 2014–Apr. 16, 2014	62	57	92%
	Total:	941	829	88%

Table II shows that most EGCs took a piecemeal approach in which they utilized some, but not all, of the modifications to the IPO process available to them. Of the EGCs in our sample, the most popular JOBS Act modification—selected by over 95% of our EGC-eligible firms—was the option to omit the internal controls report required by Section 404 of Sarbanes-Oxley. However, many of the other modified disclosures were also popular—over 70% of EGCs chose to file their registration statements confidentially, and over 40% of firms provided only two years of audited financial history. Additionally, roughly 65% provided reduced compensation disclosures.

TABLE II: DISCLOSURE REDUCTIONS AMONG EGC-ELIGIBLE FIRMS

	Total EGC-Eligible IPOs	Number of EGCs Electing Each Modification			
		Opt Out of SOX Section 404	Confidential Filing	Fewer Years of Financial History	Less Comp. Disclosure
Apr. 6, 2012 – Dec. 31, 2012	70	65	16	20	36
Jan. 1, 2013 – Dec. 31, 2013	167	165	139	45	109
Jan. 1, 2014 – Apr. 16, 2014	57	55	55	30	45
Total:	294	285	126	95	190

To determine whether the percentage of firms opting for each modification varied over time, Figure I charts the percentage of firms selecting each option relative to the number of EGC-eligible IPOs per month. Panel A shows the total number of IPOs and the number of EGC-eligible IPOs by month, and Panels B through E show the total number of EGC-eligible firms that provided reduced disclosure in each of the four areas.

Although we did not see a time trend in the number of firms that opted out of Section 404 of Sarbanes-Oxley or provided fewer years of compensation or financial data, the percentage of eligible firms electing to file confidentially increased steadily over our sample period. The average percentage of confidential filers was roughly 23% from April through December of 2012, and did not exceed 50% in any month during this period, but increased to an average of 87% thereafter. This is not surprising, however, because many of the firms that held their IPOs in 2012 had initiated the registration process prior to the passage of the JOBS Act, meaning that these firms were required to file a non-confidential registration statement. Thus, the firms that held their IPO in 2013 or later had greater opportunity to make use of this modification.

FIGURE I, PANEL A: IPOs AND EGC-ELIGIBLE FIRMS BY MONTH

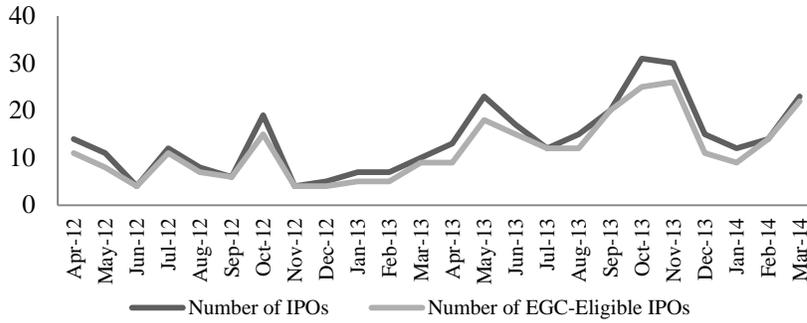


FIGURE I, PANEL B: EGC-ELIGIBLE FIRMS FILING CONFIDENTIALLY

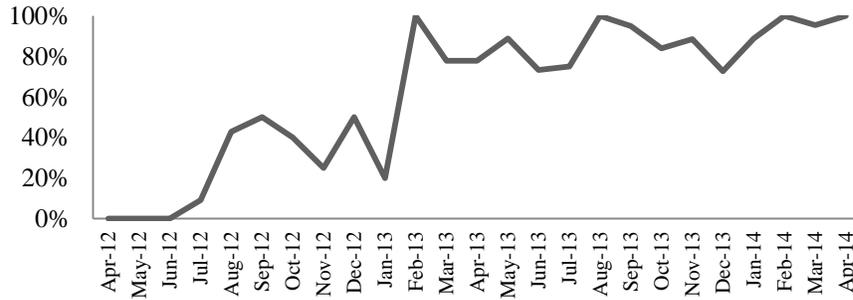


FIGURE I, PANEL C: EGC-ELIGIBLE FIRMS THAT REDUCE COMPENSATION DISCLOSURE

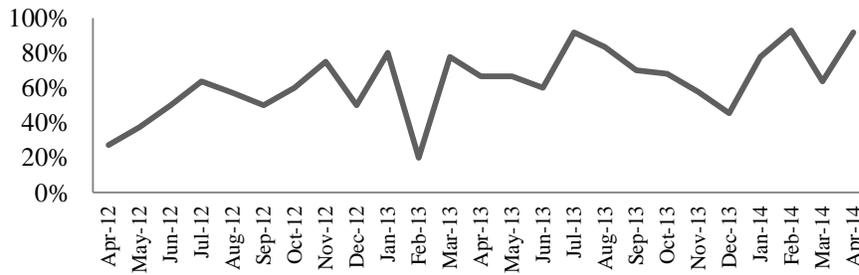


FIGURE I, PANEL D: EGC-ELIGIBLE FIRMS THAT PROVIDE FEWER YEARS OF FINANCIAL DATA

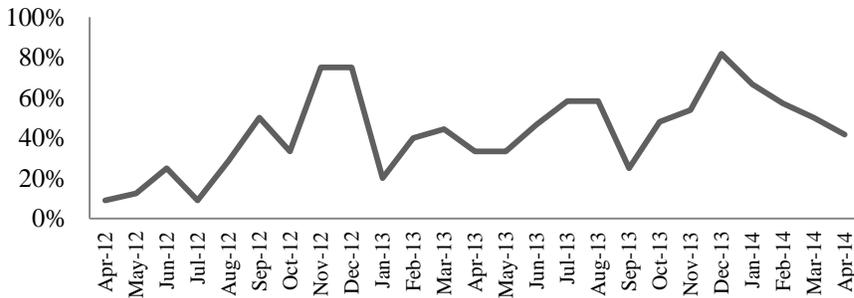
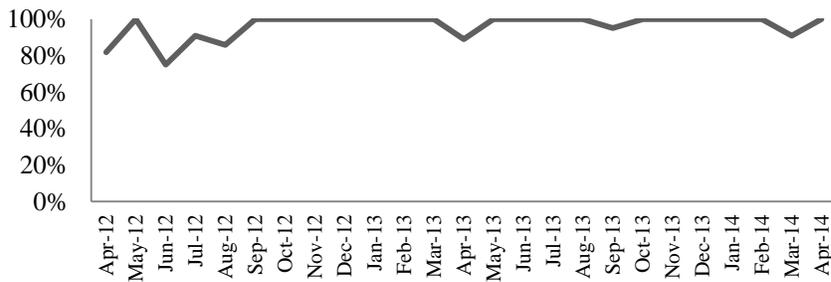


FIGURE I, PANEL E: EGC-ELIGIBLE FIRMS THAT OPT OUT OF SOX SECTION 404



C. Key Variables of Interest

1. Disclosure Index

The descriptive statistics indicate that most firms selected a piecemeal approach in which they opted for some, but not all, of the reduced disclosures available to them under the JOBS Act. This allows us to study whether the number of reduced disclosures varies cross-sectionally with individual trading. If each of the disclosures mandated for non-EGCs provides valuable information to individual investors, we would expect that individual trading of a particular company would correspondingly decrease as the company provides fewer disclosures. To test this

possibility, we constructed a firm-level index (the Disclosure Index, or “DI”) consisting of the elements below.⁶⁴

1. Did the firm provide fewer than three years of audited financial statements? EGCs are eligible to provide two (rather than three) years of prior audited financial data.
2. Did the firm opt out of the internal controls report required by Section 404 of Sarbanes-Oxley? We consider this provision to be disclosure related because the report provides individual investors with further detail on the reliability of the audited financials.
3. Did the firm provide reduced compensation disclosures? EGCs may disclose compensation for three (rather than five) executive officers, and may elect to report compensation for the last two (rather than three) years. We code the firm as providing less disclosure if the firm provides either fewer years of data or data for fewer executives.
4. Did the firm file its registration statement confidentially? Although confidential filers eventually disclose the same amount of information, we consider this provision to be disclosure related because it may severely limit the amount of time investors have to process the filings in question—a fact that has caused some to argue that the modification unfairly discriminates against individual investors.⁶⁵

We sum the reduced number of disclosures taken by each firm to create an index ranging from 0 to 4. Firms that provide reduced disclosure in all

64. We note that the elements included in the DI do not reflect the entire set of IPO modifications allowed under the JOBS Act. *See supra* notes 43–49. For the DI, we only included the modifications that are most relevant for our purposes—that is, those that most directly reduced information communicated to investors.

65. Confidential filers must wait a minimum of twenty-one days after their first public filing to officially begin their road shows, but critics argue that this is not enough time for individual investors, who presumably have other employment, to fully review the final registration statement and the attached exhibits. According to one prominent investor, Rett Wallace of Triton Research LLC, “Even for professionals, unless you’re narrowly focused, three weeks is not a lot of time. If you’re a retail investor and you have a day job, God help you.” Telis Demos, *Companies Find a Faster IPO Turnaround Doesn’t Hurt*, WALL. ST. J. (Sept. 29, 2013, 10:00 PM), <http://www.wsj.com/articles/SB10001424052702304795804579101731755248194> (internal quotation marks omitted).

areas are coded as having a DI of 4, whereas firms that do not take any reductions are coded as having a DI of 0.⁶⁶

2. *Measure of Individual Participation*

Empirical study on trading by individual investors has been hampered by the lack of available trading data. Because there is no way to determine whether every trade placed on every exchange comes from an individual or an institution, prior literature has used a number of proxies for trading by individual investors. Most studies have used small trade sizes to proxy for trades by individuals.⁶⁷ However, while this approach may have been accurate historically, it is no longer a valid proxy because institutions now use computer algorithms to disguise their trades by breaking them into smaller components.⁶⁸ In light of concerns that trade size may not be an accurate proxy, some researchers have used individual investor trading from brokerage firms.⁶⁹ Although this approach has the advantage of using actual trading data rather than a proxy for trading, the disadvantage is that the study will usually be limited to evidence from one brokerage firm.

We instead use actual trading data from the New York Stock Exchange (“NYSE”) to estimate individual investment.⁷⁰ The primary advantage of this database is that it contains actual trading data for all investors who trade on the NYSE, thus negating the use of proxies and allowing for the

66. Many of these firms took advantage of additional modifications that are available to EGC firms but are not disclosure related. We address the concern that our results may be driven by modifications to the IPO process rather than the reduced level of disclosure in our Appendix.

67. See, e.g., Bushee et al., *supra* note 4; Miller, *supra* note 5; see also Nilabhra Bhattacharya, *Investors' Trade Size and Trading Responses Around Earnings Announcements: An Empirical Investigation*, 76 ACCT. REV. 221 (2001); Nilabhra Bhattacharya et al., *Who Trades on Pro Forma Earnings Information?*, 82 ACCT. REV. 581 (2007); Gus De Franco et al., *Wealth Transfer Effects of Analysts' Misleading Behavior*, 45 J. ACCT. RES. 71 (2007); Charles M.C. Lee, *Earnings News and Small Traders: An Intraday Analysis*, 15 J. ACCT. & ECON. 265 (1992).

68. See, e.g., John Y. Campbell et al., *Caught on Tape: Institutional Trading, Stock Returns, and Earnings Announcements*, 92 J. FIN. ECON. 66 (2009) (developing a method for backing out algorithmic trades and showing key characteristics of institutional trading behavior).

69. See, e.g., Lawrence, *supra* note 5.

70. Specifically, we use the NYSE ReTrac database. The database is constructed using the NYSE Equity Consolidated Audit Trade File, which provides a chronological reconstruction of all stock trades that are executed on the NYSE. One of the fields included in the audit trade files, Account Type, indicates whether the trade originated from an individual or institution. This field has been included since October 1988, when it was included to ensure that trades by individuals received fair treatment relative to trades by institutions. It is a mandatory field, and brokers submitting an order on behalf of an individual are instructed to note that the order originated from an individual. For other studies using these data, see, for example, Ron Kaniel et al., *Individual Investor Trading and Return Patterns Around Earnings Announcements*, 67 J. FIN. 639 (2012); Kaniel et al., *supra* note 20; Wang & Zhang, *supra* note 20.

results to be generalized beyond one brokerage house.⁷¹ The primary disadvantage is that these data only include NYSE firms that held IPOs through July 2013, which limits our analyses to these observations. To measure individual participation, we calculate the percentage of daily trading by individuals in each security relative to total trading in that security.⁷²

D. Research Design

To test whether there has been a change in the level of individual participation, we needed to compare the firms that provided reduced disclosure (the “treatment firms”) with a set of firms that did not modify their disclosures (the “control firms”). Following other recent empirical studies on the JOBS Act, our control group consisted of firms that held IPOs prior to the JOBS Act and would have been eligible for EGC status if their IPOs had been completed when the JOBS Act was in effect—that is, firms with less than \$1 billion in annual revenue in the most recently completed fiscal year prior to the IPO.⁷³

Using this control group, our primary empirical design used three different analyses to determine whether there was a change in the level of individual participation: (1) linear regression, (2) modified propensity score matching, and (3) analysis over an extended period of time. The key variables of interest were a dummy variable set to 1 if the firm had taken advantage of any modification and set to 0 otherwise, and the DI reflecting the total number of reduced disclosures taken. All regressions controlled for the firm-level characteristics most likely to affect individual

71. Because many individuals trade off-exchange, we use an additional measure of individual participation based on non-institutional holdings in the robustness section. Our findings are consistent using this additional proxy.

72. As in prior literature, such as the IndVolume Ratio defined in Wang and Zhang, *supra* note 20, we calculate the absolute individual trading activity (“IT”) relative to the total trading activity (“TT”). The IT measure is equal to the total number of shares that were bought and sold by individual investors during a particular day, and the TT measure is equal to the total number of shares that were bought and sold by all NYSE customers during the initial day of trading. The TT measure is from the TAQ database. The TAQ database, which we access through Wharton Research Data Services, contains trade-by-trade data for all exchange-listed stocks.

73. See Barth et al., *supra* note 55; Chaplinsky et al., *supra* note 54; Gupta & Israelsen, *supra* note 55. We note that we began our control sample in 2007 because, although trading by individuals decreased significantly at the end of 2006, it remained constant from 2007 through April 2014 (we determined this by plotting the percentage of trading by individuals relative to total trading for each month from January 2005 through April 2014).

investment,⁷⁴ and included fixed effects for the firm's underwriter and industry.⁷⁵ Standard errors were clustered by industry.

One significant concern with our analysis is that the firms that provided less disclosure *self-selected* to do so. In an ideal experimental setting, the treatment and control firms are randomly assigned to each group. When firms instead self-select into the treatment group, as in our setting here, there is a possibility that the firms have a unique characteristic that causes *both* reduced individual participation and the choice to be a treatment firm. We note that two of our analyses address this concern. First, our second analysis uses modified propensity score matching ("PSM") to match the treatment and control firms. PSM is a statistical technique that is frequently used to address non-random sample selection, and allows us to match each firm in the treatment group with the most similar firm in the control group. Second, we examined whether the initial reduction in individual trading disappeared over time. If the treatment firms do not differ from the control sample, we expect that the differences in individual trading between the two samples will disappear soon after the IPO because, after trading begins, individual investors will have access to more sources of information. These other sources of information, such as trading history and financial analyst reports, provide additional sources of

74. Following Lawrence, *supra* note 5, we control for (1) Log(Assets), calculated as the natural logarithm of the firm's total assets in each fiscal year; (2) Book-to-Market, calculated as the book value of equity scaled by the market value of equity for the firm in each fiscal year, where the market value is calculated as the share price multiplied by the number of shares outstanding; (3) Return On Assets (ROA), calculated as the firm's net income before extraordinary items divided by the firm's total assets in each fiscal year; (4) Log(Business Segments), the natural logarithm of 1 plus the number of the firm's business segments in each fiscal year; (5) Log(Geographic Segments), the natural logarithm of 1 plus the number of the firm's geographic segments in each fiscal year; and (6) Log(Num. Missing Items), the natural logarithm of 1 plus the number of missing pieces of financial information for the firm in each fiscal year (this is determined as the number of missing items in the Compustat database). We also control for the natural logarithm of the firm's total revenue in the most recently completed fiscal year, the firm's research and development expenses scaled by total assets, the firm's age (we thank Jay R. Ritter for providing founding dates for IPO firms on his website), whether the firm is incorporated in the United States or abroad, and whether the firm is in a technology industry. We determine whether a firm is in a technology industry in accordance with Tim Loughran & Jay Ritter, *Why Has IPO Underpricing Changed Over Time?*, 33 FIN. MGMT. 5 (2004). Although these variables are based on Lawrence, *supra* note 5, we had to omit a limited number of controls because of our data and setting. To control for outliers, all control variables were winsorized at 1%.

75. The firm's industry is based on the forty-eight Fama-French industry classifications. For detail on the forty-eight industries, see Kenneth R. French, *Detail for 48 Industry Portfolios*, KENNETH R. FRENCH, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html (last visited Nov. 29, 2015). Industries are defined as, for example, "Food," "Transportation," and "Insurance." *Id.*

information that can reduce information asymmetry between different types of investors.

Finally, we ran a number of additional robustness checks to address other concerns with our research design. These tests addressed the appropriateness of our control sample, the robustness of our key measure of individual investment and trading, and the possibility that individuals may be responding to modifications in the IPO process rather than to the reduced level of disclosure. These analyses are presented in the Appendix.

E. Empirical Findings

1. Linear Regression

Our first analysis compares the treatment and control firms using ordinary least squares regression analysis in which the dependent variable is the percentage of total trading that is conducted by individual investors. The key variable in column (1) is the dummy variable *Modified*, which is set to 1 if the firm provided reduced disclosure in any area, and 0 otherwise. The key variable in column (2) is *Disclosure Index*, which is the value of the DI for any particular firm. Throughout all tables, statistical significance of 1, 5, and 10 percent is reflected by ***, **, and *, respectively, and p-values are reflected in parentheses below the regression coefficients.

TABLE III: INDIVIDUAL TRADING IN FIRMS WITH REDUCED DISCLOSURE,
FIRST DAY

	(1)	(2)
Modified	-0.033*** (0.0039)	
Disclosure Index		-0.011*** (0.0002)
Log(Assets)	0.007 (0.324)	0.007 (0.337)
Log(Revenue)	-0.007 (0.432)	-0.007 (0.414)
Log(Age)	0.003 (0.6373)	0.003 (0.669)
Book-to-Market	0.007 (0.69)	0.008 (0.686)
Return on Assets	0.0378*** (0.0001)	0.035*** (0.0003)
Log(Business Segments)	0.0037 (0.671)	0.0055 (0.517)
Log(Geographic Segments)	0.0048 (0.65)	0.005 (0.651)
Log(Num. Missing Items)	0.362 (0.127)	0.36 (0.141)
R&D/Assets	-0.0087 (0.922)	-0.0134 (0.881)
Tech	0.01 (0.221)	0.01 (0.196)
U.S. Incorp.	0.0115 (0.32)	0.0112 (0.333)
Industry Fixed Effects	Yes	Yes
Underwriter Fixed Effects	Yes	Yes
R-squared	0.3478	0.3379
Num. Observations	218	218

The results presented in Table III show that the average percentage of individual trading was lower for the treatment firms than the control firms. Column (1) shows that, as a percentage of total daily trading, individual trading was roughly 3.3% lower for the firms that provided reduced disclosure. Column (2) examines the cross-sectional variation in the number of reductions in disclosure taken by each firm and shows that the decrease in individual trading volume is additive. On average, individual

trading relative to total trades decreases by an additional 1.1% for each additional reduction in disclosure (that is, for each additional increase in the firm's DI). This suggests that all the disclosures are relevant to investors.

2. *Modified Propensity Score Matching*

In our next analysis, we used PSM to address the possibility that the firms that self-selected to provide fewer disclosures differed systematically from the control sample. PSM uses observable characteristics, such as a firm's country of incorporation or total assets, to match each treatment firm to the most similarly situated control firm. Although the match is performed along observable characteristics, the firms will theoretically be similar along unobservable characteristics as well.

To create a PSM sample, the first step is to determine the variables that predict the treatment (i.e., to determine which variables predict that a firm will provide reduced disclosure). In this first step, we found that very few observable characteristics were able to predict, at standard levels of statistical significance, whether the firm would be treated.⁷⁶ On the one hand, the fact that few firm characteristics appeared to be related to the decision to provide reduced disclosure suggests that there may be little self-selection bias. On the other hand, because our statistical tests have only limited power in predicting whether a firm will be treated, a question remains as to whether the matched sample that is created based on these tests addresses any unobserved differences.

Table IV compares the treatment firms with the matched sample.⁷⁷ The table shows that, although the control variables do not differ significantly between the treatment and control samples, individual investors are less likely to trade in the firms that provide less disclosure.

76. There are minor differences in the modified filers and control sample. Most notably, the modified filers appear to have fewer business and geographic segments, fewer missing pieces of financial information in the current fiscal year, and much greater research and development expenses relative to assets.

77. We matched the treatment and control firms based on their propensity score, provided that both firms were in the same Fama-French industry and had the same incorporation status (foreign or domestic).

TABLE IV: PROPENSITY-SCORE-MATCHED CONTROL AND TREATMENT FIRMS

	Propensity Score Matched Sample (N=42)		Treatment Sample (N=42)		Difference in Means	Difference in Medians
	Mean	Median	Mean	Median	p-value	p-value
Log(Assets)	5.986	5.763	6.018	5.806	0.903	0.42
Log(Revenue)	5.266	4.929	5.349	5.477	0.694	0.187
Log(Age)	1.93	2.197	2.217	2.197	0.178	0.402
Book-to-Market	0.382	0.325	0.478	0.256	0.481	0.297
ROA	-0.019	0.014	0.019	0.012	0.774	0.236
Log(Business Segments)	0.814	0.693	0.771	0.693	0.618	0.251
Log(Geographic Segments)	0.859	0.693	0.819	0.896	0.793	0.491
Log(Number Missing Items)	6.403	6.389	6.406	6.397	0.803	0.338
R&D/Assets	0.062	0.009	0.069	0.000	0.727	0.453
Individual Trading	0.051	0.0294	0.0201	0.0165	0.005***	0.018**

Specifically, the mean difference in individual trading for the treatment firms is roughly 3% lower than the mean for the matched control firms. The difference is statistically significant at 1%. Similarly, the median difference for the treatment sample is roughly 1.5% lower than the control sample, and the difference is statistically significant at 5%. The findings are thus both economically and statistically significant.

3. Analysis Beyond the First Day of Trading

The prior analyses showed that the firms that provided less disclosure had lower individual participation on their first day of trading.⁷⁸ From a policy perspective, however, we might wonder whether there are long-term differences. If, as theoretical literature predicts, uninformed investors are less likely to invest when they perceive information asymmetry to be higher,⁷⁹ the effect is likely to disappear over time. Compared with the vast sources of information that become available after a firm is public, such as a firm's stock price and reports from financial analysts, the reduced disclosures allowed by the JOBS Act seem relatively minor. As such, even if individuals feel disadvantaged on the first day of trading, when information asymmetry is likely to be the strongest, the effect may be short-lived.

78. See *supra* Part II.E.

79. See *supra* note 11 and accompanying text.

To test whether the result persists over an extended time period, Table V presents a series of linear regressions in which the dependent variable is individual trading behavior on the initial day of trading as well as seven, fourteen, twenty-one, sixty, and ninety days following the IPO. The key variables of interest in Panels A and B are the *Modified* and *Disclosure Index* variables, respectively.

TABLE V, PANEL A: INDIVIDUAL TRADING IN FIRMS WITH REDUCED DISCLOSURE

	1st Day	7th Day	14th Day	21st Day	60th Day	90th Day
Modified	-0.036*** (0.017)	-0.068** (0.007)	0.0245 (0.767)	0.041 (0.632)	0.01 (0.904)	0.006 (0.839)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.3787	0.5006	0.3573	0.4569	0.3938	0.4221
Num. Observations	203	203	203	203	203	203

TABLE V, PANEL B: INDIVIDUAL TRADING IN FIRMS WITH REDUCED DISCLOSURE

	1st Day	7th Day	14th Day	21st Day	60th Day	90th Day
Disclosure Index	-0.018*** (0.0002)	-0.019** (0.047)	-0.0095 (0.609)	-0.005 (0.67)	0.0076 (0.40)	-0.0087 (0.393)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.3677	0.4812	0.3481	0.402	0.3837	0.3562
Num. Observations	203	203	203	203	203	203

The results show that the statistical significance associated with our variables of interest decreased in the days following the IPO. Although all results were statistically significant on the initial day of trading and remained significant seven days following the IPO, statistical significance disappeared for both the *Modified* and *Disclosure Index* variables fourteen days after the IPO, indicating that trading by individual investors was not statistically different than expected two weeks after the firm's IPO.

From the perspective of our research design, the finding provides us with confidence that our results are not caused by a self-selection bias

related to the firms that select to provide less disclosure. Although individual investors were less likely to trade in these filers immediately following the IPO, they were not generally less likely to trade in these specific firms. This suggests that there is no unique feature about these firms that made them unappealing to individuals, helping to alleviate concerns that our results are driven by an unobservable characteristic that causes the firms to be unappealing to individual investors and to provide reduced disclosure.

III. IMPLICATIONS FOR LAWMAKERS AND COMMENTATORS

As noted in Part I, federal securities regulators are now engaged in a vociferous debate over the optimal design of securities disclosure—and the effects of that design on individual investor participation in modern stock markets. Using the unique setting provided by the JOBS Act, we have shown that reducing the quantum of information mandated by securities law does indeed reduce individual investors' participation at the IPO stage—but that this reduction disappears after just two weeks of trading.

These findings have significant implications for regulators now considering what changes, if any, to make to the mandatory disclosure rules that comprise much of US securities law. In particular, our evidence indicates that reducing the quantum of mandated disclosure at the IPO stage—when individual investors are most likely to be sensitive to the risk that large institutions are better-informed, and when complementary law such as Regulation FD does not apply—raises the most acute concerns related to individual investor participation. Thus, our evidence suggests that—to the extent that securities regulators remain focused on individual investors—there is a stronger case for changes to the mandatory disclosure regime that applies to public companies *after* the IPO stage than before.

Second, our evidence suggests that lawmakers interested in understanding the causal effects of changes to securities law on individual investors should pursue more clearly identified experimental approaches to future changes in the law. The JOBS Act worked a significant change to the law of going public, providing an exceptional setting for studying the effects of those changes. Notwithstanding our best efforts, however, as noted above the nature of the change in the law makes it difficult to draw clear causal inferences. Thus, lawmakers would do well to learn from the limits of our study—as well as from its findings—in designing any future changes to the law of mandatory disclosure.

A. Mandatory Disclosure at the IPO Stage

To the extent that securities regulators are concerned about individual investor participation in securities markets, our findings suggest that the case for reducing disclosure mandates is weakest at the IPO stage, where such investors are likely to be most sensitive to the informational effects of reduced disclosures. Instead, for the reasons given below, lawmakers seeking to reduce mandatory disclosure burdens might focus their efforts *after*, rather than before, the IPO stage.

First, as a matter of both theory and evidence, individual investors are likely to react far more strongly to a reduction in the quantum of information required to be disclosed before the IPO stage than after. As to theory, as noted in Part I, a significant benefit of mandatory disclosure for individual investors is that such disclosure reduces information asymmetry among classes of investors—or, in policy parlance, “levels the playing field”—between individual and institutional investors. This asymmetry is greatest at the IPO stage, when individual investors fear that the IPO process has given the firm opportunities to convey nonpublic information to institutional investors. Moreover, Regulation FD, which complements mandatory disclosure rules with respect to information asymmetry among investor classes,⁸⁰ does not apply before the IPO stage. Thus, as a matter of theory, reducing mandatory disclosure burdens at the IPO stage is far more likely to result in a corresponding reduction in individual investor participation than doing so after the IPO stage.⁸¹

As to evidence, we have shown in this Article that, in fact, reductions in pre-IPO disclosure under the JOBS Act led to economically and statistically significantly lower individual investor participation in IPOs. Thus, whatever the benefits of the JOBS Act, for lawmakers concerned about individual investor participation, the Act came with the cost of reducing individuals’ participation in initial public offerings. We have also shown, however, that once these companies became public—and more information about the firms became publicly available—this effect disappeared. This finding suggests that reductions in mandated disclosures

80. Selective Disclosure and Insider Trading, 65 Fed. Reg. 51,716, 51,716 (Aug. 24, 2000) (codified at 17 C.F.R. pts. 240, 243, 249).

81. We acknowledge, of course, that the number of shareholders affected by changes to the mandatory disclosure rules that apply after the IPO is likely to be significantly greater than the number of investors affected by changes to rules that apply before the IPO stage. We argue only that the marginal effect of such changes is likely to be greater for individual investors at the IPO stage than for firms that are already public, because investors can use alternative sources of information to assess already-public companies that are not available for firms before an IPO.

for post-IPO firms could have a much less pronounced effect on individual investor participation in markets for those companies' stocks.

We note, of course, that policymakers' motivations for choosing the pre-IPO stage for reductions in mandatory disclosure requirements likely had little to do with the effects of those changes on individual investor participation. Instead, those lawmakers cited a reduction in the costs of going public for relatively small businesses—where these costs are often a substantial fraction of the firm's budgets—as the basis for their choice to focus on the pre-IPO disclosure regime.⁸² We note, however, that the early evidence on whether the JOBS Act actually reduced those costs is rather mixed.⁸³ We also note that these costs can also be substantial on an ongoing basis for small businesses that completed their IPO long before the JOBS Act became law.⁸⁴

Moreover, while we certainly understand the political appeal of reducing disclosure costs for firms that may soon go public,⁸⁵ the evidence we have presented in this Article suggests that lawmakers concerned about individual investors should proceed with caution in this respect. By reducing individual investors' participation in IPOs, the JOBS Act risks creating the perception that the outsized returns occasionally available in new issues are reserved only for large institutional shareholders. We do not suggest that such a perception would be well-grounded in empirical evidence—only that this perception might carry significant political implications of its own. For lawmakers convinced that basic conceptions

82. See *supra* note 42 and accompanying text.

83. See generally Chaplinksy et al., *supra* note 54.

84. See IPO TASK FORCE, U.S. SEC. & EXCH. COMM'N, REBUILDING THE IPO ON-RAMP: PUTTING EMERGING COMPANIES AND THE JOB MARKET BACK ON THE ROAD TO GROWTH 9 (2011), https://www.sec.gov/info/smallbus/acsec/rebuilding_the_ipo_on-ramp.pdf (estimating \$2.5 million in costs for the IPO process and another \$1.5 million in annual ongoing compliance costs of staying public); see also Carlos Berdejó, *Going Public After the JOBS Act*, 76 OHIO ST. L.J. 1, 3 (2015) (noting that the trend of decline in the number of private companies conducting IPOs “has been more pronounced for small companies, reflecting the quasi-fixed nature of [regulatory] compliance costs, which disproportionately burden smaller and younger issuers”). We acknowledge, of course, that some disclosures will involve more “quasi-fixed” compliance costs than others. For example, a firm that complies with SOX Section 404 at the IPO stage will have to implement the relevant infrastructure and procedures at that point, incurring a substantial amount of such costs. Disclosures related to governance or business decisions, on the other hand, typically involve fewer costs of this kind.

85. See, e.g., Press Release, The White House Office of the Press Secretary, President Obama to Sign Jumpstart Our Business Startups (JOBS) Act (Apr. 5, 2012), available at <https://www.whitehouse.gov/the-press-office/2012/04/05/president-obama-sign-jumpstart-our-business-startups-jobs-act> (“The JOBS Act makes it easier for young, high-growth firms to go public by providing an incubator period for a new class of ‘Emerging Growth Companies.’ During this period, qualifying companies will have time to reach compliance with certain public company disclosure and auditing requirements after their [IPO].”).

of fairness—or, more simply, sound politics—demand that individual investors not be discouraged from participating in modern stock markets, reducing the disclosure burdens that apply before an IPO may well be more politically costly than making changes to the rules that apply after an IPO.

For all of these reasons, our evidence suggests that policymakers concerned about individual investor participation would do well to focus future changes to the mandatory disclosure regime on disclosures occurring *after* the IPO stage rather than before the company goes public. As a matter of theory, changes to disclosure rules after the IPO stage are less likely to reduce individual investor participation. As a matter of empirical evidence, our results are consistent with that intuition. And as a matter of political economy, such changes may allow lawmakers to capture the benefits of reduced disclosure burdens without suffering the corresponding costs related to reduced levels of individual investor participation in securities markets.⁸⁶

B. Experimental Design and Changes to Mandatory Disclosure Law

Our evidence also suggests that, to the extent lawmakers do pursue further changes to mandatory disclosure rules, they should do so in a fashion that enables researchers to evaluate the effects of those changes on the many groups of investors the SEC is charged with protecting.⁸⁷ In this respect, we join those scholars who have urged lawmakers to pursue experimental regulatory changes that would allow researchers to more clearly attribute causal effects of those changes for investors.⁸⁸

As noted in Part I, the passage of the JOBS Act worked a significant change in the disclosure rules that govern IPOs in the United States—a significant category of transactions with broad importance for investors and entrepreneurs alike. But identifying the causal effects of that change is

86. We note that, consistent with this argument, the SEC's extensive recent concept release on modernizing public-company disclosures emphasizes changes to rules that apply after the IPO rather than before. See Concept Release on Business and Financial Disclosure Required by Regulation S-K, *supra* note 5, at 6 (“We focus this release on business and financial disclosures that registrants provide in their periodic reports . . .”).

87. *What We Do*, U.S. SEC. & EXCH. COMM'N, <http://www.sec.gov/about/whatwedo.shtml> (last modified June 10, 2013) (“The laws and rules that govern the securities industry in the United States derive from a simple and straightforward concept: all investors, whether large institutions or private individuals, should have access to certain basic facts about an investment . . .”).

88. See, e.g., Cass R. Sunstein, *Cost-Benefit Analysis and the Knowledge Problem* (Harvard Univ. John M. Olin Ctr. for Law, Econ. and Bus., Discussion Paper No. 800, 2014), available at http://www.law.harvard.edu/programs/olin_center/papers/pdf/Sunstein_800.pdf.

elusive because the fashion in which the law was changed does not permit clean causal inference.⁸⁹ We have attempted to address this gap through standard techniques in settings like these, but the limits of those techniques are nontrivial. Like us, other researchers have attempted to identify the causal implications of the JOBS Act for companies and investors in other contexts. And, like us, these researchers have been forced by the setting in which the Act became law to qualify the causal implications of their findings.⁹⁰

We understand, of course, that a wide range of practical considerations limit regulators' freedom to make changes to longstanding law in a fashion that permits researchers to draw causal inference.⁹¹ But we note that federal securities regulators are among the few lawmakers who have executed randomized trials of the kind that would permit such inferences.⁹² As regulators consider whether to extend the JOBS Act's disclosure-reduction reforms to other areas, we urge them to do so in a manner that would permit clearer causal inference than is possible in the JOBS Act setting. Such an approach would allow the SEC to assess more carefully the effects of changing mandatory disclosure rules on the investors that it is required by law to protect.

IV. CONCLUSION

A common justification for the mandatory disclosure rules that serve as the bedrock of federal securities law is that such rules encourage individual investors to participate in stock markets. Although the desirability of individual investor participation in these markets has been hotly debated, the Nation's top securities regulators have repeatedly made clear that facilitating such participation is among their policy goals. Thus, whether mandatory disclosure rules do, in fact, encourage individuals to invest in stock markets remains a pressing question for lawmakers.

89. See, e.g., *supra* notes 75–77 (discussing selection effects necessarily associated with a study in this setting, and attempting to address them through PSM).

90. See, e.g., Barth et al., *supra* note 55, at 24 (noting that consistency of results between linear-regression tests and PSM “increase[s] [the authors’] confidence that the differences [they observe] are attributable to the JOBS Act”).

91. For an explanation of some of these limitations—and how they might be overcome—see Sunstein, *supra* note 88, at 14–16.

92. The SEC famously pursued a natural-experiment approach to its implementation of Regulation SHO, yielding research that could meaningfully evaluate the causal effects of stock market dynamics on managerial choices. See, e.g., Yinghua Li & Liandong Zhang, *Short Selling Pressure, Stock Price Behavior, and Management Forecast Precision: Evidence from a Natural Experiment*, 53 J. ACCT. RES. 79 (2015).

Empirical study of that question has been elusive, however, because few settings allow researchers to examine the relationship between the scope of mandatory disclosure rules and individuals' participation in the stock market.

In this Article, we have provided rare empirical evidence on this question by using the JOBS Act to study how individual investors respond to specific reductions in mandated disclosures. Our results show that individuals participate less in IPOs involving companies that provide reduced disclosure—a finding consistent with the view that broader disclosure mandates encourage small investors to participate in stock markets. However, our results also show that the decrease in individual trading disappears two weeks after a firm's IPO. This latter finding suggests that there may be an effective economic substitute for the information provided by mandatory disclosures: information provided by the markets themselves when a firm's shares are publicly traded.

These findings have important implications for regulators now considering whether and how to change the disclosure obligations that public companies face under federal law. In particular, they suggest that changes to these mandates *after* the IPO are likely to have far fewer effects on individual investor participation than the changes imposed by the JOBS Act. To the extent that lawmakers are concerned about such participation, then, they would do well to focus on firms that are already public. In particular, regulators could first focus those efforts on public companies with significant alternative sources of information about the firm—sources that could substitute for securities disclosures. But however the SEC proceeds, it is critical that it does so in a fashion that will permit observers to identify the effects of any regulatory changes on the investors that the Commission is required by law to protect.

APPENDIX

This appendix presents a number of robustness tests designed to address concerns with the research design in our primary analysis. First, because our control sample includes firms that went public prior to the JOBS Act, we address the concern that our results were driven by differences in individual trading or in the types of firms that held their IPOs in the periods before and after the JOBS Act, rather than by the reduced disclosures provided by EGCs. Second, we address the possibility that our results were driven by the construction of our measure of individual participation. Third, we address the concern that our results were driven by modifications to the IPO process rather than by reductions in disclosure.

I. SUITABILITY OF CONTROL SAMPLE

Our first set of robustness tests addressed several potential concerns regarding our control sample. First, there could have been a difference in trading by individual investors before and after the JOBS Act that was completely unrelated to any changes in disclosure requirements. For example, if individual investors were just generally less likely to trade following the JOBS Act, this structural change could have driven our findings. Second, there could have been a difference in the type of companies that went public following the passage of the JOBS Act. The JOBS Act was meant to lower the cost of raising capital, so its passage might have encouraged a different type of company to go public. If so, individuals may not have been interested in these new companies going public.

A. Changes in Individual Participation

We first addressed the possibility that, for reasons completely unrelated to changes in disclosure, individual trading differed before and after the JOBS Act. To rule out this possibility, we utilized the firms that provided full disclosure even though they were EGC-eligible. Barring a structural difference in individual trading across years, there should be no difference between these firms and the firms used for the control sample.

Table VI shows the results of linear regression analysis comparing these non-modified, EGC-eligible filers with the control sample. The dependent variable is the percentage of total trading that is conducted by individual investors, and the key variable of interest in this analysis is the dummy variable *Post*, which is set to 1 for those firms that were EGC-

eligible but did not modify their disclosures and to 0 for all control firms. The regression includes all control variables used in the primary analysis.⁹³ As before, standard errors are clustered by industry, and p-values are reflected in parentheses below the regression coefficients.

TABLE VI: ROBUSTNESS TEST: EGC-ELIGIBLE FIRMS THAT DID NOT REDUCE DISCLOSURE

	(1)	(2)
Post	-0.0013 (0.903)	-0.011 (0.408)
Control Variables	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes
R-squared	0.39	0.3597
Num. Observations	189	213

The results show that individual trading for the non-modified filers and the pre-JOBS Act control sample did not differ significantly. Column (1) includes only those firms that held an IPO following April 5, 2012, and did not modify their disclosures, and column (2) includes all those firms that held an IPO following December 8, 2011, and did not modify their disclosures (i.e., column (2) includes the firms to which the JOBS Act applied retroactively). The lack of statistical significance indicates that our results are not driven by a structural change in individual trading before and after the JOBS Act.

B. Structural Changes in the US IPO Market

We next consider whether our results were driven by a structural change in the US IPO market. We analyzed this proposition from two angles. First, we replaced the control sample used in our primary analysis—firms that went public prior to the JOBS Act—with EGC-eligible firms that did not reduce disclosure in any areas. Second, we checked whether US exchanges have gained market share following the JOBS Act.

93. See *supra* note 77 and accompanying text.

1. *Alternative Control Sample*

Table VII shows the results when we replaced the firms in our original control sample with the non-modified filers that were EGC-eligible. Assuming that these non-modified filers were similar to the pre-JOBS Act control firms, we expected to find that these results are roughly consistent with the results of the linear regression shown in Table III.⁹⁴

TABLE VII: ROBUSTNESS TEST: EGC-ELIGIBLE FIRMS THAT DID NOT REDUCE DISCLOSURE AS CONTROL

	Panel A		Panel B	
	(1)	(2)	(1)	(2)
Modified	-0.0116** (0.018)		-0.0119*** (0.000)	
Index		-0.0045** (0.036)		-0.0067*** (0.001)
Control Variables	Yes	Yes	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes	Yes	Yes
R-squared	0.3204	0.3219	0.2737	0.2786
Num. Observations	66	66	90	90

Indeed, we found that our key results are consistent using these alternative control groups. As in the prior table, the key variable in column (1) is *Modified*, and the key variable in column (2) is *Disclosure Index*. The sample in Panel A includes all non-modified, EGC-eligible firms that held an IPO following April 5, 2012, and the sample in Panel B includes all non-modified, EGC-eligible firms that held an IPO following December 8, 2011. Because our findings are consistent when our control group consists of firms that held an IPO during the same time period as the treatment firms, we do not believe that our results were driven by a structural change in the US IPO market.

94. With the exception of the control sample, all methodology is the same as that used in Table III.

2. *Relative Market Share of US Exchanges*

Because we consider the London Stock Exchange (“LSE”) to be the closest competitor to US stock exchanges, we checked whether the US exchanges have gained market share relative to the LSE since the passage of the JOBS Act. Using the total number of foreign IPOs on US exchanges and the LSE as the denominator, and the number of foreign IPOs on US exchanges as the numerator, we checked whether there was an increase in the percentage of foreign firms that held an IPO on a US exchange rather than the LSE following the passage of the JOBS Act. If so, this could indicate a change in the composition of IPO firms, suggesting that the firms holding their IPOs after the JOBS Act may not be comparable to those that held their IPO before the Act.

We found that the percentage was relatively constant, suggesting that US exchanges did not gain market share relative to the LSE. While this is a very broad analysis, we note that prior literature also has not found a general increase in US IPO volume.⁹⁵ Overall, the combination of tests provides us with confidence that our results are not driven by a change in the type of firms that went public following the passage of the JOBS Act.

II. ALTERNATE MEASURES OF INDIVIDUAL INVESTMENT

Trading by individual investors is notoriously difficult to estimate, and we had two potential concerns with our measure of individual trading. First, the NYSE database containing the level of individual trading is restricted to trades in equities listed on the NYSE; it omits trades that occurred off-exchange or on other platforms. Second, because our measure of individual trading was scaled by the total number of shares traded by NYSE customers, our findings could have been driven by the denominator rather than the numerator.

A. *Non-Institutional Holdings from 13F Filings*

Because our primary database captures only those individuals trading on the NYSE, we supplemented our analysis with an additional proxy: the level of non-institutional holdings based on Form 13F filings. Institutional

95. See Chaplinsky et al., *supra* note 54, at 33 (“Our finding that total IPO volume has not increased after the Act is consistent with earlier noted studies”); see also Dambra et al., *supra* note 58, at 126–34 (finding a slight increase in IPO volume, but that the increase was driven by firms with high proprietary disclosure costs rather than general growth of all firms).

investors who exercise discretion over \$100 million or more of qualifying assets are required to file Form 13F within forty-five days of the end of each calendar quarter.⁹⁶ In order to calculate the percentage of non-institutional holdings for each stock, we subtracted the total institutional holdings from the total shares outstanding.⁹⁷ We then scaled the level of non-institutional holdings by total shares outstanding to get a percentage. Using this broader proxy of non-institutional ownership, we replicated the analyses presented in Table III. The results are reported in Table VIII.⁹⁸

TABLE VIII: ROBUSTNESS TEST: NON-INSTITUTIONAL HOLDINGS

	Model (1)	Model (2)
Modified	-0.060** (0.004)	
Index		-0.017** (0.022)
Control Variables	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes
R-squared	0.3278	0.326
Num. Observations	829	829

The magnitude using the 13F filings was far greater than that reported using the NYSE data, but the results from the two measures consistently showed that individual investors were less likely to participate in firms with reduced disclosures. We note, however, that the larger magnitude associated with the 13F filings is not unexpected. First, the percentage of non-institutional holdings includes both institutional investors that were too small to file a 13F and individual investors, so it is far more inclusive than the NYSE dataset. Second, the NYSE data report trading, whereas the 13F filings report holdings. Individual investors are thought to hold shares for a much longer duration than institutional investors,⁹⁹ so we expect

96. See 15 U.S.C. § 78m(f)(1) (2014).

97. For this calculation, we only include common stock, and we clean the data following Campbell et al., *supra* note 68, at 69–71.

98. In an untabulated analysis, we also replicate Table IV by using the propensity score analysis presented in Table III to create a matched sample. When we compare the percentage of non-institutional holdings across the matched and control samples, the results are consistent with our earlier findings, and are therefore statistically significant.

99. Compare Brad M. Barber & Terrance Odeon, *Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors*, 55 J. FIN. 773 (2000) (finding that the

individuals to have a relatively higher holdings-to-trading ratio at the end of each fiscal quarter.

B. Alternate Scalar for NYSE Data

The second robustness check related to our measure of individual trading addressed the concern that our findings were caused by a scalar effect. Because the deflator in our primary analysis is the total volume traded on the NYSE, it is possible that differences in the total volume traded before and after the JOBS Act may be driving our findings. To address this possibility, we deflated total individual investment at the end of the day by total common shares outstanding rather than total trading volume, and replicated all the estimations in Tables III–VIII using this alternative measure. Although statistical significance decreased in some estimations, the results presented in our original analyses were all directionally consistent and maintained statistical significance at 10% or better. For concision, these results are not tabulated.

III. MODIFICATIONS THAT WERE NOT DISCLOSURE RELATED

The JOBS Act allows EGCs to make a number of modifications to the IPO process, some of which are not disclosure related, so it is possible that individual investors responded to the modifications in the IPO process rather than to the reduced level of disclosure. Other literature on the JOBS Act, which has generally considered all major modifications rather than only those that are disclosure related, has found that these non-disclosure modifications are related to an increase in indirect IPO costs.¹⁰⁰ However, while these modifications may affect other outcomes, they do not provide investors with less information. Thus, we did not expect them to be related to individual participation, so we expected the inclusion of these items to lessen the statistical and economic significance of the DI.

The two additional modifications we considered were the following: (1) did the filer elect to freeze the generally accepted accounting principles (“GAAP”) in use at the time of the IPO?; and (2) did the firm opt out of

annual turnover rate at a US-based brokerage firm is roughly 75% annually, which suggests that individuals have an average holding period of sixteen months), *with* BEN W. HEINEMAN, JR. & STEPHEN DAVIS, YALE SCH. OF MGMT., ARE INSTITUTIONAL INVESTORS PART OF THE PROBLEM OR PART OF THE SOLUTION? KEY DESCRIPTIVE AND PRESCRIPTIVE QUESTIONS ABOUT SHAREHOLDERS’ ROLE IN U.S. PUBLIC EQUITY MARKETS 9 (2011) (reporting that in 2009, equity-based mutual funds, a common type of institutional investor, had an average holding period of less than eleven months).

100. See Barth et al., *supra* note 55; see also Chaplinsky et al., *supra* note 54.

the Say-on-Pay and Say-on-Frequency provisions required by federal law?¹⁰¹ If the filer elected to freeze GAAP, it would not have to comply with changes to GAAP unless the changes also applied to nonpublic companies. If the filer elected out of the Say-on-Pay and Say-on-Frequency provisions, the filer would not have to allow the shareholders to vote on executive compensation.

Although we would have liked to test these modifications individually, we were unable to do so because there is substantial overlap between the firms that elected to use these modifications and the firms that provided reduced disclosures. Instead, we added these modifications to the DI to create a *Modified Disclosure Index*, so that the *Modified Disclosure Index* included all six modifications rather than only the four disclosure provisions. We then replicated the analysis described in Table III using this *Modified Disclosure Index*.

TABLE IX: ROBUSTNESS TEST: TOTAL MODIFICATIONS

	Model (1)	Model (2)
Disclosure Index	-0.011*** (0.000)	
Modified Index		-0.00357* (0.007)
Control Variables	Yes	Yes
Industry & Underwriter Fixed Effects	Yes	Yes
R-squared	0.3379	0.3381
Num. Observations	218	218

The results presented in Table IX show that the economic and statistical significance of our original findings were reduced when these additional variables were included. This finding, which is consistent with the conclusion that inclusion of these non-disclosure modifications “waters down” the predictive power of our original DI, suggests that individual investors responded to the reduced disclosure specifically rather than the overall number of modifications.

101. See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 951, 124 Stat. 1376, 1899 (2010).