

Reputation Acquisition and Abnormal Performance in IPO Underwriting

Walid Y. Busaba

Ivey Business School at Western University
1255 Western Road
London, Ontario, Canada N6G 0N1
wbusaba@ivey.ca

Zheng Liu

AGF Investments Inc.
zheng.liu@agf.com

Felipe Restrepo

Ivey Business School at Western University
frestrepo@ivey.ca

Abstract

We examine how underwriter reputation accumulates offering by offering conditional on the bank demonstrating abnormal performance bringing—or failing to bring—each to market. We develop a novel measure of abnormal underwriting performance by weighing the ex-ante difficulty of taking a firm public against the actual offering completion or withdrawal outcome. We show this measure positively associates with future changes in the underwriter’s market share and dollar issuing volume. The effect manifests as access to more offerings, is especially prominent for unexpected performance in midmarket (\$20–\$100 million) IPOs, and is more pronounced for the primary lead underwriter than for co-leads.

Keywords: Initial Public Offerings; Underwriter Reputation; IPO Market Share

JEL classification: G14; G24; G32

1 Introduction

Underwriting initial public offerings (IPOs) is an important business for investment banks, bringing in approximately 10% (\$13 billion) of the \$125 billion total fees they generated in 2020.¹ The financial press often highlights banks' market share rankings (also known as 'league tables') as a measure of reputation that can influence prospective clients' choice of bank or group of banks to lead a deal.² Existing studies suggest a relation between underwriter reputation and a bank's records of IPO mispricing (e.g., Beatty and Ritter, 1986; Nanda and Yun, 1997; Dunbar, 2000) and prior withdrawals (Dunbar, 2000). This paper sheds a new light on how underwriter reputation develops, by focusing on the underwriter's primary role of bringing issues to market, and showing that reputation accumulates upon each offering a bank leads, conditional on the bank demonstrating abnormal performance averting withdrawal and completing the IPO.

There are many dimensions to an underwriter's intermediary role but, first and foremost, the bank is expected to be able to bring to market (i.e., complete) an issuer's IPO. This paper empirically quantifies the abnormal performance exhibited by an underwriter attempting to bring an offering to market, given the offering's intrinsic difficulty. We provide evidence this measure positively associates with future changes in the underwriter's IPO market share and dollar volume of engagements. Abnormal performance is positive and high, for example, if an offering that ex ante looked difficult to sell is nevertheless completed. Difficult-to-sell offerings are those for which investor interest falls short of the issuer's expectations, be it due to weak investor interest

¹ See "Global banks generate record \$125bn fee haul in 2020," *Financial Times* online, December 29, 2020, <https://www.ft.com/content/c7bbdc4e-2fc9-424b-ab0b-a3acd8f20557>; accessed November 27, 2021.

² For instance, a January 2022 article in *Barron's* (Beltran, 2022) notes that "league table rankings, which list the banks that advise on deals like IPOs or mergers, are highly coveted among Wall Street investment banks. Clients are said to use the listings to help them decide which bank to use". In line with this view, Derrien and Dessaint (2018) find that market share rankings in mergers and acquisitions (M&A) predict banks' future deal flow beyond other determinants.

or to an issuer's high reservation price. An underwriter leading a difficult-to-sell offering is either capable of pumping up demand, or it lacks the ability to intermediate, letting the offer be withdrawn.

We proxy the reputation of an underwriter at the time of leading or co-leading an offering by the bank's IPO market share in the 12 months concluding with the offering. Market share in equilibrium ought to reflect perceived as well as demonstrated abilities bringing offerings to market. A bank can maintain its current market share as long as it continues to 'live up to its reputation,' that is, to demonstrate an ability to complete offerings that is consistent with having such a market share. On the other hand, deviation from expected performance in an offering might lead to a revised assessment of the underwriter's perceived ability and to a corresponding change in the bank's standing with future issuers. The purpose of the paper is not to explain variation in reputation or performance across underwriters, but to investigate how an individual underwriter's reputation *changes* following each attempt to take a firm public, depending on whether the outcome of the attempt meets or deviates from expectations.

We capture deviation from the expected underwriting outcome, or abnormal underwriting performance, by weighing the ex-ante difficulty level of taking the issuer public—i.e., of completing its IPO—against the actual outcome. Building on Busaba, Liu and Restrepo (2020), we calculate the ex-ante difficulty level as the offering's predicted likelihood of withdrawal conditional on attributes of the issuer and the offering, on market conditions after filing and before or at the time of offering/withdrawal, as well as on the aggregate reputation (i.e., market share) of the banks leading the offering. To this end, we estimate a probit model of the likelihood of withdrawal using all completed and withdrawn offerings in the U.S. from 1996 to 2020. The estimate imputed from this model for a particular offering is, hence, conditioned on who the

underwriters are and reflects the ex-ante probability of withdrawal when those exhibit the expected, or ‘normal,’ performance bringing such offering to market. On the other hand, the offering’s unexpected outcome, that is, the difference between the ex-ante probability of withdrawal and the actual outcome (where 1 denotes a withdrawal and 0 a completion), represents the underwriters’ abnormal performance.

This construction quantifies the underwriters’ abnormal ‘offer-completion’ (or alternatively, ‘withdrawal-averting’) performance as a continuous variable ranging from +1 to –1. Abnormal performance is close to +1 for a completed offering that ex ante was all but predicted to withdraw, and close to –1 for a withdrawn offering whose completion was ex ante all but assured. When an offering is led by multiple banks, we assign the abnormal underwriting performance to each and investigate how the market share of each changes in light of this performance; thus, the unit of observation is at the offering-underwriter level. We calculate the change in each bank’s market share from the 12 months ending with the offering to the 12 months after, and regress the variable against abnormal performance in specifications that include time, industry, number-of-lead-managers, and underwriter fixed effects, as well as offering-, market- and underwriter-level controls. The underwriter fixed effects, by capturing all bank-specific heterogeneity across underwriters, ensure the effect of abnormal underwriting performance is identified *within* each underwriter.

The empirical results are consistent with the hypothesis that abnormal underwriting performance exhibited in an offering influences the associated banks’ reputation and future market share. In the most exhaustive specification, a one-standard deviation increase in abnormal performance, equivalent to 0.27, is associated with a 0.10 percentage point increase in market share over the 12 months that follow. This change is economically significant given the mean 12-month

underwriter market share in the sample is 5.66% (median 4.59%), and the cumulative effect of strong abnormal performance in a few offerings can markedly alter the market standing of many banks.

A complementary manifestation of a bank's reputation is the total dollar volume of IPOs it handles over a 12-month period. We hence estimate regressions where the dependent variable is the growth rate in this dollar volume from the 12 months ending with an offering to the 12 months after, and similarly find that abnormal performance exhibited in the offering has an economically and statistically significant positive effect. Based on the most exhaustive specification, a one-standard-deviation increase in abnormal performance of 0.27 is associated with a 4.8% increase in the total proceeds of IPOs the respective bank handles over the following 12 months.

We further investigate whether changes in both market share and underwriting volume stem from changes in the size of offerings the underwriter handles, the number of lead banks the underwriter joins in individual offerings, and/or the number of offerings it engages over a 12-month period. We regress these components individually on abnormal performance and find a relation that is positive and significant only with the change in the number of offerings engaged by the underwriter. Thus, the positive effects abnormal performance has on an underwriter's market share and underwriting volume are mostly driven by the underwriter's increased visibility and subsequent ability to participate in a larger number of offerings.

In the U.S., a fixed 7% underwriting spread is prevalent among mid-market IPOs, those between \$20 million and \$100 million, which represent 54% of the sample offerings.³ Existing studies maintain that underwriters in a fixed spread environment compete by providing a higher-quality service (e.g., Busaba and Restrepo, 2022; Chen and Ritter, 2000; Hansen, 2001; Kang and Lowery,

³ As documented in Busaba and Restrepo (2022), the 7% spread is charged in 94% of IPOs with proceeds between \$20 million and \$100 million.

2014; Ljungqvist, Jenkinson, and Wilhelm, 2003). The first and most notable manifestation of such service is the completion of the public sale of the shares, and the extent of this service is captured by the abnormal performance variable we introduce. Consistent with banks in a fixed spread environment competing predominantly through a higher quality underwriting service, we find abnormal performance to have a uniquely prominent effect when it is associated with offerings in the \$20 million to \$100 million range. Demonstrating a high abnormal performance bringing one such offering to market seems to reward the offering's underwriters with growth in market share, dollar underwriting volume, and the number of handled IPOs.

We refine our analysis and investigate whether the effect of abnormal performance on underwriter competitiveness differs depending on whether the bank is the primary (or only) lead manager or whether it is a co-lead manager. Underlying this question is the possibility that the primary lead assumes a senior role in pricing and marketing the offering. As such, we estimate the effect of abnormal performance separately for banks listed either as lone leads or first among co-leads, and for the other listed co-lead banks, and indeed find the effect to be more statistically pronounced among the former group.

While the underwriter is expected to be able to bring an offering to market, its reputation in equilibrium hinges not merely on whether the offering is completed or withdrawn but on the extent to which the outcome is *unexpected*. Our abnormal performance measure captures the unexpected IPO outcome, and the measure's significance in explaining future changes in the bank's underwriting business supports our argument. Notwithstanding, we provide direct evidence by running a specification that breaks up the outcome of each IPO into the expected and unexpected components and finding that only the latter comes out significant. This finding further implies that selecting to engage offerings on the basis of their expected outcome—for example, avoiding

offerings with a high ex-ante likelihood of withdrawal—does not enhance a bank’s reputation on average, consistent with equilibrium in the underwriting industry.

Last, we subject our analysis to a key falsification test. Our analysis rests on the premise that the association between abnormal performance and *future* IPO underwriting business reflects the effect of the abnormal performance on the bank’s reputation. Abnormal performance certainly cannot influence the bank’s standing retroactively, specifically a year before the performance is detected. Hence, in the context of our analysis, abnormal performance observed in an offering should not be found to explain the change in measures of the bank’s underwriting business (market share and underwriting volume) in the 12 months *concluding with* the offering—relative to the 12 months before that. We verify that indeed it is not.

This paper contributes to the literature by developing a distinct measure of the abnormal performance an underwriter exhibits in taking a firm public and demonstrating this measure impacts the bank’s reputation and future underwriting business. Despite the importance of underwriter reputation in the capital raising industry, few papers investigate its determinants. This prior literature largely focuses on such covariates as a bank’s ‘mispricing’ and withdrawal records but, importantly, without accounting for the inherent difficulty in bringing each offering to completion. Beatty and Ritter (1986) find a bank’s market share to be negatively related to abnormal IPO initial returns. Nanda and Yun (1997) find the market value of publicly-traded underwriters to be positively related to moderate underpricing and negatively related to substantial overpricing. Dunbar (2000) reports several factors that relate to the change in an underwriter’s market share in a calendar year, including the bank’s average mispricing and percentage of withdrawals in the previous year. Our results stand beyond the effect of other covariates explored

in the literature. And, notably, the effect of abnormal performance completing (or failing to complete) an offering is distinct from the underwriter's prior performance record.

The literature further suggests avenues not directly related to performance that influence an underwriter's access to deals. Fluctuations in issuance activity during market cycles might influence access to, and the volume of, underwriting engagements for individual banks. Competition for underwriting mandates eases in hot IPO markets, for example, and various banks gain inroads to deals (e.g., Khanna, Noe, and Sonti, 2008; Fernando, Gatchev and Spindt, 2005).⁴ We include time (monthly dates) fixed effects to control for such and any cyclical influences, but our results hold equally with or without them.

Our paper contributes as well to the literature which considers whether reputation mitigates moral hazard.⁵ Griffin, Lowery, and Saretto (2014) argue and provide evidence from CDO and MBS issuances that reputation might not deter banks from selling poor quality (i.e., high risk) "complex securities" when investors lack a counterfactual for how the securities should perform. In our setting, such adverse incentive would manifest, for example, in an underwriter refraining from doing what is expected to bring a particular IPO to market. However, potential issuers observing the primary market are able to assess ex ante the difficulty of completing this offering, and then use the assessment as the counterfactual against which they judge the bank's performance. Underwriting IPOs is, therefore, a setting where reputation would have a disciplinary effect, and our finding that abnormal performance positively correlates with future underwriting business supports this conclusion.

⁴ Less certification and promotion might be required in hot IPO markets, when investor demand is already strong and issuers share industry commonality (Benveniste, Busaba, and Wilhelm, 2002; Benveniste et al., 2003).

⁵ See, for example, Diamond (1989) for how reputation influences borrower incentives.

The rest of the paper is organized as follows. We describe the specific hypothesis in Section 2 and the empirical design and data in Section 3. Results are presented in Section 4, followed by the paper's summary and conclusion in Section 5.

2. IPO MARKET SHARE AND UNDERWRITER ABNORMAL PERFORMANCE

Our main goal is to examine whether an underwriter's abnormal performance in completing—or failing to complete—an offering influences the underwriter's reputation and future market share. The completion of an offering is a function of attributes of the offering and the issuing firm, market conditions, and distinctly, the performance of the underwriter, particularly when the offering is difficult to sell. Issuers engage underwriters they *expect* to have the required skill to take similar firms public, and their expectations are based on the underwriters' reputation, naturally reflected in the banks' current market share. Banks also choose to engage issuers that suit their expertise and capabilities, to optimize the likelihood of succeeding in bringing the offerings to market. This mutual selection process results in a matching equilibrium in the spirit of Fernando et al. (2005), under which the observed issuer-underwriter pairings generate optimal IPO completion-withdrawal odds for the corresponding type of issuers and matched underwriters.⁶

Under this equilibrium, a bank should not expect an increase in its market share simply by choosing to engage offerings that are likely to be completed anyway—for example, because the issuers will sell at any price and/or because investors have shown strong interest in similar issuances. In contrast, an underwriter's perceived skill will be revised, and underwriting market share will accordingly change, if the underwriter demonstrates abnormal performance in an

⁶ Also see Beatty and Ritter (1986), Carter and Manaster (1990) and Liu and Ritter (2011) for the idea of quality matching between the underwriter and the issuer.

offering. For instance, a bank that completes an offering that has a distinctly high ex-ante withdrawal probability surpasses the expected performance (of not completing the offering with a high probability), thereby demonstrating stronger performance than anticipated. The bank, consequently, sees its reputation with issuers improve and its IPO underwriting business grow.

A positive (negative) abnormal underwriter performance is detectable ex post as it systematically ‘biases’ the IPO outcome towards offer completion (withdrawal), relative to the equilibrium probability estimated ex ante for the particular offering-underwriter pair. Potential issuers can identify a bank’s abnormal performance in an offering by observing the extent of the ‘unexpected’ outcome of the offering. The magnitude of abnormal performance is thus positive and larger for successful offerings which have a higher ex-ante likelihood of withdrawal, and negative and small for withdrawn offerings with lower ex-ante likelihood of withdrawal.

3. EMPIRICAL DESIGN AND DATA

3.1 Empirical design

Testing our hypothesis requires calculating the change in a lead underwriter’s IPO business around an offering as the main dependent variable, and the abnormal offer-completion performance demonstrated in the offering as the key regressor of interest. Our leading measure of a bank’s underwriting business is the bank’s IPO market share during a 12-month period, calculated as the sum of gross proceeds raised in the completed IPOs, and expected to be raised in the withdrawn IPOs, led by the bank during the period, divided by the sum of gross proceeds raised, and expected to be raised, in all offerings during the same period.⁷ Banks co-leading an offering are each allocated an equal share of the offering’s gross proceeds. Our main dependent variable,

⁷ For unsuccessful offerings, expected proceeds are the average of the high and low prices in the preliminary price range multiplied by the number of shares in the latest available IPO filing.

denoted by $\Delta.Mkt Share_{i,j}$, then measures for each lead manager i involved in a completed or withdrawn offering j , the change in the bank's IPO market share from the 12 months up until, and including, offering j to the 12 months after the offering.

A complementary manifestation of a bank's reputation is the bank's dollar underwriting volume, or the bank's total proceeds or expected proceeds of offerings it participated in during a 12-month period. We hence employ the alternative dependent variable $\% \Delta.UW Volume_{i,j}$ which measures the percentage change (or growth rate) in bank i 's underwriting volume from the 12 months concluding with offering j to the 12 months after. In calculating the dependent variables, we adjust a bank's total proceeds when applicable to correct for the effect of M&A activity the bank is part of during the respective 12-month period surrounding an offering.⁸

The key regressor of interest, the abnormal performance exhibited in offering j , or *Abnormal Performance_j*, is constructed as the offering's ex-ante withdrawal probability minus a binary indicator of the actual outcome of the offering where 1 represents a withdrawal and 0 a completion. This construction measures the underwriter's abnormal withdrawal-averting (or offer-completion) performance as a continuous variable ranging from +1 to -1. *Abnormal Performance* is close to +1 for a completed offering that ex ante was all but predicted to withdraw, and close to -1 for a withdrawn offering whose completion was ex ante all but assured.

We impute an IPO's ex-ante probability of withdrawal from a probit model where the dependent variable equals one for withdrawn IPOs and zero for completed ones, similar to Busaba,

⁸ If bank i was engaged in, or the outcome of, a merger during the 12 months prior to offering j , or if it acquires another bank during the 12 months after offering j , we combine the gross proceeds raised individually by the merging banks prior to the merger or acquisition for the purpose of determining bank i 's proceeds for the respective 12-month period. If bank i is acquired during the 12 months following its engagement in offering j , and therefore ceases to exist, we set the bank's proceeds for this 12-month period to 'empty' or 'missing' to reflect the fact that the bank does not have the requisite full 12-month record of IPO engagements following offering j . Data on bank mergers are obtained from the SDC's Platinum M&A database.

Benveniste and Guo (2001) and Busaba, Liu, and Restrepo (2020). Explanatory variables in the probit model include the aggregate reputation of the lead banks involved in the offering as captured by the sum of these banks' market shares. Also included are variables found in the literature to correlate with the likelihood of withdrawal, specifically attributes of the issuing firm and of the offering and the market conditions *post* filing and prior to or at the offering/withdrawal date.⁹ Definitions and summary statistics for variables used in the probit model are reported respectively in Panels A and B of Table A1 in the Appendix. The probit model estimation results are reported in Panel C of Table A1.

Formally, we estimate the following regression model to capture the effect of abnormal performance on the change in measures of a bank's underwriting reputation:

$$Y_{i,j} = \beta_0 + \beta_1 Abnormal\ Performance_j + FE + Controls + \varepsilon_{i,j}. \quad (1)$$

Where $Y_{i,j}$ is either 1) the change in bank i 's market share from the 12 months concluding with offering j to the 12 months after ($\Delta.Mkt\ Share_{i,j}$), or 2) the percentage change between the two 12-month periods in total IPO proceeds handled by bank i ($\% \Delta.UW\ Volume_{i,j}$). The regression model includes time (monthly dates), underwriter, number-of-lead-banks (participating in the IPO), and issuer industry (SIC-level 2) fixed effects. Although the inclusion of fixed effects comes at a high cost in terms of lost degrees of freedom, it further ensures our regression model isolates the effect of interest. The time fixed effects capture unobserved heterogeneity that affects all or many underwriters at the same time—they, for example, absorb macroeconomic shocks or changes in the primary market similar to what might occur in periods of elevated or otherwise reduced IPO

⁹ See also Benveniste, Ljungqvist, Wilhelm and Yu (2003), and Dunbar and Foerster (2008).

activity (e.g., Benveniste, Busaba, and Wilhelm, 2002; Benveniste et al., 2003; Khanna, Noe, and Sonti, 2008; Fernando et al., 2005).¹⁰ The underwriter fixed effects account for any unobserved heterogeneity that is specific to each bank. The number-of-lead-managers fixed effects account for any systematic effect on changes in market share, that is due to the size of the lead bank coalition. Finally, the issuer industry fixed effects account for any unobserved heterogeneity that is specific to each industry. We use two-way clustered standard errors by bank and time (monthly dates).¹¹

Control variables in Eq. (1) include attributes of the issuing firm (whether private-equity financed and revenue size), the state of the credit market at the time of the offering (10-year Treasury yield and BAA-AAA yield spread), and the NASDAQ market return leading up to the offering. Control variables include as well the respective bank's (i.e., bank i 's) performance record in the offerings it led or co-led in the 12 months *before* the current offering j . Measures of this record suggested in the literature to influence market share include average excess 1st-day return among offerings completed by the bank, average abnormal spread charged in these offerings, and the percentage of the offerings engaged by the bank that ended up withdrawn. Excess 1st-day return is calculated as the difference between an IPO's raw first day return and the NASDAQ return on that same day. Abnormal spread is the residual from a spread regression model that follows Busaba and Restrepo (2022) and that is reported in Table A2 in the Appendix.

We also estimate variants of regression Eq. (1) to investigate what particular components of the bank's market share and underwriting volume are influenced by abnormal performance. The components include the size (proceeds) of individual IPOs the bank manages, the number of lead

¹⁰ Note for instance that the monthly-date fixed effects control for growth in underwriting volume experienced by *all* offerings in a certain month, such that the dependent variable (as well as the regressors) is demeaned around the average growth rate in each month.

¹¹ We try alternative standard errors including OLS, White (heteroskedasticity robust), and one-way clustered standard errors, and find the clustered standard errors we use generally lead to the most conservative standard errors in our tests.

banks (sharing the proceeds) in each offering, and the number of IPOs the bank engages over a 12-month period. We therefore construct the following three alternative dependent variables for each bank i engaged in offering j : 1) percentage change from the 12 months ending with offering j to the 12 months after in the average size of IPOs led by the bank, $\% \Delta Offer Size_{i,j}$; 2) change between the two 12-month periods in the average number of lead banks per offering among IPOs engaged by the bank, $\Delta Coalition Size_{i,j}$; and 3) change between the two periods in the number of offerings engaged by the bank, $\Delta Num Offerings_{i,j}$. Table 1, panel A, presents the definitions of the dependent and independent variables used in the regression analysis.

3.2 Data and sample description

We construct our sample based on offerings completed or withdrawn in the U.S. during the 25-year period between 1996 and 2020. Data on these offerings are obtained from Thomson Reuters SDC's (TSDC) New Issues Database and verified against the actual filings available through the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) System on the Securities and Exchange Commission (SEC) site. Market returns and stock prices are collected from CRSP. Stock tickers, CUSIPs, and company names are used to match the stocks with the offerings in TSDC. Following the literature (e.g., Busaba, Benveniste, and Guo, 2001; Busaba, Liu, and Restrepo, 2020), we exclude unit offerings, limited partnerships, and issues by REITs, closed-end funds, and trusts. We also exclude IPOs with an offer price below \$5 and offerings smaller than \$1 million. Overall, the IPO-level sample includes 4,066 offerings, of which 15.4% were withdrawn.

We measure the effect of abnormal performance exhibited in each offering on the future IPO business of the individual banks leading the offering. On average, each of the 4,066 sample offerings is led-managed by 1.92 banks, resulting in an offering-underwriter level dataset of 7,797

observations over which we perform our analysis. Panel B of Table 1 reports summary statistics for variables used in the regression analysis.

4. RESULTS

4.1 Abnormal Performance and market share change: Main specification

The estimation results of Eq. (1) are reported in Table 2. Column 1 presents the results of a regression specification in which the change in a bank's market share is run against the abnormal performance variable along with our four fixed effects—time (monthly dates), industry, number of lead banks, and underwriter fixed effects. Abnormal performance shows up with a positive coefficient that is significant at the 5% level, indicating that demonstrating a larger abnormal performance in a particular offering (e.g., completing a hard-to-complete offering) is associated with the corresponding bank experiencing a larger change in its IPO market share over the ensuing 12 months.

Column 2 of the table presents estimation results when issuer attributes and market-level variables around the time of the offering are added. Column 3 specification augments the control variables with traditional measures of the underwriter's performance in IPOs it managed in the 12 months preceding the current offering, namely average excess 1st-day return, average abnormal spread, and the percentage of withdrawn offerings. The key variable of interest, abnormal performance, continues to show up with a positive and significant coefficient in these two specifications.

A performance measure distinctly motivated by our study is the bank's cumulative abnormal performance record over the past 12 months, which subsumes the bank's withdrawal record. Formally, the cumulative abnormal performance record of bank i is calculated as the sum of

Abnormal Performance over all offerings handled by the bank in the 12 months *prior* to participating in the current offering *j*. Column 4 of Table 2 reports estimation results of a specification that includes this variable but otherwise parallels Column 3's. Unlike the other underwriter prior-year performance variables, which are insignificant, abnormal performance amassed over the 12 months prior to an IPO exhibits statistically significant (positive) correlation with the change in the underwriter's market share after the offering. More importantly, however, the effect of abnormal performance in the current IPO is distinct, regardless of the underwriter's previous record. In fact, the effect is robust—stable coefficient and significance level—to the specification chosen, that is, to whether fixed effects or other controls, including the bank's prior abnormal performance record, are included.

Estimation results in Column 4 once again support the prediction that the abnormal performance exhibited in an offering influences a bank's reputation and future market share. The coefficient on abnormal performance is +0.386, which is significant at the 5% statistical level. The coefficient is economically significant. A one-standard deviation increase in the variable, equivalent to 0.27 (recall that by construction abnormal performance takes values between -1 and +1), leads to a 0.1 percentage point gain in market share over the 12 months that follow. Considering this is the estimated effect of overperforming in a single offering and that mean market share among banks in the dataset is 5.66% (median 4.59%), strong abnormal performance in several offerings can measurably alter the industry standing of the average bank in this group.

4.2 Abnormal performance and percentage change in dollar underwriting volume

Results in Table 2 show that abnormal performance in an offering affects a bank's market share. By construction, market share is a variable that fluctuates based on changes in a bank's dollar

underwriting volume but also based on the changes in all its competitors'. In this section, we specifically explore whether abnormal performance is associated with the growth rate in a lead bank's dollar underwriting volume. We run regression equation (1) with the dependent variable $\% \Delta UW Volume_{i,j}$, that is, the percentage change in lead bank i 's dollar underwriting volume from the 12 months ending with offering j to the 12 months after. Estimation results are reported in Table 3. Irrespective of the specification estimated, abnormal performance shows up with a positive and statistically significant coefficient. The coefficient in the most comprehensive specification (Column 3) is +0.178, which is significant at the 1% statistical level. The size of the coefficient implies a one-standard-deviation increase in abnormal performance of 0.27 is associated with a 4.8% increase in total annual IPO proceeds handled by the respective bank. Once again, a strong abnormal performance in several offerings account for a material increase in the banks underwriting business.

4.3 Sources of changes in underwriting business

A bank can experience an increase in IPO business and market share if it participates in larger offerings, works with fewer co-lead banks (to capture a larger share of proceeds), or engages a larger number of offerings. To investigate which of these components is influenced by abnormal performance, we run a regression analogous to Column (3) of Table 3 for each of the following dependent variables introduced in Section 3.1: 1) percentage change post offering j in average IPO size for bank i , $\% \Delta Offer Size_{i,j}$; 2) change in the average number of lead banks per offering among the bank's IPOs, $\Delta Coalition Size_{i,j}$; and 3) change in the number of IPOs led by the bank, $\Delta Num Offerings_{i,j}$. Regression results are presented in Table 4, one column respectively for each dependent variable.

The results indicate abnormal performance has a positive and statistically significant effect only on the change in the number of offerings engaged by the underwriter (Column 3). The relation is economically significant: a one-standard deviation increase of 0.27 in the abnormal performance demonstrated in an offering is associated with 0.39 additional offering engagements during the 12 months that follow. Estimation results in Columns 1 and 2, in comparison, indicate the relation between abnormal performance and each of the percentage change in offer size and the change in the number of lead managers per offering is insignificant. The results thus suggest that the effect of a positive abnormal performance allowing a bank to grow its IPO underwriting business is mainly driven by the bank's ability to participate in a larger number of offerings.

4.4 Effect of abnormal performance in various IPO size segments

In the U.S. IPO market, banks charge a fixed 7% spread to most medium-sized offerings, with over 90% of the \$20 million to \$100 million offerings clustered at this spread (Busaba and Restrepo, 2022). Papers that study this fixed spread structure maintain that underwriters compete in this segment not on price (i.e., the spread) but by providing a higher-quality underwriting service (e.g., Busaba and Restrepo, 2022; Chen and Ritter, 2000; Hansen, 2001; Kang and Lowery, 2014; Ljungqvist, Jenkinson, and Wilhelm, 2003). The first and most noticeable manifestation of a higher-quality service ought to be the completion of the public sale of the shares. And more specifically, the quality of the underwriting service can be quantified ex post by the abnormal performance variable introduced in our paper.

We therefore test whether the effect of abnormal performance on a bank's reputation and future IPO business is more pronounced if the abnormal performance is exhibited in midmarket offerings, as would be expected if underwriters compete on service in this segment of the market. We first

create three dummy variables to indicate, respectively, offerings below \$20 million in gross proceeds (*Proceeds Below \$20M*), offerings with gross proceeds between \$20 million and \$100 million (*Proceeds Bet. \$20M and \$100M*), and offerings larger than \$100 million (*Proceeds Above \$100M*). We then estimate the effect of abnormal performance within each segment in the following regression:

$$\begin{aligned}
 Y_{i,j} = & \beta_0 + \beta_1 \text{Abnormal Performance}_j \times \text{Proceeds Below } \$20M \\
 & + \beta_2 \text{Abnormal Performance}_j \times \text{Proceeds Bet. } \$20M \text{ and } \$100M \\
 & + \beta_3 \text{Abnormal Performance}_j \times \text{Proceeds Above } \$100M \quad (2) \\
 & + \text{Proceeds Bet. } \$20M \text{ and } \$100M + \text{Proceeds Above } \$100M + FE \\
 & + \text{Controls} + \varepsilon_{i,j}.
 \end{aligned}$$

Where $Y_{i,j}$ is either 1) the change in bank i 's market share from the 12-month period concluding with offering j to the 12-month period after offering j ; 2) the percentage change between the two periods in total IPO proceeds handled by the bank; or 3) in light of the result above, the change between the periods in the total number of offerings engaged by the bank. Note here the group of offerings below \$20 million serves as the base group and, hence, the corresponding group indicator is not included as a standalone variable.

Estimation results are reported in Table 5, one column for each dependent variable. In all columns, the positive effect of abnormal performance is especially pronounced among offerings in the \$20 million to \$100 million range. A one-standard deviation increase in the abnormal performance demonstrated in an offering in this group is associated with 0.14 percentage-point increase in the respective bank's market share, 4.9% growth in the bank's underwriting volume, and the addition of 0.45 underwriting engagements in the 12 months that follows. Abnormal

performance is not significant among the larger offerings, consistent with banks competing on other dimensions as well (including on spread) in this segment. And nor is abnormal performance significant among small offerings, consistent with these offerings attracting less of an interest from the major underwriting players. Demonstrating a high abnormal performance bringing a midmarket offering to market seems to uniquely reward the underwriter with an improved reputation and an increased share in future IPO engagements, however those are measured.

4.5 Abnormal performance effect among lead vs. co-lead underwriters

We have so far investigated the effect of abnormal performance on the market share of all lead banks involved in an offering, not differentiating the ‘main’ lead underwriter from the co-leads. The main lead bank may play a larger role in pricing and marketing the offering and, as such, its reputation may be disproportionately influenced by abnormal performance demonstrated in the offering. We therefore test here whether the effect of abnormal performance is more pronounced for the “lead-left” underwriter than it is for the remaining lead banks. The bank listed on the top left of the prospectus is generally the main lead bank, and it is the first-listed lead manager provided by SDC. We create the dummy variable *Dummy First Lead* to indicate such banks in multi-lead bank offerings as well as sole leads in single-lead bank offerings. We then replace *Abnormal Performance* in regression equation (1) with two interactive terms, $Dummy\ First\ Lead \times Abnormal\ Performance$ and $[1 - Dummy\ First\ Lead] \times Abnormal\ Performance$ to allow estimation of a separate slope coefficient for each of the two bank groups, senior leads and co-leads.

Once again, we estimate the effect of abnormal performance in an offering on the post-offering change in the underwriter’s 12-month market share, percentage change in the underwriter’s 12-month dollar underwriting volume, and change in the number of offerings the bank handles over

a 12-month period. Estimation results, reported in Table 6, show that the effect of abnormal performance on all three dependent variables is positive and significant among the main lead banks. The effect of abnormal performance on market share and dollar underwriting volume is less noticeable among the co-lead banks, while the effect on the number of handled IPOs is relatively more noticeable. Results in this section suggest that the reputation a bank puts at risk when underwriting an offering is commensurate with the role it plays in the offering.

4.6 Expected vs. unexpected IPO completion outcome

A premise underlying our analysis is that the completion of an offering is of paramount importance to the issuer. Averting IPO withdrawal seems, therefore, critical to a bank seeking to grow its underwriting reputation and future IPO business. We have argued, additionally, that it is not the IPO outcome per se (completion or withdrawal) but the extent to which the outcome is *unexpected* that demonstrates abnormal performance that shocks the bank's reputation. To assess this argument, we split the outcome of an offering (= 1 if withdrawn and 0 if completed) into its two components, the unexpected as well as the expected, and investigate the effect of each on the future change in measures of the respective bank's IPO underwriting business. The unexpected component is represented by our abnormal performance variable while the expected component is captured by our imputed estimate of the offering's ex-ante probability of withdrawal.

Formally, we estimate the following variant of regression equation (1),

$$Y_{i,j} = \beta_0 + \beta_1 \text{Abnormal Performance}_j + \beta_2 \text{Prob Withdrawal}_j + FE + \text{Controls} + \varepsilon_{i,j}. \quad (3)$$

Where Y_i is either 1) our main market share change variable, $\Delta.Mkt\ Share_{i,j}$; 2) the growth in underwriting volume, $\% \Delta.UW\ Volume_{i,j}$; or 3) the change post offering j in the number of IPOs

handled by bank i over a 12-month period. Results are reported correspondingly in Columns (1) to (3) of Table 7. As hypothesized, abnormal performance shows up in the three regressions with a positive and statistically significant coefficient (at the 1% level in the latter two regressions). In contrast, and also as hypothesized, the component of the IPO outcome that can be predicted ex ante, and captured by the probability of withdrawal, fails to assume statistical significance in any of the regressions. In this respect, completion of an offering, or otherwise withdrawal of the offering, influences a bank's reputation *only to the extent* the outcome was not anticipated. This latter result adds perspective to earlier suggestions in the literature (e.g., Dunbar, 2000) that association with a higher incidence of withdrawal adversely affects a bank's reputation, by affirming that it is association not with a particular IPO outcome per se, but with the exhibited abnormal performance, that drives the effect.

The result implies as well that a bank which adopts a withdrawal-screening strategy, i.e., a strategy of avoiding difficult-to-sell IPOs at the outset, in hopes of minimizing association with withdrawals should experience no enhancement to its reputation. While avoiding offerings that ex ante look difficult to sell can on average shield the bank from experiencing withdrawals, it deprives the bank from the opportunity to enhance its reputation through demonstrating an abnormal withdrawal-averting performance.

The result also is consistent with the presence of a matching equilibrium in the underwriting industry, as described in Section 2. The outcome of such equilibrium is issuer-underwriter pairings that generate optimal IPO completion-withdrawal odds for the corresponding type of issuers and matched underwriters. Banks which deviate from the equilibrium pairings would not benefit at the optimum. Finding that the probability of withdrawal as a standalone choice variable has no

predictive power for future changes in a bank's underwriting business is in line with this conclusion.

4.7 Falsification test

In this section we subject our analysis to a falsification test where we check for an effect of abnormal performance in a key setting where there should be none. If a high abnormal performance is demonstrated today, we have argued and provided evidence that the corresponding bank's market share, dollar underwriting volume, and number of offerings over the ensuing 12 months will all increase—relative to what they were in the 12 months that just ended. On the other hand, a performance demonstrated today could not have impacted the bank's reputation a year ago and, hence, should not be found to explain the change in the three measures of the bank's underwriting business in the 12 months that just ended relative to what they were in the 12 months prior.

To verify this is indeed the case, we calculate the market share change, the percentage change in dollar underwriting volume, and the change in the number of handled IPOs from two years to one year *before* an offering and regress the three 'false' dependent variables against the abnormal performance demonstrated in the offering along with the comprehensive list of fixed effects and controls. We report the results of the three falsification regressions in Table 8. Reassuringly and as expected, abnormal performance assumes no statistical significance in the regressions. Once again, this result demonstrates the power of the tests we conduct of our hypothesis. Abnormal performance exhibited bringing an offering to market should influence the underwriter's future business not the past, and that is what we find.

5. SUMMARY AND CONCLUSION

This paper develops a novel measure of the abnormal performance an underwriter exhibits in taking a firm public and demonstrates that this measure has a significant impact on the underwriter's standing as reflected going forward in the bank's market share and dollar underwriting volume. The impact is robust in economic magnitude and statistical significance to the inclusion of offering- and market-level controls and time, underwriter, number-of-lead banks, and industry fixed effects. Our analysis indicates the positive effect of abnormal performance on the underwriter's future IPO business is realized primarily through a positive effect on the number of offerings the bank engages rather than through an effect on the average size of these offerings or the average number of lead banks in each.

We find the effect of abnormal performance to be most prominent when associated with offerings in the \$20 million to \$100 million range, where the 7% spread is prevalent. This is consistent with the argument in the literature that underwriters in a fixed spread regime compete on the quality of service. The effect is also most prominent for the main lead bank (which can be the sole lead), which appears top left in the prospectus and typically assumes a larger role than do co-leads in pricing and marketing the offering. This result supports our hypothesis that abnormal performance enhances reputation, as it shows that credit for performance is commensurate with role. And last, our results survive a falsification test in which we verify that current abnormal performance cannot 'explain' past changes in market share and underwriting volume, as it should not be able to influence underwriter reputation retroactively.

Our results shed new light on the intermediary role of IPO underwriters. Bringing offerings to market is at the forefront of what underwriters are expected to deliver in primary equity markets. Notwithstanding, it is not completing offerings per se that builds a bank's reputation, but rather it

is the extraordinary performance the bank exhibits in its efforts to take the offerings public. Completing offerings that require little skill does not enhance a bank's reputation and, similarly, neither does the withdrawal of hard-to-sell offerings hurt such reputation. The novel variable *Abnormal Performance* we introduce in this paper quantifies the extraordinary underwriting performance demonstrated in taking an offering public.

It is worth noting that the effects we document for abnormal performance are independent of other strategies a bank might employ to establish a relation with potential issuers. In a study of debt and equity offerings by seasoned firms, Ljungqvist, Marston, and Wilhelm (2009) report evidence that banks can increase the likelihood of joining underwriting syndicates as co-managers, by preemptively providing research coverage for potential security issuers. Serving as co-managers in turn increases the banks' prospects of assuming lead roles in future offerings. Notwithstanding the distinct secondary market setting in Ljungqvist et al, our results imply that gaining access to future deals, particularly in lead roles, would depend on the aspiring banks' performance relative to expectations, however defined in the context of underwriting seasoned debt and equity issues.

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Table 1. Variable Definitions and Summary Statistics

The table reports variable definitions (Panel A) and summary statistics (Panel B). Data are obtained from Thomson Reuters SDC's (TSDC) New Issues Database and the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) System for the period 1996-2020. Market returns around the time of the offerings, and aftermarket prices of the offered shares, are collected from CRSP. Stock tickers, CUSIPs (both historical and concurrent), and company names are used to match the stocks with the offerings in TSDC. Interest rate data are obtained from the Federal Reserve System website (<http://www.federalreserve.gov/releases/h15/data.htm>).

Panel A. Variable Definitions

Variable	Definition
<i>Dependent Variables:</i>	
Change in UW's Market Share (Δ . <i>Mkt Share</i> _{<i>i,j</i>})	For bank <i>i</i> engaged in IPO <i>j</i> , difference in IPO market share between 12 months after the offering and 12 months up to and including the offering; Market Share is total proceeds (actual or expected) of IPOs handled by the bank during 12 months, divided by total proceeds of IPOs handled by all banks during the period
Pct. Change in UW's Dollar Underwriting Volume (% Δ . <i>UW Volume</i> _{<i>i,j</i>})	For bank <i>i</i> engaged in offering <i>j</i> , percentage change in total IPO proceeds (actual or expected) handled by the bank during the 12 months after vs. the 12 months concluding with offering <i>j</i>
Pct. Change in UW's Avg. Offering Size (% Δ . <i>Offer Size</i> _{<i>i,j</i>})	For bank <i>i</i> engaged in IPO <i>j</i> , percentage change in average proceeds per IPO led by the bank during the 12 months after vs. the 12 months concluding with offering <i>j</i>
Change in UW's Avg. Coalition Size (Δ . <i>Coalition Size</i> _{<i>i,j</i>})	For bank <i>i</i> engaged in offering <i>j</i> , difference between the average number of lead underwriters per IPO the bank engages in the 12 months after vs. the 12 months concluding with offering <i>j</i> (= Avg. coalition size post <i>j</i> – Avg. coalition size up to <i>j</i>)
Change in UW's Number of Offerings (Δ . <i>Num Offerings</i> _{<i>i,j</i>})	Difference between bank <i>i</i> 's number of IPOs led in 12 months after vs. 12 months concluding with offering <i>j</i> (= Num. IPOs post <i>j</i> – Num. IPOs up to <i>j</i>)
<i>Regressors:</i>	
<i>IPO Characteristics</i>	
Dummy Withdrawn _{<i>j</i>}	Indicator variable equals 1 if IPO <i>j</i> is withdrawn; 0 if completed
Probability of Withdrawal _{<i>j</i>}	IPO <i>j</i> 's ex-ante probability of withdrawal, imputed from the probit model reported in Appendix Table A1
Abnormal Performance _{<i>j</i>}	Probability of Withdrawal _{<i>j</i>} minus Dummy Withdrawn _{<i>j</i>}
ln(Revenues _{<i>j</i>})	Natural log of the issuer's revenues (\$ million) in the last fiscal year before IPO <i>j</i>
Dummy PE _{<i>j</i>}	Indicator equals 1 if issuer of IPO <i>j</i> is private-equity funded; 0 otherwise
<i>Market Characteristics</i>	
BAA-AAA yield spread _{<i>j</i>}	BAA-AAA yield spread at issue/withdrawal date of IPO <i>j</i>
10-Year Treasury Constant Maturity Rate _{<i>j</i>}	Ten-year Treasury yield at issue/withdrawal date of IPO <i>j</i>
NASDAQ return 60 days prior _{<i>j</i>}	NASDAQ composite index return in 60 days before issue/withdrawal of IPO <i>j</i>
<i>Underwriter Characteristics</i>	
UW's prior-year avg. excess 1 st -day ret. _{<i>i,j</i>}	For underwriter <i>i</i> engaged in IPO <i>j</i> , average excess 1 st -day return among IPOs completed by the bank in the 12 months prior to the offering
UW's prior-year avg. abnormal spread _{<i>i,j</i>}	For underwriter <i>i</i> engaged in IPO <i>j</i> , average abnormal spread paid by IPOs completed by the bank in the 12 months prior to the offering
UW's prior-year avg. withdrawals pct. _{<i>i,j</i>}	For underwriter <i>i</i> engaged in IPO <i>j</i> , the percentage of withdrawals among the bank's IPOs in the 12 months prior to the offering
UW's prior-year cum. abnormal performance _{<i>i,j</i>}	For underwriter <i>i</i> engaged in IPO <i>j</i> , the bank's cumulative abnormal performance in the 12 months prior to the offering

Panel B. Summary Statistics

	N	Mean	Median	Std. Dev.	p1	p99
<i>Dependent variables:</i>						
Change in UW's Market Share (pct. pts.)	7,797	-0.32	-0.11	3.04	-9.56	8.80
Pct. Change in Dollar Underwriting Volume	7,187	-0.07	-0.06	0.86	-2.50	2.14
Pct. Change in UW's Avg. IPO Size	7,002	0.07	0.05	0.59	-1.42	1.75
Change in UW's Avg. Coalition Size	7,225	0.17	0.10	0.83	-2.03	2.71
Change in UW's Number of Offerings	7,797	1.60	1.00	11.71	-28.00	37.00
<i>Level variables used to construct dependent variables:</i>						
UW's Market Share (%)	7,797	5.66	4.59	5.05	0.00	19.48
UW's Dollar Underwriting Volume (\$ mil)	7,797	1,926.94	1,306.31	2,195.12	0.00	11,700.00
UW's Avg. IPO Size (\$ mil)	7,797	306.78	256.30	331.03	0.00	1,300.55
UW's Avg. Coalition Size	7,797	3.26	2.71	1.91	1.00	8.00
UW's Number of Offerings	7,797	20.04	18.00	15.10	1.00	61.00
<i>Regressors:</i>						
<i>IPO Characteristics</i>						
Dummy Withdrawn	7,797	0.11	0.00	0.31	0.00	1.00
Probability of Withdrawal	7,797	0.11	0.04	0.17	0.00	0.77
Abnormal Performance	7,797	0.00	0.02	0.27	-0.96	0.57
ln(Revenues)	7,797	3.92	4.42	2.90	-1.20	9.44
Dummy PE	7,797	0.28	0.00	0.45	0.00	1.00
<i>Market Characteristics</i>						
BAA-AAA yield spread	7,797	0.87	0.85	0.24	0.54	1.46
10-Year Treasury Constant Maturity Rate	7,797	3.78	3.35	1.57	1.55	6.71
NASDAQ return 30 days prior	7,797	0.01	0.02	0.06	-0.21	0.16
<i>Underwriter Characteristics</i>						
UW's prior-year avg. excess 1 st -day ret.	7,137	0.22	0.16	0.25	-0.04	1.23
UW's prior-year avg. abnormal spread	7,149	-0.03	-0.05	0.30	-0.60	1.02
UW's prior-year avg. withdrawals pct.	7,225	0.09	0.04	0.14	0	0.86
UW's prior-year cum. abnormal performance	7,797	0.20	0.14	1.01	-2.33	3.09

Table 2. Abnormal Performance and Change in Underwriter Market Share

The dependent variable is an underwriter's *Change in Market Share* around a completed/withdrawn IPO, measured as the difference between a bank's market share during the 12 months after vs. 12 months before the offering. The regressor of interest is *Abnormal Performance*, measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO outcome (withdrawn = 1, completed = 0). All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. Column 1 has no control variables, column 2 includes IPO- and market-level controls, and columns 3 and 4 add underwriter-level covariates. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable: Change in Market Share			
	(1)	(2)	(3)	(4)
Abnormal Performance	0.376** (2.14)	0.371** (2.18)	0.353** (2.01)	0.386** (2.23)
Dummy PE		0.183 (1.22)	0.180 (1.22)	0.196 (1.35)
ln(Revenues)		-0.084*** (-3.23)	-0.084*** (-3.20)	-0.084*** (-3.16)
BAA-AAA yield spread		-0.247 (-0.16)	0.189 (0.11)	0.251 (0.14)
10-Year Treasury Constant Maturity Rate		-0.104 (-0.29)	-0.248 (-0.68)	-0.236 (-0.63)
NASDAQ return 30 days prior		-0.510 (-0.40)	-0.395 (-0.29)	-0.402 (-0.28)
UW's prior-year avg. excess 1 st -day ret.			1.143 (0.90)	0.739 (0.68)
UW's prior-year avg. abnormal spread			0.080 (0.35)	0.063 (0.26)
UW's prior-year avg. withdrawals pct.			-0.804 (-1.28)	
UW's prior-year cum. abnormal performance				0.330*** (2.75)
Time (Monthly) FE	Yes	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes	Yes
Observations	7,641	7,641	7,082	7,082
R-squared	0.113	0.116	0.126	0.134

Table 3. Abnormal Performance and Growth in Dollar Underwriting Volume

The dependent variable is an underwriter's *Percentage Change in Total IPO Proceeds* around a completed/withdrawn IPO, measured as the percentage change in a bank's total IPO proceeds from the 12 months before to the 12 months after the offering. The regressor of interest is *Abnormal Performance*, measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO outcome (withdrawn = 1, completed = 0). All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. Column 1 has no control variables, column 2 includes IPO- and market-level controls, and column 3 adds underwriter-level covariates. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable: Pct. Change in Dollar Underwriting Volume		
	(1)	(2)	(3)
Abnormal Performance	0.324** (2.22)	0.317** (2.19)	0.178*** (2.62)
Dummy PE		0.053 (0.91)	0.024 (0.65)
ln(Revenues)		-0.026** (-2.12)	-0.020*** (-2.80)
BAA-AAA yield spread		-0.855 (-0.97)	-0.307 (-0.48)
10-Year Treasury Constant Maturity Rate		0.500 (1.22)	0.115 (0.47)
NASDAQ return 30 days prior		0.141 (0.19)	0.088 (0.13)
UW's prior-year avg. excess 1 st -day ret.			0.423 (1.48)
UW's prior-year avg. abnormal spread			0.116 (0.90)
UW's prior-year cum. abnormal performance			0.016 (0.37)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	7,641	7,641	7,082
R-squared	0.180	0.181	0.305

Table 4. Abnormal Performance and Components of Underwriter Market Share

The dependent variables are, respectively, an underwriter's *Percentage Change in Average Offering Size*, *Change in Syndicate Size*, and *Change in Number of Offerings* in columns 1, 2 and 3, all measured during the 12 months after vs. 12 months before a completed/withdrawn IPO. The regressor of interest is *Abnormal Performance*, measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO outcome (withdrawn = 1, completed = 0). All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable:		
	Pct. Change in UW's Avg. IPO Size (1)	Change in UW's Avg. Coalition Size (2)	Change in UW's Number of Offerings (3)
Abnormal Performance	-0.001 (-0.02)	0.001 (0.02)	1.449*** (3.03)
Dummy PE	0.007 (0.20)	0.012 (0.55)	-0.144 (-0.49)
ln(Revenues)	-0.009 (-1.51)	-0.004 (-0.76)	-0.086 (-1.42)
BAA-AAA yield spread	1.018 (0.75)	-0.297 (-1.06)	4.462 (0.95)
10-Year Treasury Constant Maturity Rate	0.115 (0.51)	-0.152 (-1.24)	-1.941 (-1.12)
NASDAQ return 30 days prior	-0.381 (-0.90)	-0.044 (-0.22)	7.969 (1.51)
UW's prior-year avg. excess 1 st -day ret.	0.905 (1.34)	-0.330* (-1.97)	-9.536** (-2.03)
UW's prior-year avg. abnormal spread	0.079 (0.63)	0.436** (2.59)	2.871** (2.34)
UW's prior-year cum. abnormal performance	-0.020 (-0.51)	-0.009 (-0.44)	0.747 (1.55)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	6,896	7,082	7,082
R-squared	0.280	0.293	0.513

Table 5. Abnormal Performance in IPO Size Segments

The dependent variables are, in Column (1), the underwriter's *Change in Market Share* around a completed/withdrawn IPO, measured as the difference between a bank's market share during the 12 months after vs. 12 months before the offering; and in Column (2), the underwriter's *Percentage Change in Total IPO Proceeds* around a completed/withdrawn IPO, measured as the percentage change in a bank's total IPO proceeds from the 12 months before to the 12 months after the offering. IPO gross proceeds thresholds are denoted by the indicator variables: *Proceeds Below \$20M*, *Proceeds Bet. \$20M and \$100M*, and *Proceeds Above \$100M*. Regressions interact these IPO gross proceeds thresholds indicator variables and *Abnormal Performance*. All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable:		
	Change in Market Share	Pct. Change in Dollar Underwriting Volume	Change in UW's Number of Offerings
	(1)	(2)	(3)
Abnormal Performance × Proc. Below \$20M	-0.007 (-0.04)	0.413 (0.81)	2.798 (1.58)
Abnormal Performance × Proc. Bet. \$20M and \$100M	0.527** (2.31)	0.181* (1.74)	1.676** (2.41)
Abnormal Performance × Proc. Above \$100M	0.212 (0.65)	0.124 (1.58)	0.766 (0.96)
Proceeds Bet. \$20M and \$100M	0.026 (0.09)	-0.268 (-1.25)	-1.105 (-0.95)
Proceeds Above \$100M	-0.290 (-1.00)	-0.403* (-1.82)	-1.636 (-1.36)
Dummy PE	0.226 (1.53)	0.037 (1.01)	-0.089 (-0.29)
ln(Revenues)	-0.076*** (-3.06)	-0.016** (-2.20)	-0.073 (-1.25)
BAA-AAA yield spread	0.278 (0.16)	-0.274 (-0.43)	4.525 (0.97)
10-Year Treasury Constant Maturity Rate	-0.292 (-0.77)	0.111 (0.46)	-1.935 (-1.12)
NASDAQ return 30 days prior	-0.299 (-0.21)	0.130 (0.20)	8.113 (1.53)
UW's prior-year avg. excess 1 st -day ret.	0.765 (0.70)	0.428 (1.51)	-9.532** (-2.04)
UW's prior-year avg. abnormal spread	0.054 (0.23)	0.111 (0.86)	2.858** (2.31)
UW's prior-year cum. abnormal performance	0.330*** (2.78)	0.016 (0.37)	0.750 (1.56)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	7,082	7,082	7,082
R-squared	0.135	0.307	0.514

Table 6. Abnormal Performance and First-Listed Lead Bank

The dependent variables are, in Column (1), the underwriter's *Change in Market Share* around a completed/withdrawn IPO, measured as the difference between a bank's market share during the 12 months after vs. 12 months before the offering; and in Column (2), the underwriter's *Percentage Change in Total IPO Proceeds* around a completed/withdrawn IPO, measured as the percentage change in a bank's total IPO proceeds from the 12 months before to the 12 months after the offering. *Dummy First Lead* takes a value of 1 for an IPO's first (or only) lead bank, and 0 for all other participating banks. *Abnormal Performance* is measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO outcome (withdrawn = 1, completed = 0). All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable:		
	Change in Market Share	Pct. Change in Dollar Underwriting Volume	Change in UW's Number of Offerings
	(1)	(2)	(3)
Dummy First Lead = 1	-0.087 (-0.98)	-0.035 (-1.02)	-0.063 (-0.14)
Dummy First Lead = 0 × Abnormal Performance	0.322 (1.30)	0.102 (1.64)	1.927*** (2.70)
Dummy First Lead = 1 × Abnormal Performance	0.415** (2.08)	0.213** (2.20)	1.471** (2.22)
Dummy PE	0.196 (1.34)	0.024 (0.64)	-0.433 (-0.97)
ln(Revenues)	-0.085*** (-3.21)	-0.020*** (-2.88)	-0.101 (-1.11)
BAA-AAA yield spread	0.243 (0.14)	-0.312 (-0.49)	10.972* (1.83)
10-Year Treasury Constant Maturity Rate	-0.236 (-0.62)	0.117 (0.47)	-0.483 (-0.21)
NASDAQ return 30 days prior	-0.397 (-0.28)	0.095 (0.14)	5.191 (0.87)
UW's prior-year avg. excess 1 st -day ret.	0.734 (0.67)	0.421 (1.48)	-8.393 (-1.59)
UW's prior-year avg. abnormal spread	0.061 (0.25)	0.116 (0.90)	4.411*** (2.88)
UW's prior-year cum. abnormal performance	0.329*** (2.74)	0.015 (0.36)	0.838 (1.28)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	7,082	7,082	7,082
R-squared	0.134	0.305	0.501

Table 7. Abnormal Performance vs. Probability of Withdrawal

The dependent variables are (Column 1) the difference between a bank's market share during the 12 months after vs. 12 months before and including the offering; (Column 2) the percentage change in a bank's total dollar IPO underwriting volume from the 12 months before and including an offering to the 12 months after the offering; and the change from the 12 months ending with an offering to the 12 months after in the total number of IPOs handled by the bank (Column 3). The regressors of interest are *Abnormal Performance*, measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO's outcome (withdrawn = 1, completed = 0), and *Probability of Withdrawal*, imputed from the probit model in Appendix table A1. All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable:		
	Change in Market Share	Pct. Change in Dollar Underwriting Volume	Change in UW's Number of Offerings
	(1)	(2)	(3)
Abnormal Performance	0.386** (2.24)	0.178*** (2.63)	1.452*** (3.01)
Probability of Withdrawal	0.179 (0.39)	-0.134 (-0.53)	-1.174 (-0.71)
Dummy PE	0.201 (1.30)	0.020 (0.50)	-0.180 (-0.61)
ln(Revenues)	-0.076*** (-3.04)	-0.026** (-2.49)	-0.138 (-1.27)
BAA-AAA yield spread	0.223 (0.13)	-0.286 (-0.45)	4.647 (0.99)
10-Year Treasury Constant Maturity Rate	-0.224 (-0.58)	0.106 (0.43)	-2.021 (-1.19)
NASDAQ return 30 days prior	-0.344 (-0.24)	0.044 (0.07)	7.586 (1.43)
UW's prior-year avg. excess 1 st -day ret.	0.736 (0.68)	0.425 (1.49)	-9.516** (-2.03)
UW's prior-year avg. abnormal spread	0.063 (0.26)	0.116 (0.90)	2.866** (2.34)
UW's prior-year cum. abnormal performance	0.330*** (2.75)	0.016 (0.37)	0.744 (1.54)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	7,082	7,082	7,082
R-squared	0.134	0.305	0.513

Table 8. Falsification Tests: Regressions of Lagged Dependent Variables

The dependent variables are, respectively, an underwriter's *Lagged Change in Market Share* and *Lagged Percent Change in Dollar Underwriting Volume*. The regressor of interest is *Abnormal Performance*, measured as the difference between the IPO's ex-ante probability of withdrawal and the IPO outcome (withdrawn = 1, completed = 0). All regressions include Time (monthly), Industry (SIC level-2), Syndicate Size and Underwriter fixed effects. t-statistics (in parentheses) are based on two-way clustered standard errors, by underwriter and time (monthly). ***, **, and * indicates significance at the 1%, 5%, and 10% level, respectively.

	Dependent Variable:		
	Lagged Change in Market Share	Lagged Pct. Change in Dollar Underwriting Volume	Lagged Change in UW's Number of Offerings
	(1)	(2)	(3)
Abnormal Performance	-0.201 (-0.74)	0.035 (0.61)	-0.301 (-1.42)
Dummy PE	-0.105 (-0.66)	-0.021 (-0.69)	0.077 (0.27)
ln(Revenues)	0.053* (1.79)	0.021*** (2.78)	0.011 (0.21)
BAA-AAA yield spread	-2.688 (-1.20)	-0.273 (-0.58)	-7.115 (-1.45)
10-Year Treasury Constant Maturity Rate	-0.452 (-0.55)	0.066 (0.29)	1.289 (0.85)
NASDAQ return 30 days prior	5.024*** (2.69)	0.425 (0.95)	-3.560 (-0.98)
UW's prior-year avg. excess 1 st -day ret.	-1.101 (-0.94)	0.376 (1.29)	1.829** (2.17)
UW's prior-year avg. abnormal spread	-0.063 (-0.19)	-0.616** (-2.58)	13.544** (2.13)
UW's prior-year cum. abnormal performance	0.198 (1.16)	-0.056* (-1.89)	0.000 (0.00)
Time (Monthly) FE	Yes	Yes	Yes
Industry (SIC2) FE	Yes	Yes	Yes
Syndicate size FE	Yes	Yes	Yes
Underwriter FE	Yes	Yes	Yes
Observations	6,182	6,524	6,524
R-squared	0.139	0.411	0.596

Appendix

Table A1. Probit Estimation of the Decision to Withdraw

This table reports the probit model used to estimate the ex-ante probability of withdrawal. Panel A presents variable definitions and Panel B summary statistics for the IPO-level variables used in the probit estimation. Panel C reports estimation results from the probit model which is run over 4,037 observations (3,425 completed IPOs and 612 withdrawn offerings). The dependent variable *Dummy Withdrawal* takes a value of one for withdrawn IPOs and zero for completed offerings. The coefficients from Panel C are used to estimate the probability of withdrawal (PW) utilized to construct the variable abnormal performance (= PW – Dummy Withdrawal) in the main tests of the paper. Heteroscedasticity-consistent standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

Panel A. Variable definitions for IPO-level variables used in Probit estimation

Variable	Definition
<i>Dependent Variables:</i>	
Dummy Withdrawn	Indicates withdrawn IPOs (withdrawn = 1, completed = 0)
<i>Regressors:</i>	
<i>IPO Characteristics</i>	
ln(Revenues)	Natural logarithm of revenues (\$ million) in the last fiscal year before the offering
ln(Proceeds)	Natural logarithm of IPO proceeds (\$ million) for completed offerings, and of expected proceeds (= filed shares × mid-price of preliminary range) for withdrawn offerings
Dummy Technology	Indicates issuers in Fama and French (1997) industries 34 (business services) and 36 (chips)
Dummy PE	Indicates issuers with private equity funding
Dummy Debt Retirement	Indicates offerings where debt retirement is listed as the primary use of IPO proceeds
Dummy Amex	Indicates issuers to be listed on the AMEX
Dummy Nasdaq	Indicates issuers to be listed on the NASDAQ
Dummy NYSE	Indicates issuers to be listed on the NYSE
<i>Market Characteristics</i>	
Completed IPOs 2 Months Prior	Total number of completed offerings during the two months prior to the current offering
Withdrawn IPOs 2 Months Prior	Total number of withdrawn offerings during the two months prior to the current offering
BAA-AAA yield spread	BAA-AAA yield spread at issue/withdrawal date
Change in BAA-AAA spread in prior 30 days	Change in BAA-AAA yield spread in prior 30 days before the offering/withdrawal date
10-Year Treasury Constant Maturity Rate	Ten-year Treasury yield at issue/withdrawal date
Change in 10-Year Treasury Constant Maturity	Change in ten-year Treasury yield in prior 30 days before the offering/withdrawal date
Book/Market Median by FF 10 Industry/Month	Pre-offering book-to-market ratio, adjusted for the median book-to-market ratio in the corresponding month and industry (Fama-French 10 industries)
Price/Sales Median by FF 10 Industry/Month	Pre-offering price-to-sales ratio, calculated using the midpoint of the preliminary price range and adjusted for the median book-to-market ratio in the corresponding month and industry (Fama-French 10 industries)
NASDAQ return 30 days prior	The NASDAQ composite index return in prior 30 days before issue/withdrawal
<i>Underwriter Characteristics</i>	
Coalition Market Share	Sum of market shares of participating lead and co-lead banks, where market shares are based on the IPO proceeds in the 12-months preceding the offering
Herfindahl Index	Sum of the banks' squared percentage of market shares

Panel B. Summary statistics for IPO-level variables used in Probit estimation

<i>Probit Model IPO-Level Estimation Variables</i>	N	Mean	Median	Std. Dev.	p1	p99
<i>Dependent Variable:</i>						
Dummy Withdrawn	4,066	0.15	0.00	0.36	0.00	1.00
<i>Regressors:</i>						
<i>IPO Characteristics</i>						
ln(Revenues)	4,066	3.02	3.25	2.66	-1.61	8.96
ln(Proceeds)	4,066	11.22	11.18	1.10	8.75	14.40
Dummy Technology	4,066	0.33	0.00	0.47	0.00	1.00
Dummy PE	4,066	0.18	0.00	0.38	0.00	1.00
Dummy Debt Retirement	4,066	0.12	0.00	0.33	0.00	1.00
Dummy Amex	4,066	0.02	0.00	0.14	0.00	1.00
Dummy Nasdaq	4,066	0.73	1.00	0.45	0.00	1.00
Dummy NYSE	4,066	0.22	0.00	0.41	0.00	1.00
<i>Market Characteristics</i>						
Completed IPOs 2 Months Prior	4,063	41.50	32.00	29.56	2.00	114.00
Withdrawn IPOs 2 Months Prior	4,063	7.56	4.00	7.37	0.00	28.00
BAA-AAA yield spread	4,047	0.83	0.80	0.23	0.54	1.45
Change in BAA-AAA spread in prior 30 days	4,047	0.00	-0.01	0.10	-0.25	0.26
10-Year Treasury Constant Maturity Rate	4,045	4.51	4.79	1.55	1.60	6.75
Change in 10-Year Treasury Constant Maturity	4,045	-0.01	-0.03	0.26	-0.57	0.67
Book/Market Median by FF 10 Industry/Month	4,063	0.46	0.42	0.18	0.19	0.97
Price/Sales Median by FF 10 Industry/Month	4,063	2.35	1.94	1.57	0.35	7.37
NASDAQ return 30 days prior	4,056	0.01	0.02	0.07	-0.23	0.19
	4,056	0.61	1.00	0.49	0.00	1.00
<i>Underwriter Characteristics</i>						
Coalition Market Share	4,066	0.12	0.06	0.14	0.00	0.61
Herfindahl Index	4,066	0.69	0.59	0.36	0.12	1.48

Panel C. Probit Estimation of the Decision to Withdraw

Dependent Variable: Dummy Withdrawal	
	(1)
ln(Revenues)	-0.298*** (-15.72)
ln(Proceeds [Actual or Expected])	0.105** (2.35)
Dummy Technology	-0.289*** (-3.48)
Dummy PE	-0.657*** (-4.40)
Dummy Debt Retirement	-0.259* (-1.91)
Dummy Amex	0.500** (2.29)
Dummy Nasdaq	0.244 (1.60)
Dummy NYSE	0.483*** (2.61)
Completed IPOs 2 Months Prior	-0.006*** (-3.76)
Withdrawn IPOs 2 Months Prior	0.040*** (6.94)
BAA-AAA yield spread	0.595*** (3.20)
Change in BAA-AAA spread in prior 30 days	0.236 (0.89)
10-Year Treasury Constant Maturity Rate	-0.060 (-1.53)
Change in 10-Year Treasury Constant Maturity Rate	-0.275*** (-2.69)
Book/Market Median by FF 10 Industry/Month	-0.242 (-0.76)
Price/Sales Median by FF 10 Industry/Month	-0.206*** (-6.02)
Coalition Market Share	-1.438*** (-3.80)
NASDAQ return 30 days prior	-2.252*** (-6.34)
Herfindahl Index	-0.076 (-0.80)
Observations	4,037
Pseudo-R-squared	0.301

Table A2. Estimation of Abnormal Spread

We estimate abnormal spread as the difference between an IPO's observed spread and the estimated spread in the following regression, based on Busaba and Restrepo (2022), which captures the changes in functional form in the relation between spread and issue size around the \$20 million and \$100 million thresholds:

$$\begin{aligned} Spread_i = & \beta_0 + \beta_1 Bel\ Low\ Thld_i + \beta_2 Above\ Hi\ Thld_i + \beta_3 [Ln(Proc_i) - Ln(Hi\ Thld)] \\ & + \beta_4 \{Bel\ Low\ Thld_i \times [Ln(Proc_i) - Ln(Low\ Thld)]\} \\ & + \beta_5 \{Above\ Hi\ Thld_i \times [Ln(Proc_i) - Ln(Hi\ Thld)]\} + Controls + \varepsilon_i \end{aligned}$$

The dependent variable, *Spread*, is the underwriting spread expressed as a percentage of the offer price. Offer size, denoted by *Proc*, is gross IPO proceeds excluding the overallotment option. The dummy variable *Bel Low Thld* indicates deals with *Proc* below \$20 million, and the dummy variable *Above Hi Thld* indicates deals with *Proc* above \$100 million. The variables $[Ln(Proc) - Ln(Low\ Thld)]$ and $[Ln(Proc) - Ln(Hi\ Thld)]$ are the natural logarithm of gross proceeds minus the natural logarithm of the lower (\$20 million) and upper (\$100 million) thresholds, respectively, and represent the distance in percentage terms between the size of an offering and the corresponding threshold. Panel A presents summary statistics and Panel B reports estimation results.

Panel A. Summary statistics for IPO-level variables used in Abnormal Spread estimation

<i>Abnormal Spread IPO-Level Estimation Variables:</i>						
<i>Dependent Variable:</i>						
Spread	4,209	6.89	7.00	0.90	3.99	10.00
<i>Regressors:</i>						
Above High Thld	4,231	0.35	0.00	0.48	0.00	1.00
ln(Proc) - ln(Low Thld)	4,231	1.29	1.25	1.15	-1.20	4.54
ln(Proc) - ln(Hi Thld)	4,231	-0.32	-0.36	1.15	-2.81	2.93
Bel Low Thld	4,231	0.12	0.00	0.32	0.00	1.00
Above High Thld	4,231	0.35	0.00	0.48	0.00	1.00
ln(Revenues)	4,938	2.93	3.14	2.63	-1.61	8.85
Dummy Nasdaq	4,938	0.74	1.00	0.44	0.00	1.00
NASDAQ return 30 days prior	4,927	0.01	0.02	0.07	-0.22	0.18
Dummy PE	4,938	0.16	0.00	0.37	0.00	1.00

Panel B. Abnormal Spread Estimation

	Dependent Variable: Spread (1)
Constant	7.054*** (201.35)
Bel Low Thld	-0.089 (-1.36)
Above High Thld	0.265*** (6.74)
$[\ln(\text{Proc}) - \ln(\text{Low Thld})] \times \text{Bel Low Thld}$	-0.101*** (-4.43)
$[\ln(\text{Proc}) - \ln(\text{Hi Thld})] \times \text{Above High Thld}$	-0.656*** (-4.02)
$\ln(\text{Proc}) - \ln(\text{Hi Thld}) \# \text{Above High Thld}$	-0.810*** (-22.57)
$\ln(\text{Revenues})$	-0.025*** (-5.14)
Dummy Nasdaq	-0.006 (-0.20)
NASDAQ return 30 days prior	-0.187 (-0.78)
Dummy PE	0.039 (1.50)
Time (Monthly) FE	Yes
Industry (SIC2) FE	Yes
Syndicate size FE	Yes
Underwriter FE	Yes
Observations	4,071
R-squared	0.761