Early Price Discovery in IPOs

Anantha Divakaruni[§] Howard Jones Emmanuel Pezier

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Abstract

We study how investor feedback before bookbuilding influences IPO pricing and allocations. Using a novel dataset of investor–underwriter meetings and new airline route launches that reduce travel times as an exogenous source of variation facilitating these interactions, we find that precise, optimistic feedback narrows the price range and drives the offer price upward. Investors providing pre-bookbuilding feedback are more likely to bid and secure larger, more profitable allocations, supporting information revelation theories. Our findings shed light on the historically opaque role of early investor engagement in shaping IPO outcomes, with implications for capital markets design and regulation.

Keywords: Initial Public Offerings, Price Discovery, Pre-Deal Investor Education, Bookbuilding, Information Revelation

JEL Codes: D22, G14, G23, G24, G34

[§] Divakaruni, anantha.divakaruni@uib.no, is at the University of Bergen, Dept. of Economics, P.O. Box 7802, NO-5020 Bergen, Norway. Jones, howard.jones@sbs.ox.ac.uk and Pezier, emmanuel.pezier@sbs.ox.ac.uk are at Saïd Business School, University of Oxford, Park End Street, Oxford OX1 1HP, U.K. We thank Siddhant Sachdeva, Surabhi Chaturvedi, Kalyana Mulpuri, and Zachary Glabman for excellent research assistance. We also thank the Norwegian School of Economics for granting access to the OAG airline data. All errors remain our own.

I. Introduction

Initial public offerings (IPOs) are characterized by persistently positive first-day returns. This phenomenon has been attributed to information asymmetry between underwriters and investors concerning the true value of the issuing firm (Rock 1986). Benveniste and Spindt (1989) propose that underwriters address this asymmetry by rewarding investors with underpriced share allocations for revealing their private valuations during bookbuilding. However, empirical support for this information revelation hypothesis remains inconclusive. Studies that use price-limited bids as proxies for investor information revelation during bookbuilding have yielded mixed findings (Cornelli & Goldreich 2001; Jenkinson & Jones 2004), raising questions about their effectiveness in aiding price discovery (Jenkinson & Jones 2009). While the focus has traditionally centered on investor bidding behavior during bookbuilding, interactions between investors and underwriters prior to this phase have long been hypothesized to influence IPO pricing (Jenkinson & Jones 2004; Jenkinson *et al.* 2006). Recent work provides indirect support for this conjecture (Jenkinson *et al.* 2018; Gustafson *et al.* 2023) but the content and impact of these pre-bookbuilding interactions have so far remained largely unobserved.[1]

Our paper addresses this significant gap in the literature by analyzing detailed records of pre-bookbuilding interactions in IPOs. These records, sourced from a leading adviser to IPO issuers in Europe under strict confidentiality, offer unprecedented insights into the preliminary information revealed by investors: their views on the IPO's prospects, their perceived valuations of the issuer, and their bidding intentions. Using this data and an identification strategy which exploits a plausibly exogenous variation in investor information revelation, we address two major questions: (i) Does information revealed by investors before bookbuilding influence IPO outcomes?; and (ii) Are investors rewarded for this early information disclosure through favourable share allocations? Our findings affirm both questions, suggesting that previous studies focused only on bookbuilding may have underestimated the full extent of price discovery in IPOs.

Pre-bookbuilding interactions between underwriters and investors occur in both US and European IPOs, but differ markedly in structure and timing. In the US, "testing-the-waters" (TTW) meetings, permitted under the JOBS Act since 2012 for emerging growth companies and expanded

[1] Jenkinson et *al.* (2018) show that pre-bookbuilding interactions between underwriters and investors lead to more generous share allocations in European IPOs. Similarly, Gustafson et al. (2023) link the dissemination of US IPO prospectuses among prospective investors to increased price revisions and underpricing. Notably, neither study uses data on investor information revelation prior to bookbuilding, presenting an opportunity for further exploration.

to all issuers in 2019, allow underwriters to gauge investor demand before formal regulatory filings (Lowry *et al.* 2017). However, these meetings occur without prior distributon of analyst research and are followed by a two-week period before bookbuilding during which contact with investors is not permitted, limiting information exchange.[2] In contrast, European IPOs feature a distinct pre-bookbuilding phase known as "Pre-Deal Investor Education" (PDIE), during which underwriters' analysts distribute detailed research reports and engage extensively with prospective investors.[3] Interested investors respond by providing crucial insights that may influence IPO outcomes. They offer quantitative estimates of the issuer's expected equity value (within a predetermined range set by underwriters), highlight key qualitative strengths and weaknesses, and signal their bidding intentions.[4] This structured early engagement during PDIE, barred until recently in US IPOs before the JOBS Act, makes European equity markets an appropriate setting to study pre-bookbuilding information dynamics, building on prior research in this context (Cornelli & Goldreich 2001; Jenkinson & Jones 2004; Jenkinson *et al.* 2018).[5]

Our study uses direct evidence of pre-bookbuilding information revelation by investors prior to the commencement of bookbuilding. On average, over 680 investors are contacted per IPO, with more than 72% located outside the issuer's home country. Nearly 80% of them express their views on the IPO's prospects, and about 25% disclose their issuer valuation to the underwriters. We also have comprehensive data on investor bidding behavior and share allocations at the end of bookbuilding, providing us with a complete view of investor demand at every stage of the IPO process. Prior studies have been unable to examine the significance of PDIE on IPO outcomes owing to a lack of detailed data.

Our dataset is novel in three ways. First, the investor disclosures made during PDIE contain both quantitative details (perceived issuer valuations and bidding intentions) and qualitative insights such as private assessments of the issuer's strengths and weaknesses. Second, we can track

[2] In US IPOs occurring under the JOBS Act, TTW meetings typically begin after the confidential submission of the initial S-1 filing by the issuer to the S.E.C. and prior to its public disclosure, and rarely during the 15-day period prior to the start of the roadshow.

[3] These research reports are comprehensive studies designed for investors with little prior knowledge of the issuer. They present a buy case for the shares and include an indicative valuation for the firm.

[4] The indicative valuation range established before PDIE guides investors in providing information on their perceived issuer valuation, much like the indicative price range informs bidding during bookbuilding.

[5] The European IPO market has a comparable number of IPOs to the US market (averaging 276 vs 302, respectively, per year between 2010 and 2021, according to Dealogic). Further details on the institutional framework distinguishing European and U.S. IPO timetables, including regulatory constraints and the structure of the PDIE phase, are provided in Appendix B.

each investor's information disclosure and actions throughout an IPO. Our dataset captures details of every investor contacted by underwriters during PDIE, including whether they provided feedback and the specific details of that feedback. We also record all bids submitted during bookbuilding, covering both investors who participated in PDIE and those who bid without prior engagement. Third, daily records of investor participation during PDIE and bookbuilding allow us to track changes in disclosure patterns, such as valuation adjustments and bid revisions, as well as identify discrepancies in information shared with multiple underwriters managing the IPO.

We develop two novel metrics to capture investors' assessments of the issuer's equity value. The first, *Feedback Midpoint*, is the average of the upper and lower bounds of the investor's valuation estimates disclosed during PDIE. The second, *Feedback Tilt*, scales the investor's estimated value within the indicative valuation range set by underwriters at the start of PDIE. A tilt toward the upper end of the indicative range signals greater optimism regarding the issuer's future prospects. We use these metrics to assess how investor feedback during PDIE influences IPO outcomes during and after bookbuilding. These outcomes include the indicative price range set at the start of bookbuilding, investor demand (proxied by bid size), share allocations relative to bid size, and the final offer price.

It is plausible that investor participation during PDIE or the decision to bid during bookbuilding is non-random, influenced by both observable and unobservable investor and deal-related factors. For example, investors might be more likely to participate in PDIE when the issuer is easier to evaluate, the underwriters are more reputable, or when they have a strategic interest in shaping IPO outcomes. Similarly, the extent and nature of information revealed may depend on characteristics of the issuing firm, such as industry, size, or risk profile. These factors suggest that standard OLS estimates could be biased if they do not account for the endogeneity arising from these selection mechanisms.

To mitigate these concerns, we use a two-stage procedure Heckman (1979) following similar methodologies employed in studies of investor-underwriter interactions to account for potential selection biases (Dunbar 1995; Fang 2005; Golubov *et al.* 2012). Specifically, we use the introduction of direct airline routes between underwriter and investor locations as a source of exogenous variation in the likelihood of information revelation by investors. The rationale for this instrument is that shorter travel times facilitate more interactions between underwriters' analysts and investors without directly affecting the IPO's outcomes. Shorter travel times may lead to more

in-person meetings and encourage investors to share private information with the underwriter. However, while changes in travel time may directly affect an investor's decision to disclose information, they do not directly influence IPO outcomes during PDIE or bookbuilding. This characteristic makes new airline routes a strong candidate for meeting the exclusion restriction.

We define our instrument as a binary indicator. It equals one if a new direct flight connects London, where underwriter analysts handling European IPOs are primarily based, with a prospective investor's location during the quarter before the PDIE phase, provided that the investor was contacted during that phase.[6] To gather direct evidence on whether investor involvement increases as travel time is reduced, we conduct a global survey of IPO underwriter analysts. The survey evidence supports our conjecture that investor information disclosure responds to the introduction of direct flight connections.[7]

Our main results are as follows. First, using the Heckman (1979) setup, we show that investor feedback during PDIE shapes the bookbuilding price range. A direct flight connection increases the probability of valuation feedback provision among investors by approximately 7%. After adjusting for selection bias, we find that investor sentiment is positively associated with valuations, measured by their feedback midpoint and tilt. Investors expressing interest in the IPO provide valuations with midpoints up to 0.29 standard-deviations (SD) above the sample average, while those expressing caution report midpoints around 0.14 SDs below average. At the deal level, greater investor engagement significantly improves the precision of the bookbuilding price range. A one SD increase in the number of investors contacted per deal in PDIE narrows the range by 2.15 SDs, and a one SD increase in the fraction of investors providing feedback during PDIE reduces its width by 1.52 SDs. These findings highlight the critical role of early investor engagement in defining the indicative price range and improving pricing efficiency before

[6] Giroud (2013) use a similar empirical strategy to examine how geographic proximity to plants enables managers at headquarters to more effectively monitor plant performance. Bernstein, Giroud, and Townsend (2016) also adopt this approach, using the introduction of new airline routes which reduce travel times for venture capitalists (VCs) to their portfolio companies, as an instrument to show that increased on-site involvement by VCs enhances innovation and improves the likelihood of a successful exit for these firms. We also explore alternative specifications of the instrument: (i) the introduction of new direct airline routes between the locations of prospective investors and IPO issuers, and (ii) flight ticket costs in economy, premium economy, and business class between London and the locations of prospective investors. Our findings remain consistent across all these specifications.

[7] We surveyed a total of 191 participants of whom 79% agreed that direct flights (as opposed to layovers) between analysts and IPO investors enhance the frequency of analyst visits to prospective investors. Respondents also agreed that the introduction of a direct flight facilitates more effective IPO discussions, fosters stronger relationships with investors, improves understanding of investor preferences and concerns, and enables better assessment of investor demand for the IPO. The survey results are available in online appendix D.

commencement of bookbuilding.

Second, we assess whether investor feedback in PDIE is a credible signal of subsequent bidding behavior, as opposed to being merely cheap talk that does not reflect their true intentions or future actions in the IPO.[8] Using the two-stage approach to address selection bias from voluntary investor participation, our analysis shows that investors providing PDIE feedback are up to 12% more likely to submit bids. Moreover, those offering more optimistic valuations during PDIE, as proxied by feedback tilt, demonstrate an additional increase in bidding likelihood. We also examine the role of investor sentiment expressed towards the IPO during PDIE, revealing a significant effect on bidding behavior: investors who express themselves 'interested' are most likely to bid, followed by 'neutral' investors, with 'concerned' investors least likely to participate. These findings indicate that, far from being cheap talk, the feedback shared during PDIE serves as a predictor of investor actions in the bookbuilding phase.

Third, we examine the effect of investor feedback during PDIE on bid sizes. We find that investors contacted during PDIE submit larger bids than those from investors who are not contacted. Among contacted investors, those who provide feedback and express higher valuations tend to submit larger bids. Next, we assess the allocations received at the end of bookbuilding by measuring *Normalized Rationing* (Cornelli & Goldreich 2001; Jenkinson *et al.* 2018). This metric compares an investor's allocation to that of all other bidders. The results mirror the patterns observed for bid sizes: investors contacted during PDIE receive significantly higher normalized rationing than those not contacted. Moreover, among the contacted investors, those who provide feedback, disclose valuations, especially higher valuations, secure more generous allocations. Overall, these findings indicate that underwriters reward investors for early information disclosure, which likely improves price discovery and allocative efficiency.

Fourth, we evaluate whether the more generous allocations tied to PDIE participation are, in expectation, more profitable for investors. This question is important since larger allocations may feature more prominently in IPOs exhibiting lower expected first-day returns, potentially offsetting the economic benefit of such allocations. Our analysis reveals that PDIE participation significantly improves expected profitability, with incremental benefits observed when investors provide

[8] PDIE feedback is voluntarily disclosed, legally non-binding, and may not correlate with subsequent bidding behavior. For example, in our sample, only 56% of investors contacted and 25% of those giving feedback ultimately submitted bids.

feedback and disclose their valuations.

Finally, we investigate if PDIE feedback influences the final offer price beyond the effect of investor demand observed during bookbuilding. This analysis disentangles the role of early investor feedback from later demand signals and evaluates their relative impact on IPO pricing. We find that PDIE feedback, especially investor valuations, significantly shape the offer price even when accounting for bookbuilding demand, deal characteristics, and market conditions. These results point to the informational value of PDIE in improving pricing efficiency even after the bookbuilding phase, lending support to information revelation theories of IPO pricing.

This paper contributes to the IPO literature by introducing PDIE as a novel mechanism for information revelation. While existing research emphasizes how issuers and underwriters convey information through prospectuses (Hanley & Hoberg 2010), proprietary disclosures (Boone *et al.* 2016; Barth *et al.* 2017), marketing efforts (Grullon *et al.* 2004; Liu *et al.* 2014), regulatory interactions (Lowry *et al.* 2020), investor relations (Chahine *et al.* 2020), press releases (Dambra *et al.* 2023), and roadshows (Blankespoor *et al.* 2023; Gustafson *et al.* 2024), our study analyzes investors as active participants in the information production process before bookbuilding begins. During PDIE, underwriter-sponsored research reports and face-to-face meetings prompt prospective investors to share quantitative valuations and qualitative assessments of the issuer. We demonstrate that this early feedback refines the bookbuilding price range, predicts subsequent bidding behavior, and influences the final offer price and share allocations. Unlike studies that explore indirect or noisy information channels outside bookbuilding, such as media coverage (Bajo & Raimondo 2017; Bushee *et al.* 2020) or technology-driven communication (Welch 2022), our analysis exploits the structured nature of PDIE to establish a direct link between investor feedback and IPO outcomes. This approach aligns with research on the value of in-person interactions (Green *et al.* 2014; Bradley *et al.* 2022; Cicero *et al.* 2023) and contributes to the understanding of investor sentiment as shaped by direct communication (Hirshleifer 2020).

We also contribute to the literature comparing bookbuilding with alternative IPO mechanisms, such as auctions and fixed-price methods (Sherman 2000; Derrien & Womack 2003; Kutsuna & Smith 2004; Sherman 2005; Degeorge *et al.* 2007). By demonstrating that pre-bookbuilding interactions during PDIE significantly reduce information asymmetry, our findings suggest that bookbuilding, when combined with structured investor feedback mechanisms like PDIE, may be more effective at achieving efficient price discovery than previously acknowledged. This insight

also informs ongoing discussions about alternatives to traditional IPOs, such as direct listings and SPACs (Klausner *et al.* 2022; Zheng 2022; Gahng *et al.* 2023), by highlighting the benefits of incorporating early investor engagement to improve pricing accuracy.

Our study further contributes to the expanding literature on IPOs in non-US markets, where, as Doidge *et al.* (2013) highlight, an increasing share of global IPO activity occurs. Despite this ongoing trend, detailed micro-level data from these markets remain scarce. Several studies have used unique datasets to explore IPO dynamics outside the US. For instance, Chiang *et al.* (2010) and Chiang *et al.* (2011) use Taiwanese auction data to analyze investor bidding behavior, while Chang *et al.* (2017) examine how pre-IPO trading in Taiwan impacts offer price determination. Similarly, Jenkinson *et al.* (2018), Larrain *et al.* (2024), and Larrain *et al.* (2025) utilize proprietary European data to study IPO allocations, post-IPO profitability, and the impact of ownership concentration, respectively. Like these studies, our research employs unique, hand-collected European IPO data to address fundamental questions about price discovery and information revelation, offering novel insights with broad relevance to global IPO markets.

Lastly, our study advances the literature which uses exogenous shocks in travel and weather to explore investor-firm interactions and information dynamics. For instance, Giroud (2013), Giroud and Mueller (2015), and Bernstein et al. (2016) use new airline routes to examine how lower travel costs enhance corporate monitoring and venture capital investment, while Chen *et al.* (2022) exploit high-speed rail introductions to study analyst information production. Bradley *et al.* (2023) analyze taxi ridership to investigate interactions between Federal Reserve Bank officials and financial institutions. Weather disruptions are employed by Dehaan *et al.* (2017) and Dong *et al.* (2019) to link to analyst productivity, and by Brown *et al.* (2021) to firms' cash flow shocks. In the IPO context, Gustafson *et al.* (2023) and Gustafson *et al.* (2024) use weather-induced travel delays during roadshows to study the effects of investor participation on pricing. We extend this research by using new airline routes introduced just prior to the PDIE phase as an instrument to identify the causal impact of investor information revelation on subsequent IPO outcomes.

II. Sample construction

A. IPO data

Our IPO data is sourced from a leading IPO adviser based in London, United Kingdom, under

strict conditions of confidentiality. IPO advisers are typically firms with no research or trading activities appointed by the issuer to help them navigate the complex IPO process.[9] Approximately 40% of European IPOs engage an adviser, compared to around 30% in the US (Jenkinson *et al.* 2024).

We received data on a total of 42 European IPOs conducted between 2010 and 2021. There was missing information for the PDIE (bookbuilding) phase in four (five) IPOs, with one deal having missing data for both phases. After excluding these ten IPOs, our final sample consists of 32 IPOs with complete information for both PDIE and bookbuilding phases. Of these, ten IPOs were for issuers based in the UK, four in the Netherlands, three in Germany, and two each in Sweden, Norway, France, and Belgium. A total of 62 investments banks served as underwriters for the IPOs in our final sample.[10]

Table 1 presents descriptive statistics on the issuing firms and IPOs in our sample. The issuers are on average mature companies, with a mean age of 50 years at IPO, employ 6,370 people, and have an EBITDA of 18%. However, the standard deviations are large, and the sample includes issuers as young as 3 years and with only 79 employees. The average deal is over EUR 417 million in size (gross proceeds), typically managed by broad underwriting syndicates comprising 5 to 6 banks that charge relatively low fees (1.74%, the 'gross spread') compared to US IPOs. The average deal offers modest first-day gains of just 1.6% to investors, with 41% of IPOs closing below their offer price on the first day. The average width of the indicative price range for these IPOs, computed as $\frac{Price\ Range\ (High) - Price\ Range\ (Low)}{\frac{Price\ Range\ (High) + Price\ Range\ (Low)}{2}}$, is 22.1%, with the final IPO price being below (above) the range in 31% (7%) of cases. The average first-day returns of 1.6% compare with the average for all European IPOs of 6.9% over the same period, reflecting the fact that over 40% had negative first-day returns. In line with the findings of other studies (e.g. Jenkinson *et al.* (2018)), European first-day returns are also lower than for US IPOs, which

[9] In some cases, investment banks may also be appointed as IPO adviser with no other formal involvement in the transaction. The appointment of an adviser may or may not be publicly disclosed.

[10] Appendix E presents a series of propensity score matched-sample comparisons demonstrating that our sample IPOs do not differ in their observable characteristics from a broader set of European IPOs. Table E1 shows that key deal metrics (price-range width, offer price placement, gross proceeds), underwriter composition and fees, post-IPO outcomes (first-day returns), and issuer fundamentals (revenue, employee count) are statistically indistinguishable between our IPOs and the matched sample. These results affirm that our findings are externally valid and generalize to the broader European IPO market.

averaged 20% over that period.[11]

Table 1. Firm- and deal-level characteristics of IPO issuers

This table reports descriptive statistics for the IPOs and their issuers in our sample conducted between 2010 and 2021, with complete data for both the PDIE and bookbuilding phases. Issuer characteristics are measured as of the IPO year, and are obtained from Capital IQ. IPO characteristics are computed from our sample.

	Mean	SD	Minimum	25 pct	Median	75 pct
Issuer Characteristics						
Assets (million €)	7128.07	28994.62	57.35	614.96	1072.80	2442.25
Revenues (million €)	1308.92	2449.69	34.82	343.48	618.60	1240.91
Gross Profit (% Revenues)	42.19	21.16	6.73	29.03	39.25	55.29
EBITDA (% Revenues)	17.72	22.46	-49.14	11.19	15.08	23.86
Debt Ratio (%)	66.50	20.54	15.98	58.40	69.39	78.05
R&D (% Assets)	0.22	0.46	0	0	0	0.13
Firm Age (years)	49.69	50.63	3	10.75	22.50	65.25
Employees	6371.03	8187.99	79	1055.75	3530.50	7279.75
IPO Characteristics						
IPO % of Shares Issued	12.13	13.24	0	0	9.16	21.97
Bookbuilding Price Range (% midpoint)	22.14	11.13	0	19.03	22.22	24.59
Offer Price < Price Range (low)	31.03	47.08	0	0	0	100
Offer Price > Price Range (high)	6.90	25.79	0	0	0	0
Gross Proceeds (million €)	417.03	344.38	0	172.16	315.41	580.84
Underpricing (%)	1.62	7.17	-15.61	-3.42	2.02	6.22
Underwriter Syndicate Size	5.59	3.50	2	4	5	5.25
Underwriter Fees (% gross proceeds)	1.74	0.43	0.62	1.50	1.75	2
Use of Proceeds (% Working Capital)	52	50.99	0	0	100	100
Use of Proceeds (% Debt Repayment)	76	43.59	0	100	100	100
Use of Proceeds (% M&A)	4	20	0	0	0	0
Use of Proceeds (% R&D)	4	20	0	0	0	0

B. Sample construction

Our analysis considers investor participation both during PDIE and bookbuilding. We now describe the samples constructed for these two phases.

1. PDIE sample

For each of the 32 IPOs, we consolidate the daily PDIE interactions into one dataset, detailing every investor contacted by an underwriter, their investment style, geographic location, and the day of contact (relative to the start of PDIE). This data captures both quantitative feedback—such as investors' valuation estimates, expressed as a point value or a range—and qualitative insights such as their willingness to participate in the IPO and assessments of the issuer's growth potential,

[11] European (including UK) data were sourced from Capital IQ; US data were sourced from Jay Ritter's home page (https://site.warrington.ufl.edu/ritter/files/IPOs-Underpricing.pdf, October 2024). In Jenkinson *et al.* (2018) the sample period was 2010 to 2014 and the average first-day return for the sample of IPOs listed on European exchanges was 4.8% compared with 12.6% for all US IPOs.

managerial quality, and business operations.[12] Additionally, the data records investors' willingness to participate in roadshow meetings with the issuer, whether individually or in groups, as well as the expected size and any price limits of the bids they may submit during bookbuilding.[13]

In total, 36,359 contacts were made with investors during the PDIE stage of the IPOs in our sample. After excluding repeat contacts between the same underwriter and investor for the same IPO, we identify 18,536 unique contacts with 3,202 investors from 59 countries. The highest percentage of contacts were with investors from the UK (30.4%), followed by the US (24.3%), Germany (7%), France (6.8%), Switzerland (5.8%), Norway (4.6%), and Denmark (3.8%). Most investors (66.4%) are classified as long-only, with the remainder being hedge funds.

2. Bookbuilding sample

During bookbuilding, investors submit bids within the indicative price range. These bids can take one of three forms: a *limit* bid, where the investor specifies the maximum price they are prepared to pay per share; a *step* bid, which consists of several limit bids at different price points; or a *strike* bid, which has no set price limit (Jenkinson *et al.* 2018).

A total of 24,453 bids were submitted by 2,240 investors across our sample IPOs. After grouping bids that were revised after initial submission, and excluding those withdrawn during bookbuilding, there were 5,811 active bids on the final day of bookbuilding of all IPOs.

C. Key variables

PDIE feedback comprises both qualitative and quantitative information. We measure qualitative feedback in two ways: *Investor Sentiment* and *Substantive Opinion*. *Investor Sentiment* is captured by three dummy variables indicating whether investors are *Neutral* about the IPO, *Interested* in investing in it, or have *Concerns* about the IPO or Issuer. Together, these dummy variables measure an investor's general interest in the IPO.[14] We use another dummy variable, *Substantive Opinion*, indicating whether the investor shared additional feedback beyond expressing just the general *Investor Sentiment.*

[12] Figure A1 in the appendix presents a representative feedback form used by underwriters during the PDIE phase to elicit information from investors about their interest in the IPO.
[13] In IPOs that do not involve an adviser, the lead-left underwriter is tasked with providing this template to fellow syndicate underwriters and consolidating investor feedback gathered during PDIE.
[14] These sentiments are not mutually exclusive. For instance, an investor may express interest in investing while simultaneously raising specific concerns about the IPO. Hence, we cannot codify these individual investor sentiments into a single categorical variable.

To assess the quantitative feedback received from investors during PDIE, we use two measures. *Limit Feedback* is a dummy variable indicating whether an investor provided a point valuation or specified both a lower and upper bound for their expected valuation (implying that the valuation is expressed as a range rather than a single point estimate). In either case, *Limit Feedback* is set to one, and is zero otherwise. *Strike Feedback* is another dummy variable denoting whether the investor placed no limits within the indicative valuation range on the issuer's expected value.

We construct two additional novel quantitative measures of investor feedback. *Feedback Midpoint* is the average of the minimum and maximum values of the valuation estimates revealed by the investor. This effectively converts valuation feedback expressed as a range into a point value. We compute a second measure, *Feedback Tilt*, denoting how an investor's valuation compares to the indicative valuation range set prior by underwriters. It is estimated as follows:

$$Feedback\ Tilt_{ij} = \frac{(Valuation\ Min_{i,j} + Valuation\ Max_{i,j})}{(Valuation\ Range\ Min_i + Valuation\ Range\ Max_i)}$$

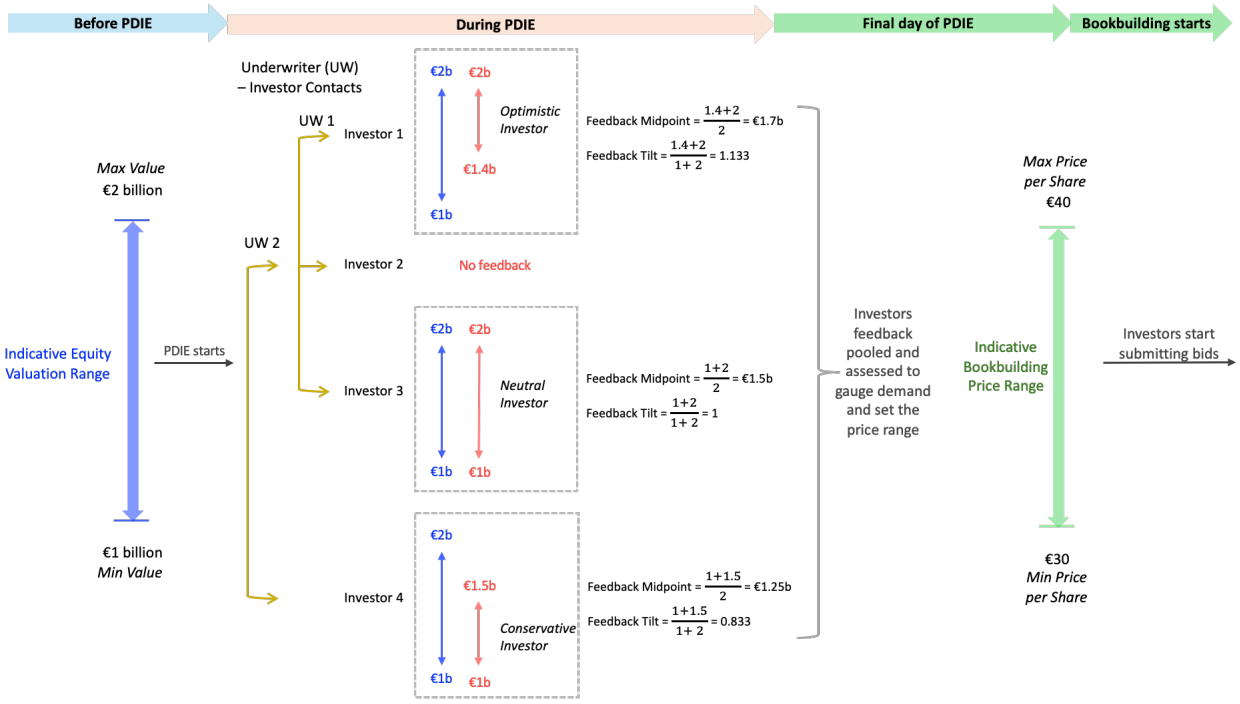
where *i* and *j* denote the IPO and investor, respectively. *Valuation Min* and *Valuation Max* represent the minimum and maximum estimates of the investor's equity valuation of the issuer. *Valuation Range Min* and *Valuation Range Max* refer to the correponding minimum and maximum values of the indicative equity valuation range set by the underwriters at the start of PDIE. In the case of *Limit Feedback*, the investor's valuation may fall entirely within, overlap with, or lie outside the indicative valuation range. For *Strike Feedback*, where no limits are placed, the numerator and denominator are equal, resulting in a *Feedback Tilt* of one. Scaling *Feedback Midpoint* and *Feedback Tilt* by the indicative valuation range standardizes these measures, making them comparable across investors within the same IPO and further across different IPOs. Notably, *Feedback Tilt* is invariant to whether the indicative valuation range of the issuer's equity is expressed in pre– or post–money terms (i.e. before or after including any new equity capital raised in the IPO), as investors provide their valuation feedback under the same terms under a given deal.

Figure 1 illustrates the process of information disclosure through investor feedback during the PDIE phase. In this example, two underwriters, UW1 and UW2, together establish an indicative valuation range of €1 to €2 billion prior to the start of PDIE for an IPO. During PDIE, UW1 contacts three investors, while UW2 contacts two investors, resulting in feedback from three out of the four investors approached. Investor 1 provides a valuation range of €1.4 to €2 billion, yielding a *Feedback Midpoint* of €1.7 billion (above the €1.5 billion midpoint of the indicative

range) and a *Feedback Tilt* of 1.133 (indicating a tilt toward the upper end of the range). This optimistic outlook suggests confidence in the issuer's post-IPO prospects. Feedback from the other investors reflects more neutral (*Midpoint* = €1.5 billion; *Tilt* = 1) and conservative (*Midpoint* = €1.25 billion; *Tilt* = 0.833, tilted toward the lower end of the range) views on the issuer's prospects. On the final day of PDIE, the underwriters aggregate this feedback to gauge demand and interest in the IPO, using it to set the indicative price range for the subsequent bookbuilding phase.

Figure 1. Illustrative example of investor participation during PDIE

This figure illustrates the collection of investor feedback during the PDIE phase of a hypothetical IPO. Underwriters establish an indicative equity valuation range of €1 to €2 billion, depicted in blue, and engage with investors to solicit their valuation estimates. In this example, two underwriters contact a total of four investors, with three of them providing feedback, shown in red. *Feedback Midpoint* and *Feedback Tilt* are calculated for each information disclosing investor. The figure highlights the variation in investor valuation expectations relative to the indicative range, capturing differences in optimism about the issuer's prospects. This illustrative scenario demonstrates how underwriters gather and process investor insights revealed during PDIE to inform the subsequent bookbuilding process.



D. Airline routes and prices

We exploit the introduction of new airline routes between investors and underwriters to address the possibility that investor participation during PDIE, or their decision to place a bid during bookbuilding, is not random. Data on airline routes and ticket prices during the sample period were obtained from the Official Aviation Guide of the Airways (OAG). The OAG dataset contains

details on monthly flight schedules, fares, and passenger counts for flights between any two airports in Europe (spanning 50 countries, including those outside the European Union) and the US. Since OAG reports this data at the airline level, we can precisely identify the introduction of new airline routes between specific origin and destination airport pairs over time. Using the geographical coordinates of each airport in our sample, we grouped airports located within a 30-kilometre radius of each other, as they are likely to cater to a shared local population. The only exception is London, which is collectively served by six airports across a 60 kilometre radius. Despite this distance, these airports are sufficiently well connected via road and rail to London's financial institutions (Rothfeld *et al.* 2019), allowing us to pool flights to and from these six airports as being from a single entity.

An advantage of using OAG data is its detailed reporting for each origin-destination city (airport) pair, including the total number of enplaned passengers and average ticket prices across various fare classes—broadly categorized as economy, premium economy, and business class. This rich dataset enables us to test multiple variants of the instrument, such as the introduction of new direct routes between investors and underwriters, as well as average flight ticket prices between investor locations and London.

Table C1 in the online appendix presents summary statistics on airline routes, highlighting the characteristics and deal behavior of investors based on whether they are located on a treated route (i.e., one where a new direct flight connection to London was introduced in the quarter before PDIE) or a control route. During our sample period, there are 3,941 treated investor-underwriter pairs and 14,595 control pairs. The introduction of a direct flight reduces the average scheduled round-trip travel time by 245 minutes. Such a significant reduction in travel time can be pivotal in facilitating meetings, as it enables both investors and underwriters' analysts to optimize their schedules, attend more meetings, reduce travel fatigue, and lower associated costs. This, in turn, enhances their capacity to participate in IPO-related activities and share information more effectively.[15]

III. Research design

[15] Table B1 further shows that treated routes, defined by new direct flights before IPOs, significantly reduce ticket fares and influence investor behavior. Non-US investors on treated routes show greater interest and provide valuation feedback with fewer revisions, while US investors show stronger engagement, with more roadshow requests and feedback provision. The effects are more pronounced for US investors, likely due to larger route distances and greater fare reductions.

A. Measuring investor feedback during PDIE

One challenge in evaluating the impact of investor feedback during PDIE on IPO outcomes is the voluntary nature of this feedback, which may be influenced by unobservable factors such as underwriter effort or investor network effects, making it potentially endogenously determined. While incorporating investor, underwriter, or investor-underwriter fixed effects helps mitigate this selection bias, it may not fully account for variations in information revelation preferences across deals and over time.

To address this issue, we employ the two-step procedure of Heckman (1979). In the first-stage, we model each investor's decision to provide valuation feedback during PDIE upon being contacted. In the second-stage, we examine the content of this valuation feedback, correcting for selection bias using the results from the first stage.[16] To implement this approach, we use an instrumental variable in the first-stage equation that is excluded in the second stage (Wooldridge 2015). Such an instrument is valid only if it satisfies the exclusion restriction: it should strongly influence investors' preferences for information revelation during PDIE, but have no direct bearing on the content of the feedback provided or the setting of the bookbuilding price range.

In identifying our instrument, we exploit the fact that travel costs may affect investors' active involvement in the IPO. Our source of exogenous variation is the introduction of direct airline routes that reduce travel time and costs between underwriters' analysts and investors during PDIE. These new routes should increase the probability that investors on direct routes have face-to-face meetings with underwriters and build trust, improving the likelihood of information disclosure. If investor engagement is crucial for price discovery, improved air connectivity (and reduced travel costs) during PDIE should lead to better investor feedback.[17]

Our instrument, *New Route*, is a binary variable set to one if a new airline route connecting London and a prospective investor's location is introduced in the quarter before the IPO's PDIE phase. Direct routes shorten the travel time between the analyst—based primarily in London for

[16] Similar two-step procedures have been used in previous studies by Dunbar (1995) to study the use of equity warrants as underwriter compensation, by Fang (2005) to study the effect of underwriter prestige in bond underwriting, and by Golubov et al,. (2012) to study the effect of adviser prestige in M&A transactions.

[17] Prior research indicates that reducing travel time decreases monitoring costs for firms with headquarters that are geographically distant from their production facilities (Giroud, 2013; Bernstein et al., 2016).

European IPOs—and the prospective investor's location.[18] Shorter travel times reduce information acquisition costs by facilitating in-person meetings, allowing investors to gather more detailed insights about the IPO. This may incentivize investors to share more private information during PDIE, ultimately contributing to more informed and accurate pricing decisions. Details on the estimation of travel times between locations can be found in Appendix C. To validate our instrument, we conducted a global survey of underwriters' analysts to obtain direct evidence of the impact of improved air connectivity on investor participation in IPOs. The survey results confirm that the introduction of direct airline routes significantly increases the scope of investor participation and feedback provision during the PDIE phase. Notably, the majority of respondents (89%) agreed that direct flights to investors greatly improve analysts' ability to conduct in-person meetings, thereby leading to higher-quality interactions and feedback compared to remote communication via online platforms or phone calls. The survey details are in Appendix D.[19]

Our first-stage model for estimating the effect of newly introduced airline routes on investor feedback provision during PDIE is as follows:

$$\begin{aligned} Valuation\ Feedback_{i,j,c,u} \\ = \beta.New\ Route_{j,c,t} + \delta_1.Investor_{j,c} + \delta_2.Investor\ Sentiment_{i,j,c,u} \\ + \gamma_i + (\gamma_j.\gamma_u) + (\gamma_{j,c}) + (\gamma_{j,c}.\gamma_t) + (\gamma_u.\gamma_t) + \epsilon_{i,j,c,u} \end{aligned} \quad (1)$$

where *i* denotes IPO deals, *j* denotes investors, *c* denotes a country where the investor has an office, and *u* denotes underwriters managing the IPO. The outcome variable, $Valuation\ Feedback_{i,j,c,u}$, is a dummy equal to one if the investor provided valuation feedback during PDIE. Among the

[18] As a robustness check, we also examine a binary variable set to one if a new airline route is introduced between the headquarter city of the IPO issuer and a prospective investor. Our results are unchanged when using this alternative measure of new airline routes. We also use the quarterly average fare, grouped by ticket fare classes (economy, premium economy, and business), as direct proxies of travel costs by flight between investor locations to London. The results obtained using these alternative travel cost proxies are consistent with our baseline regression estimates of the first-stage equation. These results can be found in Tables A3 and A5 in the online appendix.

[19] Table A2 in the appendix uses quarterly passenger counts from the OAG to show that direct connections materially increase general travel flows between city-pairs. Panel (a) shows that the launch of a new non-stop route between investor locations and London (the primary hub for European IPO underwriters) boosts passenger volumes on those city-pairs by roughly 9 percent in the quarter immediately following introduction. Panel (b) finds a 3.5 percent uplift when a new direct flight service links investor and issuer cities. Coefficients for placebo tests in the one/two quarters before and for two/four quarters after direct flight introduction are statistically insignificant, confirming the absence of pre-trends and of any persistent effect beyond the immediate quarter. This temporal pattern highlights that the passenger volume increase is a direct, contemporaneous response to the reduction in travel time, reinforcing the plausible exogeneity of the instrument.

explanatory variables, $Investor_{j,c}$ is a dummy variable denoting the investor's style, which is equal to one if investor j based in country c is identified as long-only (as opposed to a hedge fund) by the adviser.

The model controls for differences in issuer characteristics that are observable to IPO participants but not to the researcher through the inclusion of deal fixed effects γ_i. Additionally, the model accounts for fixed differences between treated ($New\ Route = 1$) and control ($New\ Route = 0$) investor-underwriter pairs by incorporating investor × underwriter fixed effects $(\gamma_j.\gamma_u)$. Investor-country fixed effects $(\gamma_{j,c})$ control for persistent differences among different subsidiaries of the same investor that may co-participate in the deal, such as differences in investment styles and information revelation preferences despite being part of the same firm. Furthermore, investor–country × year–quarter fixed effects $(\gamma_{j,c}.\gamma_t)$ and underwriter × year-quarter fixed effects $(\gamma_u.\gamma_t)$ control for contemporaneous local shocks affecting investors and underwriters, which could be correlated with the introduction of new airline routes. Since an underwriter typically engages with multiple investors during PDIE, we double-cluster standard errors at underwriter and year-quarter levels to account for potential heterogeneity in interactions between a given underwriter and different investors within the IPO. The main coefficient of interest, β, measures the effect of introducing a direct airline route on the likelihood that an investor located along the route provides valuation feedback upon being contacted during PDIE.

To gain deeper insights into the factors associated with investor valuation feedback, we examine how investor-specific characteristics and qualitative sentiments influence the metrics *Feedback Midpoint* and *Feedback Tilt*, which capture absolute and relative valuation sentiments, respectively. Our second-stage model explores these dynamics, conditional on the investor's decision to share feedback (modelled in the first-stage), considering investor-level characteristics such as investment style, geographic proximity to the issuer, and qualitative sentiments expressed by them during PDIE. Our second-stage specification is outlined as follows:

$$\begin{aligned} Y_{i,j,c,u} = \ & \delta_1.Investor_{j,c} + \delta_2.Investor\ Sentiment_{i,j,c,u} + \delta_3.IMR_{i,j,c,u} + \\ & \gamma_i\ + (\gamma_j.\gamma_u) + (\gamma_{j,c}) + (\gamma_{j,c}.\gamma_t) + (\gamma_u.\gamma_t) + \epsilon_{i,j,c,u} \end{aligned} \tag{2}$$

where Y_{ijcu} is the outcome variable denoting *Feedback Midpoint* or *Feedback Tilt*. The equation includes the array of fixed effects outlined in the first-stage equation (1), as well as the inverse

Mills ratio $IMR_{i,j,c,u}$ estimated from that specification.

B. Measuring the impact of investor feedback during PDIE on IPO outcomes

Our two-step approach Heckman (1979) addresses the endogeneity of information revelation by investors, using new airline routes as a source of exogenous variation at the investor–underwriter–deal level. Underwriters aggregate this investor feedback to gauge their early interest in the IPO and use it to set the indicative price range for the bookbuilding phase. While this information aggregation aligns with the actual IPO process, a key econometric concern is omitted variable bias: some IPOs are inherently more attractive to investors, which may result in greater investor feedback and, consequently, a narrower and more aggressive price range for these offerings. Qualitative characteristics that influence an IPO's attractiveness are typically unobservable to the researcher and may simultaneously impact both investor feedback and the price range. This simultaneity undermines the causal validity of a simple OLS regression of aggregate feedback on the price range.

We address these empirical challenges in several ways. First, we compute the predicted probability of feedback provision by each investor using regression estimates from Equation (1) and aggregate these fitted values to calculate the predicted fraction of investors that provided feedback ($FeedbackFrac_i$) during PDIE for each IPO. This variable serves as an instrumented version of the endogenous feedback intensity at the IPO level. Similarly, we estimate the average predicted *Feedback Midpoint* and *Feedback Tilt* using regression estimates from Equation (2).

Our identifying assumption is that the instrument (*New Route*) affects the price range only through investor feedback, and not through other unobserved IPO-level characteristics. By relying on this plausibly exogenous variation in investor travel costs, we mitigate the biases associated with aggregating investor feedback at the deal level. Additionally, we control for deal-level characteristics such as IPO size, underwriter syndicate size and reputation, investor composition (total investor contacts, fractions of long-only and foreign investors), issuer size and profitability, and prevailing stock market conditions during PDIE, to account for potential confounders. We estimate the following OLS specification for a given deal-level outcome Y_i:

$$Y_i = \beta_1 \widehat{Feedback}_{\iota,PDIE} + \beta_2 . X_i + \delta_c + \theta_t + \epsilon_i \quad (3)$$

where outcome Y_i is estimated per IPO i. X_i denotes the controls described above. $\widehat{Feedback}_{i,PDIE} \in \left(\widehat{FeedbackFrac}_i, \widehat{Avg\ Feedback\ Midpoint}_i, \widehat{Avg\ Feedback\ Tilt}_i\right)$ represents the three predicted variables capturing aggregate investor feedback during PDIE. Equation (3) includes fixed effects for both the issuer's country (c) and the IPO year-quarter (t). Country fixed effects account for systematic country-specific characteristics, such as regulatory quality, macroeconomic conditions, and institutional factors that affect IPO outcomes. The time fixed effects account for unobserved temporal heterogeneity, capturing broad factors like business cycle fluctuations, shifts in global economic conditions, or changes in equity market sentiment that simultaneously affect all issuers. Standard errors are clustered by issuer country and IPO quarter. With only 32 IPOs in our sample, traditional statistical methods may yield unreliable standard errors. We address this by employing bootstrapped standard errors, following the procedure outlined by Cameron *et al.* (2008). This method ensures reliable inference despite the small sample size and produces conservative standard errors, supporting cautious statistical conclusions.

IV. Results

In this section, we present our findings separately for outcomes observed at the end of the PDIE phase and those during or after bookbuilding. For each phase, we begin by presenting summary statistics, followed by regression analysis using the research design outlined in section III. This analysis addresses three critical questions: first, how investor feedback during PDIE influences the setting of the initial price range for bookbuilding; second, whether this feedback serves as a predictor of investor bidding behaviour during bookbuilding; and third, how it shapes the demand for and allocation of IPO shares to investors.

A. PDIE outcomes

1. Summary statistics

Table 2 provides descriptive statistics on investor participation and feedback during the PDIE phase of our sample IPOs. Panel (a) shows that each IPO was managed by an average of 5.28 underwriters, with the PDIE phase lasting approximately 10 business days. During this period, underwriters contacted an average of 681 prospective investors per IPO, or about 128 investors per underwriter, though this varied widely (SD = 61). Nearly 75% of these contacts were with foreign

investors, a substantial portion of them based in the US. The majority of investors followed a long-only investment style.

Table 2: Descriptive statistics: Pre-Deal Investor Education

This table presents descriptive statistics on underwriter–investor contacts and feedback gathered during the PDIE phase for the IPOs in our sample. "Total contacts" captures the aggregate number of outreach attempts by underwriters to prospective investors. Panel (a) summarizes deal-level engagement across five dimensions: (i) the timing and intensity of underwriter-led outreach, (ii) the geographic and style-based composition of participating investors, (iii) the various modalities through which feedback was conveyed, (iv) the nature of valuation-related feedback provided, and (v) the frequency of requests for further meetings. Panel (b) reports investor-level measures of participation and the extent of information disclosure within each IPO.

(a) IPO-level characteristics

	Mean	SD	Min	25Pct	Median	75Pct	Max
PDIE duration (days)	10.03	2.74	5	8	10	11	18
Total investor contacts	681.34	354.77	128	398.25	637	870	1678
Investor contacts per underwriter	128.27	61.12	3	87.25	123	167.75	344
Underwriter syndicate size	5.28	2.33	2	4	5	6	13
Contacts by investor type (% total contacts)							
Foreign	72.63	25.04	18.40	55.58	80.45	93.22	100
US-based	19.43	7.48	0.80	14.22	19.25	24.77	33.20
Hedge funds	31.10	7.70	15.60	26.70	31.75	35.20	51.60
Long-only	68.20	7.12	48.40	64.80	68	72.55	80.60
Investor sentiment (% total contacts)							
Interested	47.54	17.14	21.80	34.58	47.60	56	86.70
Not interested	1.63	3.36	0	0	0	0	10.60
Concerns	8.38	14.53	0	1.10	4.35	8.32	63.10
Neutral	14.82	10.83	0	6.95	13.15	23.02	39.80
Substantive opinion	79.25	7.83	60.20	74.58	79.65	84.60	96
Provision of valuation feedback (% total contacts)							
Pre-money equity value	6.25	24.59	0	0	0	0	100
Post-money equity value	18.75	39.66	0	0	0	0	100
Additional meeting requests with underwriter (% total contacts)							
Any meeting	5.87	13.67	0	0	0	0	59.80
One-on-one meeting	3.77	10.28	0	0	0	0	52.10
Group meeting	2.10	3.86	0	0	0	0	12.20
Additional meeting requests with issuer (% total contacts)							
Any meeting	11.77	13.45	0	0	5.70	22.90	43.60
One-on-one meeting	6.10	8.10	0	0	1.60	10.35	30.10
Group meeting	5.67	4.46	0	0	1.15	7.05	18.30

(b) Investor-level characteristics per IPO

	Mean	SD	Min	25Pct	Median	75Pct	Max
Underwriter contacts per investor	2.15	1.76	1	1	1	3	18
Feedback provision (% of underwriter contacts)	23.34	37.41	0	0	0	50	100
Limit feedback (%)	86.74	48.25	0	0	0	100	100
Revised feedback (%)	29.98	45.82	0	0	0	100	100
Feedback midpoint (€ mil.)	533.55	1024.64	0.45	3	290	550	9000
Feedback tilt (scaled by valuation range midpoint)	0.89	0.10	0.58	0.82	0.89	0.94	1.33

Among the investors contacted, 79% provided substantive qualitative feedback, offering insightful commentary on the merits of the offering beyond mere expressions of interest. Nearly half of them expressed an intention to submit bids during the bookbuilding phase, but only a quarter of them disclosed their valuation expectations for the issuer. Requests for further engagement from investors during PDIE were more limited: 12% of those contacted sought more meetings with the issuer's management, and 6% requested follow-ups with underwriters.

Panel (b) of Table 2 summarizes investor-level characteristics per IPO. On average, each investor is contacted by about 2 underwriters during PDIE but provides valuation feedback in fewer than 25% of cases. Feedback is expressed as a point valuation or within a bounded range (*Limit Feedback*) in an overwhelming 86% of cases, while the rest provide unbounded valuations (*Strike Feedback*). Additionally, investors revised their valuation in more than 30% of cases over the course of PDIE. Valuations are generally conservative, with an average feedback tilt of 0.89—below the neutral benchmark of 1—indicating a tendency among investors to lean toward the lower bound of the indicative range set by underwriters.

2. Characteristics of investor feedback during PDIE

We use the two-stage framework outlined in section III.A to examine the determinants of valuation feedback provision by investors during PDIE. In the first stage, we use probit regressions (Equation 1) to examine whether the introduction of a direct airline route reducing travel time between London (where European IPO underwriters' analysts are primarily based) and a prospective investor increases the likelihood of the investor revealing their valuation estimates during PDIE.

The results are presented in panel (a) of Table 3. Coefficients of the probit estimates of the instrument *New Route* are positive and highly significant across all specifications. Marginal effects analysis reveals that the opening of a new airline route to prospective investors increases the likelihood of them disclosing their valuations by up to 7%.[20]

[20] Table A4 in the appendix presents placebo tests conducted on the *New Route* instrument by estimating the same first-stage specification as in panel (a) of Table 3 for direct flight introductions well before and after the PDIE phase. The estimates show that indicators for a new direct connection between investor locations and London introduced four quarters before, two quarters before, one quarter after, and two quarters after PDIE each yield coefficients that are statistically insignificant. The absence of effects outside the quarter immediately preceding PDIE confirms the temporal validity of the instrument and supports its plausibly exogenous role in explaining the propensity for valuation provision by investors.

Table 3: PDIE investor feedback

(a) Valuation disclosure

Dependent Variable:	Valuation Feedback				
Model:	(1)	(2)	(3)	(4)	(5)
New Route [Investor – Underwriter (London)]	0.402***	0.480***	0.505***	0.493***	0.486***
	(0.137)	(0.118)	(0.126)	(0.119)	(0.119)
Long-Only Investor		0.073	0.039	0.076	0.071
		(0.075)	(0.082)	(0.077)	(0.074)
Substantive opinion		4.72***	4.67***	4.68***	4.74***
		(0.522)	(0.512)	(0.521)	(0.522)
Underwriter Reputation		-0.391	-0.580	-0.447	-0.342
		(0.764)	(0.832)	(0.767)	(0.741)
Investor Sentiment (Interested)			1.51***		
			(0.136)		
Investor Sentiment (Neutral)				-0.409**	
				(0.164)	
Investor Sentiment (Concerns)					-0.391**
					(0.145)
Deal FE		✓	✓	✓	✓
Underwriter FE		✓	✓	✓	✓
Investor FE		✓	✓	✓	✓
Investor Country FE		✓	✓	✓	✓
Observations ()	18,536	18,536	18,536	18,536	18,536
Pseudo R^2	0.173	0.307	0.362	0.310	0.308
Mean (SD) of depvar			0.28 (0.45)		

(b) Valuation feedback characteristics

Dependent Variables:	Log (Feedback Midpoint)				Feedback Tilt			
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long-Only Investor	-0.015*	-0.014*	-0.014*	-0.015*	-0.012*	-0.012*	-0.011*	-0.012*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
Foreign Investor	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Substantive opinion	-0.015	-0.014	-0.019	-0.007	-0.008	-0.007	-0.012	-0.002
	(0.030)	(0.026)	(0.029)	(0.031)	(0.028)	(0.025)	(0.027)	(0.030)
Underwriter Reputation	0.182**	0.175**	0.178**	0.185**	0.161**	0.156**	0.158**	0.164**
	(0.074)	(0.072)	(0.072)	(0.073)	(0.070)	(0.069)	(0.069)	(0.070)
Investor Sentiment (Interested)		0.28***				0.025***		
		(0.071)				(0.006)		
Investor Sentiment (Neutral)			-0.16**				-0.015**	
			(0.065)				(0.006)	
Investor Sentiment (Concerns)				-0.45***				-0.039***
				(0.112)				(0.009)
Deal FE	✓	✓	✓	✓	✓	✓	✓	✓
Underwriter FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor x Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Inverse Mills Ratio (Valuation Feedback)	0.013	0.032	0.010	0.014	0.010	0.029	0.008	0.011
	(0.078)	(0.076)	(0.076)	(0.077)	(0.074)	(0.075)	(0.073)	(0.073)
Observations	5,814	5,814	5,814	5,814	5,814	5,814	5,814	5,814
Adjusted R^2	0.589	0.583	0.567	0.582	0.346	0.354	0.347	0.350
ρ (Depvar., Valuation Feedback)	0.003	0.002	0.004	0.003	0.001	0.001	0.002	0.001
Mean (SD) of depvar	7.37 (0.97)				0.88 (0.11)			

This table shows how exogenous variation in travel accessibility, captured by the introduction of new airline routes and associated travel costs, shapes the likelihood that prospective investors disclose their expected equity valuation of the issuer upon being contacted by underwriters. Observations are at the investor-underwriter-deal level, and contacts with investors located in more than one country are treated separately. The variable *New Route* equals one if an airline connection that reduces travel time between the underwriter analyst, based primarily in London, and the investor location was introduced in the quarter preceding the PDIE phase of the given IPO. Panel (a) reports first-stage probit estimates from equation (1) of the probability that a contacted investor discloses a valuation, following the Heckman (1979) approach. Panel (b) presents the second-stage estimates from equation (2), which examine how the informational content of disclosed feedback, captured by the *Feedback Midpoint* and *Feedback Tilt*, relates to investor characteristics and qualitative sentiments expressed during PDIE, conditional on disclosure. The reported inverse Mills ratio, constructed from the estimates in Panel (a), adjusts for selection bias. All specifications include deal, underwriter, investor, and investor country fixed effects, and report robust standard errors clustered by underwriter and IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Our specifications control for several qualitative aspects of investor feedback during the PDIE phase, as outlined in section III.A. Notably, the coefficients on *Substantive Opinion* are highly significant and positive, indicating that investors who provide substantive insights on their opinions about the IPO are more likely to disclose their valuations to the underwriters. Columns (3) to (5) further reveal that greater interest in the IPO is positively associated with valuation feedback, while investors who remain neutral or voice concerns about the offering are significantly less likely to provide such feedback.

Overall, the results in panel (a) suggest that reducing investors' information acquisition and monitoring costs—achieved through shorter travel times for analysts travelling from London—significantly increases the likelihood of investors disclosing their expected valuations before bookbuilding. This effect is likely driven by lower barriers to in-person interactions, fostering more open and detailed communication. This information revelation tendency is particularly strong among investors who express early interest in participating in the IPO.

Next, we examine the characteristics of valuations provided by investors, conditional on their decision to disclose feedback, using the two quantitative measures of investor feedback described in Section II.C: *Feedback MidPoint* and *Feedback Tilt*. The results based on the regression specification outlined in Equation (2) are presented in panel (b) of Table 3. Investors signaling interest in the IPO submit valuations with a feedback midpoint 0.29 standard deviations higher (coef = 0.28 / depvar SD = 0.97) and a feedback tilt 0.23 standard deviations higher (coef = 0.025 / depvar SD = 0.11) than those not doing so. Conversely, those expressing neutral views or concerns provide more conservative feedback estimates, with their average feedback midpoint and tilt dropping by 0.16–0.46 and 0.14–0.35 standard deviations, respectively. These results suggest that investors signaling interest in the IPO tend to value the issuer near the upper bound of the

valuation range, whereas neutral or concerned investors provide more conservative estimates near the lower bound, reflecting their cautious approach during PDIE. Lastly, higher average reputation among the underwriters in the IPO syndicate is consistently associated with less conservative feedback among investors, although these results are not statistically significant.

The coefficients for the inverse Mills ratio (*IMR*) in panel (b) are small and statistically insignificant, suggesting that sample selection bias is unlikely to affect our results. Likewise, the estimated error-term correlations (ρ) between the first- and second-stage regressions are small and insignificant, indicating that omitted variable bias is unlikely to influence both feedback provision and the nature of that feedback. These findings indicate that our model captures the underlying relationships without substantial distortion from unobserved factors.

In summary, the results in Table 3 highlight that investors with a positive sentiment toward the IPO during PDIE are more likely to provide valuation feedback and, when they do, they tend to value the issuer more optimistically.

3. Impact of PDIE investor feedback on the indicative price range

We now examine the relationship between investors' valuation feedback during PDIE and the width and position of the indicative price range. If underwriters incorporate PDIE feedback, we expect tighter clustering of investor valuations to result in a narrower price range, and higher investor valuations to shift the price range upward relative to the indicative PDIE valuation range.

Table 4 presents the results from the regression specification in Equation (3). We focus on three outcome variables capturing important aspects of the IPO price range. The first measure is the width of the indicative price range scaled by its midpoint, as defined in section II.A, proxying the relative uncertainty in pricing the IPO at the start of bookbuilding. The second measure denotes the anticipated deal size (in million €) by combining price expectations and share volume, and is calculated as $\left(\left[\frac{Price\ Range\ (High) + Price\ Range\ (Low)}{2}\right] * Shares\ outstanding\ preIPO\right)$. Our third and final variable, the price range tilt, measures the alignment of the price range with the indicative valuation range set before the commencement of PDIE, and is estimated as $\frac{[Price\ Range\ (High) + Price\ Range\ (Low)]}{(Valuation\ Range\ Min + Valuation\ Range\ Max)} * Shares\ outstanding\ preIPO$. Models (1), (4), and (7) present the baseline results for the three outcomes. Models (2), (5), and (8) add deal-level

characteristics, particularly those related to the PDIE phase. Models (3), (6), and (9) further include issuer-specific and stock market-level characteristics at the time of the IPO.

Table 4: Impact of investor feedback during PDIE on bookbuilding price range

This table presents OLS estimates of the specification outlined in equation (3) using IPO-level observations to assess how the quantitative characteristics of investor feedback gathered during the PDIE phase shape the setting of the indicative bookbuilding price range. Models (1)–(3) regress the *Price Range Width*, which captures the breadth of the price range and is calculated as the difference between its upper and lower bounds divided by their midpoint. Models (4)–(6) replace the dependent variable with the *Price Range Midpoint*, defined as the log of the midpoint of the price range multiplied by pre-IPO shares outstanding of the issuer. Models (7)–(9) use the *Price Range Tilt*, measured as the midpoint of the price range scaled by the indicative valuation range set at the start of PDIE. Among the regressors, *FeedbackFrac* is the fitted fraction of contacted investors who disclose a valuation, taken from model (2) in Panel (a) of Table 3. *Avg Feedback Midpoint* is the mean of the predicted disclosed valuation midpoints from model (1) in Panel (b) of Table 3, and *Avg Feedback Tilt* is the average of the predicted disclosed valuation midpoints scaled by the indicative valuation range set at the start of PDIE, based on model (5) in Panel (b) of Table 3. All regressions include controls for the aggregate number of investor contacts and valuation disclosures, investor composition, deal and issuer characteristics, underwriter prestige, market conditions, as well as issuer country and IPO-quarter fixed effects. Bootstrapped standard errors, based on the fast wild cluster bootstrap inference method of Cameron et al., (2008) are reported in parantheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Dependent Variable:	Price Range Width			Log (Price Range Midpoint)			Price Range Tilt		
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\widehat{\text{FeedbackFrac}}$	-0.844**	-1.74***	-1.25**						
	(0.351)	(0.538)	(0.495)						
Log Avg $\widehat{\text{Feedback}}$ Midpoint				1.411***	1.424***	1.285***			
				(0..436)	(0.424)	(0.506)			
Avg $\widehat{\text{Feedback}}$ Tilt							1.681***	1.190**	1.029**
							(0.407)	(0.416)	(0.435)
Log(Num Investor Contacts)	-0.192*	-0.453**	-0.343**	-0.141	-0.138	-0.090	0.044	-0.083	-0.013
	(0.091)	(0.155)	(0.127)	(0.408)	(0.892)	(0.763)	(0.177)	(0.165)	(0.145)
Log(Num Investor Feedbacks)				0.038	0.338	0.054	0.065	0.082	-0.032
				(0.196)	(0.553)	(0.431)	(0.043)	(0.073)	(0.080)
Shares Offered by Issuer (% Outstanding)		-0.022	0.009		-0.507***	-0.452		-0.282***	-0.317***
		(0.068)	(0.088)		(0.144)	(0.423)		(0.092)	(0.066)
Log(Gross Proceeds)		0.048***	0.040**		0.238	0.116		0.088	0.059
		(0.016)	(0.015)		(0.371)	(0.440)		(0.072)	(0.068)
Log(Syndicate Size)		-0.025	0.011		-1.245	-0.373		-0.108	-0.083
		(0.042)	(0.037)		(1.293)	(2.401)		(0.168)	(0.225)
Avg Underwriter Reputation		-0.018*	-0.025		-0.049	-0.225		-0.051	-0.049
		(0.010)	(0.018)		(0.117)	(0.279)		(0.055)	(0.061)
Long-only Investors (%)		-0.299	-0.434***		-4.143	-4.160		-0.984	-1.07
		(0.202)	(0.138)		(5.308)	(6.449)		(1.13)	(0.933)
Foreign Investors (%)		0.066	0.067		0.403	0.500		0.039	0.172
		(0.050)	(0.067)		(0.962)	(1.256)		(0.248)	(0.218)
Revised Valuations (%)		-0.003	-0.127		0.145	0.183		0.199	-0.148
		(0.139)	(0.239)		(0.966)	(2.640)		(0.174)	(0.245)
Log(Assets)			-0.040			0.157			0.041
			(0.026)			(0. 227)			(0.036)
Gross Profit/Sales			-0.035			1.639			0.086
			(0.045)			(2.515)			(0.242)
Market Index Return			-0.201**			-0.771			-0.556
			(0.086)			(1.867)			(0.366)
VIX Index			-0.002			0.074			0.016*
			(0.005)			(0.134)			(0.008)
Issuer Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
IPO Year-quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	32	32	32	32	32	32	32	32	32
Adjusted R^2	0.195	0.140	0.075	0.549	0.517	0.435	0.072	0.348	0.441
Mean (SD) of depvar		0.20 (0.09)			6.77 (1.55)			0.76 (0.24)	

Models (1)–(3) show that obtaining feedback from a larger fraction of contacted investors ($\widehat{FeedbackFrac}$) is associated with a narrower price range. Specifically, model 3 suggests that a

one-standard-deviation increase in *FeedbackFrac* narrows the price range by $\left(Coef_{model\,3} * \widehat{FeedbackFrac}\ SD\right)/Depvar\ SD$ = (-1.25 * 0.1091) / 0.09 = -1.52 standard deviations. Similarly, reaching out to more investors is also significantly linked to a narrower price range by -2.15 standard deviations. These findings highlight the informational value of early investor engagement in improving efficiency and reducing uncertainty during the IPO price discovery process.

Models (4)–(6) show that higher investor valuations during PDIE, as measured by $Avg\ \widehat{Feedback}\ Mıdpoınt$, are strongly associated with higher anticipated deal sizes. In particular, model (6) shows that a one-standard-deviation increase in $Log(Avg\ \widehat{Feedback}\ Mıdpoınt)$ raises log of price range midpoint by $\left(Coef_{model\,6} * \text{Log}(Avg\ \widehat{Feedback}\ Mıdpoınt)\ SD\right)/Depvar\ SD$ = (1.285 * 1.187) / 1.55 = 0.98 standard deviations. Similarly, models (7)–(9) show that higher average feedback tilt among valuation-disclosing investors is associated with higher price range tilt, implying that underwriters adopt more aggressive pricing strategies in response to investor optimism towards the IPO.

Collectively, Table 4 demonstrates that underwriters utilize investor feedback from PDIE to refine the indicative price range for bookbuilding. Greater investor participation in feedback provision narrows the price range, while more optimistic feedback increases the offer size and raises the bookbuilding price-range, enabling underwriters to adopt more aggressive pricing strategies. These findings highlight the critical role of early investor engagement in shaping IPO outcomes.

B. Bookbuilding outcomes

1. Summary statistics

Table 5, panel (a) shows the distribution of investor activity during bookbuilding. Among the instances where investors contacted during PDIE provided valuation feedback, 43% submitted bids during bookbuilding. Even among those who did not provide valuation feedback, 27% still placed bids. Notably, 2,687 bids (about one-third of all bids) came from investors not contacted during PDIE, likely reflecting underwriter efforts to broaden demand and raise the final offer price by allowing last-minute participation from new investors. Nearly 80% of bids from PDIE participants received allocations, compared to only 55% from investors who were never contacted, likely

reflecting underwriters' preference for investors who engaged early and provided valuable feedback during the PDIE phase.

Panel (b) of Table 5 presents descriptive statistics on investor bidding behavior during the bookbuilding phase. On average, bookbuilding spans 8 working days and generates 173 bids per IPO. Of these, 56% are from investors contacted during PDIE, but only 26% are from those who provided valuation feedback, implying that not all investors engaged during PDIE proceed to bid. Foreign investors account for 58% of the bids, consistent with the literature emphasizing the role of cross-border capital in IPOs (Doidge *et al.* 2013). Interestingly, hedge funds, despite being contacted less frequently during PDIE than long-only investors (see Table 2), submit up to 20% more bids, likely reflecting their active trading strategies and greater risk tolerance. Finally, 40% of bidders request additional meetings during the roadshow, underscoring the importance of underwriter-investor interactions in shaping bidding behavior.

Lastly, panel (c) highlights differences in bid amounts based on investors' participation in PDIE. Following standard practices in the IPO literature, each bid is converted to a single amount using a weighted average of the shares indicated by the investor at each price point within the price range.[21] To enable comparison across IPOs, bid amounts are then scaled by the midpoint of the price range. Investors contacted during PDIE submit more conservative bids, averaging a scaled bid amount of 0.96, compared to 1.006 for those not contacted. Similarly, investors providing valuation or substantive opinion during PDIE place bids 3.5% and 4.5% lower, respectively, than those who do not, reflecting more cautious price assessments. These results suggest that investors engaged in PDIE possess deeper knowledge of the issuer and market conditions, leading to more informed but conservative bidding behavior during bookbuilding.

2. Does PDIE engagement influence investors' willingness to bid?

[21] Specifically, the bid amount is calculated as $\frac{\sum_{j=1}^{n} P_j \cdot Q_j}{\sum_{j=1}^{n} Q_j}$, where P_j represents the price at price point j, Q_j the quantity of shares indicated for purchase by investor at price point j, and n the total number of price points set within the indicative price range. For *price-sensitive* bids, P_j corresponds to the single maximum price the bidder is willing to pay. For *step* bids, P_j and Q_j vary across multiple price points, and the weighted average aggregates them. For *strike* bids, which do not specify a price limit, the midpoint of the bookbuilding price range is used as P*j* , weighted by the total share quantity. For example, consider an indicative price range of 50 to 70 euros, with five price points (50, 55, 60, 65, 70) available for bidding. Suppopse an investor places a step bid across three of these price points: $P_1 = 50$, $P_2 = 55$, and $P_3 = 60$, with corresponding share quantities $Q_1 = 100$, $Q_2 = 200$, and $Q_3 = 300$. The weighted average bid amount is given as: $\frac{(50*100)+(55*200)+(60*300)}{100+200+300} = 56.67$.

We now examine the factors influencing investors' willingness to submit bids during bookbuilding, focusing on their prior participation and feedback during PDIE. We use the two-stage method Heckman (1979), consistent with the approach in section III.A to analyze PDIE outcomes, focusing only on investors contacted during PDIE and excluding those who bid without prior involvement.

Table 5: Descriptive statistics: investor bidding behavior during bookbuilding

(a) Composition of investor bids and allocations

	Investor contacted in PDIE		
	Yes		No
Obs.	18,536		2,687
Valuation feedback given (% obs.)	Yes	No	
	5,814 (31.4%)	12,722 (68.6%)	
Submitted bid (% valuation feedback obs.)	2,509 (43.2%)	3,462 (27.2%)	2,687 (NA)
Received allocation (% bids)	2,072 (82.6%)	2,764 (79.8%)	1,482 (55.2%)

(b) Distribution of investor bids

	Mean	SD	Min	25Pct	Median	75Pct	Max
Bidding activity & participation							
Bookbuilding duration (days)	8.10	1.85	3	7	8	10	10
Total bids per IPO	172.81	128.82	29	70.50	136	242	578
Bids by investors contacted in PDIE (% total)	56.07	22.86	0	50.10	64	70.40	86
Bids by investors with valuation feedback (% total)	25.37	12.45	0	18.45	25.80	31.70	56
Bids by investors with substantive opinion (% total)	46.61	19.24	0	35.60	51	58.60	78.80
Investor types (% total bids per IPO)							
Foreign Investors	57.49	30.19	0	37.25	64.20	82.10	98.20
US Investors	10.77	7.75	0	5.55	9.40	15.30	30.20
Hedge Funds	54.33	19.12	0	45.25	57.30	68.45	89
Long-Only	34.50	13.92	0	25.10	36	43.55	63.90
Retail	0.69	1.73	0	0	0	0.35	7.80
Roadshow meeting requests (% total bids per IPO)							
Investors seeking meetings	39.55	26.94	0	18.65	42.60	61.20	88.90
Investors seeking one-on-on meetings	20.11	15.93	0	5.90	20	31.20	57.80
Investors seeking group meetings	19.42	13.28	0	4	22.30	29.55	37.90

(c) Differences in bid amounts by investor participation in PDIE

Investor participation in PDIE	No		Yes		Difference
	Mean	SD	Mean	SD	Mean
Contacted investor?	1.006	0.065	0.959	0.066	0.047***
Valuation feedback provided (upon contact)?	0.996	0.068	0.961	0.067	0.035***
Substantive opinion provided (upon contact)?	1.004	0.066	0.959	0.066	0.045***

This table presents summary statistics on investor participation, bidding activity, and allocation outcomes in the bookbuilding phase for our sample IPOs. All statistics are computed from deal-level shadowbooks, which are internal records of investor orders, preferences, and allocations maintained by underwriters during each day of bookbuilding. Panel (a) compares bid submission and allocation rates across three groups of investors: those contacted during PDIE who disclosed their valuations, those contacted but did not disclose, and those uncontacted during PDIE. Panel (b) summarizes the distribution of investor bidding behavior per IPO, including the duration of bookbuilding, total number of bids, the share of bids from PDIE-contacted investors and those who provided valuation or substantive feedback,

as well as the breakdown of bids by investor type and the incidence of additional roadshow meeting requests. Panel (c) reports summary measures of limit and step bids. Limit bids specify a maximum or minimum price within the indicative range along with the corresponding share quantity, while step bids allocate share quantities across multiple discrete price levels within the range. To aggregate each order into a single value, we multiply the number of shares at each price level by its price, sum these products, and then scale the result by the midpoint of the indicative range.

Table 6 presents probit estimates of the first-stage regressions corresponding to Equation (1). The dependent variable *Bid Submitted* equals one if an investor placed a bid, and is zero otherwise. The instrument *New Route* is consistently positive and significant, indicating that new airline routes to prospective investors shortly before PDIE increase their likelihood of submitting a bid by about 14%.[22] Models (3) and (4) show that feedback provision during PDIE strongly predicts bid submission, with feedback providers being 7–12% more likely to bid. Similarly, models (5)–(8) indicate that investors providing valuation feedback and offering optimistic valuation estimates during PDIE are significantly more likely to bid during bookbuilding. With respect to qualitative feedback, investors who express interest in the IPO during PDIE are the most likely to place a bid, followed by those with a neutral stance, while those expressing concerns are unlikely to bid. Additionally, investors who requested underwriter or roadshow meetings previously during PDIE are significantly more likely to submit bids.

Overall, these results show that quantitative and qualitative feedback from investors during PDIE strongly predicts their likelihood of submitting bids during bookbuilding. This aligns with the IPO literature emphasizing the critical role of investor engagement in reducing information asymmetry and improving price discovery (Gustafson *et al.* 2023; Gustafson *et al.* 2024).

[22] Table A6 in the appendix presents placebo tests conducted on the New Route instrument by estimating the same first-stage specification as in Table 6 for direct flight introductions well before and after the PDIE phase. The estimates show that indicators for a new direct connection between investor locations and London introduced four quarters before, two quarters before, one quarter after, and two quarters after PDIE each yield coefficients that are statistically insignificant. The absence of effects outside the quarter immediately preceding PDIE confirms the temporal validity of the instrument and supports its plausibly exogenous role in explaining investor bidding behavior.

Table 6: Investor engagement during PDIE and bidding behaviour

This table shows how exogenous variation in travel accessibility, captured by the introduction of new airline routes and associated travel costs, shapes the likelihood that an investor contacted during PDIE submits a bid during bookbuilding. The table reports first-stage probit estimates from equation (1) following the Heckman (1979) approach, where the dependent variable *Bid Submitted* equals one if the investor placed any bid during the bookbuilding period. Observations are defined at the investor-underwriter-deal level, with investors operating in multiple countries counted separately, and include those who received no PDIE contact. All specifications include deal, investor–country, underwriter, and IPO quarter fixed effects, and control for investor characteristics, investor engagement during PDIE, and underwriter reputation. Standard errors clustered by underwriter and IPO quarter in parentheses are reported in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Dependent Variable:	Bid Submitted							
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New Route	0.537***	0.536***	0.511***	0.506***	0.520***	0.513***	0.512***	0.507***
[Investor – Underwriter (London)]	(0.065)	(0.066)	(0.066)	(0.066)	(0.065)	(0.067)	(0.066)	(0.068)
Feedback Provided			0.293***	0.271***				
			(0.032)	(0.033)				
Limit Feedback					0.180***	0.162***		
					(0.046)	(0.048)		
Feedback Tilt							0.334***	0.309***
							(0.037)	(0.035)
Long-only Investor		0.136**	0.122*	0.114*	0.126*	0.116*	0.123*	0.115*
		(0.065)	(0.063)	(0.063)	(0.063)	(0.062)	(0.060)	(0.064)
Substantive opinion		0.214***	0.007	-0.031	0.136**	0.078	0.007	-0.032
		(0.037)	(0.066)	(0.065)	(0.065)	(0.065)	(0.066)	(0.065)
Underwriter Reputation		-0.007	-0.022	-0.026	-0.024	-0.028	-0.023	-0.026
		(0.055)	(0.058)	(0.068)	(0.067)	(0.061)	(0.069)	(0.068)
Investor Sentiment (Interested)			0.427***	0.408***	0.482***	0.454***	0.423***	0.404***
			(0.047)	(0.046)	(0.042)	(0.042)	(0.046)	(0.045)
Investor Sentiment (Neutral)			0.248***	0.218***	0.306***	0.263***	0.248***	0.217***
			(0.078)	(0.078)	(0.077)	(0.077)	(0.079)	(0.078)
Investor Sentiment (Concerns)			0.059	0.039	0.093	0.066	0.060	0.041
			(0.133)	(0.133)	(0.132)	(0.132)	(0.133)	(0.133)
Underwriter Meeting Requested			0.418***	0.399***	0.473***	0.445***	0.423***	0.404***
			(0.125)	(0.125)	(0.123)	(0.123)	(0.125)	(0.125)
Roadshow Meeting Requested			0.299***	0.273***	0.344***	0.308***	0.301***	0.275***
			(0.085)	(0.085)	(0.084)	(0.084)	(0.085)	(0.085)
Feedback Revised				0.245***		0.299***		0.246***
				(0.060)		(0.059)		(0.060)
Deal FE	✓	✓	✓	✓	✓	✓	✓	✓
Investor x Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Underwriter FE	✓	✓	✓	✓	✓	✓	✓	✓
IPO Year-quarter FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	21,223	21,223	21,223	21,223	21,223	21,223	21,223	21,223
Pseudo R^2	0.276	0.277	0.301	0.302	0.297	0.299	0.301	0.302

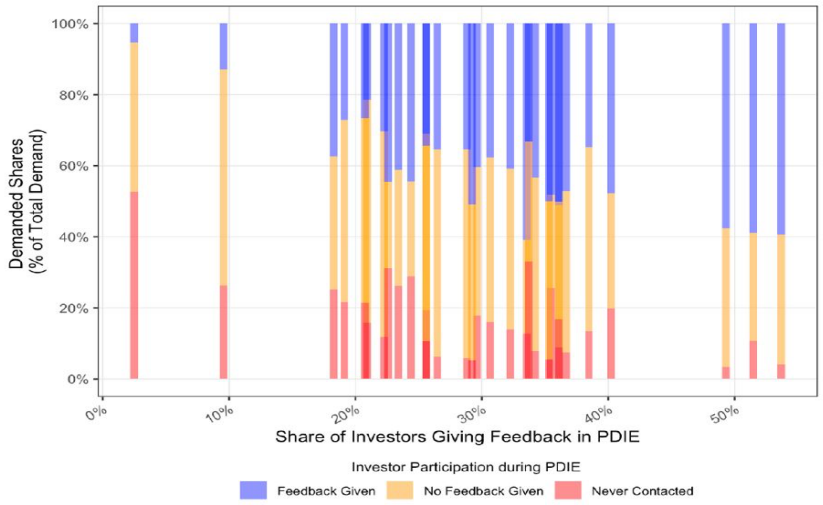
3. Does PDIE engagement shape investor demand and IPO share allocations?

In section IV.B.2, we showed that investors signalling interest and providing early feedback during PDIE are more likely to participate in bidding, reflecting their stronger commitment to the IPO. Here, we explore further how PDIE participation impacts investors' bid sizes and allocations. This comparison enables us to assess how early investor engagement and information sharing influence underwriters' allocation decisions, emphasizing the importance of informed investor

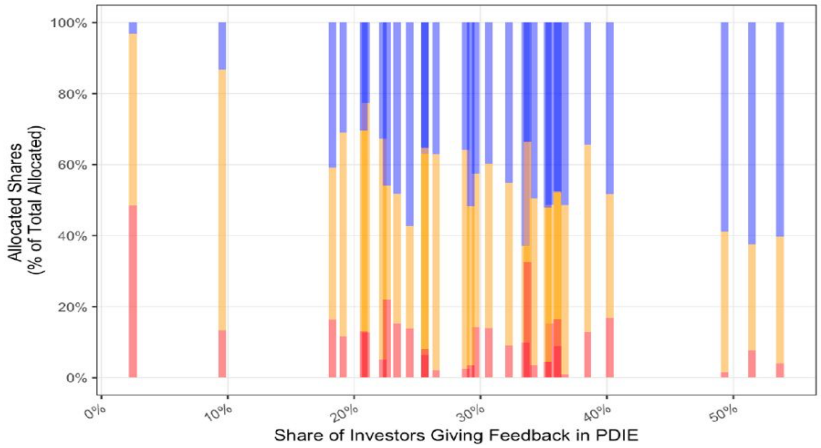
participation in improving pricing accuracy and deal success.

Figure 2: Investor participation in PDIE, share demand, and allocations
This figure illustrates how shares demanded and allocated in the bookbuilding phase are distributed across investor subgroups defined by the nature of their engagement in the PDIE phase. Each bar represents one IPO, sorted in ascending order by the share of bidding investors who provided valuation feedback during PDIE. Panel (a) reports, for each IPO, the proportion of total shares demanded by (i) investors contacted during PDIE who disclosed valuations, (ii) those contacted but withholding valuations, and (iii) those never contacted. Panel (b) shows the corresponding proportions of total shares actually allocated to these three subgroups. All values are computed from transaction-level shadowbooks maintained by underwriters during bookbuilding. Values in Panel (a) denote each investor subgroup's percentage of total share demand, while those in Panel (b) denote each subgroup's percentage of total shares allocated.

a) Investor demand



b) Investor allocations



To motivate this analysis, we group bids for each IPO into three categories: (i) investors contacted during PDIE who gave valuation feedback, (ii) those contacted who did not give valuation feedback, and (iii) those never contacted. For each IPO, we calculate the relative

proportion of total shares demanded and allocated to each investor subgroup. Figure 2 displays these proportions of demanded and allocated shares, with the sample IPOs sorted in ascending order by the total share of bidding investors providing valuation feedback. Panel (a) shows that IPOs with fewer feedback providers (left side of the x-axis) rely more on "never contacted" investors to generate demand, compensating for the lack of informed investor participation. Panel (b) shows that in these IPOs with fewer feedback providers more shares are allocated to "never contacted" or "no feedback given" investors. Conversely, IPOs with a higher share of feedback providers (right side of the x-axis) generate more of their demand from this subgroup, leading underwriters to allocate more shares to these informed investors. These patterns underscore the role of early investor feedback in reducing uncertainty and shaping demand and allocation strategies during bookbuilding. Encouraged by this visual evidence, we formally evaluate the relationship between individual investor engagement during PDIE and their demand for IPO shares.

The results are presented in Table 7. The dependent variable, *Investor Demand*, is the number of IPO shares bid by an investor as of the last day of bookbuilding, expressed as a percentage of the issuer's total outstanding shares pre-IPO. Model (1) includes bids from both investors contacted in PDIE as well as those not contacted. The remaining models apply the second-stage equation outlined in Section III.A and focus solely on bids from investors contacted during PDIE. Models (1) and (2) show significantly lower demand from investors not contacted during PDIE or those contacted but not providing any qualitiative or valuation feedback, indicating limited participation by investors who are less involved in the price discovery process prior to the bookbuilding phase. In contrast, models (3)-(5) show a positive and significant link between feedback provision and demand among investors offering specific valuation guidance and those expressing more optimistic valuations, highlighting the importance of early investor engagement in driving demand.

The IMR in models (2)–(5) controls for unobservable investor characteristics such as risk aversion or specific investment criteria that may simultaneously determine whether investors bid and also influence their order size. Even though we control for observable factors (e.g., investor type, deal characteristics, location etc.), there remain unmeasured attributes of these investors such as their tendency to scrutinize deals more thoroughly or to require bigger discounts that drive both their decision to place a bid (first stage) and the size of their order (second stage). The negative and highly significant IMR coefficients in models models (2)–(5) indicate a negative selection

effect: investors who self-select into the bidding phase upon being contacted in PDIE end up demanding fewer shares on average based on their unobserved characteristics.

Table 7: Investor engagement during PDIE and demand for IPO shares

This table reports estimates of how investor engagement in the PDIE phase affects their individual share demand, defined as the number of IPO shares requested by the final day of bookbuilding expressed as a percentage of pre-IPO outstanding stock. Model (1) presents OLS estimates on a dummy equal to one if the investor was not contacted by underwriters during PDIE. Models (2)–(5) present second-stage OLS estimates from the Heckman (1979) two-step procedure based in equation (2), correcting for investor self-selection into bidding by including inverse Mills ratios (IMRs). The IMR in model (2) is computed from the first-stage probit estimates in column (2) of Table 6, the IMR in model (3) from column (4), the IMR in model (4) from column (6), and the IMR in model 5 from column (8). Models (3)–(5) introduce alternative valuation feedback measures for contacted investors. Model (3) uses a dummy for any disclosed valuation, equal to one if the investor provided a price valuation estimate during PDIE. Model (4) uses a dummy for limit feedback, which captures orders specifying a maximum or minimum price within the indicative range. Model (5) includes a scale-free measure of relative investor optimism, Feedback Tilt, calculated as the investor's disclosed valuation midpoint divided by the midpoint of the indicative valuation range. All specifications include deal, investor-country, and underwriter fixed effects, and control for investor- and issuer- characteristics, underwriter reputation, and stock market conditions. Robust standard errors clustered by underwriter and IPO quarter are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Investor Demand (% Outstanding Shares of Issuer)				
Valuation feedback variable:			Feedback Provided	Limit Feedback	Feedback Tilt
Model:	(1)	(2)	(3)	(4)	(5)
Investor not contacted in PDIE	-0.075**				
	(0.029)				
Investor contacted in PDIE but gave no valuation feedback		-0.042***			
		(0.012)			
Valuation feedback (*PDIE contacts only*)			0.033***	0.035**	0.044***
			(0.011)	(0.016)	(0.013)
Controls	✓	✓	✓	✓	✓
Deal FE	✓	✓	✓	✓	✓
Underwriter FE	✓	✓	✓	✓	✓
Investor x Country FE	✓	✓	✓	✓	✓
Inverse Mills Ratio (Bid submission)		-0.299**	-0.247**	-0.232**	-0.320**
		(0.151)	(0.125)	(0.112)	(0.153)
Observations	8,658		5,971		
Adjusted R^2	0.590	0.567	0.568	0.566	0.568
Mean (SD) of depvar (%)	1.23 (1.65)		1.49 (1.89)		

We now test, in Table 8, whether underwriters reward active investor participation and feedback sharing during PDIE by analyzing *Normalized Rationing*, defined as an investor's allocation-to-bid ratio divided by the average allocation-to-bid ratio of all investors in that IPO (Cornelli & Goldreich 2001; Jenkinson & Jones 2004; Jenkinson *et al.* 2018). A normalized rationing value greater than one indicates a more generous allocation to that investor relative to other investors in the IPO, whereas a value below one indicates a scaled back allocation. If underwriters value investor feedback during PDIE, we expect such investors to receive more

generous allocations than the average investor in the IPO.

Table 8: Investor engagement during PDIE and allocation of IPO shares

This table reports estimates of how investor engagement in the PDIE phase affects each investor's *Normalized Rationing*, defined as the number of IPO shares allotted divided by the number requested (see Cornelli and Goldreich (2001), Jenkinson and Jones (2004), and Jenkinson *et al.* (2018) for prior analysis on this outcome). Model (1) presents OLS estimates on a dummy equal to one if the investor was not contacted by underwriters during PDIE. Models (2)–(5) present second-stage OLS estimates from the Heckman (1979) two-step procedure based in equation (2), correcting for investor self-selection into bidding by including inverse Mills ratios (IMRs). The IMR in model (2) is computed from the first-stage probit estimates in column (2) of Table 6, the IMR in model (3) from column (4), the IMR in model (4) from column (6), and the IMR in model 5 from column (8). Models (3)–(5) introduce alternative valuation feedback measures for contacted investors. Model (3) uses a dummy for any disclosed valuation, equal to one if the investor provided a price valuation estimate during PDIE. Model (4) uses a dummy for limit feedback, which captures orders specifying a maximum or minimum price within the indicative range. Model (5) includes a scale-free measure of relative investor optimism, Feedback Tilt, calculated as the investor's disclosed valuation midpoint divided by the midpoint of the indicative valuation range. All specifications include deal, investor-country, and underwriter fixed effects, and control for investor- and issuer- characteristics, underwriter reputation, and stock market conditions. Robust standard errors clustered by underwriter and IPO quarter are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Normalized Rationing				
Valuation feedback variable:			Feedback Provided	Limit Feedback	Feedback Tilt
Model:	(1)	(2)	(3)	(4)	(5)
Investor not contacted in PDIE	-0.064**				
	(0.026)				
Investor contacted in PDIE, but gave no valu. feedback		-0.018			
		(0.011)			
Valuation feedback			0.045***	0.030***	0.048***
(*PDIE contacts only*)			(0.007)	(0.010)	(0.008)
Controls	✓	✓	✓	✓	✓
Deal FE	✓	✓	✓	✓	✓
Underwriter FE	✓	✓	✓	✓	✓
Investor x Country FE	✓	✓	✓	✓	✓
Inverse Mills Ratio (Bid submission)		-0.297***	-0.374***	-0.366***	-0.429***
		(0.091)	(0.094)	(0.094)	(0.097)
Observations	8,658		5,971		
Adjusted R^2	0.574	0.546	0.227	0.226	0.230
Mean (SD) of depvar	0.56 (0.39)		0.66 (0.28)		

We follow the same empirical approach as used to understand investor demand (see Table 7). Model (1) considers allocations to all investors regardless of their participation in PDIE and finds that those not contacted during PDIE receive allocations relative to their bids approximately 0.13 standard deviations ($Coef_{model\ 1}/Depvar\ SD = -0.064/0.49$) lower than their counterparts who were contacted. Model (2) examines investors contacted during PDIE but who provided no qualitiative or valuation feedback, showing similarly lower, but statistically insignificant, relative allocations compared to feedback sharing investors. By contrast, models (3)–(5) reveal that investors providing valuaton feedback during PDIE, particularly those placing limits on their expected valuations and those disclosing more optimistic valuations, receive significantly larger

allocations compared to the broader investor pool. Specifically, models 3 and 4 show that investors providing feedback and those placing limits on their valuations receive allocations larger by 0.09 and 0.063 standard deviations, respectively, relative to peers who did not. Lastly, model 5 implies that a one-standard-deviation increase in *Feedback Tilt* corresponds to a 0.08 standard deviation increase in relative allocation $\left((Coef_{model\ 5} * Feedback\ Tilt\ SD)/Depvar\ SD = \frac{(0.048 * 0.457)}{0.276} = 0.08\right)$. Together, the results in models 4 and 5 emphasize that investors revealing more precise and optimistic feedback are rewarded with more generous allocations.

Once again, the negative and significant IMR coefficients across models (2)–(5) indicate that, after accounting for observable factors, the unobserved characteristics driving an investor's likelihood of bidding are also associated with more conservative allocations by underwriters. This parallels the findings in Table 7 which shows that investors likely to take part in PDIE may, for reasons unobservable to the researcher, tend to submit smaller bids. Now we find that, based on the unobservable factors, these smaller bids themselves translate into lower normalized rationing.

4. Expected profitability of bids

So far, we have shown that investors who engage in PDIE and place bids receive more favorable allocations. However, allocations alone do not confirm whether these investors actually profit from their involvement, as allocations could be higher in IPOs that underperform in the aftermarket. To determine whether investor engagement during PDIE leads to profitable allocations, we follow (Jenkinson *et al.* 2018), who highlight that investors value allocations most in IPOs with strong early performance signals. PDIE interactions may serve as a key information channel, providing investors with such early insights into the expected profitability of their allocations.

We follow (Jenkinson *et al.* 2018) and measure the *Expected Profitability* of each bid as the product of the allocation rate (shares received relative to shares bid) and the expected IPO underpricing. This measure reflects expected, rather than realized, profitability as neither investors nor underwriters have perfect foresight about the post-IPO performance of shares at the end of bookbuilding. Using this measure, it is possible to test whether, in expectation, investors who provide timely information prior to bookbuilding gain economically or merely receive larger stakes in IPOs that do not appreciate.

Table 9: Expected profitability of investor bids

This table reports estimates of how investor engagement in the PDIE phase affects each investor's expected bid profitability, defined as the product of the expected first-day return (fitted underpricing from the first-stage regression in Table A7 in the online appendix) and the shares allocated, divided by the shares requested (see Jenkinson *et al.* (2018) for prior analysis on this outcome). Model (1) presents OLS estimates on a dummy equal to one if the investor was not contacted by underwriters during PDIE. Models (2)–(5) present second-stage OLS estimates from the Heckman (1979) two-step procedure based in equation (2), correcting for investor self-selection into bidding by including inverse Mills ratios (IMRs). The IMR in model (2) is computed from the first-stage probit estimates in column (2) of Table 6, the IMR in model (3) from column (4), the IMR in model (4) from column (6), and the IMR in model 5 from column (8). Models (3)–(5) introduce alternative valuation feedback measures for contacted investors. Model (3) uses a dummy for any disclosed valuation, equal to one if the investor provided a price valuation estimate during PDIE. Model (4) uses a dummy for limit feedback, which captures orders specifying a maximum or minimum price within the indicative range. Model (5) includes a scale-free measure of relative investor optimism, Feedback Tilt, calculated as the investor's disclosed valuation midpoint divided by the midpoint of the indicative valuation range. All specifications include deal, investor-country, and underwriter fixed effects, and control for investor- and issuer-characteristics, underwriter reputation, and stock market conditions. Robust standard errors clustered by underwriter and IPO quarter are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Expected Bid Profitability				
Valuation feedback variable:			Feedback Provided	Limit Feedback	Feedback Tilt
Model:	(1)	(2)	(3)	(4)	(5)
Investor not contacted in PDIE	-0.207				
	(0.346)				
Investor contacted in PDIE, but gave no valu. feedback		-0.138**			
		(0.067)			
Valuation feedback			0.138**	0.168**	0.211***
(*PDIE contacts only*)			(0.067)	(0.069)	(0.072)
Controls	✓	✓	✓	✓	✓
Deal FE	✓	✓	✓	✓	✓
Underwriter FE	✓	✓	✓	✓	✓
Investor x Country FE	✓	✓	✓	✓	✓
Inverse Mills Ratio (Bid submission)		-0.272***	-0.272***	-0.262***	-0.298***
		(0.064)	(0.063)	(0.065)	(0.062)
Observations	8,658		5,971		
Adjusted R^2	0.709	0.281	0.283	0.280	0.282
Mean (SD) of depvar (%)	2.72 (6.02)		0.83 (3.62)		

To estimate expected underpricing, we regress first-day underpricing (market price at the end of the first trading day relative to the offer price) on key deal-level characteristics, including offer size, percentage of shares offered, underwriter syndicate size, number of PDIE investor contacts, number of bids, issuer size (total assets), and issuer profitability. We also control for prevailing local market conditions, incorporating both past returns and volatility. The results of this estimation are shown in Table A7 in the appendix. Expected underpricing is derived from the fitted values of this regression and and multiplied by the allocation-to-bid ratio to compute expected underpricing for each bid.

Table 9 reports the relationship between investor engagement in PDIE and expected profitability. The results show a clear pattern. In models (1) and (2), investors who are not

contacted or do not provide feedback tend to have lower expected profits. In contrast, models (3)–(5) indicate that PDIE participation and valuation feedback provision significantly increase expected IPO profits. These findings are consistent with the information-revelation hypothesis: underwriters reward investors who provide precise valuations ahead of bookbuilding. The IMR is negative throughout, indicating that, consistent with the findings on normalised rationing above, unobserved factors affecting an investor's decision to bid also influence their ultimate profitability. Overall, the findings highlight that early information disclosure prior to the roadshow is not just "cheap talk" but translates into meaningful economic gains for participating investors.

5. Impact of PDIE feedback on IPO offer price

The results thus far show that investor feedback during PDIE significantly influences bookbuilding outcomes, including bid submission, bid sizes, and share allocations. A key unresolved question, however, is whether this early feedback affects the final IPO offer price, or if its impact is entirely mediated by the demand expressed through investor bids during bookbuilding. Understanding the relative influence of investor inputs at different stages of the IPO is essential for assessing how price discovery unfolds and impacts post-bookbuilding outcomes such as the offer price. In this section, we conduct horserace regressions between the aggregate investor feedback received during PDIE and aggregate investor demand, scaled by offer size, during bookbuilding to compare their respective effects on the offer price. This analysis disentangles the contributions of early-stage valuation insights (during PDIE) from later-stage demand signals (during bookbuilding), shedding light on whether PDIE provides unique information that persists through to IPO pricing decisions. By isolating these effects, we contribute to the IPO literature by evaluating the extent to which pre-bookbuilding interactions enhance the efficiency of the pricing process beyond the well-studied bookbuilding phase.

To assess whether investor feedback during PDIE influences the offer price beyond that of investor demand during bookbuilding, we run the following horserace regression at the deal level:

$$Price_i = \beta_1 \widehat{Feedback}_{i,PDIE} + \beta_2 Demand_{i,Bids} + \beta_3 . X_i + \delta_c + \theta_t + \epsilon_i \quad (4)$$

where $Price_i$ denotes the offer price for IPO i. $\widehat{Feedback}_{i,PDIE}$ represents the three predicted variables representing aggregate investor feedback during PDIE, as described in section III.B. $Demand_{i,Bids}$ measures aggregate investor demand as the total shares bid by all investors, scaled

by the number of shares offered in the IPO. We are interested in β_1, which measures the impact of aggregate valuation feedback from investors during PDIE on the offer price. X_i is a vector of deal-level controls, including deal size, underwriter syndicate size and reputation, number and composition of investor contacts (fractions of long-only, foreign, and bid-revising investors), issuer size (total assets), gross profit margin at IPO, and prevailing stock market conditions. Lastly, similar to our estimation in Equation (3), we control for time-invariant country-specific factors and common shocks by including fixed effects for the issuer's country (*c*) and IPO year-quarter (*t*). Given the small sample size at the deal level, we bootstrap the standard errors and double-cluster them by issuer country and IPO year-quarter.

Table 10: Investor engagement during PDIE and IPO offer price

This table presents OLS estimates of the horserace regression specification outlined in equation (4) at the IPO level, evaluating how aggregate investor feedback from the PDIE phase and aggregate share demand during bookbuilding jointly determine the final offer price. The dependent variable *Offer Price*, expresses the position of the final offer within the initial indicative range by measuring how far above the lower bound it lies relative to the width of the price range itself. Models (1) and (2) assess the effect of *FeedbackFrac*, the fitted share of PDIE-contacted investors who supplied valuation feedback (based model (2), panel (a) of Table 3). Model (1) estimating the unconditional effect of *FeedbackFrac*, while model (2) estimating its effect conditional on aggregate bid demand. Models (3)–(4) replicate these specifications using *Avg Feedback Midpoint*, defined as the mean of the predicted valuation midpoints from the first-stage regression estimates from model (1) in panel (b) of Table 3. Models (5)–(6) repeat the exercise with *Avg Feedback Tilt*, the predicted midpoint of disclosed valuations scaled by the width of the initial indicative valuation range (based on estimates of model (5) in panel (b) of Table 3). All specifications control for deal size, underwriter syndicate size and reputation, investor composition during PDIE, issuer financial characteristics, prevailing stock market conditions, and also include issuer country and IPO quarter fixed effects. Bootstrapped standard errors based on the fast wild cluster method of Cameron *et al.* (2008) are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable:	Offer Price (Scaled)					
Valuation feedback variable:	$\widehat{\text{FeedbackFrac}}$		Log Avg $\widehat{\text{Feedback}}$ Midpoint		Avg $\widehat{\text{Feedback}}$ Tilt	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Aggregate Valuation Feedback	7.001**	6.230**	0.603**	0.546**	2.851***	2.524***
	(1.920)	(1.310)	(0.135)	(0.130)	(0.608)	(0.254)
Controls & FE	✓	✓	✓	✓	✓	✓
Aggregate Investor Demand (bids)		✓		✓		✓
Observations	32	32	32	32	32	32
Adjusted R^2	0.651	0.637	0.758	0.705	0.697	0.660
Mean (SD) of depvar (%)	0.29 (0.38)					

Table 10 reports results of the horserace estimations, revealing the distinct roles of the PDIE and bookbuilding phases. In model 1, we regress the predicted fraction of contacted investors providing valuation feedback during PDIE ($\widehat{FeedbackFrac}$) along with deal-level controls on the offer price. The estimates indicate that stronger investor involvement in feedback provision leads to higher offer prices. This relationship remains robust in model 2 after controlling for aggregate

bid demand. Although the coefficient β_1 stays positive and statistically significant ($p < 0.05$) in both models, it decreases from 7 in model 1 to 6.23 in model 2. This attenuation suggests that while some pricing information from bookbuilding overlaps with PDIE feedback, the sustained significance of β_1 suggests that PDIE contributes unique information to the offer price. Similar results are obtained for the other two proxies of $\widehat{Feedback}_{\iota,PDIE}$, implying that more optimistic investor valuations early on during the IPO are associated with higher offer prices.

Overall, the horserace results in Table 10 establish that the PDIE phase is an important contributor to IPO pricing, complementing the role of bookbuilding in the price discovery process. Rather than being redundant, PDIE feedback provides underwriters with early, actionable insights that influence the offer price independently of later bids. These findings challenge the conventional view that bookbuilding alone drives IPO price discovery.

V. Conclusions

This study provides empirical evidence on the underexplored role of investor feedback during the pre-bookbuilding phase of IPOs. Utilizing a proprietary, hand-collected dataset capturing every investor-underwriter interaction in a sample of European IPOs, and employing an identification strategy exploiting exogenous variation from new airline routes, we demonstrate that precise and optimistic investor feedback provided during the PDIE phase significantly refines pricing accuracy, narrowing the bookbuilding range and elevating the offer price, while rewarding contributing investors with larger, more profitable allocations. These findings underscore the significance of early information revelation, challenging the longstanding emphasis on bookbuilding as the setting for price discovery.

The credibility of PDIE feedback, which is predictive of subsequent bidding, suggests that informal pre-bookbuilding feedback elicits high quality investor insights, reducing uncertainty beyond structured issuer disclosures and bookbuilding alone. These findings complement existing theories positing information asymmetry as a central friction to efficient IPO pricing (Benveniste & Spindt 1989), demonstrating how it can be mitigated by early investor engagement. We advance the IPO literature by delineating the unique contribution of pre-bookbuilding interactions to IPO pricing efficiency, a nuance often subsumed under broader bookbuilding narratives.

Our results carry important practical implications for market participants and regulators. For issuers and underwriters, encouraging early-stage feedback from investors may reduce information

asymmetries, improve valuation accuracy, and minimize underpricing. From a regulatory perspective, adopting and regularizing early-stage investor engagement could improve market efficiency and pricing accuracy, especially in the US where such practices remain limited.

While our approach provides robust insights, certain limitations inherent in our European context and the specific instrument used (new airline routes) suggest opportunities for future research. Extending our methodology to different market settings, regulatory frameworks, or investor types would further test the generalizability of our findings: How do feedback dynamics differ across regulatory regimes or investor compositions? Could alternative pre-bookbuilding interaction mechanisms yield similar efficiencies? Future studies could also explore the interplay between early investor engagement and other forms of market communication (e.g., issuer-led roadshows or media interactions) to further disentangle information flows in IPOs and optimize market practices.

In sum, our paper highlights the critical role of early investor feedback in IPO pricing and allocation. It bridges theoretical gaps, offers actionable insights for IPO market participants and regulators, and goes some way to redressing the balance in favour of information revelation in the explanation of IPO pricing and allocations. Yet its true impact lies in a deeper investigation into the interplay of information, timing and efficiency in capital markets – a pursuit we recommend for future research.

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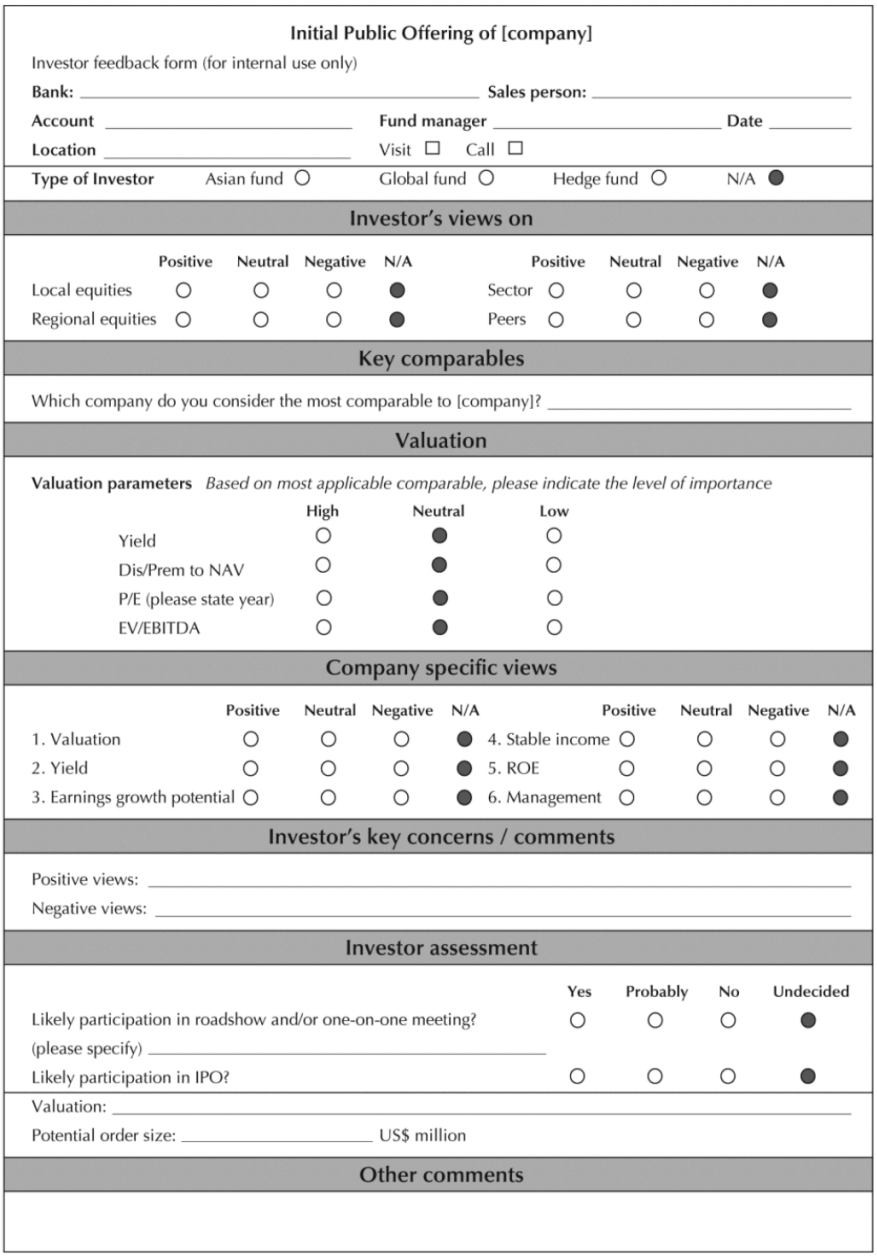
Internet Appendix

A Supplementary figures and tables

Figure A1. Example of a feedback form supplied to investors during PDIE

This figure shows an example of the form distributed by underwriters to prospective investors to elicit structured feedback during the PDIE phase of European IPOs. The form aims to elicit the following details from investors: their profile and contact details; sentiment ratings on local and regional equity markets, sector outlooks, and peer company benchmarks; quantitative assessments of the issuer's valuation, growth prospects, and management quality; qualitative open-ended comments on the IPO's merits and concerns; and indicators of interest in follow-up roadshows and eventual participation in the bookbuilding phase of the IPO. Image source: Espinasse (2021).



Initial Public Offering of [company]

Investor feedback form (for internal use only)

Bank: _____ **Sales person:** _____

Account _____ **Fund manager** _____ **Date** _____

Location _____ Visit ☐ Call ☐

Type of Investor Asian fund ○ Global fund ○ Hedge fund ○ N/A ●

Investor's views on

	Positive	Neutral	Negative	N/A		Positive	Neutral	Negative	N/A
Local equities	○	○	○	●	Sector	○	○	○	●
Regional equities	○	○	○	●	Peers	○	○	○	●

Key comparables

Which company do you consider the most comparable to [company]? _____

Valuation

Valuation parameters *Based on most applicable comparable, please indicate the level of importance*

	High	Neutral	Low
Yield	○	●	○
Dis/Prem to NAV	○	●	○
P/E (please state year)	○	●	○
EV/EBITDA	○	●	○

Company specific views

	Positive	Neutral	Negative	N/A		Positive	Neutral	Negative	N/A
1. Valuation	○	○	○	●	4. Stable income	○	○	○	●
2. Yield	○	○	○	●	5. ROE	○	○	○	●
3. Earnings growth potential	○	○	○	●	6. Management	○	○	○	●

Investor's key concerns / comments

Positive views: _____

Negative views: _____

Investor assessment

	Yes	Probably	No	Undecided
Likely participation in roadshow and/or one-on-one meeting?	○	○	○	●
(please specify) _____				
Likely participation in IPO?	○	○	○	●

Valuation: _____

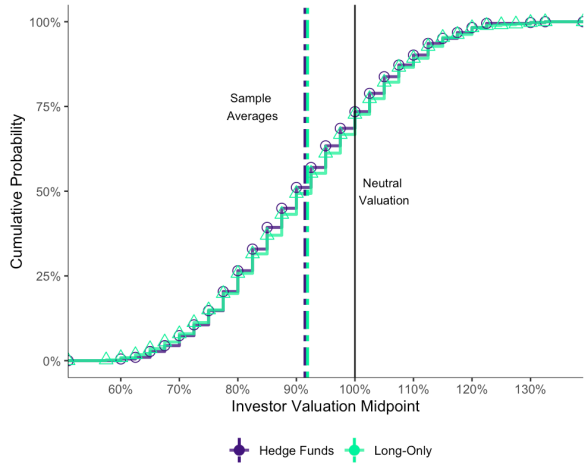
Potential order size: _____ US$ million

Other comments

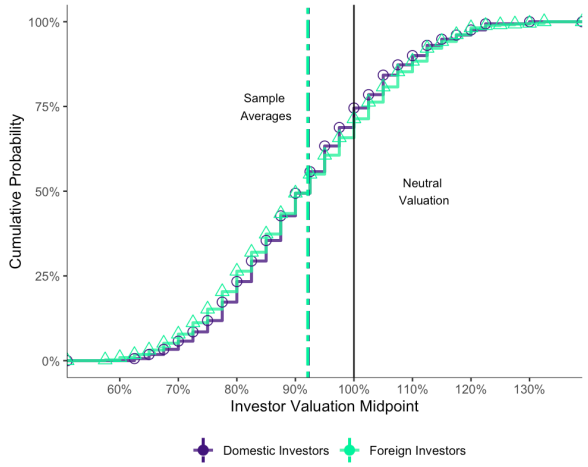
Figure A2. Cumulative distribution function (CDF) of investor valuation feedback

This figure shows the CDF of valuation midpoints and tilts reported by investors during the PDIE phase of IPOs in our sample, grouped by investor type and by geographic proximity to the issuer. Each valuation midpoint is normalized by the midpoint of the indicative valuation range established immediately prior to the commencement of the PDIE phase.

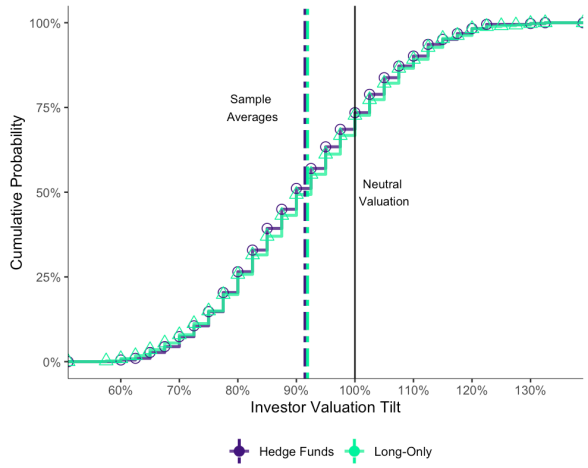
(a) Feedback midpoint by investor type



(b) Feedback midpoint by investor location



(c) Feedback tilt by investor type



(d) Feedback tilt by investor location

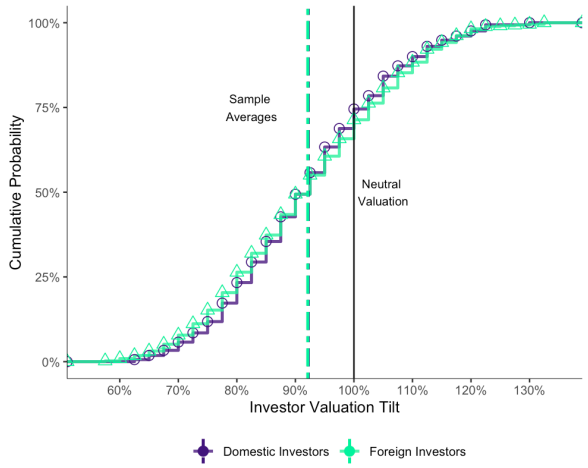


Table A1. Timeline comparisons of European and US IPOs

The table presents differences in European and US institutional practice with respect to the marketing of IPOs, the participation of research analysts, and the ability to amend IPO size and pricing after launch.

	European approach	US approach (post-JOBS Act)[23]
Pre-Announcement Investor Meetings	'Pilot Fishing' ("PF") meetings permitted in advance of the IPO becoming public. Marketing documents with information on IPO size and firm valuation are shared but typically not left with investors at PF meetings.	'Testing the Waters' ("TTW") meetings permitted, usually between confidential filing and public filing. Information must be consistent with that provided in the registration statement; hence, convention is that underwriters do not leave written marketing materials with investors after TTW meetings.
Research analysts' participation	Analysts attend an Analyst Day with the issuer and have 2 weeks in which to prepare pre-IPO reports which are published 2 weeks before the roadshow. Once reports are published, analysts spend 2 weeks educating c. 200 investors during Pre-Deal Investor Education ("PDIE"). Analyst research is a pivotal part of the IPO marketing process, helps shape investor sentiment, and provides valuation guidance prior to setting the Initial Filing Range.	Research can be published before, during and post-IPO; however, convention for bookrunners has been to publish 25 days post-IPO. Research analysts attend an Analyst Day with the issuer and provide a teach-in on positioning and valuation to the underwriters' salesforces when the IPO is launched. Research analysts engage in discussions with investors during the roadshow, assisting with the building of valuation models that are incorporated in their post-IPO reports.
When does the IPO become public?	IPO becomes public at the moment pre-IPO research is published. This is often accompanied by an Intention to Float ("ITF") press release.	For an EGC, the F-1 filing (including company's financials and business model) is filed confidentially until the public filing at latest 15 days prior to the roadshow launch.
Upsizing/ Downsizing and Re-Pricing the IPO	Prospectus filing range typically cannot be changed without triggering prospectus amendment, investors' withdrawal rights and new minimum marketing period.	+/- 20% flex available via Rule 430A(a). Additional disclosure about revisions can be made via a Free Writing Prospectus rather than a full recirculation of the preliminary prospectus.

[23] Prior to September 2019, when the SEC adopted Rule163B under the Securities Act 1933 allowing all issuers to engage in TTW activities.

Table A2. Impact of new airline routes on aggregate travel patterns

This table reports OLS estimates of how the introduction of direct airline connections that reduce travel time affects aggregate passenger flows between two cities. The data on airline routes passenger flows are obtained from the Official Aviation Guide of the Airways (OAG). Observations are at the city-pair × quarter level for routes linking locations of investors, issuers, and underwriters (i.e., London where underwriter analysts of European IPOs are primarily based) in our sample. City pairs that are optimally served by road transport are excluded. The dependent variable, *Passengers*, is the total number of passengers traveling on the route during a given quarter. All specifications include city-pair, quarter, origin city × quarter, and destination city × quarter fixed effects. Standard errors, clustered by city-pair, are shown in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

(a) New airline routes between investor locations and underwriters (London)

Dependent Variable:	Log (Passengers)				
		Placebo tests			
Model:	(1)	(2)	(3)	(4)	(5)
	$t = -1Q$	$t = -4Q$	$t = -2Q$	$t = +1Q$	$t = +2Q$
New Route [Investor – Underwriter (London)](t)	0.088***	-0.127	-0.050	-0.034*	0.003
	(0.034)	(0.086)	(0.058)	(0.017)	(0.040)
Controls & FE	✓	✓	✓	✓	✓
Observations	13,887	13,887	13,887	13,887	13,887
Pseudo R^2	0.944	0.945	0.945	0.949	0.958
Mean (SD) of depvar	8.97 (2.42)				

(b) New airline routes between investor and issuer locations

Dependent Variable:	Log (Passengers)				
		Placebo tests			
Model:	(1)	(2)	(3)	(4)	(5)
	$t = -1Q$	$t = -4Q$	$t = -2Q$	$t = +1Q$	$t = +2Q$
New Route [Investor – Issuer Locations] (t)	0.035***	0.005	0.010	-0.026*	-0.022*
	(0.012)	(0.011)	(0.011)	(0.011)	(0.010)
Controls & FE	✓	✓	✓	✓	✓
Observations	51,304	51,304	51,304	51,304	51,304
Pseudo R^2	0.946	0.944	0.945	0.950	0.959
Mean (SD) of depvar	8.97 (2.42)				

Table A3. PDIE investor feedback: validity of results under alternative instruments

This table presents first-stage probit estimates, based on equation (1), of the probability that a contacted investor discloses valuation feedback during PDIE, using the same specification and dependent variable as Panel (a) of Table 3. Panel (a) employs an indicator for the introduction of new direct airline routes between investor and issuer locations in the quarter preceding the PDIE phase of the IPO; Panels (b)–(d) use the log of mean reported class-specific fares per quarter for flights connecting investor locations to London where underwriter analysts are primarily based—specifically, economy class (panel b), premium economy (panel c), and business class (panel d). All flight and fare data are drawn from OAG. Observations are at the investor-underwriter-deal level, and contacts with investors located in more than one country are treated separately. All specifications include deal, underwriter, investor, and investor country fixed effects, and report robust standard errors clustered by underwriter and IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

(a) New airline routes between investor and issuer locations

Dependent Variable:	Valuation Feedback			
Model:	(1)	(2)	(3)	(4)
New Route (Investor – Issuer Locations)	0.282***	0.281**	0.284***	0.283***
	(0.101)	(0.108)	(0.102)	(0.102)
Controls & FE	✓	✓	✓	✓
Observations	18,536	18,536	18,536	18,536
Adjusted R^2	0.308	0.362	0.310	0.309

(b) Economy class ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Valuation Feedback			
Model:	(1)	(2)	(3)	(4)
Log (Mean Economy Fare)	-0.047**	-0.050**	-0.048**	-0.047**
	(0.021)	(0.021)	(0.021)	(0.022)
Controls & FE	✓	✓	✓	✓
Observations	18,536	18,536	18,536	18,536
Adjusted R^2	0.307	0.362	0.310	0.308

(c) Premium economy class Ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Valuation Feedback			
Model:	(1)	(2)	(3)	(4)
Log (Mean Premium Economy Fare)	-0.124***	-0.107***	-0.124***	-0.125***
	(0.025)	(0.025)	(0.025)	(0.025)
Controls & FE	✓	✓	✓	✓
Observations	18,536	18,536	18,536	18,536
Adjusted R^2	0.309	0.363	0.311	0.310

(d) Business class ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Valuation Feedback			
Model:	(1)	(2)	(3)	(4)
Log (Mean Business Fare)	-0.138***	-0.118***	-0.138***	-0.139***
	(0.022)	(0.024)	(0.022)	(0.022)
Controls & FE	✓	✓	✓	✓
Observations	18,536	18,536	18,536	18,536
Adjusted R^2	0.309	0.363	0.312	0.310

Table A4. Effect of placebo treatment on feedback provision

This table presents first-stage probit estimates, based on equation (1), of the probability that an investor contacted during the PDIE phase of an IPO discloses their valuation, using placebo instruments for route introductions in quarters well before and after the PDIE phase. Models (1)–(4) present regression estimates using placebo indicators for the introduction of a new direct airline connection between investor locations and London (where underwriter analysts of European IPOs are primarily based) at various horizons relative to PDIE: four quarters before (t = –4Q), two quarters before (t = –2Q), one quarter after (t = +1Q), and two quarters after (t = +2Q). Observations are at the investor-underwriter-deal level, and contacts with investors located in more than one country are treated separately. All specifications include deal, underwriter, investor, and investor country fixed effects, and report robust standard errors clustered by underwriter and IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Dependent Variable:	Valuation Feedback			
Model:	(1)	(2)	(3)	(4)
	t = –4Q	*t* = –2Q	*t* = +1Q	*t* = +2Q
New Airline Route [Investor – Underwriter (London)](*t*)	-0.010	0.106	-0.075	-0.119
	(0.468)	(0.571)	(0.335)	(0.420)
Controls & FE	✓	✓	✓	✓
Observations	18,536	18,536	18,536	18,536
Pseudo R^2	0.609	0.610	0.602	0.609
Mean (SD) of depvar	0.28 (0.45)			

Table A5. Bid submission: validity of results under alternative instruments

This table presents first-stage probit estimates, based on equation (1), of the probability that an investor contacted previously during PDIE submits a bid during bookbuilding, using the same dependent variable as in Table 6. Panel (a) employs an indicator for the introduction of new direct airline routes between investor and issuer locations in the quarter preceding the PDIE phase of the IPO; Panels (b)–(d) use the log of mean reported class-specific fares per quarter for flights connecting investor locations to London where underwriter analysts are primarily based—specifically, economy class (panel b), premium economy (panel c), and business class (panel d). All flight and fare data are drawn from OAG. Observations are defined at the investor-underwriter-deal level, with investors operating in multiple countries counted separately, and include those who received no PDIE contact. Each regression includes deal, underwriter, investor, and investor country fixed effects, and reports robust standard errors clustered by underwriter and IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

(a) New airline routes between investor and issuer locations

Dependent Variable:	Bid Submitted		
Model:	(1)	(2)	(3)
Controls for investor participation in PDIE	*Feedback Provision*	*Limit Feedback*	*Feedback Tilt*
New Route [Investor − Issuer Locations]	0.278*	0.278*	0.271*
	(0.121)	(0.123)	(0.117)
Controls & FE	✓	✓	✓
Observations	21,223	21,223	21,223
Adjusted R^2	0.275	0.271	0.283

(b) Economy class ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Bid Submitted		
Model:	(1)	(2)	(3)
Controls for investor participation in PDIE	*Feedback Provision*	*Limit Feedback*	*Feedback Tilt*
Log (Mean Economy Fare)	-0.223***	-0.225***	-0.213***
	(0.031)	(0.031)	(0.030)
Controls & FE	✓	✓	✓
Observations	21,223	21,223	21,223
Adjusted R^2	0.294	0.290	0.299

(c) Premium economy class Ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Bid Submitted		
Model:	(1)	(2)	(3)
Controls for investor participation in PDIE	*Feedback Provision*	*Limit Feedback*	*Feedback Tilt*
Log (Mean Premium Economy Fare)	-0.183***	-0.184***	-0.175***
	(0.025)	(0.025)	(0.024)
Controls & FE	✓	✓	✓
Observations	21,223	21,223	21,223
Adjusted R^2	0.291	0.287	0.297

(d) Business class ticket fares for flights between investor and underwriter (London) locations

Dependent Variable:	Bid Submitted		
Model:	(1)	(2)	(3)
Controls for investor participation in PDIE	*Feedback Provision*	*Limit Feedback*	*Feedback Tilt*
Log (Mean Business Fare)	-0.175***	-0.176***	-0.167***
	(0.025)	(0.025)	(0.024)
Controls & FE	✓	✓	✓
Observations	21,223	21,223	21,223
Adjusted R^2	0.293	0.289	0.299

Table A6. Effect of placebo treatment on bid submission

This table presents first-stage probit estimates, based on equation (1), of the probability that an investor contacted during PDIE submits a bid during bookbuilding, using placebo instruments for exogenous variation in travel accessibility. Coefficients in each cell report the marginal impact of a route introduced at specified horizons relative to the PDIE window: four quarters before (t = –4Q), two quarters before (t = –2Q), one quarter after (t = +1Q), and two quarters after (t = +2Q). Observations are defined at the investor-underwriter-deal level, with investors operating in multiple countries counted separately, and include those who received no PDIE contact. All specifications include deal, underwriter, investor, and investor country fixed effects, and report robust standard errors clustered by underwriter and IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Dependent Variable:	Bid Submitted		
Model:	(1)	(2)	(3)
Controls for investor participation in PDIE	*Feedback Provision*	*Limit Feedback*	*Feedback Tilt*
New Route [Investor – Underwriter (London)](*t* = –4Q)	0.828	0.830	0.803
	(0.528)	(0.527)	(0.532)
New Route [Investor – Underwriter (London)](*t* = –2Q)	-0.308	-0.307	-0.318
	(0.256)	(0.257)	(0.252)
New Route [Investor – Underwriter (London)](*t* = +1Q)	0.106	0.101	0.128
	(0.318)	(0.321)	(0.318)
New Route [Investor – Underwriter (London)](*t* = +2Q)	0.130	0.127	0.132
	(0.265)	(0.264)	(0.265)

Table A7. Expected underpricing: first-stage specification to estimate expected profitability of bids

The dependent variable is IPO underpricing, that is, the first-day return as reported by Capital IQ for each IPO in our sample. The independent variables capture both the IPO issuance mechanism and investor engagement: a dummy for for offerings conducted at a fixed price (*Fixed Price IPO*), total gross proceeds (in euros), the share of equity offered, size of the underwriter syndicate, and the intensity of investor outreach during PDIE and demand during bookbuilding. The regression includes issuer country and IPO quarter fixed effects, and reports standard errors clustered by IPO quarter in parentheses. Statistical significance at the 1%, %, and 10% levels is denoted by ***, **, and *, respectively.

Dependent Variable:	IPO Underpricing
Model:	(1)
Fixed Price IPO	-0.440**
	(0.085)
Log(Offer Value EUR)	0.012
	(0.028)
IPO Shares (% Outstanding)	0.006**
	(0.001)
Log(Underwriter Syndicate Size)	0.498***
	(0.066)
Log(Investor Meetings)	-0.312***
	(0.062)
Log(Investor Bids)	-0.246***
	(0.017)
Log(Issuer Assets)	0.025**
	(0.007)
Issuer EBITDA/Sales	-0.191**
	(0.043)
Country Index Return (3m)	-0.037
	(0.093)
Country Index SD (3m)	0.0002**
	(0.0000)
VIX Index	0.009**
	(0.003)
Hot IPO Market	-0.016
	(0.045)
Issuer Country FE	✓
IPO Quarter FE	✓
Observations	32
Adjusted R^2	0.614

B Institutional background and related literature

In this section, we highlight key differences between the European and US IPO timetables. Unlike US IPOs, European IPOs typically include a two-week period of intense interaction between underwriters' analysts and investors before bookbuilding begins. We hypothesize that a substantial portion of the information exchanged between investors and underwriters in European IPOs occurs during this pre-bookbuilding phase. Consequently, prior studies focusing exclusively on the bookbuilding phase may have overlooked critical information flows that might take place beforehand. The structued and formalized nature of investor-underwriter interactions during this pre-bookbuilding period among European IPOs provides a unique opportunity to study these information flows, which have the potential to significantly influence IPO outcomes.

1. European versus US IPOs: the importance of PDIE

The timeline for European is largely similar to that of US IPOs, with one notable exception: the two-week period between IPO announcement and start of bookbuilding. In Europe, this phase is characterized by underwriters' analysts publishing research reports and interacting extensively with prospective investors. In contrast, US regulations restrict analysts from publishing research or having significant contact with investors during this period.

Beyond this distinction, the IPO process in both markets follows a broadly similar structure. Before the public announcement, issuing firms conduct confidential exploratory meetings with select investors and brief the underwriters (see Figure B1 and Table A1 in the appendix).[24] Following the public announcement of the IPO, there is typically a two-week period before the indicative price range is set, which signals the start of the bookbuilding phase, lasting approximately two weeks. During the bokbuilding phase, the issuer conducts a roadshow with potential investors, while the lead underwriter gathers bids from those interested in participating in the offering. At the end of bookbuilding, the lead underwriter, on behalf of the issuer, sets the IPO price and allocates shares to investors.

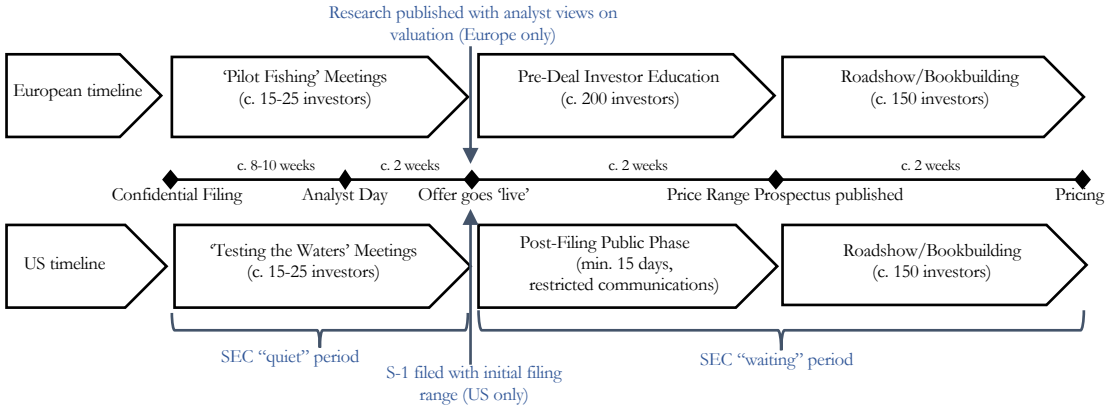
The main distinction between the European and US IPO timelines lies in the two-week period before bookbuilding. In the US, underwriters' analysts face strict communication limits—they cannot publish research, must stick to factual information about the issuer, and are prohibited from

[24] These investor meetings are called 'testing-the-waters' in the US and 'pilot-fishing' in Europe. Testing-the-waters meetings have been permitted for Emerging Growth Companies under the Jumpstart Our Business Startups (JOBS) Act since 2012 and for all companies (under Regulation D, Rule 163B of the US Securities Act 1933) since 2019.

soliciting investor bids. In contrast, European IPOs involve a more active role for underwriters' analysts during the *Pre-Deal Investor Education* (PDIE) phase. Analysts produce detailed reports and interact with hundreds of prospective investors worldwide, presenting the investment case for the IPO and soliciting feedback on investor interest. As part of this marketing, each analyst will typically meet 5–10 investors per day across multiple time zones, potentially reaching hundreds of investors over two weeks in deals involving multiple underwriters.

Figure B1. Comparison of European and US IPO timelines

The figure compares European and US IPO timelines. In the period after confidential filing and before the offer goes 'live', both timelines allow for meetings between the issuer and leadership investors, and the briefing of research analysts by the issuer. Once the offer goes 'live', the European timeline differs in three respects: first, there is no publicly available registration statement akin to the US S-1; second, research analysts publish and circulate pre-IPO reports that contain their views on valuation; third, research analysts begin a 15-day period of Pre-Deal Investor Education (PDIE) during which they meet with investors to present their research reports and to collect detailed investor feedback including non-binding indications of interest in the IPO shares. Once the 'Price Range Prospectus' is published, each timeline proceeds with two weeks of roadshow/bookbuilding before the IPO price is set. In both regions, it may be possible to trade in the IPO shares on a when-issued basis via over-the-counter markets that may exist after the IPO goes live. Such IPO pre-markets are discussed in (Chang *et al.* 2017).



During PDIE, analysts relay feedback obtained from investors to the lead underwriter, who then shares it with the issuer and their adviser (if any). This feedback contains both qualitative insights—such as investor views on the strengths and weaknesses of the issuer—and quantitative information, including investor valuations of the firm being floated and estimates of the size and pricing of the bids they expect to submit during bookbuilding (Espinasse 2014, 2021). This extensive private information allows underwriters to fine-tune the indicative price range and size of the IPO, a process not available to their US counterparts.[25] It is important to highlight that, at the start of PDIE, underwriters provide an indicative valuation range (usually expressed in the

[25] The higher informational content of investor feedback in European IPOs gives rise to striking institutional differences between US and European IPOs. We document many of these differences in Appendix F.

issuer's native currency) to guide investors in expressing their valuations of the issuer. This range differs from the indicative price range, which is set at the beginning of the bookbuilding phase.

2. Related literature

The concept of information revelation has been central to IPO research since Benveniste and Spindt (1989), who proposed that informed investors share their valuation insights on the issuer with the lead underwriter in exchange for favourable share allocations. Sherman and Titman (2002) extend this framework arguing that the cost of acquiring information from investors is higher in IPOs which are difficult to value, making such information more valuable and better rewarded.

Models of information revelation were first tested on European IPOs by Cornelli and Goldreich (2001) and Jenkinson and Jones (2004), both of which used price-limited bids as a proxy for information revelation by investors. Evidence from these studies on whether information revelation is rewarded is mixed, with the former finding evidence that price-limited bids are favorably allocated and the latter not. Given that each study used IPO data from different lead underwriters across approximately 30 IPOs under varying market conditions, drawing consistent conclusions from their combined findings is challenging. The use of price-limited bids as a proxy for information revelation was itself challenged in Jenkinson and Jones (2009), who showed through a survey that investors do not use price-limited bids to reveal information on valuation, but rather to push down the IPO price in cold IPOs where they hold greater bargaining power. The survey responses in that study also raised doubts about the manner in which investors produce their own information in the first place: most investors reported that they rely on analyst research reports to form their views on the issuer's valuation. Other respondents cited their brokerage relationships with the lead underwriter as the most influential factor in securing favorable IPO allocations. Based on these survey results, the authors conclude that agency frictions offer a more compelling explanation for IPO pricing dynamics than information-based theories.

These two contrasting explanations for IPO allocations – information revelation and a *quid pro quo* for broking business – were examined by Jenkinson *et al.* (2018). Using a dataset sourced through the UK regulator, the Financial Conduct Authority (FCA), as part of a regulatory market study, the authors analyzed 220 European IPOs managed over a four-and-a-half-year period by all leading underwriters. They found that investors who placed price-limited bids or attended meetings with the company (whether before the launch or during bookbuilding) received more generous

allocations, supporting the information revelation hypothesis. However, this effect is overshadowed by the extent to which allocations are determined by the volume of broking business done between the allocated investor and the underwriter handling their bid. This finding aligns with empirical research suggesting that IPO allocations are more driven by agency effects than by information revelation. For instance, Reuter (2006) and Goldstein *et al.* (2011) find evidence consistent with *quid pro quo* in US IPOs between investor allocations and trading volumes. However, neither study had direct access to data on allocations.

Another channel through which information flows between investors and IPO underwriters is via 'partial adjustment', under which the price range, offer size, or both may not be fully adjusted during bookbuilding in response to unexpectedly high or low demand. Studies of this phenomenon, which is common in the US market, show that negative information tends to drive downward price adjustments more often than positive information leads to upward revisions (Hanley 1993). Additionally, these adjustments are more likely to occur when highly reputable underwriters are involved (Wang & Yung 2011) and they incorporate not only investor feedback but also public information (Bradley & Jordan 2002; Lowry & Schwert 2004).

The fact that price ranges are often revised in the US but rarely in Europe is another striking difference between these two markets. Jenkinson *et al.* (2006) explain this difference by pointing out that, in Europe, underwriters' analysts publish research and market the IPO to investors well before bookbuilding during PDIE, a practice not permitted in the US.[26] Their model suggests that informed investors have an incentive to understate their true issuer valuations to secure a lower price range. To counteract this, the lead underwriter commits not to exceed the indicative price range and to make favorable allocations to uninformed investors if the IPO is oversubscribed. This commitment incentivizes informed investors to reveal their valuations truthfully, as failing to do so risks being crowded out of the most promising IPOs in the aftermarket.

In this paper, we find that a significant portion of the information essential for accurate IPO pricing is disclosed before bookbuilding and that this early information is rewarded with generous share allocations. We therefore bridge the gap between early models of information revelation (e.g. Benveniste and Spindt (1989)) and more recent studies (e.g. Jenkinson *et al.* (2018) that report limited evidence of information disclosure during bookbuilding.

[26] Jenkinson et al. (2006) report that around one-half of US IPOs are priced outside their original range, but only around one-tenth of European IPOs.

C Data on airline routes and prices

We use data on new airline routes as an exogenous shock to address the non-random matching of investors with investment banks serving as IPO underwriters. In defining *New Route*, we consider whether driving from London is faster than flying for analysts. Following Bernstein *et al.* (2016), we assume that driving is preferred over flying if the distance between London and the investor location is under 160 km (100 miles). Under both such cases, *New Route* is set to zero. Data on airline routes during the sample period was acquired from the Official Airlines Guide (OAG). The OAG data contains comprehensive monthly flight schedule information, fares, and passenger counts for flights between any two airports in Europe (all 50 countries) and the US Since OAG reports this data by individual airlines, we are able to identify the introduction of direct airline connections between any origin and destination airport pair at any given time. We determine the geographical coordinates of each airport in our sample from the Global Airport Database.[27] Using this information, we group together airports located within a 30-kilometre radius, as they are likely to cater to a shared local population. The only exception to this rule is the city of London in the UK, which is served by six different airports located in Heathrow, Gatwick, Luton, Stansted, London Southend, and London City that are at most 60 kilometres apart from each other. It is important to note that each origin-destination city (airport) pair is treated as a unidirectional route serviced by an airline. Consequently, flights operated by a specific carrier, such as Scandinavian Airlines, are treated as distinct based on direction—for example, flights from London to Oslo are considered separate from those traveling from Oslo to London. For each such distinct carrier–route combination, OAG reports the number of enplaned passengers and fares, categorized into three broad fare classes: *economy, premium economy,* and *business* classes.

1. Airline routes and investor behavior

To be treated, an investor-underwriter pair must be distant enough that air travel is the preferred mode of transport. Since the underwriters in our sample are all based in London, treated pairs include only investors outside London. To ensure sufficient distance meriting travel by air, we restrict treated pairs to investors based outside England that have a new direct flight introduced between their location and London in the quarter preceding the IPO (specifically its PDIE phase). This difference can be seen in Table C1, where treated pairs are, on average, located 1,600

[27] The Global Airport Database can be accessed at https://www.partow.net/miscellaneous/airportdatabase/

kilometres farther away than nontreated pairs. Introducing new flights on these longer routes seems logical, since that is where meaningful travel-time savings matter the most. To further illuminate the differences between treated and nontreated pairs, we compare how the introduction of direct flights coincides with quarter-on-quarter change in fares with the same route. Economy fares increase slightly by €1.55 on nontreated pairs but fall by €14.77 on treated pairs. Similarly, premium economy (business) class fares rise on average by €2.45 (€13.91) in nontreated pairs, but drop by €11.38 (€16.15) in treated pairs.

Table C1. Summary statistics for the instrument

This table compares treated and control investor–underwriter city-pairs used to construct our instrument variable *New Route*. Observations are at the investor-underwriter-deal level, and contacts with investors located in more than one country are treated separately. Treated pairs are those where a direct flight connecting London (the primary hub for underwriter analysts of European IPOs) and an investor's location was introduced in the quarter before the PDIE phase of the IPO. To ensure sufficient distance meriting travel by air, we restrict treated pairs to investors based outside England and aso exclude city pairs that are optimally served by road transport. The table reports differences in route characteristics at the investor-underwriter city-pair level across the treatment and control groups, including great-circle distance and quarterly changes in economy, premium-economy, and business-class fares (in euros). It also presents differences in sentiment, additional information demand (via follow-up meeting requests), and valuation estimates among the investors across both groups. Data on airline routes passenger flows are obtained from OAG.

	Nontreated Pairs		Treated Pairs		*t*-test statistic
Variable	Mean	SD	Mean	SD	(Diff. in means)
Investor–Underwriter Pair Level:					
Great circle distance (km)	1,993.61	2,471.87	3,593.86	2,751.93	33.36***
ΔEconomy Fares (€)$_{t-1,t}$	1.55	19.20	-14.77	25.24	29.643***
ΔPremium Economy Fares (€)$_{t-1,t}$	2.45	84.41	-11.38	43.54	9.057***
ΔBusiness Fares (€)$_{t-1,t}$	13.91	25.43	-16.15	29.97	61.341***
Investor Sentiment:					
Interested	0.37	0.48	0.45	0.5	7.756***
Not Interested	0.03	0.17	0.02	0.12	4.661***
Concerns	0.04	0.19	0.05	0.22	3.189***
Neutral	0.17	0.37	0.11	0.32	7.427***
Substantive opinion	0.73	0.45	0.76	0.43	2.923***
Addl. Roadshow Meeting Requests	0.08	0.26	0.11	0.31	4.866***
Addl. Issuer Meeting Requests	0.05	0.22	0.10	0.28	11.173***
Valuation Feedback:					
Feedback Provided	0.21	0.41	0.25	0.43	4.652***
Valuation Revised	0.28	0.45	0.19	0.39	10.019***
Valuation Midpoint (€, mil.)	536.75	1,504.94	708.15	1,682.53	4.948***
Valuation Tilt	0.91	0.11	0.88	0.11	5.454***
Observations	14,595		3,941		

The remaining characteristics in Table C1 reveal that direct flights appear to significantly influence investor sentiment and feedback. Investors on treated routes are more likely to express interest, request follow-up meetings with the issuer and underwriters, and disclose valuations while being less likely to remain neutral or uninterested in the IPO. They also revise their valuations less

frequently and tend to be more conservative in their valuation estimates. The marginally higher incidence of substantive opinion among treated investors suggests that direct connections facilitate more informed and decisive disclosures.

Overall, these differences illustrate how reduced travel times enhance investor engagement in the period leading up to the IPO. Investors become more actively involved in the roadshow and provide more precise feedback, which may improve price discovery and lead to a more informed bookbuilding process.

D Survey of IPO underwriter analysts

1. Purpose of the survey

A key assumption underlying our identification strategy is that investor involvement in an IPO increases as travel times between underwriters' analysts and investors decrease. However, it is difficult to test this assumption as direct observation of analyst–investor interactions is not possible. To address this limitation and strengthen the validity of our instrument, *New Route*, we conducted a global survey of analysts specializing in IPO-related research.

Surveying IPO analysts poses challenges, as they are often reluctant to disclose sensitive IPO details and are frequently constrained by employer policies from divulging such information externally. To encourage participation, we targeted analysts worldwide who are actively involved in IPOs. We designed a concise questionnaire to limit the survey duration to no more than three minutes, assured respondents of complete anonymity, and pledged to share the final results with all participants. Despite our best efforts, strict internal disclosure policies at many prominent investment banks likely limit the representative of our survey sample relative to the broader IPO universe. However, there is no indicaton that our survey disproportionately captures analysts whose PDIE activities are more influenced by travel time reductions, supporting the validity of our findings.

2. Survey design and implementation

To design our survey, we draw on the questionnaire frameworks of (Bernstein *et al.* 2016) and (Chen *et al.* 2022), incorporating measures to mitigate social desirability bias (SDB) – which is the tendency among survey participants to present themselves in a favourable or socially acceptable manner (Maccoby & Maccoby 1954). In the context of our survey, a key concern is that social desirability bias (SDB) might lead IPO analysts to downplay the impact of reduced travel times on their ability to engage with investors during PDIE. Admitting that travel constraints influence their interactions could be perceived as an acknowledgment that their efforts are less comprehensive for investors in distant locations. Instead, analysts may feel compelled to present themselves as always providing equal access and attention to all investors, regardless of logistical challenges. This inclination could stem from a desire to maintain a professional image, either for themselves or for external parties they believe might access the survey results. During the survey design process, several experienced IPO analysts we consulted independently highlighted this concern, noting that

respondents might be reluctant to disclose the true extent to which logistical factors shape their PDIE activities.

To encourage candid responses from analysts, we conducted the survey anonymously via a secure online platform. Participants were explicitly assured that their identities would remain confidential and that their responses would not be traceable to them, fostering an environment where they could share insights freely without concern for personal or professional repercussions. However, it is possible that some participants mat still be concerned that the online survey platform used to collect responses does not fully eliminate identifying information, such as IP addresses. To address this concern, we supplemented anonymization with the established technique of "indirect questioning" to minimize SDB (Haire 1950; Calder & Burnkrant 1977; Anderson 1978). Specifically, in the first set of key questions, instead of asking analysts directly about their own behavior, we focused on their perceptions of general industry practices. For example, we asked analysts about how they believe travel-time reductions “generally” influence the broader behavior of underwriter teams during PDIE. While this method helps reduce SDB, it raises the possibility that analysts might misjudge the general sensitivity of others to travel-time reductions. To account for this, we employed a second set of “personalized” questions enquiring about analysts' own behavior, acknowledging that these responses might be more affected by SDB. In this question set, we presented a hypothetical scenario where a multi-leg flight from an analyst’s base in Edinburgh to meet an investor in Munich—requiring a layover in Amsterdam—is replaced with a direct, non-stop route between the two cities. Analysts were then asked to assess how such a reduction in travel complexity and time might influence their ability to engage with investors during the PDIE phase. We compare analysts' responses to both the direct and indirect survey questions to assess the consistency of their insights and ensure that their answers reflect genuine perspectives, minimizing the potential influence of SDB.

Finally, consistent with best practices in survey design, we framed several sub-questions to each key question in multiple, closely related ways to ensure that responses were not influenced by potential misinterpretations of a single question. This approach also allows us to explore the various mechanisms through which reduced travel time might influence analysts’ interactions with investors during PDIE. Specifically, we posed several variations of questions addressing different dimensions, such as the frequency and duration of in-person meetings, the depth of engagement, and the quality of information exchange. Nonetheless, our primary focus remains on whether

analysts report being more likely to conduct in-person meetings with investors when travel times are reduced.

For each question, respondents indicated their level of agreement with statements regarding the impact of direct airline routes on analyst–investor engagement and information disclosure. Responses were measured using a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). It is unclear ex ante what fraction of positive responses are sufficient to validate our empirical findings. For example, even if only one-third of analysts report increasing PDIE activities following the introduction of a direct flight, this could still yield a statistically significant effect. In practice, this concern proved irrelevant, as a substantial majority of survey respondents agreed with the presented statements.

To identify prospective respondents, we compiled an initial list of approximately 6,282 research analysts from the Capital IQ database with valid email addresses, focusing on those located in the US, the U.K., Continental Europe, Japan, and Hong Kong. We excluded analysts covering only IT/software, as well as those focused on economics, fixed income, credit, currencies, or other non-common-stock asset classes. We further removed analysts covering only seasoned equities—these analysts do not cover IPO stocks nor do they participate in any pre-IPO research. We distributed the final questionnaire via Qualtrics to 2,087 eligible IPO research analysts, of which approximately 534 emails bounced due to errors or inactive accounts. Of the remaining 1,553 valid addresses, 191 analysts responded, yielding a 12.3% response rate that compares favorably with the surveys in (Bernstein *et al.* 2016) and (Chen *et al.* 2022).

Figure D1 presents the distribution of survey respondents by geographic location, job role, and employer type. Panel (a) shows that the majority of analysts are based in the UK/Europe (44%) and Asia (38%), regions where local regulations commonly permit the dissemination of pre-IPO research, facilitating the active pre-marketing of IPOs. The remaining 18% of respondents are based in the US, where the law traditionally prohibits analysts from publishing pre-IPO research. However, US analysts may still interact with investors during the pre-IPO phase, for instance, by assisting them in developing valuation models. Panel (b) shows that the majority of respondents (77%) are sector analysts, with the remaining split between IPO-only analysts, country-specific analysts, and other roles.[28] Sector analysts play a critical role in IPOs by leveraging their deep

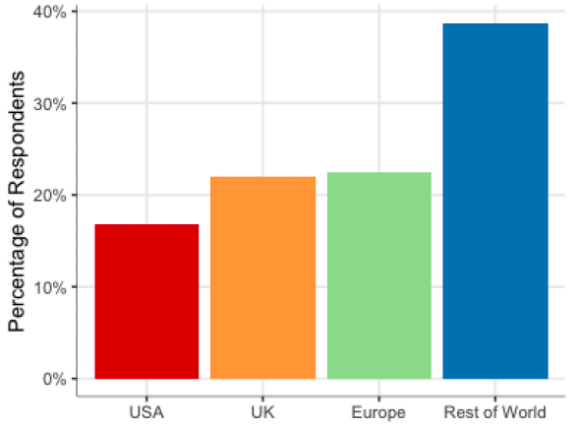
[28] The small number of dedicated IPO analysts reflects the fact that most firms assign IPO coverage to sector or industry analysts rather than maintaining separate IPO-only teams.

expertise in specific industries to assess issuer fundamentals, address investor concerns, and provide nuanced insights that enhance investor confidence. Their sector-specific knowledge is particularly valuable in tailoring presentations to attract investors active within specific industries, making them indispensable to successful IPO execution. Thus, while dedicated IPO-focused or country-specific analysts appear underrepresented compared to sector analysts, this likely reflects the predominance of sector-focused analysts in the equity research industry rather than a source of potential bias in the survey sample.

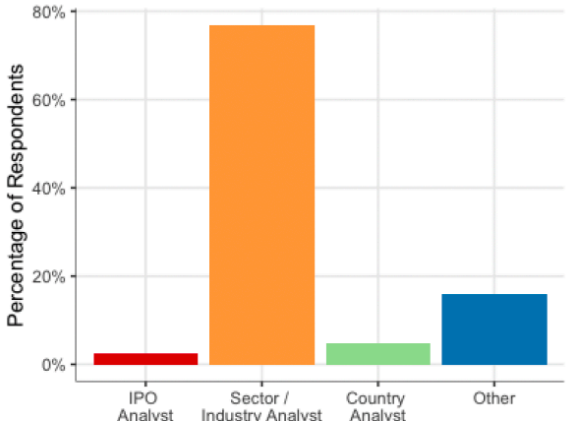
Figure D1. Distribution of survey respondents

This figure summarizes the composition of analysts participated in the survey across three dimensions. Panel (a) shows the geographic distribution of respondents by primary work location. Panel (b) classifies respondents by their job role, distinguishing IPO specialists, sector or industry analysts, country analysts, and other functions. Panel (c) reports the type of employer, including investment banks, brokerage firms, independent research firms, and other institutions. All percentages reflect the share of total survey participants.

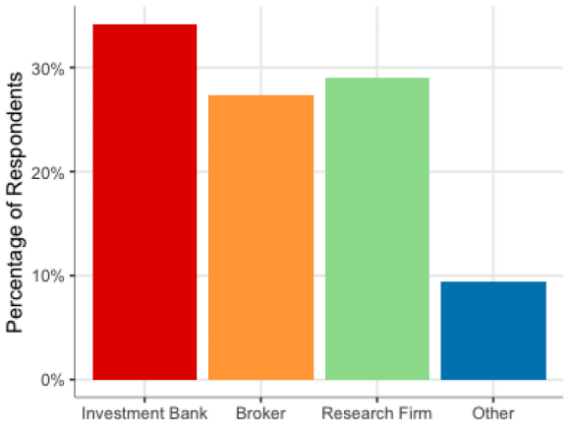
a) Analyst location



b) Analyst job role



c) Analyst employer



Panel (c) illustrates that respondents are predominantly employed at investment banks (33%), with the rest working for brokers (28%), and independent research firms (29%). While brokers and research firms are not directly involved in underwriting, they play a crucial role in PDIE, and overall IPO processes, by providing independent market intelligence, facilitating investor relationships, and influencing price discovery through their interactions with institutional investors. These analysts often serve as key intermediaries, shaping investor sentiment and demand, which are critical components of successful IPO execution. Taken together, these distributions underscore the diversity of our participants, spanning geographies, job roles, and firm types.

3. Survey findings

Figure D2 displays responses to our initial set of “general" questions about the impact of direct flights between analysts and IPO investors, particularly around the PDIE phase. The exact phrasing of these questions is detailed in Section C.4. For the first statement, 89% of respondents agreed that direct flights enhance analysts' ability to visit investors, with a mean response of 3.5 out of 4—significantly above the neutral benchmark of 2.5 at the 1% level. This indicates a strong consensus among analysts on the importance of direct flight connections. For the remaining four statements, an average of 82.75% of respondents agreed that direct flights enhance IPO-related discussions, improve overall communication, strengthen relationships with investors, and help analysts better understand investors' concerns and investment interest in the IPO. Across all statements, mean responses were significantly above neutral, emphasizing the critical role direct flights play in facilitating effective interactions between analysts and investors during the IPO.

Figure D2. Analyst views on direct flight connections (versus layovers) to IPO investors
This figure presents the distribution of analyst responses to five statements comparing the value of direct flights against itineraries with layovers for engaging prospective IPO investors. The statements assess whether direct connections (i) increase the ability to visit investors, (ii) facilitate IPO discussions, (iii) enable more effective communication, (iv) help establish relationships, and (v) improve understanding of investor concerns and investment potential. Each stacked bar shows the percentage of respondents who strongly agree, somewhat agree, somewhat disagree, or strongly disagree. The sample comprises all analysts who completed the survey.

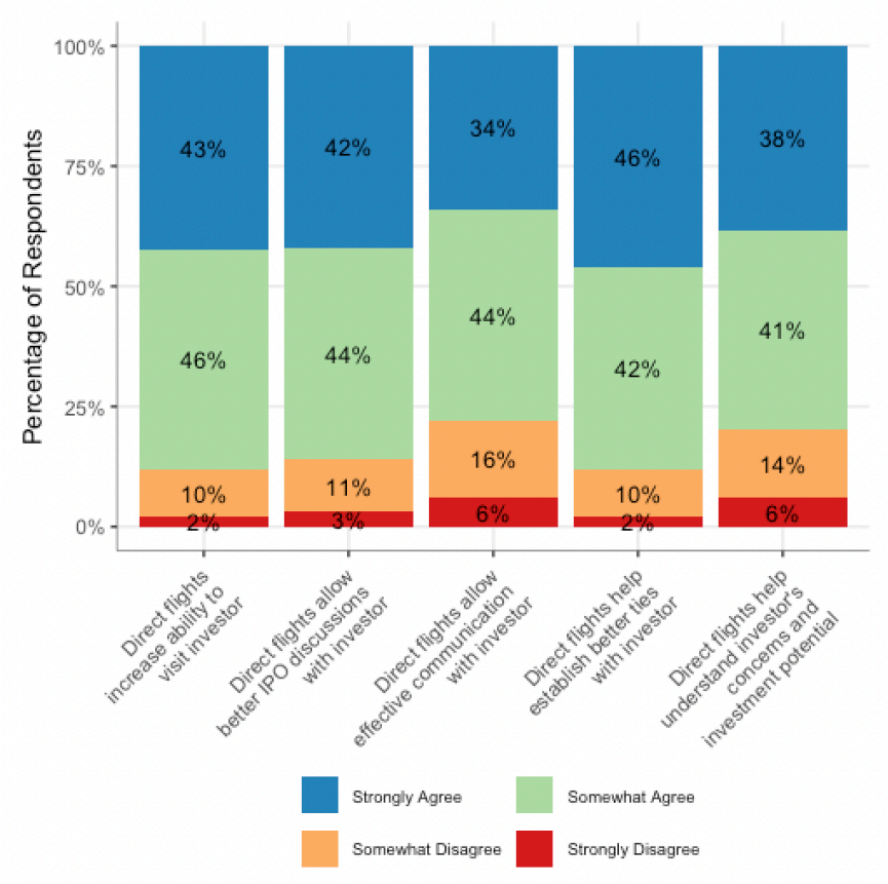


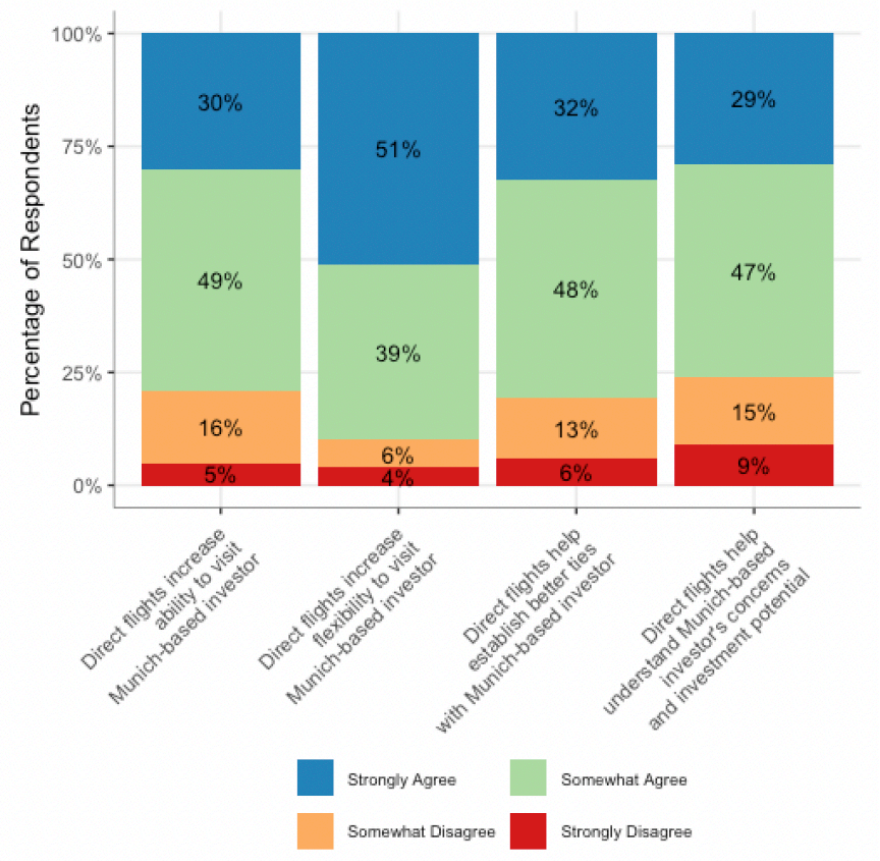
Figure D3 summarizes the responses to our "personalized" questions, with the exact wording provided in Section C.4. Notably, 79% of respondents agreed that the introduction of hypothetical direct flights between analysts (based in Edinburgh) and investors (located in Munich) would increase the frequency of analyst visits to Munich, with a mean response of 3.2 out of 4. Across the remaining three sub-questions, an average of 82% of respondents affirmed that direct flights would enhance analysts' flexibility to meet Munich-based investors, strengthen relationships, and improve their understanding of investors' concerns and potential interest in the IPO.

Figure D4 presents responses to an additional set of "general" questions comparing the perceived benefits of in-person versus electronic (phone or online) meetings with IPO investors during PDIE. The exact question wording is detailed in Section C.4. A majority of respondents

strongly or somewhat agreed that physical meetings provide substantial benefits over electronic meetings. Specifically, 81% of them affirmed that physical meetings enable more effective communication with investors, while 78% agreed they offer better insights into investors' concerns and investment potential. Similarly, 85% indicated that in-person meetings provide better insights into investor views on the IPO, and 75% agreed they are better for gauging demand. These results highlight the widespread belief among analysts that physical meetings during PDIE are critical for fostering investor engagement and facilitating an efficient IPO price discovery process.

Figure D3. Analyst views on hypothetical direct flight connections to IPO investors

This figure shows the distribution of analyst responses to four statements about the value of a hypothetical direct flight connecting Edinburgh (where the analysts are based) and Munich (home to prospective investors in the IPO), compared to alternative journeys involving layovers. The statements evaluate whether introduction of direct flights (i) would increase the ability to visit the Munich-based investor, (ii) would enhance flexibility in scheduling such visits, (iii) would help establish stronger relationships with that investor, and (iv) would improve understanding of the investor's concerns and investment potential. Each stacked bar reports the share of respondents who strongly agree, somewhat agree, somewhat disagree, or strongly disagree. The sample comprises all analysts participating in the survey.

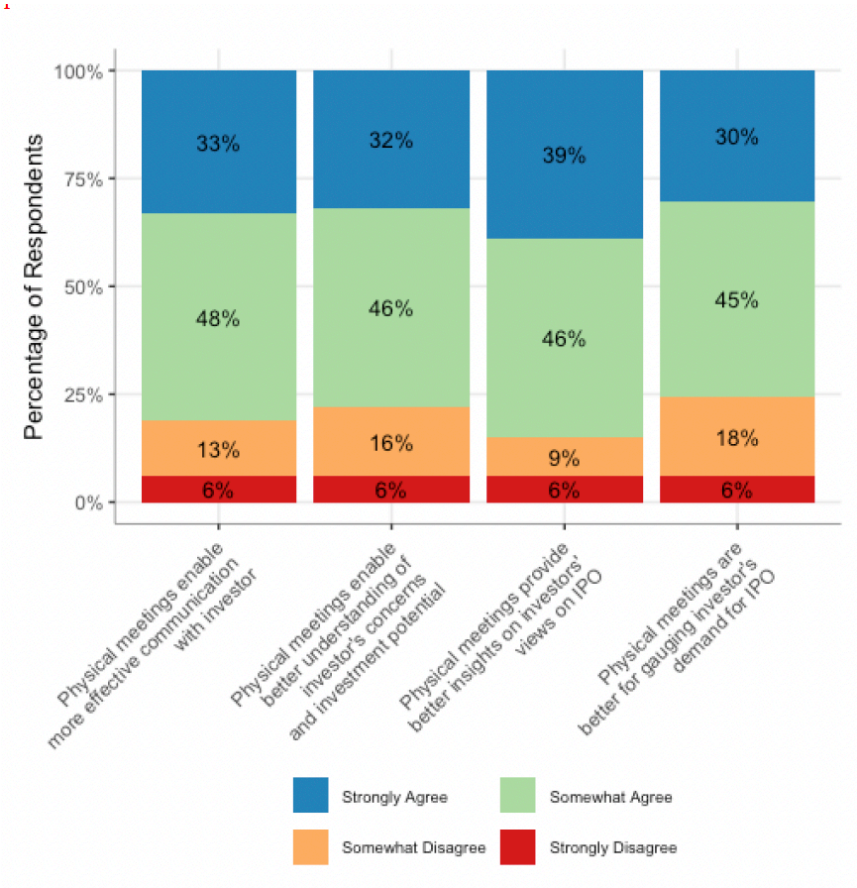


In summary, our survey results support our empirical findings, providing evidence that the introduction of direct airline routes significantly increases the likelihood of investor participation

in PDIE. This qualitative evidence strengthens the core assumption of our research design – that investor engagement and information sharing with analysts are responsive to changes in travel accessibility.

Figure D4. Analyst views on physical versus electronic meetings with IPO investors

This figure displays the distribution of analyst responses to four statements comparing in-person meetings and electronic conferences with prospective IPO investors. The statements ask whether physical meetings (i) enable more effective communication, (ii) improve understanding of investor concerns and investment potential, (iii) provide better insights into investors' views on the IPO, and (iv) are superior for gauging investor demand. Each stacked bar shows the percentage of respondents who strongly agree, somewhat agree, somewhat disagree, or strongly disagree. The sample includes all analysts who completed the survey.



4. Survey questionnaire

Please take a moment to answer the six questions below; it should only take a few moments of your time.

Note that the survey is confidential, and no individual details or responses will be disclosed. The survey results will be shared with you in a few weeks. Thank you for your participation!

* 1. Where are you located?

- ◯ USA
- ◯ UK
- ◯ Europe
- ◯ Rest of World

* 2. Please select the term that best describes your firm type.

- ◯ Investment Bank
- ◯ Broker
- ◯ Research Firm
- ◯ Other

* 3. What is your job role?

- ◯ IPO Analyst
- ◯ Sector / Industry Analyst
- ◯ Country Analyst
- ◯ Other

4. Imagine a world without phone calls or online meetings, e.g. via Zoom or Teams, and where face-to-face meetings are the only possible way to engage with investors during PDIE. Please state whether you agree or disagree with the following statements:

"*In general, better flight connections (direct flights as opposed to flights with layovers) between your city and an investor's location would...*

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
...increase my ability to visit the investor in person to explain about an IPO."	◯	◯	◯	◯
...allow me to spend more time in person discussing an IPO with the investor."	◯	◯	◯	◯
...allow me to communicate more effectively with the investor about an IPO."	◯	◯	◯	◯
...help me establish better relationships with the investor."	◯	◯	◯	◯
...help me better understand the investor's concerns and investment attitudes (e.g. potential order size, pricing views) regarding the IPO."	◯	◯	◯	◯

5. Now consider the following hypothetical scenario. Suppose you are a research analyst based in Edinburgh, UK and wish to conduct PDIE meetings with institutional investors based in Munich, Germany. Currently, the fastest way to travel from Edinburgh to Munich is a flight with a layover in either London, Frankfurt, Paris, or Amsterdam. Suppose a major airline announced plans to introduce direct flights between Edinburgh and Munich, which would substantially reduce travel time between the two locations.

Please state whether you agree/disagree with the following statements:

"*The introduction of direct flights from Edinburgh to Munich would...*

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
...increase the frequency with which I will visit the Munich-based investors."	◯	◯	◯	◯
...increase my flexibility to visit the Munich-based investors in person."	◯	◯	◯	◯
...help me establish better relationships with the Munich-based investors."	◯	◯	◯	◯
...help me better understand the Munich-based investor's concerns and investment attitudes (e.g. potential order size, pricing views) towards the IPO."	◯	◯	◯	◯

6. Now assume that phone calls and online meetings with investors are possible. Please state whether you agree or disagree with the following statements:

"*In general, I prefer meeting investors in person rather than by a phone call or online during PDIE…*

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
…as it helps me communicate more effectively about an IPO."	◯	◯	◯	◯
…as it helps me better understand the investor's concerns and investment attitudes regarding the IPO."	◯	◯	◯	◯
…as it allows me to extract better insights from investors regarding their views on the IPO issuer's quality."	◯	◯	◯	◯
…as it helps to guage investor's demand for the IPO."	◯	◯	◯	◯

E Comparisons between our sample and other European IPOs

This section examines the representativeness of our adviser-managed IPO sample by comparing its characteristics to a matched set of similar European IPOs managed by other advisers or without adviser involvement. Table E1 provides descriptive statistics for deal-level variables, such as the price range, final offer price, and gross proceeds, alongside firm-level measures like revenue and employee count, and post-IPO performance indicators like first-day returns. The comparison groups are constructed using propensity score matching, where each sample IPO is paired with three other European IPOs from Capital IQ, matched on issuer size (total assets), industry (two-digit SIC code), IPO year, and issuer country. Welch *t*-tests are used to evaluate differences in mean characteristics between the both groups, adjusting for unequal variances.

Groups (1) and (2) of Table E1 compare our sample IPOs with the matched European IPOs. Most characteristics show no statistically significant differences, indicating that our sample is broadly representative. For instance, gross proceeds average €529.05 million in our sample versus €434.88 million in the matched group, with a *t*-statistic of 1.14, suggesting no significant difference. Similarly, underwriter fees (4.35% vs. 3.98%) and first-day returns (2.43% vs. 3.14%) are statistically indistinguishable, implying that our sample does not consist of deals that are unusually priced or perform differently post-IPO. While the fraction of shares offered (% of outstanding shares) is slightly lower in our sample (10.73% vs. 14.82%) with a *t*-statistic of -1.71, this difference is modest and does not materially affect broader IPO characteristics.

Groups (3) and (4) extend the analysis by comparing our sample IPOs to distinct matched samples of adviser-led and non-adviser-led European IPOs. Notably, adviser-led IPOs (group 3) show slightly wider price ranges (0.21 vs. 0.18) and a higher fraction of shares offered (16.56% vs. 10.73%), but these differences are modest. Non-adviser-led IPOs (group 4) reveal similar characteristics to the overall matched sample, with no significant deviations in price range width, gross proceeds, or first-day returns.

Across all comparisons, the results consistently demonstrate that the adviser-managed IPOs in our sample are representative of European IPOs overall, mitigating concerns about sample bias. Any observed differences, such as the fraction of shares offered, are minor and unlikely to influence pricing, size, or performance measures meaningfully. These findings underscore the external validity of our analyses and support the broader generalizability of the conclusions drawn from our sample.

Table E1. Characteristics of sample versus other European IPOs

This table compares deal, pricing, and issuer attributes for our sample IPOs against three reference groups of European IPOs over the same period. Data on European IPOs comes from Capital IQ. Each sample IPO in column (1) is matched to three European IPOs in the remaining columns on lagged total assets, industry (two-digit SIC code), IPO year, and issuer country using nearest-neighbor propensity-score matching without replacement. Columns (1) and (2) report means and standard deviations for the sample and all European IPOs, respectively. Columns (3) and (4) repeat this exercise for adviser-led and non–adviser-led IPOs, respectively, against the sample. Welch *t*-test statistics for differences in means are presented alongside each attribute. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Sample IPOs (1)		**European IPOs (2)**			**Adviser-led European IPOs (3)**			**Non adviser-led European IPOs (4)**		
Variable	**Mean**	**SD**	**Mean**	**SD**	**Welch *t*-test diff in means: (1) vs (2)**	**Mean**	**SD**	**Welch *t*-test diff in means: (1) vs (4)**	**Mean**	**SD**	**Welch *t*-test diff in means: (1) vs (4)**
Price range (width)	0.18	0.09	0.20	0.09	-1.05	0.21	0.08	-1.63	0.20	0.09	-1.17
Offer price (scaled by price range midpoint)	0.98	0.06	0.95	0.13	1.63	0.97	0.07	0.38	0.95	0.14	1.61
Gross proceeds (€m)	529.05	426.23	434.88	326.38	1.14	399.44	321.93	1.58	458.90	284.96	0.87
Underwriter syndicate size	5.28	2.33	4.67	2.50	1.27	4.82	2.96	0.89	4.66	2.25	1.32
Underwriter fees (€m)	8.54	6.66	9.68	12.13	-0.67	9.66	12.46	-0.65	8.35	10.27	0.12
Underwriter fees (% gross proceeds)	4.35	1.11	3.98	1.86	1.36	4.73	1.51	-1.53	3.96	2.01	1.38
Shares offered (% outstanding)	10.73	11.98	14.82	10.78	-1.71*	16.56	13.17	-2.32**	15.54	9.05	-2.08**
First day returns (%)	2.43	6.94	3.14	18.17	-0.32	5.47	16.38	-1.47	3.80	18.11	-0.62
Total revenue (€m)	1441.21	2564.04	845.76	1719.53	1.23	770.66	1841.85	1.37	756.95	1416.73	1.44
Employees	2951.44	1405.55	2828.97	1603.64	0.41	2547.90	1716.06	1.33	2853.53	1909.11	0.31
Obs.	32		96			96			96		

F Comparisons between our sample and US IPOs

Given the distinct regulatory environments and institutional practices governing IPO markets in Europe and the US, as discussed in section B1 in the appendix, it is essential to examine whether European IPOs systematically differ from their US counterparts. This section compares the characteristics of European IPOs in our sample with a matched sample of US IPOs, focusing on investor engagement, deal timelines, pricing outcomes, and financial characteristics. Specifically, we contrast the PDIE process in European IPOs with investor engagement during IPO roadshows in the US to assess whether early investor feedback gives European IPOs a competitive edge.

Investor engagement in US IPOs centers on the distribution of the preliminary prospectus—a key document describing the IPO and the preliminary price range. This document is derived from the issuer's initial registration statement (Form S-1) submitted to the Securities and Exchange Commission (SEC). The SEC must review and approve the S-1 filing before it can be used by the issuer and its underwriters during the roadshow. The prospectus details essential information about the issuer, including financial statements, business operations, and risk factors along with a preliminary price range for the offered shares. Underwriters use it to introduce the IPO to potential investors and assess their interest during the roadshow. However, stringent SEC regulations restrict these interactions. Communications must remain factual and consistent with the prospectus, and no material details may be revealed unless they appear explicitly in the preliminary prospectus.[29]

In contrast, European IPOs feature a formal PDIE phase well before the roadshow (i.e., bookbuilding). During PDIE, underwriters' analysts proactively engage investors by distributing detailed research reports—including indicative valuations—and facilitating discussions on the issuer's strengths, weaknesses, and potential valuation ranges. These interactions are designed to gather substantive opinion that directly informs pricing decisions ahead of the roadshow. By comparison, investor engagement in US IPOs only occurs after the SEC has formally reviewed and approved the preliminary prospectus, and it is subject to additional regulatory restrictions on analyst involvement. As a result, PDIE enables early and more robust exchange of information even before bookbuilding commences.

The introduction of "testing-the-waters" (TTW) meetings under the JOBS Act of 2012

[29] For an authoritative overview of US IPO regulatory requirements and the typical transaction timeline, see Latham and Watkins (2024), U.S. IPO Guide (available at https://www.lw.com/admin/upload/SiteAttachments/lw-us-ipo-guide.pdf).

transformed US IPO practices by allowing smaller firms, known as Emerging Growth Companies (EGCs), to engage institutional investors before publicly filing their registration statements. This provision was extended to all issuers in 2019. Although TTW meetings have increased pre-roadshow engagement with prospective investors, they remain less structured than PDIE and exclude analyst research, which limits their effectiveness for early-stage price discovery compared to European PDIE practices.

We used propensity score matching (PSM) to ensure proper comparison between our sample and US IPOs. Each European IPO in our sample was paired with three US IPOs based on issuer size (total assets), industry (two-digit SIC code), IPO year, and country. This matching minimizes biases from issuer differences so that outcome variations reflect differences in institutional practices across both markets. Dollar-denominated variables are converted to euros using the USD/EUR exchange rate at the time of IPO roadshow. For European IPOs, the variable *Investor Contacts* counts the number of investors reached out during PDIE, while for US IPOs we use the "marketing breadth" measure from (Gustafson *et al.* 2023).

Table F1 shows descriptive statistics and mean differences between our sample and matched US IPOs. The sample IPOs report far fewer investor contacts (681 vs. 4,809), reflecting PDIE's targeted approach versus the broader US roadshows. They also have shorter filing periods (16 vs. 64 days) and roadshow durations (8.1 vs. 11.4 days), likely due to early investor engagement during PDIE that reduces uncertainty before bookbuilding.

European IPOs have a narrower indicative price range (0.13 vs. 0.18) and price within the range more often (94% vs. 43%) than US IPOs. US IPOs are more likely to price below the range (33% vs. 6%), which indicates less efficient pricing. These results reaffirm one of the main findings in this paper that PDIE feedback helps underwriters set more accurate price ranges for IPO bookbuilding. Moreover, European IPOs have smaller underwriter syndicates (5.3 vs. 9.5) and pay lower underwriter fees (4.35% vs. 6.13%), reflecting greater cost efficiency in deal execution. European IPOs also demonstrate lower first-day returns compared to US IPOs, suggesting reduced underpricing due to better initial valuations informed by PDIE feedback.

Overall, these results show that PDIE improves price discovery in European IPOs. It reduces uncertainty through early investor engagement, leading to narrower price ranges and aligning offer prices with investor expectations. The PSM method ensures that these benefits are attributable to institutional differences between European and US IPO markets rather than from issuer

characteristics. These findings highlight PDIE's crucial role in IPO price discovery. They provide insights for policymakers who want to improve pricing efficiency in capital markets: instead of advocating broader, but less substantive, approaches such as marketing in US-style roadshows, reforms should focus on facilitating early-stage information sharing mechanisms like PDIE.

Table F1. Differences between sample (European) and US IPOs

This table compares deal, pricing, and issuer attributes for our sample IPOs against a reference group of US IPOs over the same period. Data on US IPOs comes from Capital IQ. Each sample IPO is matched to three comparable US IPOs on lagged total assets, industry (two-digit SIC code), and IPO year using nearest-neighbor propensity-score matching without replacement. Welch *t*-test statistics for differences in means are presented alongside each attribute. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Sample IPOs		US IPOs		Welch *t*-test
Variable	**Mean**	**SD**	**Mean**	**SD**	**diff in means**
Investor contacts (PDIE – European, Roadshow – US)	681.34	354.77	4808.77	4450.77	-9.001***
Filing period (days)	16.00	7.50	63.81	44.36	-10.135***
Roadshow duration (days)	8.10	1.85	11.4	6.39	-4.523***
Price range (width)	0.18	0.09	0.133	0.04	3.036***
Offer price within range (%)	94.12	24.25	43.14	50.02	7.647***
Offer price below range (%)	5.88	24.25	33.33	47.61	-4.236***
Offer price (scaled by price range midpoint)	0.98	0.06	0.954	0.19	0.965
Gross proceeds (€m)	529.05	426.23	557.18	1221.29	-0.193
Underwriter syndicate size	5.28	2.33	9.549	5.97	-5.804***
Underwriter fees (€m)	8.54	6.66	17.78	18.89	-4.090***
Underwriter fees (% gross proceeds)	4.35	1.11	6.13	1.34	-7.451***
Shares offered (% outstanding)	10.73	11.98	33.32	26.04	-6.647***
First day returns (%)	2.43	6.94	11.37	23.03	-3.371***
Total revenue (€m)	1441.21	2564.04	1394.54	2715.21	0.088
Employees	2951.44	1405.55	3285.93	6646.67	-0.463
Obs.	32		96		