

The Seller’s Curse: The Learning Puzzle and a Naïve Issuer Theory of IPO Underpricing

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When a new stock’s price pops on the first day of trading, it garners positive headlines and CEOs cheer. But why are companies so happy to hand over underpriced equity in initial public offerings (“IPOs”) to investors who can flip it for immediate profits? On average, issuers sell common stock in IPOs at a discount to the price at which the market values it, a phenomenon known as underpricing. Leading explanations of IPO underpricing focus on information frictions and agency costs, but all fail to address a central question: why do issuers fail to learn from the underpricing of previous IPOs? I refer to this question and the issues it raises as the learning puzzle. Agency costs theories do not explain why issuers fail to demand contractual terms that mitigate conflicts of interest or why issuers choose underwriters with a reputation for underpricing. Information asymmetry theories fail to explain why issuers do not use warranties; invest in educating investors; or demand institutional protections from free riding by issuers with weak demand. The persistently high levels of underpricing combined with the failure of traditional theories to explain the learning puzzle lead to a naïve issuer hypothesis. I analyze the pricing and other contractual terms generated by IPO markets in equilibrium, focusing on the market structure of issuers and the incentives of underwriters. I model two types of issuers: hard bargainers who hold their underwriters accountable to maximizing proceeds in their IPOs, and weak bargainers who do not monitor their underwriters’ choices of terms or IPO processes. If weak bargainers fail to anticipate the incentives of underwriters to underprice and act as if they misunderstand the costs of underpricing due to myopia, reference point bias, expertise bias, issuer-internal agency conflicts, or any other reason, then the operation of IPO markets will generally give underwriters incentives to facilitate a set of contracts and prices that exploit the misunderstanding problem of weak bargainers. Underwriters extract information rents through the imposition of non-salient underpricing costs on weak bargainers that generate kickbacks from rent-seeking investors.

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I. Introduction

Spotify AB (“*Spotify*”) recently indicated plans to go public in an unusual way.¹ Spotify will forego the traditional initial public offering (“*IPO*”) process and declare itself public without issuing new equity. After Spotify registers its common stock with the Securities and Exchange Commission (“*SEC*”), existing Spotify shareholders could sell their common stock on the New York Stock Exchange (“*NYSE*”). The first price will be set through an opening auction on the NYSE, similar to the ones that occur for every listed stock at the beginning of every trading day.² One research firm estimated that Spotify might save up to \$300 million in investment banking fees and indirect underpricing costs by choosing a direct listing rather than a traditional underwritten IPO.³ Spotify has still hired investment banks and will pay them approximately \$30 million in fees in connection with its direct listing, but it is changing the rules of the game.⁴ The Wall Street Journal called Spotify’s plans “arguably the greatest challenge to the Wall Street IPO machines since Google went public in 2004.”⁵ The connection between Google’s IPO and Spotify’s IPO lies at the heart of this Article. Does Spotify’s intent to eschew the traditional underwritten IPO process represent an inefficient deviation from customary practices? Or does it reflect efficient learning by Spotify?

The underpricing of IPOs is a first-order issue in corporate law and finance.⁶ Over the last four decades, first-day returns on newly issued common stock have averaged approximately 18%.⁷ Persistently high levels of underpricing in IPO markets show that issuers on average sell common stock to capital markets at a discount from market value.

The amount of money that pre-IPO stockholders transfer to initial investors due to underpricing is astounding. Since 1980, issuers have collectively left approximately \$155 billion on the table.⁸ The average IPO issuer over the same time period left approximately \$28.7 million

¹ Lucas Shaw, *SEC Is Studying Spotify’s Plan to Bypass IPO in NYSE Listing*, BLOOMBERG (Aug. 21, 2017, 11:44 AM), <https://www.bloomberg.com/news/articles/2017-08-21/sec-is-said-to-study-spotify-plan-to-bypass-ipo-in-nyse-listing>.

² See Self-Regulatory Organizations; New York Stock Exchange LLC; Order Instituting Proceedings to Determine Whether to Approve or Disapprove a Proposed Rule Change, as Modified by Amendment No. 2, to Amend Section 102.01B of the NYSE Listed Company manual to Provide for the Listing of Companies that List Without a Prior Exchange Act Registration and that Are Not Listing in Connection with an Underwritten Initial Public Offering and Related Changes to Rules 15, 1-5, and 123D, Securities and Exchange Commission Release No. 34-81640, at 4 (Sept. 15, 2017).

³ Stephen Wilmot, *Spotify, Like Google, Wants to Reinvent the Tech IPO*, WALL ST. J. (Dec. 5, 2017, 2:05 PM), <https://www.wsj.com/articles/spotify-like-google-wants-to-reinvent-the-tech-ipo-1512476451?tesla=y>.

⁴ Maureen Farrell, *Spotify Disrupted the Music World, Now It’s Doing the Same to Wall Street*, WALL ST. J. (Jan. 15, 2018, 7:00 AM), <https://www.wsj.com/articles/spotify-disrupted-the-music-world-now-its-doing-the-same-to-wall-street-1516024778>

⁵ *Id.*

⁶ For reviews of the IPO underpricing literature of the literature, see Alexander Ljungqvist, *IPO Underpricing*, in HANDBOOK OF EMPIRICAL CORPORATE FINANCE 375 (B. Espen Eckbo ed., 2007) (reviewing the IPO underpricing literature) and Michelle Lowry et al., Initial Public Offerings: A Synthesis of the Literature and Directions for Future Research 2 (Mar. 20, 2017) (unpublished manuscript), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2912354.

⁷ Jay R. Ritter, Initial Public Offerings: Underpricing, Tbl. 1 (April 24, 2017), <https://site.warrington.ufl.edu/ritter/files/2017/05/IPOs2016Underpricing.pdf>.

⁸ *Id.* at Tbl. 1.

on the table.⁹ As one example, Snap Inc. (“*Snapchat*”) offered 200,000,000 shares of common stock at a price of \$17 per share in its IPO. Snapchat’s common stock immediately popped in secondary markets and closed trading on the first day at a 44% premium.¹⁰ Had Snapchat sold its newly issued stock to the public at the first day closing price of \$24.48 per share, it would have raised approximately \$1.5 billion of additional proceeds in the offering.¹¹ In LinkedIn Corporation’s (“*LinkedIn*”) IPO, the price per share of its common stock soared from an offer price of \$45 per share to \$94.25 at the close of the first day of trading, a 109% premium.¹² LinkedIn would have raised approximately \$431 million more in its IPO if it had sold its newly issued stock to the public at the first day closing price.

The causes of IPO underpricing are frequently discussed but still debated in the academic literature.¹³ Prior explanations bear on the question of why underpricing exists in IPO markets, but they all ignore a central question: why do decision-makers at issuers fail to learn from the underpricing of previous IPOs, and why do they fail to demand contractual protections and institutional features that mitigate underpricing? Relatedly, why are private firms on the cusp of going public not investing in learning—about their valuation and about their investment bankers’ processes? I refer to these questions as the *learning puzzle*.¹⁴

In this Article, I set forth a naïve issuer theory of underpricing. I model two types of issuers in IPO markets: hard bargainers and weak bargainers. The hard bargainers hold underwriters accountable to maximizing proceeds in the offering and police underpricing.¹⁵ The weak bargainers act as if they misunderstand the costs of underpricing or fail to anticipate the

⁹ *Id.* Calculated as the product of the total amount that issuers have left on the table times the proceeds-weighted mean underpricing.

¹⁰ Anita Balakrishnan, *Snap Closes Up 44% after Rollicking IPO*, CNBC (Mar. 2, 2017, 11:19 AM), <https://www.cnbc.com/2017/03/02/snapchat-snap-open-trading-price-stock-ipo-first-day.html>.

¹¹ Calculated as the product of the total number of shares offered in the IPO and the difference between the first-day closing price and the offer price, not including underwriting fees. Snapchat offered 200 million shares of common stock to the public at a price of \$17 per share. Snap Inc., Prospectus, (Form 424B4) (Mar. 1, 2017).

¹² Balakrishnan, *supra* note 10.

¹³ See, e.g., Lowry et al., *supra* note 6, at 2 (stating that “the reasons for such large one-day returns continue to be debated”); Kathleen Weiss Hanley, *The Economics of Primary Markets*, in THE NEW SPECIAL STUDY OF THE SECURITIES MARKETS 2 (“Despite hundreds of papers that have examined the pricing of securities issued to the public for the first time, there is no clear consensus about either the equilibrium level of underpricing or the relative costs and benefits of using bookbuilding to raise capital.”). For an overview of the debate, see Lowry et al., *supra* note 6, at 38-78 and Ljungqvist, *supra* note 6, at 384-417.

¹⁴ Jay R. Ritter has made a similar observation: “[g]iven how much effort is put into earning a profit, it is surprising how casual many firms are about trying to minimize the costs of going public.” Jay R. Ritter, *Equilibrium in the Initial Public Offerings Market*, 3 ANNUAL REV. FIN. ECON. 347, 351, 368 (2011).

¹⁵ In this Article, I assume that the issuer’s objective function is to maximize the proceeds in an IPO. This assumption is consistent with the dominant view of the academic literature on the appropriate objective of IPO issuers. See Alexander Ljungqvist & William J. Wilhelm, *IPO Allocations: Discriminatory or Discretionary?* 65 J. FIN. ECON. 167, 168 (2002) (stating that the bulk of academic theory treats maximization of proceeds as the appropriate objective); Alexander Ljungqvist et al., *Hot Markets, Investor Sentiment, and IPO Underpricing*, 79 J. BUS. 1667, 1668-69 (arguing that a profit-maximizing issuer’s optimal strategy is to maximize proceeds). Marketing and signaling theories of IPO underpricing suggest that a marketing or signaling effect of underpricing, may increase the total value of the firm after the IPO, so the issuer’s objective is more complicated than merely maximizing proceeds. These theories lack empirical support and are generally criticized because issuers have more efficient and cost-effective means of advertising or signaling than underpricing. Jay R. Ritter & Ivo Welch, *A Review of IPO Activity, Pricing, and Allocations*, 57 J. FIN. 1795, 1803 (2002) (“On theoretical grounds, however, it is unclear why underpricing is a more efficient signal than, say, . . . advertising . . .”). Marketing and signaling theories are outside the scope of this Article.

incentives of underwriters to underprice their IPO, and they fail to take cost-effective steps to mitigate underpricing.¹⁶ I use the term “naïve issuer” broadly to include issuers that for any reason act as if they misunderstand the costs of underpricing or that fail to anticipate the underpricing incentives of their lead underwriter. I use the term “weak bargainer” to include all naïve issuers that do not take steps to address their misunderstanding problem, for example by outsourcing IPO pricing decisions to an independent and unbiased third party.

It may be surprising to some that founders and managers who have built successful companies act naïvely, along with their investors and advisors. Of course, not all issuers are weak bargainers. The naïve issuer theory merely states that issuers are heterogeneous, and that at least some act naïvely. In Part III, I analyze four explanations for why decision-makers at issuers may act as if they misunderstand the costs of underpricing: reference point bias, expertise bias, issuer-internal agency costs, and myopia.

First, consider myopic issuers.¹⁷ A typical IPO transaction lasts six months. At the kickoff, when an issuer hires its lead underwriter, myopic decision-makers incompletely analyze the future game tree and place excessive weight on near-term objectives like due diligence and road shows. As a result, the preferences of myopic decision-makers at the time they engage the lead underwriter may be inconsistent with their preferences at the pricing meeting the day of the IPO. Myopic decision-makers agree to terms when they negotiate the engagement letter that permit underwriters to turn the underpricing screws on them months later when the decision-makers prefer to accurately price their IPO but when it is also very costly to back out of the IPO.

Secondly, decision-makers at issuers may misunderstand the costs of underpricing because they compare estimates of IPO proceeds to the wrong reference point. These decision-makers mistakenly reference estimated IPO proceeds to the last round of private financing, the initial offering range, or some other external reference point.¹⁸ Profit-maximizing underwriters have incentives to low-ball the valuations of issuers, and reference point-biased issuers are susceptible to the artificially low estimates because no other objective reference point exists before the IPO.

Thirdly, decision-makers at issuers may misunderstand the costs of underpricing due to expertise bias.¹⁹ Decision-makers may receive psychic benefits from hiring a prestigious underwriter, and they may overestimate the value of brand name and affiliated analyst coverage.

In Section II.C.2, I analyze the incentives of underwriters in response to IPO markets containing weak bargainers. I show that competitive forces in IPO markets inexorably yield contracts that generate non-salient underpricing costs if some issuers act as if they misunderstand those underpricing costs or fail to anticipate the underpricing incentives of their lead underwriter.²⁰ Naïve issuers do not evaluate underwriters or their decisions on an underpricing

¹⁶ See *infra* Part II.C.1.

¹⁷ See *infra* Section III.A.

¹⁸ See *infra* Section III.B. This behavior lies at the heart of the Loughran and Ritter’s prospect theory account of underpricing. Tim Loughran & Jay R. Ritter, *Why Don’t Issuers Get Upset About Leaving Money on the Table in IPOs?*, 15 REV. FIN. STUDIES 413 (2002).

¹⁹ See *infra* Section III.C. See also Tim Loughran & Jay Ritter, *Why Has IPO Underpricing Changed Over Time?* FIN. MGMT. 9 (Autumn 2004). Analyst coverage refers to the independent research analysts that opine on the value of securities. The securities laws generally separate analysts from investment banks and prohibit analysts from advancing many investment banking objectives. See *infra* Section III.C.

²⁰ See *infra* Section II.C. The naïve issuer theory draws heavily on the key finding in the consumer product and finance markets literatures that when one party misunderstands a pricing feature, the operations of markets will lead its counter-party to shift costs onto the non-salient pricing term and away from salient pricing terms. See, e.g., OREN

dimension. Instead, they evaluate underwriters on other dimensions such as brand name, direct fees charged, or the presence of an affiliated all-star research analyst in their industry. Because underpricing is non-salient to naïve issuers, reputational mechanisms that normally prevent inefficient outcomes break down.²¹

The analysis also shows that underwriters impose opaque bookbuilding processes as a mechanism to extract information rents from issuers. Underwriters gain private information about investor demand for issuers’ stock during opaque, bilateral negotiations with investors. Unfettered control over allocation decisions enables underwriters to monetize their private information by allocating underpriced shares to rent-seeking investors from whom they expect kickbacks. The kickbacks, which may include increased trading commissions or investment banking fees, are a *quid pro quo* for the allocation of underpriced shares of stock.²² The preferential allocations may not even result in abnormal profits for underwriters, but may merely be a requirement to remain competitive in non-IPO investment banking markets.²³ Underwriters secure comfort that they will not be liable for a breach of fiduciary duty by engaging issuers in firm commitment underwriting agreements, even though they structure the economics to resemble a best efforts offering.²⁴

The naïve issuer theory would be less persuasive if other theories of IPO underpricing specified a complete equilibrium in which all parties acted rationally. The two dominant explanations of underpricing in the academic literature posit that underpricing results from the market failures of information asymmetries and agency costs, respectively.²⁵ Information asymmetry theories explain underpricing as compensation to uninformed investors who risk purchasing overvalued stock or as a reward to informed investors that reveal their private information about the issuer’s valuation.²⁶ Agency cost explanations posit that underpricing is a function of underwriters that allocate valuable shares of underpriced common stock to rent-seeking investors with the expectation of receiving a *quid pro quo* in the form of increased trading commissions or investment banking services.²⁷

But the learning puzzle demonstrates that leading agency-cost and information asymmetry theories of underpricing are incomplete. If all of the parties involved are able to bargain at low cost, then there should be no market failure, and no underpricing.²⁸ Existing

BAR-GILL, SEDUCTION BY CONTRACT: LAW, ECONOMICS, AND PSYCHOLOGY IN CONSUMER MARKETS (2012) (discussing the implications of consumer biases for consumer contracts); Ryan Bubba et al., *A Behavioral Contract Theory Perspective on Retirement Savings*, 47 CONN. L. REV. 1317 (2015) (analyzing the design of employer-sponsored retirement plans in response to myopic savers); Stefano DellaVigna & Ulrike Malmendier, *Contract Design and Self-Control: Theory and Evidence*, 119 Q. J. ECON. 353, 365 (2004) (showing that rational firms introduce back-loaded fees in response to counter-parties with time-inconsistent preference who are partially naïve); Xavier Gabaix & David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 Q. J. ECON. 505, 507 (2006) (showing that firms respond to biased consumers by shrouding the pricing details of non-salient pricing terms).

²¹ See *infra* Section II.C, note 96 and accompanying text.

²² See *infra* Section II.C.

²³ See *infra* note 90 and accompanying text.

²⁴ See *infra* note 95 and accompanying text.

²⁵ See, e.g., Ljungqvist, *supra* note 6, at 417 (stating that the two broad theories of what causes underpricing are the information extraction models rooted in information asymmetries and agency theories).

²⁶ See *infra* Section IV.A.

²⁷ See *infra* Section IV.B.

²⁸ See R. H. Coase, *The Problem of Social Cost*, 3 J.L. & Econ. 1, 28-32 (1960) (arguing that absent if participants are able to contract at low cost they will achieve the most efficient outcomes possibly by bargaining

explanations of underpricing are not plausible unless they also identify a second order market failure: the failure of private-order responses to address the purported first-order market failure.

First, consider agency cost explanations. The typical market response to conflicts of interest is to mitigate the agency problem through contract, monitoring, and the imposition of fiduciary standards. But IPO markets are devoid of the usual contractual protections that combat agency problems, and issuers eagerly and expressly disclaim fiduciary protections. Moreover, agency cost theories fail to explain why competition among underwriters fails to mitigate agency problems.

Information asymmetry explanations of IPO underpricing also fail to address the learning puzzle. Market responses to information asymmetries include the provision of warranties and mechanisms that openly share information. But IPO transactions do not utilize warranties, and dominant bookbuilding processes are instead characterized by opacity and secrecy. Some strands of information asymmetry theories emphasize that underwriters can use their allocation discretion to induce investors to participate in offerings with weak demand by credibly promising them future allocations of underpriced shares.²⁹ Such theories provide an explanation for why it may be socially optimal for issuers as a group to accept underpricing, if all issuers are willing to take their lumps. But these theories fail to explain why the “good” issuers agree to cross-subsidize “bad” issuers by accepting IPO processes that pool them together.

The naïve issuer theory identifies bounded rationality as the second-order market failure that distorts private-order responses to IPO underpricing. Naïve issuers *believe* they have learned from prior IPOs, but, if maximizing firm value is their objective, they have mistakenly learned the wrong lessons. Weak bargainers do not fully understand the costs of underpricing or they do not anticipate their underwriters’ underpricing incentives when negotiating important contractual terms. The hard bargainers, on the other hand, do indeed learn from the mistakes of prior issuers and take cost effective steps throughout the IPO process to police underpricing. Like the underwriters, hard bargainers *prefer* the inefficient contractual terms because they receive cross-subsidies on both the direct fees they have to pay to their underwriters and the price at which investors will purchase their securities.³⁰

My account of the role of underwriters in IPO markets also differs significantly from other leading accounts. Information asymmetry theories and finance professionals portray underwriters as noble gatekeepers that act in the best interests of issuers.³¹ Finance professionals insist that the human touch is necessary for successful IPOs. They argue that the implicit social contract that keeps investors participating in IPOs—and that is ultimately in the best interests of issuers as a group—is that underwriters thoughtfully allocate shares to the “right” investors and engage in price stabilization activities so that trading in secondary markets will be liquid and orderly. The leading information asymmetry theory of IPO underpricing even ascribes a socially

around market failures); Ryan Bubb & Prasad Krishnamurthy, *Regulating Against Bubbles: How Mortgage Regulation Can Keep Main Street and Wall Street Safe – From Themselves*, 163 U. PA. L. REV. 1539 (2015) (claiming that in standard models of information economics participants in markets characterized by asymmetric information bargain for optimal contractual provisions).

²⁹ Lawrence M. Benveniste & Paul A. Spindt, *How Investment Bankers Determine the Offer Price and Allocations of New Issues*, 24 J. FIN. ECON. 343, 354 (1989) (presenting a model in which underwriters can induce investors to subscribe to weak IPOs by threatening to withhold allocations from hot IPOs).

³⁰ See *infra* note 103 and accompanying text.

³¹ See *infra* Section IV.A.

benevolent, redistributive role to underwriters, positing that underwriters cross-subsidize bad IPOs by underpricing good IPOs.³²

In the line of agency cost theories, I provide a darker account of underwriters in IPO markets. Underwriters exploit mistakes by weak bargainers and allocate underpriced shares to rent-seeking investors from whom they expect kickbacks. The kickbacks that underwriters receive in underpriced IPOs swamp the foregone revenue underwriters would otherwise receive through direct fees if they would accurately price IPOs.³³ Underwriters merely pursue their self-interest, but the normal legal and contractual checks fail in IPO markets when some issuers are weak bargainers.

An information asymmetry theory called the *winner’s curse*, discussed in Section IV.A.1, is one of the dominant explanations of IPO underpricing in the academic literature.³⁴ If a group of informed bidders in a sales auction possesses private, negative information about an issuer’s valuation, then other bidders without that negative information might bid higher than the informed investors. The uninformed investors would disproportionately win larger allocations in such auctions, but they would be “cursed” in the sense that the reason they won is because they paid too much. But, as Professor Richard Thaler has noted, the winner’s curse would not exist in markets without a behavioral explanation.³⁵ The reason is because rational bidders anticipate the adverse selection problem of the winner’s curse and discount their bids accordingly. The winner’s curse theory claims that underpricing in IPO markets corresponds to the rational bid shaving of uninformed investors.

This Article argues that IPO issuers face a *seller’s curse*. Issuers in IPO markets are also subject to adverse selection problems if their underwriters have private valuation information.³⁶ In customary bookbuilding processes, underwriters obtain private information because they gain a better understanding of the demand curve of investors than issuers do. In response, rational issuers should demand institutional and contractual protections against extraction of information rents by underwriters. Short of these protections, rational issuers would mark up the IPO offer prices suggested by underwriters in anticipation of underpricing, just as investors shave down their bids in response to the winner’s curse. My claim about the seller’s curse echoes the one made by Thaler about the winner’s curse: The observation that issuers do not engage in private-order responses to eliminate the seller’s curse implies that at least some issuers are naïve.

The naïve issuer theory is consistent with existing empirical evidence and it generates clear, testable predictions.³⁷ Most notably, the theory predicts that the determinants of underpricing should vary in different segments of the issuer population.³⁸ The naïve issuer

³² See *infra* note 210 and accompanying text.

³³ See *infra* note 220.

³⁴ Kevin Rock, *Why New Issues Are Underpriced*, 15 J. FIN. ECON. 187 (1986). See also *infra* Section IV.A.1.

³⁵ Richard H. Thaler, *Anomalies: The Winner’s Curse*, 2 J. ECON. PERSPECTIVES 191, 192 (1988) (“The winner’s curse cannot occur if all the bidders are rational.”).

³⁶ See *infra* note 90 and accompanying text.

³⁷ For example, the naïve issuer theory is consistent with the distribution of underpricing across issues that are priced below, in the middle, or above the initial offering range. The reason that issues in which the final offer price is revised upwards from the initial offering range have averaged 49% underpricing is because these are the issues that belong to weak bargainers that allow their underwriter to low-ball their valuation in the initial offering range. Hard bargainers who prevent their underwriter from low-balling their valuation fare significantly better. Underpricing averaged only 3% for issues priced below the initial offering range.

³⁸ I am conducting empirical tests of the naïve issuer theory in forthcoming work.

theory also makes predictions about those IPOs that are *overpriced* and about those lead underwriters that persistently underprice more than their peers.

The naïve issuer theory suggests that other theories of underpricing are incomplete and overemphasized in the academic literature.³⁹ Additionally, by suggesting a reason why underwriters low-ball the valuations of issuers, the naïve issuer theory suggests that empirical studies that treat initial offering ranges as unbiased estimates of issuers’ valuations suffer from simultaneity bias.⁴⁰ Similarly, the naïve issuer theory suggests that studies on IPO underpricing that control for underwriter reputation are also flawed because expertise-biased issuers are more likely to select prestigious underwriters. Academics, regulators and market participants regularly fret over the declining number of firms choosing to undertake IPOs.⁴¹ The striking and persistent empirical observation that, on average, investors make back-slapping first-day profits while issuers accept a corresponding 18% haircut suggests that problems related to the seller’s curse should be at the forefront of policy and regulation of IPOs. More broadly, the ways in which underwriters abuse the special exemptions afforded to them erode trust in the fairness and integrity of markets.⁴²

³⁹ See also Ritter & Welch, *supra* note 15, at 1816 (“While asymmetric information models have been popular among academics, we feel that these models have been overemphasized.”).

⁴⁰ The naïve issuer theory suggests that underwriters intentionally low-ball the initial offering range in order to further its underpricing objectives, and it is more successful at doing so for issues of weak bargainers relative to issues of hard bargainers. Simultaneity bias occurs where the explanatory variable (in this case, price revisions) is jointly determined with the dependent variable (in this case, underpricing). The extent of price revisions from the initial offering range to the offer price is the single best predictor of underpricing in every empirical study on IPO underpricing, even controlling for other factors traditionally thought to influence underpricing. Alexander Butler et al., *Robust Determinants of IPO Underpricing and Their Implications for IPO Research*, 27 J. CORP. FIN. 367 (2014). And the effect of price revisions on underpricing is frequently orders of magnitudes larger than any other explanatory variables. For example, in one study, a \$1 change in price revisions is associated with 42 cents of additional underpricing. Alexander Ljungqvist & William J. Wilhelm, Jr., *IPO Pricing in the Dot-com Bubble*, 63 J. FIN. 723, 744, Tbl. VI (2003). Conditional on a positive price revision, a \$1 increase in price revisions is associated with 89 cents of additional underpricing. *Id.* Most of the empirical literature treats the initial offering range as the underwriter’s unbiased estimate of the issuer’s valuation and interprets subsequent revisions as reflecting new information received from investors. See, e.g., *Id.* at 724-25 (interpreting price revisions as a measure of information acquired during bookbuilding). This assumption is particularly prevalent in bookbuilding theories that explain the partial adjustment phenomenon as the result of underwriters adjusting the initial offering range in response to investor demand. See, e.g., Ann E. Sherman, *IPOs and Long-Term Relationships: An Advantage of Book Building*, 13 REV. FIN. STUDIES, 697, 703 (2000) (“When investors learn the final price and number of shares to be sold, they can compare it to the initial range and get a fairly good idea of the level of demand expressed by informed investors.”); Ljungqvist & Wilhelm, Jr., *supra* note 40, at 170, 194 (stating that they interpret deviations from the initial offering range as reflecting information production and expressly stating that the empirical model depends heavily on a broad interpretation of the Benveniste and Spindt theoretical framework). But see Michelle Lowry & G. William Schwert, *Is the IPO Pricing Process Efficient?*, 71 J. FIN. ECON. 3, 19 (2004) (discussing evidence that the midpoint of the initial filing range is not an unbiased estimate of the issuer’s valuation). According to the naïve issuer theory, underpricing and price revisions are jointly determined, and studies that control for price revisions suffer from simultaneity bias.

⁴¹ See, e.g., Xiaohui Gao et al., *Where Have All the IPOs Gone?*, 48 J. FIN. & QUANTITATIVE ANALYSIS 1663 (2013); Craig Doidge et al., *The US Left Behind? Financial Globalization and the Rise of IPOs Outside the US*, 110 J. FIN. ECON. 546 (2013).

⁴² See, e.g., Securities and Exchange Commission, *What We Do*, SEC.GOV, available at <https://www.sec.gov/Article/whatwedo.html> (“The mission of the U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.”); NYSE/NASD IPO Advisory Committee, Report and Recommendations of a Committee Convened by the New York Stock Exchange, Inc. and NASD at the Request of the U.S. Securities and Exchange Commission 2 (May 2003) (stating that investors

The rest of this Article proceeds as follows. Part II is the analytical core of the Article. Section II.A frames the final offer price of an IPO as a negotiation between issuers and underwriters. Section II.B sets forth the neoclassical benchmark for the equilibrium features of IPO markets—what pricing features, institutions, and processes would be expected to emerge in IPO markets if all actors are rational? Section II.C develops the naïve issuer theory of IPO underpricing. It relaxes the rationality assumption and discusses how equilibrium outcomes change from the neoclassical benchmark if at least some issuers, weak bargainers, act as if they misunderstand the costs of underpricing or fail to anticipate their underwriters’ underpricing incentives. Part III discusses three reasons why weak bargainers may act as if they misunderstand underpricing costs. Part IV turns to the traditional explanations of IPO underpricing and argues that they are incomplete because they fail to address why issuers do not learn from the underpricing of prior IPOs and bargain for efficient contractual terms. Part V concludes by offering a few perspectives on ways in which laws and regulations might ameliorate the seller’s curse.

II. The IPO Final Offer Price: A Negotiation Between Issuers and Underwriters

The story of IPO underpricing is largely the story of how issuers, underwriters and investors share the value and risks associated with the zero-sum sale of ownership in a private firm. The goal of this Article is to analyze the private-order responses issuers might utilize to maximize their pre-IPO shareholders’ share of the value and to analyze if issuers are successful at employing them. Sections II.A and II.B set the stage with my analytical framework, and Section II.C sets forth the naïve issuer theory of underpricing.

A. The IPO Game Tree

An IPO transaction is a complex but traditional sales process. The items for sale are shares of common stock representing claims on the future cash flows of the issuer. Like any sales process, it is a zero-sum game. I assume that the objective of issuers is to maximize IPO proceeds because this is the action that maximizes value for its pre-IPO shareholders, so issuers want to set the offer price as high as the market will bear.⁴³ Underwriters are not perfect agents of issuers.⁴⁴ If underwriters might derive any gain by underpricing, they have an incentive to low-ball the issuer’s valuation and to set the offer price lower than what the market can bear.⁴⁵

are losing confidence in the IPO market due to the widespread perception that “IPOs are parceled out disproportionately to a few, favored investors”); Christine Hurt, *Moral Hazard and the Initial Public Offering*, 26 Cardozo L. Rev. 711, 717 (2005) (stating that the combined practices of underwriters in bookbuilding processes create an unfair regime).

⁴³ Theories claiming that issuers can increase firm value by underpricing, such as marketing and advertising theories, are outside the scope of this Article. *See supra* note 15.

⁴⁴ My analysis is therefore in the line of David Baron, *A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues*, 37 J. FIN. 955 (1982); Biais et al., *An Optimal IPO Mechanism*, 69 REV. ECON. STUDIES 117 (2002); Loughran & Ritter, *supra* note 18; and Ljungqvist & Wilhelm, Jr., *supra* note 40.

⁴⁵ The naïve issuer theory provides explains how underwriters low-ball issuers’ valuation. *See infra* note 142 and accompanying text. The naïve issuer theory also suggests that empirical studies that control for price revisions as independent variables suffer from simultaneity bias. *See supra* note 40.

The objective of investors is to purchase securities at the lowest price possible, but not above their estimate value of the securities.

I model the IPO offer price and, relatedly, the extent of underpricing, as the result of two interrelated negotiations between three sets of principals. The first negotiation is between the issuer and the underwriter to set the final offer price. The second is between the underwriter and investors to purchase shares of the issuer’s common stock. While there is a separate literature on the long-term performance of IPO investments, I focus on issues related to how the issuer’s market value is split between issuers, underwriters, and initial investors in the IPO sales process.⁴⁶ Securities regulators, including the SEC and the Financial Industry Regulatory Authority (“FINRA”) may also shape important equilibrium negotiation outcomes.⁴⁷

I model three critical nodes in the negotiation between issuers and underwriters to set the *final offer price*—the price at which the issuer’s common stock is sold in the IPO. The opening round of the negotiation occurs at the time an issuer engages a lead underwriter, or *the engagement*. The second node, the decision to set the *initial offering range*, occurs after the underwriter completes due diligence on the issuer and before it markets the issuer’s securities to investors. The initial offering range represents the issuer’s initial asking amount in the different, but related, sales negotiations with investors. The final node is the decision to set the final offer price and it occurs at the *pricing meeting* the day of or the night before the offering.⁴⁸

Modeling the final offer price as a negotiation between issuers and underwriters is in the line of Loughran and Ritter and Ljungqvist and Wilhelm.⁴⁹ My approach adds an important wrinkle. I push the beginning of the negotiation of the final offer price back in time to the engagement of the lead underwriter, because it is at this node when the issuer possesses the most leverage to shape the terms of the negotiation in its favor. This node is also the point when underwriters secure most of the contractual and institutional arrangements that facilitate their ability to underprice IPOs.

At the engagement, the lead underwriter and issuer agree to most of the key contractual features of the IPO in a letter of intent. In a typical IPO, the letter of intent specifies that the

⁴⁶ There is a literature that addresses the long-term value of IPO investments, but it is outside the scope of this Article. For an overview, see Ritter, *supra* note 14, at 364-69 (reviewing the empirical literature on long-run returns of IPOs). Earlier studies had shown that investments in IPO underperformed the market, but these studies failed to control for important factors and recent research provides little evidence of significant under- or over-performance of long-run IPO investments. See Lowry et al., *supra* note 6, at 97 (showing that multiple specifications of a regression analysis of all U.S. IPOs meeting their sample criteria from 1973-2012 show no evidence of significant under- or over-performance). There is evidence that, at least for some IPOs, investors act naïvely by overestimating the value of issuers because they are over-exuberant. See Ljungqvist et al., *supra* note 15. I follow Ljungqvist et al. in assuming that the issuer’s optimal choice in this market structure is the same as a market structure consisting entirely of rational investors: maximize proceeds by capturing as much of the surplus from investors as possible, including the naïve or sentimental investors.

⁴⁷ See, e.g., *infra* note 106 and accompanying text.

⁴⁸ Ljungqvist, *supra* note 6, at 381 (stating that the offer price is typically set just hours before trading on the stock market begins); Katrina Ellis et al., *When the Underwriter is the Market Maker: An Examination of Trading in the IPO Aftermarket*, 60 J. FIN. 1039, 1043 (2000) (stating that the underwriter and issuer discuss the final offer price and the number of shares to be sold the day prior to the issuance date after the market closes).

⁴⁹ See Loughran & Ritter, *supra* note 18, at 416 (“Our prospect theory explanation can be recast in terms of a bargaining model in which underwriters want a lower offer price and issuing firms desire a higher offer price.”) and Ljungqvist & Wilhelm, *supra* note 40, at 724 (“[I]f we think of issuing firms’ CEOs as agents for other shareholders in bargaining over the IPO offer price, we expect less monitoring—and thus greater underpricing—the smaller is CEO ownership.”).

underwriter will price the IPO through a bookbuilding process and will facilitate the transfer of common stock in exchange for cash through a firm commitment offering.⁵⁰ Underwriters and issuers even agree in the letter of intent to terms that are not relevant until the day of the IPO, such as the overallotment option, even though they obtain relevant information throughout the IPO process that bears on the efficiency of those terms.⁵¹

The second critical node in the negotiation of the final offer price occurs after the underwriter has completed its due diligence process and just before the road shows begin: determining the initial offering range for the preliminary prospectus.⁵² The issuer, together with the underwriter, can set the initial offering range at any value under the securities laws, provided that it constitutes a “bona fide” estimate of the offering range.⁵³ The initial offering range represents the issuer’s first asking price for its common stock in the sales negotiation with investors. It may also have the effect of anchoring the expectations of both the issuer and investors.

After the issuing firm files a draft registration statement with the SEC and adequately responds to its comments, the underwriting syndicate solicits indications of interest from investors. In the price-setting component of bookbuilding, the syndicate members distribute the preliminary prospectus widely to institutional investors and take non-binding indications of interest.⁵⁴ The lead underwriter arranges the road shows—private, one-on-one meetings between the management of the issuer and select investors. The lead underwriter builds a deal book of

⁵⁰ See *Id.* at 38 (stating that the bookbuilding mechanism is the dominant method of bring companies public in the U.S.); Hurt, *supra* note 42, at 724 (stating that almost all U.S. IPOs are conducted using the bookbuilding method). The letter of intent may specify the underwriter’s main source of compensation, the gross spread, but this fee may also be negotiated at the pricing meeting. Lowry et al., *supra* note 6, at 28 (stating that an important aspect of the letter of intent is to specify the gross spread or the underwriting discount). Underwriters generally also receive a commitment to be reimbursed for their expenses if the potential issuer withdraws from its offering. *Id.* The gross spread is set at 7% in the majority of U.S. IPOs. Lowry et al., *supra* note 6, at 29 & Figure 7. See also Hsuan-Chi Chen & Jay R. Ritter, *The Seven Percent Solution*, 55 J. FIN. 1105 (2000) (finding that more than 90% of IPOs in the late 1990s that raised between \$20 and \$80 million in proceeds had spreads of exactly 7%).

⁵¹ Virtually every issuer in a U.S. IPO agrees to provide underwriters an overallotment option of 15% in the letter of intent. See Lowry et al., *supra* note 6, at 29 (stating that the letter of intent typically includes a commitment by the company to grant a 15% overallotment option); Ellis et al., *supra* note 48, at 1058 (stating that 295 out of 306 IPOs in their sample had an overallotment option for 15% of the issue). Because the purpose of the overallotment option is ostensibly to stabilize the trading price in secondary markets immediately after the IPO, it would likely be more efficient to negotiate the overallotment option at the end of the IPO when the issuer and underwriter had more information about investor demand.

⁵² Item 501(b)(3) of the SEC’s Regulation S-K, 17 C.F.R. § 229.501(b)(3).

⁵³ Item 501(b)(3) of the SEC’s Regulation S-K, 17 C.F.R. § 229.501(b)(3), Instruction 1.(A) to paragraph 501(b)(3). If the issuer wants to increase the maximum aggregate offer price by more than 20%, it is required to make an additional filing to the SEC. Rule 430A of the Securities Act, 17 C.F.R. § 230.430A(a), Instruction to Paragraph (a).

⁵⁴ During the waiting period—the period after the registration statement has been filed but before it has been declared effective—Section 5(b) of the Securities Act generally prohibits any person from transmitting a “prospectus” prior to the filing of the registration statement. 15 U.S.C. § 77e(b). “Offers” are permitted under Section 5 only if they are done according to the requirements set forth by the SEC. 15 U.S.C. § 77b(a)(10)(b). SEC Rule 430 permits the use of a “preliminary prospectus” containing omissions. 17 C.F.R. § 230.430. SEC Rule 431 permits the use of “summary prospectuses” in certain circumstances. 17 C.F.R. § 230.431. SEC Rule 433 covers the use of “free writing prospectuses.” 17 C.F.R. § 230.431. Sales of the security remain prohibited under Section 5(a) of the Securities Act during the waiting period. 15 U.S.C. § 77e(a). See generally GARY M. BROWN, SECURITIES LAW AND PRACTICE DESKBOOK § 3.3.1 (6th ed. 2014).

investor demand, and holds the level of investor demand tightly.⁵⁵ Combined with their role in soliciting demand from investors, lead underwriters often acquire more valuation information than any other party to the IPO transaction, including issuers.

During the allocation component of bookbuilding, the lead underwriter selects the investors that will receive shares of common stock. Because underwriters are not required to disclose data about their allocation practices, the actual allocation rules individual underwriters utilize and the variance of those rules between underwriters is mostly unknown.⁵⁶

The final offer price and the total amount of shares of common stock offered—the economic terms of the IPO—are finalized at the pricing meeting.⁵⁷ Once the parties have agreed to the key economic terms, they sign the underwriting agreement, which supersedes the letter of intent. In a firm commitment offering, the underwriter is not required to purchase the issuers securities until the underwriting agreement is signed. The IPO occurs promptly following the signing of the underwriting agreement, shortly after the next time the markets open.

B. *Equilibrium IPO Prices and Contracts: The Neoclassical Benchmark*

This Section describes the pricing structure and key contractual features that would be expected to emerge for underwriting services in IPO markets under standard neoclassical economic assumptions. The key take-away is that underpricing of the issuer’s common stock does not occur in the neoclassical benchmark to any significant degree. While there are frictions that might raise distortions, parties anticipate those frictions and bargain around them to generate the most efficient outcomes available to them.

Consider a market with many investors that purchase equity securities in various IPOs. I assume perfectly competitive capital markets in the neoclassical benchmark, and investors as a group always have enough capital to fill IPOs. I also assume competitive underwriting markets. Issuers, underwriters and investors participate in IPO markets and all participants behave rationally, though they may face information asymmetries or have conflicted interests. Each actor makes decisions to maximize its lifetime utility and each has consistent preferences.

Investors estimate the expected value per share of the common stock of issuers and purchase securities when their valuation estimates net of transaction costs exceed the offer price in the IPO. Each investor has an unbiased estimate of the value of the future cash flows for sale

⁵⁵ Ljungqvist, *supra* note 6, at 392 (stating that the bids institutional investors submitted and the allocations they received are usually kept confidential).

⁵⁶ See Aggarwal et al., *Institutional Allocation in Initial Public Offerings: Empirical Evidence*, 57 J. FIN. 1421, 1422 (2002) (stating that the SEC does not mandate public disclosure of allocations and consequently it remains an opaque aspect of IPOs). See also NYSE/NASD IPO Advisory Committee, *supra* note 42, at 16 (recommending that regulators require underwriters to disclose the final IPO allocations to the issuer). The limited empirical studies on the issue suggests that information production plays only a minor role in underwriter allocation decisions, but the most recent and most comprehensive study suggests that underwriter agency cost reasons play a larger role. Tim Jenkinson et al., *Quid Pro Quo? What Factors Influence IPO Allocations to Investors?* J. FIN. 1, 3-4 (forthcoming 2017). See also Francesca Cornelli & David Goldreich, *Bookbuilding: How Informative is the Order Book?* 58 J. FIN. 1415 (2003) (analyzing allocation behavior of a single European investment bank); Tim Jenkinson & Howard Jones, *Bids and Allocations in European IPO Bookbuilding*, 59 J. FIN. 2309 (2004) (analyzing allocation behavior of a different European investment bank); Kathleen Weiss Hanley & Gerard Hoberg, *Litigation Risk, Strategic Disclosure and the Underpricing of Initial Public Offerings*, 103 J. FIN. ECON. 235 (2009) (finding that less informative prospectuses lead to higher levels of price revisions and underpricing during the book-building phase of IPOs).

⁵⁷ See *supra* note 48.

in the IPO (though the estimates contain errors), and each investor values a share of common stock as the future cash flows for sale divided by the total securities for sale. Investors would prefer to pay less than market value, but in the neoclassical benchmark they will generally be unable to do so.

The objective of each issuer is to maximize firm value for pre-IPO shareholders. Once they have chosen to go public, issuers maximize their values by receiving the highest price possible for their common stock.⁵⁸ The issuer has the choice of running various processes to sell its common stock, subject only to the securities laws and other legal and regulatory requirements. An important question for issuers is, among such IPO processes, which process would maximize their firm values?

The issuer’s challenge in an IPO is more complex than the seller of a single, indivisible object, such as a piece of art, because the issuer sells identical units (common stock) of a divisible object (the future cash flows of the firm).⁵⁹ Investors can purchase as many or as few shares of stock as they desire up to the offering limit, and they may have liquidity, diversification, or other external constraints.

The first important problem an issuer faces if it wants to maximize proceeds in its IPO is that each individual investor has an incentive to withhold private valuation information in the hopes of buying an underpriced security. To incentivize bidders to reveal their reservation prices, an issuer will choose to run some form of a second-price auction process with as many bidders as possible.⁶⁰ In general, the design of a second-price auction makes it more profitable for bidders to honestly reveal their reservation prices and, absent frictions, produces Pareto-optimal outcomes.⁶¹

The second, subtler, problem for issuers emerges from the fact that the valuations of investors are affiliated. Affiliation means that as an investor’s valuation estimate rises, the investor expects other investors’ estimates to rise as well, because higher values for other investors’ estimates become relatively more likely.⁶² Each investor makes its bid based on the information it believes other investors’ have.

⁵⁸ I do not address marketing or signaling theories of IPO underpricing in this Article. *See supra* note 15.

⁵⁹ *See generally* MILGROM, *supra* note 203, at 255-335 (describing auction theory).

⁶⁰ *See, e.g.*, MILGROM, *supra* note 203, at 215 (showing that the entry of a marginal bidder aligns with the objective of maximizing social surplus). Certain forms of auctions have received no-action treatment from the SEC. *See*, Wit Capital Corp., SEC No-Action Letter, 1999 WL 49854 (July 14, 1999); W.R. Hambrecht + Co., SEC No-Action Letter, 2000 WL 987735 (July 12, 2000).

⁶¹ Milgrom & Weber, *supra* note 203, at 1091, 1096 (stating that the results of a second-price auction are generally Pareto optimal and that honesty is the best policy in such auctions). Note that the issuer will likely not engage in bilateral trading with a single investor. When there are exactly two traders, the market generally breaks down or less trading than is efficient occurs. *See generally* Roger Myerson & Mark Satterwaith, *Efficient Mechanisms for Bilateral Trading*, 28 J. ECON. THEORY 265 (1983).

⁶² Milgrom & Weber, *supra* note 203, at 1096; MILGROM, *supra* note 203, at 182. It is worth noting that the information extraction model of Benveniste and Spindt, described in Section IV.A.2 *infra*, does not include affiliated bids. Assumption A.3 of their model expressly assumes that bidders have some piece of information that is independent of the information possessed by other investors. Benveniste & Spindt, *supra* note 29 at 348. A corollary is that investors have some piece of exclusive information. These assumptions are highly implausible in well-functioning capital markets.

To solve the various problems, the issuer would run a clock auction.⁶³ The key feature of this type of auction is that the process is designed to share aggregate demand information between investors. All shares of the issuers’ common stock would be auctioned simultaneously in multiple rounds. The auctioneer would call the prices at the beginning of each round and post them on a screen for all bidders to view.⁶⁴ The auctioneer would begin bidding at some low price and each bidder would submit a bid consisting of a quantity demanded at the specified price. Bidders could make different bids in each ascending round. The auction would end when supply meets demand.⁶⁵

In a clock auction, bidders gain useful information by observing the bidding behavior of their competitors in a clock auction.⁶⁶ At the end of each round, the identity of the bidders and their bids are made public and shared with all investors. Bidders can make inferences from the number of bidders still participating at any given price level and their identities.

Issuers’ choices between engaging underwriters in a firm commitment offering or a best efforts offering depends on their preferences related to the tradeoff it faces between certainty about the price or the quantity of common stock it sells. In a best efforts offering, the issuer can set the price it desires, but has no guarantee that investors will agree to subscribe to the quantity of shares that it desires to place.⁶⁷ In a firm commitment offering, the underwriter guarantees that it will purchase a specified quantity of shares, but the issuer has less control over the price at which the underwriter will agree to purchase them.⁶⁸ To the extent that the underwriter provides some insurance or option value to the issuer by agreeing to a firm commitment offering, it receives a risk-based fee through the gross spread.⁶⁹ Underwriters perform the exact same information gathering and marketing activities in both types of offerings. Depending on their individual circumstances, different issuers will have different preferences related to the choice of best efforts and firm commitment underwriter agreements, and equilibrium will contain a mix of both types of offerings.

Do the winning bidders for the issuer’s common stock suffer from the “winners curse” in the neoclassical benchmark? Investors are rational in the neoclassical benchmark, but they have

⁶³ See generally Milgrom & Weber, *supra* note 203 (describing the principles and implications of a simultaneous ascending auction). Milgrom and Weber prove that the ascending auction yields a higher average price for the seller of multi-unit objects than second price auctions, Dutch auctions, and first price auctions. *Id.* at 1095.

⁶⁴ MILGROM, *supra* note 203, at 265.

⁶⁵ The clock auction would have to be customized to the IPO context. For example, the securities laws place restrictions on offers, binding commitments, and discriminatory pricing. The auction would also have to contain rules that carefully guard against collusive behavior and bid rigging by investors. See generally R. Preston McAfee & John McMillan, *Bidding Rings*, 82 AM. ECON. REV. 579 (1992) (describing implications of bidding rings in which members make collusive agreements about how to divide the items for sale in an auction).

⁶⁶ Milgrom & Weber, *supra* note 203, at 1095. There are more efficient auction designs than ones that are permitted under the securities laws. Ausubel, *supra* note 188, at 317. One such auction design permits bidders to clinch allocations of units at a lower price than the market-clearing price under certain conditions. *Id.* at 324-27. However, ascending clock auctions of this type are not permissible under the securities laws. Because securities must be sold pursuant to a registration statement, the issuer cannot offer or sell securities at a price different than the one on the registration statement declared effective by the SEC.

⁶⁷ Best efforts offerings involve the underwriter, acting as the issuer’s agent, making its best attempt to place the shares of the issuer’s common stock with investors, but never committing to purchase the issuer’s shares itself. BROWN, *supra* note 54, at § 2:3.1.

⁶⁸ In a firm commitment offering, the underwriter purchases the securities from the issuer and resells the securities to investors. *Id.*

⁶⁹ Underwriters have structured contemporary firm commitment offerings to effectively eliminate principal risk and provide no insurance or option value to issuers. See *infra* notes 93-94 and accompanying text.

heterogeneous information, and their valuation estimates contain normal errors. Rational investors anticipate that they will be subject to adverse selection if other investors are more informed than them. In response, each investor discounts the price it is willing to pay and shaves its bid appropriately, so there is no winner’s curse in the neoclassical benchmark, as in Kevin Rock’s seminal winner’s curse theory.⁷⁰

But the participants in the neoclassical benchmark are more sophisticated than the ones in Rock’s simple model. Rational issuers anticipate that investors would require a discount to address the risk of adverse selection, and issuers therefore offer investors a warranty with each share of common stock. The warranty would take the form of a derivative that would return a specified percentage of the investor’s loss after a certain period of time, and the specific terms could be efficiently tailored to each individual issuer.⁷¹ A warranty is the standard mechanism to address adverse selection in consumer product markets and other markets characterized by information asymmetries. The warranty would shift the risk of price declines over the covered time period from investors to issuers. Moreover, the ascending clock auction is specifically designed to mitigate the adverse selection problem embodied by the winner’s curse; bridge information gaps between investors; and encourage aggressive bidding. Adverse selection becomes less meaningful to uninformed investors with the new information brought by each successive round of the clock auction.⁷²

The result is that first-day underpricing that serves to compensate investors for adverse selection or the assumption of any other valuation risk does not occur in the neoclassical benchmark. The warranty alleviates the adverse selection problem, and investors price other risks into their bids. Initial investors bear the residual risk and uncertainty that is normally associated with any security, but so do the subsequent investors to whom the initial investors sell the security in secondary markets on the first-day of trading, and such risk is incorporated into the market price of the security. There is no first day pop in the price of the issuer’s common stock to compensate initial investors for taking on risk of any kind.

An additional problem the issuer might face is that gathering information is costly for investors.⁷³ Investors may not want to gather due diligence and valuation information about the issuer at all, and even if they do, there is a large fixed cost for each investor to conduct its own investigation from scratch. Unless they expect to at least cover their transaction costs on average across the IPOs in which they participate, investors may rationally refrain from participating in any given IPO. Enter the underwriter. The underwriter specializes in helping the issuer compile and market the information that investors find most relevant. Each investor still conducts its own diligence on the issuer, but the underwriter’s marketing efforts reduce a large fixed cost for each investor.

⁷⁰ See *infra* Section IV.A.1.

⁷¹ See *infra* note 188 and accompanying text.

⁷² Ausubel, *infra* note 188, at 318 (stating that the ascending auction ameliorates the winners curse and leads to more aggressive bidding).

⁷³ Sherman, Yung and Sherman and Titman argue that book building is more efficient than auctions to induce investor participation, and that the optimal outcome for issuers may be for the underwriter to *limit* the investor pool as a means of controlling information costs. Sherman, *supra* note 40; Ann E. Sherman & Sheridan Titman, *Building the IPO Order Book: Underpricing and Participation Limits with Costly Information*, 65 J. FIN. ECON. 3 (2002); Chris Yung, *IPOs with Buy-And Sell-Side Information Production: The Dark Side of Open Sales*, 18 REV. FIN. STUDIES 327 (2005). These results require extremely restrictive conditions that are not likely applicable to traditional underwritten IPOs. See also Lowry, *supra* note 6, at 60 (summarizing the literature supporting book building processes and calling the fact that auction mechanisms are not more popular “puzzling”).

As in markets for publicly traded companies, private investors have an incentive to engage in the efficient level of information production. It is possible that intentionally introducing some level of underpricing may be an efficient mechanism to incentivize investor participation in price discovery, or at least to a price setting tranche of the IPO.⁷⁴ In our neoclassical benchmark, underwriters compete on the discount necessary to obtain optimal levels of investor participation, and, in equilibrium, the efficient discount, bidding credits, or set-asides are offered to investors, but no more.⁷⁵

Because markets are perfectly competitive, the underwriters’ compensation should be equal to the value of their intermediation services. These services include, among others, marketing, distribution, and lending of their reputational brand. Smaller and unknown issuers may not easily attract the attention of some investors. An underwriter can add value by providing the issuer with access to its list of investors and by maximizing the number of bidders in the auction. Underwriters compete on each of these dimensions. More skillful underwriters may be compensated more than their less skillful peers, but, critically, the efficient compensation comes in the form of a higher gross spread or other direct fees. All parties are incentivized to bargain for efficient terms, and it is not efficient to compensate the underwriter through indirect underpricing revenue, so the underwriter’s compensation has no relation to underpricing.

Underwriters are not passive agents of issuers, and instead engage in utility maximizing behavior. Underwriters compete to win the role of lead underwriter at the engagement by telling the issuer they can fetch the highest valuation possible in its IPO. But, critically, the underwriter’s incentives and behavior change after they have been engaged. Conditional on being selected as the lead underwriter, the optimal choice for every lead underwriter is to underprice the issuer’s IPO at the third node of the IPO game. The reason is because underwriters gain a benefit by allocating underpriced shares to their preferred customers who provide something of value in return as a *quid pro quo*. The disconnect between underwriter incentives at the first node, the engagement, and the third node, the pricing meeting, exposes issuers to a seller’s curse.

The seller’s curse is parallel to Rock’s winner’s curse.⁷⁶ In the winner’s curse, uninformed investors are subject to adverse selection and informed investors reap information rents in the form of underpricing. In the seller’s curse, weak bargainers are subject to adverse selection and underwriters reap information rents by transferring the issuer’s value to itself and to its preferred investors. Just as uninformed investors shave down their bids in response to the winner’s curse, issuers that are uninformed about the demand of an underwriter’s order book mark-up their selling price in response to the seller’s curse.

But the seller’s curse, like the winner’s curse, is not present in the neoclassical benchmark. Issuers are rational so they anticipate the underwriter’s conflict of interest at the third node. Issuers therefore bargain for contractual mechanisms at the first node—when they

⁷⁴ See Milgrom & Weber, *supra* note 203, at 1096 (stating that bidders only participate in auctions if their expected profit from bidding exceeds the entry fee); Ann E. Sherman, *Global Trends in IPO Methods: Book Building Versus Auctions with Endogenous Entry*, 78 J. FIN. ECON. 615 (2005) (stating that rational investors will only acquire information and place a bid in an IPO if they expect to recover their information production costs); Charles R. Schnitzlein et al., *Come on In, the Water’s Fine! An Experimental Examination of Hybrid IPO Auctions with a Public Pool* 13 (working paper, 2016) (describing an auction model with a price-setting tranche that receives a discount and a retail tranche that does not receive a discount).

⁷⁵ MILGROM, *supra* note 203, at 235 (describing bidder credits and set-asides that incentivize bidder participation).

⁷⁶ See Rock *supra*, note 34; Section IV.A.1.

engage the underwriter and have the most leverage—to prevent underwriters from successfully acting on their incentives to underprice. These contractual mechanisms could take the form of fiduciary protections, compensation claw back mechanisms, or reduced discretion in allocation decisions, among others.⁷⁷ Failing contractual or institutional protections, rational issuers respond by *marking up* their common stock from the price suggested by the underwriter when it agrees to the initial offering range and the final offer price. In the next Section, I show that the results change if some issuers act naïvely, because the normal contractual, monitoring, and reputational mechanisms break down.

In summary, issuers maximize their values in IPOs in the neoclassical benchmark by conducting ascending clock auctions. Investors purchase all the shares of stock sold in those auctions for the expected value of the future cash flows associated with those shares of stock, appropriately discounted for efficient transaction costs. Issuers also sell a warranty with each share of stock if they are worried about information asymmetries. Importantly, underpricing of issuers’ common stock—a positive first-day return on the value of the stock above the auction price—does not occur on average except for the efficient amount of compensation for information production and participation in the IPO, if any. The underwriter acts to mitigate the costs of information collection; market the issue to investors; maximize the number of bidders by providing access to its list of clients; and facilitate the transfer of common stock in exchange for cash. The issuer pays the underwriter a direct fee from its IPO proceeds equal to the value of its intermediation services.

Actual outcomes observed in IPO markets exhibit extreme deviations from the neoclassical benchmark. Why has inefficient underpricing persisted in IPO markets for decades at such extraordinary levels?⁷⁸ And why do issuers agree to bookbuilding processes characterized by secrecy when the neoclassical benchmark suggests that issuers should employ transparent price discovery and allocation processes? Part IV discusses the traditional explanations, but the next Section sets forth a new hypothesis: these are precisely the set of IPO pricing terms and processes that would emerge in equilibrium if some issuers, weak bargainers, act as if they misunderstand the costs of underpricing or fail to anticipate their underwriters’ underpricing incentives.

C. *Equilibrium IPO Prices and Contracts with Naïve Issuers*

This Section develops the naïve issuer theory of IPO underpricing. It describes the bundle of contractual terms and processes that would be expected to emerge in equilibrium in IPO markets if at least some issuers fail to anticipate their underwriters’ underpricing incentives and act as if they misunderstand the costs of underpricing. Relative to the neoclassical benchmark, this Section introduces a behavioral wrinkle: the rationality assumption is relaxed and I examine how the analysis changes if some issuers are naïve in the sense that they act as if they misunderstand the costs of underpricing. The analysis demonstrates that contemporary bookbuilding practices, which are deeply distortionary relative to the neoclassical benchmark, are explained as the contractual terms and processes that profit-maximizing underwriters impose on naïve issuers in order to extract information rents.

This Section draws insights from the literature on the law and economics of consumer products and consumer finance when some consumers act naïvely. A key finding in those

⁷⁷ For a more detailed discussion, see *infra* Section IV.B.

⁷⁸ See *supra* note 7.

literatures is that if consumers misunderstand one feature of a price for a product or service, then profit-maximizing firms have incentives to shift costs onto that pricing term.⁷⁹ Those pricing schemes may be “exploitative” in the sense that their design is motivated by an attempt to profit off of their counterparties’ mistakes.⁸⁰

1. Heterogeneous Issuers: Hard Bargainers and Weak Bargainers

I model two simplified types of issuers. The first type, *hard bargainers*, fully understands the costs of underpricing at all stages of IPO transactions. Hard bargainers hold their underwriters accountable to maximizing proceeds by taking cost-effective actions to police underpricing. Anticipating the underwriter’s incentive to underprice, hard bargainers mark up the initial offering range and final offer price suggested by underwriters. Large and mature issuers with more resources—like Spotify, Uber, Airbnb, SpaceX, and other so-called “unicorns”—are more likely to be hard bargainers.⁸¹ Likewise, issuers that are portfolio companies of sophisticated, repeat-player private equity firms are also more likely to be hard bargainers under certain conditions.⁸²

Some hard bargainers are naïve in the sense that they misunderstand underpricing, but they are sophisticated enough to be aware of their bias (“*naïve sophisticates*”). Naïve sophisticates understand that the optimal course of action is to outsource decisions to an independent and unbiased third party. Some naïve sophisticates establish a pricing committee of the board of directors composed of a majority of independent directors that must approve all valuation and pricing decisions.⁸³ Other naïve sophisticates, like the portfolio companies of the private equity firm Carlyle, hire an independent financial advisor like Solebury Capital LLC to advise on their IPOs.⁸⁴ Solebury Capital describes their IPO advisory services in the following manner: “we advise on valuation and go-to-market price range, advise on transaction size, police the quality of the roadshow audience, monitor bookbuilding and develop strategies for optimal pricing, share allocations and aftermarket trading.”⁸⁵

Other heterogeneity likely exists among hard bargainers. Well-known hard bargainers that have large potential bases of individual investors, like Spotify or Facebook, likely have more

⁷⁹ See, e.g., Gabaix & Laibson, *supra* note 20, at 506 (arguing that firms hide information from consumers about the prices of add-on products and fees).

⁸⁰ See Botond Köszegi, *Behavioral Contract Theory*, 52 J. ECON. LITERATURE 1075, 1104 (2014) (stating that a contract is exploitative if the economically central considerations driving it derive from attempting to profit from a counterparty’s mistake).

⁸¹ See, e.g., Loughran & Ritter, *supra* note 19, at 25 Tbl. V (showing that underpricing decreases with size of the issuer’s assets).

⁸² However, venture capital investors are also heterogeneous. Inexperienced venture capital investors or investors who are insulated from underpricing due to holding convertible preferred stock may still act like weak bargainers. See *infra* text accompanying note 248. New venture capital firms, eager to demonstrate their ability to successfully take a portfolio company through an IPO, may experience higher relative underpricing. See, e.g., Paul A. Gompers, *Grandstanding in the Venture Capital Industry*, 42 J. FIN. ECON. 133 (1996) (finding that the younger venture capital firms had higher levels of underpricing in their IPOs than more mature firms).

⁸³ See, e.g., NYSE/NASD IPO Advisory Committee, *supra* note 42, at 4 (recommending that regulators require each issuer to establish an IPO pricing committee of its board of directors including independent directors).

⁸⁴ The practice of hiring a financial advisor in connection with an IPO in addition to an underwriter is more common in European IPO markets. Jenkinson et al., *supra* note 56, at 7.

⁸⁵ IPO Advisory, SOLEBURY CAPITAL LLC, <http://www.solecap.com/solebury-capital/advisory-services>, February 7, 2018.

bargaining power relative to less well known hard bargainers. For the purposes of simplicity, I model naïve sophisticates in the same group as other hard bargainers and do not distinguish between levels of bargaining power. The key characteristic of a hard bargainer is that, in their interactions with underwriters and investors, they act as if they accurately understand the costs of underpricing and take cost effective steps to mitigate it.

The second type of issuer, *weak bargainers*, does not engage in cost-effective monitoring of their underwriters’ decisions or IPO processes. They are naïve in the sense that they act as if they misunderstand the costs of underpricing or fail to anticipate their underwriter’s incentives to underprice their IPO. Unlike the naïve sophisticates, they are unaware of their misunderstanding problem so they do not address it by outsourcing decisions to an unbiased third party. Weak bargainers may misunderstand the relative costs and benefits of IPO features for any reason, including myopia, reference point bias, or expertise bias.⁸⁶ Weak bargainers generally bargain hard on the salient pricing term, the gross spread, but they fail to bargain hard on the non-salient cost of underpricing because they do not evaluate the underwriter or its decisions on an underpricing dimension.⁸⁷

It may seem more plausible that relatively unsophisticated consumers might make mistakes when bargaining with more sophisticated firms, but less plausible that sophisticated founders and executives who spend money on advice from bankers and lawyers might make mistakes in IPO transactions. Nevertheless, Part III presents theoretical and empirical evidence that many issuers do indeed act naïvely. There may even be additional biases in IPO markets not present in consumer markets. For example, expertise-bias may be a bigger factor when the choice is between titans of finance like Goldman Sachs or JP Morgan and lesser-known underwriters relative to the choice between toaster manufacturers. The biases of decision-makers in IPOs may even be exacerbated because there are *too many* laws. Specifically, the securities laws impose demanding due diligence, disclosure, and post-IPO reporting obligations on issuers and might distract decision-makers from monitoring underpricing by underwriters. The next Section also explains how investment bankers and lawyers of issuers do not address the misunderstanding problem because they are subject to a de-biasing curse.⁸⁸

2. Equilibrium IPO Markets with Weak Bargainers

In choosing the set of contracts and IPO processes they offer to issuers, the incentives of underwriters depend on the preferences of issuers across alternative IPO processes, underwriter services, and costs. In the neoclassical benchmark, issuers anticipated underwriters’ incentives to underprice and bargained for institutional and contractual protections. But weak bargainers may perceive different features of IPO services to be of outsized importance, such as underwriter prestige, and they may overlook or underestimate the costs of underpricing or contractual features that make underpricing more likely. If some issuers are naïve, the market for underwriting services will generally give underwriters incentives to design contracts that respond

⁸⁶ See *infra* Part III for an discussion of various ways in which weak bargainers act as if they misunderstand the costs of underpricing.

⁸⁷ The underpricing costs were so non-salient to Redfin CEO Glenn Kelman that he even felt *bad* because his investment bankers only made “a few million bucks” in direct fees compared to the “princely sum” made by investors who flipped their stock within thirty minutes of the IPO. Glenn Kelman, *Diary of an IPO*, REDFIN BLOG (Jan. 16, 2018), <https://www.redfin.com/blog/2018/01/diary-of-an-ipo.html>.

⁸⁸ See *infra* text accompanying notes 101 and 107.

to what those issuers perceive to be of value.⁸⁹ The key question from the perspective of underwriters is what IPO processes and pricing structures maximize their profits?

If underwriters possess private information about the valuation of issuers, they may be able to subject those issuers to adverse selection and to extract information rents for themselves or for investors.⁹⁰ The extraction mechanism is the preferential allocation of underpriced shares to rent-seeking investors. The allocations are a dimension on which underwriters compete for institutional clients in other investment banking markets, and the allocations drive investment banking business and revenues back to the underwriter. The benefit to the underwriter might come in the form of extra profits through increased trading commissions and investment banking fees. But, if the underwriter’s competitors are also preferentially allocating underpriced IPO shares to investment banking clients, the allocations may not even generate abnormal profits. Such allocations may merely be a requirement to maintain a competitive position in non-IPO investment banking markets.

Contemporary bookbuilding processes are ideal to empower underwriters that want to extract information rents from issuers. A typical bookbuilding process is characterized by secrecy and private, bilateral discussions between underwriters and investors. Underwriters may generate private information about investor demand because investors choose to share it only with the underwriter, or because decision-makers at issuers do not collect or review information about investor demand.

To monetize their private information, underwriters need to control allocation decisions. Ideally, the IPO process would give underwriters the ability to limit the investors invited to participate and provide ample opportunities to collude with investors. Once again, a contemporary bookbuilding process is ideal. The defining characteristic of bookbuilding relative to other auctions is the complete delegation of allocation decisions to the discretion of underwriters.⁹¹ The underwriter’s allocation decisions are not reviewable by the issuer, and typically not even shared with them. Auctions, in contrast, require the simultaneous written submission of bids from investors in a format that is easily reviewed by issuers, so underwriters prefer to avoid auctions. The bookbuilding process keeps the underwriter in the role of gatekeeper, whereas an auction process would remove the levers of pricing and allocation from the underwriter. The bookbuilding process in the equilibrium with naïve issuers crowds out and displaces the superior price discovery mechanism of clock auctions combined with warranties that would emerge in the neoclassical benchmark.

Underwriters need to secure a few key contractual commitments to give them comfort that they will not face legal liability for extracting information rents from issuers. To exploit myopic issuers, underwriters secure these contractual commitments when they are engaged nearly six months before the IPO, even though it would be more efficient to negotiate these terms later in the process when issuers would have more information to make informed decisions.⁹² Most crucially, underwriters engage issuers in firm commitment offerings rather than best efforts offerings. The reason is because a best efforts offering must be done as the

⁸⁹ As in the neoclassical benchmark, investors are still willing to pay their estimate of the value of the future cash flows for sale in the initial public offering, transaction costs, though they prefer to pay less. One difference is that, in the equilibrium with naïve issuers, investors will frequently succeed at paying less than market value.

⁹⁰ See Biais et al., *supra* note 44, at 124 (stating that underpricing in their model corresponds to the informational rent of the informed agent, the underwriter and underpricing is minimized by minimizing informational rents).

⁹¹ Sherman, *supra* note 40, at 697.

⁹² See *supra* note 67 and accompanying text.

issuer’s agent, potentially opening the underwriter up to fiduciary liability.⁹³ A firm commitment offering can be structured as a transaction between principals with no fiduciary obligations.⁹⁴

The underwriter also prefers to structure the firm commitment offering to replicate the economics of a best efforts offering, because it wants to eliminate its principal risk. It does this by waiting to sign the underwriting agreement that finalizes the quantity and price of the shares sold in the IPO until the night before the offering, exposing itself to principal risk only over the course of one night, if that.⁹⁵ Underwriters can walk away from the deal at any point before the underwriting agreement is signed. The type of firm commitment offering most commonly used in IPOs adds no meaningful insurance or option value to issuers, but it protects underwriters from liability for breach of fiduciary duty.

Decision-makers at weak bargainers and hard bargainers have the same *ex ante* preferences about underpricing—they generally will not accept it, and will only do so in exchange for a benefit that is perceived to be more valuable. The key point is that weak bargainers *believe* that they understand the costs of underpricing and the benefits of other IPO features and contractual terms, even if they do not actually understand underpricing in relation to their firm maximization objectives. When some issuers act naïvely, the normal market reputational and contractual checks break down, permitting underwriters to load costs onto the non-salient, back-end underpricing cost.⁹⁶

Each weak bargainer may have a unique reason for misunderstanding the costs of underpricing. Underwriters utilize an all-of-the-above strategy to further their underpricing objectives, but a critical part of their strategy is to low-balling the issuer’s valuation at every opportunity.⁹⁷ Low-balling the issuer’s valuation is most critical for the underwriter just before the road shows when it sets the initial offering range. It helps set underwriters up to exploit decision-maker reference point bias at the pricing meeting, and soliciting demand from investors at a lower baseline gives investors and underwriters more leverage to resist last-minute price increases after road shows are complete.

Notwithstanding the fact that they persistently underprice IPOs, underwriters appear to have knowledge of the direction and the extent of virtually the entire first-day return at the time they agree to the final offer price in IPOs. After the initial investors make binding commitments to purchase the issuer’s common stock but before the stock begins trading on secondary exchanges, there is a pre-opening period in which market makers can gauge demand for the issuer’s common stock. The lead underwriter always set the first nonbinding quote during the preopening period, and most of the run-up from the offer price to the opening price is explained

⁹³ See *EBC I Inc. v. Goldman Sachs & Co.*, 5 N.Y.3d 11, 19 (N.Y., 2005) (describing fiduciary duty law in New York in the context of a firm commitment offering).

⁹⁴ All contemporary underwriting agreements contain a clause in which issuers waive their rights to fiduciary protections. See *infra* note 230 and accompanying text.

⁹⁵ Indeed, it is common practice in IPO markets that underwriters do not become obligated to purchase the issuer’s securities until they sign the underwriting agreement after markets close on the day before the IPO when demand uncertainty has already been resolved. Lowry et al., *supra* note 6, at 28 (stating that “the underwriter, at best, purchases the shares from the issuer only on the night before it goes public, when most of the uncertainty has been resolved”).

⁹⁶ See BAR-GILL, *supra* note 20, at 32, 93, 129 (noting that sellers design various contracts to shift costs onto non-salient pricing terms when their counterparties misunderstand those terms).

⁹⁷ See *supra* Section III.B.

by the lead underwriter’s initial quote.⁹⁸ This pattern suggests that underwriters have good knowledge about the market value of the issuer’s common stock, notwithstanding their agreement with the issuer at the pricing meeting to price the issue below market value.

Remarkably, after the lead underwriter sets the first nonbinding quote, market makers discover the first secondary trading price through a form of an efficient clock auction, but for the benefit of the *initial investors* and not for the issuer. During the pre-opening period, which is as brief as 5 minutes on the Nasdaq, various market makers submit nonbinding sell quotes to the exchange and investors return nonbinding indications of interest.⁹⁹ The preopening process permits the lead underwriter to test demand at different price levels and permits investors to gauge the demand of other participants by tracking changes in bids.

The pre-opening price discovery process produces more efficient outcomes than IPO bookbuilding processes, and it takes five minutes or less. In a sample of 188 Nasdaq IPOs in 1997, the first transaction in secondary markets occurred at a price 17.66% higher than the offer price, on average.¹⁰⁰ The average closing price at the end of the first day for those same IPOs was 19.47%, indicating that the underwriters succeeded in gauging much of the first-day demand before trading in secondary markets even began.¹⁰¹

Competition among underwriters does not operate to de-bias naïve issuers because underwriters that attempt to do so are subject to a de-biasing curse. Failing to allocate underpriced shares to their preferred investors would weaken their competitive position for the investment banking business of the big clients who receive such allocations from other investment banks. In turn, investment banks that de-biased issuers would be able to provide lower compensation for their bankers that underwrite IPOs, and for the employees of the collateral investment banking markets in which one of the ways that investment banks compete is by allocating clients underpriced IPO shares. Underwriters do not even advance their competitive position in IPO markets by accurately pricing, because naïve issuers do not evaluate the underwriters on this dimension when they make the lead underwriter selection decision.

Why don’t hard bargainers insist on the more efficient price discovery mechanism of auctions instead of bookbuilding processes?¹⁰² Like underwriters, hard bargainers also prefer the inefficient contractual terms because they receive a subsidy on both the direct fees they pay to their underwriter *and* on the price that they can sell their common stock to the market.¹⁰³ If underwriting markets are perfectly competitive, then any additional revenue underwriters reap from the underpricing of weak bargainers would accrue to hard bargainers in the form of downward price pressure on the salient gross spread fee. In the neoclassical benchmark, underwriters charged hard bargainers the marginal cost of their underwriting services in each individual IPO. In the equilibrium with naïve issuers, underwriters pool hard and weak

⁹⁸ Reena Aggarwal, *Price Discovery in Initial Public Offerings and the Role of the Lead Underwriter*, 55 J. Fin. 2903, 2908 (2000).

⁹⁹ *Id.* at 2904.

¹⁰⁰ *Id.* at 2906.

¹⁰¹ *Id.*

¹⁰² Some evidence suggests that underwriting markets are bifurcated, and hard bargainers may select the underwriters with a record of less underpricing than their peers. One study found that highly prestigious underwriters persistently underpriced more than low prestige underwriters by a large amount—about ten percentage points. See Hoberg, *supra* note 228. One interpretation is that prestigious underwriters primarily serve weak bargainers and while less prestigious underwriters primarily serves hard bargainers.

¹⁰³ If underwriters have market power and preferred inefficient contractual terms, then hard bargainers could not obtain efficient processes or pricing even if they wanted them.

bargainers together. Because underwriters receive revenue in the IPOs of weak bargainers that exceeds their marginal costs, underwriters are able to underwrite the IPOs of hard bargainers below marginal cost.

If some investors are uninformed in the sense that they cannot always distinguish undervalued IPOs from overvalued IPOs, then hard bargainers also receive a subsidy on the price at which they can offer their common stock to the market.¹⁰⁴ In a market structure with naïve issuers and uninformed investors, hard bargainers may be able to set the final offer price of their IPO *above* market value. Uninformed investors pool together the issues of weak bargainers and strong bargainers. They will continue to participate in IPO markets as long as their expected profits from the IPOs of weak bargainers exceed their expected losses in the IPOs of hard bargainers. Indeed, every year a significant number of IPOs are overpriced, and the naïve issuer theory suggests that these are likely to be the IPOs of hard bargainers.¹⁰⁵ In the equilibrium with weak bargaining issuers, first-day returns for IPOs of hard bargainers would be close to zero on average, and they may even be negative. First-day returns for IPOs of weak bargainers would be positive and significantly higher than the pooled average of hard and weak bargainers.

Another question is why underwriters do not price discriminate between hard and weak bargainers. Underwriters are likely able to distinguish the issuer’s type—hard or weak bargainer—at the time they are engaged. Ideally, the underwriter would offer different contracts and pricing terms to each type, but underwriters decide not to do so in IPO markets. The reason is because underwriters rely on shrouding the costs of underpricing to entrench the biases of naïve issuers *and* regulators.¹⁰⁶ Underwriters could choose to compete on their relative records of minimizing underpricing, but instead they choose to hide this information. Providing an IPO market benchmark process that is offered to the most sophisticated and prestigious issuers would help de-bias weak bargainers and may result in them demanding the market-standard terms received by the most prestigious issuers. An even bigger threat to underwriters is that discriminatory contracts would result in regulators demanding non-discriminatory treatment among issuers. Underwriters therefore prefer to tell issuers, regulators, and market participants that there is only one contract and that it offers the only feasible and efficient way to conduct an IPO.

A final question to be addressed is why the issuer’s legal counsel does not advise the issuer to bargain for better terms. At a minimum, the naïve issuer theory suggests that leading law firms hired as legal counsel to issuers in connection with IPOs give their clients very poor advice. For example, the naïve issuer theory posits that underwriters exploit decision-maker myopia at the time they are engaged to secure valuable contractual commitments that give underwriters leverage to underprice the IPO at the pricing meeting six months later. Yet a leading law firm advises potential clients that the form of underwriting agreement that they review at the engagement and that they sign at the pricing meeting: “at first glance may strike you as somewhat one-sided. But do not let that put you off . . . negotiating it should not be a particularly adversarial or time-consuming process.”¹⁰⁷

One explanation is that legal counsel may itself be naïve. Lawyers may simply advise their clients to agree to use a bookbuilding process as the price discovery and allocation

¹⁰⁴ These are the same type of uninformed investors in Rock’s winner’s curse model. *See infra* Section IV.A.1.

¹⁰⁵ *See, e.g.,* Ellis et al., *supra* note 48, at 1052, Table IV (showing that, in their sample of 306 Nasdaq IPOs between 1996-1997, 8% had first-day returns less than 0% and 18% had initial returns of 0%).

¹⁰⁶ Gabaix & Laibson, *supra* note 20, at 506-507.

¹⁰⁷ LATHAM & WATKINS LLP, U.S. IPO GUIDE 2016 EDITION 7 (2016).

mechanism of the IPO because that’s what their investment banking colleagues tell them is optimal; because it’s the way it has always been done; and because they do not put much thought into the economics of underpricing. A second explanation is that the law firms that issuers hire are reluctant to rock the boat because of their own conflicts of interest. Most big law firms that advise issuers on IPOs also represent the underwriters on other transactions or frequently work alongside them. These conflicts may encourage legal counsel of IPO issuers to willfully blind themselves to questions about the efficiency of IPO processes. Finally, legal counsel may be bound by a similar de-biasing curse as underwriters. If a naïve issuer *prefers* a particular underwriter notwithstanding its detrimental underpricing practices—for example, because of its prestigious brand name—and legal counsel demands that they select a different underwriter, the issuer may instead select a different legal counsel.

III. Naïve Issuers in IPO Markets

How exactly do naïve issuers act as if they misunderstand underpricing? This Part discusses three reasons why issuers may act naïvely at various points in the IPO process: myopia, reference point bias, and expertise bias. Decision-makers at issuers may be subject to a host of other biases not discussed in this Section, including optimism bias, Stockholm syndrome, and bias related to the internalization of incorrect definitions of what a “successful” IPO means.¹⁰⁸

A. Myopia

The decision to set the final offer price does not usually occur until nearly six months after the issuer engages a lead underwriter.¹⁰⁹ Section II.A describes three critical nodes in the IPO transaction game: the engagement, setting the initial offering range, and setting the final offer price. The gap between the time that an issuer signs an initial agreement with its lead underwriter at the engagement and the date of the IPO provides the lead underwriter with an opportunity to exploit myopic decision-makers.

Myopic decision-makers are individuals that are near-sighted or present biased.¹¹⁰ They pay excessive attention to short-term objectives and pay insufficient attention to long-term objectives. For example, the short-term pressures of navigating due diligence and road shows

¹⁰⁸ Optimism bias causes decision-makers to believe that they are at a lesser risk of experiencing a negative event compared to others. In the context of IPOs, optimism bias may interact with myopia to prevent issuers from bargaining at the initial stages of the IPO for protections at latter stages of the IPO. Stockholm Syndrome is the psychological term for feelings of trust or affection felt in instances of kidnapping or hostage taking by a victim toward a captor. In the context of IPOs, underwriters keep decision-makers at issuers on grueling timelines and make demanding request. Decision-makers may be so relieved that their bankers are assisting them and working longer hours than they themselves are that they feel signs of affection towards them. *See generally* Kelman, *supra* note 87 (praising their investment bankers for never complaining during stressful times of the road shows, posting pictures of them eating pizza together after a delayed flight). The most common account of a “successful” IPO in the financial press and among investment bankers is an IPO that pops on the first day, indicating that the company is in high demand among investors. At best, this definition is incomplete, as a successful IPO also entails raising some amount of funds.

¹⁰⁹ LATHAM & WATKINS LLP, *supra* note 107, at 4.

¹¹⁰ *See also* Ryan Bubba et al., *supra* note 20, at 1341 (describing myopic workers with time inconsistent preferences) and Shlomo Benartzi & Richard Thaler, *Risk Aversion or Myopia? Choices in Repeated Gambles and Retirement Investments*, 45 MGMT. SCIENCE 364 (1999) (describing myopic decisions by investors).

may lead decision-makers to focus on attributes like underwriter prestige rather than the factors that bear on the long-term objective of maximizing proceeds.

Myopic decision-makers incompletely analyze the future game tree. One result may be that they hold time inconsistent preferences. Specifically, such decision-makers weigh their preference to mitigate or eliminate underpricing more strongly at the end of the IPO process than at the beginning of the IPO process. Myopic decision-makers may therefore regret, at the time of the pricing meeting, their choice of underwriter or the contractual liberties it granted to it at the engagement.

Compounding the myopia problem, decision-makers at issuers may underestimate the complexity and the physical and mental demands of due diligence and road shows. The most common feeling shared by chief executive officers, chief financial officers and other executives at issuers during an IPO is exhaustion. Decision-makers must produce and analyze reams of due diligence information and update their accounting systems and governance structures to comply with public company rules.¹¹¹ The road shows are “grueling.”¹¹² The CEO and CFO typically complete ten meetings a day in a new city every day, and the IPO occurs immediately after the road shows end.¹¹³ For many decision-makers at issuers, an IPO process is like drinking from a fire-hose. They have little bandwidth for making independent decisions or doing anything other than following the instructions of their lawyers and investment bankers, even down to the clothes they should wear to meetings.¹¹⁴

Myopia may be a particularly powerful bias for underwriters to exploit in high-stakes and closely watched IPO transactions. If it is prohibitively costly for issuers to back out of an IPO once they have made a splash in the financial press and completed due diligence and road shows, underwriters will be able to turn the screws on issuers at the pricing meeting and force them to accept high underpricing costs. To see this, note that the dominant strategy by rational issuers (including hard bargainers) in equilibrium at the final node—the decision to set the final offer price—would be to complete the IPO transaction with any level of underpricing that does not exceed the costs of backing out of the IPO. If an issuer unexpectedly backs out of an IPO, it may be shut out of public equity markets for a period of time because of the negative information content of a withdrawn offering. Issuers would then have to pay new fees to a second underwriter to perform a second IPO process. As a consequence, underwriters are able to drive a hard bargain at the pricing meeting. The securities laws compound problems for myopic issuers. If a myopic issuer decides at the last minute that it wants to mitigate underpricing by raising the offer price—and convinces its underwriter to go along—they may have to postpone the IPO or the road shows while they file an amendment to their registration statement with the SEC.¹¹⁵

One example of a myopic decision-maker, surprisingly, was Bill Gates.¹¹⁶ At the second node in Microsoft’s IPO negotiation, Microsoft’s lead underwriter, Goldman Sachs,

¹¹¹ LATHAM & WATKINS LLP, *supra* note 107, at 4.

¹¹² *Id.*, at 8.

¹¹³ Kelman, *supra* note 87.

¹¹⁴ *See id.* (stating that Redfin CEO asked his bankers what clothes to wear to road show meetings).

¹¹⁵ Generally, an issuer would be required to file an amendment to its registration statement if it proposed to increase the maximum aggregate offer price by more than 20%. *See supra* note 53. *See also* NYSE/NASD IPO Advisory Committee, *supra* note 42 (recommending that the SEC should raise the threshold requirement for amendment to the prospectus from an increase of 20% to 40%).

¹¹⁶ See Scott Olster, Inside the Deal that Made Bill Gates \$350,000,000, *Fortune* (July 21, 2986) (describing the Microsoft IPO), available at <http://fortune.com/2011/03/13/inside-the-deal-that-made-bill-gates-350000000/>.

recommended an initial offering range of \$17-20 per share.¹¹⁷ The naïve issuer theory suggests that Goldman Sachs was low-balling Microsoft’s valuation at this stage, and that their private view was that Microsoft could fetch a price per share above the offered range.¹¹⁸ Gates insisted on *lowering* the initial offering range proposed by Goldman Sachs, a tactic described as “unusual” for issuers.¹¹⁹ Purportedly, Gates’ concern at that point in time was simply that \$20 per share was too high of a price to ask.¹²⁰

At the pricing meeting, the third node, Gates held considerably different preferences. Gates weighed the costs of underpricing, seemingly for the first time. Goldman Sachs considered the IPO to be a “hot” one, and estimated that it would trade at \$25 per share in the weeks after the IPO.¹²¹ Goldman Sachs stated that an offer price of \$20-21 would get the deal done.¹²² The underpricing implied by Goldman’s proposal upset Gates who said: “these guys who happen to be in good with Goldman and get some stock will make an instant profit of \$4. Why are we handing millions of the company’s money to Goldman’s favorite clients?”¹²³ After some convincing, Microsoft counter proposed with a range of \$21 to \$22, increasing the range by \$1 but compromising by still leaving room for expected underpricing of \$3-4 per share.¹²⁴ But Goldman Sachs pushed back strongly against the counterproposal, insisting that an offer price \$1 too high could sink the entire deal.¹²⁵ Goldman Sachs’s team walked out of the room when Microsoft would not budge. At that point, Goldman Sachs held all the leverage and there was little Microsoft could do if it wanted to close the IPO. The parties eventually agreed on a final offer price of \$21.¹²⁶

Gates’ failure to focus on the underpricing risk when setting the initial offering range made it more difficult for Microsoft to bargain underpricing away at the pricing meeting. Threatening to spring eleventh hour price increases to what had been presented to investors as a done deal gave institutional investors—and, in turn, Goldman Sachs—leverage to walk away on the day before the IPO. It wasn’t until it was too late to stop the underpricing that Microsoft’s team finally concluded that Goldman Sachs was an “adversary” trying to scratch its institutional clients’ backs rather than getting Microsoft the best IPO price.¹²⁷ On the day of the IPO, initial investors bought Microsoft’s common stock at \$21 per share. The first transaction in secondary markets occurred at \$25.75 per share.¹²⁸ Goldman Sachs and the other lead underwriter, Alex.

¹¹⁷ *Id.*

¹¹⁸ See *infra* Section III.B for a discussion of why underwriters low-ball the initial offering range.

¹¹⁹ Olster, *supra* note 116.

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ Goldman Sachs’ partner in charge of common stock offerings, Eric Dobkin used “every argument he could muster” to push back against the proposal. He noted that coming out \$1 too high would drive off quality investors, which could lead to defections by other investors. Dobkin raised the specter of other “failed” IPOs that traded below their offer price and warned that Microsoft’s IPO could similarly fail. *Id.*

¹²⁷ Microsoft’s CFO, Gaudette, told Dobkin at the pricing meeting: “I can’t deny what’s in my head. I keep thinking of all that pent-up demand from individual investors, which you haven’t factored in. And I keep thinking we may never see you again, but you go back to the institutional investors all the time. They’re your customers. I don’t know whose interests you’re trying to serve, but if you’re playing both sides of the street, then we’ve just become adversaries.” *Id.*

¹²⁸ *Id.*

Brown immediately exercised their overallotment option to take an additional 15% of shares, suggesting that they expected the price to continue to rise.¹²⁹ Microsoft’s stock closed the first day of trading at \$27.75 per share, giving initial investors a 32% return in a single day.¹³⁰

B. *Reference Point Bias*

Some weak bargainers may misunderstand the costs of underpricing because they compare expected IPO proceeds to the initial offering range or the last round of private financing instead of the current market value of the stock. Tim Loughran and Jay Ritter first noted that the failure of issuers to become upset after completing an underpriced IPO might be explained by prospect theory.¹³¹ This Section generalizes Loughran and Ritter’s prospect theory of underpricing to explain why issuers do not utilize the first node to bargain for protections against underwriters who would exploit their psychology at the third node. Additionally, it provides an explanation of how underwriters structure the entire IPO transaction to low-ball the valuations of issuers, and why issuers may misunderstand those efforts and the incentives of underwriters to make them.

Loughran and Ritter’s prospect theory of IPO underpricing states that issuers permit underpricing at the pricing meeting because they mistakenly compare expected proceeds to the initial offering range. Rooted in seminal work by Kahneman and Tversky, prospect theory posits that individuals account for gains and losses in relation to some pre-established reference point.¹³² One implication of the theory is that reference-point biased individuals may care more about the perceived change in their wealth relative to their reference point rather than the absolute level of their wealth.

The prospect theory explanation of underpricing therefore emphasizes the importance of framing at the pricing meeting.¹³³ If issuers compared the costs of underpricing relative to the expected first-day market value, they would bargain harder to eliminate it.¹³⁴ When underpricing comes as a package together with unexpected increases to their wealth—when the initial offering range is unexpectedly revised upwards—issuers become “complacent” and acquiesce to leaving money on the table.¹³⁵ Loughran and Ritter suggest that prospect theory explains why issuers are not upset *ex post* about underpriced IPOs.

As supporting evidence, Ritter and Loughran cite to the same partial adjustment evidence that proponents of the information extraction theory cite in support of their claims.¹³⁶ Loughran and Ritter show that there is a strong relationship between price revisions and underpricing. In IPOs between 1990-1998 in which the final offer price was set below the minimum of the file price range, first-day returns averaged 4%. Issues in which the offer price was set above the maximum of the initial offering range experienced first-day returns of 32%.¹³⁷ The subsequent

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ Loughran & Ritter, *supra* note 18, at 414.

¹³² Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979).

¹³³ Loughran & Ritter, *supra* note 18, at 424.

¹³⁴ *Id.* at 416.

¹³⁵ *Id.* at 424.

¹³⁶ *See infra* note 208, and accompanying text.

¹³⁷ Loughran & Ritter, *supra* note 18, at 415.

behavior of IPO issuers in seasoned equity offerings provides additional empirical support for the prospect theory of underpricing.¹³⁸

Loughran and Ritter’s prospect theory explanation, however, left important questions unanswered. Loughran and Ritter apparently did not fully embrace their own behavioral story.¹³⁹ They wrote in a later paper that their own prospect theory “does not explain why issuers hire underwriters who will *ex post* exploit issuers’ psychology.”¹⁴⁰ Ritter also later wrote that “what has been missing is an explanation of how a market structure can persist in which competition between underwriters does not drive underpricing down to more modest levels.”¹⁴¹

Loughran and Ritter’s prospect theory of underpricing provides an explanation as to why issuers acquiesce to underpricing once they have reached the third node—the pricing meeting on the night before the IPO. Specifically, it fails to explain why issuers do not learn from the exploitation of prior naïve issuers and demand contractual protections at the first node—the engagement—that would prevent underwriters from exploiting their psychology. It also fails to explain why these reference point-biased issuers do not outsource key pricing decisions to an unbiased third party or to a pre-determined algorithm, such as a transparent auction process. Finally, it fails to explain why reputational mechanisms do not operate to de-bias reference-point biased issuers.

The naïve issuer theory pushes the reference point bias problem back in time: decision-makers that mistakenly compare IPO proceeds to the wrong reference point at the pricing meeting the night before the IPO are also likely to compare the underwriter’s estimates about the issuer’s valuation to the wrong reference point throughout the entire negotiation of the final offer price. Moreover, weak bargainers, unlike naïve sophisticates, do not believe that they engage in reference-biased thinking, and they do not anticipate that underwriters will exploit their biases. An important implication is that, if an issuer is biased throughout the entire IPO transaction, its underwriter does not have to rely on random outcomes to exploit reference-point bias, as suggested by Loughran and Ritter. They argue that, when investors unexpectedly reveal strong demand during road shows, underwriters opportunistically react and exploit reference point bias by only partially incorporating the unexpectedly strong demand into the final offer price.¹⁴² The naïve issuer theory instead posits that underwriters actively *structure* the entire IPO process to exploit an issuer’s reference point bias by low-balling the issuer’s expectations about its valuation from the engagement through the final offer price.

¹³⁸ IPO firms are less likely to switch underwriters when prospect theory suggests that issuers should be satisfied with the IPO underwriter’s performance relative to issuers for whom prospect theory suggests they should not be satisfied. Alexander Ljungqvist & William Wilhelm, *Does Prospect Theory Explain IPO Market Behavior*, 60 J. FIN. 1759, 1761 (2005). The switching of venture-backed firms is not influenced by behavioral proxies for their satisfaction, evidence supporting the division of issuers into hard bargainers and weak bargainers. *Id.* at 1762. Underwriters also extract higher fees for subsequent transactions from the biased firms identified by the prospect theory proxy compared to non-biased firms. *Id.*

¹³⁹ Loughran and Ritter suggest that underpricing is useful to underwriters because they are able to achieve greater total compensation by obtaining some of their revenue through a non-salient underpricing cost, but they do not develop this line of analysis. Loughran & Ritter, *supra* note 18, at 416.

¹⁴⁰ Loughran & Ritter, *supra* note 19, at 7. *See also* Ritter, *supra* note 14, at 360 (stating that the prospect theory model “does not explain why issuing firms willingly hire an underwriter with a history of excessively underpricing IPOs”).

¹⁴¹ Ritter, *supra* note 14, at 369.

¹⁴² Loughran & Ritter, *supra* note 19, at 416 (“We are arguing that when unexpectedly strong demand becomes apparent during the preselling period, issuing firms acquiesce in leaving more money on the table. When demand is unexpectedly weak, issuing firms negotiate more aggressively, leaving little money on the table.”).

The critical point that generalizes Loughran and Ritter’s prospect theory to the entire IPO transaction is that a reliable market value reference point is not available to issuers at any of the three nodes in the IPO game tree. This makes reference point bias ripe for underwriters to exploit. For example, the underwriter suggests a low-balled initial offering range to the issuers at the second node, and it is more likely to succeed if the issuer compares the estimated initial offering range favorably to the underwriter’s prior (and lower) estimates of the issuer’s valuation, or to a prior round of equity financing.¹⁴³ Under the naïve issuer theory, it is not surprising that price revisions to the initial offering range are the single best predictor of underpricing in the empirical literature, and that the effect of price revisions on underpricing is orders of magnitude larger than any other explanatory variable in most studies.¹⁴⁴

The example of the IPO transaction that privatized Royal Mail in the U.K. illustrates the ways in which underwriters structure IPO transactions to exploit reference point bias. Royal Mail was established in 1516 as a government enterprise to deliver postal mail (the profile of a weak bargainer if one ever existed). The IPO experienced underpricing of 38% and was characterized as a boondoggle costing taxpayers over £750 million.¹⁴⁵ One of the observations of a post-mortem report on the IPO was that “the valuations presented to the Department by its independent corporate finance adviser and the global co-ordinators varied over the course of the transaction.”¹⁴⁶ The issue ultimately priced at 330 pence per share, but underwriters started with sky-high valuations up to 867 pence per share when they competed to be engaged for the IPO.¹⁴⁷ The next month, the lead underwriters that Royal Mail had selected, with their letters of intent securely signed, immediately walked the price back to an estimated range of 265-365 pence per share, and continued to walk down their estimates on a monthly basis to as low as 190 pence per share, before slowly walking their estimates back up.¹⁴⁸ If decision-makers at Royal mail compared the final offer price of 330 pence per share favorably to the prior estimate of 190 pence per share, they may not have bargained hard for a market value price.

Valuation estimates are extremely sensitive to assumptions and methodologies, making these estimates very easy for investment banks to manipulate to achieve desired ends. One tactic the underwriters in the Royal Mail IPO employed to lower their valuation estimates was to argue that traditional discounted cash flow and comparable company valuation analyses did not apply to Royal Mail. Instead, the underwriters forecasted Royal Mail’s valuation through a discounted dividend approach that valued the company on its projected short-term dividend yield, an approach that was criticized in the post mortem report.¹⁴⁹

¹⁴³ There is anecdotal evidence that underwriters pursue a strategy of low-balling issuer valuations. *See* Loughran & Ritter, *supra* note 19, at 23-24 (summarizing evidence that underwriters low-balled the file price range on some IPOs during the internet bubble); Lowry & Schwert, *supra* note 40, at 11, 19 (discussing reasons why underwriters might low-ball the initial offering range and evidence that they do).

¹⁴⁴ *See supra* note 40. According to the naïve issuer theory, however, estimates of the effect of price revisions on underpricing are unreliable because the two outcomes are jointly determined. *See id.* The information extraction theory interprets price revisions as a measure of the amount of information underwriters are able to extract from investors, but this is a flawed measure if the initial offering range is not an unbiased estimate of issuers’ valuations across IPOs. *See supra* note 40.

¹⁴⁵ National Audit Office, *The Privatisation of Royal Mail*, Report by the Comptroller and Auditor General, Department for Business, Innovation & Skills, 17 (Apr. 1, 2014).

¹⁴⁶ *Id.* at 29.

¹⁴⁷ *Id.* at 30, Figure 9.

¹⁴⁸ *Id.* at 30, Figure 9.

¹⁴⁹ *Id.* at 29. The audit report criticized the discounted dividend approach as not accounting for “the potential valuation of surplus London property, broader asset backing or potential capital structure changes.” *Id.*

As in the Microsoft example, myopia likely exacerbated Royal Mail’s reference point bias problem. The audit report found that “the Department set the low end of the price range at a cautious 260 pence per share to prioritise certainty.”¹⁵⁰ The low estimates provided to Royal Mail and to potential investors throughout the IPO transaction made it easier for underwriters to ultimately price the deal at 330 pence per share and produce £750 million in value for first-day investors.

The IPO of Redfin offers an illustration of the way in which underwriters carefully craft the experience of decision-makers during road shows to exploit reference point bias. Redfin CEO Glenn Kelman stated that Redfin’s investment bankers from Goldman Sachs tracked ongoing demand for Redfin’s IPO against a benchmark of demand for a basket of prior IPOs.¹⁵¹ Kelman noted that the benchmark numbers sloped steeply upwards, but the purported demand for Redfin common stock sloped downwards like a “dying slug.”¹⁵² The relative figures that Goldman Sachs showed to Redfin decision-makers are exactly what an underwriter would do if it wanted to exploit reference point bias.

At the halfway point of the road shows, Goldman Sachs told Kelman that they were only at a third of the demand of where a strong IPO should be by that point, and the framing had a significant effect on Kelman.¹⁵³ Around that time, Kelman called the chair of the board to inform him that their IPO was “in trouble” because not enough people wanted to buy Redfin’s common stock.¹⁵⁴ Kelman spent that weekend at home “despondent”, shaking his head “grimly,” and “expecting [Redfin’s] first day of trading the following Friday to be a fiasco.”¹⁵⁵

Then, from Kelman’s perspective, something inexplicable and unexplained happened at the halfway point of the road shows.¹⁵⁶ As Kelman narrates it, Goldman Sachs worked overtime hours and “went into overdrive with every open account.”¹⁵⁷ He continues: “All we know is that between Friday night and Monday morning in San Francisco, the number of orders for our stock had tripled. And after every meeting, more orders came pouring in. When we left California for the Midwest, the road show had gone from a death-march to a celebration.”¹⁵⁸ By the final day, Redfin had orders for *twenty-three* times the number of shares they were selling in the IPO.¹⁵⁹ Redfin sold its shares to IPO investors at \$15 per share. Then it’s stock soared 45% on the first day.¹⁶⁰ The first-day investors in Redfin shared approximately \$62 million in gains in a single day.¹⁶¹

Kelman’s explanation for the increased demand in the home stretch of Redfin’s IPO was that Goldman Sachs’s effort and persuasion convinced investors to see the light, turning a failing IPO into a successful one. A more plausible account is that Goldman Sachs was bad at its job and could not accurately gauge the reservation prices of investors, leading investors to get a free

¹⁵⁰ *Id.* at 8.

¹⁵¹ Kelman, *supra* note 87.

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.* (“I don’t know what changed that weekend.”).

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ Katie Roof, *Redfin Soars 45% after IPO; CEO Calls It ‘Amazon of Real Estate’*, TECHCRUNCH (Jul. 28, 2017), <https://techcrunch.com/2017/07/28/real-estate-site-redfin-soars-45-after-ipo/>.

¹⁶¹ *Id.*

lunch. Still a more plausible explanation is that Goldman Sachs was good at its job, and that they exploited the reference point bias of decision-makers at Redfin to achieve their desired end of underpricing the IPO.

C. *Expertise Bias*

Issuers may act as if they misunderstand the costs of underpricing if they excessively value underwriter prestige or brand name. A lead underwriter may exploit expertise bias to make underpricing more likely at the time it is engaged; when it makes critical decisions during due diligence and road shows; and at the pricing meeting when the final offer price is set. In general, if decision-makers overvalue an underwriter’s brand name at the engagement, underwriters have incentive to use their prestige as leverage to bargain for terms that maximize their profits.

One reason that decision-makers at issuers may overvalue an underwriter’s prestige is because it provides them with psychic benefits. For a founder of a business, hiring a prestigious investment bank might validate their hard work and give them the impression they have “made it.” One sign of an expertise-biased decision-maker is that they refer to their investment bankers in hyperbolically positive language, such as referring to them as the “Yo-Yo Ma” of their profession or the “Last of the Mohicans.”¹⁶²

Issuers may have a rational reason for selecting an underwriter on the basis of prestige if more prestigious underwriters certify the quality of their issue. The certification effect would help convince skeptical investors to take more risks on the issuer’s common stock in the IPO than they normally would because they trust the underwriter.¹⁶³ But more prestigious underwriters are actually associated with statistically significantly *higher* levels of underpricing after controlling for the traditional determinants of underpricing. Even attempts to control for selection bias have failed to find an underwriter certification effect.¹⁶⁴ The underwriter certification argument is a reputational argument, but the naïve issuer theory suggests that reputational mechanisms have broken down in underwriting markets, and the empirical evidence supports this claim.

Issuers may also believe that an underwriter’s affiliated stock analysts will provide coverage of the issuer’s common stock after the IPO, and potentially even coverage that is positively biased.¹⁶⁵ Critically, the securities laws prohibit investment banks from charging issuers directly for the provision of independent analyst coverage, so underpricing an issuer’s IPO may be the only way for underwriters to monetize demand for analyst coverage by issuers.¹⁶⁶ If issuers overvalue affiliated analyst coverage, they will be more willing to accept

¹⁶² See, e.g., Kelman, *supra* note 87 (calling Goldman’s IPO salespeople the “Last of the Mohicans” and calling the trader that would open up trading of Redfin stock the “Yo-Yo Ma of [t]rading [s]tocks”).

¹⁶³ See generally James R. Booth & Richard L. Smith II, *Capital Raising, Underwriting and the Certification Process*, 15 J. FIN. ECON. 261 (1986) (stating that investment banks use their reputation to certify that an issue is not overpriced).

¹⁶⁴ See *supra* note 191. Habib and Ljungqvist have conjectured that the negative relationship disappears after controlling for selection effects, and that underwriter prestige actually has no effect on underpricing. Even their heavily disputed results merely refute a negative effect of prestigious underwriters on underpricing and provide no evidence of a certification effect. *Id.*

¹⁶⁵ See, e.g., Hurt, *supra* note 42, at 727 (stating that the analyst acts as an accessory to the underwriter in pumping up the price of the issuer’s common stock).

¹⁶⁶ See FINRA Manual, Rule 2711 (regulating conflicts of interests that may arise for analysts with respect to their affiliated investment bank).

one-sided terms to secure their desired underwriter. Ritter and Loughran call this behavior “analyst lust” behavior.¹⁶⁷ Some issuers are seemingly willing to agree to nearly any term as long as they can hire the underwriter with the affiliated analyst that they covet.

Empirical evidence suggests that decision-makers at issuers favorably weigh the presence of affiliated all-star analyst coverage when choosing underwriters, and that analyst coverage is associated with underpricing. The presence of an affiliated all-star analyst in the issuing firm’s industry, as designated by the Institutional Investor publication, increases the probability of that underwriter being chosen as the lead underwriter.¹⁶⁸ From 1993-2008, issuers that used a book runner that bundled underwriting with influential analyst coverage experienced 9% more underpricing and the incremental underpricing was greater for issuers that perceived all-star analyst coverage as more valuable.¹⁶⁹ Another study showed that issues underwritten by an underwriter with an all-star analyst in the industry of the issuing firm at the time of the IPO were associated with first-day returns that were 16.3% higher than issues in which the underwriter did not have such an analyst.¹⁷⁰

Certain underwriters advertise affiliated analyst coverage prominently in their engagement pitches, suggesting that they believe this is an important dimension on which to compete to land the role of lead underwriter.¹⁷¹ The planned IPO of Toys “R” Us, Inc. (*‘Toys “R” Us’*) demonstrates the lengths to which underwriters will go to convince issuers of the importance of analyst coverage. Toy’s “R” Us and its private equity sponsors invited ten investment banks to compete for a role in its IPO and asked the equity analysts from each to make a separate presentation.¹⁷² After an investigation, FINRA fined *all ten* of the investment banks a total of \$43.5 million for permitting their equity research analysts to solicit investment banking business and for offering favorable research coverage in connection with Toys “R” Us’s IPO.¹⁷³ Not a single investment bank was willing and able to maintain compliance with FINRA rules on research analyst coverage when Toys “R” Us indicated its interest.

Affiliated stock analysts seem to give issuers what they want—positively biased coverage. Analysts affiliated with the underwriter that took a company public on average release more buy recommendations than analysts not affiliated with an underwriter of that issuer.¹⁷⁴ The

¹⁶⁷ See Loughran & Ritter, *supra* note 19, at 9-11.

¹⁶⁸ Alexander P. Ljungqvist et al., *Competing for Securities Underwriting Mandates: Banking Relationships and Analyst Recommendations* (2003).

¹⁶⁹ Xiaoding Liu & Jay R. Ritter, *Local Underwriter Oligopolies and IPO Underpricing*, 102 J. FIN. ECON. 579, 580 (2011).

¹⁷⁰ Michael T. Cliff & David J. Dennis, *Do IPO Firms Purchase Analyst Coverage with Underpricing*, 45 J. FIN. 1045, Table 6 (2004).

¹⁷¹ See, e.g., Joel Houston et al., *What a Difference a Month Makes: Stock Analyst Valuations Following Initial Public Offerings*, 41 J. FIN. & QUANTITATIVE ANALYSIS 111, 127 (2006) (describing anecdotal evidence of widespread involvement by analysts in marketing IPOs).

¹⁷² Financial Industry Regulatory Authority, *FINRA Fines 10 Firms a Total of \$43.5 Million for Allowing Equity Research Analysts to Solicit Investment Banking Business and for Offering Favorable Research Coverage in Connection with Toys “r”Us IPO*, (Dec. 11, 2014), available at <https://www.finra.org/newsroom/2014/finra-fines-10-firms-total-435-million>.

¹⁷³ *Id.*

¹⁷⁴ Roni Michaely & Kent Womack, *Conflict of Interest and the Credibility of Underwriter Analyst Recommendations*, 12 REV. FIN. STUDIES 653 (1999).

SEC has brought numerous enforcement actions against investment banks to police violations of the rules separating analysts from broader investment banking objectives.¹⁷⁵

One objection is that issuers’ choices related to analyst coverage are efficient and rational, and not behavioral, because issuers rationally determine that the benefits of analyst coverage exceed the costs. This objection makes the unlikely suggestion that issuers are willing to trade large expected underpricing costs and uncertainty about total proceeds in exchange for speculative and attenuated benefits from future analyst coverage that do nothing to help the fundamentals of the issuer’s business. Moreover, this response should trouble policymakers and regulators. It suggests that underwriters have discovered a way to monetize their analyst coverage in contravention of rules prohibiting such payments, and that issuers are willing to pay for it through a distortionary underpricing fee. It suggests that regulators could improve efficiency in IPO markets by permitting underwriters to directly sell biased analyst coverage.

Underwriters may exploit expertise bias throughout due diligence and the road shows. Issuers may question the underwriter’s decisions less if they value its prestige. When the underwriter low balls the issuer’s valuation for the suggested initial offering range or the final offer price, an expertise-biased issuer is more likely to trust the underwriter’s valuation and to push back less. The underwriter may even impliedly threaten sparse or negative analyst coverage by its affiliated analysts at the pricing meeting if the issuer does not accept the final offer price suggested by the underwriter.

Empirical evidence supports a connection between reference point bias and expertise bias: Price revisions appear to be a practice done primarily by more prestigious underwriters.¹⁷⁶ Less prestigious underwriters on average make negative price revisions, while more prestigious underwriters make on average 4.3% positive price revisions.¹⁷⁷ Price revisions are very highly correlated with underpricing in issues underwritten by more prestigious issuers, but there is no association in issues underwritten by less prestigious underwriters.¹⁷⁸

Expertise bias may also interact with myopia. At the time of the pricing meeting, the issuer may regret its weak bargaining position on the final offer price that resulted from its preferences for a prestigious underwriter when it selected a lead underwriter. Expertise bias may also help explain the breakdown of reputational mechanisms in underwriting markets. If issuers overvalue underwriter prestige in IPO markets, they are less likely to choose underwriters based on their history mitigating underpricing.

¹⁷⁵ See, e.g., Securities and Exchange Commission Litigation Release No. 18113 (Apr. 28, 2003), *available at* <https://www.sec.gov/litigation/litreleases/lr18113.htm> (alleging that Goldman Sachs violated NASD and NYSE rules by, among other allegations, compensating analysts in part upon their participation in investment banking-related activities; permitting analysts to participate in investment banking marketing efforts; and publishing recommendations that were exaggerated or unwarranted in furtherance of investment banking activities); SEC v. Bear, Stearns & Co., et al. 03 Civ. 2937 (S.D.N.Y. 2004) (alleging that investment banks were authorizing and possibly requiring analysts to give favorable ratings to clients when those ratings were not warranted); See generally Hurt, *supra* note 42, at 756-758 (describing various enforcement actions and litigation matters related to research analyst coverage).

¹⁷⁶ Wei Wang & Chris Yung, *IPO Information Aggregation and Underwriter Quality*, 15 REV. FIN. 301, 302 (2011) (stating that pre-IPO revisions are 65% more variable for reputable banks); Lowry & Schwert, *supra* note 40, at 4 (finding that more prestigious underwriters’ pricing revisions are likely to be larger than less prestigious underwriters). The information extraction theory, which assumes the initial offering range is unbiased, interprets this data to mean that prestigious underwriters are better at extracting positive information from investors in the solicitation period. See *infra* Section IV.A.2.

¹⁷⁷ Wang & Yung, *supra* note 176, at 309, Table 1.

¹⁷⁸ *Id.* at 304.

IV. Traditional Explanations and the Learning Puzzle

The naïve issuer theory is less persuasive if other satisfactory theories of IPO underpricing exist that specify a complete equilibrium in which all participants act rationally. In this Part, I evaluate the dominant theories of IPO underpricing and analyze their underlying logic. I show that information asymmetry and agency cost explanations of IPO underpricing raise a puzzle: why do new issuers fail to learn from the mistakes of previous issuers and to respond with institutional and contractual solutions? And why do they not invest in learning about their own valuation and their investment bankers’ processes? The information asymmetry and agency cost theories of IPO underpricing provide plausible first-order market failures to explain why first-best outcomes fail to obtain in IPO markets. However, any satisfactory explanation of IPO underpricing must also identify a second-order market failure that prevents or limits private-order responses from establishing second-best outcomes. The failure of the traditional explanations to adequately address the learning puzzle critique suggests that they are incorrect or incomplete.

A. *Information Asymmetries*

The dominant explanation of IPO underpricing in the academic literature is that underpricing arises as a solution to problems of information asymmetries in IPO markets.¹⁷⁹ This Part describes the two strands of information asymmetry theories and analyzes whether issuers might address these problems through contractual or other private-order solutions. One strand, the winner’s curse explanation, theorizes that underpricing serves to compensate uninformed investors who face expected adverse selection in IPO markets. Another strand, the information extraction theory, posits that underwriters strategically allocate underpriced shares of stock to compensate investors who reveal private information. I demonstrate that IPO markets lack the cost-effective institutional and contractual features that mitigate information asymmetry problems. The failure of issuers to learn from the problems arising from the theorized information frictions suggests that theories of IPO underpricing based on information asymmetries are unsatisfactory or incomplete.

1. The Winner’s Curse

The “winner’s curse” explanation of IPO underpricing posits that underpricing serves as compensation to uninformed investors who are subject to adverse selection in IPO markets.¹⁸⁰

¹⁷⁹ See, e.g., Ljungqvist, *supra* note 6, at 379 (stating that the empirical evidence supports the view that information frictions contribute to IPO underpricing, but the evidence for other theories is mixed); See Ritter, *supra* note 14, at 348 (stating that the asymmetric information-based models with no agency problems dominate the academic literature); Hurt, *supra* note 42, at 724 (stating that the cause of underpricing most often cited by economists is that it constitutes consideration to investors that reveal their private valuation information).

¹⁸⁰ Rock, *supra* note 34. A strand of the winner’s curse literature also posits that the winner’s curse may be exacerbated if uninformed investors can receive signals from informed investors. Ivo Welch, *Sequential Sales, Learning, and Cascades*, 47 J. FIN. 695 (1992) (arguing that signals sent by investors withdrawing from an IPO may lead to a cascade of other investors withdrawing); Yakov Amihud et al., *Allocations, Adverse Selection and Cascades in IPOs: Evidence from the Tel Aviv Stock Exchange*, 68 J. FIN. ECON. 137 (2003) (finding that a sample of Israeli IPOs tend to be either undersubscribed or greatly oversubscribed, a finding the authors characterize is consistent with the information cascade theory).

The winner’s curse explanation is based on a classic lemons model.¹⁸¹ Some IPOs are “good” investments and some are “bad” investments (lemons) that will lose money. The twist is that informed investors can distinguish the good IPOs from the lemons, but uninformed investors cannot.¹⁸² The informed investors are assumed to be sufficiently small that they cannot fill any given IPO solely with their own demand.¹⁸³ Without underpricing, uninformed investors in IPO markets would be “cursed” because they would receive a disproportionate share of the lemons IPOs to which informed investors do not subscribe.¹⁸⁴ The uninformed investors anticipate the bias to their allocations and shave their bids downward for all IPOs—the good ones and the lemons—as a response to the expected adverse selection.¹⁸⁵ The winner’s curse theory suggests that underpricing serves as the guarantee to uninformed investors that they will receive a positive expected return on their investment, whether the issue is “good” or “bad”. The information rents that accrue to informed investors serve as a necessary cost to keep uninformed investors in IPO markets.

Adverse selection is indeed a classic market failure that leads to inefficiencies in markets.¹⁸⁶ However, sellers are not merely doomed to accept whatever lemons discount risk-averse buyers might demand. In other markets, including consumer products markets and markets for structured financial products, sellers utilize a warranty to mitigate lemons problems. If uninformed investors require a guarantee on their investment to continue participating in IPO markets, it is puzzling that issuers fail to offer investors warranties. The provision of a warranty would eliminate the need for underpricing by directly alleviating the adverse selection.¹⁸⁷

In IPO markets, a simple and readily available warranty mechanism exists. Issuers could bundle a derivative with each share of common stock sold in the IPO that would return a specified percentage of losses at a specified point in time.¹⁸⁸ Underpricing is an extremely crude mechanism to address adverse selection. Warranties are more efficient mechanisms, and, importantly, issuers that used warranties would capture the value associated with the information rents that accrue to first-day investors under the winner’s curse model.

If the winner’s curse explains underpricing, it is also puzzling that IPO markets do not exhibit more efforts by issuers to close the information gap among uninformed investors.¹⁸⁹ For

¹⁸¹ Ljungqvist, *supra* note 6, at 384. See also George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488, 490-91 (1970) (analyzing the adverse consequences of asymmetric information).

¹⁸² *Id.* at 190-191.

¹⁸³ *Id.* at 191. The assumption that there are not enough informed investors to fill any single IPO may have been more intuitively plausible in 1986 when Rock first published the paper, but it is less plausible today. Since the 1980s, investing markets have seen a rapid increase in the assets under management of mutual funds, private equity funds, venture capital funds, and other informed investors and intermediaries that participate in IPO markets. See generally Marcel Kahan & Edward Rock, *Embattled CEOs*, 88 TEXAS L. REV. 988 (2010) (describing the long-term trend of increasing size and influence of institutional investors and other shareholder groups).

¹⁸⁴ *Id.* at 192 (stating that the probability of an uninformed investor receiving an allocation in an overpriced offering is greater than the probability of receiving an allocation in an underpriced offering).

¹⁸⁵ *Id.* at 193.

¹⁸⁶ Akerloff, *supra* note 181 at 490-91 (1970) (analyzing adverse consequences of asymmetric information in markets).

¹⁸⁷ *Id.* at 499.

¹⁸⁸ See Lawrence M. Ausubel, *Implications of Auction Theory for New Issues*, in BROOKINGS-WHARTON PAPERS ON FINANCIAL SERVICES 331 (Richard Herring, ed., 2002).

¹⁸⁹ Ljungqvist, *supra* note 6, at 388 (stating that under information asymmetry theories of IPO underpricing there are clear incentives to reduce the information asymmetry).

instance, dominant bookbuilding processes are characterized by bilateral conversations and secrecy and constitute a very inefficient auction process if the goal is to ameliorate adverse selection. Issuers worried about the winner’s curse should insist on clock auctions and direct education of investors, such as through electronic road shows.¹⁹⁰ Instead, road shows are usually compressed into a ten-day time frame with a limited number of bilateral conversations with investors that are hand-selected by the lead underwriter. It is also surprising that there are not more robust market mechanisms available to issuers that wish to purchase certification.¹⁹¹

Issuers could also offer a price-setting tranche of the IPO that would only be open to informed investors and that might even provide a discount to incentivize information revelation.¹⁹² Uninformed investors could participate in a non-price-setting tranche at the market-clearing price.¹⁹³ Uninformed investors would not need to worry about adverse selection if they allowed the informed investors to engage in price discovery and received the same price as the informed investors.

Finally, the winner’s curse theory directly yields a trade-off between a greater average offer price and greater guaranteed proceeds.¹⁹⁴ The winner’s curse theory suggests that, for underwriters that are not desperate for a fixed amount of cash, it would be more efficient to engage an underwriter on a best efforts basis. Under a best efforts agreement, the issuer and the underwriter would agree to set the final offer price at the price at which informed investors would pay. The quantity the issuer could sell would be limited by the amount informed investors are willing to purchase, but this approach would eliminate the need to underprice due to adverse selection. However, best efforts underwriting agreements have been largely displaced by firm commitment underwriting agreements in IPO markets.¹⁹⁵

Finally, the concept of “good” and “bad” IPOs at the heart of the winner’s curse model is problematic once reputational mechanisms are considered, unless the underwriter is as clueless as the uninformed investors.¹⁹⁶ The winner’s curse theory fails to explain why “good” issuers do not demand reputational mechanisms that would prevent informed investors from extracting information rents from their issues merely because there are free-riding “bad” issuers in the

¹⁹⁰ See NYSE/NASD IPO Advisory Committee, *supra* note 42, at 15 (recommending that regulators impose mandatory disclosure of their IPO road show electronically to an unrestricted audience).

¹⁹¹ The effect of hiring a prestigious underwriter on underpricing varies by time, and the most recent results show that more prestigious underwriters are associated with *higher* underpricing—the opposite of a certification effect by prestigious underwriters. See R. P. Beatty & I. Welch, *Issuer Expenses and Legal Liability in Initial Public Offerings*, 39 J. L. & ECON. (1996) (finding that more prestigious underwriters increase underpricing in the 1990s). Habib and Ljungqvist have argued that the negative correlation is spurious and merely reflects selection effects, but even their results suggest that underwriter prestige has no effect on underpricing and therefore no certification effect. Michel A. Habib and Alexander P. Ljungqvist, *Underpricing and Entrepreneurial Wealth Loss in IPOs: Theory and Evidence*, 14 REV. FIN. STUDIES 433, 437 (2001). Like Lowry et al., I am not convinced that Habib and Ljungqvist’s choice of pre-IPO assets and earnings as instruments satisfies the exclusion restriction. See Lowry et al., *supra* note 6, at 41.

¹⁹² The securities laws would have to be changed to permit discriminatory IPO pricing for this approach to be feasible. Schnitzlein et al., *supra* note 74.

¹⁹³ *Id.* at 13.

¹⁹⁴ Rock, *supra* note 34, at 195-196. See also *supra* notes 67-68.

¹⁹⁵ See, e.g., Lowry, *supra* note 6, at 26 (stating that firm commitment arrangements are most common).

¹⁹⁶ See generally Robert Wilson, *Game-Theoretic Models of Bargaining*, in REPUTATIONS IN GAMES AND MARKETS (A. Roth, ed., 1985) (describing reputation dynamics in repeat-settings where there is uncertainty about some property of one or more participants in the minds of the other participants). On the contrary, empirical evidence suggests that underwriters do indeed seem to have considerable knowledge about market value pricing, even when they agree to a final offer price below market value. See *supra* notes 99-101 and accompanying text.

market. No IPO is intrinsically “good” or “bad;” these determinations can only be made in relation to the offer price. Underwriters have a simple solution to turn a “bad” IPO into a “good” IPO, or vice versa—lower (or raise) the offer price below (above) market value. Those underwriters that are willing to bring lemons to the market should lose the confidence of uninformed investors and would shortly be unable to fill subscriptions for IPOs. Other issuers that are not trying to push overvalued assets on capital markets would select those underwriters that have a reputation for taking only “good” IPOs to markets and therefore would not need to discount their prices.

2. The Information Extraction Theory

The information extraction theory, originating with Benveniste and Spindt, is the dominant explanation for IPO underpricing in the theoretical and legal academic literature. Its proponents argue that underpricing is part of the compensation package that underwriters offer to investors in exchange for their truthful revelation of private information about the valuation of issuers.¹⁹⁷ The underwriter’s practice of partially adjusting positive information revealed by investors purportedly has the effect of reducing required underpricing in the aggregate across issuers.¹⁹⁸ Underpriced shares serve as the compensation provided in exchange for investors’ private information.¹⁹⁹

But investors have incentives to hide their private information in every sales process, not just IPOs. Like in a second-price auction, the information extraction theory posits that underwriters should announce allocation rules that induce investors to truthfully reveal their private, positive information.²⁰⁰ To a first approximation, the optimal allocation rules proposed by Benveniste and Spindt are identical to those in a standard auction: reward investors that submit high bids with allocations and punish investors that submit low bids by withholding allocations.²⁰¹

Without social redistribution, the benefits of the Benveniste and Spindt’s optimal price and allocation rules cannot be maintained if competition between investors is introduced. The posted-price selling mechanism embodied by the information extraction theory generally yields a lower price for the seller than a second-price auction, and can reproduce or exceed the efficiency of a second-price auction only under restrictive conditions and assumptions.²⁰² Indeed, auction processes are commonly used in other complex sales relating to mineral rights, spectrum licenses, and U.S. treasuries, and they are commonly thought to be the sales mechanism that maximizes proceeds for sellers in these contexts.²⁰³

¹⁹⁷ Benveniste & Spindt, *supra* note 29. See also Chester Spatt & Sanjay Srivastava, *Preplay Communication, Participation Restrictions and Efficiency in Initial Public Offerings*, 4 REV. FIN. STUDIES 709 (1991).

¹⁹⁸ See, e.g., Ljungqvist & Wilhelm, *supra* note 15, at 169 (stating that compensating investors for revealing private information diminishes the issuer’s proceeds from the offering ex post, but maximizes expected proceeds).

¹⁹⁹ Benveniste & Spindt, *supra* note 29, at 344. See also Ljungqvist & Wilhelm, Jr., *supra* note 15, at 180.

²⁰⁰ Benveniste & Spindt, *supra* note 29, at 344-45.

²⁰¹ *Id.*, at 352, Theorem 1.

²⁰² Chester Spatt & Sanjay Srivastava, *Preplay Communication, Participation Restrictions, and Efficiency in Initial public offerings*, 4 REV. FIN. STUDIES 709, 715-16 (1991).

²⁰³ See, e.g., PAUL MILGROM, PUTTING AUCTION THEORY TO WORK 2 (2004) (discussing auctions of spectrum rights); Paul R. Milgrom & Robert J. Weber, *A Theory of Auctions and Competitive Bidding*, 50 ECONOMETRICA 1089, 1089 (1982) (stating that auctions account for an enormous volume of economic activity).

So why not just run an auction process? Under the information extraction theory, bookbuilding is superior to a pure auction because underwriters can redistribute underpricing across issuers as a group by pooling them all together.²⁰⁴ The optimal offer price and allocation schedule that Benveniste and Spindt set forth has the express and intentional design of underpricing hot issues with high demand and accurately pricing cold issues in which investors have low demand.²⁰⁵ By underpricing the hot issues, underwriters provide investors with a surplus profit that the underwriter can draw against in future issues to induce investors to take a badly received IPO off the underwriter’s hands.²⁰⁶

Proponents of the information extraction theory in the academic literature frequently state that the theory implies that underpricing is *required* to reward investors for truthfully revealing good information.²⁰⁷ Later researchers—mostly in empirical papers—also interpreted the information extraction theory to imply that, to reward investors that reveal good information, underwriters must limit upward price revisions so that they only partially incorporate positive information revealed by investors and leave some underpricing as compensation in exchange for the revelation of the positive information.²⁰⁸ But these claims are both normative and not logical claims. As in a second-price auction, the Benveniste and Spindt information extraction theory model strictly requires no underpricing.²⁰⁹

²⁰⁴ Benveniste & Spindt, *supra* note 29, at 354. *See also* Ljungqvist & Wilhelm, Jr., *supra* note 15, at 185 (stating that Benveniste and Spindt argue that underwriters can reduce underpricing by ‘bundling’ deals.”

²⁰⁵ This is the direct result of the proposed proceeds-maximizing offer price: “[t]he surplus is targeted at regulars with good information most effectively by underpricing when all regulars who declare [high interest] receive allocations – that is, when [interest] is high.” Benveniste & Spindt, *supra* note 29, at 352. *Id.*

²⁰⁶ Benveniste & Spindt, *supra* note 29, at 354. Later extensions of Benveniste and Spindt’s model that deal with problems of costly information production rely on the same redistributive logic as the Benveniste and Spindt model, and they impose restrictive assumptions and conditions. *See, e.g.,* Sherman, *supra* note 40, at 704-05 (showing that underwriters can “bribe” investors to accept a lower return on an issue through the promise of allowing them to participate in future underpriced offerings).

²⁰⁷ *See, e.g.,* Sherman, *supra* note 40, at 698 (stating there is no way for underwriters to give investors the incentive to report their information accurately without preferential allocations); Loughran & Ritter, *supra* note 18, at 415 (Benveniste & Spindt’s model “argues that regular investors, in order to truthfully reveal their demand to an underwriter during the bookbuilding phase of an IPO’s marketing, must be rewarded with more underpricing on deals for which there is strong demand.”); Kathleen Weiss Hanley, *The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon*, 34 J. FIN. ECON. 231, 233 (1993); Ljungqvist & Wilhelm, Jr., *supra* note 15, at 169 (stating that Benveniste and Spindt’s model argues that institutions would have little incentive to bid aggressively without compensation in the form of large allocations of underpriced shares).

²⁰⁸ *See* Hanley, *supra* note 207 at 232 (stating that Benveniste and Spindt explain why prices only partially adjust to demand); Ljungqvist & Wilhelm, *supra* note 207 at 180 (stating that the partial adjustment phenomenon in the Benveniste and Spindt framework describes the practice of underwriters to only raise the price of securities partially in order to reward information revelation through underpriced securities); Ljungqvist & Wilhelm, *supra* note 40 at 735 (stating that the Benveniste and Spindt framework requires partial adjustment of the offer price with respect to the positive information received) Ritter & Welch, *supra* note 15, at 1811 (stating that the information extraction theory predict that the final offer price is not fully adjusted from the midpoint of the file price range when underwriters receive favorable information); Ritter, *supra* note 14, at 355 (stating that a central prediction of the Benveniste and Spindt model is that there should be partial adjustment to favorable private information revealed during bookbuilding); Loughran & Ritter, *supra* note 18, at 415 (stating that the prevailing wisdom among academics for why underwriters partially adjust offerings is based on the Benveniste and Spindt model).

²⁰⁹ In their proof to Theorem 1, Benveniste and Spindt show that the underwriter can minimize underpricing in *every* offering by merely setting the offer price to the expected price as revealed by investors. Benveniste & Spindt, *supra* note 29, at 360. When translating their findings into the optimal allocation schedule, Benveniste and Spindt add the normative claim that underpricing is most effectively “targeted”—presumably, in a socially optimal manner—when the underwriter manufactures underpricing in issues with high demand. *Id.*, at 352. Puzzlingly—and

The unique contribution of the information extraction theory to the IPO underpricing literature is not its insights into efficient auction design, as much of the subsequent literature has implied. Rather, the unique contribution of the information extraction theory is the provision of a socially redistributive objective function that specifies parameters under which underwriters acting as benevolent social planners can use hot issues to cross-subsidize cold issues without increasing aggregate underpricing across issuers. The underwriter cannot reduce underpricing for issuers in the aggregate in the Benveniste and Spindt framework, but can only redistribute value from “good” IPOs to “bad” IPOs.²¹⁰

If the information extraction theory accurately identifies one of the causes of underpricing in IPO markets, it dramatically highlights the learning puzzle critique. Why do issuers agree to go public through a process characterized by inefficient cross-subsidization? Strategic underpricing is beneficial to underwriters for obvious reasons. And the information extraction theory provides an explanation for the social utility of strategic underpricing to issuers as a group if all issuers are willing to take a hit for the team. But the underwriter’s practice of cross-subsidizing the cold issues is not efficient or desirable for an issuer undergoing an IPO with high demand.

The highly demanded issuer should instead insist on choosing an IPO process with contractual protections that would mitigate inefficient underpricing. For example, the highly demanded issuer might choose an underwriter with a reputation for not engaging in strategic underpricing. The issuer might also insist on allocation rules that remove the underwriter’s pricing discretion and more strictly define the offer price as the highest price at which supply clears demand. In general, a second-price auction would be a preferable mechanism for all highly demanded issuers. Instead, issuers agree to give underwriters complete and unfettered discretion over allocation decisions.

B. *Agency Cost Theories*

Along with information asymmetry explanations, the dominant explanation for IPO underpricing is that underpricing arises due to underwriter conflicts of interest.²¹¹ This Section describes the principal-agent problem at the heart of agency cost theories of underpricing and analyzes whether issuers might address these problems through contractual or other private-order solutions. I show that IPO markets lack the classic institutional and contractual features that generally mitigate principal-agent problems. The failure of issuers to learn from and take cost-

this is likely the cause of future confusion in the literature—Benveniste and Spindt also state that the intuition behind Theorem 1 is that: “[e]xpected underpricing arises to provide incentives for regulars to reveal good information.” *Id.* But the posted-price mechanism of the Benveniste and Spindt model can only reproduce the efficiency of a second-price auction, which also incentivizes truthful revelation of information, under restrictive circumstances. Spatt & Srivastava, *supra* note 202.

²¹⁰ An objection may be that Benveniste and Spindt’s theorem 2 contradicts this point. It states: “For a given minimum of presales, an underwriter can provide unconditionally higher proceeds to an issuing firm by giving priority to regular investors.” Benveniste & Spindt, *supra* note 29, at 355. But, for any given issue, the underwriter’s stick is only as big as the value it can credibly commit to redistribute from future offerings.

²¹¹ See Ritter, *supra* note 14, at 348 (arguing that agency cost theories of IPO underpricing are of first-order importance); Ljungqvist, *supra* note 6, at 396 (describing principal-agent model explanations of IPO underpricing); Hurt, *supra* note 42, at 725 (stating that the underpricing of IPO shares is often an intentional act resulting from agency conflicts).

effective responses to agency problems suggest that existing agency-cost theories of IPO underpricing are unsatisfactory or incomplete.

When a potential issuer delegates the task of running an IPO transaction to a lead underwriter, the underwriter’s interests may diverge from the potential issuer’s interests in two ways. First, the issuer may face a moral hazard problem because the underwriter has incentives to minimize distribution costs and other effort costs.²¹² Secondly, and more significantly, the underwriter may acquire private information throughout the IPO process, subjecting the issuer to an adverse selection problem.²¹³ The underwriter might use its private knowledge to extract information rents.²¹⁴

The theorized mechanism that underwriters use to extract information rents from the issuer is implicit but straightforward. Underwriters allocate shares of underpriced stock to investors from whom they expect to receive something of value in return. These investors funnel valuable investment banking and trading business to underwriters and their affiliates as a *quid pro quo*.

While data on the allocation practices of U.S. underwriters in IPOs is sparse, empirical studies strongly support the proposition that allocations are in part motivated by favoritism of investors that provide investment banks high fees and commissions.²¹⁵ Numerous SEC enforcement actions have targeted underwriters that allocated underpriced shares of stock to the individual accounts of executives with the expectation of receiving increased investment banking business as a *quid pro quo*, a practice called spinning.²¹⁶ There is also extensive evidence that investors engage in rent-seeking activities in order to receive preferential allocations from underwriters.²¹⁷

²¹² ANDREW MAS-COLELL ET AL., MICROECONOMIC THEORY 445, 448, 477 (1995); Baron, *supra* note 44, at 955-56 (presenting a model of IPO underpricing based on underwriter moral hazard). *See also* Hurt, *supra* note 42, at 733 (stating that the bookbuilding generates underwriter moral hazard).

²¹³ ANDREW MAS-COLELL ET AL., *supra* note 212, at 436-50.

²¹⁴ *See supra* note 90 and accompanying text.

²¹⁵ Jonathan Reuter, *Are IPO Allocation for Sale? Evidence from the Mutual Fund Industry*, 61 J. FIN. 2289 (2006) (finding a positive relation between the commissions a mutual fund family pays to an investment bank and the fund’s holdings of IPOs underwritten by that bank); M. Nimalendran et al., *Do Today’s Trades Affect Tomorrow’s IPO Allocations*, 84 J. FIN. ECON. 87 (2006) (finding that institutional investors appear to compete to give underwriters higher trading commissions in the six days preceding an IPO); Michael A. Goldstein et al., *Purchasing IPOs with Commissions*, 46 J. FIN. & QUANTITATIVE ANALYSIS 1193 (2011) (documenting that investors increase round-trip stock trades and pay unusually high trading commissions to book runners around the time of an IPO); and Jenkinson et al., *supra* note 56 (finding that investment banks in IPOs primarily on European stock exchanges allocate IPO shares disproportionately to clients that provide them higher revenues). *See also* Lowry et al., *supra* note 6, at 52-55 (summarizing the literature on conflicts of interest between underwriters and issuing firms); Jay Ritter & Donghang Zhang, *Affiliated Mutual Funds and the Allocation of Initial Public Offerings*, 86 J. FIN. ECON. 337 (2007) (finding that mutual funds that are affiliated with underwriters of an IPO are more likely to receive allocations of valuable IPOs).

²¹⁶ *See infra* notes 235-241 and accompanying text.

²¹⁷ *See infra* note 221 and accompanying text (alleging that investors who received underpriced shares in IPOs returned as much as 65% of the profits that they received from the underpriced shares back to the underwriter in the form of commission business); *In the Matter of Peter G. Grabler*, Order Instituting Cease-And-Desist Proceedings Pursuant to Section 21C of the Securities Exchange Act of 1934, Making Findings, and Imposing a Cease-And-Desist Order, SEC Administrative Proceeding File No. 3-13886 (May 11, 2010) (alleging that Peter Grabler “engaged in a strategy of participating in numerous secondary offerings of stock in public companies in order to improve his access to initial public offerings . . . underwritten by the same broker-dealers through which he participated in the secondary offerings.”).

The empirical studies providing evidence that underpricing arises from underwriter conflicts of interest has led many to posit that such agency costs at least partially explain IPO underpricing. But the empirical literature has outpaced the theoretical literature. Numerous other markets involve transactions in which agents act on behalf of principals, but few such markets operate with an average discount of 18% of the value of each transaction due to agency problems.

Agency costs and conflicts of interest certainly provide a plausible first-order market failure that might generate underpricing. But why do new IPO issuers fail to learn from the agency costs suffered by prior IPO issuers? Parties typically contract around agency problems, but IPO markets do not exhibit the institutional mechanisms and contractual arrangements that other markets plagued by agency problems employ to address conflicts of interest. Such features could broadly take three forms. First, issuers could align the incentives of underwriters with their own incentives through compensation. Secondly, issuers could weaken the rent extraction mechanism by contracting for decreased underwriter discretion in allocation decisions. Finally, issuers could implement institutional mechanisms that mitigate agency problems, such as by selecting issuers with a reputation for accurate pricing or by imposing a contractual fiduciary duty on the underwriter.

First, consider incentive-based compensation. Agency problems can be addressed by making the agent’s compensation a function of the total value to the principal. For example, it is commonly believed that giving CEOs compensation in the form of stock options aligns the interests of the CEO with the interests of stockholders in maximizing the value of the firm.²¹⁸ The gross spread serves a parallel function in underwriting agreements. The gross spread is specified as a fixed percentage of the total proceeds of the issuer, frequently around 7%.²¹⁹ This pricing term aligns the underwriter’s incentives with the issuer’s interests by giving the underwriter 7% of any increase in the proceeds the issuing firm raises.

However, the contractual effort to align incentives through compensation is incomplete. In the agency cost line of the IPO underpricing literature, it is believed that the information rents underwriters obtain from underpricing far outweigh foregone gross spread revenue.²²⁰ For example, the SEC alleged that, as a direct result of preferential allocation of underpriced shares of stock, Credit Suisse First Boston (“CSFB”) received commission business equal to as much as 65% of the profits that some investors received from hot IPOs.²²¹ Underwriters prefer 65% to 7% when it comes to revenues.

To complete the alignment of interests through compensation, underwriting agreements could contain a claw back mechanism that would require underwriters to return some portion of the IPO underpricing. If underwriting markets are competitive, the increased risk underwriters would assume through the claw back mechanism would be compensated by an increase in the

²¹⁸ See, e.g., David Yermack, *Do Corporations Award CEO Stock Options Effectively?*, 39 J. FIN. ECON. 237, 242 (1995) (conjecturing that boards of directors use stock options to increase CEOs’ pay-performance sensitivities).

²¹⁹ See Hsuan-Chi Chen & Jay R. Ritter, *The Seven Percent Solution*, 55 J. FIN. 1105 (2000) (finding that more than 90% of IPOs in the late 1990s that raised between \$20 and \$80 million in proceeds had spreads of exactly 7%).

²²⁰ See Loughran & Ritter, *supra* note 19, at 8 (summarizing the reasons why it may be profitable for underwriters to underprice); Loughran & Ritter, *supra* note 18, at 416 (arguing that underwriters are willing to forego gross spread revenue in order to receive indirect compensation through underpricing); Hurt, *supra* note 42, at 735 (stating that the increased revenue derived from underpricing might exceed the foregone direct fee revenue for underwriters).

²²¹ SEC Litigation Release 17,327 (January 22, 2002); SEC News Release 2002-14 (reporting that the SEC charged CSFB with abusive IPO allocation practices related to spinning and reporting a \$100 million settlement).

gross spread. Alternatively, underwriting agreements could provide that part of the compensation of underwriters come in the form of discretionary fees that are only paid out to the extent the issuer is satisfied, a practice common in other jurisdictions but not in the U.S.²²²

Issuers are also subject to a moral hazard problem because it is easier and less costly for underwriters to place underpriced issues.²²³ The efficient contract in this context would involve paying the underwriter direct compensation for distribution costs. For example, the issuer could pay the underwriter a bonus tied to the number of bids received.²²⁴ However, underwriting agreements do not contain direct payments for distribution costs, and they enshrine bookbuilding processes that give underwriters maximal leverage to impose moral hazard costs.

If underwriter conflicts of interest explain IPO underpricing, it is also puzzling that underwriting agreements fail to limit or monitor underwriter discretion in allocation decisions.²²⁵ Issuers could demand an entirely different price discovery method than the dominant one employed by bookbuilding, which is characterized by secrecy and unfettered discretion by the underwriter.²²⁶ Underwriters could even keep the bookbuilding process but split the price-discovery and allocation decisions by hiring one investment bank to set the price and an independent investment bank or other third party to make allocation decisions.²²⁷

Perhaps the most significant challenge to the adequacy of agency-cost theories of IPO underpricing is why reputational mechanisms fail to address agency problems. Underwriters are repeat players in IPO markets, so reputational mechanisms should develop to move the parties to a more efficient equilibrium that lacks distortions due to conflicts of interest. The reputational mechanism should work through the selection of underwriters that do not extract information rents by underpricing. On the contrary, empirical evidence shows issuers tend to make exactly the opposite choice. Underwriters that underpriced more than their competitors actually *gained* market share for underwriting services over the period of 1980-2007.²²⁸

Agency theory explanations fail to explain why issuers do not contract for fiduciary protections. Instead, virtually all issuers in U.S. IPOs consent to a term in underwriting agreements in which the parties state that they are engaging each other as principals. In contexts in which agency problems are particularly problematic, as they appear to be under agency-cost theories of underpricing, most states’ corporate laws impose mandatory, non-waivable fiduciary duties on contracting parties.²²⁹ But no states’ corporate law imposes mandatory fiduciary duties

²²² Jenkinson et al., *supra* note 56, at 9.

²²³ See *supra* note 212 and accompanying text.

²²⁴ Baron, *supra* note 44, at 957.

²²⁵ Biais et al., *supra* note 44, at 118, 119 (finding that an optimal IPO mechanism would limit allocation discretion if the underwriter of the IPO had incentives to underprice).

²²⁶ See *supra* Section II.B for a description of the optimal auction in a setting reflecting neoclassical economic assumptions.

²²⁷ See Tim Jenkinson & Howard Jones, *Competitive IPOs*, 15 EUR. FIN. MGMT. 733 (2009) (analyzing cases in European IPOs which issuers separate the preparation and distribution roles of investment banks).

²²⁸ Gerard Hoberg, *The Underwriter Persistence Phenomenon*, 62 J. FIN. 1169, 1169 (2007) (stating that high underpricing underwriters have gained market share over time).

²²⁹ Delaware law imposes a well-known duty of loyalty on members of the board of directors of corporations. See, e.g., *Ivanhoe Partners v. Newmont Min. Corp.*, 535 A.2d 1334, 1341 (Del. Sup. Ct., 1987) (stating that the board of directors is charged with a fiduciary duty of loyalty in meeting its obligations to manage the business and affairs of a corporation). The duty is particularly implicated when directors stand on both sides of a transaction or are beholden to a party with an interest in the transaction. *Id.* at 1346. In the context of Delaware corporate law, the dominant view is that most aspects of the fiduciary duty of loyalty are mandatory and non-waivable. See Gabriel

on underwriters in IPO markets, and issuers eagerly and expressly bargain away their contractual rights to a fiduciary duty in underwriting agreements.²³⁰

One counterargument to the notion that issuers should bargain for fiduciary protections is that doing so would eliminate the insurance value of a firm commitment offering. Without engaging the issuer as a principal, an underwriter cannot accept the principal risk necessary to guarantee a certain level of offering proceeds and to provide insurance value. This counterargument might have force if underwriters truly took on principal risk, such as if the parties agreed at the engagement on the economics of the IPO to be conducted six months later. But, instead, underwriters have structured contemporary firm commitment offerings to virtually eliminate principal risk. As a practical matter, the most principal risk that underwriters assume in contemporary firm commitment offerings is overnight risk. Issuers and underwriters do not agree on the pricing and quantity terms of the IPO until the pricing meeting after markets close the day before the IPO. Underwriters do not become obligated to purchase the issuer’s securities until they sign the underwriting agreement that night when demand uncertainty has already been resolved.²³¹ To the extent that underwriters actually did provide insurance value by committing to the economics of the IPO months ahead of time, there would be no need for protections against conflict of interest. Selling the shares of the issuer’s common stock at a discount to the public would then become the underwriter’s problem, not the issuer’s problem.

Conflicts of interest do not even appear to be a relevant factor for issuers when selecting a lead underwriter or when negotiating the underwriting agreement. Issuers might negotiate for better information about the agency conflicts of their underwriters to help them make a more informed choice about the risks of underwriter agency conflicts. Later in the process, issuers could demand that underwriters agree to certain representations and warranties, such as ones specifying that the lead underwriter will run an inclusive auction process and that they will allocate shares of stock on the basis of the investors that offer the highest prices. However, issuers in IPO markets do not ask for even minimal disclosures or representations and warranties regarding underwriters’ allocation practices that might bear on agency problems.

C. *Issuer-Internal Conflicts of Interest and Momentum Trading*

A final explanation for IPO underpricing is that it results from issuer internal conflicts of interest. This Section describes the logic of these theories. I show that IPO markets have not moved towards the efficient terms and arrangements that would mitigate issuer-internal conflicts and have instead moved in the opposite direction. Like the other traditional explanations, the issuer-internal agency cost explanation has at best partial explanatory power.

In general, issuer-internal agency costs explanations of underpricing suggest that conflicted decision-makers fail to monitor their underwriter’s decisions or bargain hard to increase the final offer price. The standard story is that rational shirking by decision-makers at issuers exacerbates underpricing. In other words, decision-makers will bargain harder on the IPO

Rauterberg & Eric Talley, *Contracting Out of the Fiduciary Duty of Loyalty: An Empirical Analysis of Corporate Opportunity Waivers*, 117 COLUM. L. REV. 1075, 1077 and note 8 (2017).

²³⁰ See, e.g., Stitch Fix, Inc., Prospectus, Exhibit 1.1, § 16 (Form 424B4) (Nov. 16, 2017) (disclaiming a fiduciary duty).

²³¹ Lowry et al., *supra* note 6, at 28 (stating that “the underwriter, at best, purchases the shares from the issuer only on the night before it goes public, when most of the uncertainty has been resolved”).

offer price if they have more skin in the game, for example, if they sell personal shares in the IPO.

Indeed, there is empirical evidence suggesting that decision-makers are more effective at mitigating underpricing when they are selling their own shares in the IPO, instead of newly issued shares of the corporation. Pre-IPO shareholders are still diluted to the extent of the discount on the primary shares, but the costs to decision-makers are much more severe when they directly sell their own shares at a discount in their IPO. In one prominent study, increased CEO ownership or increased sales in the IPO by the CEO yielded a statistically significant decrease in underpricing.²³²

A more complex story involves lock-up agreements and momentum trading. Pre-IPO shareholders that sign lock-up agreements with their lead underwriters are prohibited from selling their shares during the restricted period, usually six months.²³³ Decision-makers subject to lockup agreements may be rationally focused on the price of the stock at the expiration of the lockup period, rather than at the IPO. If they believe that underpricing can lead to momentum trading that will result in an abnormally high price at the expiration of their lock-up agreement, they have a personal incentive to underprice their IPO.²³⁴

The most prominent example of decision-makers ignoring the costs of underpricing due to their own conflicts of interest involves the practice of spinning, a type of *quid pro quo* arrangement that the SEC has expressly prohibited.²³⁵ Spinning refers to an allocation of underpriced shares of stock in an IPO by the underwriter to the personal accounts of executives of a company with the implicit expectation of receiving future investment banking business from such executives in return.²³⁶ Spinning is designed to give decision-makers at issuers a personal incentive to hire a particular underwriter for their firm’s IPO.

The GT Interactive Software IPO illustrates the effects of spinning.²³⁷ Joseph Cayre, the CEO of a privately held computer software firm called GT Interactive Software, purportedly made a \$2 million profit on the day of Pixar’s IPO when he flipped shares of Pixar common stock that had popped 77% above the offer price.²³⁸ Pixar’s lead underwriter, Robertson Stephens, allocated the stock to Cayre.²³⁹ When Cayre’s company, GT Interactive Software, went public the next month, it was underwritten by Robertson Stephens and channeled underwriting fees back to Robertson Stephens.²⁴⁰ Because Robertson Stephens was making side

²³² Ljungqvist & Wilhelm, Jr., *supra* note 40, at 725. *But see* Loughran & Ritter, *supra* note 19, at 31-32 (arguing that over a longer time period, there are only weak relations between underpricing and ownership structure).

²³³ *See generally* Alon Brav & Paul A. Gompers, *The Role of Lockups in Initial Public Offerings*, 16 REV. FIN. STUDIES 1, 8 (2003) (discussing lock-up agreements in IPOs).

²³⁴ *See* Rajesh K. Aggarwal et al., *Strategic IPO Underpricing, Information Momentum, and Lockup Expiration Selling*, 66 J. FIN. ECON. 105 (2002) (presenting a model in which managers strategically underprice IPOs to maximize personal wealth from selling shares at lockup expiration).

²³⁵ *See generally* Sean J. Griffith, *Spinning and Underpricing: A Legal and Economic Analysis of the Preferential Allocation of Shares in Initial Public Offerings*, 69 BROOKLYN L. REV. 583 (2004). *See also* Loughran & Ritter, *supra* note 19, at 11-12 (suggesting that spinning may explain IPO underpricing).

²³⁶ Lowry et al., *supra* note 6, at 54.

²³⁷ *Id.* at 634-36. *See also* Therese H. Maynard, *Spinning in a Hot IPO – Breach of Fiduciary Duty or Business as Usual?* 43 WM. & MARY L. REV. 2023, 2025 (2002) (discussing the IPO of GT Interactive Software). Michael Siconolfi, *The Spin Desk: Underwriters Set Aside IPO Stock for Officials of Potential Customers*, WALL ST. J., NOV. 12, 1997, at A1.

²³⁸ Maynard, *supra* note 237, at 2026.

²³⁹ *Id.*

²⁴⁰ *Id.*

payments to Cayre as GT Interactive Software’s IPO transaction was in progress, Cayre had an incentive to ignore underpricing in his own IPO. In turn, Robertson Stephens likely spun some of GT Interactive’s underpriced shares of common stock to executives at other companies.²⁴¹

Rule changes implemented by the National Association of Securities Dealers (“NASD,” later renamed FINRA) in the early 2000s that made it more difficult for underwriters to lawfully implement spinning arrangements provided a rare example of efficient learning in IPO markets—in this case, the learning was done by regulators.²⁴² The SEC and the NASD have also brought enforcement actions against alleged instances of spinning.²⁴³ The actions taken against spinning have improved efficiency in IPO markets, but the rules still fail to reach informal side-payments and many *quid pro quo* arrangements.²⁴⁴

The issuer-internal conflict of interest explanations of underpricing only peel the onion back an additional layer. The textbook theory of the firm predicts that firms evolve to possess efficient governance structures and to offer efficient employment contracts to their managers. If issuer-internal agency costs explain underpricing, why have IPO markets failed to evolve in the direction of encouraging shareholders or managers to monitor of underwriters? For example, lock-up restrictions and friends and family options have become more prevalent in IPOs over time. Lock-up restrictions may shield some pre-IPO stockholders from the worst costs of underpricing, thereby blunting their incentives to mitigate it. Friends and family options provide decision-makers with a side payment that directly incentivizes underpricing, much like spinning does.

In a friends and family option program, the board of directors—which is captured by management at some firms—issues options to key decision-makers on the day of or just prior to

²⁴¹ As Sean Griffith puts it, underpricing is both a means and an end of spinning. Griffith, *supra* note 235, at 589.

²⁴² FINRA (formerly the NASD) rules flatly prohibit underwriter allocations in IPOs to a narrowly targeted group of executives, broker-dealers, and associated or affiliated persons. FINRA Rule 5130 targets the mutual back-scratching that might occur if underwriters reciprocally allocated each other shares of underpriced common stock in IPOs. It prohibits underwriters from allocating shares of common stock in an IPO to the accounts of individuals and entities associated with other broker-dealers and certain institutional investors and investment companies. FINRA Manual, Rule 5130. FINRA Rule 5131 targets allocations that might be made to reward people who are in a position to direct future business to the investment bank. The rule generally prohibits underwriters from allocating any securities in an IPO to executives of public or certain private companies if it has received, expects to receive, or conditions the allocation on the receipt of investment banking services from that company. FINRA Manual FINRA Rule 5131, ¶ (b). The rule also prohibits a broker-dealer from offering or threatening to withhold shares of stock it allocates in an IPO as consideration or inducement for the receipt of excessive compensation. *Id.*, ¶ (a). In addition, the rules contain prophylactic measures designed to prohibit “abusive” allocation arrangements. Financial Institutional Regulatory Authority, Regulatory Notice 10-60: SEC Approves New FINRA Rule to Address Abuses in the Allocation and Distribution of New Issues 2 (May 27, 2011).

²⁴³ See Maynard, *supra* note 237, at 2039; Securities and Exchange Commission Litigation Release No. 17,923 (January 9, 2003) (setting forth the consent of Roberson Stephens to pay \$28 million in response to allegations that it allocated IPOs to institutional clients in exchange for past and future commission business); Private litigation has also targeted alleged quid pro quo arrangements between underwriters and investors. See, e.g., *EBC I Inc. v. Goldman Sachs & Co.*, 5 N.Y.3d 11, 19 (N.Y., 2005) (“[t]he complaint alleges that Goldman Sachs entered into arrangements ‘whereby its customers were obligated to kick back to Goldman a portion of any profits that they made from the sale of eToys securities subsequent to the initial public offering.’”).

²⁴⁴ See, e.g., Hurt, *supra* note 42, at 738 (stating that most allocations of IPO shares for the purpose of receiving a benefit in return are not prohibited under either SEC rules or NASD rules, including the predecessor rules of the current rules in place).

the IPO.²⁴⁵ The strike price of the option is the offer price, making the options increase in value with the extent of underpricing. The effect of the options is to reduce or reverse the losses managers experience due to underpricing. If these options contribute to underpricing, boards of directors should not be granting them, and the shareholders that stand to get diluted should be aggressively policing decisions by boards to grant these options.

Indeed, there is evidence that good governance does in fact mitigate the conflicts of interest that arise from family and friends options. The effect of family and friends options on underpricing varies by the governance of the firm. One study pooled all IPOs together and found that friends and family options had no significant effect on underpricing across the entire sample.²⁴⁶ A later study found that if it controlled for a proxy indicating that the issuer was a “well-governed” firm, the options did not increase underpricing.²⁴⁷ However, the options had a significant, positive effect on underpricing if the issuer was a “poorly governed” firm.²⁴⁸

Having an investor that is a sophisticated, repeat-player private equity firm may not increase the effectiveness of the issuer’s monitoring efforts if the investor holds convertible preferred stock. If the IPO is underpriced, the convertible preferred holders are not diluted, because they do not convert to common stock until after the market has already reached the new, higher price. From their perspective, underpricing has the beneficial effect of diluting *other* stockholders.

The failure of IPO firms to develop good governance and eliminate conflicts of interest suggests that issuer-internal conflict of interest theories have only limited explanatory power. An important open question in this strand of the literature is determining precisely who is pushing for lock-up agreements and friends and family options in IPOs? The lead underwriters in furtherance of their underpricing objectives? Or the decision-makers at issuers for their own personal gain? Another open issue is determining how pre-IPO shareholders make decisions of when to sell their personal shares in the IPO, and when holders of convertible preferred shares decide to convert.

V. Conclusion

The dominant theory purporting to explain IPO underpricing posits that underpricing serves to compensate investors in markets characterized by information asymmetries. Agency cost theories are also prominent in the academic literature. This Article shows that both of the leading theories fail to address the learning puzzle: why do issuers fail to learn from the mistakes of prior issuers that lead to underpricing? IPO market participants do not respond in ways that would be predicted by either of the dominant explanations of IPO underpricing. If information asymmetry explanations were accurate, IPO markets would contain more issuers utilizing warranties; educating investors; demanding more transparent price discovery processes; and demanding mechanisms designed to sort the good issuers from the lemons. If agency cost

²⁴⁵ Michelle Lowry & Kevin J. Murphy, *Executive Stock Options and IPO Underpricing*, 85 J. FIN. ECON. 39, 40 (2007).

²⁴⁶ *Id.*, at 41.

²⁴⁷ Salim Chahine & Marc Goergen, *The Two Sides of CEO Option Grants at the IPO*, 17 J. Corp. Fin. 1116, 1117.

²⁴⁸ *Id.*

theories were accurate, IPO markets would contain more contractual and institutional protections, such as fiduciary standards, reputational selection, and claw back provisions.

The naïve issuer theory demonstrates that underpricing arises inexorably in equilibrium in IPO markets with profit-maximizing underwriters and in which at least some issuers act as if they misunderstand the costs of underpricing. After winning the role of lead underwriter on an IPO, underwriters always have incentives to underprice the IPO. If issuers act as if they misunderstand underpricing for any reason, or fail to anticipate the incentives of underwriters to underprice, then underwriters will secure contractual commitments and structure IPO transactions in ways that generate IPO underpricing. Even if an issuer’s preferences change and it shows up at the pricing meeting the night before the IPO determined to mitigate underpricing, the lead underwriter may have already secured the contractual commitments and negotiation leverage necessary to impose underpricing.

Underwriters have no incentive to compete on underpricing costs because naïve issuers do not evaluate the underwriters they hire on this dimension. Hard bargainers also prefer IPO markets in which the IPOs of weak bargainers are underpriced, so they will not attempt to correct market inefficiencies. Hard bargainers receive a cross-subsidy from weak bargainers if underwriters use the profits derived from underpricing IPOs of weak bargainers to compete on the direct fee they charge to hard bargainers. Additionally, hard bargainers may be able to push overpriced assets onto the market if uninformed investors pool the IPOs of (underpriced) weak bargainers and (overpriced) hard bargainers together when making investment decisions.

The naïve issuer theory also explains the learning puzzle. The preferences of weak bargainers that generate the IPO processes that yield underpricing arise from bounded rationality, and decision-makers at issuers cannot learn from mistakes that they do not perceive as mistakes. At various points in the IPO transaction, and particularly at the engagement, naïve issuers do not evaluate the underwriter or its decisions on an underpricing dimension and instead prioritize other concerns ahead of underpricing. Naïve issuers therefore *believe* they have learned all the relevant lessons from prior IPOs, but, if maximizing firm value is their objective, they have taken the wrong lessons.

In this conclusion, I offer a few perspectives on how laws and regulations might usefully address the problems raised by the learning puzzle critique and the naïve issuer theory. Further research and analysis is required to determine the costs and benefits of legal interventions and to precisely define optimal rules. Such an analysis is outside the scope of this Article and, in the interests of brevity, this Conclusion offers merely suggestive thoughts about legal and regulatory interventions.

The standard justification for regulatory intervention applies in the context of IPO underpricing: IPO markets generate inefficient outcomes and the operations of IPO markets have failed to self-correct underpricing distortions on their own for decades. There is also an unusual and additional justification for governmental intervention in IPO markets beyond the traditional one: there are already *too many* laws and regulations in IPO markets. The securities laws are designed to protect investors, but one collateral effect is to exacerbate the problems of naïve issuers. The demanding and exhausting due diligence necessary to comply with the securities laws incentivizes issuers to hire investment bankers in the first place, and may have the effect of distracting management from the negotiation over the final offer price during the IPO transaction, especially if decision-makers are myopic or are conflicted.

The most obvious and lightest-touch intervention would be the imposition of mandatory disclosures on underwriters. Mandatory disclosures are consistent with other areas of the

securities laws and impose only minimal burdens on the parties in IPO transactions. They are easy to implement and enforce. The naïve issuer theory supplies a reason why issuers fail to negotiate for optimal levels of disclosure, so mandatory disclosures would likely improve efficiency.²⁴⁹ Regulators might require underwriters to disclose statistics about their underpricing history compared to market benchmarks at each of the three nodes identified in the IPO game, and particularly before the underwriter is engaged. To counter reference point bias, regulators might require underwriters to disclose historical correlations between price revisions and underpricing any time one of its clients revises the initial offering range for its IPO.

The naïve issuer theory also justifies more heavy-handed interventions. It suggests that naïve issuers need protection from themselves. Legislators and regulators might consider the costs and benefits mandatory rules, prohibitions, and limits. While corporate and contract law generally does not seek to interfere with the arms-length transactions of parties, the securities laws governing IPO markets already contain at least one express ban.²⁵⁰ FINRA prohibits underwriters from imposing an overallotment option in connection with an IPO in excess of 15% of the issue and deems such arrangements to be “unfair and unreasonable.”²⁵¹ This restriction resembles a rule of unconscionability, which is typically only applied in consumer contexts in which one unsophisticated or powerless party may be exploited by a more sophisticated or powerful party in a one-sided negotiation. The implication of FINRA’s rule is that issuers are not able to make their own informed decision about the size of the overallotment option that is optimal for them. Legislators and regulators might consider extending the logic of FINRA’s unfairness and unreasonableness rule to other contractual provisions.

The SEC and FINRA may consider the imposition of mandatory fiduciary duties on broker-dealers that underwrite IPOs, particularly in the context of contemporary firm commitment offerings that underwriters have structured to eliminate their own principal risk or if the underwriter holds itself out as advising the issuer on its valuation.²⁵² As a practical matter, all underwriting agreements now carefully disclose broad conflicts of interest in their underwriting agreements with issuers and expressly disclaim fiduciary duties or an agency relationship of any kind.²⁵³ But if the economics look like an agency relationship, and naïve issuers fail to bargain for optimal contractual protections, legislators might consider the imposition of a fiduciary duty on underwriters similar to those imposed in other areas of corporate law, such as on directors of corporations. There is already the precedent of a similar rule. The SEC imposes a fiduciary duty on registered investment advisers running to their clients.

²⁴⁹ The merits of mandatory disclosures in capital markets are debated. See Roberta Romano, *Empowering Investors: A Market Approach to Securities Regulation*, 107 YALE L.J. 2359 (1998); John C. Coffee, Jr., *Market Failure and the Economic Case for Mandatory Disclosure*, 70 VA. L. REV. 717 (1984); Merritt B. Fox, *Retaining Mandatory Securities Disclosure: Why Issuer Choice is Not Investor Empowerment*, 85 VA. L. REV. 1335 (1999).

²⁵⁰ I analyze the role of price stabilizing activities in IPOs in forthcoming work. See Patrick Corrigan, (Legal) Market Manipulation, Insider Trading, and IPOs: Price Stabilization Activities (forthcoming).

²⁵¹ FINRA Rule 5110(f)(2)(I). An overallotment option provides the lead underwriter with the ability to purchase an additional amount of the issuer’s common stock. The purported benefit to the issuer is that the option facilitates the engagement of the underwriter in price stabilization activities in secondary markets.

²⁵² See *supra* note 95 and accompanying text. Maynard espouses a similar position in a parallel IPO context: “the lessons learned from the story of ‘spinning’ stand in sharp contrast to the modern law and economics view that parties should be afforded complete freedom to contract for the entire scope of fiduciary duty between owners and managers of the corporate enterprise.” Maynard, *supra* note 237, at 2029. See also *EBC I Inc. v. Goldman Sachs & Co.*, 5 N.Y.3d 11, 19 (N.Y., 2005) (failing to dismiss a claim of breach of fiduciary duty even though the underwriting agreement did not expressly impose such a duty).

²⁵³ See *supra* note 230.

Finally, the SEC and FINRA might consider imposing further separations between underwriters and their affiliated research analysts. One approach would be to prohibit analysts from presenting to issuers before its affiliated underwriter is engaged on the IPO. A more robust measure would be to prohibit underwriter-affiliated analysts from discussing the issuer for a period of years following an IPO. Regulators might provide an exception to the general prohibition if the investment bank can meet certain statistical criteria indicating that its research analysts act independently of investment banking objectives.