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The Initial Public Offerings of Listed Firms

FRANÇOIS DERRIEN and AMBRUS KECSKÉS*

ABSTRACT

A number of firms in the United Kingdom list without issuing equity and then issue equity shortly thereafter. We argue that this two-stage offering strategy is less costly than an initial public offering (IPO) because trading reduces the valuation uncertainty of these firms before they issue equity. We find that initial returns are 10% to 30% lower for these firms than for comparable IPOs, and we provide evidence that the market in the firm's shares lowers financing costs. We also show that these firms time the market both when they list and when they issue equity.

ONE TYPICAL FEATURE OF AN INITIAL PUBLIC OFFERING is that the firm lists and issues equity simultaneously. As such, the value of the shares sold is inherently subject to great uncertainty, which results in underpricing. Rock (1986) argues that if both informed and uninformed investors are to purchase shares in the IPO, underpricing is necessary to attract uninformed investors. Similarly, Benveniste and Spindt (1989) argue that if some investors have better information about the value of the shares than the underwriter, the underwriter can extract this information by rewarding informed investors with underpriced shares. No matter who benefits from an informational advantage, however, the IPO literature agrees that uncertainty is costly for issuers.

To reduce valuation uncertainty, a natural solution for firms wishing to raise equity is to proceed in two stages, listing and letting develop a public market in the firm's existing shares in the first stage, and selling new shares to the public in the second stage. The more active the market that develops in the firm's existing shares, the greater the reduction of valuation uncertainty, and, in turn, the less the underpricing required when the firm sells new shares.

The benefits of this two-stage strategy are unquantifiable in the United States, where firms that list on stock exchanges concurrently issue equity.[1] By contrast, the United Kingdom is an ideal setting in which to investigate this strategy. In the U.K., issuers can choose between an IPO and an

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[1] Until the 1970s, most U.S. firms listed on a regional exchange or traded over the counter, and after a period of successful trading they would graduate to the NYSE or AMEX. Today, virtually all firms list directly on the NYSE, AMEX, or NASDAQ. For details, see Gompers and Lerner (2003).

introduction, that is, a new listing unaccompanied by the sale of any primary or secondary shares. In terms of regulatory requirements and institutional details, an introduction is identical to an IPO except that no shares are sold in an introduction.

In this paper, we use a unique hand-collected data set of U.K. introductions to measure the benefits of the two-stage strategy relative to an IPO. We consider three types of firms: pure introductions, two-stage firms, and regular IPOs. *Pure introductions* are firms that list but do not issue equity to the public within 5 years of listing. *Two-stage firms* are firms that list without issuing equity and then issue equity to the public within 5 years of listing. We examine two potential benefits of the two-stage strategy.

First, as we suggested above, because the two-stage strategy may reduce valuation uncertainty by the time the firm issues equity, it may reduce underpricing. We call this the "cost reduction hypothesis."

Second, the two-stage strategy may allow the firm to time the market more effectively than an IPO. It is well documented that IPOs cluster at equity market peaks, in so-called "hot issues" markets. By contrast, in "cold" markets, issuing equity seems to be more difficult. Thus, in cold markets, firms desiring the benefits of listing may substitute introductions for IPOs, and, when market conditions subsequently improve, may then issue equity to the public. Being listed may also allow two-stage firms to exploit favorable market conditions faster than IPOs. We call this the "market timing hypothesis."

Our results support both of our hypotheses. After accounting for the endogeneity of the choice of the two-stage strategy over an IPO, we estimate that initial returns are 10% to 30% lower for two-stage firms than for comparable IPOs. We also find that for two-stage firms, underpricing is lower when valuation uncertainty at the offering is lower and when valuation uncertainty decreases between the introduction and the offering. This suggests that the market helps reduce underpricing.

As for the market timing hypothesis, we find that in cold markets firms substitute introductions for IPOs. Moreover, two-stage firm offerings occur at the beginning of IPO waves. This suggests that being already listed allows two-stage firms to exploit favorable market conditions faster than IPOs.

A legitimate concern about our results is that two-stage firm offerings might simply be seasoned equity offerings. We consider several testable implications of this alternative interpretation, and provide evidence that suggests that firms deliberately choose the two-stage strategy over an IPO. Conversations with practitioners and public statements made by two-stage firms confirm that firms deliberately choose the two-stage strategy. For instance, a press release by one of our sample two-stage firms states that "iTrain was introduced . . . in 2002 but . . . market conditions meant that the Company did not raise additional capital at the time of its . . . flotation."[2] The firm issued equity in early 2004.

[2] From "iTrain slips into red in FY—says well placed despite mkt conditions," AFX-UK, June 30, 2003, and from "REG-iTrain PLC (IRN.L) Issue of Equity," Regulatory News Service, February 2, 2004.

Moreover, for two-stage firm offerings, we examine returns and trading volume around the offering announcement day and the offering day. Benchmarked against the stylized facts in the IPO and SEO literatures, our results suggest that two-stage firms are very similar to IPOs but are quite unlike SEOs.

By analyzing the market of U.K. introductions, we make several contributions to the corporate finance literature. In explaining IPO underpricing, most researchers since Rock (1986) hypothesize that issuers deliberately underprice their shares and proxy for unobserved underpricing with observed initial returns. Since we observe market prices for two-stage firms, we can directly measure underpricing (the difference between the market price on the day before the offering announcement day and the offering price), we can compare underpricing to initial returns (the difference between the market price on the offering day and the offering price), and we can explore the determinants of underpricing.

We also contribute to the IPO mechanism debate. One focus of this debate is the cost of information production borne by the issuer in the form of underpricing. Benveniste and Spindt (1989), Sherman (2000), and others argue that bookbuilding allows underwriters to extract the information needed to price IPOs. Biais and Faugeron-Crouzet (2002), Derrien and Womack (2003), and others argue that well-designed auctions are just as good at extracting information. Recent studies address related issues using the German when-issued market, a forward market in the shares of soon-to-be IPOs. For instance, Cornelli, Goldreich, and Ljungqvist (2006) find that the when-issued market provides information about secondary market activity and prices. We argue that a market in the firm's shares is another way to solve this information production problem. This alternative does not suffer from short-selling constraints and can exist without bookbuilding, in contrast to the German when-issued market (see Dorn (2003) and Aussenegg, Pichler, and Stomper (2004)).

Finally, we contribute to the literature on market timing by equity issuers. Ibbotson and Jaffe (1975) and Ritter (1984) document that IPOs cluster around equity market peaks. Ritter (1991) and Spiess and Affleck-Graves (1995) estimate that IPOs and SEOs, respectively, underperform in the long run.[3] Loughran, Ritter, and Rydqvist (1994) combine the preceding insights to argue that firms deliberately issue equity when the market is higher.[4] Our evidence suggests that firms that go public via the two-stage strategy time the market twice, namely, when they list and when they issue equity.

The rest of the paper is organized as follows. Section I describes some institutional features of the U.K. IPO market. Section II develops our hypotheses. Section III presents the data. Section IV provides sample descriptive statistics.

[3] While the long-term underperformance of IPOs and SEOs is controversial (e.g., Brav and Gompers (1997)), it is established for small, nonventure capital-backed U.S. firms.

[4] There is a lively debate about the interpretation of these findings. Loughran and Ritter (1995) and Baker and Wurgler (2000) argue that firms issue equity when they are overvalued by the market. By contrast, Schultz (2003) and Pástor and Veronesi (2005) argue that fundamentals can explain the time-varying pattern of equity issuance.

Sections V and VI test the cost reduction and market timing hypotheses, respectively. Section VII contrasts the two-stage strategy with a seasoned equity offering. Section VIII concludes.

I. Institutional Features

In this section, we present some essential institutional features of the U.K. IPO market.[5] The London Stock Exchange (LSE) has two markets, the Official List (OL) and the Alternative Investment Market (AIM). While the institutional details we describe apply to both markets, we focus on AIM because that is the market on which our sample firms are listed.

Launched in June 1995, AIM is the exchange for smaller companies. AIM is to the OL as the AMEX and NASDAQ are to the NYSE, although listing requirements on AIM are less strict than on any of these U.S. exchanges. As of December 2004, 958 firms were listed on AIM.

Every AIM-listed firm must appoint and retain at all times both a nominated advisor and a nominated broker. The nominated advisor has an investor protection role and advises the directors of the company on compliance with AIM rules. The nominated broker promotes trading in the firm's shares and usually plays the role of underwriter when the firm sells securities.

Every firm wishing to list on AIM must prepare a prospectus that meets the requirements of the Public Offers of Securities Regulations 1995 and AIM admission rules. Prospectuses largely have the same contents in the U.K. as they do in the U.S., and preparation of the prospectus can take anywhere from 3 to 6 months. At this stage, the nominated advisor and nominated broker provide certification, due diligence, coordination with lawyers, accountants, and regulators, and public relations activities to ensure sufficient investor interest for a viable market. They also provide a valuation of the firm for such purposes as market making by the broker, but this information is not publicly disclosed. All of these activities are required regardless of whether the firm does an introduction or an IPO.

The only difference between an introduction and an IPO is the sale of shares. If the firm does an IPO, that is, simultaneously lists and sells shares, the nominated broker assumes responsibility for pricing and marketing of the shares. If the firm does an introduction, current shareholders (e.g., owners, managers, employees, etc.) trade with anyone who wishes to buy shares in the firm.

If the firm is already listed, the incremental requirements for an offering are minimal. A prospectus must be filed only if shares are sold to a large number of investors. The offering prospectus contains the updated version of the introduction prospectus, a summary of previously available publicly disclosed information, and the terms of the offering. Thus, once a firm is listed, it can sell shares quickly.

[5] For details, see Brennan and Franks (1997) and Ljungqvist and Wilhelm (2002).

II. Hypotheses

A. The Cost Reduction Hypothesis

The main cost of going public is underpricing (e.g., Ritter (1987)). Most IPO underpricing theories link valuation uncertainty and underpricing, and Beatty and Ritter (1986) show empirically that greater valuation uncertainty is associated with higher initial returns. If, for introductions, the market in their shares reduces valuation uncertainty, then their subsequent offerings should have lower initial returns than those of comparable IPOs. Our first hypothesis, therefore, is that the two-stage strategy is less costly than an IPO.

Second, we expect that for two-stage firms underpricing should be lower when valuation uncertainty at offering is lower and when valuation uncertainty decreases between introduction and offering. Specifically, lower valuation uncertainty at offering, a decrease in valuation uncertainty, greater information production, and longer seasoning between introduction and offering should be associated with lower underpricing.

Habib and Ljungqvist (2001) and others argue that issuers deliberately underprice their shares so that IPO investors earn a positive initial return. Relying on this argument, empirical studies assume that observed initial returns are a good proxy for unobserved underpricing. For our two-stage firms, we observe both underpricing (the difference between the market price on the day before the offering announcement day and the offering price) and initial returns (the difference between the market price on the offering day and the offering price), so we test whether initial returns are a good proxy for underpricing.

B. The Market Timing Hypothesis

The IPO market is sensitive to general market conditions. Specifically, IPOs cluster at equity market peaks, and public firms in general issue relatively more equity than debt before periods of low market returns (e.g., Ritter (1984) and Baker and Wurgler (2000)). This suggests that investor demand for equity is time varying, and that issuers time the market by issuing equity in hot markets, when equity values are higher.

As we discussed in Section I, an introduction is identical to an IPO except that no shares are sold in an introduction. We therefore expect that in cold markets firms desiring the benefits of listing without the cost of selling shares at depressed prices substitute introductions for IPOs.

Second, if firms anticipate financing needs but do an introduction rather than an IPO because the market is cold, then they should issue equity when market conditions subsequently improve. Thus, two-stage firm offerings should cluster concurrently with IPOs at equity market peaks. Moreover, once a firm has done an introduction and is listed in good standing on an exchange, issuing equity is just a matter of finding investors. An offering is fast for a listed firm, faster than an IPO is for a private firm. Since being listed allows two-stage firms to exploit favorable market conditions faster than can IPOs, two-stage firm offerings should occur at the beginning of IPO waves.

III. Sample Selection and Data Sources

In this section, we outline our sample selection procedure and describe our data sources. Our sample consists of introductions and IPOs on the LSE between June 1995 and July 2004. Introductions are divided into pure introductions (firms that list but do not issue equity within 5 years of listing) and two-stage firms (firms that list without issuing equity and then issue equity within 5 years of listing). We hand collect our sample of introductions and IPOs based on data provided by the LSE. The LSE data include firm name, issue type, industry, date of admission for trading of new shares, offering price (except for introductions), market capitalization on admission day, gross proceeds (except for introductions), and nominated broker name. The introduction date and IPO date also come from the LSE data. We only consider firms that we can match to Datastream based on firm name and introduction date or IPO date.

Table I describes the filters we use to construct our sample of pure introductions and two-stage firms. We begin with firms for which the issue type is "introduction." After eliminating cross-listings, firms that have already been listed before, investment funds and trusts, firms that could not be matched to Datastream, combinations of two classes of shares, and IPOs misclassified as introductions, we narrow the list to 119 firms. We eliminate 18 "irregular" introductions, which differ systematically from the rest of our sample because they list on the Official List and are large, established firms, and typically spin-offs.[6]

To select our two-stage firms, we collect press releases from Factiva for each introduction within the first 5 years after the introduction date. We deem the offering for a firm to be the earliest sale of primary shares that we find, if any, for that firm. We deem the offering announcement date to be the earliest date for which we find information about the offering, and the offering date the date for which the newly issued shares begin trading according to the LSE. Of our 101 introductions, 66 two-stage firms issue equity within 5 years of introduction while 35 pure introductions do not.

We collect prospectuses from Worldscope for each of our introductions. These prospectuses provide most of our data on introductions. We locate offering prospectuses for about half of our two-stage firms. We supplement the prospectuses with semiannual and annual reports from Worldscope and with press releases from Factiva. These sources provide most of our data on offerings.

IPOs on AIM are the most suitable comparison group for our two-stage firms. Our sample of 786 IPOs includes virtually all of the IPOs on AIM during the period we examine. We use LSE data on offering price, market capitalization, and gross proceeds to calculate both shares outstanding after the offering and shares offered. We use Worldscope for accounting data on annual sales, operating income, and net income. We extract each of these variables if it is available within half a year before or after the IPO date; we take the chronologically

[6] However, we do retain four Official List firms that have the same characteristics as Alternative Investment Market firms. We redo all analyses excluding these firms. The results are substantially similar.

Table I
Sample Selection

This table describes the filters we use to construct our sample of pure introductions and two-stage firms. An introduction is a firm that lists without issuing equity. A pure introduction is a firm that lists but does not issue equity within 5 years of listing. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. We begin with all firms that list on the London Stock Exchange between June 1995 and July 2004, inclusive, for which issue type is "introduction." We eliminate cross-listings, firms that have already been listed before, investment funds and trusts, firms that cannot be matched to Datastream, combinations of two classes of shares, and IPOs misclassified as introductions. We also eliminate "irregular" introductions, which differ systematically from the rest of our sample because they list on the Official List and are large, established firms, and typically spin-offs. We are left with our sample of 35 pure introductions and 66 two-stage firms.

Firms from LSE data for which issue type is "introduction"		203
Less: Cross-listings from other exchanges	−35	
Less: Firms already traded before introduction somewhere in the world	−17	
Less: Investment funds and trusts	−16	
Less: Firms that cannot be matched to Datastream	−3	
Less: Combinations of two classes of shares into one	−1	
Less: IPOs misclassified as introductions	−12	
Equals: Introductions		=119
Less: Irregular introductions	−18	
Equals: Sample introductions (pure introductions and two-stage firms)		=101
Less: Sample pure introductions	−35	
Equals: Sample two-stage firms		=66

first available value within this window. We obtain accounting data for 690 IPOs (88% of our sample). Using Securities Data Company (SDC) to determine which IPOs did SEOs and when, we match 674 IPOs (86% of our sample) to SDC.

We obtain our market data from Datastream. These data span June 1995 to December 2004. They include closing, bid, ask, high, and low prices, trading volume, and shares outstanding. We use unadjusted prices to calculate underpricing and initial returns for two-stage firms and initial returns for IPOs. Datastream also provides our delisting dates. We use the Hoare Govett Smaller Companies (HGSC) Index as the market index. Daily closing levels of the HGSC Index are from Datastream.[7]

IV. Descriptive Statistics

In this section, we judge both the comparability of two-stage firm introductions and pure introductions, and the comparability of two-stage firm offerings and IPOs. To this end, Tables II and III present various descriptive statistics.

[7] The HGSC Index is a popular U.K. small-cap index. We use this index both because it is standard in the U.K. literature and because we were unable to find a more suitable index that existed throughout the period under study.

Table II
Descriptive Statistics

This table presents descriptive statistics for two-stage firms, pure introductions, and IPOs. The sample comprises 66 two-stage firms, 35 pure introductions, and 786 IPOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A pure introduction is a firm that lists but does not issue equity within 5 years of listing. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. Panel A presents statistics on year and industry distribution, market capitalization, sales, operating income, and net income. Columns 1 and 2 pertain to pure introductions on the introduction day, columns 3 and 4 to two-stage firms on the introduction day, columns 5 and 6 to two-stage firms on the offering day, and columns 7 and 8 to IPOs on the IPO day. Panel B presents statistics on age, spin-offs, and stated reason for introduction. Columns 1 and 2 pertain to two-stage firms on the introduction day, and columns 3 and 4 to pure introductions on the introduction day. Age is the number of years between incorporation and introduction dates. Panel C presents statistics on gross proceeds, underpricing, initial return, years between introduction and offering announcement, days between offering announcement and offering, and press coverage. Columns 1 and 2 pertain to two-stage firms at offering, and columns 3 and 4 to IPOs on the IPO day. We define *underpricing* as the market price on the day before the offering announcement day divided by the offering price, minus one. *Initial return* is the market price on the offering day divided by the offering price, minus one. *Press coverage* is the number of press releases in Factiva between introduction and offering announcement divided by the number of years elapsed from introduction to offering announcement.

Panel A: Pure Introductions, Two-Stage Firms at Introduction, Two-Stage Firms at Offering, and IPOs

	Pure Introductions		Two-Stage Firms at Introduction		Two-Stage Firms at Offering		IPOs	
Number and % in year								
1995	5	14%	6	9%	1	2%	17	2%
1996	7	20%	11	17%	5	8%	95	12%
1997	2	6%	7	11%	10	15%	70	9%
1998	0	0%	7	11%	7	11%	35	4%
1999	2	6%	3	5%	4	6%	58	7%
2000	9	26%	10	15%	7	11%	176	22%
2001	1	3%	10	15%	10	15%	90	11%
2002	3	9%	6	9%	9	14%	60	8%
2003	4	11%	5	8%	8	12%	63	8%
2004	2	6%	1	2%	5	8%	122	16%
Total	35		66		66		786	
Number and % in industry								
High technology	4	11%	9	14%	9	14%	161	20%
Natural resources, primary and secondary	3	9%	12	18%	12	18%	69	9%
Construction and real estate	6	17%	8	12%	8	12%	39	5%
Financial	4	11%	13	20%	13	20%	145	18%
Business and professional services	9	26%	4	6%	4	6%	95	12%
Leisure	1	3%	5	8%	5	8%	64	8%
Low technology equipment	2	6%	4	6%	4	6%	30	4%
Other secondary industries	2	6%	7	11%	7	11%	89	11%

(*continued*)

Table II—*Continued*

	Pure Introductions	Two-Stage Firms at Introduction	Two-Stage Firms at Offering	IPOs
Market capitalization (£ millions)				
Mean	44.003	26.724	30.011	26.990
Standard deviation	83.288	49.378	51.539	64.039
First quartile	4.066	4.167	5.762	6.221
Median	13.150	9.013	11.724	13.849
Third quartile	45.334	31.479	27.037	28.103
Sales (£ millions)				
Mean	29.153	6.526	9.418	6.955
Standard deviation	67.362	13.011	20.368	20.943
First quartile	0.695	0.021	0.046	0.142
Median	4.884	1.459	2.531	1.462
Third quartile	31.441	6.379	8.304	5.805
Operating income (£ millions)				
Mean	1.702	0.121	−0.189	−0.243
Standard deviation	4.612	2.490	2.347	2.793
First quartile	−0.006	−0.266	−0.900	−0.969
Median	0.227	0.097	−0.049	−0.113
Third quartile	2.931	0.805	0.711	0.424
Net income (£ millions)				
Mean	1.102	−0.187	−0.776	−0.652
Standard deviation	4.374	2.312	3.126	2.579
First quartile	0.000	−0.338	−0.936	−1.008
Median	0.177	0.016	−0.136	−0.130
Third quartile	1.654	0.0160	0.357	0.290

Panel B: Two-Stage Firm Introductions and Pure Introductions

	Two-Stage Firms at Introduction		Pure Introductions	
Age (years)				
Mean	9.3		9.3	
Median	3.7		3.2	
Spin-offs	8	12%	5	14%
Number and % stating that reason for introduction is				
Liquidity	26	53%	15	71%
Market timing	17	35%	7	33%
Anticipate financing needs	32	65%	13	62%
Customer/supplier relations	11	22%	5	24%
Employee incentivization	12	24%	8	38%
Raise firm's profile	26	53%	14	67%
Acquisition currency	19	39%	7	33%
Unknown	17	35%	14	67%

(*continued*)

Table II—*Continued*

Panel C: Two-Stage Firm Offerings and IPOs		
	Two-Stage Firms at Offering	IPOs
Gross proceeds (£ millions)		
Mean	5.882	6.579
Standard deviation	12.655	11.751
First quartile	0.477	1.450
Median	1.747	3.000
Third quartile	3.640	6.830
Underpricing (%)		
Mean	13.9	–
Standard deviation	16.7	–
First quartile	1.3	–
Median	10.0	–
Third quartile	20.0	–
Initial return (%)		
Mean	11.9	24.7
Standard deviation	20.8	46.3
First quartile	3.0	4.2
Median	11.3	12.4
Third quartile	21.6	25.0
Years between introduction and offering announcement		
Mean	1.1	–
Median	0.9	–
Days between offering announcement and offering		
Mean	32.4	–
Median	29.4	–
Press coverage		
Mean	52.0	–
Standard deviation	69.4	–
First quartile	19.7	–
Median	31.1	–
Third quartile	60.0	–

Panel A of Table II shows that pure introductions, two-stage firm introductions, two-stage firm offerings, and IPOs are roughly evenly distributed over the sample period. Similarly, pure introductions, two-stage firms, and IPOs are roughly evenly distributed across our industry groups.[8] Two-stage firms are smaller than pure introductions, whether measured by market capitalization

[8] We create a small number of industry groups in such a way as to ensure that two-stage firms, pure introductions, and IPOs all have at least a few firms in each group. Our industry groups are (grouped by SIC): high technology (357X, 3660-3679, 489X, and 737X); natural resources, primary and secondary (8XXX, 1000–1499, 3300–3499, and 29XX); construction and real estate (1500–1799, 24XX, 32XX, and 65XX); financial (6000–6499 and 6600–6799); business and professional services (7300–7369, 7380–7399, 8000–8299, and 87XX); leisure (58XX, 70XX, 7800–7999, and 84XX); low technology equipment (3500–3569, 3580–3599, 3600–3659, 3680–3699, and 38XX); and other secondary industries (2500–2899, 30XX, 39XX, 37XX, and 4000–4599).

Table III
Market Microstructure Statistics

This table presents market microstructure statistics on two-stage firms, pure introductions, and IPOs. The sample comprises 66 two-stage firms, 35 pure introductions, and 786 IPOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A pure introduction is a firm that lists but does not issue equity within 5 years of listing. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. Column 1 of statistics pertains to pure introductions during the month starting on the introduction day, column 2 to two-stage firms during the month starting on the introduction day, column 3 to two-stage firms during the month ending on the day before the offering announcement day, and column 4 to IPOs during the month starting on the IPO day. *Relative quoted spread* is the bid-ask spread in currency units divided by the mean of the bid and ask prices. We define *relative daily volume* as mean daily trading volume divided by shares outstanding, where shares outstanding is measured as the mean of the shares outstanding on the first and last days of the period used.

	Pure Introductions Starting on Introduction Day	Two-Stage Firms Starting on Introduction Day	Two-Stage Firms Ending on Offering Announcement Day	IPOs Starting on IPO Day
Relative quoted spread (%)				
Mean	13.1	12.0	11.4	9.1
Standard deviation	14.1	9.2	8.0	7.4
First quartile	5.3	5.3	6.1	4.2
Median	8.7	9.1	8.8	6.5
Third quartile	14.2	15.7	15.2	11.4
Relative daily volume (%)				
Mean	0.32	0.59	0.21	0.49
Standard deviation	0.63	0.93	0.25	0.81
First quartile	0.01	0.08	0.03	0.07
Median	0.10	0.28	0.13	0.21
Third quartile	0.18	0.60	0.32	0.57
Annualized standard deviation of daily returns (%)				
Mean	49.8	56.9	50.6	44.9
Standard deviation	45.8	56.1	50.7	50.4
First quartile	15.7	19.6	16.9	14.3
Median	36.6	39.8	37.0	30.9
Third quartile	66.3	79.2	62.2	56.9

or sales. Two-stage firms become slightly larger between introduction and offering. Two-stage firms at offering are about the same size as IPOs. Pure introductions are also somewhat more profitable than two-stage firms and IPOs. Two-stage firms and IPOs are comparably profitable.

Panel B of Table II compares two-stage firms and pure introductions. Two-stage firms at introduction and pure introductions are of the same age, where age is defined as the number of years between incorporation and introduction dates. Similar proportions of two-stage firms and pure introductions are spin-offs.[9] Two-stage firms and pure introductions cite the same reasons for doing an introduction.

[9] We redo all analyses excluding all spin-offs. The results are substantially similar.

Panel C of Table II compares two-stage firm offerings and IPOs. We define *underpricing* as the market price on the day before the offering announcement day divided by the offering price, minus one. *Initial return* is the market price on the offering day divided by the offering price, minus one. Two-stage firms and IPOs raise comparable amounts of equity. However, the distribution of initial returns is monotonically lower for two-stage firms than for IPOs, with a mean (median) of 11.9% (11.3%) versus 24.7% (12.4%), respectively.[10]

We observe both underpricing and initial returns for two-stage firms. For two-stage firms, underpricing and initial returns have a correlation of 0.5783 (p-value 0.0000). This suggests that issuers deliberately underprice their shares.

We calculate descriptive statistics for three market microstructure variables during the month starting on the introduction day for pure introductions and two-stage firms, ending on the day before the offering announcement day for two-stage firms, and starting on the IPO day for IPOs. *Relative quoted spread* is the bid–ask spread in currency units divided by the mean of the bid and ask prices. We define *relative daily volume* as mean daily trading volume divided by shares outstanding, where shares outstanding is measured as the mean of the shares outstanding on the first and last days of the period used. We measure return volatility as the *annualized standard deviation of daily returns*.

Table III presents market microstructure descriptive statistics. The quoted spread and return volatility of two-stage firms are similar to those of pure introductions and IPOs. Quoted spread and return volatility for two-stage firms decrease slightly between introduction and offering announcement. Trading volume is similar for both two-stage firms at introduction and IPOs. Trading volume for two-stage firms halves between introduction and offering announcement, becoming comparable to the trading volume of pure introductions. For two-stage firms, abnormally high trading volume at introduction suggests that they become more widely held after introduction.

Overall, Table II and III suggest that it is reasonable to compare two-stage firm introductions and pure introductions as well as two-stage firm offerings and IPOs.

V. Testing the Cost Reduction Hypothesis

In this section, we test the cost reduction hypothesis, which states that the two-stage strategy is less costly than an IPO because the market in the firm's shares reduces valuation uncertainty. First, we test whether initial returns are lower for two-stage firms than for comparable IPOs. Then, we test whether, for two-stage firms, valuation uncertainty decreases between introduction and offering, and we explore the link between this decrease in valuation uncertainty and underpricing.

[10] We double-check and if necessary correct initial returns of less than −50% and of more than +100% for IPOs. Also, we exclude any IPO with initial return in excess of 400%.

A. Costs of a Two-Stage Strategy versus an IPO

When testing whether initial returns for two-stage firms are lower than for comparable IPOs, we must account for the endogeneity of the choice of the two-stage strategy. We are interested in the effect of an endogenous binary variable, the choice of the two-stage strategy (T), on another endogenous continuous variable, initial return (y), conditional on two sets of exogenous variables (X and Z), so a treatment effects model is appropriate. Specifically, we are interested in estimating the model $y = T\delta + X\beta + \varepsilon$. The choice of treatment is the outcome of an unobserved latent variable $T^* = \gamma Z + \zeta$. T is observed as being $T = 1$ if $T^* > 0$ and as being $T = 0$ otherwise. ε and ζ are bivariate normal with zero mean and covariance matrix $\left(\begin{smallmatrix} \sigma & \rho \\ \rho & 1 \end{smallmatrix}\right)$. For details, see Maddala (1983).

Note that the treatment effects model really estimates two models. The first-stage model estimates the probability of choosing the two-stage strategy conditional upon one set of exogenous variables. The second-stage model estimates initial returns conditional upon the choice of the two-stage strategy and another set of exogenous variables. The errors of the first- and second-stage models are allowed to be correlated. We use maximum likelihood (ML) to estimate the treatment effects model, and we also present ordinary least squares (OLS) estimates for comparison.

For the first-stage model, we pick variables that we believe explain the firm's choice of the two-stage strategy over an IPO. For the second-stage model, we pick variables that are known to explain initial returns.

For the first-stage model, we use as exogenous variables:

- *Healthy at introduction/IPO dummy*: We would like to proxy for how healthy a firm is without using valuation-related variables. Positing that a firm is healthy if it has significant sales and is profitable, we construct a proxy for financial health. The healthy dummy equals one if the firm at introduction/IPO has positive sales, positive operating income, and positive net income, and zero otherwise.
- ln*(Market capitalization at introduction/IPO)*
- *Market level at introduction/IPO*: We follow the market timing literature (e.g., Lerner (1994)) and use the market level, i.e., the level of the market index on the introduction/IPO day, to proxy for market conditions.
- *Descending market dummy*: Whenever we include the market level in regressions, we also include this dummy. It equals one if the month in question falls between July 1998 and December 1998 or between January 2001 and March 2003 inclusive, both periods of substantial and sustained declines in equity markets worldwide. The descending market dummy controls for unfavorable market conditions, that is, when the market level is high but descending.
- *Prestigious broker at introduction/IPO dummy*: This variable proxies for the quality of the firm assuming that high quality firms typically employ high quality agents. It equals one if the firm's nominated broker at introduction/IPO is prestigious, and zero otherwise. We classify a broker as

"prestigious" if it is a global investment bank. In instances in which prestige is not obvious, we consult the 1997 to 2003 editions of Thomson's Extel Survey.[11]

- *Spin-off dummy*: This is a dummy variable that equals one if the firm is a spin-off, and zero otherwise.

For the second-stage model, we use as exogenous variables:

- *Healthy at offering/IPO dummy*: This dummy equals one if the firm at offering/IPO has positive sales, positive operating income, and positive net income, and zero otherwise.
- ln*(Gross proceeds of offering/IPO)*
- *Market return at offering/IPO*: We follow the IPO literature (e.g., Loughran and Ritter (2002)) and use this variable to proxy for market conditions. It is the return on the market index over the 3 months ending the day before the offering/IPO day.
- *Prestigious broker at offering/IPO dummy*: This is a dummy that equals one if the firm's nominated broker at offering/IPO is prestigious, and zero otherwise.

We also include our industry dummies in the second-stage model. Furthermore, we include as a right-hand-side variable *two-stage firm probability*, the probability of choosing the two-stage strategy estimated from the first-stage model. The OLS model that we estimate is just the second-stage ML model (including industry dummies) plus the *two-stage firm dummy* (a dummy variable that equals one if the firm is a two-stage firm, and zero otherwise) and the *spin-off dummy*.

The literature predicts that firms are more likely to do an IPO when market conditions are favorable, namely, when the market level is high and the market is not descending. The literature also predicts that initial return should be negatively related to gross proceeds of the offering/IPO and positively related to the market return at the offering/IPO, but it offers no clear prediction about broker prestige. We predict that initial returns should be negatively related to our healthy dummy since firms in good financial health are less risky.

Our estimations use all two-stage firms, except for four firms that did rights offerings, and all IPOs. Table IV presents the results (excluding results for our industry dummies). In the first-stage regressions, the market level, the descending market dummy, and the spin-off dummy are statistically significant determinants of the choice of the two-stage strategy. Our results indicate that when the market level is lower, when the market is descending, and if the firm is a spin-off, the firm has a higher probability of choosing the two-stage strategy.

[11] We only consider brokers in our sample of introductions, offerings, and IPOs. The global investment banks are ABN AMRO (incl. Hoare Govett), Cazenove & Co., Credit Lyonnais Securities, Dresdner Kleinwort Wasserstein, HSBC Securities (incl. James Capel), ING Financial Markets (incl. Charterhouse Securities), Investec Henderson Crosthwaite Securities, KBC Securities (incl. Peel Hunt), Lazard, Lehman Brothers, Nomura International, Schroder Salomon Smith Barney, SG Securities, UBS, and WestLB (incl. Panmure Gordon).

Table IV

Initial Return for Two-Stage Firms versus IPOs

This table presents the difference in initial returns between two-stage firm offerings and IPOs after controlling for firm characteristics and accounting for endogeneity. The sample comprises 66 two-stage firms and 786 IPOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. We exclude four two-stage firms that did rights offerings. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. We estimate two models. In columns 1 and 2, we run ordinary least squares. In columns 3 and 4, we use maximum likelihood to estimate the treatment effects model $y = T\delta + X\beta + \varepsilon$ and $T^* = \gamma Z + \zeta$, where T, the two-stage firm dummy, is observed as being $T = 1$ if $T^* > 0$ and $T = 0$ otherwise, y is the initial return, and X and Z are vectors of exogenous variables. *Two-stage firm dummy* equals one if the firm is a two-stage firm, and zero otherwise. *Two-stage firm probability* is the probability of choosing the two-stage strategy. *Initial return* is the market price on the offering day divided by the offering price, minus one. *Healthy at introduction/IPO dummy* equals one if the firm at introduction/IPO has positive sales, positive operating income, and positive net income, and zero otherwise. ln*(Market capitalization at introduction/IPO)* is measured in £ millions. *Market level at introduction/IPO* is the level of the market index on the introduction/IPO day. *Descending market dummy* equals one if the introduction/IPO day falls between July 1998 and December 1998 or between January 2001 and March 2003, inclusive. *Prestigious broker at introduction/IPO dummy* equals one if the firm's nominated broker at introduction/IPO is prestigious, and zero otherwise. *Spin-off dummy* equals one if the firm is a spin-off, and zero otherwise. *Healthy at offering/IPO dummy* equals one if the firm at offering/IPO has positive sales, positive operating income, and positive net income, and zero otherwise. ln*(Gross proceeds of offering/IPO)* is measured in £ millions. *Market return at offering/IPO* is the return on the market index over the 3 months ending the day before the offering/IPO day. *Prestigious broker at offering/IPO dummy* equals one if the firm's nominated broker at offering/IPO is prestigious, and zero otherwise. All models include our industry dummies. Standard errors are heteroskedasticity-consistent. Below each coefficient estimate is its corresponding *p*-value.

	Models			
	OLS	OLS	ML	ML
Stage 1: Dependent Variable Is Two-stage Firm Dummy				
Independent variables				
Healthy at introduction/IPO dummy				0.1823
				0.198
ln(*Market capitalization at introduction/IPO*)			−0.1050	−0.0876
			0.130	0.241
Market level at introduction/IPO			−0.0005**	−0.0004*
			0.013	0.062
Descending market dummy			0.3830***	0.3511**
			0.007	0.018
Prestigious broker at introduction/IPO dummy			0.0067	0.0278
			0.974	0.893
Spin-off dummy			1.1377***	1.1073***
			0.000	0.000
Constant			−0.2141	−0.5666
			0.660	0.256
Pseudo-R^2			0.0682	0.0686

(*continued*)

Table IV—*Continued*

	Models			
	OLS	OLS	ML	ML
Stage 2: Dependent Variable Is Initial Return				
Independent variables				
Two-stage firm dummy	−0.1212***	−0.1019***		
	0.002	0.010		
Two-stage firm probability			−0.3188***	−0.3137***
			0.000	0.000
Healthy at offering/IPO dummy		−0.0614**		−0.0578**
		0.037		0.047
ln(*Gross proceeds of offering/IPO*)	−0.0435***	−0.0421***	−0.0455***	−0.0466***
	0.001	0.001	0.000	0.000
Market return at offering/IPO	1.1148***	1.1103***	1.0861***	1.0811***
	0.000	0.000	0.000	0.000
Prestigious broker at offering/IPO dummy	−0.0354	−0.0412	−0.0370	−0.0397
	0.370	0.341	0.349	0.355
Spin-off dummy	−0.0258	−0.0947**		
	0.765	0.037		
Constant	0.1932***	0.2178***	0.2091***	0.2364***
	0.000	0.000	0.000	0.000
Observations	836	740	836	738
R^2	0.0751	0.0834		
p-value of Wald chi-square			0.0000	0.0000
p-value of test of $\rho = 0$			0.0000	0.0000

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

In the two OLS regressions and in the second stage of the two ML estimations, the dependent variable is initial returns. Our coefficient estimates and significances are robust across all specifications. Our results indicate that if the firm is healthy, the offering is larger, and the market return of the 3 months preceding the offering/IPO is lower, then initial return is lower, as expected.

The key result is that initial returns for two-stage firms are about 10% lower than for comparable IPOs. After accounting for endogeneity, the initial return advantage of two-stage firms grows to about 30%.[12] In all specifications, the coefficient on the two-stage firm probability/two-stage firm dummy is statistically significant at the 1% level. As we expected, initial returns for two-stage firms are lower than for comparable IPOs.

Is the two-stage strategy cheaper than an IPO? To answer this question, we must compare the two strategies based on the total cost of issuing equity which includes not only the indirect cost of initial return but also the direct cost of listing and underwriting. For an IPO, the total direct cost is just the IPO fee. For the two-stage strategy, the total direct cost is the introduction fee plus the offering fee. For an IPO, the indirect cost is initial return times gross

[12] The test of endogeneity (i.e., whether the residuals of the first and second stage ML estimations are correlated) is rejected at the 1% level, so correcting for endogeneity is appropriate.

proceeds. For a two-stage firm, the indirect cost is also initial return times gross proceeds, but we also have to account for the fact that pre-introduction shareholders sell some of their shares in the market prior to the offering at prices that may be below the market price at the time of the offering. This can be considered a transfer of underpricing from offering investors to post-introduction investors.[13]

We measure all costs in pounds sterling. For two-stage firms, the mean introduction (offering) fee is £0.748 millions (£0.329 millions), so the total direct cost is £0.748 millions + £0.329 millions = £1.077 millions. Because we lack IPO fee data, we estimate gross spreads from Ljungqvist (2004). However, he only reports summary statistics on AIM and OL gross spreads together, which biases our estimates against finding a cost difference. His mean gross spread from 1995 to 2002 is 4.9%. We assume that if two-stage firms had used an IPO instead of a two-stage strategy, this is the direct cost that they would have incurred. We multiply this gross spread by the mean gross proceeds of our two-stage firms' offerings. Thus, we estimate the mean direct cost of an IPO to be 4.9% × £5.882 millions = £0.288 millions.

For two-stage firms, mean initial return times mean gross proceeds is 11.9% × £5.882 millions = £0.700 millions. In addition, we estimate the transfer of underpricing from offering investors to post-introduction investors as follows. The mean price run-up between introduction and offering announcement is 3.3%. We estimate that, between introduction and offering announcement, pre-introduction investors release on average 21.3% of shares outstanding to the market.[14] We know from Table II that the mean market capitalization of two-stage firms at offering is £30 millions. Therefore, we estimate the underpricing transfer cost to be 3.3% × 21.3% × £30 millions = £0.211 millions. The total indirect cost of the two-stage strategy is then £0.700 millions + £0.211 millions = £0.911 millions. If these firms had chosen to do an IPO, we know from Table IV that it would have cost them about 30% more in underpricing. Their indirect cost would have been about 42% × £5.882 millions = £2.470 millions.

Therefore, for two-stage firms the mean total cost is £1.077 millions + £0.911 millions = £1.988 millions. Had these firms chosen to do an IPO, it would have cost them about £0.288 millions + £2.470 millions = £2.758 millions. With this rough approximation, an IPO is almost 40% more expensive than the two-stage strategy.

B. Effect of the Market on the Underpricing of Two-Stage Firm Offerings

We now turn to testing whether the two-stage strategy is less costly than an IPO because the market in the firm's shares reduces valuation uncertainty. If

[13] We are grateful to the referee for bringing this to our attention.

[14] We estimate the number of shares released between introduction and offering announcement using the data on shareholdings contained in introduction and offering prospectuses. Where we do not have an offering prospectus, we use the first annual report after the offering day.

this is the case, we should observe a decrease in valuation uncertainty between a firm's introduction and its offering. Moreover, the firms for which this decrease in uncertainty is more pronounced should exhibit less underpricing.[15]

In order to test these hypotheses, we need a proxy for valuation uncertainty. While the quoted spread is a good candidate, we know from the microstructure literature that it is influenced by factors that are unrelated to valuation uncertainty. To isolate the valuation uncertainty component of the quoted spread, we purge the quoted spread of these factors. That is, we regress the quoted spread on determinants that are not related to valuation uncertainty (order processing costs, inventory holding costs, adverse selection costs, and market making competition) and we use the residuals as our proxy for valuation uncertainty. The Appendix describes in detail how we apply this approach to create the variable *uncertainty at offering announcement*.

We first examine how valuation uncertainty at offering is related to underpricing. If our variable *uncertainty at offering announcement* is a good proxy for valuation uncertainty when a two-stage firm announces its offering, then this variable should be positively related to underpricing. We control for the variables that appear in columns 1 and 2 of Table IV. We run all OLS regressions in this subsection using only those two-stage firms for which underpricing is meaningful, so we exclude four firms that did rights offerings and three firms for which we did not find offering announcement dates.

Column 1 of Table V, Panel A presents the results. A 1.1% decrease in uncertainty at offering announcement is associated with a 1% decrease in underpricing. This is consistent with our hypothesis that lower valuation uncertainty at offering announcement is associated with lower underpricing.

Next, we explore the link between the characteristics of two-stage firms between introduction and offering and the underpricing of these firms' offerings. If the market in the firm's shares reduces valuation uncertainty, then the change in valuation uncertainty between introduction and offering should be positively related to underpricing. Similarly, two-stage firms can transfer some of the underpricing from offering investors to post-introduction investors through a low introduction price. If this is the case, better stock performance in excess of the market index return between introduction and offering should be associated with lower underpricing. Moreover, since more information production and longer seasoning are both likely to improve the firm's information environment, we expect both more information production and longer seasoning to be associated with lower underpricing.

Our proxy for valuation uncertainty at introduction is the variable *uncertainty at introduction*, which is created in the same way as the variable *uncertainty at offering announcement* (see the Appendix). We calculate the *uncertainty change* between introduction and offering announcement as the difference between *uncertainty at introduction* and *uncertainty at offering announcement*. For stock performance, we use the variable *excess of market*

[15] The results in this section are substantially similar when we use initial return instead of underpricing.

Table V

Underpricing and Valuation Uncertainty of Two-Stage Firms

The sample comprises 66 two-stage firms on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. We exclude four firms that did rights offerings and three firms for which we did not find offering announcement dates. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. Panel A presents OLS regressions in which underpricing is explained by uncertainty, uncertainty change, market performance, information production, and seasoning. We define *underpricing* as the market price on the day before the offering announcement day divided by the offering price, minus one. We create *uncertainty at introduction* and *uncertainty at offering announcement* using the residuals of the regression of the quoted spread on its determinants at introduction and at offering announcement, respectively. *Uncertainty change* is *uncertainty at offering announcement* minus *uncertainty at introduction*. *Excess of market return* from introduction to offering announcement is the raw return in excess of the market index. *Press coverage* is the number of press releases in Factiva between introduction and offering announcement divided by the number of years elapsed between introduction and offering announcement. *Healthy at offering dummy* equals one if the firm at offering has positive sales, positive operating income, and positive net income, and zero otherwise. ln*(Gross proceeds of offering)* is measured in £ millions. *Market return at offering announcement* is the return on the market index over the 3 months ending the day before the offering announcement day. *Prestigious broker at offering dummy* equals one if the firm's nominated broker at offering is prestigious, and zero otherwise. *Spin-off dummy* equals one if the firm is a spin-off, and zero otherwise. All models include our industry dummies. Standard errors are heteroskedasticity-consistent. Panel B analyzes the evolution of the quoted spread between introduction and offering announcement for two-stage firms. Each firm-day pair starting on the introduction day and ending on the day before the offering announcement day of the given firm is an observation. *Relative quoted spread* is the bid-ask spread in currency units divided by the mean of the bid and ask prices. *Years elapsed* is the number of years from the introduction day of the given firm to the current day. *Month after introduction dummy* is a dummy that equals one for a given firm-day if the day is in the month following the introduction of the firm, and zero otherwise. *Month before offering announcement dummy* is a dummy that equals one for a given firm-day if the day is in the month ending the day before the offering announcement day of the firm, and zero otherwise. We define *relative daily volume* as trading volume divided by shares outstanding. *Trading continuity* is the fraction of days from the introduction day of the given firm to the current day during which there is strictly positive trading volume. *Relative range* is the high-low range in currency units divided by the mean of the high and low prices. ln*(Price)* is the natural logarithm of the closing price measured in pence. *Market capitalization* is measured is £ millions. We run ordinary least squares regressions. Standard errors are heteroskedasticity-consistent and explicitly correct for correlation of residuals across time for each firm. Below each coefficient estimate is its corresponding *p*-value.

Panel A: Underpricing Explained by Uncertainty, Uncertainty Change, Market Performance, Information Production, and Seasoning

	Dependent Variable Is Underpricing					
Independent Variables						
Uncertainty at offering announcement	1.1451**					
	0.013					
Uncertainty at introduction		1.2595***				1.2296**
		0.007				0.012
Uncertainty change		1.1012**				1.0947*
		0.028				0.057
Excess of market return			−0.0547*			−0.0129
			0.065			0.633
Press coverage				−0.0005***		−0.0004**
				0.006		0.017
Years between introduction and offering announcement					−0.0530**	0.0032
					0.048	0.908
Healthy at offering dummy	−0.0876**	−0.0862*	−0.1045**	−0.0801*	−0.0780*	−0.0767*
	0.045	0.053	0.048	0.068	0.083	0.088
ln(*Gross proceeds of offering*)	−0.0042	−0.0045	0.0156	0.0068	0.0072	−0.0016
	0.869	0.859	0.562	0.797	0.783	0.954
Market return at offering announcement	0.2131	0.2050	0.2348	0.4384	0.1957	0.2784
	0.579	0.591	0.610	0.317	0.676	0.505

(*continued*)

Table V—*Continued*

Dependent Variable Is Underpricing						
Prestigious broker at offering dummy	0.0255	0.0200	−0.0009	0.0007	0.0727	0.0015
	0.734	0.791	0.991	0.993	0.360	0.987
Spin-off dummy	−0.0048	−0.0053	0.0418	0.0540	0.0296	0.0092
	0.931	0.925	0.573	0.415	0.665	0.863
Constant	0.1238	0.1265	0.1100	0.1606**	0.1335	0.1821**
	0.135	0.119	0.184	0.033	0.188	0.013
Observations	56	56	58	58	58	56
R^2	0.3467	0.3492	0.1871	0.1978	0.1954	0.3867

Panel B: Evolution of the Quoted Spread between Introduction and Offering Announcement			
Dependent Variable Is Relative Quoted Spread			
Independent Variables			
Years elapsed	−0.0175**		−0.0148*
	0.042		0.078
Month after introduction dummy		0.0313***[a]	0.0205**[b]
		0.008	0.016
Month before offering announcement dummy		−0.0039[a]	−0.0017[b]
		0.671	0.862
Relative daily volume	−0.3126*	−0.3064*	−0.3307*
	0.062	0.062	0.055
Trading continuity	−0.0988***	−0.0859***	−0.0993***
	0.003	0.005	0.002
Relative range	0.0297	0.0286	0.0282
	0.225	0.228	0.234
ln(*Price*)	−0.0236**	−0.0236**	−0.0236**
	0.015	0.014	0.015
Market capitalization	0.000015	0.000018	0.000016
	0.264	0.176	0.237
Constant	0.2889***	0.2620***	0.2858***
	0.000	0.000	0.000
Number of firm-day pairs	7594	7594	7594
Number of firms	59	59	59
R^2	0.2222	0.2149	0.2259

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.
[a] and [b] indicate statistical significance of the coefficient pair at the 1% and 5% levels, respectively.

return calculated from introduction to offering announcement as the firm's stock return in excess of the market index return. For information production, we use the variable *press coverage* calculated as the number of press releases in Factiva between introduction and offering announcement divided by the number of years elapsed between introduction and offering announcement.[16] We measure seasoning as the number of *years between introduction and offering announcement*.

Columns 2 through 6 of Table V, Panel A present the results. In the univariate regressions, the coefficients on all our variables have the expected sign and are significant, both statistically and economically. A 1% decrease in uncertainty at introduction is associated with a 1.3% decrease in underpricing, and a 1%

[16] Although analyst coverage is another sensible proxy for information production, we are unable to find analyst coverage for most two-stage firms.

decrease in uncertainty change is associated with a 1.1% decrease in underpricing (column 2). Furthermore, a 10% increase in stock performance in excess of the market index return is associated with a 0.5% decrease in underpricing (column 3). A one-standard deviation increase in press coverage is associated with a 3.3% decrease in underpricing (column 4). One extra year between introduction and offering announcement is associated with a 5.3% decrease in underpricing (column 5). For uncertainty at introduction, uncertainty change, and press coverage, our univariate results survive in the multiple regression (column 6) and remain statistically robust. Stock performance and seasoning become statistically insignificant in the multiple regression. Overall, these results support our hypothesis that a decrease in valuation uncertainty and more information production are associated with less underpricing.

The key result from Panel A of Table V is that there is an economically large and statistically significant positive relation between change in valuation uncertainty and underpricing. It remains to be seen whether the valuation uncertainty of two-stage firms decreases between introduction and offering announcement. Table III shows that the quoted spread falls only marginally from introduction to offering announcement, from 12.0% to 11.4% on average. To estimate more precisely the effect of the market on reducing valuation uncertainty, we repeat the approach used previously, and we model the quoted spread on a daily basis in a multivariate setting, which allows us to control for the known determinants of the quoted spread.

Each day, we regress quoted spread on trading volume, trading continuity, return volatility, price per share, and market capitalization (blockholder ownership cannot be used since it only changes annually because it is reported annually). We define *relative daily volume* here as the daily trading volume divided by the number of shares outstanding. *Trading continuity* is the fraction of days from the introduction day to the current day during which there is strictly positive trading volume. We estimate return volatility daily using the *relative range*, which is the high-low trading range in currency units divided by the mean of the high and low prices on a given day. We track the passage of time with *years elapsed*. We use *month after introduction dummy* (equal to one if the introduction was less than a month ago) and *month before offering announcement dummy* (equal to one if the offering announcement is in less than a month) to estimate the difference in quoted spreads between the introduction and the offering announcement.

Panel B of Table V presents the results. Except for return volatility and market capitalization, the determinants of the quoted spread are significant, both statistically and economically. The key result is that after controlling for these determinants, the quoted spread narrows from introduction to offering announcement. One more year (approximately the mean and median time) between introduction and offering announcement is associated with a 1.7% decrease in the quoted spread (column 1). The difference between the coefficients on the *month after introduction* and *month before offering announcement* dum-

mies shows that from introduction to offering announcement, the quoted spread narrows by 2% to 3% on average, which is a substantial 20% to 30% decrease in the level of the quoted spread. This difference is statistically significant (p-values of the difference between the coefficients are 0.0054 and 0.0385 in columns 2 and 3, respectively).

Therefore, after controlling for the known determinants of the quoted spread that are unrelated to valuation uncertainty, we find that for two-stage firms the quoted spread decreases substantially between introduction and offering. Together with the results presented in Panel A of Table V, this suggests that the market in the firm's shares reduces valuation uncertainty, which in turn reduces the underpricing of two-stage firms.

VI. Testing the Market Timing Hypothesis

A. *Market Timing of Introductions*

We test whether in cold markets firms desiring the benefits of listing are more likely to do an introduction than an IPO. We have already found in Table IV that the probability of choosing an introduction over an IPO is higher when the market level is lower and when the market is descending. We now explore this finding further.

The data in this section consist of calendar month time series of the *number of introductions* (including all 101 introductions), the *number of IPOs*, the *number of two-stage firm offerings*, the *market level* on the last trading day of the month, and the number of delistings of pure introductions. In keeping with the literature, we use the market level to proxy for market conditions. We split the market level variable into quintiles.[17] The *hot (cold) market dummy* equals one during months in which the market level is in the top (bottom) quintile, and zero otherwise. As in our tests of the cost reduction hypothesis, we also include a *descending market dummy*.

Panel A of Table VI presents the univariate summary of the number of introductions and IPOs by market level quintile. As we expected, the number of IPOs is increasing in the market level, and the number of introductions is well above average in cold markets. The number of introductions is also above average in hot markets. However, in hot markets, introductions represent only 10% of new lists (introductions plus IPOs), whereas in cold markets, they represent 28% of new lists. We recast the analysis in a regression framework. Note that we use the negative binomial model here and throughout this section since the dependent variables are counting variables. We regress the number of introductions and the number of IPOs in separate regressions on the market condition dummies and the descending market dummy. Panel B of Table VI presents the regression results, which confirm the univariate findings. These results suggest that in cold markets firms substitute introductions for IPOs.

[17] The results are substantially similar if we use terciles or quartiles.

Table VI
Market Timing of Introductions

This table presents the number of introductions and IPOs in various market conditions. The sample comprises 101 introductions and 786 IPOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. An introduction is a firm that lists without issuing equity. Panel A presents univariate summary statistics on the number of introductions and IPOs. Panel B presents the analysis in a multiple regression framework. The data are calendar-month time series. The *market level* is the level of the market index on the last trading day of the month. *Hot (cold) market dummy* equals one during months in which the market level is in the top (bottom) quintile, and zero otherwise. *Descending market dummy* equals one if the month in question falls between July 1998 and December 1998 or between January 2001 and March 2003, inclusive. We use maximum likelihood to estimate our negative binomial regressions. Standard errors are heteroskedasticity-consistent. Below each coefficient estimate is its corresponding *p*-value.

Panel A: Univariate Summary

	Number of Introductions			Number of IPOs		
Market Level Quintile	Mean	Median	Total	Mean	Median	Total
1 (cold)	1.23	1.00	27	3.14	2.50	69
2	0.86	0.00	19	5.68	5.50	125
3	0.64	0.50	14	5.64	6.00	124
4	0.59	0.50	13	9.95	7.50	219
5 (hot)	1.27	1.00	28	11.32	11.00	249
Total			101			786

Panel B: Multiple Regression

	Dependent Variables	
Independent Variables	Number of Introductions	Number of IPOs
Hot market dummy	0.6064***	0.4550***
	0.009	0.003
Cold market dummy	0.6171**	−0.7647***
	0.024	0.002
Descending market dummy	−0.2859	−0.2865*
	0.155	0.058
Constant	−0.2944*	2.0290***
	0.089	0.000
Observations	110	110
Pseudo-R^2	0.0321	0.0438

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

B. Market Timing of Offerings

IPOs cluster at equity market peaks. Since two-stage firm offerings are equity issues, we expect them to cluster concurrently with IPOs at equity market peaks. Moreover, if two-stage firms are able to exploit favorable market conditions faster than IPOs, as we argue in Section I, then two-stage firm offerings should occur at the beginning of IPO waves.

We first regress the number of two-stage firm offerings on the number of IPOs last month, this month, and next month, on the market level and the descending

market dummy, on year dummies, and on the "reservoir" of potential two-stage firm offerings. We define *reservoir* as $reservoir_t = reservoir_{t-1} + introductions_t - two\text{-}stage\ firm\ offerings_t - pure\ introduction\ delistings_t$. This variable controls for the number of potential two-stage firm offerings, which accumulate over time.

Column 1 of Table VII, Panel A presents the results (results for year dummies are not reported). The number of two-stage firm offerings this month is positively related to both the number of IPOs this month and next month. The coefficient estimate on the number of IPOs last month is statistically insignificant. To underscore the economic significance of the results, consider that the mean number of two-stage firm offerings per month is 0.60. A one standard deviation increase in the number of IPOs this month and next month is associated with an increase in the number of two-stage firm offerings of +0.469 (+78%) and +0.351 (+59%), respectively.

Next, we regress the number of IPOs on the number of two-stage firm offerings last month, this month, and next month while controlling for market conditions, as before. Column 1 of Table VII, Panel B presents the results (results for year dummies are not reported). The number of IPOs this month is positively related to both the number of two-stage firm offerings last month and this month. The coefficient estimate on the number of two-stage firm offerings next month is statistically insignificant. The results of column 1 of Table VII show that two-stage firm offerings occur before and concurrent with IPOs, and IPOs occur concurrent with and after two-stage firm offerings. In other words, two-stage firm offerings occur at the beginning of IPO waves.[18]

We also test this causality in a more traditional way. If two-stage firm offerings are not predicted by lagged IPOs after controlling for lagged two-stage firm offerings, but current IPOs are predicted by lagged two-stage firm offerings after controlling for lagged IPOs, then two-stage firm offerings Granger-cause IPOs. From column 2 of Panels A and B in Table VII, two-stage firm offerings do indeed Granger-cause IPOs.[19]

VII. Two-Stage Firm Offering versus Seasoned Equity Offering[20]

We thus far assume that firms deliberately choose the two-stage strategy over an IPO. This assumption is justified by conversations with practitioners and by public statements made by two-stage firms. In this section, we test the alternative interpretation that a two-stage firm offering is simply an SEO.

We consider four implications of this interpretation. First, if two-stage firm offerings are SEOs, the time between introduction and offering for two-stage firms should be about the same as the time between IPO and SEO for IPOs

[18] In unreported results, for two-stage firms, the 1- and 2-year excess of market index returns following the offering are −15.8% (p-value 0.0489) and −16.1% (p-value 0.2224), respectively (we have observations on 94% and 74% of firms, respectively). This is consistent with other studies of long-run post-equity issuance performance.

[19] The results are substantially similar if we include more than one lag.

[20] We are grateful to Rob Stambaugh for motivating this analysis.

Table VII
Market Timing of Two-Stage Firm Offerings

This table presents the relationship between the number of two-stage firm offerings and the number of IPOs. The sample comprises 66 two-stage firms and 786 IPOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. Column 1 of Panels A and B presents the number of two-stage firm offerings and the number of IPOs, respectively, each explained by the other. Column 2 of Panels A and B presents Granger causality tests. The data are calendar month time series. The *market level* is the level of the market index on the last trading day of the month. *Descending market dummy* equals one if the month in question falls between July 1998 and December 1998 or between January 2001 and March 2003 inclusive. We define *reservoir* as $reservoir_t = reservoir_{t-1} + introductions_t - two\text{-}stage\ firm\ offerings_t - pure\ introduction\ delistings_t$. We use maximum likelihood to estimate our negative binomial regressions. All models include year dummies. Standard errors are heteroskedasticity-consistent. Below each coefficient estimate is its corresponding *p*-value.

Panel A: Dependent Variable Is Number of Two-Stage Firm Offerings		
Independent Variables		
Number of IPOs last month	0.0215	0.0290
	0.425	0.250
Number of IPOs this month	0.0730**	
	0.017	
Number of IPOs next month	0.0546***	
	0.007	
Number of two-stage firm offerings last month		−0.4128**
		0.013
Market level	−0.0006	0.0002
	0.314	0.751
Descending market dummy	0.1909	0.4302
	0.729	0.440
Reservoir	−0.0504	−0.0377
	0.410	0.529
Constant	−0.6519	−1.8411
	0.664	0.187
Observations	108	109
Pseudo-R^2	0.0748	0.0619
Panel B: Dependent Variable Is Number of IPOs		
Independent Variables		
Number of two-stage firm offerings last month	0.2008***	0.1786**
	0.007	0.011
Number of two-stage firm offerings this month	0.2384***	
	0.002	
Number of two-stage firm offerings next month	0.0880	
	0.204	
		0.0030
Number of IPOs last month		0.812
	0.0014***	0.0015***
Market level	0.000	0.000
	0.1081	0.0908
Descending market dummy	0.696	0.774
	−1.7251***	−1.6728**
Constant	0.008	0.012
Observations	108	109
Pseudo-R^2	0.1387	0.1298

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

that do SEOs. Second, the SEO literature documents that SEOs experience a permanent negative offering announcement day market reaction (e.g., Asquith and Mullins (1986) and Masulis and Korwar (1986)) and a temporary negative offering day market reaction (e.g., Corwin (2003)). Two-stage firms should experience similar offering announcement and offering day market reactions if their offerings are SEOs. Third, trading volume during the first day of trading for IPOs is an order of magnitude greater than subsequent trading volume (e.g., Ellis, Michaely, and O'Hara (2000) and Corwin, Harris, and Lipson (2004)). If two-stage firm offerings are SEOs, then trading volume on the offering day should be normal. Fourth, SEOs experience a price run-up before they issue equity (e.g., Asquith and Mullins (1986)). Two-stage firms should also experience a price run-up prior to offering if two-stage firm offerings are SEOs.

First, to test whether the time between introduction and offering is comparable to the time between IPO and SEO, we consider all of our introductions and the IPOs that we can match to SDC. Of our sample introductions, 66 (65%) do an offering within 5 years after introduction, whereas of our sample IPOs, 225 (33%) do their first SEO within 5 years after IPO. Each quarter, we calculate the fraction of offerings by introductions and of SEOs by IPOs that have taken place by the end of the quarter. Figure 1 shows the results. At any point in time, at least twice as many introductions have done offerings as IPOs have done SEOs.

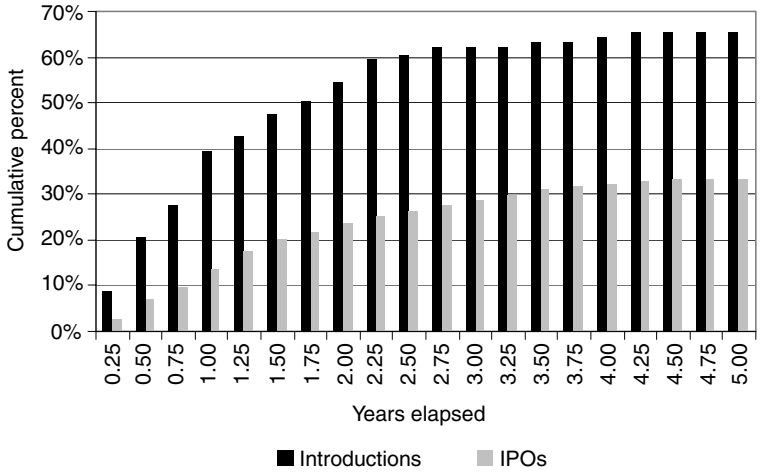

Figure 1. Cumulative percent of introductions that do offerings and of IPOs that do SEOs. The sample comprises 101 introductions, 66 two-stage firms, 674 IPOs, and 225 SEOs on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. We only consider offerings within 5 years after introduction and SEOs within 5 years after IPO. An introduction is a firm that lists without issuing equity. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing.

Second, to test whether two-stage firms' offering announcement day and offering day market reactions are similar to those of SEOs, we perform one event study centered on the offering announcement day and another event study centered on the offering day.[21] For both days minus and plus 1 week, we calculate cumulative average raw returns as well as cumulative average returns in excess of market index returns. We also calculate the *p*-value of each daily return. We compare our offering announcement day results to those of Asquith and Mullins (1986) for SEOs. We compare our offering day results to those of Corwin (2003) roughly averaged across NYSE and NASDAQ SEOs.

Figure 2 shows the results. On both the offering announcement and offering days, there is an economically small but positive and statistically significant market reaction.[22] In stark contrast, for seasoned equity offerings, Asquith and Mullins (1986) document a sizeable offering announcement day plunge, and Corwin (2003) documents a v-shaped offering day reaction.

Third, to test whether trading volume is normal on the offering day, we examine offering day trading volume for two-stage firms. For each day in the window [offering day −22 days, offering day +22 days], we average relative daily volume across all firms.[23]

Figure 3 shows the results. There is a large spike in trading volume on the 2 days starting on the offering day. To assess significance, we regress relative daily volume on a dummy variable that equals one during these 2 days, and zero otherwise. Trading volume during these 2 days, when mean relative daily volume is 0.66%, is significantly different (*p*-value 0.0000) from trading volume during the rest of the window, when mean relative daily volume is 0.17%. Therefore, trading volume of two-stage firms at offering is unusually large, as is the case for IPOs but quite unlike the case for SEOs.

Fourth, we explore the price run-up of two-stage firms before offering. We calculate the return from introduction day to the day before the offering announcement day. These returns are small, with a mean (median) raw return of 3.3% (–3.3%) and a mean (median) excess of market return of –0.4% (–6.8%), and are not statistically significant at conventional levels. The typical price run-up in the SEO literature is significantly larger (about 20% each year in the 2 years before a primary SEO (Asquith and Mullins (1986)).

Our tests in this section suggest that the offerings of two-stage firms are very different from SEOs, but quite similar to IPOs. This supports our assumption that the two-stage strategy is an alternative to an IPO.

[21] For details, see MacKinlay (1997).

[22] The *p*-values for the offering announcement day raw and excess of market returns are 0.1316 and 0.0354, respectively, whereas for the offering day raw and excess of market returns are 0.0887 and 0.1205, respectively.

[23] The results are substantially similar if we use a wider window.

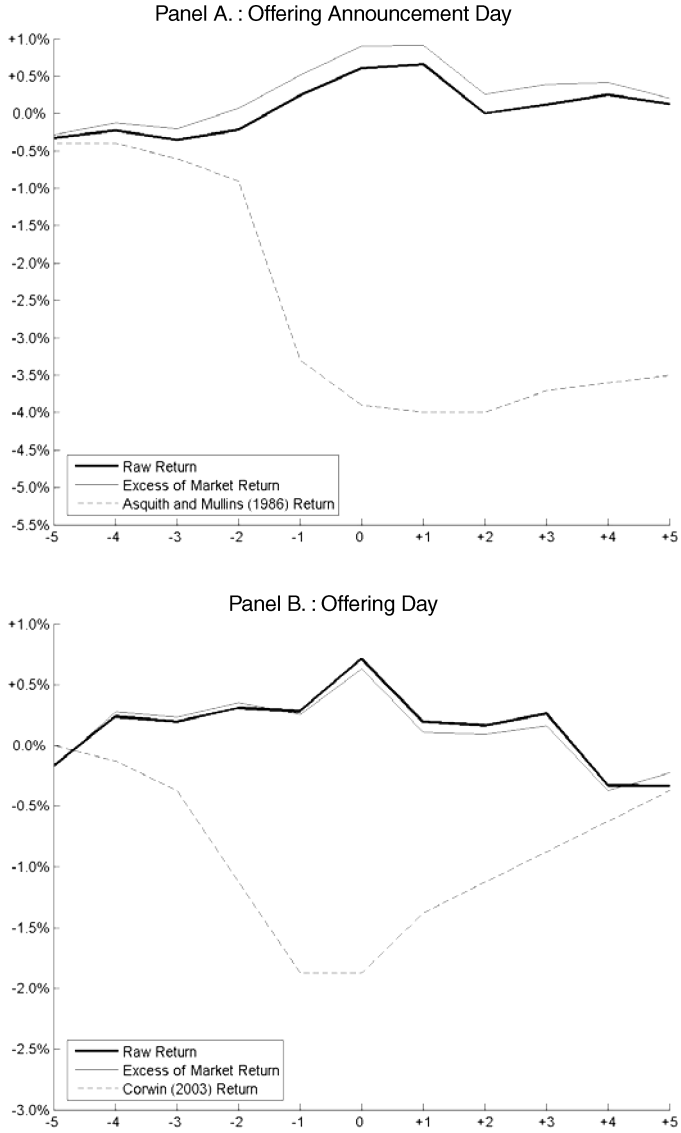

Figure 2. Market reaction for two-stage firms around the offering announcement day and the offering day. The sample comprises 66 two-stage firms on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. Figure 2a shows the results of one event study centered on the offering announcement day. Figure 2b shows the results of another event study centered on the offering day. For both days minus and plus 1 week, we calculate cumulative average raw returns as well as cumulative average returns in excess of market index returns. We compare our offering announcement day results to those of Asquith and Mullins (1986) for primary equity offerings. We compare our offering day results to those of Corwin (2003) roughly averaged across NYSE and NASDAQ SEOs.

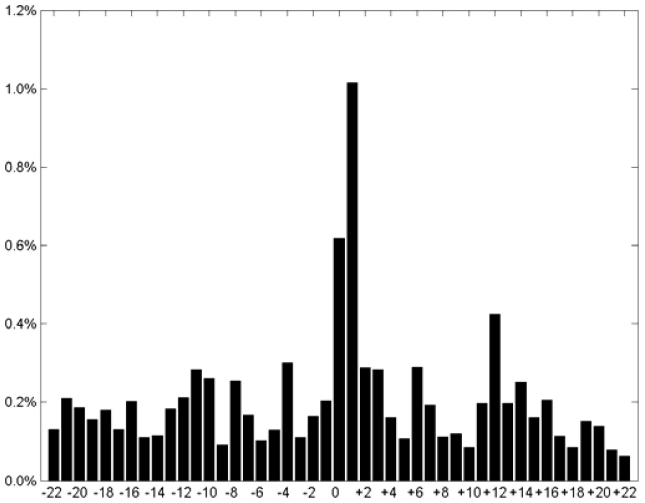

Figure 3. Relative daily volume for two-stage firms around the offering day. The sample comprises 66 two-stage firms on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. For each day in the window [offering day −22 days, offering day +22 days], we average relative daily volume across all firms. We define *relative daily volume* as mean daily trading volume divided by shares outstanding, where shares outstanding is measured as the mean of the shares outstanding on day −22 and day −1 before the offering day, and as the mean of shares outstanding on day 0 and on day +22 on and after the offering day.

VIII. Conclusion

We investigate the two-stage strategy as an alternative to an IPO, and we test both the cost reduction and market timing hypotheses.

First, we find that initial returns for two-stage firms are 10% to 30% lower than for comparable IPOs. We also find that for two-stage firms, underpricing is lower both when valuation uncertainty at the offering is lower and when valuation uncertainty decreases between the introduction and the offering. This supports our hypothesis that the two-stage strategy reduces financing costs.

Second, we find that in cold markets, firms substitute introductions for IPOs. We also find that two-stage firm offerings occur at the beginning of IPO waves. This supports our hypothesis that firms use the two-stage strategy to time the market twice, first when listing and second when issuing equity.

Further consideration of the two-stage strategy would be valuable to academics and practitioners alike. The two-stage strategy broadens the corporate finance opportunity set in two ways. Like auctions, the two-stage strategy allows firms to reduce their cost of equity (e.g., Derrien and Womack (2003) and Kaneko and Pettway (2003)), and it gives firms the flexibility to list and issue equity at separate points in time. More generally, the two-stage strategy

challenges the received wisdom about going public. Hopefully, firms will consider the two-stage strategy a serious contender to a traditional IPO.

Appendix: Valuation Uncertainty Proxy Construction

In this section, we describe our proxy for valuation uncertainty at introduction and at offering announcement. The literature tells us that the quoted spread is determined by a number of factors (see Tinic (1972), Benston and Hagerman (1974), Copeland and Galai (1983), Harris (1994), and Bollen, Smith, and Whaley (2004)). According to the recent overview of the literature given by Bollen et al. (2004), these factors can be grouped into order processing costs (OPC), inventory holding costs (IHC), adverse selection costs (ASC), and market-making competition (COMP). We assume that the residual component of the quoted spread that is not explained by the above factors is a good proxy for valuation uncertainty.

Below, we list the variables on which we regress *relative quoted spread*. For each variable, we also indicate in parentheses the factor for which it proxies according to Bollen et al. (2004).

- *Relative total volume* (OPC)
- *Trading continuity*: The fraction of days over the period used during which there is strictly positive trading volume (IHC)
- *Annualized standard deviation of daily returns* (IHC)
- ln*(Price)* (IHC)
- *Blockholder ownership*: The fraction of shares outstanding held by blockholders (minimum 3% stake) taken from introduction prospectuses, offering prospectuses, and annual reports dated prior to the offering announcement day (IHC)
- *Market capitalization* (ASC)

We calculate relative total volume, trading continuity, and return volatility during the month starting on the introduction day and during the month ending on the day before the offering announcement day. We use price, blockholder ownership, and market capitalization on the introduction day and on the day before the offering announcement day.[24]

Table AI presents the results. All of the coefficients that are statistically significant have the sign predicted by the literature. The explanatory power of our model at introduction and at offering announcement is a substantial 60%. We attribute the regression residuals to valuation uncertainty, and we thus create the variables *uncertainty at introduction* and *uncertainty at offering announcement*. We calculate *uncertainty change* between introduction and offering announcement as the difference between these two variables.

[24] The only market-making competition proxy that is relevant to our sample is the number of market makers. Although we are unable to obtain data on the number of market makers, conversations with practitioners indicate that our sample firms typically have one market maker.

Table AI

Determinants of the Quoted Spread for Two-Stage Firms

This table presents the determinants of the quoted spread at introduction and at offering announcement. The sample comprises 66 two-stage firms on the Alternative Investment Market in the United Kingdom between June 1995 and July 2004. A two-stage firm is a firm that lists without issuing equity and then issues equity within 5 years of listing. *Relative quoted spread* is the bid–ask spread in currency units divided by the mean of the bid and ask prices. *Relative total volume* is total daily trading volume over the period used divided by shares outstanding, where shares outstanding is measured as the mean of the shares outstanding on the first and last days of the period used. *Trading continuity* is the fraction of days over the period used during which there is strictly positive trading volume. ln(*Price*) is the natural logarithm of the closing price measured in pence. *Blockholder ownership* is the fraction of shares outstanding held by blockholders. *Market capitalization* is measured in £ millions. We calculate trading volume, trading continuity, and return volatility during the month starting on the introduction day and during the month ending on the day before the offering announcement day. We use price, blockholder ownership, and market capitalization on the introduction day and on the day before the offering announcement day. We run ordinary least squares regressions. Standard errors are heteroskedasticity-consistent. Below each coefficient estimate is its corresponding *p*-value.

	Dependent Variables	
Independent Variables	Relative Quoted Spread after Introduction	Relative Quoted Spread before Offering Announcement
Relative total volume	−0.1946***	−0.1401***
	0.001	0.010
Trading continuity	−0.0685*	−0.0889***
	0.053	0.001
Annualized standard deviation of daily returns	0.0885***	0.0714**
	0.000	0.021
ln(*Price*)	−0.0383***	−0.0409***
	0.000	0.000
Blockholder ownership	0.0018	−0.0483
	0.956	0.108
Market capitalization	0.000003	−0.000017
	0.973	0.895
Constant	0.2690***	0.3232***
	0.000	0.000
Observations	64	64
R^2	0.6381	0.6091

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

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