Too much (early) information? The option to test the waters before going public

Michele Dathan and Yan Xiong*

05/09/25

Abstract

The declining number of U.S. public companies has attracted concern from regulators, prompting changes to make the IPO process more attractive. One key initiative, the JOBS Act, was designed to reduce IPO costs by allowing eligible firms to test the waters with investors and reduce disclosure. Using a difference-in-differences setting, we show that these provisions have decreased targeted firms' propensity to go public relative to the control samples, but improved the average quality of targeted firms that complete an IPO. This is consistent with our conceptual framework where testing the waters (rather than reduced disclosure) gives firms an opportunity to learn from investors before incurring information revelation costs from a public filing.

KEYWORDS: IPOs, going public, JOBS Act, testing the waters, reduced disclosure

JEL CLASSIFICATION: D82, G14, G30

*Dathan: Board of Governors of the Federal Reserve System, michele.h.dathan@frb.gov. Xiong: Hong Kong University of Science and Technology, yanxiong@ust.hk. We are especially thankful for detailed discussions with Sergei Davydenko, Alexander Dyck, and Andrey Golubov. We are grateful for comments from Pat Akey, Ling Cen, Craig Doidge, David Goldreich, Matthew Gustafson, Gerard Hoberg, Nicolas Inostroza, Charles Martineau, Jay Ritter, Kerry Siani, Margarita Tsoutsoura, Ekaterina Volkova, Liyan Yang, conference participants at the Midwest Finance Association Conference, Eastern Finance Conference and the Asian-Pacific Corporate Finance Online Workshop, and seminar participants at Hong Kong University of Science and Technology, University of Toronto, HEC Montréal, Bank of Canada, Cass Business School, Cornerstone Research, BI Norwegian, Villanova School of Business, and Federal Reserve Board. Michele gratefully acknowledges financial support from the Canadian Securities Institute Research Foundation PhD Scholarship. This work was supported by the Research Grants Council of the Hong Kong Special Administrative Region, China (project no. HKUST 26500720). The analysis and conclusions are those of the authors and do not reflect the views of the Board of Governors of the Federal Reserve Board.

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1 Introduction

Traditionally, high growth private firms in the U.S. have used the public equity markets as their primary source of external financing to fund innovation and expansion. For this reason, well-functioning capital markets have been instrumental to the U.S. economy, supporting job creation and economic growth. In recent decades, however, there has been a decreasing number of U.S. companies going and staying public (e.g., Gao et al., 2013; Doidge et al., 2017, 2025), attracting significant concern from regulators.

In particular, the U.S. Securities and Exchange Commission (SEC) has acknowledged that many firms are "going dark" and raising capital in private markets, with serious implications for investors and the economy (Securities and Exchange Commission, 2021) – for example, most investors are excluded from accessing these investment opportunities, and everyone is impacted by the reduced availability of "transparent, information rich and fair" public prices (Securities and Exchange Commission, 2019). In light of firms shunning the traditional initial public offering (IPO) process, regulators have made interventions to make public equity markets more welcoming and attractive relative to private markets, especially for young and high growth firms.

In this paper, we examine an important set of changes to the U.S. IPO process, the Jumpstart Our Business Startups Act of 2012 (the JOBS Act). The JOBS Act has two main components for eligible "emerging growth companies": de-risking provisions and de-burdening provisions. The de-risking provisions allow eligible firms to confidentially file registration statements with the SEC and "test the waters" by meeting with qualified institutional buyers prior to filing a registration statement. Meanwhile, the de-burdening provisions subject eligible firms to fewer disclosure requirements in their IPO filings.

We provide a conceptual framework with sound theoretical and empirical support to understand the impact of this important legislation on treated firms' willingness and ability to go public and the related effects on important market outcomes such as the quality of public firms.

In our framework, a firm seeks funding for a risky project by selling equity shares to an institutional investor and/or a pool of retail investors. Our model incorporates a two-dimensional information structure, where the firm's project valuation is influenced by two types of uncertainty, one privately known to the firm and the other privately known to the institutional investor. While the firm has superior knowledge of its own business conditions, the institutional investor may have a better understanding of external factors, such as competitors and the broader macroeconomic environment. This two-dimensional information structure enables us to establish a unified framework for the two key provisions: the testing the waters (TTW) provision relates to the dimension where the institutional investor has an informational advantage, while the reduced disclosure provision pertains to the dimension where the firm holds the advantage.[1]

To capture that the TTW provision allows firms to communicate with the institutional investor in advance, we further introduce a two-stage structure, which concerns the timing of the communication with the institutional investor relative to the filing of the public registration statement. The public filing is significant because it can reveal confidential information to competitors, resulting in substantial costs for the firm, often referred to as proprietary costs. Prior to the JOBS Act, once a firm engaged underwriters and considered raising public capital, it was required to publicly file the registration statement before meeting with investors to gauge interest and valuation. This meant that by the time the firm communicated with the institutional investor, the proprietary costs had already been incurred. In contrast, following the JOBS Act, firms are allowed to gauge investor interest through TTW before incurring any proprietary costs.

We show that by altering the timing of investor engagement, the TTW provision can affect firms' willingness and ability to go public. First, there is an "expanding effect" whereby

[1]While confidential filing is another significant provision of the JOBS Act, it primarily shifts the waiting period to pre-public filing, allowing the SEC to ensure that the registration statement "satisfies full and fair disclosure requirements." This process mainly involves "clearing comments," wherein the SEC issues comment letters on the registration statement, and firms, lawyers, or underwriters respond to these comments or revise the documents accordingly. As such, confidential filings do not involve meaningful interactions between the firm and investors. We thus do not include confidential filing in our framework.

the provision encourages more IPO attempts, meaning that the firms engage underwriters and lawyers in order to conduct these pre-filing TTW meetings. The TTW provision allows firms to gain insights into their valuation prior to filing a public prospectus, which is particularly valuable for those that may have shied away an IPO prior to the JOBS Act. By engaging with institutional investors, a firm may discover that its public market valuation is more favorable than expected, motivating it to incur the proprietary costs necessary to move forward with the IPO process.

Second, there is also a "filtering effect." After utilizing the TTW provision, a firm may discover that its public market valuation is less favorable than anticipated, leading it to decide against pursuing an IPO. Before the JOBS Act, even if a firm recognized its low valuation during the bookbuilding process, it might have continued with the IPO due to sunk proprietary costs. However, following the JOBS Act, once a firm becomes aware of its unfavorable valuation, it can choose to halt the IPO process to avoid incurring those proprietary costs. Thus, by advancing the timing of investor engagement, a firm is more likely to pause the IPO process.

The interplay between the expanding effect and the filtering effect yields the following outcomes: the TTW provision can result in (i) a (weak) increase in the likelihood of firms beginning the IPO process, (ii) a decrease in the propensity of firms to complete IPOs, and (iii) an improvement in the average quality of completed IPOs.

Unlike testing the waters, which involves information that firms do not possess beforehand, reduced disclosure pertains to information for which firms hold an advantage over institutional investors. In our framework, this provision can be conceptualized as a shift from disclosing this information to withholding it. We find that the reduced disclosure provision does not affect the likelihood of IPO attempts. Additionally, in contrast to the filtering effect of the testing the waters provision, the reduced disclosure provision tends to increase the propensity for firms to complete their IPO while decreasing the average quality of those IPOs. In summary, the implications of the TTW provision and the reduced

disclosure provision regarding IPO attempts, propensity, and quality are fundamentally opposing. We will conduct empirical analysis to test these predictions.

In order to examine the net effects of the JOBS Act on the IPO market, we look at initial public offerings between 2001 and 2019. Since many of our outcomes of interest are strongly driven by latent IPO market conditions, our identification strategy relies on a difference-in-differences framework between firms that are eligible to use the JOBS Act provisions and those that are not. The treatment group is U.S. firms that have "emerging growth company" status, or less than $1 billion in revenue in the year before IPO (U.S. EGCs). The main control group is U.S. firms with more than $1 billion in revenue (U.S. non-EGCs). Where applicable, we also show our results are robust to using U.K. firms with less than $1 billion in revenue (U.K. EGCs) as the control group.

Our first empirical result shows that treated firms in the post-JOBS period are relatively *less* likely to go public, as shown by lower listing propensity and lower likelihood of choosing IPO over an alternative private transaction (such as raising private equity or being acquired) compared to non-treated firms. However, the quality of the treated firms that complete an IPO is higher after the JOBS Act. In addition, we show that underpricing increases and fees paid to underwriters, lawyers and auditors are higher. On balance, these empirical results are consistent with our conceptual framework that introduces an option for private firms to TTW with investors before revealing information widely in the form of filing a registration statement.

In contrast, we argue that the implications generated by the JOBS Act's ability for IPO firms to reduce disclosure is not consistent with our empirical results. Explanations focused on reduced disclosure would result in more firms going public and lower quality IPO firms (neither of which we find evidence for in the data). In addition, we exploit the introduction of the Small Reporting Company exemption in 2008, which allowed some firms to reduce disclosure. This test shows that the ability to reduce disclosure increased IPO propensity, and that the introduction of the ability to test the waters decreased firms

likelihood of doing an IPO and caused a large increase in underpricing.

Overall, our paper explains key empirical facts about the post-JOBS Act IPO landscape, including that private firms continue to stay private and have not become more likely to pursue an IPO. While the literature has focused on the benefits of reduced disclosure on firms (e.g., Dambra et al., 2015; Ewens et al., 2024; Lewis and White, 2023), we show that firms' ability to seek out additional information via testing the waters, a previously unexplored channel, explains small private firms' relatively decreased willingness to go public as well as other empirical findings. Our analysis suggests regulators both in the U.S. and globally[2] should expand their focus from de-risking and de-burdening the IPO process for entrepreneurs and consider broader implications.

Our paper first contributes to the literature on the declining number of U.S. public companies (Doidge et al., 2017) and IPOs (Gao et al., 2013; Doidge et al., 2013), which has been observed since the turn of the century. There have been several reasons proposed for the decline in IPOs, including the deregulation of private equity markets easing private capital raising (Ewens and Farre-Mensa, 2020), the fact that firms have more intangible assets that are better suited to private ownership (Stulz, 2020), and that market competition has increased the relative benefit of selling to a larger firm rather than going public (Gao et al., 2013). We provide an in-depth analysis of the regulators' response, which did not address any of these possible explanations. Thus, our paper informs policymakers interested in improving the design of the capital raising process (e.g., Cong et al., 2018; Kutsana and Smith, 2004)

Second, our paper contributes to the IPO literature. Our paper documents several findings and provides a cohesive explanation for the changes to the U.S. IPO market, such as propensity to go public and underpricing. First of all, we show that targeted firms' relative propensity to IPO has declined despite the JOBS Act, which is different than Dambra et al.

[2]Canadian regulators adopted similar regulation as the JOBS Act in August 2013. Furthermore, they specifically believe that firms are choosing private rather than public equity due to "the limited ability to 'test the waters' prior to a prospectus offering" (Ontario Securities Commission, 2021). Our results indicate that this is misguided.

(2015) and Ewens et al. (2024). Dambra et al. (2015) look at the first two years after the implementation of the JOBS Act and show increased IPO activity relative to the number of public firms; in contrast, Huang et al. (2023) show that more operating firms went public per year in 2004-2007 than in 2013-2021, leading them to conclude that the "JOBS Act has not resulted in an increase in IPO volume in the United States."[3] Ewens et al. (2024) use a structural model and show increased IPO activity up to 2018 relative to the universe of VC-backed firms. While Dambra et al. (2015), Ewens et al. (2024) and our paper use the same numerator to calculate IPO propensity, the difference is driven by the choice of denominator; we argue that the focus should be on firms that either need external capital or whose investors are looking to exit, and for this reason we use the number of private firms in an industry-year that raise private equity or sell via M&A. Second of all, while we also show that underpricing has increased for eligible firms since the introduction of JOBS Act as in Barth et al. (2017) and Chaplinsky et al. (2017), we argue that is not due to reduced disclosure as in these other papers, but rather due to firms' ability to test the waters.[4] And finally, we are the first to examine the impact of the implementation of the JOBS Act on the quality of firms that complete an IPO, providing evidence that the "filtering effect" of TTW results in higher-quality IPO firms.

2 Institutional Background and Hypothesis Development

2.1 Institutional Background: JOBS Act

The Jumpstart Our Business Startups Act was proposed in late 2011 in response to the 2008 financial crisis and enacted on April 5, 2012. Title I of the Act ("Reopening American Capital Markets to Emerging Growth Companies") was designed to encourage small

[3]The clear exception here is the biotechnology industry, which saw a tremendous surge in IPO activity (Lewis and White (2023), Dambra et al. (2015)).

[4]Even-Tov et al. (2022) use a similar difference-in-differences methodology and argue no increase in underpricing in a small window around the JOBS Act; we calculate a larger impact on underpricing that has been sustained until the end of our sample period in 2019.

private companies to access the public capital markets via initial public offering. The regulatory response focused on the perspective of private firms: changes were proposed to de-risk and de-burden the process for firms considering an IPO. In particular, for firms with annual sales less than $1 billion (emerging growth companies or EGCs), the Act included provisions to reduce the regulatory burden at IPO and on an ongoing basis and to reduce the risks of IPO failure.

In terms of de-burdening provisions, the Act reduced ongoing accounting and disclosure requirements, including requiring only two years of audited financials (from three), reducing disclosure around executive compensation, extending the deadline for auditor attestation to five years after IPO (from two), allowing the firm from opting out of future FASB or PCAOB standards, and removing the need to conduct say-on-pay votes. These provisions reduced the ongoing cost of being a public firm, and reduced the amount of information available to investors.

In terms of de-risking provisions, the Act permitted eligible firms to confidentially file registration statements before public filing as well as "test the waters" for an IPO. Confidential filing allows a firm to engage with the SEC before public filing in order to clear regulatory comments to ensure that the registration statement meets the required disclosure requirements. Clearing comments in advance of public filing allows firms some additional control in timing an IPO; before the JOBS Act, a long SEC review could require a firm to push out its launch (as discussed in NYSE (2023)).

Confidential filing is more process-oriented, as clearing regulatory comments is not seen as a burden for most firms with competent underwriters and lawyers. On the other hand, testing the waters was introduced specifically to reduce the risk of a failed IPO by allowing firms to meet with investors and discuss pricing.[5] While previous literature has focused on the de-burdening provisions of the JOBS Act (e.g., Chaplinsky et al., 2017;

[5]In a survey of CFOs, Brau and Fawcett (2006) show that the two most commonly cited reasons for withdrawn IPOs are "bad market/industry conditions" and "low price of our stock", both of which are related to investors' valuation of a firm.

Barth et al., 2017), our conceptual framework allows us to examine the theoretical implications of such reduced disclosure as well as testing the waters, about which we now provide details.

Testing the Waters (TTW) Section 5(c) of the Securities Act prohibits the discussion of a potential offering without the filing of a registration statement. Such discussions with potential investors before a public filing would be considered "gun-jumping" and could result in fines or delays.

The JOBS Act added section 5(d) to the Securities Act, which provided exemptions for EGCs to discuss a potential offering with qualified institutional buyers and institutional accredited investors (two categories of large institutional investors who are financially sophisticated and generally do not require investor protection). The purpose of these "testing the waters" discussions is to gauge investor interest in the firm's IPO, assess investors' valuation of the securities, and determine which IPO terms may be important to investors. After engaging in TTW meetings, the firm then decides whether or not to publicly file a registration statement in order to launch a formal bookbuilding process.

Figure 1 compares how the U.S. IPO process timeline has changed for EGCs in the post-JOBS Act period.[6]

[Figure 1 About Here]

The most notable difference is when the firm first publicly declares its intention to go public and reveals corporate information to the market (and its competitors). In the pre-JOBS period, the public knows about a firm's desire to go public very early in the process, and the registration statement is available while the firm clears regulatory comments and prepares for the roadshow. The firm is not allowed to engage in any marketing activities before making the decision whether to begin the IPO process. In the post-JOBS period,

[6]The steps are adapted from NYSE IPO Guides (2010 version for pre-JOBS Act, and 2023 for post-JOBS Act).

on the other hand, EGCs file confidentially with the SEC in order to begin the process of clearing comments, and then are able to test the waters with potential institutional buyers and decide whether or not to file publicly based on early feedback. These timeline shifts allow a firm to gather more information and ensure a smoother regulatory experience before filing a public prospectus.

TTW meetings are similar to bookbuilding in certain ways: firms are pitching themselves to investors in hopes of garnering interesting, and investors provide information in terms of interest and valuation. However, because these TTW meetings take place before any public disclosure, it provides an *earlier* option to exit the IPO process.

Overall, regulators view testing the waters as a means to increase the chances that an offering is successful, which may encourage more private firms to engage in registered offerings, a primary goal of the SEC.

2.2 Theoretical Framework

In this section, we provide an overview of our theoretical framework that generates testable hypotheses. We begin by examining the implications of the de-risking provisions, particularly the testing the waters (TTW) provision, and then proceed to discuss the de-burdening provisions, specifically the reduced disclosure provision. A comprehensive analysis can be found in Appendix A.

Consider a firm seeking funding for a risky project by selling its equity shares. It can sell its equity to a single institutional investor and/or a pool of retail investors. Following Benveniste and Spindt (1989), we assume that while the institutional investor can absorb the entire equity issue, retail investors alone are unlikely to be sufficient to purchase the entire offering.

Our model incorporates a two-dimensional information structure. Specifically, the success probability of the firm's project is influenced by two dimensions of uncertainty: the firm possesses better information regarding its own business conditions, while the insti-

tutional investor has greater insight into external factors, such as competitors and the broader macroeconomic environment. These two dimensions, each privately known to either the firm or the institutional investor, jointly affect the project's value and, consequently, the firm's overall valuation.

However, after engaging with the institutional investor, the firm may gain insights into the other dimension of information held by the investor. We consider both bookbuilding and testing the waters as mechanisms for the firm to communicate with the institutional investor.

Moreover, to raise capital in the public market, the firm must publicly file the IPO prospectus. This filing discloses previously confidential information to competitors, incurring a cost to the firm, often referred to as the proprietary cost. In our model, the key change introduced by the TTW provision in the JOBS Act is the relative timing of when the proprietary cost is incurred compared to the communication with the institutional investor.

Specifically, prior to the JOBS Act, once a firm engages underwriters and considers raising public capital, it is required to publicly file the prospectus with the regulator first. Only after this filing can the firm communicate with the institutional investor through bookbuilding, at which point the proprietary cost is sunk. In contrast, after the JOBS Act, firms contemplating raising public capital can initially gauge investor interest through TTW before making a public filing. Thus, in this two-stage process post-JOBS Act, the proprietary cost will be incurred only when the firm decides to proceed with the public filing of the registration statement.

2.2.1 Implications of Testing the Waters

We first examine how the TTW provision impacts the quantity of IPOs. This provision offers firms the opportunity to gain insights into their valuation before filing a public prospectus. This option is particularly valuable for firms that may have shied away an IPO prior to the JOBS Act, as they can first test the waters. By engaging with institutional investors, a firm

may discover that its public market valuation is favorable, prompting it to incur the proprietary cost necessary to proceed with the IPO process. This intuitive "expanding effect" suggests that the TTW provision can lead to an increase in IPO attempts, i.e., engaging underwriters to explore opportunities for raising public capital. The first part of Implication 1 summarizes this result.

Implication 1 (IPO attempts and propensity)**.** *After the "testing the waters" provision, we have the following results.*

1. *The likelihood of firms attempting IPOs (weakly) increases.*

2. *The propensity of firms completing IPOs decreases.*

In addition to the expanding effect of the TTW provision, there is also a "filtering effect." After utilizing the TTW provision, a firm may find that its public market valuation is less favorable than expected, leading it to decide against pursuing an IPO.

While this filtering effect existed prior to the JOBS Act – where firms could identify unfavorable market valuations through bookbuilding and subsequently withdraw from the IPO process – the TTW provision changes the timing of investor engagement, leading to significant differences. Before the JOBS Act, even if a firm recognized its low valuation during bookbuilding, it might choose to continue with the IPO process due to sunk proprietary costs. In this scenario, the information asymmetry between the firm and investors might allow it to pool with high-quality firms and successfully complete its IPO. However, after the JOBS Act, once a firm becomes aware of its low valuation, it may opt to halt the IPO process before incurring the proprietary costs. Essentially, a firm will only proceed with the IPO and incur these costs if the TTW meetings indicate that the net benefits of going public are positive. Thus, by advancing the timing of investor engagement, a firm is more likely to pause the IPO process.[7]

[7]It is important to note that this type of pause is not reflected in the standard withdrawal rates, as a firm is only observable when it files a public prospectus.

The interplay between the expanding effect and the filtering effect influences IPO propensity, defined as the ratio of firms that successfully complete IPOs to those that begin the IPO process, meaning that they engage underwriters. There are two cases to consider, both indicating a decrease in IPO propensity following the JOBS Act, as summarized in the second part of Implication 1.

First, if the pool of firms attempting IPOs does not expand, the filtering effect directly suggests a decline in IPO propensity.

Second, a more complex scenario involves both the expanding effect and the filtering effect. As previously discussed, the TTW provision may expand the pool of firms attempting IPOs, which also implies an increase in the number of firms that complete IPOs. However, which force prevails? The new IPO attempts must come from firms with relatively lower valuations compared to those in the previous pool. This new group is more prone to discover low valuations and, consequently, may opt to halt their IPO pursuits after the TTW engagement. Therefore, while the number of firms completing IPOs may increase, it is likely to do so at a lower rate than the number of firms attempting IPOs, resulting in a decrease in IPO propensity.

Implication 2 (IPO quality)**.** *After the "testing the waters" provision, the average quality of firms that go public increases.*

Implication 2 indicates that while the TTW provision may reduce the propensity for IPOs, the average quality of firms that do go public improves following the JOBS Act. This enhancement is a result of the filtering effect: firms with relatively lower valuations are more likely to opt out of the IPO process when given the opportunity to assess early insights into their valuation. As a result, the remaining firms that complete IPOs tend to exhibit higher average quality post the JOBS Act.

Other Implications Finally, our model has implications for IPO underpricing. Following Benveniste and Spindt (1989), underpricing arises in our framework because the firm

would like to encourage the institutional investor to reveal positive information. We find that if the cost of acquiring early information for the institutional investor is relatively high, underpricing will increase following the JOBS Act. The rationale is that obtaining early information is valuable to the firm, as it can help mitigate proprietary costs associated with public filings, especially if the firm receives a negative firm-specific signal regarding its probability of success. Consequently, the firm may be willing to leave more money on the table to incentivize investors' information acquisition and participation, resulting in increased underpricing. We note that this result is contingent on the magnitude of the information acquisition cost, which ultimately remains an empirical question. It is also important to acknowledge that there exist many other explanations for underpricing (e.g., Rock, 1986; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989), each of which may have different implications for underpricing in the context of the JOBS Act. For this reason, we focus more on the quantity implications of the TTW provision.

2.2.2 Implications of Reduced Disclosure

Next, we discuss the implications of the reduced disclosure provision. Unlike testing the waters, which involves information that firms do not possess beforehand, reduced disclosure relates to information for which firms typically have an advantage over prospective investors. Specifically, these provisions allow firms to withhold its private information.

Prior to the JOBS Act, when firms were required to disclose extensive information, the dimension of information that the firm knows better was disclosed to investors. However, following the JOBS Act, many firms have opted to reduce their disclosure, leaving this critical information unknown to investors.[8]

Table 1 compares the implications of the reduced disclosure provision on IPO quantity and quality with those of the TTW provision, yielding the following findings.

[8]Note that when assessing the impact of the reduced disclosure provision, we isolate its effects by controlling for the testing the waters provision, treating the proprietary costs as sunk at the time of investor communication.

First, unlike the expanding effect associated with the testing the waters provision, the reduced disclosure provision does not influence the likelihood of firms attempting IPOs. Second, in contrast to the filtering effect of the testing the waters provision, the reduced disclosure provision (weakly) increases the completion rate of IPOs and thus the IPO propensity. Third, the quality of firms completing an IPO following the reduced disclosure provision is expected to decline. This decline is driven by an increase in completed IPOs from firms of relatively lower quality. With less information available, these lower-quality firms can pool with higher-quality firms to secure funding, ultimately reducing the average quality of IPOs.

Finally, the reduced disclosure provision does not impact underpricing in our framework. As previously discussed, reduced disclosure relates to information that the firm already understands better than investors, rather than information the firm seeks to obtain from them. Consequently, this provision does not change the underlying frictions that contribute to underpricing in Benveniste and Spindt (1989). Again, as discussed at the end of Section 2.2.1, many factors beyond our model may influence underpricing, and we thus focus on the quantity implications of the JOBS Act.

In summary, the implications of the TTW provision and the reduced disclosure provision regarding IPO attempts, propensity, and quality are fundamentally opposite. As will be demonstrated in later sections, our empirical findings indicate that testing the waters, rather than reduced disclosure, is likely to be the underlying mechanism driving our results.

	Testing the waters	**Reduced disclosure**
IPO attempts	(weakly) increase	unchanged
IPO propensity	decrease	(weakly) increase
IPO quality	increase	decrease

Table 1: Comparison of implications of testing the waters and reduced disclosure

3 Empirical Design

3.1 Data

To investigate the effects of the JOBS Act on the IPO market, we take advantage of the fact that it applies only to a subset of firms. We examine data on IPOs and other private firm transactions (private equity and M&A) for firms in the United States and the United Kingdom.

We include in our IPO sample all offerings in the U.S. and the U.K. with an issue date between January 1, 2001 and December 31, 2019 and an offering size of at least $5 million.[9] We exclude financial firms (SIC code beginning with 6), shell companies, limited partnerships, unit offerings, OTC listed firms, best efforts and non-underwritten offerings, and foreign issuers. We use firm and offering data from both Thomson Reuters' Securities Data Company and Bloomberg, and supplement with information hand collected from firms' IPO prospectuses. We use CRSP and Compustat data for post-IPO outcomes, as well as several sources for financial misconduct. The online appendix describes all variables and their sources in detail.

Confidential filings are found on EDGAR, while use of the reduced disclosure and testing the waters provisions is hand collected from firms' IPO prospectuses, underwriting agreements and correspondence with the SEC. We document that a firm has tested the waters if they include standard legal language in their underwriting agreements that they or their underwriters may have engaged in testing the waters activity. We also track when IPO firms provide more detailed information in underwriting agreements or SEC correspondence that confirms that they actually tested the waters. For example, firms may list the materials shown to investors or list the time frame in which they met with investors. We code this as 'TTW with evidence'. The online appendix provides samples of TTW language taken from IPO documents.

[9] Because we focus on difference-in-differences analysis, we end our data in 2019 because the SEC allowed all firms, including non-EGCs, to engage in TTW as of December 3, 2019.

We classify all IPO firms with revenue less than $1 billion as an emerging growth company, though that classification and its privileges only exist for U.S. firms in the post-JOBS period.

Using Capital IQ, we build a database of transactions by private companies headquartered in the U.S. or U.K. between 2001 and 2019.[10] We include in this sample all private capital raised (includes early stage, venture capital, growth and mature financing) and M&A transactions that are at least $5 million; we exclude transactions by financial firms (SIC code beginning with 6) and asset transactions or M&A where less than 50% of the firm is sold. A subset of these transactions include pre-transaction revenue for the target; we predict revenue for the full sample by regressing revenue on transaction value and assigning EGC status if the predicted revenue is less than $1 billion.[11]

Finally, we calculate listing propensity using the number of public firms in Compustat and the total number of U.S. firms from the Census Bureau's Statistics of U.S. Businesses (SUSB). We exclude pipelines (NAICS codes beginning with 486), many of which are structured as limited partnerships, and financial firms (NAICS codes beginning with 52 and 53). For public firms, EGC status is based on annual revenue and uses $1 billion as the cutoff; for the full sample of U.S. firms, the EGC pool includes firms with between 20 and 500 employees, while the non-EGC pool includes firms with more than 500 employees.[12]

Table 2 shows summary statistics for the main variables of interest for U.S. EGCs, U.S. non-EGCs and U.K. EGCs in both the pre- and post-JOBS periods. Our U.S. sample includes 2,275 IPOs, of which 1,611 were completed. Our U.K. sample includes 722 IPOs, of which

[10] Our sample ends before the boom in SPAC IPOs in 2020-2021 and mergers in the following years (Gangh et al., 2023). Theoretical papers explaining the emergence of this phenomenon include Banerjee and Szydlowski (2024), Gryglewicz et al. (2022) and Bai et al. (2023).

[11] For the subset of deals with revenue available, the rate of correct EGC status assignment is as follows: 85.4% for U.S. M&A, 88.7% for U.S. PE, 94.1% for U.K. M&A, and 92.6% for U.K. PE. We correct EGC status for those misclassified.

[12] The SUSB data does not include firm-level revenue, so we have to classify firms in the broader economy according to the number of employees. Cutoffs were determined using the full sample of U.S. public firms in Compustat: of firms with less than $1 billion in sales, the median number of employees is 190 (and the 75th percentile is 904). While there are likely some firms in the 500+ employee category that would be EGCs, we are limited by the SUSB categorization.

547 were completed. Our U.S. and U.K. samples include 43,573 and 9,002 PE and M&A transactions, respectively.[13]

[Table 2 About Here]

3.2 Difference-in-Differences Design

We perform our analysis in a difference-in-differences setting around the introduction of the JOBS Act. Our pre-JOBS period includes IPOs publicly filed before December 1, 2011 (when the JOBS Act was first proposed) and the post-JOBS period includes IPOs publicly filed after June 30, 2012. Though the JOBS Act was enacted on April 5, 2012, we allow a period of time for firms to actually take advantage of the testing the waters provision. Our treatment group includes U.S. firms with less than $1 billion in revenue in the year before IPO; in the post-JOBS period, these firms are deemed emerging growth companies and are eligible to use the provisions of the JOBS Act.

We use two different control groups. The first is U.S. firms with at least $1 billion in revenue in the year before IPO (U.S. non-EGCs). As shown in Table 2, this is a much smaller sample of IPOs and these firms are larger by design, so to the extent that firm size influences any outcomes of interest, this is an imperfect control group. As an alternative, we also examine IPOs of U.K. firms[14] with the equivalent of less than US$1 billion in revenue in the year before IPO (U.K. EGCs); in other words, these firms would be considered EGCs if they were going public in the U.S. after the JOBS Act. This control group has more observations relative to the U.S. non-EGCs, but there are several limitations, such as potential latent differences in U.S. vs U.K. firms and markets, and limited data availability

[13]The minimum deal size of $5 million results in a large reduction in number of private transactions, but this is included to remain comparable with the minimum $5 million IPO size.

[14]We selected U.K. EGCs as the second control group by first considering the five control countries used in Dambra et al. (2015): Australia, Canada, Hong Kong, Japan and the U.K. We eliminated Canada as they adopted rules similar to the JOBS Act in 2013. Given the importance of legal origin to capital markets (La Porta, Lopez-de Silanes, Shleifer, and Vishny, 1997), we eliminated Japan (German legal origin compared to English origin for the U.S.). Of the remaining three countries, the U.K. is the largest economy, and has most similar statistics in terms of IPOs relative to public companies (see Table B1 in Dambra et al. (2015)).

for some outcomes of interest. We acknowledge that neither control group is perfect, but we hope to improve our tests by looking at results using both control groups.

Because each firm only completes one IPO, we are unable to use strategies that rely on panel data. For this reason, our difference-in-differences identification draws on inferences from the pooled cross-section of IPO firms (i.e., comparing the average EGC or non-EGC firm in the pre- or post-JOBS period).

The key assumption for the validity of the use of the difference-in-differences framework is that absent the treatment, the difference in outcome variables between the treatment and control groups would remain constant. In other words, we want to observe parallel trends in outcome variables for the treated and control groups in the pre-treatment period. Figure 2 examines the parallel trend assumption for two of our variables of interest. Panel (a) shows IPOs as a percentage of private firm deals by industry-year for U.S. EGCs, subtracting the percentage for U.S. non-EGCs (left graph) and U.K. EGCs (right graph). Panel (b) shows the same analysis for the difference in average annual underpricing (after controlling for firm size, market performance and industry). In all four graphs, the pattern in the pre-2012 period oscillates around zero, especially relative to the post-JOBS period. We show the parallel trends in other outcome variables in the online appendix.

[Figure 2 About Here]

We use a difference-in-differences setting because we believe many of the outcome variables for IPO firms are heavily influenced by market conditions that do not have sufficient empirical proxies, such as investor sentiment. U.S. non-EGCs face the same market conditions as EGCs, but do not benefit from the provisions of the JOBS Act, allowing their inclusion to control for these latent market conditions. For this to work, it is important that firms cannot influence their treatment status; in other words, firms do not manipulate along the running variable (revenue in the year before IPO) in order to receive EGC status.[15] We do not believe firms engage in fraudulent accounting manipulation, and there is

[15]Our focus here is on U.S. firms only, as revenue levels affect treatment status; U.K. firms are not subject

little evidence that firms time their IPO as they approach the $1 billion revenue cutoff in order to benefit from the testing the waters provisions.[16]

In all regressions, we control for industry composition of firms engaging in IPO or other transaction by including industry fixed effects (as proxied by three-digit SIC or NAICS code), which compares outcomes between firms within the same industry.

4 Did the JOBS Act Increase IPOs?

Given the stated purpose of the JOBS Act was to increase the number of IPOs, our initial investigation focuses on whether the Act succeeded in encouraging more firms to go public. As outlined in Section 2.2, the de-risking and de-burdening provisions of the Act yield conflicting predictions regarding IPO propensity. In this section, we provide evidence that the JOBS Act reduced targeted firms' propensity to go public relative to the control samples, and that absent the testing the waters provision, we would have expected more smaller firms to go public.

To begin, we examine the number of IPOs and private market transactions graphically in Figure 3. Panel (a) shows the number of non-withdrawn IPOs by U.S. EGCs by year, excluding 2012, the year that the JOBS Act was implemented. The graphs are separated into firms in the biotechnology space (SIC codes beginning with 283) on the right, and all other firms on the left. There is a surge in IPOs in 2013 and 2014, with a especially significant surge in IPOs by biotechnology firms (consistent with the findings in Dambra et al. (2015) and Lewis and White (2023)). But for non-biotech firms, the 2013 and 2014 surge was temporary and the number of yearly IPOs was still below the number seen in the boom years of 2004 to 2007.

[Figure 3 About Here]

to different treatment above or below the $1 billion revenue mark.

[16] In untabulated results, there is no evidence that the distribution of revenues for IPO firms changes in the post-JOBS period compared to the pre-JOBS period.

Panel (b) then looks at the number of yearly transactions for our control groups, focusing on non-biotech firms. The top three graphs in panel (b) show the number of U.S. non-EGC IPOs in blue, the number of U.K. EGC IPOs in dark gray, and the number of U.S. EGC private equity and M&A transactions in light gray; all graphs exclude biotech transactions. Relative to 2009-11, all three groups saw increased transactions in 2013-14, suggesting that the surge observed in U.S. EGC IPOs is partly driven by attractive market conditions which led to increased capital raising and M&A activity. With this in mind, we try to calculate the predicted number of U.S. EGC IPOs, and compare that to the actual number of IPOs (in brown) in the second row of graphs in panel (b), where the prediction assumes that the number of EGC IPOs would follow the same pattern as the control groups. Specifically, we use the annual pattern of annual transactions in the graphs in the first row, normalized to the number of U.S. EGC IPOs (non-biotech) over the full sample period. Years where the color-less bars (predicted) exceed the brown bars (actual) indicate that there are "missing" U.S. EGC IPOs (i.e., not as many U.S. EGC IPOs as would be predicted by the control group). In contrast, years where the brown bars are higher than the color-less bars indicate that there are excess U.S. EGC IPOs. By design, the excess and missing IPOs sum up to zero over the full sample period; if the JOBS Act worked, we should observe excess IPOs post-2012 and missing IPOs pre-2012. We observe that U.K. small firms show missing IPOs in 2016-17, but the huge surge in small firm IPOs in U.K. in 2004-2006 results in the bulk of missing IPOs showing up in those years. The patterns for U.S. non-EGC IPOs and U.S. EGC private transactions show that in the post-JOBS period, we see more years with missing IPOs than excess IPOs. Overall, our analysis of the time series dynamics of IPOs indicates that the finding of increased IPOs due to the JOBS Act discussed in Dambra et al. (2015), whose sample ended in 2014, may have been a premature conclusion.

We next supplement this time series analysis with a set of formal tests that control for two important factors: overall market conditions, and the pool of firms that may plausibly

be willing to go public. We address the former using the difference-in-differences setting, and we address the latter using three different variables of interest: listing propensity, IPO propensity, and PE exit via IPO.

We first follow Doidge et al. (2017) and calculate the listing propensity in the U.S. economy by comparing the number of public firms to the total number of firms. Using annual listing propensity in year y at the three-digit NAICS level j between 2001 and 2019, we compare propensity to be public for small and large firms (as indicated by the group g subscript) in the pre- and post-JOBS Act periods in the following regression, which includes industry fixed effects:

$$listing\_propensity_{y,j,g} = \beta \cdot post_y + \delta \cdot EGC + \theta \cdot post_y \times EGC + \gamma_j. \quad (1)$$

[Table 3 About Here]

Panel A of Table 3 shows the results of this analysis. Column (1) includes all industries while column (2) includes only industries that are 'active' in terms of public companies (industries that have at least one public company classified as an EGC and non-EGC in each of the pre- and post-JOBS periods). While EGCs are less likely to be publicly listed (as indicated by the negative coefficient for EGC status), the coefficient on the interaction term θ shows that in the post-JOBS period, these firms were even less likely to be publicly listed. In particular, EGCs in the post-JOBS period have listing propensities that are between 1.5 and 1.7 percentage points lower.

The ideal test to gauge whether the JOBS Act succeeded in the meeting the regulators' goal of encouraging more firms to go public would examine all private firms that wanted to do an IPO and observe whether or not they pursue an IPO; comparing the IPO decisions of private firms that meet the EGC criteria to those that do not in the pre- and post-JOBS Act periods would allow us to determine if the JOBS Act really encouraged small firms to go public. Though we cannot observe this exact sample, we look at the universe

of private firms that, during our sample period, engaged in a public equity raise (IPO), completed a merger or were acquired (M&A) or raised private equity (PE).[17] This sample likely approximates possible IPO candidates, so examining the likelihood that a private firm chooses IPO over the other options is a strong test of whether the JOBS Act encouraged firms to go public.

With this in mind, we use the sample of private company transactions to estimate IPO propensity for each EGC category g at the industry-year level as follows:

$$IPO\_propensity_{y,j,g} = \frac{IPO_{y,j,g}}{IPO_{y,j,g} + PE_{y,j,g} + MA_{y,j,g}}, \tag{2}$$

where each of *IPO*, *PE* and *MA* either represent the number of transactions or the dollar value of transactions. Because we use three-digit SIC codes as the industry level to define IPO propensity, in some specifications we include only industries where IPO activity is positive across our treatment and control samples in both the pre- and post-JOBS periods. We then run the following regression:

$$IPO\_propensity_{y,j,g} = \beta \cdot post_y + \delta \cdot US\_EGC + \theta \cdot post_y \times US\_EGC + \gamma_j. \tag{3}$$

The variable US_EGC is defined based on the control group: in the U.S. only sample it is 1 for EGC and 0 for non-EGC; in the EGC only sample it is 1 for the U.S. and 0 for the U.K.

Panel B of Table 3 shows the results of this analysis. In all specifications the θ coefficient on the interaction term is negative, and significantly so if we focus on industries with positive IPO activity.[18] We estimate that the likelihood of a U.S. EGC choosing IPO over PE or M&A decreased in the post-JOBS period by between 4% and 7% relative to the control groups. Note that coefficient on the post period and on the interaction term add up to

[17] While we refer to it as PE as a shorthand, our sample includes venture capital and other early stage private capital financing.

[18] Note that while this sub-sample only includes approximately a quarter of the industries for the U.S. and ECG samples, these industries represent 75% of IPOs.

approximately 2%, indicating that the level of IPO propensity was slightly higher for U.S. EGCs in the post-JOBS periods, but the negative interaction term implies that firms not targeted by the JOBS Act increased their IPO propensity even more. In other words, the relative decline in IPO propensity is driven not by a decrease in IPO propensity for U.S. EGCs, but rather an increase in IPO propensity for the control groups. We argue that this still indicates an effect of the JOBS Act: in particular, we believe that in the absence of the implementation of the Act, the IPO propensity for U.S. EGCs would have *increased* in the post-JOBS period as much as the control groups.

In a third test, we analyze the decisions of firms that engage in at least one PE transaction in our sample period followed by either an IPO or M&A transaction later in the sample (i.e., how the PE investor chooses to exit). For the subsample of U.S. transactions, we run the following regression:

$$IPO\_exit\_dummy_i = \beta \cdot post_i + \delta \cdot EGC_i + \theta \cdot post_i \times EGC_i + \zeta_i + \gamma_j, \tag{4}$$

where the dependent variable takes on a value of 1 if the PE-funded firm exit is done via IPO and 0 if the exit is done via M&A, and controls ζ_i include the date of initial PE investment, the number of PE rounds, and the total amount raised via PE. We also calculate IPO exit propensity at the industry-year level as we calculate IPO propensity above (number of IPO exits divided by total number of exits in an industry-year). Panel C of Table 3 shows that PE exits of EGCs have become approximately 35% less likely to be via IPO in the post-JOBS period relative to a control sample of non-EGC exits.

These three difference-in-differences regressions point to the fact that firms targeted by the reforms in the JOBS Act have experienced a diminished propensity to go public, relative to a group of firms not eligible to use the JOBS Act provisions. This result differs from the conclusion in Ewens et al. (2024) that without the JOBS Act, venture capital (VC) backed firms' IPO propensity would decrease. In their estimation, they use as the de-

nominator for calculating IPO propensity the sample of private firms that have ever raised VC funding and that are still a going concern. We reconcile these contrasting findings by showing (in the online appendix) that it is due to the different denominator: using our sample of transactions, IPO propensity for EGCs calculated using the Ewens et al. (2024) denominator increases more in the post-JOBS period, diminishing the difference between the control and treatment groups.[19] We believe the denominator for IPO propensity in panels B and C of Table 3 (private firms that are issuing private equity or completing an M&A transaction in a year) is a representative sample of firms that are considering an IPO, since these firms either need external capital or have current investors who want to sell their position.

It is important to acknowledge the other factors that are occurring over the time frame of our analysis, such as the rise of intangible assets (Stulz, 2020), increased market competition (Gao et al., 2013), and higher levels of private capital (Ewens and Farre-Mensa, 2020), all of which may result in reduced IPO propensity. These changes are especially stark if we consider the beginning compared to the end of our sample period (2001 vs. 2019). To that end, we have re-run the analysis in this section using a shorter time period (2010-2014) where the changes in these factors are considerably less extreme, and find that our results generally hold. These tables are shown in the online appendix.

Overall, our tests show that firms that benefit from the JOBS Act provisions are relatively less likely to choose IPO after the Act's introduction, consistent with the filtering effect that occurs due to the introduction of testing the waters (and not consistent with reduced disclosure). In other words, our results point to the possibility that there may have been *even more* IPOs by emerging growth companies absent the enactment of the JOBS Act. While the JOBS Act was designed to encourage small private firms to go public, we

[19]Note, it can be shown mathematically that an increase in the number of M&A or IPOs in year t decreases the denominator calculated by Ewens et al. (2024) in years $t+1$ and beyond, increasing their measure of IPO propensity even if the total number of IPOs over the sample period remains the same. This can result in artificially inflating IPO propensity using their measure if the JOBS Act induced some firms to go public earlier than that would have absent the provisions (e.g., the JOBS Act 'pulled forward' some IPOs).

argue that it has not succeeded in that objective. However, as we argue in the next section, this is not necessarily welfare-reducing, given the impact on the *quality* of firms that are most affected by the JOBS Act.

5 Empirical Analysis of Other Model Implications

In the previous section, we demonstrate that the JOBS Act resulted in a relative decrease in targeted firms' likelihood of going public, thus supporting the key implication of testing the waters in our conceptual framework. In this section, we explore additional empirical analyses and examine the remaining theoretical implications. Overall, testing the waters provides a comprehensive and coherent explanation for our empirical findings.

5.1 Use of JOBS Act provisions

We first examine U.S. EGCs' use of the JOBS Act provisions in the post-JOBS period in Table 4.

[Table 4 About Here]

More than 90% of EGCs confidentially file their prospectus with the SEC and include language in their IPO documentation that they or their underwriters may have tested the waters. We find that 29% of firms with completed IPOs provide evidence and details of the TTW meetings that took place before their public filing. In contrast, the utilization of the de-burdening provisions is less widespread, with the fraction varying between 25% and 75%.

5.2 Firm quality

If testing the waters leads to low-quality firms self-selecting out of the IPO process, then U.S. EGCs that ultimately choose to complete their IPO after testing the waters should,

on average, be of higher quality. Conversely, the reduced disclosure provision predicts the opposite effect. To conduct the test, we run the following difference-in-differences regression:

$$IPO\_outcome_i = \beta \cdot post_i + \delta \cdot US\_EGC_i + \theta \cdot post_i \times US\_EGC_i + \zeta_i + \gamma_j. \quad (5)$$

where $IPO\_outcome_i$ is a variable that is a proxy for firm quality.

Due to data limitations for the U.K. sample, we focus only on U.S. non-EGCs as the control sample for firm quality, and we account for industry fixed effects, as well as control variables such as firm size (measured by revenue and log total assets) and firm age.

Firm quality is extremely difficult to measure; in the context of our theoretical framework, higher firm quality means a higher likelihood of project success, where a successful outcome results in a large positive payout for investors. To this end, we have attempted to measure likelihood of success from four perspectives.

First, we look at trading outcomes, including market- and match-adjusted two year return, dummy variables if the stock is still trading one year after IPO and at the end of 2021, and a dummy if the firm has gone bankrupt.[20]

Second, we compare how realized revenues compare to revenues predicted by analyst estimates at the time of IPO. In particular, for each firm, we calculate the ratio of actual sales minus estimated sales (divided by actual sales) for all future fiscal periods that are published by analysts within 60 days of the firm's IPO issue date. We then calculate the average of these ratios at the firm level across different analysts and fiscal periods.

Third, we look at proxies for financial misconduct, including restatements due to fraud or resulting in an SEC investigation from Audit Analytics, and non-dismissed class action lawsuits as per the Securities Class Action Clearinghouse.

And finally, we look at two financial statement ratios that are related to near-term

[20]We estimate bankruptcy if the stock is delisted, the return to the delisting date is -90% or lower, and the final trading price is $0.50 or less. These criteria lead us to estimate that 6.0% of the IPO sample goes bankrupt.

success: year-over-year sales growth and profitability, both measured one year after IPO relative to the median firm in the same industry-quarter.

[Table 5 About Here]

As shown in Table 5, the interaction term is statistically significant for four of the ten variables: relative to non-EGCs, post-JOBS U.S. EGCs are more likely to be trading one year after IPO and at the end of 2021, have a higher ratio of future actual sales to predicted sales at IPO, and have higher sales growth. In addition, the coefficients for other dependent variables that are not statistically significant move in the direction consistent with higher quality: post-JOBS EGCs have higher market- and match-adjusted performance, are less likely to restate their financials or be subject to a securities class action lawsuit, and have higher profitability.

A better test of our theory would look at the quality of firms that could have gone public compared to those that did go public in the pre- vs. post-JOBS periods. This requires measures of quality of a sample of private firms, which is very difficult without proprietary data (see Chemmanur, He, Ren, and Shu (2025) for an example using U.S. Census data). However, we believe these results imply higher firm quality in the U.S. EGC sample post-JOBS relative to the control sample.

5.3 Underpricing

While there are many other explanations for underpricing, our conceptual framework indicates that a relatively high information acquisition cost can lead to increased IPO underpricing for U.S. EGCs in the post-JOBS Act period. Measuring this cost is challenging, and the effect on underpricing remains an empirical question. Nevertheless, to investigate the implications for underpricing, we re-run the regression in Equation (5) with underpricing as the dependent variable. Underpricing is calculated as the price at the end of the first

day of trading divided by the IPO price minus 1. We include in all specifications industry fixed effects and in some specifications we add deal- and firm-level controls.[21]

[Table 6 About Here]

The first three columns use U.S. non-EGCs as the control sample, and we find that underpricing is approximately 7% higher for EGCs in the post-JOBS Act period in all specifications.[22] This is also economically significant, as the sample average underpricing for U.S. EGCs is 16.5%. In the last three columns, we use U.K. EGCs as the control group, and find that U.S. EGCs post-JOBS increase in underpricing was approximately 14% relative to these U.K. firms.

5.4 IPO fees

The filtering effect of the TTW provision also has an effect on the entities that help firms engage in an IPO: underwriters, lawyers and auditors. Namely, their compensation will be higher for firms that ultimately choose to complete an IPO, but the work is front-loaded before testing the waters occurs.

As shown in Figure 1, TTW meetings take place after the confidential prospectus submission, which means that the first draft of the prospectus will be written by the firm and its IPO team. Since the underwriting spread is calculated as a percentage of IPO proceeds, the underwriters receive no compensation for a firm that opts out of the IPO process after

[21] Such controls include firm size (the natural logarithm of total assets), market performance (the performance of the S&P 500 or FTSE 100 Index from public filing to two months after public filing, consistent with Bernstein (2015)), firm age, a dummy if a firm has received PE or VC funding, the number of bookrunners, the Carter-Manaster rank of the top left bookrunner, the firm's pre-IPO debt-to-asset ratio, and the percentage of the IPO from secondary rather than primary sources.

[22] Even-Tov et al. (2022) argue that the JOBS Act did not increase underpricing using a similar difference-in-differences framework with U.S. non-EGCs as the control sample. We show in the online appendix that their non-result is eliminated by including industry fixed effects and eliminating from the analysis IPOs that are filed between December 1, 2011 and June 30, 2012. As discussed in Section 3, we argue that IPOs filed during that time would not have been able to use the JOBS Act provisions, especially the ability to test the waters.

TTW. Lawyers and accountants are paid a fixed fee, but will typically make more for firms that progress through the public filing stage.

Because the TTW provision results in some firms opting out of the public filing process, we hypothesize that underwriters, lawyers and auditors will charge more on average for firms that complete an IPO in order to make up for un(der)paid work done for firms that opt out.

In order to test this hypothesis, we re-run the regression in Equation (5) with fees paid to underwriters, lawyers and accountants as the dependent variables, controlling for deal size, firm size, firm age, PE- or VC-backed status, and industry fixed effects. We compare our treatment sample to non-EGC U.S. firms.

[Table 7 About Here]

Table 7 shows the results of these difference-in-differences regressions. The coefficient on the interaction term shows that post-JOBS Act, EGCs are charged significantly higher fees by underwriters, lawyers and accountants relative to non-EGC firms. Economically, the increase in fees paid to lawyers and accountants is much higher than the increase in fees to underwriters; compared to the pre-JOBS average fees paid by EGCs, the increase is 51%, 36% and 3% for lawyers, accountants and underwriters, respectively.

6 Further Discussion on Reduced Disclosure

In this section, we further argue that testing the waters is a more compelling explanation than reduced disclosure for the overall impacts of the JOBS Act on the IPO market. We present three key arguments to support this claim.

First, the implications of our reduced disclosure model include increased IPO propensity and decreased firm quality. However, our analysis of the data in Sections 4 and 5 does not support these assertions.

Second, we acknowledge that our difference-in-differences specification does not allow us to identify if the results are due to TTW or to reduced disclosure afforded by the JOBS Act, because the treatment sample experiences both at the same time. We attempt to disentangle their impacts by exploiting the introduction of the Small Reporting Company (SRC) exemption in 2008 (also used in Chaplinsky et al. (2017), Balogh et al. (2022)). This exemption allowed qualifying firms to provide reduced public filing disclosure similar to the JOBS Act (see Anthony L.G. PLLC (2018) for a discussion of provisions), where qualifying status is determined based on the firm having less than $75 million in public float (i.e., an IPO size of $75 million or less). We caution that this status is endogenous since IPO deal size is a firm choice variable and qualification is easily manipulated.[23] But nevertheless we use this cutoff to examine the dynamics of IPO propensity and underpricing in three periods: (i) 2001-2007, when no companies had the ability to reduce disclosure or test the waters; (ii) 2009-2011, when SRC firms were able to reduce disclosure; and (iii) 2013-2019, when all EGCs (including SRCs) are able to reduce disclosure and test the waters. We examine U.S. SRCs as our treatment group, and compare them to two control groups: firms in the U.K. with a transaction size of $75 million or less (U.K. SRCs), and U.S. EGCs with a transaction size of $75 million or more (non-SRC U.S. EGCs). We then run a difference-in-differences regression for IPO propensity and underpricing; the results are shown in Table 8.

[Table 8 About Here]

In order to examine the impact of the various regulations, we need to compare the sum of coefficients for the different groups. The introduction of the SRC exemption status identifies the impact of reduced disclosure as the change in dependent variable for U.S. SRCs in period 2 compared to the change in the control group in period 2. The introduction of the JOBS Act identifies the impact of testing the waters differently depending on the

[23] Chaplinsky et al. (2017) show the results of the density test and reject the null hypothesis that the density is continuous at the $75 million deal size threshold after the introduction of the SRC exemption.

control group. For the U.K. SRCs, we measure it as the change in the dependent variable for U.S. SRCs in period 3 compared to the change in the dependent variable for U.K. SRCs in period 3. Because the non-SRC U.S. EGCs also get the ability to test the waters, we only look at the single change in the dependent variable for U.S. SRCs in period 3.[24]

With that in mind, the impact of the introduction of the SRC exemption (disclosure only) in period 2 is an increase in IPO propensity of 4.3% or 1.4% for all industries for U.K. SRCs and non-SRC U.S. EGCs, respectively. When we look at active IPO industries only, the increase in IPO propensity is higher at 5.7% and 2.0% for U.K. SRCs and non-SRC U.S. EGCs, respectively. The change in underpricing is an increase of 0.1% and 2.8%. The impact of the introduction of the JOBS Act (testing the waters only) on IPO propensity is a decrease of 1.1% or 2.9% with the U.K. SRCs control sample and no change for non-SRC U.S. EGC control sample. The impact on underpricing is an increase of 8.0% and 4.4% for the U.K. SRC and non-SRC U.S. EGC subsamples, respectively.

Overall, this analysis underscores that it is testing the waters, rather than disclosure, that is driving the decrease in IPO propensity, since the introduction of reduced disclosure via the SRC exemption actually increased IPO propensity. Similarly, while both regulation changes increased underpricing, the introduction of testing the waters via the JOBS Act increased underpricing to a higher degree.

As our final argument to better attribute the increased underpricing to testing the waters rather than reduced disclosure (as in Chaplinsky et al. (2017)), we conduct two analyses. First, to the extent that the costs of disclosure are fixed, reduced disclosure costs will disproportionately benefit smaller firms, so we repeat our underpricing regressions for large firms only (firms with at least $100 million in revenue in the year before IPO). Second, we look at the relationship between EGCs' reduced disclosure in the post-JOBS

[24]The change in U.S. SRCs in period 2 is calculated as the sum of the coefficients of *US x Period 2* and *Period 2*. The change in U.K. SRCs and in non-SRC U.S. EGCs in period 2 is the coefficient of *Period 2*. The change in U.S. SRCs in period 3 is the sum of the coefficients of *US x Period 3* and *Period 3* less the sum of the coefficients of *US x Period 2* and *Period 2*. The change in U.K. SRCs is the coefficient of *Period 3* less the coefficient of *Period 2*.

period and their subsequent underpricing. Table 9 shows the results of this analysis.

[Table 9 About Here]

Panel A shows that the interaction terms in our difference-in-differences regression are positive and significant, indicating that the underpricing results are not driven by smaller firms, for whom we would expect the benefits of reduced disclosure to be larger.

In Panel B, we examine the actual use of the reduced disclosure provisions by EGCs in their IPO prospectus and its impact on underpricing. We develop a score for EGCs' use of the IPO disclosure exemptions and of ongoing disclosure requirements (which we call de-burdening exemptions in the table). A higher score means that the firm used more of the exemptions and provided investors with less information. There is no statistically significant result between the reduced disclosure scores and the level of underpricing. Since potential investors know about this reduced disclosure before orders are submitted and the price is determined, then we can interpret the lack of significance in this regression as reduced disclosure not driving our underpricing results. The lack of a significant relationship between disclosure and underpricing is consistent with Chaplinsky et al. (2017), although they warn of the endogeneity in firms' chosen disclosure levels.

7 Conclusion

In response to the declining number of public companies in the U.S., regulators enacted the Jumpstart Our Business Startup Act in order to de-risk the IPO process and de-burden being public for firms with less than $1 billion in annual revenue. In this paper, we show that these changes, in particular the ability for firms to test the waters with investors before public filing, did not succeed in increasing targeted firms' propensity to go public.

Before the JOBS Act, firms would have to publicly disclose their financial statements in a registration statement in order to begin the bookbuilding process, which would result

in firms deciding whether or not to complete their IPO after incurring a proprietary disclosure cost. As we show in our theoretical framework, introducing a pre-filing investor communication stage may induce more firms to engage underwriters and start the IPO process, but increased knowledge about valuation will lead some firms to avoid paying the proprietary disclosure cost. We show that the net result is that the number of treated firms choosing to go public after the JOBS Act is fewer than would be expected based on two different control samples.

We also show that our model is consistent with other developments in the post-JOBS Act IPO landscape: EGCs are higher quality, experience higher underpricing, and pay higher fees to their IPO team. Furthermore, we show both in our theoretical framework and in our empirical tests that our results are not consistent with the effects of the JOBS Act's de-burdening provisions (i.e., reduced disclosure for IPO firms).

Our paper highlights the importance of analyzing regulatory policy changes from multiple perspectives; while we argue that decreased go-public propensity might go against regulators' stated goals, the improvement in public firm quality is an important economic benefit.

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Figure 1: U.S. EGC IPO process in pre- and post-JOBS Act periods.

Before JOBS Act:

To start	Week 1	Weeks 2-4	Week 5	Weeks 6-7	Weeks 8-13	Week 14-16	To end
Firm engages underwriters and lawyers	Organizational meeting	Draft S-1	File S-1 publicly	Prep for roadshow	Reivew & address SEC comments on S-1	File S-1 w/ price range, conduct roadshow, bookbuilding	IPO completed or firm withdraws

After JOBS Act, for EGCs:

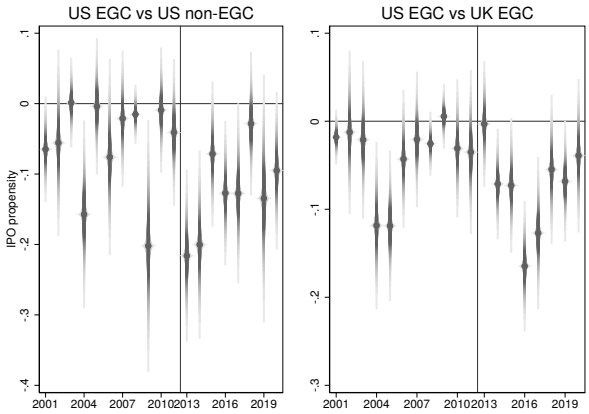
To start	Week 1	Weeks 2-5	Week 6	Week 7-8	Weeks 9-13	Weeks 14-15	Week 16-17	To end
Firm engages underwriters and lawyers	Organizational meeting	Draft S-1	**File S-1 confidentially**	Prep for roadshow **and test the waters**	Reivew & address SEC comments on S-1	File S-1 publicly (15+ days before start of roadshow)	File S-1 w/ price range, conduct roadshow, bookbuilding	IPO completed or firm withdraws

Shaded cells indicate when S-1 is publicly available

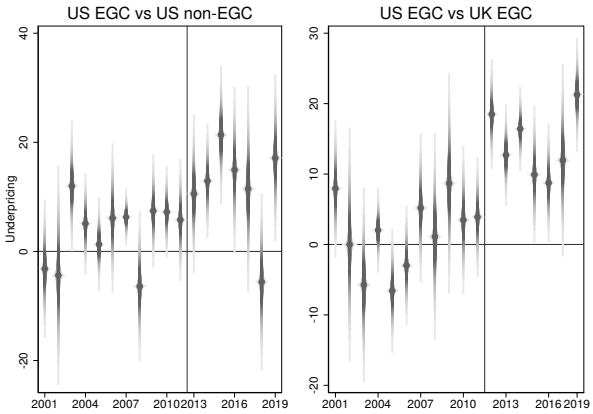
Bold font indicates new steps from JOBS Act

Figure 2: Parallel trends

Panel (a) of this figure plots the coefficients for the interaction term from a regression of industry-level IPO propensity on estimated EGC status interacted with year dummies. Panel (b) plots the coefficients for the interaction term from a regression of underpricing on EGC status interacted with year dummies, controlling for the natural logarithm of assets and market return. In all plots, the dot represents the coefficient while the shaded areas represents 95% confidence intervals; the vertical line shows 2012, the year of implementation of the JOBS Act.



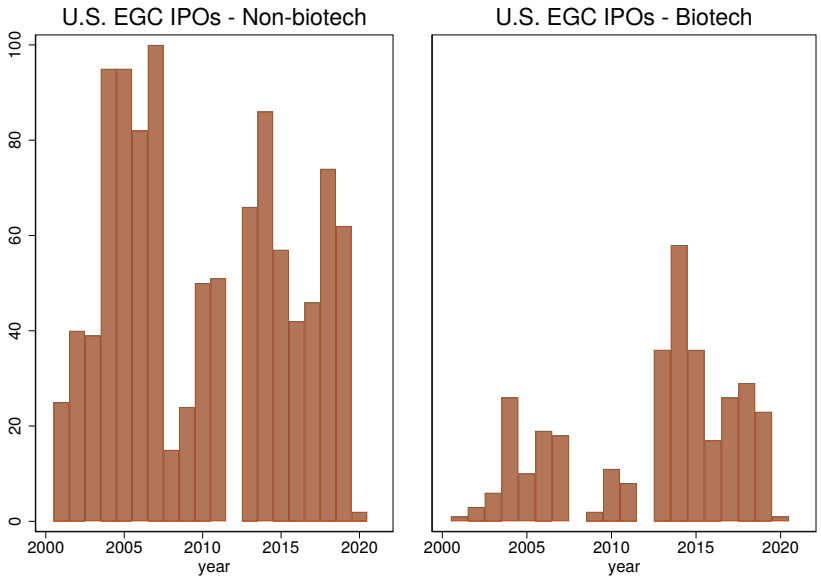
(a) IPO propensity



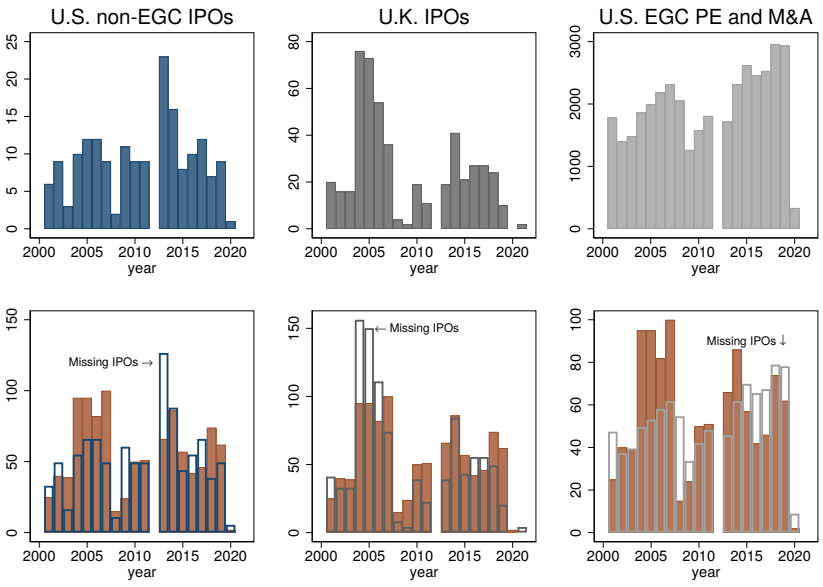
(b) Underpricing

Figure 3: IPO dynamics over time

Panel (a) shows the number of U.S. EGC IPOs by year, separating out IPOs by biotechnology firms (SIC codes beginning with 283). Panel (b) shows the number of IPOs or private transactions (M&A and PE) per year for control groups, as well as the actual and predicted number of IPOs for U.S. EGCs. All graphs in panel (b) exclude biotech firms.



(a) U.S. EGC IPOs over time



(b) Predicting U.S. EGC IPOs using control group transactions. Excludes biotech firms.

Table 2: Summary statistics.

This table presents the summary statistics for the variables used in this paper. Online Appendix I describes all variables and their sources in detail.

		Pre-JOBS			Post-JOBS		
		US EGC	**US Non-EGC**	**UK EGC**	**US EGC**	**US Non-EGC**	**UK EGC**
Number of filed IPOs		1,175	163	479	817	120	243
	Withdrawal %	35.23%	36.01%	22.76%	18.48%	28.33%	21.40%
Number of completed IPOs		761	103	357	662	85	190
Controls	Deal size	$136.3	$746.0	$48.1	$149.1	$752.7	$96.4
	Secondary percent	16.28%	20.98%	16.72%	5.10%	19.15%	41.52%
	Total revenue	$159.5	$4,550.2	$121.0	$126.7	$3,517.5	$143.6
	Total assets (ln)	4.39	7.72	3.17	4.15	8.00	3.59
	Firm age	17.73	51.45	9.67	12.00	52.01	10.00
	PE- or VC-backed	49.48%	11.65%	18.77%	72.51%	20.00%	20.21%
	Index perf two mths post-filing	0.36%	0.43%	0.50%	1.96%	2.65%	0.64%
	Debt to assets	30.40%	46.52%		28.85%	51.36%	
IPO outcomes	Underpricing	13.15%	6.70%	11.81%	20.47%	12.36%	10.08%
	Underwriting spread	6.85%	5.98%		6.80%	5.68%	
	Accounting fees to proceeds	0.66%	0.24%		1.09%	0.38%	
	Legal fees to proceeds	1.04%	0.49%		1.79%	0.61%	
Firm quality	Mkt adj 2 yr ret	-1.56%	11.20%		11.27%	4.85%	
	Match adj 2 yr ret	-7.62%	-9.42%		8.50%	12.49%	
	Trade 1 yr	98.00%	100.0%		99.24%	98.82%	
	Trade 2021	30.36%	47.52%		71.60%	71.76%	
	Bankrupt	10.65%	6.93%		2.60%	1.18%	
	Actual minus estimates sales	6.89%	5.66%		46.98%	-1.51%	
	Restate	3.93%	3.88%		0.76%	1.18%	
	Class action	18.85%	16.50%		18.28%	18.82%	
	Sales growth	145.65%	103.11%		179.02%	103.27%	
	Profitability	-3.28	1.67		2.20	0.85	
Number of transactions (IPO, PE, M&A)		22,255	861	5,925	21,053	1,015	3,624
Listing propensity	IPO dummy	3.43%	11.96%	6.03%	3.14%	8.37%	5.33%
	IPO propensity	3.28%	11.96%	5.62%	2.33%	11.29%	5.31%
	IPO propensity ($)	4.87%	12.63%	5.78%	3.57%	11.23%	6.03%

Table 3: Difference-in-differences regression: IPO likelihood.

Panel A. Listing propensity.

This panel presents the difference-in-differences regression comparing listing propensity for U.S. EGCs to U.S. non-EGCs in the pre- and post-JOBS periods using data from 2001 to 2019. Listing propensity is calculated separately for U.S. EGCs and non-EGCs at the industry-year level (where industry is three-digit NAICS) based on number of public firms in Compustat divided by total number of firms in the U.S. taken from the Census Bureau's SUSB. We define EGCs as firms with less than $1 billion in annual revenue (in Compustat) and between 20 and 500 employees (in SUSB). We define non-EGCs as firms with more than $1 billion in annual revenue (in Compustat) and more than 500 employees (in SUSB). The first column includes all industries while the second column includes only industries with at least one public EGC and non-EGC in each of the pre- and post-JOBS periods. Three-digit NAICS code fixed effects are included and standard errors are clustered at the year and NAICS3 level.

VARIABLES	(1) Listing propensity	(2) Listing propensity
Post JOBS	0.866*	0.950*
	(0.421)	(0.485)
EGC (estimate)	-2.790***	-3.337***
	(0.658)	(0.756)
Post JOBS x EGC (estimate)	**-1.509*** **	**-1.652*** **
	(0.459)	**(0.521)**
Observations	2,769	2,340
R-squared	0.727	0.725
Sample	All industries	Active industries
FE	NAICS3	NAICS3
Cluster	Yr&NAICS3	Yr&NAICS3

Panel B. IPO propensity.

This panel presents the difference-in-differences regression comparing the propensity for private companies to do an IPO, comparing the treatment group (U.S. EGCs) to the control groups (U.S. non-EGCs in columns (1)-(3) and U.K. EGCs in columns (4)-(6)) in the pre- and post-JOBS periods. The sample includes all private companies who undertook a public equity raise (IPO), private equity raise (PE) or merger or acquisition (M&A) between 2001 and 2019. The dependent variable in columns (1), (2), (4) and (5) is the percentage of transactions in the industry-year that were IPOs, while in columns (3) and (6) it is the percentage of dollars raised in the industry-year by IPOs. Columns (1) and (4) include all industries, while all other columns include only industries with at least one control and treatment IPO in each of the pre- and post-JOBS periods. Firms are assigned EGC status based on pre-transaction revenue where available, otherwise EGC status is estimated predicting revenue based on transaction size. Three-digit SIC code fixed effects are included and standard errors are clustered at the year and three-digit SIC level.

‘	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	IPO propensity	IPO propensity	IPO propensity ($)	IPO propensity	IPO propensity	IPO propensity ($)
Post JOBS	-0.000403	0.0974**	0.0991**	0.000521	0.0582**	0.0802***
	(0.0293)	(0.0355)	(0.0345)	(0.0141)	(0.0237)	(0.0233)
EGC (estimate)	-0.0873***	-0.0546**	-0.0262			
	(0.0175)	(0.0196)	(0.0206)			
Post JOBS x EGC (estimate)	**-0.00983**	**-0.0747****	**-0.0679****			
	(0.0264)	**(0.0287)**	**(0.0262)**			
US				-0.0289***	-0.0398**	-0.0103
				(0.00912)	(0.0180)	(0.0172)
Post JOBS x US				**-0.0114**	**-0.0390***	**-0.0597****
				(0.0122)	**(0.0212)**	**(0.0232)**
Observations (# industries)	5,064	1,251	1,234	6,534	1,359	1,347
(coverage of IPOs)	100%	75%	75%	100%	75%	75%
R-squared	0.140	0.156	0.132	0.131	0.114	0.089
Sample	All industries	Active industries	Active industries	All industries	Active industries	Active industries
FE	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3

Panel C. PE exit as IPO propensity.

This panel presents the difference-in-differences regression comparing the propensity for private companies to do an IPO, comparing U.S. EGCs to U.S. non-EGCs in the pre- and post-JOBS periods, using transactions between 2001 and 2019. The sample includes only PE-funded firms that resulted in an M&A or IPO exit within the sample time frame. The dependent variable in columns (1) and (2) is a dummy that takes on a value of 1 if the exit was an IPO, and column (3) calculates the percentage of exits in an industry-year that is done by IPO. Firms are assigned EGC status based on pre-transaction revenue where available, otherwise EGC status is estimated predicting revenue based on transaction size. Three-digit SIC code fixed effects are included and standard errors are clustered at the exit year and three-digit SIC level.

	(1)	(2)	(3)
VARIABLES	Exit via IPO	Exit via IPO	IPO exit propensity
Post JOBS	0.402**	0.327*	0.353**
	(0.170)	(0.185)	(0.164)
EGC (estimate)	-0.0639	-0.0341	-0.0758
	(0.0781)	(0.0754)	(0.0723)
Post JOBS x EGC (estimate)	**-0.357***	**-0.344***	**-0.347****
	(0.175)	**(0.180)**	**(0.157)**
Date of initial investment		9.31e-06	
		(1.08e-05)	
Number of PE rounds		0.0778***	
		(0.0110)	
Amount raised via PE		0.000162**	
		(6.68e-05)	
Observations	2,541	2,541	603
R-squared	0.214	0.283	0.318
Sample	PE exits	PE exits	PE exits
FE	SIC3	SIC3	SIC3
Cluster	Exit Yr&SIC3	Exit Yr&SIC3	Exit Yr&SIC3

Table 4: Use of JOBS Act provisions by U.S. EGCs filing for IPOs between July 1, 2012 and December 31, 2019.

	All IPOs	Completed IPOs
De-risking provisions		
Confidential filing	93.9%	95.5%
Testing the waters	92.3%	92.7%
Testing the waters with evidence	27.0%	28.6%
De-burdening provisions		
Reduced statement disclosure	70.9%	70.7%
Reduced compensation disclosure	75.2%	73.7%
Auditor attestation opt-out	45.1%	44.0%
Future accounting standards opt-out	24.6%	26.3%
PCAOB rulings opt-out	24.8%	25.7%
Executive compensation vote opt-out	42.2%	41.1%

Table 5: Difference-in-differences regression: Firm quality.

This table presents the difference-in-differences regression comparing firm quality measures for U.S. EGCs to U.S. non-EGCs in the pre- and post-JOBS periods, using IPOs filed between 2001 and 2019. Columns (1)-(5) examine trading outcomes based on CRSP data. Column (6) looks at realized revenues relative to analyst estimated revenues at IPO. Columns (7)-(8) examine proxies for financial misconduct. Columns (9)-(10) examine financial statement ratios relative to the median firm in a given three-digit SIC code industry in Compustat. Three-digit SIC code fixed effects are included in the trading outcomes and financial misconduct proxy regressions. Standard errors are clustered at the three-digit SIC level.

	Trading outcomes					Perf rel to IPO estimates	Fin'l misconduct		Fin'l statement ratios	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	Mkt adj 2 yr ret	Match adj 2 yr ret	Trade 1 yr	Trade 2021	Bankrupt	Actual minus projected sales	Restate	Class action	Sales growth	Profit-ability
EGC	0.0980	0.0657	-0.0126	-0.112*	0.00314	0.385	0.0698***	0.0606	-0.210**	-9.754
	(0.109)	(0.164)	(0.0161)	(0.0577)	(0.0393)	(0.236)	(0.0221)	(0.0462)	(0.105)	(8.684)
Post JOBS	-0.0785	0.191	-0.0244	0.206***	-0.0300	-0.317**	-0.00168	0.0423	0.0772*	0.498
	(0.111)	(0.164)	(0.0149)	(0.0695)	(0.0377)	(0.141)	(0.0275)	(0.0633)	(0.0451)	(2.585)
Post JOBS x EGC	**0.190**	**0.0306**	**0.0293***	**0.178****	**-0.0437**	**0.580****	**-0.0250**	**-0.0322**	**0.258****	**5.460**
	(0.121)	**(0.185)**	**(0.0167)**	**(0.0752)**	**(0.0473)**	**(0.268)**	**(0.0272)**	**(0.0642)**	**(0.117)**	**(3.582)**
Revenue	-0.00785***	0.0382**	-0.000257	0.00764**	0.00114	-0.0108	0.000517	0.0106***	0.0109***	0.156
	(0.00277)	(0.0188)	(0.000327)	(0.00351)	(0.000735)	(0.00701)	(0.00204)	(0.00273)	(0.00390)	(0.263)
Firm age	0.00253*	0.00170	-0.000190	0.000968	-0.000466	-0.00238	0.000170	-0.00175**	-0.00499**	0.158
	(0.00129)	(0.00310)	(0.000187)	(0.000773)	(0.000416)	(0.00216)	(0.000281)	(0.000688)	(0.00193)	(0.118)
Total assets (ln)	0.0506**	-0.0379	0.00625**	-0.00427	-0.0152**	0.168	0.00345	0.0103	-0.169***	-3.201
	(0.0198)	(0.0250)	(0.00278)	(0.0107)	(0.00623)	(0.110)	(0.00343)	(0.00669)	(0.0440)	(3.445)
Observations	1,505	1,276	1,505	1,505	1,505	909	1,520	1,520	1,262	1,462
R-squared	0.063	0.077	0.128	0.241	0.151	0.053	0.193	0.084	0.015	0.002
Sample	All	All	All	All	All	All	All	All	All	All
FE	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	None	None
Cluster	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3

Table 6: Difference-in-differences regression: IPO underpricing.

This table presents the difference-in-differences regression comparing IPO underpricing for the treatment group (U.S. EGCs) to the control groups (U.S. non-EGCs in columns (1)-(3) and U.K. EGCs in columns (4)-(6)) in the pre- and post-JOBS periods, using IPOs filed between 2001 and 2019. Three-digit SIC code fixed effects are included and standard errors are clustered at the year and three-digit SIC level.

	(1) Underpricing	(2) Underpricing	(3) Underpricing	(4) Underpricing	(5) Underpricing	(6) Underpricing
Post JOBS	2.124	1.741	1.022	-5.437***	-5.315***	-5.819***
	(2.676)	(2.772)	(3.539)	(1.279)	(1.304)	(1.339)
EGC	3.755**	4.101***	1.384			
	(1.740)	(1.399)	(1.904)			
Post JOBS x EGC	**7.239****	**7.402****	**7.022****			
	(2.679)	**(2.766)**	**(3.293)**			
US				-0.0170	0.318	0.300
				(1.862)	(2.168)	(1.798)
Post JOBS x US				**14.28*****	**14.03*****	**14.07*****
				(1.573)	**(1.721)**	**(1.803)**
Total assets (ln)		0.122	-0.361		-0.233	-0.0430
		(0.369)	(0.858)		(0.236)	(0.250)
Index perf two		13.11	18.97		10.57	10.70
mths post-filing		(10.27)	(13.82)		(8.086)	(9.607)
Firm age			-0.0984***			-0.104**
			(0.0336)			(0.0389)
PE- or VC-backed			2.301			1.471
			(1.691)			(1.750)
Number of bookrunners			0.130			-0.159
			(0.864)			(0.555)
Left bookrunner rank			1.397***			
			(0.311)			
Debt to assets			-6.160***			
			(1.805)			
Secondary percent			2.098			0.126
			(2.806)			(1.679)
Observations	1,550	1,547	1,333	1,823	1,817	1,791
R-squared	0.134	0.135	0.180	0.121	0.121	0.126
Sample	US EGC/non	US EGC/non	US EGC/non	US/UK EGC	US/UK EGC	US/UK EGC
FE	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3

Table 7: Difference-in-differences regression: Fees paid.

This panel presents the difference-in-differences regressions comparing the fees paid to underwriters, accountants and lawyers for U.S. EGCs (the treatment group) to U.S. non-EGCs (the control group) in the pre- and post-JOBS periods, using IPOs filed between 2001 and 2019. The sample includes completed IPOs only. Three-digit SIC code fixed effects are included and standard errors are clustered at the year and three-digit SIC level.

	(1)	(2)	(3)
VARIABLES	Underwriting spread	Accounting fees to proceeds	Legal fees to proceeds
Post JOBS	-0.00250**	0.00187	0.00190
	(0.000975)	(0.00108)	(0.00199)
EGC	0.00529***	0.000349	-0.000594
	(0.00110)	(0.00119)	(0.00173)
Post JOBS x EGC	**0.00218****	**0.00237****	**0.00529*****
	(0.000881)	**(0.00102)**	**(0.00174)**
Deal size	-0.00573***	-0.00149	-0.00217*
	(0.00167)	(0.000935)	(0.00115)
Total assets (ln)	-0.00113***	-0.000709**	-0.00143***
	(0.000289)	(0.000294)	(0.000300)
Firm age	-5.46e-06	-1.91e-06	6.87e-07
	(1.21e-05)	(1.08e-05)	(1.88e-05)
PE- or VC-backed	0.000121	0.000829	-0.000228
	(0.000415)	(0.000841)	(0.000661)
Observations	1,522	1,511	1,511
R-squared	0.629	0.180	0.214
Sample	US EGC/non	US EGC/non	US EGC/non
FE	SIC3	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3	Yr&SIC3

Table 8: Difference-in-differences regression: Small Reporting Company exemption.

This table examines IPO propensity and IPO underpricing using the definition of small reporting company (SRC) exemption (public float of less than $75 million) using IPOs and other private firm transactions between 2001 and 2019. Period 2 represents the years 2009 to 2011, inclusive, when companies eligible for SRC status were able to reduce disclosure but not test the waters. Period 3 represents the years 2013 to 2019, inclusive, when all U.S. EGCs were eligible to reduce disclosure and test the waters. Columns (1)-(3) compare U.S. firms to U.K. firms, all with an transaction size less than $75 million. Columns (4)-(6) compare U.S. EGCs with a transaction size less than $75 million (SRC dummy) to those with a transaction size above $75 million. The dependent variable in columns (1), (2), (4) and (5) is a dummy that takes on a value of 1 if the firm chooses an IPO over private equity or M&A and 0 otherwise (columns (2) and (5) only include active industries, as defined in Panel B of Table 3). The dependent variable in columns (3) and (6) is IPO underpricing. Three-digit SIC code fixed effects are included. Standard errors are clustered at the year and three-digit SIC level.

	(1)	(2)	(3)	(4)	(5)	(6)
	IPO	IPO		IPO	IPO	
VARIABLES	dummy	dummy	Underpricing	dummy	dummy	Underpricing
US	-0.0655***	-0.0739***	-5.165*			
	(0.0157)	(0.0211)	(2.550)			
US x Period 2	0.0427***	0.0570***	0.127			
	(0.0142)	(0.0196)	(4.256)			
US x Period 3	0.0314*	0.0276	8.185***			
	(0.0153)	(0.0205)	(1.893)			
SRC				-0.109***	-0.118***	-12.46***
				(0.00884)	(0.0135)	(2.273)
SRC x Period 2				0.0140	0.0201	2.821
				(0.0159)	(0.0185)	(3.763)
SRC x Period 3				0.0162	-0.00332	-5.545*
				(0.0155)	(0.0226)	(3.032)
Period 2	-0.0543***	-0.0698***	-1.720	-0.0250	-0.0339	-3.851**
	(0.0174)	(0.0231)	(2.178)	(0.0178)	(0.0219)	(1.387)
Period 3	-0.0391**	-0.0348	-5.984***	-0.0252	-0.00781	8.879***
	(0.0176)	(0.0231)	(2.043)	(0.0180)	(0.0261)	(2.831)
Observations	39,134	29,582	856	39,924	27,012	1,325
R-squared	0.049	0.054	0.124	0.071	0.075	0.183
Sample	US & UK SRC	US & UK SRC - Active industries	US & UK SRC	US EGC	US EGC - Active industries	US EGC
FE	SIC3	SIC3	SIC3	SIC3	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3	Yr&SIC3

Table 9: Underpricing and reduced disclosure.

This table examines IPO underpricing in the context of the reduced disclosure afforded to U.S. EGCs in the post-JOBS period. Panel A presents the difference-in-differences regression comparing underpricing for the treatment group (U.S. EGCs) to the control groups (U.S. non-EGCs in column (1) and U.K. EGCs in column (2)) in the pre- and post-JOBS periods, including only firms with at least $100 million in revenue in the year before IPO. Panel B examines the impact of disclosure/deburdening exemptions on IPO underpricing for EGCs in the post-JOBS period. Three-digit SIC code fixed effects are included. Standard errors are clustered at the year and three-digit SIC level.

Panel A: Subsample (firms with $100m revenue+)		
VARIABLES	(1) Underpricing	(2) Underpricing
Post JOBS	-0.370	-1.550
	(3.731)	(1.715)
EGC	-1.003	
	(2.169)	
Post JOBS x EGC	5.405**	
	(2.323)	
US		8.404***
		(2.234)
Post JOBS x US		8.246***
		(2.447)
Total assets (ln)	-2.191*	-1.168*
	(1.061)	(0.611)
Index perf two	23.44	28.11
mths post-filing	(17.70)	(18.92)
Firm age	-0.0804**	-0.106**
	(0.0361)	(0.0451)
PE- or VC-backed	3.913**	3.686*
	(1.411)	(1.986)
Number of bookrunners	0.796	-0.0337
	(0.923)	(0.474)
Left bookrunner rank	1.477**	
	(0.688)	
Debt to assets	-6.364**	
	(2.265)	
Secondary percent	1.850	1.389
	(3.090)	(1.957)
Observations	570	645
R-squared	0.283	0.239
Sample	US EGC/non	US/UK EGC
FE	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3

Panel B: Disclosure and underpricing		
VARIABLES	(1) Underpricing	(2) Underpricing
Use of disclosure	-0.359	
exemptions	(3.597)	
Use of deburdening		-1.333
exemptions		(1.284)
Total assets (ln)	0.612	0.597
	(1.882)	(1.945)
Index perf two	2.591	4.540
mths post-filing	(70.22)	(72.53)
Firm age	-0.231	-0.243
	(0.127)	(0.133)
PE- or VC-backed	3.109	3.178
	(6.542)	(6.266)
Number of bookrunners	-0.0270	0.0433
	(1.351)	(1.373)
Left bookrunner rank	0.825	0.743
	(0.685)	(0.642)
Debt to assets	-10.19	-10.43
	(5.551)	(5.567)
Secondary percent	18.07	18.41
	(12.32)	(12.49)
Observations	432	432
R-squared	0.159	0.163
Sample	US EGC	US EGC
FE	SIC3	SIC3
Cluster	Yr&SIC3	Yr&SIC3

Appendix A Theoretical Framework and Proofs

In Appendix A.1 and Appendix A.2, we will introduce a framework that incorporates a two-dimensional information structure and operates in two stages to explore the implications of the testing the waters (TTW) provision. In Appendix A.3, we will extend this framework to model the reduced disclosure provision and discuss its implications.

While confidential filing is also a significant provision of the JOBS Act, it primarily shifts the waiting period to pre-public filing, allowing the SEC to ensure that the registration statement "satisfies full and fair disclosure requirements." Thus, confidential filings do not involve meaningful interactions between the firm and investors and we do not consider it in our framework.

Appendix A.1 A Model of Testing the Waters

A firm is seeking financing for a project by selling $Q = 1$ share of equity. It can sell its equity to a single institutional investor and/or a pool of retail investors. The institutional investor's maximum demand is $D_i = 1$ share, and the maximum demand from the pool of retail investors is $D_r < 1$ shares. That is, although it may be possible to allocate the entire issue to the institutional investor, retail demand alone will never be sufficient to purchase the entire issue.

The project requires an initial investment of one dollar. The project is risky as it has the potential to generate a return of $R > 0$ with a probability $\tilde{p}$, while offering a return of zero otherwise. The probability of the project's success is influenced by two dimensions of uncertainty:

$$\tilde{p} = p_0 + \tilde{p}_1 + \tilde{p}_2. \tag{A1}$$

In the equation, $p_0 \in (0, 1)$ is a constant and the tilde denotes random variables. $\tilde{p}_1$ and $\tilde{p}_2$ represent two types of information frictions that impact the project's valuation: $\tilde{p}_1$ reflects the dimensions in which the firm possesses better information, such as its own business condition, while $\tilde{p}_2$ captures the factors outside the firm that the institutional investor is more informed about, including competitors and the broader macroeconomic environment. Suppose that both $\tilde{p}_1$ and $\tilde{p}_2$ take binary values with equal probability:

$$\tilde{p}_1 = \begin{cases} \Delta & \text{w/ prob. } 0.5 \\ -\Delta & \text{w/ prob. } 0.5 \end{cases} \quad \text{and} \quad \tilde{p}_2 = \begin{cases} \Delta & \text{w/ prob. } 0.5 \\ -\Delta & \text{w/ prob. } 0.5 \end{cases} \tag{A2}$$

where $\Delta > 0$, $p_0 + 2\Delta < 1$, and $p_0 - 2\Delta > 0$.

We consider both bookbuilding and testing the waters as mechanisms for the firm to communicate with the institutional investor, although the distinctions between them will

become clearer later. We assume that, in the absence of interaction with the institutional investor, the firm privately observes the value of $\tilde{p}_1$, while the institutional investor privately knows the value of $\tilde{p}_2$. Consequently, when not communicating with the institutional investor, the firm's expectation regarding $\tilde{p}_2$ is $E(\tilde{p}_2) = 0$, and the valuation of the firm project with positive information $\tilde{p}_1 = \Delta$ and negative information $\tilde{p}_1 = -\Delta$ are respectively

$$H \equiv (p_0 + \Delta)R - 1, \tag{A3}$$

$$L \equiv (p_0 - \Delta)R - 1. \tag{A4}$$

Following interactions, the firm may also become aware of the value of $\tilde{p}_2$ if the institutional investor reveals her information to the firm. When studying TTW, our focus is on the firm's learning, so we assume that the value of $\tilde{p}_1$ remains unknown to the institutional investor (in Section Appendix A.3, we will relate $\tilde{p}_1$ to the reduced disclosure provision). Based on the realizations of $\tilde{p}_1$ and $\tilde{p}_2$, we can define the valuation of the firm's project as follows:

$$HH \equiv (p_0 + 2\Delta)R - 1, \tag{A5}$$

$$HL \equiv p_0 R - 1, \tag{A6}$$

$$LL \equiv (p_0 - 2\Delta)R - 1. \tag{A7}$$

That is, when both dimensions yield positive information, i.e., $\tilde{p}_1 = \tilde{p}_2 = \Delta$, the valuation of the firm's project is HH. In cases where only one dimension provides positive information – specifically, when $\tilde{p}_1 = \Delta$ and $\tilde{p}_2 = -\Delta$, or $\tilde{p}_1 = -\Delta$ and $\tilde{p}_2 = \Delta$ – the valuation of the firm's project is HL. Conversely, when both dimensions generate negative information, i.e., $\tilde{p}_1 = \tilde{p}_2 = -\Delta$, the valuation of the firm's project is LL. By comparing equations (A3)–(A7), it is straightforward that $LL < L < HL < H < HH$.

To further apply the model within the context of the JOBS Act, we introduce several additional assumptions. Specifically, when a firm seeks to raise capital in the public market, there are several associated costs to consider.

- First, the public filing of the IPO prospectus reveals previously confidential information to competitors, resulting in a cost, denoted as $c > 0$, to the firm. This is often referred to as a proprietary cost. In our model, a key change introduced by the JOBS Act, particularly the provision of TTW, is the relative timing of when the proprietary cost c is incurred compared to the communication with the institutional investor. Prior to the JOBS Act, once a firm engages underwriters and contemplates raising public capital, it is required to first publicly file the prospectus with the regulator, which has incurred the cost c. That is, only after paying the cost c can the firm obtain

any insights into the second dimension $\tilde{p}_2$ via bookbuilding and continue the IPO process.

In contrast, after the JOBS Act, firms that contemplate raising public capital are permitted to first gauge investor interest via TTW before making a public filing. Thus, in this two-stage setting, the proprietary cost c is incurred only when the firm determines to continue the IPO process. Within our model, this adjustment implies that after the firm learns about $\tilde{p}_2$, it has the option whether to proceed with the costly public offering. Additionally, we assume that TTW and bookbuilding, although occurring at different times, provide the same amount of information to the firm.

We interpret this two-stage framework as a crucial aspect of the TTW provision in the JOBS Act. It fundamentally drives the key implications of our model, including IPO attempts, IPO completion, IPO propensity, and IPO quality.

- Second, if the firm lacks access to capital from the public market, it can opt to raise funds from the private market instead. In this context, the firm's valuation in the private market serves as the outside option when evaluating capital-raising opportunities in the public market, which we denote as $v > 0$. Note that while the focus of our model is a firm raising capital for investment, the same outside option could be achieved in the context of a firm selling itself (i.e., completing an M&A transaction).

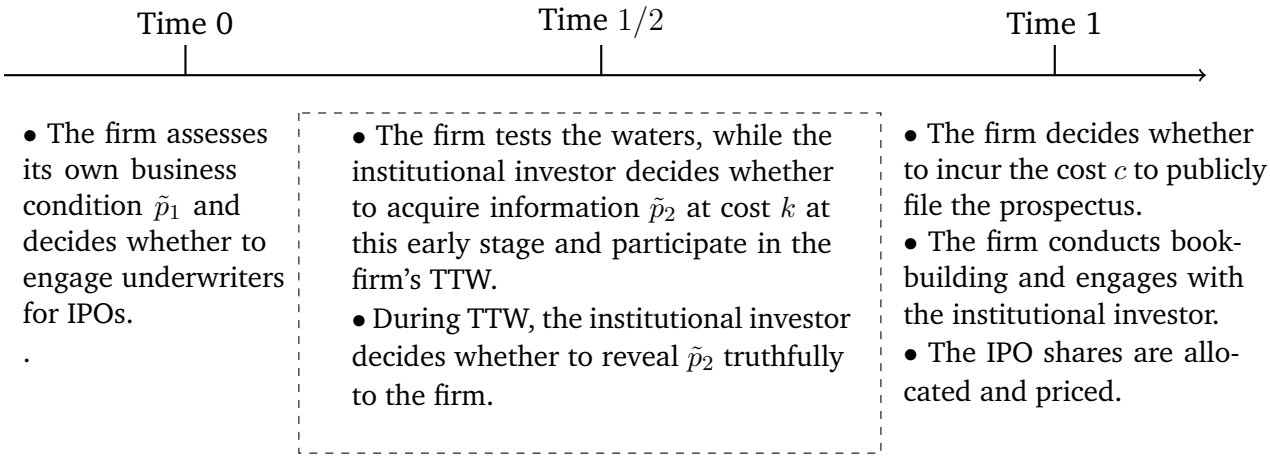
- Third, following the enactment of the JOBS Act, to participate in the TTW process, the institutional investor must incur an additional cost of $k > 0$. This expense can be regarded as the cost associated with acquiring early information, such as the time and manpower needed to value the private firm and complete due diligence. As will be clear later, the cost of acquiring early information can play a role in shaping the implications related to changes in underpricing. We also assume that there are no additional costs for the firm associated with TTW.

Figure A1 plots the timeline of events in the IPO process. At time 0, the firm assesses its own business condition, $\tilde{p}_1$. The IPO process officially begins with the engagement of underwriters. The firm decides whether to engage underwriters to start the IPO process, with the trade-offs differing before and after the implementation of the JOBS Act.

Before the JOBS Act, the firm directly proceeds to time 1, where it decides whether to publicly file the prospectus. Thus, before the JOBS Act, only when the firm has decided to publicly file the prospectus will it engage underwriters at the beginning. This public filing incurs a proprietary cost c. Once the public filings are complete, the firm can conduct bookbuilding and communicate with the institutional investor to gain insights into the other dimension of information, $\tilde{p}_2$, such as market demand. At the end of time 1, the IPO shares are allocated and priced.

The time-$1/2$ events in the dashed box apply only after the JOBS Act. That is, after the JOBS Act, prior to the public filing, the firm can decide whether to test the waters with the institutional investor to gain early insights into $\tilde{p}_2$ at time $1/2$. In our model, the firm must engage in testing the waters since it incurs no cost. In our model, since the proprietary cost is only incurred at time 1, the firm can choose to engage underwriters at time 0 without the need to consider this cost.

Additionally, at time $1/2$, the institutional investor decides whether to incur a cost to acquire information about $\tilde{p}_2$ at this early stage and participate in the TTW. During the TTW, the investor also decides whether to reveal $\tilde{p}_2$ truthfully to the firm. The remaining events at time 1 remain the same as those before the JOBS Act.



This figure plots the timeline of events in an IPO in our model. The events in the dashed box indicate the ones that will occur after the JOBS Act.

Figure A1: Timeline of events

To focus on the relevant cases, we further make the following assumptions regarding the parameter regions.

Assumption 1. *Suppose that (i)* $LL - c < v$ *and (ii)* $LL > v$.

Part (i) of the assumption, i.e., $LL - c < v$, indicates that if the firm were to determine that it is of type LL, it would choose, ex ante, not to engage underwriters to seek public capital. However, part (ii) of the assumption shows that if the cost has already been incurred upon the public filing, as in the case prior to the JOBS Act, such a firm would still proceed with its pursuit of public capital, that is, $LL > v$.

Appendix A.2 The Implications of the Testing the Waters Provision

In this part, we will study the implications of the testing the waters provision. The discussion of the reduced disclosure provision will follow in the next section. As discussed in

Section Appendix A.1, the crucial change introduced by the TTW provision in the JOBS Act is that after the firm engages the underwriters, the IPO process takes two stages: (i) a firm can test the waters, and then (ii) the firm decides whether to publicly file the prospectus, which incurs a proprietary cost c. We will then discuss various situations depending on the value of $c + v$ as illustrated in Figure A2.

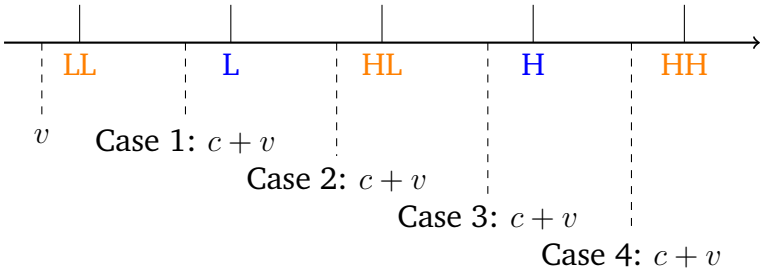


Figure A2: Distribution of firm valuation

Case 1: $L - c > v$ As shown in Figure A2, when $L - c > v$, the expected net benefit of raising public capital is positive for both types of firms, H or L. We next discuss the implications of the TTW.

The Effect of the TTW on IPO Quantity and Quality. When $L - c > v$, the expected net benefit for either firm type, H or L, is positive ex ante. As such, prior to the JOBS Act, both types of firms would engage underwriters to publicly file the prospectus. However, before the JOBS Act, the firm could only interact with the institutional investor after making a public filing. By that point, the proprietary cost c is already sunk and will not influence the firm's subsequent decisions. How will the firm proceed after communicating with the institutional investor?

If the institutional investor possesses positive information, i.e., $\tilde{p}_2 = \Delta$, and reveals it truthfully to the firm, the firm knows its type with certainty. However, the institutional investor only knows that the firm type is either HH or HL, each with equal probability. Proposition A1 in this appendix shows that a unique equilibrium exists in which both types of firms pool together; that is, they offer a return of $\bar{R}_h$ in the case of project success and 0 in the case of failure, where the subscript h indicates that the institutional investor reveals positive information. Therefore, given that the project's average success rate is $\frac{1}{2}(p_0 + 2\Delta + p_0) = p_0 + \Delta$, the expected price paid by investors is

$$q_h \equiv (p_0 + \Delta)\bar{R}_h - 1. \tag{A8}$$

The upper part of Figure A3 illustrates the firm valuation after the institutional investor truthfully reveals her positive, $\tilde{p}_2 = \Delta$, information to the firm. We will solve for the

expected price q_h shortly.

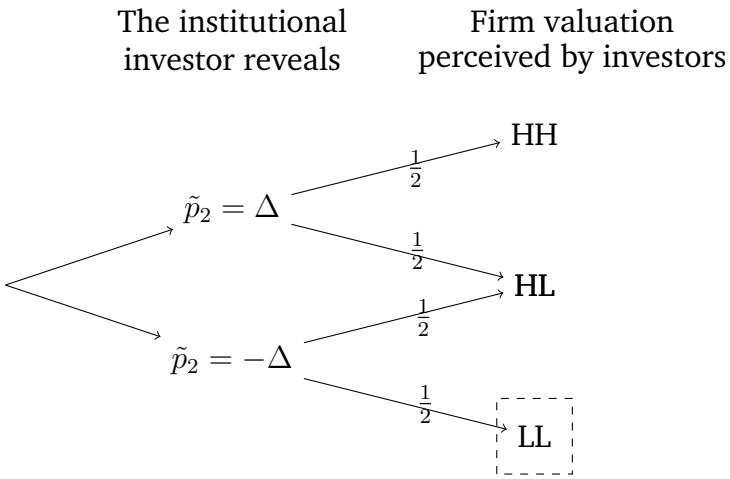


Figure A3: Firm valuation after investors revealing information

Similarly, as shown in the lower part of Figure A3, if the institutional investor observes $\tilde{p}_2 = -\Delta$ and reveals it to the firm, the firm then knows its type with certainty. Yet, the institutional investor only understands that the firm type is either LL or HL, also with equal probability. Once again, Proposition A1 shows that in the unique equilibrium, both types of firms offer a return of $\bar{R}_l$ in the case of project success and 0 in the case of failure, where the subscript l indicates that the institutional investors reveals negative information. Thus, given that the project's average success rate is $\frac{1}{2}(p_0 - 2\Delta + p_0) = p_0 - \Delta$, the expected price paid by investors is

$$q_l \equiv (p_0 - \Delta)\bar{R}_l - 1. \tag{A9}$$

Again, the expected price will be characterized shortly.

Taken together, after engaging with the investor during the bookbuilding process, both the type-H firm – which may be realized as either HH or HL – and the type-L firm – which may be realized as either HL or LL – will complete their IPOs.

We next discuss the case after the JOBS Act. As shown in Figure A2, both type-H and type-L firms will engage underwriters to conduct testing of the waters. After the enactment of the JOBS Act, the firm can engage with the institutional investor prior to the public filing. According to part (i) of Assumption 1, if a firm learns that it is of type LL, it will opt not to proceed with the capital raise. Thus, while the JOBS Act does not alter the likelihood of attempting an IPO (engaging underwriters), the probability of IPO completion decreases. As a result, IPO propensity – defined as the ratio of completed IPOs to the number of firms engaging underwriters to start IPO process – declines, while concurrently, the quality of IPOs improves.

The first three rows of the first column in Table A1 summarize these results.

The Effect of the JOBS Act on IPO Allocation and Pricing. We will next explore the implications of the JOBS Act on the allocation of equity shares during the IPO process and its impact on expected IPO pricing.

Following Benveniste and Spindt (1989), we will next characterize q_h and q_l in equations (A8) and (A9) based on the conditions that incentivize the institutional investor to truthfully disclose her information to the firm. The characterizations of $\bar{R}_h$ and $\bar{R}_l$ will follow directly.

Suppose that the institutional investor receives allocations A_h and A_l when revealing positive and negative information about the firm, respectively. When the institutional investor possesses positive information and chooses to reveal it truthfully, she receives an allocation of A_h shares. In this scenario, she pays the price q_h and acquires equity with an expected value of $\frac{HH+HL}{2} = H$. To incentivize the institutional investor to honestly disclose her information, the firm should consider pricing and allocating the offering in the following manner:[25]

$$A_h \left(H - q_h\right) \geq A_l \left(H - q_l\right). \tag{A10}$$

We now analyze the incentive compatible condition (A10) and characterize the optimal pricing and allocation by the firm. Initially, it appears that the right-hand-side of (A10) could be driven to zero by setting the offer price q_l at H whenever the institutional investor reveals negative information. But, of course, if the firm followed this strategy, the institutional investor would be unwilling to participate when the true $\tilde{p}_2$ is actually negative. Thus, in response to an indication that the issuing firm's $\tilde{p}_2 = -\Delta$, the firm is forced to set $q_l = L$, which is the average firm valuation if the true $\tilde{p}_2 = -\Delta$.

The firm's remaining leverage in such a case is to minimize the allocation A_l. It can do this by committing to grant allocation priority to retail investors when the institutional investor provides a negative signal; that is, to allocate the lowest possible shares to the institutional investor: $A_l = 1 - D_r$.

Since $q_l = L < H$, the expected profit necessary to elicit a positive indication, i.e., the right-hand-side of (A10), is positive. However, the actual discount from the true price, i.e., $H - q_h$, can be minimized by favoring the institutional investor with a large allocation in response to a positive signal. In this example, $A_h = 1$.

Therefore, following the preceding logic ($q_l = L$, $A_l = 1 - D_r$, and $A_h = 1$), to satisfy condition (A10) requires an offer price q_h that is no higher than the following level: $q_h \leq H - 2(1 - D_r)\Delta R$ in response to an indication of positive signal from the institutional

[25] In cases where the investor possesses negative information, it is evident that there are no incentives for her to falsely report positive information, as doing so would only result in a higher price and a larger share allocation, ultimately leading to a loss. From this point onward, we will focus exclusively on the incentive compatibility of the institutional investor knowing positive information.

investor. Thus, the firm must charge the highest possible price to maximize profit:

$$q_h = \underbrace{H}_{\text{expected firm value}} - \underbrace{2(1-D_r)\Delta R}_{\text{underpricing}}. \tag{A11}$$

The first part in equation (A11) represents the expected valuation of the firm, whereas the second part is the underpricing.

Next, we will characterize the share allocation and pricing after the JOBS Act. Let the allocations resulting from the institutional investor revealing positive and negative information be denoted as A'_h and A'_l respectively, with the corresponding prices represented as q'_h and q'_l.

The analysis remains similar for the scenario where the institutional investor learns $\tilde{p}_2 = \Delta$ and chooses to disclose this information truthfully. In this case, a pooling equilibrium exists in which investors pay the expected price q'_h.

When the institutional investor learns negative information, $\tilde{p}_2 = -\Delta$, and discloses it to the firm, as discussed earlier, the firm may opt to withdraw if it determines its type to be LL, which occurs with a probability of $\frac{1}{2}$. In Figure A3, we use the dashed box to indicate that the type-LL firm will opt out. The remaining firm type must then be HL, and consequently, the price must equal to $q'_l = HL$.

As a result, the institutional investor is motivated to fully disclose the positive information when

$$A'_h(H - q'_h) \geq \frac{1}{2}A'_l(HH - q'_l). \tag{A12}$$

Note when the institutional investor receives positive information but lies to the firm, if she still observes that the firm continues the IPO process, she can infer that the firm type must be HH. This explains that the firm valuation is HH on the right-hand side of (A12).

As discussed earlier, the firm should preferentially allocate a substantial amount of $A'_h = 1$ to the institutional investor when she discloses positive information, while offering a minimal allocation of $A'_l = 1 - D_r$ upon the revelation of negative information. Coupled with the price set for negative revelation, $q'_l = HL$, the incentive condition (A12) can be expressed as

$$q'_h \leq \underbrace{H}_{\text{expected firm value}} - \underbrace{(1-D_r)\Delta R}_{\text{underpricing}}. \tag{A13}$$

In addition, acquiring early information incurs a cost k. The institutional investor is willing to bear this cost only when the expected payoff exceeds it. If the investor obtains the early information, there is a probability of $1/2$ that she will learn positive information, truthfully disclose it, and achieve an expected profit of $A'_h(H - q'_h)$. Conversely, if she

learns negative information and reveals it truthfully, her expected profit will be 0, as the firm may either opt out or sell its equity at a fair price. Therefore, the expected payoff from acquiring early information is $\frac{1}{2} \times A'_h(H - q'_h) + \frac{1}{2} \times 0$. By setting this expected payoff greater than the information-acquisition cost k, we derive the following inequality:

$$q'_h \leq H - 2k. \tag{A14}$$

Taken together, the combination of the incentive compatibility (IC) condition (A13) and the individual rationality (IR) condition (A14) establishes that the maximum price that can be charged to the institutional investor, upon the revelation of positive information, is:

$$q_h = H - \max\{(1 - D_r)\Delta R, 2k\}. \tag{A15}$$

In comparison to the pricing (A11) prior to the JOBS Act, when the cost of information acquisition is not trivial, i.e., $k \geq (1 - D_r)\Delta R$, the firm experiences greater underpricing after the JOBS Act. Otherwise, if the information acquisition cost is minimal, the underpricing decreases. The last row of the first column in Table A1 summarize this result.

The rationale is that obtaining information early is valuable to the firm because it can help mitigate proprietary costs associated with public filing, particularly if the firm is aware that its valuation is relatively low. As a result, the firm may be willing to leave more money on the table for investors (i.e., increase underpricing) to incentivize their information acquisition and participation. However, this outcome depends on the magnitude of the information-acquisition costs, which remains an empirical question and we do not emphasize much.

Case 2: $L - c < v$ and $HL - c > v$ When $L - c < v$ and $HL - c > v$, as shown in Figure A2, the expected net benefit of raising public capital is positive for type-H firm but negative for type-L firm.

The Effect of the JOBS Act on IPO Quantity and Quality. When $L - c < v$, prior to the JOBS Act, ex ante, a firm that knows $\tilde{p}_1 = -\Delta$, i.e., type L, will not attempt to engage underwriters. This is because, given the expectation $E(\tilde{p}_2) = 0$, the associated costs dominate. As such, only the firm with information $\tilde{p}_1 = \Delta$, type H, will engage underwriters to initiate the IPO process. Then, will the type-H firm finish the IPO process? Yes, as analyzed in Case 1, both the type-HH and HL firms will complete their IPOs.

After the JOBS Act, the type-L firm may also engage the underwriters to initiate the IPO process, since it now has the option to withdraw without incurring the proprietary cost c. Specifically, ex ante, there is a probability of $\frac{1}{2}$ that the firm learns its type is LL. In this case, the firm will not continue to publicly file prospectus. Conversely, with a probability of $\frac{1}{2}$, it may find that its type is HL, prompting it to file prospectus publicly.

Consequently, the JOBS Act results in an increase in the number of firms engaging underwriters to start the IPO process, rising from $\frac{1}{2}$ to 1. However, the IPO completion increases from $\frac{1}{2}$ to $\frac{3}{4}$, leading to a decrease in IPO propensity, from 100% to 75%. Finally, the quality of IPOs is expected to improve. The second column in Table A1 summarizes these results.

The Effect of the JOBS Act on IPO Allocation and Pricing. Next, we turn our attention to the pricing and allocation of shares. Let us first consider the case prior to the JOBS Act. Only type-H firm will initiate the IPO process by engaging underwriters. During the communication with the institutional investor, when the institutional investor learns positive information and truthfully reveals it, she is allocated A_h shares and pays a price of q_h for shares that have an expected value of HH. If she chooses to lie, she will pay the price q_l and receive the allocation A_l. Therefore, the incentive compatibility (IC) condition requires that $A_h(HH-q_h) \geq A_l(HH-q_l)$. As analyzed in Case 1, we need to have $q_l = HL$, $A_h = 1$, and $A_l = 1 - D_r$. Thus, the IC condition implies that $q_h \leq HH - 2(1 - D_r)\Delta R$. Setting the maximum possible price yields:

$$q_h = HH - 2(1 - D_r)\Delta R. \tag{A16}$$

After the JOBS Act, both types of firms, either H or L, will engage underwriters to conduct TTW. However, after learning their type, the type-LL firm will not proceed. The situation remains the same to the post-JOBS Act scenario in Case 1. Following the same procedure, we know that after the JOBS Act, the price is

$$q_h' = H - \max\{(1 - D_r)\Delta R, 2k\}. \tag{A17}$$

Comparing the right-hand-side of (A16) and (A17), we obtain that the change of underpricing as follows (note that the firm's expected valuation upon the revelation of the positive information changes from H to HH after the JOBS Act):

$$\frac{\max\{(1 - D_r)\Delta R, 2k\}}{H} - \frac{2(1 - D_r)\Delta R}{HH} > 0 \text{ if } k > \frac{2(1 - D_r)\Delta R \cdot H}{HH}. \tag{A18}$$

So underpricing goes up after the JOBS Act if the information-acquisition cost is not too low. The last row of the second column in Table A1 summarizes this finding.

Case 3: $HL - c < v$ and $H - c > v$ Suppose that $HL - c < v$ and $H - c > v$ so that the expected net benefit of raising public capital is only positive for the type-H firm. As shown in Figure A2, before the JOBS Act, only type H attempted an IPO by engaging underwriters. After the JOBS Act, type H remains the only type looking to test the waters for an IPO, indicating no change in the number of IPO attempts. While both types HL

and HH complete IPOs before the JOBS Act, post-JOBS Act, only type HH will proceed with an IPO after gathering insights during TTW. As a result, the propensity for IPOs has decreased from 100% to 50%, while the overall quality of the IPOs is expected to improve. The third Column of Table A1 summarizes these results.

What are the implications of the JOBS Act for equity pricing and allocation? Regardless of the JOBS Act, only the type-H firm will engage underwriters to initiate the IPO process. Before the JOBS Act, the IC condition that encourages the institutional investor with positive information to truthfully disclose remains the same as in Case 2. As a result, the price set by the firm will be the same as in equation (A16), which we repeat here:

$$q_h = HH - 2(1 - D_r)\Delta R. \tag{A19}$$

After the JOBS Act, upon learning their specific type during TTW, the type-HL firm will withdraw from the IPO process. Consequently, if the institutional investor receives positive information and truthfully discloses it to the firm, she will receive an allocation of A_h shares and pay a price of q_h for the shares that have an expected valuation of HH. On the other hand, if she decides to misrepresent the information, the firm will opt out and the investor gains nothing. This leads to the IC condition given by: $A'_h(HH - q'_h) \geq 0$, which suggests

$$q'_h \leq HH. \tag{A20}$$

Moreover, to incentivize the institutional investor to acquire early information and participate in the TTW, the expected payoff should at least cover the cost; that is, $\frac{1}{2}A'_h(HH - q'_h) \geq k$, which yields

$$q'_h \leq HH - 2k. \tag{A21}$$

Taken together, post the JOBS Act, the maximum price charged upon the revelation of positive information should satisfy:

$$q'_h = HH - 2k. \tag{A22}$$

Comparing (A19) and (A22), we obtain that the expected underpricing goes up if the information-acquisition cost is not too low, i.e., $k > (1 - D_r)\Delta R$, and it goes down otherwise. The last row of the third column in Table A1 summarizes this result.

Case 4: $H - c < v$ **and** $HH - c > v$ Before the JOBS Act, no firms attempted to engage underwriters for an IPO. However, following the JOBS Act, the type-H firm began to engage underwriters and conduct TTW, although only half of them ultimately decided

to proceed with the IPO. Thus, the number of firms engaging underwriters will go up after the JOBS Act. Nonetheless, there are no implications for IPO completion, propensity, quality, or underpricing, given that no IPOs occurred prior to the JOBS Act.

Summary The implications of the TTW provision is summarized in Table A1.

	Case 1	Case 2	Case 3	Case 4
Parameter Regions	$L-c>v$	$L-c<v$ $HL-c>v$	$HL-c<v$ $H-c>v$	$H-c<v$ $HH-c>v$
IPO Attempts	unchanged	$\uparrow$	unchanged	$\uparrow$
IPO Completion	$\downarrow$	$\uparrow$	$\downarrow$	n.a.
IPO Propensity ($=\frac{\text{completion}}{\text{attempts}}$)	$\downarrow$	$\downarrow$	$\downarrow$	n.a.
IPO Quality	$\uparrow$	$\uparrow$	$\uparrow$	n.a.
Underpricing	$\uparrow$ if $k>(1-D_r)\Delta R$	$\uparrow$ if $k>(1-D_r)\Delta R\cdot\frac{2H}{HH}$	$\uparrow$ if $k>(1-D_r)\Delta R$	n.a. n.a.

Table A1: Implications of the testing the waters (TTW) provision

Except for Case 4, where the cost is prohibitively high and firms do not engage underwriters to pursue IPOs, we consistently observe in all other cases that the TTW provision results in (i) a (weakly) increase in IPO attempts, (ii) a decrease in IPO propensity, (iii) an increase in IPO quality, (iv) an increase in underpricing when the cost of acquiring early information to attend the TTW is not too low.

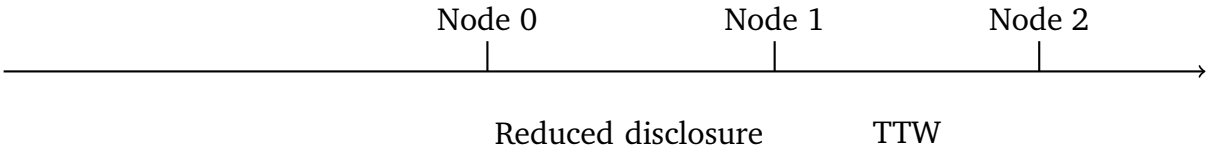
Meanwhile, we observe variations in the implications for IPO attempts. As shown in Cases 1 and 3, the TTW provision may not affect the pool of firms attempting IPOs. In contrast, in Case 2, the type-L firm that may have shied away from an IPO prior to the JOBS Act might reconsider going public afterward. This is the "expanding effect" of the TTW provision.

Additionally, our model also formalizes a "filtering effect" of the TTW provision. For instance, in Case 1, the type-L firm consistently attempts an IPO, regardless of the JOBS Act. For a firm that learns its type is LL, the cost c of public filing is sunk before the JOBS Act, prompting it to continue the IPO process by pooling with the type HL. However, after the JOBS Act, once it learns its type is LL, it withdraws early to avoid incurring this cost.

Overall, by considering both the "expanding effect" and the "filtering effect" of the TTW provision, we find that throughout all parameter regions, the IPO propensity consistently decreases and the IPO quality consistently increases.

Appendix A.3 The Implications of Reduced Disclosure

So far, our discussion has focused on the TTW provision. Another important aspect of the JOBS Act is the reduced disclosure provision, which allows firms to withhold certain information. Our two-dimensional information framework and two-stage structure can integrate both the TTW and reduced disclosure provisions, as illustrated in Figure A4.



Information $\tilde{p}_1$ disclosed to investors?	Yes	No	No
The cost c sunk upon communicating with the institutional investor?	Yes	Yes	No

Figure A4: Provisions of reduced disclosure and TTW

Specifically, the JOBS Act represents the transition from Node 0 to Node 2, incorporating the reduced disclosure provision from Node 0 to Node 1 and the TTW provision from Node 1 to Node 2. The reduced disclosure provision relates to information that the firm knows better, represented by the dimension $\tilde{p}_1$. Prior to the JOBS Act, when firms were required to disclose extensive information, the dimension $\tilde{p}_1$ was also disclosed to investors. However, after the JOBS Act, as many firms choose to exercise their option to reduce disclosure, the dimension $\tilde{p}_1$ remains unknown to investors, reflecting the situation outlined in Appendix A.2 before the TTW provision. Moreover, as discussed in Appendix A.2, the primary change introduced by the TTW provision is that the firm can communicate with the institutional investor to gain insights about $\tilde{p}_2$ before publicly filing the prospectus, which incurs a cost c.

Let's analyze the impact of the reduced disclosure provision, focusing on Case 1, where $L - c > v$. The analysis for other cases is similar.

When $L - c > v$, both types of firms – type H and type L – expect to have positive net benefit from going public, even without knowing the additional dimension $\tilde{p}_2$. Thus, both types will engage underwriters and pursue the IPO process, regardless of the reduced disclosure provision. Thus, the reduced disclosure provision does not influence the likelihood of attempting an IPO.

However, it does affect which firms are able to complete the IPO process, thereby impacting the propensity and quality of the IPOs. Specifically, prior to the JOBS Act, although

both type H and L firms would attempt IPOs, investors could perfectly identify a type L firm that turned out to be LL. Since the net benefit for a type-LL firm to raise public capital is negative, investors would be unwilling to provide funding. As a result, only type HL and type HH firms would successfully navigate the IPO process.

In contrast, after the JOBS Act, the lack of information regarding $\tilde{p}_1$ prevents investors from distinguishing between type LL and type HL firms. Consequently, type LL firms can pool with type HL firms and secure funding from the public capital market. As a result, due to reduced information disclosure following the provision, more firms will complete IPOs – indicating an increase in the likelihood of IPO completion and, subsequently, a higher IPO propensity. However, this increase comes at the cost of a decline in the average quality of IPO firms.

Finally, note that the expected underpricing remains unchanged following the introduction of reduced disclosure. The intuition is that in Benveniste and Spindt (1989), underpricing occurs because firms seek to gather information from institutional investors about aspects they do not initially possess. In contrast, reduced disclosure pertains to information that the firm already understands better than investors. As a result, the reduced disclosure provision does not alter the underlying friction that contributes to underpricing.

		Case 1	Case 2	Case 3	Case 4
IPO attempts	Before	H, L	H	H	∅
	After	H, L	H	H	∅
	Change	unchanged	unchanged	unchanged	n.a
IPO completion	Before	HL, HH	HL, HH	HH	∅
	After	LL, HL, HH	HL, HH	HL, HH	∅
	Change	↑	unchanged	↑	n.a
IPO propensity	Change	↑	unchanged	↑	n.a
IPO quality	Change	↓	unchanged	↓	n.a.

Table A2: Implications of the reduced disclosure provision

Table A2 summarizes the implications of the reduced disclosure provision on IPO quantity and quality. A comparison between Tables A1 and A2 reveals the following findings, which highlight the distinct effects of the reduced disclosure provision and the TTW provision.

First, unlike the expanding effect associated with the testing the waters provision, the reduced disclosure provision does not influence the likelihood of firms attempting IPOs. Second, in contrast to the filtering effect of the testing the waters provision, the reduced disclosure provision (weakly) increases the completion rate of IPOs and thus the IPO propensity. Finally, the quality of IPOs following the reduced disclosure provision is expected to decline. This decline is driven by an increase in completed IPOs from firms of relatively lower quality: by pooling with higher-quality firms, these lower-quality firms can

also secure funding, which ultimately reduces the average quality of IPO firms.

Appendix A.4 Auxiliary Proposition

We analyze a generic signaling game in which a firm can be classified as either high (h) type or low (l) type with equal probability. The project success rate for a high-type firm is denoted as p_h, while for a low-type firm, it is represented as p_l, satisfying the condition $p_h > p_l$. Let the average success rate be defined as $\bar{p} \equiv \frac{1}{2}p_h + \frac{1}{2}p_l$.

This setup nests the following two cases. When investors reveal positive information, the potential firm types are identified as HH or HL, where $p_h = p_0 + 2\Delta$ and $p_l = p_0$. Conversely, if investors reveal negative information, the possible firm types are HL or LL, characterized by $p_h = p_0$ and $p_l = p_0 - 2\Delta$.

The following proposition summarizes the subgame equilibrium in this signaling game.

Proposition A1 (Unique pooling equilibrium)**.** *Suppose that the firm's project success rate can be either high (p_h) or low (p_l), each with equal probability. There exists a unique equilibrium where both types of firms offer identical financial contracts to investors. Specifically, the firm offers a return of $\bar{R}$ in the case of success and 0 in the case of failure.*

Proof. We first study the pooing equilibrium and then discuss the possibility separating equilibrium.

Pooling equilibrium. Following Tirole (2010), we can focus on the financial contracts that give the investors a compensation $\bar{R}$ in the case of success and 0 in the case of failure. In the pooling equilibrium, investors must at least break even, i.e., $\bar{p}\bar{R} \geq 1$. Since the firm's profits are decreasing in $\bar{R}$, setting the inequality to zero yields

$$\bar{R} = \frac{1}{\bar{p}}. \tag{A23}$$

Further, the high- and low-type firms must make non-negative profits:

$$p_h(R - \bar{R}) \geq 0, \tag{A24}$$

$$p_l(R - \bar{R}) \geq 0. \tag{A25}$$

If (A25) holds then (A24) must hold as well. Now with (A23) and (A25) we know that the pooling equilibrium exists when

$$R \geq \frac{1}{\bar{p}}. \tag{A26}$$

Separating equilibrium. We first prove by contradiction that in the separating equilibrium it cannot be the case in which both types of firms are funded: the high-type (low-type) firm offers R_h (R_l) in the case of success and 0 in the case of failure. Suppose not. Then for the low type not to mimic the high type, we need $p_l(R-R_l) \geq p_l(R-R_h)$ and similarly for the high type not to mimic the low type we need $p_h(R-R_h) \geq p_h(R-R_l)$. Thus the two inequalities imply that $R_h = R_l$, which contradicts with the separating equilibrium.

Therefore, in the separating equilibrium, it must be the case in which the high-type firm is funded whereas the low-type firm is not funded. Suppose that the high-type offers a stake R_h in the case of success and 0 otherwise. To have this equilibrium sustained, we need the following program:

$$\begin{aligned} & \max_{R_h} (R-R_h)p_h \\ \text{s.t.} \quad & p_h R_h \geq 1 \qquad (IR) \\ & p_l(R-R_h) \leq 0 \quad (IC) \end{aligned}$$

The profit function of the high-type firm is monotonically decreasing in R_h. Consequently, the lower R_h is, the higher the profits for the high-type firm. However, the incentive compatibility constraint (IC) mandates that $R_h \geq R$, which implies that the only feasible solution is $R_h = R$. However, this scenario is trivial, as it results in the high-type firm earning zero profit. Therefore, the separating equilibrium cannot be sustained.

To summarize, the pooling equilibrium is the unique equilibrium in the subgame.