Analyst Hype in IPOs: Explaining the Popularity of Bookbuilding

François Degeorge
Swiss Finance Institute, University of Lugano

François Derrien
University of Toronto

Kent L. Womack
Tuck School of Business

The bookbuilding IPO procedure has captured significant market share from auction alternatives recently, despite the significantly lower costs related to the auction mechanism. In France, where both mechanisms were used in the 1990s, the ostensible advantages of bookbuilding were advertising-related benefits. Book-built issues were more likely to be followed and positively recommended by lead underwriters. Even nonunderwriters' analysts promote book-built issues more in order to curry favor with the IPO underwriter for allocations of future deals. Yet we do not observe valuation or post-IPO return differentials that suggest these types of promotion have any value to the issuing firm. (*JEL* G24, G32)

To observe the underwriting scandals that have come to light in the United States since the market crash of 2000, one might think that the bookbuilding mechanism used to price initial public offerings (IPOs) would have come under attack. The reality, however, both in the United States and globally, is surprisingly the opposite. In France, for example, where the market was roughly equally split in the 1990s between auctioned and book-built IPOs, auctions are now virtually extinct. In Japan, when bookbuilding was made available to issuers, IPO auctions quickly disappeared [Kaneko and Pettway (2003), Kutsuna

This paper was previously titled "Quid Pro Quo in IPOs: Why Book-building is Dominating Auctions." We thank Larry Ausubel, Dan Bradley, Clay Corbus, Edith Ginglinger, David Goldreich, Jacques Hamon, Bruno Husson, Bertrand Jacquillat, Aditya Kaul, Julien Le Maux, Alexander Ljungqvist, Eric Nowak, Jay Ritter, Jörg Rocholl, Ioanid Rosu, Ann Sherman, Andrei Shleifer, Jeremy Stein, Luigi Zingales, seminar participants at Université Paris Dauphine, the University of Alberta, the University of Calgary, and the University of Lausanne, and conference participants at the third EVI Conference at the Tuck School, the third EuroConference on Auctions and Market Design, the NCCR Finrisk Research Day, the third RICAFE Conference, the French Finance Association, and the American Finance Association for helpful comments. Part of this research has been carried out within the project on Corporate Finance of the National Centre of Competence in Research "Financial Valuation and Risk Management" (NCCR FINRISK). The NCCR FINRISK is a research program supported by the Swiss National Science Foundation. Degeorge and Derrien also acknowledge support from the RICAFE program (HPSE-CT-2002-00140). Jens Martin and Sébastien Michenaud provided able research assistance. Address correspondence to Kent L. Womack, Tuck School of Business, Dartmouth College, 100 Tuck Hall, Hanover, NH 03755, or e-mail: Kent.L.Womack@dartmouth.edu.

doi:10.1093/rfs/hhm010 Advance Access publication January 29, 2007

and Smith (2004)]. Ljungqvist et al. (2003) and Sherman (2004) report that in virtually all countries where bookbuilding has been introduced recently, preexisting mechanisms, including auctions, have disappeared or lost significant market shares. In the United States, competitors of bookbuilding underwriters such as W.R. Hambrecht that have attempted to create Dutch auctions to sell shares have not, as yet, been successful in gaining meaningful market share.

Yet there are convincing theoretical arguments for the use of auctions in IPOs and strong empirical support for the hypothesis that auctions are less costly in terms of not just direct fees but also minimizing initial underpricing, which often represents a significant cost to the issuing company. Biais et al. (2002) and Biais and Faugeron-Crouzet (2002) show that well-designed auction mechanisms enable underwriters to extract investors' information and incorporate this information into the IPO price at a limited cost, a virtue previously attributed to bookbuilding by Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), and Sherman (2000). Derrien and Womack (2003) and Kaneko and Pettway (2003) confirm empirically that auctioned IPOs exhibit lower underpricing than does bookbuilding, especially during "hot" IPO markets.

Therefore, our central question is as follows: Why do we observe the ostensible failure of auctions despite strong economic incentives in their favor? Our hypothesis, which we call the "analyst hype" hypothesis, is that corporate issuers and investment banks are in a *quid pro quo* relationship that extends beyond the obvious direct costs. That is, issuers are willing to pay the higher direct and indirect costs of bookbuilding in exchange for increased and more favorable research coverage because analyst coverage is important to them. In a survey of issuers that switch underwriters between their IPO and their seasoned equity offerings (SEO), Krigman et al. (2001) find that the most important reason for switching was to enhance analyst coverage. Cliff and Denis (2003) also provide evidence consistent with the hypothesis that issuers use IPO underpricing to "purchase" analyst coverage.

To test our hypothesis, we examine the behavior of security analysts following IPOs by bookbuilding versus IPOs by auction. Although this comparison is impossible in the United States, where bookbuilding is virtually the only procedure available, France offers an interesting investigation field in which the two mechanisms coexisted for some time.[1]

We find convincing empirical evidence that, in addition to placing the IPO shares with investors, underwriters that employ bookbuilding implicitly commit to providing more favorable coverage to the companies

[1] To our knowledge, as of September 2005, the universe of auctioned IPOs in the United States is limited to 14 performed by W.R. Hambrecht since 1999 and Google. During the same period, hundreds of book-built IPOs have been completed.

they take public in the aftermarket. Specifically, we find that analysts affiliated with the lead underwriter of the offering issue more (as well as more favorable) recommendations for recent book-built IPOs than they do for auctioned offerings. We also find that these analysts provide "booster shots"—that is, positive recommendations following poor stock market performance—to recent book-built IPOs. We do not observe this behavior in auctioned offerings.

Recent anecdotal evidence suggests that analyst coverage is important to not only issuers but also underwriters. In 2004, seven financial institutions that failed to disclose payments received from an underwriter for providing "unaffiliated" research on recent IPO and SEO companies paid a $3.65 million settlement to U.S. regulators.[2] Short of outright paying for coverage by other banks, bookbuilding underwriters can use the power afforded them by the total discretion they enjoy in allocating shares.[3] We hypothesize that lead underwriters use this power to "lean on" even unaffiliated analysts to provide positive coverage and find empirical confirmation of this hypothesis. Specifically, unaffiliated analysts issue positive recommendations on IPOs taken public by an underwriter if the underwriter is about to take another company public soon (using bookbuilding). We do not observe this behavior for auctioned IPO underwriters.

Together with the "analyst lust" hypothesis proposed by Loughran and Ritter (2004), our results may explain the demise of IPO auctions in France in the 1990s. Loughran and Ritter (2004) argue that a shift occurred in the 1990s, especially during the latter part of the decade, whereby issuing firms placed increasing weight on analyst coverage. These authors claim that this shift can explain in part the surge in IPO underpricing during that period. Our results suggest a similar shift occurred outside the United States and that it contributed to the demise of IPO auctions in France. Faced with a choice between auctions (low cost, low coverage) and bookbuilding (high cost, high coverage), firms increasingly chose the latter as the perceived importance of analyst coverage grew.[4]

---

[2] "7 firms to pay $3.65 million in S.E.C. fines.", *The New York Times*, August 26, 2004.

[3] This feature of bookbuilding recently made financial headlines in the context of several IPO scandals. Unlawful underwriters' practices include "spinning," or giving underpriced IPO shares to executives of prospective investment banking clients in the hope of winning future business from their companies, and "laddering," or the practice of giving generous IPO allocations to clients in return for the promise that they will buy more shares of the IPO company on the aftermarket. In April 2003, 10 investment banks agreed to pay $1.4 billion in a global settlement pertaining to an analyst conflict of interest probe by the Securities and Exchange Commission (SEC), the New York State Attorney General, and the National Association of Securities Dealers (NASD). Other recent examples can be found on Jay Ritter's Web site (http://bear.cba.ufl.edu/ritter/ipolink.htm).

[4] One of the forces underlying Loughran and Ritter's (2004) "analyst lust" hypothesis is the increase in company valuations in the late 1990s. When companies' growth opportunities fetch higher prices, a small change in expected growth rates results in a larger change in selling price, leading companies to place greater weight on analyst coverage.

We conduct several robustness checks of our results to verify that they are not driven by firm or underwriter characteristics. We also test alternative explanations of our findings, including the possibility that underwriters may select the best issuers to perform bookbuilding. We find that book-built offerings do not exhibit better long-term performance than auctions and that they are priced at lower multiples at the time of the IPO. We also explore another possibility: In book-built offerings, underwriters may control the information produced about the issuer and coordinate the participation of investors; thus, they reduce the risk of the offering, whereas investor interest and information production may vary in a more unpredictable way in auctions. We find that auctions do not exhibit more variable aftermarket performance than book-built offerings.

In addition to explaining the preference for bookbuilding, our evidence sheds light on the issue of the conflicts of interests faced by underwriter-linked analysts in IPOs. Michaely and Womack (1999) provide evidence consistent with such a conflict of interest. From a sample of U.S. IPOs, they find that underwriter analyst recommendations are more bullish than are recommendations from unaffiliated analysts. Their evidence also is consistent with Kahneman and Lovallo's (1993) ''inside view,'' according to which affiliated analysts view the IPO that their bank took public in a narrow frame. Similar to parents who view their children as special, they are unable to accept the statistical reality that many of their IPOs will turn out to be average or below average, and therefore, they are more likely to issue bullish recommendations than unaffiliated analysts, who are more willing to take the cold-hearted ''outside view.'' If underwriter analyst bullishness were due only to the inside view explanation, however, we would expect no difference in coverage or bullishness between auctioned and book-built IPOs. Hence, our evidence provides additional support for the conflict of interest explanation of underwriter analyst bullishness.

The rest of the article is organized as follows: In Section 1, we present our hypotheses, then in Section 2, we briefly describe the institutional features of the French IPO market. Next, we describe the data used in the study. We present our empirical results in Section 4, robustness checks and tests of alternative explanations in Section 5, and our conclusions in Section 6.

1. Hypotheses

Globally, bookbuilding has become the most popular procedure by far for taking companies public. In many countries, it is essentially the only method used. An alternative mechanism for selling a portion of the company to public investors is to conduct an auction. Although auctions come in many flavors, it is generally accepted that they have attractive properties in terms of eliciting information from market participants and

maximizing proceeds for the issuer. Moreover, Derrien and Womack (2003) and Kaneko and Pettway (2003) report empirical evidence on the French and Japanese IPO markets, in which both auctions and bookbuilding have been used to take companies public. They find that auctioned IPOs have lower initial returns than book-built IPOs at the offering, especially in "hot" IPO markets. The puzzle, of course, is as follows: If auctions enable IPO issuers to raise more proceeds at lower cost, why do issuers prefer bookbuilding?

Our central hypothesis, which we call the "analyst hype" hypothesis, is that the bookbuilding procedure entails a tacit agreement between issuers and banks. Issuers are willing to pay the higher direct and indirect costs of bookbuilding in exchange for increased and more favorable analyst coverage. Thus, we hypothesize that in addition to placing the IPO shares, bookbuilding underwriters implicitly commit to providing favorable coverage to IPOs in the aftermarket.

Coverage comes in several forms, of which research reports and analyst recommendations are the most prominent. Obtaining favorable coverage for their stock ranks among the top concerns of the managers of IPO firms. For example, Krigman, Shaw, and Womack (2001) document that the desire to increase reputable analyst coverage is a main reason for issuers to switch underwriters when they return to the equity market for an equity offering. Dunbar (2000) finds that IPO underwriters increase their market share if they have analysts in the *Institutional Investor's All-American Research Team*. Rajan and Servaes (1997) find that the intensity of analyst coverage is positively correlated with the degree of initial return. Cliff and Denis (2003) confirm this result and find that post-IPO analyst coverage is negatively correlated with the probability of switching underwriters between the IPO and the SEO. They conclude that issuers "purchase" analyst coverage with underpricing. Aggarwal, Krigman, and Womack (2002) offer a further explanation of this interest in analyst coverage by developing a model in which issuers use underpricing to generate analyst coverage and maximize the stock price at the end of the lock-up period, the first time that they can sell their retained shares.

Providing coverage, especially favorable coverage, for an IPO stock is not without costs for an underwriter. In addition to the cost of devoting human resources, there may be a reputational cost to be borne if investors perceive that analyst recommendations are slanted. Yet recent newspaper headlines have shown that investment bankers are sometimes willing to bear such costs.

We hypothesize that analysts affiliated with the IPO underwriter are more actively involved in supporting book-built IPOs than auctioned IPOs in the year following the offering. Our hypothesis yields several testable predictions. Relative to auctioned IPOs, affiliated analysts in book-built IPOs should provide (i) more analyst reports, (ii) more recommendations,

(iii) more favorable recommendations, and (iv) more recommendations when the stock price does poorly [i.e., booster shots; see Michaely and Womack (1999), James and Karceski (2004)].

In addition to the lead underwriter's direct contribution to the coverage through research reports and recommendations, the underwriters of book-built IPOs may influence the coverage of the IPO stocks by unaffiliated analysts. A relevant and important feature of the bookbuilding mechanism is the complete discretion of the underwriter over the allocation of shares in case of excess demand. This discretion gives the underwriter a substantial amount of power vis-à-vis investors and other brokerage firms. Typically, French banks participate in offerings even when they are not members of IPO syndicates by placing orders for their clients. Whether these orders are filled is left to the underwriter's discretion. We hypothesize that underwriters may use this discretion to induce banks that are not syndicate members to provide positive coverage to their recent IPOs.

Consider two investment banks, A and B. Bank A recently has taken Company X public and is going to take Company Y public next month. Bank B was not a comanager for the IPO of X, nor does it expect to be one for the IPO of Y. Yet Bank B, which has placed orders in the IPO of Y in its clients' name, hopes to obtain generous share allocations of IPO Y next month. One way to curry favor with Bank A is to issue favorable recommendations on Company X. Thus, we expect the coverage of a book-built IPO by analysts unaffiliated with the underwriter to be especially favorable when that same underwriter is about to take another company public using the bookbuilding mechanism.

2. Institutional Features of the French IPO Market

The French IPO market offers an ideal testing ground for the hypotheses developed in the previous section. Historically, two IPO mechanisms have been used there: Offre à Prix Minimal, an auction mechanism, and Offre à Prix Ferme, a fixed-price mechanism. In 1993, the bookbuilding procedure was made available to issuers by stock market authorities. For a few years, these three mechanisms coexisted. In this article, we consider auctioned and book-built IPOs between 1993 and 1998, a period during which the two mechanisms were used with roughly equal frequency.

The bookbuilding mechanism used in France is similar to its North American counterpart.[5] A few weeks before the offering, the issuer and lead underwriter (or book manager) agree on an initial price range. Then the "road show" starts, during which the underwriter and issuer advertise the offering to investors. The underwriter collects indications of interest

[5] For a more detailed description of the two listing mechanisms and institutional details of the French IPO market, see Derrien and Womack (2003).

from investors, which specify a quantity of shares, may or may not specify a price limit, and can be cancelled or modified before the offering. Just before the offering, the lead underwriter closes the order book, sets the IPO price, and allocates the shares with complete discretion.

In auctioned IPOs, price setting and share allocation are market-driven. Therefore, the role of the underwriter is more limited than in book-built IPOs, as is the marketing effort of the underwriter——targeted marketing effort through road shows is unnecessary and may even be detrimental to the underwriter if the underwriter does not control the allocation of IPO shares. When the auction mechanism is used, a minimum price is announced a few weeks before the offering. Then, investors submit limit orders. Unlike indications of interest submitted for book-built offerings, these orders cannot be withdrawn before the offering. The orders are collected by the Paris Bourse. A few days before the IPO date, the Paris Bourse sets a maximum price, above which orders are eliminated,[6] and proposes several IPO prices to the issuer. There is no written rule as to how these prices are chosen, but discussions with issuers and Paris Bourse employees suggest that they are set slightly below the market-clearing price. Regardless, the issuer and underwriter choose the IPO price from the set of prices proposed by the Paris Bourse. All orders with prices above the IPO price and below the maximum price are served at the IPO price, and rationing occurs on a *pro rata* basis.

Thus, the role of the underwriter is much more modest in auctioned IPOs than in book-built IPOs. Moreover, as is the case in most U.S. IPOs, book-built offerings are associated with a firm commitment by the underwriter. In contrast, auctions are associated with "best effort" contracts; that is, the underwriter is not committed to buying the shares that are left unsold to the public if the demand is insufficient to complete the offer at the minimum price.[7]

In our time period, French IPOs took place on three exchanges. The Premier Marché is the exchange on which the largest companies are traded. Except for those of several large firms, few IPOs take place on this exchange, and issuers generally choose to list on the Second Marché or the Nouveau Marché. Owing to different listing requirements, the Second Marché attracts well-established mature companies, whereas the Nouveau Marché is designed for growth companies. This exchange was created in 1996, following NASDAQ's model.

---

[6] The goal of this maximum price is to prevent investors from free-riding on the mechanism by placing orders at very high prices to get IPO shares that are underpriced on average.

[7] The role of an IPO underwriter is not limited to pricing and placing shares [see for instance Ellis, Michaely, and O'Hara (2000) on the underwriter's market making function in the United States]. As far as other functions of the underwriter are concerned, however, we are not aware of any difference between the bookbuilding and auction mechanisms.

The French sell-side security analyst market is similar to its U.S. counterpart. However, unlike the U.S. IPO market, there is no "quiet period" in France for IPO stocks. Therefore, there is no clustering of the initiation of analyst coverage a few weeks after the offering, as is the case in the United States.[8] Analyst coverage can start as early as the IPO date or even before the company's shares are traded.

3. Data

Our IPO sample consists of book-built and auctioned IPOs completed on the French stock exchange. Because our goal is to compare auctions and bookbuilding, we focus on a period in which these two mechanisms were both in use. Thus, we restrict our IPO sample to the period between January 1993 and August 1998, in which 204 IPOs used one of the two mechanisms. One hundred fourteen of them occurred through bookbuilding and 90 were auctioned.[9] Given the difference in size between Premier Marché IPOs and those completed on the two other exchanges, as well as the fact that there were only 17 IPOs on the Premier Marché during our time period, we limit our sample to those completed only on the Second Marché and Nouveau Marché.[10]

Our data about the characteristics of the IPO firms and the details of the offering come directly from IPO prospectuses. This information consists of the IPO mechanism used, the number of shares offered, the names of the lead underwriters and comanagers, and the fees paid to these underwriters. For 12 auctioned IPOs, we were not able to identify the lead underwriters. In subsequent tests, when we examine hypotheses related to the behavior of analysts affiliated with the lead underwriter, we eliminate those 12 offerings from our sample.

The IPO prices were obtained from Euronext, as were prices in the year following the IPO. The data on trading volume and bid–ask spreads in the year following the offering come from Datastream.

For each IPO in our sample, we collected analyst recommendations from the I/B/E/S analyst-by-analyst, "detail" recommendation database. We track analyst recommendations issued in the year following the IPO. For each recommendation, the date of the recommendation is available, as is the type of the recommendation—classified by I/B/E/S as 1: strong buy, 2: buy, 3: hold, 4: underperform, and 5: sell—and the name of the broker who

[8] See Bradley, Jordan, and Ritter (2003) on the initiation of analyst coverage at the end of the quiet period for U.S. IPOs.

[9] Between September 1998 and December 2003, 170 companies listed on the Paris stock exchange. Only 12 used the auction mechanism.

[10] We also ignore companies transferred from the Marché Libre, a transitory exchange comparable to the over-the-counter (OTC) market in the United States. Informational issues may be less important for these companies, which were publicly traded before their IPO, than for "regular" offerings.

issued the recommendation. Overall, we identified 845 recommendations for the 204 IPOs in our sample, or about four recommendations per offering.[11]

We also collected information on the total number of reports written by analysts in the year following the offering from the Investext research database of Thomson Research.[12] For each IPO company, we know the number of analyst reports, as well as the names of the brokerage houses that issued them. Finally, we hand-collected information on seasoned equity issues by our IPO companies in the 5-year period following their initial offering from Euronext. This information contains the date and amount of each SEO.

4. Empirical Results

4.1 Summary statistics

Table 1 presents descriptive statistics about our IPO sample.

In Table 1, Panel A, we present the number of IPOs per year, exchange, and industry. We first note that the proportion of book-built IPOs has increased over the period. Whereas between 1993 and 1997, the number of offerings using the two mechanisms was quite balanced, there were twice as many bookbuildings as auctions between January and August 1998 (52 vs. 26). As for exchanges, the use of the two mechanisms is well balanced on the Second Marché. In contrast, all Nouveau Marché IPOs have used the bookbuilding mechanism, even though choice is permitted by the exchange authorities. The important role of the underwriter, as well as the firm commitment contract associated with bookbuilding, may be used as a certification mechanism by Nouveau Marché offerings, which are young, growth companies and for which the listing requirements are not as strict as for Second Marché IPOs. Industries are quite balanced between the two mechanisms.

Table 1, Panel B, presents the list of lead underwriters for our sample of IPOs. Three of the lead underwriters, responsible for nine offerings (six auctions and three bookbuildings), are not matched in the I/B/E/S recommendation database.[13] In other cases, the underwriter is not included in I/B/E/S but one of the subsidiaries or its mother company is. In such cases, we consider the bank and its subsidiary as a single entity. Panel B shows that large underwriters are as likely to perform auctions as bookbuilding. In fact, the most active underwriter in terms of number of

[11] As a comparison, Bradley, Jordan, and Ritter (2004) report 11 recommendations per IPO on average for U.S. IPOs in 1999–2000.

[12] We are aware of the limitations of Investext, which is known to be incomplete (e.g., it does not contain Goldman Sachs's reports), but it is the only source of analyst reports of which we are aware.

[13] In subsequent tests, when we examine hypotheses related to the behavior of analysts affiliated with the lead underwriter, we eliminate these nine IPOs.

Table 1
Descriptive statistics

Panel A: Number of observations per IPO year, exchange, and industry

		Bookbuilding	Auction	Total
IPO year	1993	1	1	2
	1994	11	11	22
	1995	1	8	9
	1996	19	23	42
	1997	30	21	51
	1998	52	26	78
Exchange	Second Marché	53	90	143
	Nouveau Marché	61	0	61
Industry	Mechanical engineering	4	3	7
	Intermediate goods	3	5	8
	Other capital goods	3	3	6
	Automotive	2	7	9
	Household/professional goods	8	8	16
	Pharmaceuticals/cosmetics	7	7	14
	Opticals	1	1	2
	Textile	5	2	7
	Beverages	5	2	7
	Other agrifood	6	2	8
	Electricity/electronics/telecommunication	11	6	17
	Information technology	19	10	29
	Communication/advertising/broadcasting	6	7	13
	Consumer retailing	11	9	20
	Sport/entertainment	4	2	6
	Transport/storage	3	2	5
	Environment/collective services	8	5	13
	Sales to business	1	4	5
	Hotels/catering/tourism	4	4	8
	Insurance	3	1	4

IPOs, Banques Populaires, did 33 auctions and only four bookbuildings during our time period. Table 1, Panel B, also shows that all IPOs in which the lead underwriter was not a French bank used bookbuilding. This is consistent with Ljungqvist, Jenkinson and Wilhelm's (2003) finding that large international banks almost always use bookbuilding in countries where other IPO mechanisms are available.[14]

In Table 1, Panel C, we present summary statistics of the IPO sample. Book-built IPO companies are, on average, larger than auctions, and they sell a larger fraction of their post-IPO shares to the public. Their size also exhibits more variance (with an interquartile range of FF 431 million compared with FF 161 million for auctions). On the Second Marché, large issuers tend to choose bookbuilding. On the Nouveau Marché, where issuers are typically small, all IPOs have used bookbuilding. Book-built offerings also are slightly younger on average. They use more underwriters (lead and comanagers) and pay larger IPO fees (mean 7.03% vs. 4.67% for auctioned IPOs; median 7% vs. 2.5%). Book-built issuers tend to do more SEOs in the 5-year period following their IPO (0.51 per firm on

[14] Except for Genset, which listed simultaneously in France and on Nasdaq, all the firms in our sample listed in France only.

Table 1
(Continued)

Panel B: Lead underwriters

Underwriter's name	Book building	Auction	Remarks
ABN Amro	2	0	
Aurel	3	0	
BA Robertson Stephens International	1	0	
Banque Française de Service et de Crédit	0	2	
BNP	7	7	
Banques Populaires	4	33	
Banque CPR	5	0	
Banque Colbert	1	0	
Banque Scalbert-Dupont	1	0	
Banque Worms	2	2	Recs not recorded in I/B/E/S
Banque d'Orsay	0	4	Recs not recorded in I/B/E/S
Banque de Neuflize, Schlumberger, Mallet	1	0	
Banque de Vizille	2	0	
Crédit Agricole	10	10	
Caisse des Dépôts et Consignations	3	0	
Crédit Industriel et Commercial	5	7	
Crédit Lyonnais	15	3	
Crédit National	6	5	
Crédit Mutuel	0	2	
Cyril Finance	1	0	Recs not recorded in I/B/E/S
Ferri	4	0	
HSBC	1	0	
Hambrecht & Quist	3	0	
Lazard	2	0	
Lehman Brothers	1	0	
Lyonnaise de banque	0	1	
Merrill Lynch	1	0	
Natexis	1	0	
Natwest	1	0	
Nomura	1	0	
Oddo	2	0	
Paribas	8	1	
Pinatton	9	0	
Société Générale	9	1	
SPEF Technology	2	0	

Panel C: IPO characteristics

		Bookbuilding	Auction
Market capitalization (in MFRF)	Mean	567	287
	Median	263	187
	IQR	431	161
	Min	55	62
	Max	6138	1356
	N	114	90
Shares in the public	Mean	28.74%	14.36%
	Median	27.78%	13.15%
	IQR	14.55%	7.39%
	Min	9.00%	9.79%
	Max	75.40%	28.00%
	N	114	90
Age	Mean	17.65	18.24
	Median	10.00	15.00
	IQR	14.00	16.00
	Min	1.00	1.00
	Max	124.00	61.00
	N	98	86
Book-to-market	Mean	0.23	0.24
	Median	0.15	0.21
	IQR	0.21	0.19
	Min	−0.01	0.02
	Max	1.12	0.93
	N	111	90

Table 1
(Continued)

	Mean	2.08	1.79
	Median	2.00	2.00
Number of underwriters	IQR	1.00	1.00
	Min	1.00	1.00
	Max	9.00	4.00
	N	114	90
	Mean	7.03%	4.67%
	Median	7.00%	2.50%
Underwriting fees	IQR	5.00%	5.13%
	Min	1.29%	0.66%
	Max	17.14%	12.90%
	N	85	27
	Mean	0.51	0.28
	Median	0.00	0.00
Number of SEOs	IQR	1.00	0.00
	Min	0.00	0.00
	Max	4.00	3.00
	N	114	90
	Mean	18.89%	10.68%
	Median	13.23%	8.62%
Initial return (1 day)	IQR	26.82%	15.78%
	Min	−24.86%	−16.47%
	Max	119.64%	48.00%
	N	114	90
	Mean	20.57%	15.93%
	Median	8.94%	7.69%
Initial return (10 days)	IQR	32.26%	26.46%
	Min	−24.97%	−38.21%
	Max	155.00%	128.57%
	N	114	90

The sample consists of 204 offerings (114 bookbuildings and 90 auctions) completed between January 1993 and August 1998 on the Second Marché and Nouveau Marché of the Paris stock exchange.
Panel A presents the number of IPOs per year, exchange, and industry for the two mechanisms.
Panel B presents the lead underwriters' names and, for each, the number of auctions and bookbuildings in which he or she was the lead underwriter. *Recs not recorded in I/B/E/S* in the column to the right of the table indicates that the recommendations made by the underwriter's brokerage house are not recorded in the I/B/E/S database.
Panel C presents summary statistics of the sample IPOs per listing mechanism. *Market capitalization* is the total number of shares post-issue times the IPO price, in millions of French francs. *Shares in the public* is the fraction of the company's shares owned by the public after the IPO, equal to the total number of shares sold in the offering divided by the total number of shares outstanding after the IPO. *Age* is the age of the company as at IPO date. *Book-to-market* is the ratio of book-to-market value of equity, using the offer price at the end of the tenth trading day to calculate market value. *Number of underwriters* is the total number of deal managers involved in the IPO. *Underwriting fees* is the ratio of fees paid to the underwriters to gross proceeds. *Number of SEOs* is the number of equity offerings in the 5 years following the IPO. *Initial return* (*1 day*) [*Initial return* (*10 days*)] is the percent difference between the IPO price and the closing price at the end of the first (tenth) trading day. *IQR* is the interquartile range.

average compared with 0.28 for auctions). They are also more underpriced, consistent with the findings of Derrien and Womack (2003) and Kaneko and Pettway (2003).

4.2 The IPO procedure chosen and levels of analyst coverage

Table 2 presents statistics about the number of analyst reports and analyst recommendations issued in the year following the IPO for both mechanisms. The number of analyst reports is obtained from the Investext research database of Thomson Research, whereas individual recommendations come from the I/B/E/S analyst-by-analyst database. Both sources give the name of the broker that issued the report or recommendation, which enables us to determine the affiliation of the analyst.[15] Analysts are coded as *lead-affiliated, non-lead-affiliated*, or *unaffiliated*. We consider that an analyst is lead affiliated if he or she works for the lead underwriter of the offering, one of its subsidiaries, or its mother company. An analyst is non-lead affiliated if he or she works for a comanager of the IPO (excluding the lead underwriter), one of its subsidiaries, or its mother company. All the analysts that are not affiliated or co-affiliated are considered unaffiliated.

The first column of Table 2, Panel A, presents the number of analysts that issued at least one recommendation in the year following the offering. Lead-affiliated analysts do so much more frequently for bookbuildings than for auctions; only 26% of auctions received at least one recommendation from their lead underwriter as opposed to 62% of book-built IPOs. Unaffiliated analysts also issue more recommendations for book-built offerings; 71% of book-built IPO firms received unaffiliated recommendations in contrast with 53% of auctions, and 18% of bookbuildings received recommendations from more than four unaffiliated analysts versus only 9% of auctions.[16]

The second column of Table 2, Panel A, breaks down our sample by the number of analyst research reports covering the IPO. We do not observe an analyst report for more than half of the IPO firms in the year following their IPO. However, book-built offerings attract the attention of more analysts than do auctions: Almost none of the auction IPOs had reports written by lead-affiliated analysts, whereas more than 20% of book-built IPOs did. The same pattern holds for non-lead-affiliated and unaffiliated analysts.

[15] Throughout, we focus on the name of the brokers that issued reports or recommendations, not the names of individual analysts, and we use the terms "broker" and "analyst" interchangeably.

[16] I/B/E/S coverage is known to have improved over the years, which might affect the data on analyst coverage for the early IPOs in our sample. In fact, IPOs in the first half of our period (1993–1995) are approximately as covered as those in the second half (1996–1998). Moreover, our subsequent results are qualitatively similar if we consider only IPOs completed between 1996 and 1998.

Table 2
Number of analyst reports and recommendations by analyst affiliation

Panel A: Number of analysts, analyst reports and recommendations by IPO mechanism and type of analyst affiliation

	Number of IPOs recommended by *n* analysts within 1 year of the IPO			Number of IPOs receiving *n* reports within 1 year of the IPO			Number of IPOs receiving *n* recommendations within 1 year of the IPO		
Analyst affiliation	*n*	Bookbuilding (%)	Auction (%)	*n*	Bookbuilding (%)	Auction (%)	*n*	Bookbuilding (%)	Auction (%)
	0	42 (37.9)	53 (73.6)	0	91 (79.8)	75 (96.1)	0	42 (37.5)	53 (73.6)
	1	69 (62.2)	19 (26.4)	1	8 (7.0)	1 (1.3)	1	46 (41.1)	10 (13.9)
Lead-affiliated				2	6 (5.3)	2 (2.5)	2	13 (11.6)	7 (9.7)
				3	5 (4.4)	0	3	5 (4.5)	0
				4	1 (0.9)	0	4	3 (2.7)	1 (1.4)
				>4	3 (2.6)	0	>4	2 (1.8)	1 (1.4)
	0	72 (63.2)	49 (54.4)	0	106 (93.0)	89 (98.9)	0	72 (63.2)	49 (54.4)
	1	31 (27.2)	33 (36.7)	1	2 (1.7)	0	1	23 (20.2)	25 (27.8)
Non-lead-affiliated	2	8 (7.0)	6 (6.7)	2	5 (4.4)	0	2	10 (8.8)	12 (13.3)
	3	2 (1.8)	0	3	1 (0.9)	1 (1.1)	3	5 (4.4)	1 (1.1)
	4	1 (0.9)	2 (2.2)				4	2 (1.7)	0
							>4	2 (1.7)	3 (3.3)
	0	33 (29.0)	42 (46.7)	0	58 (50.9)	60 (66.7)	0	33 (29.0)	42 (46.7)
	1	29 (25.4)	21 (23.3)	1	15 (13.2)	8 (8.9)	1	25 (21.9)	19 (2.1)
Unaffiliated	2	9 (7.9)	10 (11.1)	2	15 (13.2)	11 (12.2)	2	8 (7.0)	9 (10.0)
	3	11 (9.6)	5 (5.6)	3	9 (7.9)	6 (6.7)	3	13 (11.4)	5 (5.5)
	4	11 (9.6)	4 (4.4)	4	6 (5.3)	1 (1.1)	4	9 (7.9)	2 (2.2)
	>4	21 (18.4)	8 (8.9)	>4	11 (9.6)	4 (4.4)	>4	26 (22.8)	13 (14.4)

Table 2

Panel B: Determinants of number of analysts, analyst reports and recommendations by type of analyst affiliation

	Dependent variable								
	Lead-affiliated analysts			Non–lead-affiliated analysts			Unaffiliated analysts		
Explanatory variables	# of analysts	# of reports	# of recommendations	# of analysts	# of reports	# of recommendations	# of analysts	# of reports	# of recommendations
Exchange	0.500	1.673**	0.108	0.390	3.844	0.544	0.189	0.375	0.149
	(1.46)	(2.51)	(0.34)	(1.19)	(1.63)	(1.58)	(0.92)	(1.31)	(0.62)
Log(market capitalization)	0.135	0.208	−0.064	0.530***	−0.156	0.531***	0.744***	0.921***	0.812***
	(0.89)	(0.66)	(−0.43)	(5.04)	(−0.27)	(4.79)	(10.83)	(7.14)	(11.64)
Initial return	0.668	0.730	0.279	0.419	−3.686**	0.267	1.060***	0.069	1.117***
	(1.56)	(1.04)	(0.79)	(1.58)	(−2.23)	(0.88)	(4.94)	(0.23)	(4.67)
Number of underwriters	0.113	0.180	0.160	0.379***	3.210***	0.432***	0.049	0.060	0.066
Bookbuilding	(1.01)	(0.73)	(1.28)	(6.08)	(5.81)	(5.70)	(1.12)	(0.62)	(1.62)
	1.192***	2.964***	0.725**	−0.223	5.524***	−0.134	0.368**	0.049	0.307**
	(3.87)	(3.41)	(2.18)	(−0.83)	(2.69)	(−0.46)	(2.46)	(0.19)	(2.06)
Constant	−4.085	−25.856	−14.974	−7.495	−55.371	−7.825	−10.298	−26.888	−10.932
Pseudo-R^2	0.232	0.376	0.123	0.250	0.693	0.315	0.442	0.355	0.504

Panel A presents the number of analysts who issued recommendations, the number of reports, and the number of recommendations issued within 1 year of the IPO. The first, second, and third row present results for lead-affiliated analysts, non–lead-affiliated analysts, and unaffiliated analysts, respectively. An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non–lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated*. The first column presents the count of IPOs depending on the number of analysts issuing recommendations in the year following the offering. The second column presents the count of IPOs depending on the number of analyst reports issued in the year following the offering. The third column presents the count of IPOs depending on the number of recommendations issued in the year following the offering. The numbers in parentheses are the percentages of IPOs in each category.
Panel B presents Poisson regressions (except for the first column, which is a Probit egression). The dependent variables are the number of analysts (lead-affiliated in column 1, non–lead-affiliated in column 4, unaffiliated in column 7), number of analyst reports (columns 2, 5 and 8), and number of analyst recommendations (columns 3, 6 and 9). The explanatory variables are *Exchange*, a variable equal to 1 for Second Marché IPOs and 0 for Nouveau Marché IPOs; *Log(market capitalization); Initial return,* the percentage difference between the IPO price and the closing price at the end of the tenth trading day; *Number of underwriters*; and a *bookbuilding* dummy variable. IPO year and industry dummy variables are used as control variables, but their coefficients are not reported. *z*-Statistics are in parenthesis.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

The third column of Table 2, Panel A, classifies offerings according to the number of recommendations received in the first year of their public life. Again, book-built IPOs attract more recommendations from lead-affiliated and unaffiliated analysts than do auctions.

Table 2, Panel B, confirms these results in a multivariate analysis. We run Poisson regressions in which the dependent variables are the number of analysts issuing recommendations in the year following the IPO (columns 1, 4, and 7), the number of analyst reports (columns 2, 5, and 8), and the number of recommendations received (columns 3, 6, and 9). The bookbuilding dummy represents the explanatory variable of principal interest. To avoid any omitted variable bias, we also include explanatory variables that are likely to influence analyst coverage and are correlated with the IPO procedure. Rajan and Servaes (1997), Cliff and Denis (2003), and Aggarwal, Krigman, and Womack (2002) find that underpricing is strongly associated with analyst coverage, so we include initial returns as an independent variable. An IPO with more underwriters may benefit from greater coverage; hence, we include the number of underwriters (lead and comanagers) as well. Finally, we include the stock exchange, firm size, IPO year, and industry as control variables.[17]

The regressions in Table 2, Panel B, strongly suggest that book-built offerings have greater analyst coverage, especially from lead-affiliated analysts. For example, controlling for other factors, book-built IPOs receive about twice as many recommendations from lead-affiliated analysts as do auctions (p-value $< 5\%$).

Overall, the results presented in Table 2 show that book-built IPOs enjoy more analyst coverage from lead-affiliated and unaffiliated analysts.

4.3 Are lead-affiliated analysts more bullish on book-built IPOs?

Our analyst hype hypothesis predicts that affiliated analyst recommendations should be more positive in book-built deals than in auctions.

In Table 3, Panel A, we consider all analyst recommendations issued within 1 year of the IPO for our sample of companies.[18] Lead-affiliated analysts are more positive for book-built than for auctioned offerings; 82% of their recommendations on bookbuildings are "strong buys" or "buys" compared with 67% for auctions. The same picture appears for non-lead-affiliated analysts, whose recommendations are "strong buys" or "buys" 84% of the time for bookbuildings versus 68% for auctions. Unaffiliated analysts exhibit no difference in bullishness across the two types of offerings.

[17] To conserve space, we do not report the coefficients on the industry or the IPO year dummy variables.

[18] Analysts mostly issue "strong buy" and "buy" recommendations for our sample of IPOs (71% of the recommendations are of one of these two types), consistent with previously documented findings for seasoned companies [Womack (1996)] and IPOs [Bradley, Jordan, and Ritter (2003, 2004)].

Table 3
Type of analyst recommendations by analyst affiliation

Panel A: Type of analyst recommendations by IPO mechanism and type of analyst affiliation

Analyst affiliation	Type of recommendation	# for bookbuildings	# for auctions
Lead-affiliated	1 (strong buy)	53 (48.2%)	11 (33.3%)
	2 (buy)	37 (33.6%)	11 (33.3%)
	3 (hold)	17 (15.4%)	8 (24.2%)
	4 (underperform)	2 (1.8%)	3 (9.1%)
	5 (sell)	1 (0.9%)	0
Non-lead-affiliated	1 (strong buy)	30 (39.5%)	24 (33.8%)
	2 (buy)	34 (44.7%)	24 (33.8%)
	3 (hold)	10 (13.2%)	19 (26.8%)
	4 (underperform)	2 (2.6%)	3 (4.2%)
	5 (sell)	0	1 (1.4%)
Unaffiliated	1 (strong buy)	121 (32.5%)	57 (31.1%)
	2 (buy)	137 (36.8%)	76 (41.5%)
	3 (hold)	76 (20.4%)	33 (18.0%)
	4 (underperform)	30 (8.1%)	14 (7.6%)
	5 (sell)	8 (2.1%)	3 (1.6%)

Panel B: Determinants of analysts recommendations by type of analyst affiliation

	Dependent variable: recommendation type by		
Explanatory variables	Lead-affiliated	Non-lead-affiliated	Unaffiliated
Exchange	−0.582**	0.260	−0.075
	(−2.18)	(1.07)	(−0.44)
Log(market capitalization)	0.195*	0.136	−0.010
	(1.78)	(1.13)	(−0.21)
Initial return	0.349	−0.204	−0.036
	(0.94)	(−0.91)	(−0.27)
Number of underwriters	−0.027	−0.039	−0.041
	(−0.37)	(−0.86)	(−1.03)
Bookbuilding	−0.812***	−0.303*	0.015
	(−3.00)	(−1.67)	(0.14)
Pseudo-R^2	0.035	0.018	0.002
Number of observations	143	147	555

Panel A presents the number of analyst recommendations within 1 year of the IPO by type of recommendation for bookbuildings versus auctions. Recommendations can be of five types: 1, 2, 3, 4, and 5 correspond to "strong buy," "buy," "hold," "underperform," and "sell," respectively. The number of recommendations of each type is reported for both IPO mechanisms by type of analyst affiliation. An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non-lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated*. The number in parenthesis is the percentage of recommendations in the corresponding category.

Ordered Probit regressions appear in Panel B. Types of recommendations from lead-affiliated, non-lead-affiliated, and unaffiliated analysts (1: strong buy, . . ., 5: sell) are the dependent variables in columns 1, 2, and 3, respectively. For each recommendation, the type of recommendation is regressed against *Exchange*, a variable equal to 1 for Second Marché IPOs and 0 for Nouveau Marché IPOs; *Log(market capitalization); Initial return,* the percentage difference between the IPO price and the closing price at the end of the tenth trading day; *Number of underwriters*; and a *bookbuilding* dummy variable.

z-Statistics, calculated assuming independence across companies using Huber's robust variance estimator, are in parenthesis.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

These results are confirmed by the multiple regressions of Table 3, Panel B. We report ordered probit regressions in which each individual analyst recommendation is used as an observation. To account for the facts that recommendations for the same company are correlated and that some companies receive more recommendations than others, we calculate z-statistics using Huber's (1967) methodology.[19] Both lead-affiliated and non-lead-affiliated recommendations are significantly more positive for book-built than for auctioned offerings. (The bookbuilding dummy variable exhibits a significantly negative sign at the 1% and 10% levels for lead-affiliated and non-lead-affiliated recommendations, respectively.) Holding other variables at their sample means, the likelihood of receiving a "strong buy" recommendation from a lead-affiliated analyst increases by 19 percentage points for book-built offerings (25% to 44%), and the likelihood of receiving a positive ("strong buy" or "buy") recommendation increases by 22 percentage points (57% to 79%).[20] This result is consistent with our analyst hype hypothesis. Unaffiliated analysts, in contrast, do not issue more favorable recommendations for either of the two types of offerings.

4.4 Booster shots

In Table 4, we explore analyst recommendations conditional on the prior stock performance of IPO firms. According to the analyst hype hypothesis, we are more likely to observe positive recommendations after a poor performance from affiliated analysts, a practice known as "giving booster shots". Table 4, Panel A, presents the number of analyst recommendations and their average type depending on the prior stock price performance of the IPO. For each recommendation, prior performance is calculated as the average daily buy-and-hold return since the offering, adjusted using the return of a size and book-to-market matched portfolio of seasoned companies. Seasoned companies are those that have been listed for at least 5 years. Every year, seasoned companies are split into five size portfolios and five book-to-market portfolios, and each IPO is assigned to one of the 25 size/book-to-market portfolios depending on its appropriate values as of the IPO date.

Consistent with the analyst hype hypothesis, the results in the first two columns of Table 4, Panel A, suggest that lead-affiliated analysts provide booster shots to bookbuilding IPO firms; the worse their past performance, the more favorable the recommendation tends to be (average recommendation type is 1.64 for bottom performance recommendations vs. 1.96 for top performance recommendations). Moreover, almost half of the recommendations for book-built IPOs coming from lead-affiliated

[19] Hereafter, we use the same methodology whenever different firms have different numbers of observations.

[20] See Greene (2003, p. 736) regarding the interpretation of ordered probit coefficients.

analysts follow bad performance (Panel A, first column). In other cells of the table, analyst recommendations are almost always less favorable after bad performance than after good performance. In particular, analysts affiliated with lead underwriters of auctions do not seem more keen to provide recommendations after bad performance, and when they do so, they provide less favorable recommendations (consensus recommendation rating is 2.23 for recommendations in the bottom one-third of performance vs. 1.93 in the top one-third).

We confirm the booster shot phenomenon in Panels B and C of Table 4 by running ordered probit regressions in which the dependent variable is the type of recommendation. In addition to the usual set of control variables and a lead-affiliated dummy variable equal to 1 when the analyst is lead affiliated, we create two interaction variables: *Lead-affiliated*negative past*

Table 4
Analyst recommendations and past stock price performance

Panel A: Analyst recommendations by IPO mechanism and type of analyst affiliation depending on past performance

		Bookbuilding		Auction	
Analyst affiliation	Third of prior performance	Number of recommendations (%)	Average type of recommendations	Number of recommendations (%)	Average type of recommendations
Lead-affiliated	1 (bottom)	50 (47.2)	1.64	13 (39.4)	2.23
	2 (middle)	32 (30.2)	1.75	6 (18.2)	2.17
	3 (top)	24 (22.6)	1.96	14 (42.4)	1.93
Non-lead-affiliated	1 (bottom)	28 (38.4)	1.96	26 (37.7)	1.88
	2 (middle)	19 (26.0)	1.74	17 (24.6)	2.18
	3 (top)	26 (35.6)	1.69	26 (37.7)	2.23
Unaffiliated	1 (bottom)	123 (34.4)	2.33	31 (17.7)	2.19
	2 (middle)	132 (37.0)	1.99	65 (37.1)	2.17
	3 (top)	102 (28.6)	2.02	79 (45.1)	2.00

Panel B: Determinants of analysts recommendations—Ordered probit coefficients

	Dependent variable: type of recommendation	
Explanatory variables	Bookbuilding	Auction
Exchange	−0.153	—
	(−0.94)	
Log(market capitalization)	0.054	0.057
	(0.94)	(0.62)
Lead-affiliated	−0.165	−0.181
	(−1.09)	(−0.66)
Lead-affiliated * negative past performance	−0.279[a]	0.689**[c]
	(−1.26)	(2.00)
(1-Lead-affiliated) * negative past performance	0.459***[a]	−0.068[c]
	(3.45)	(−0.33)
Pseudo-R^2	0.019	0.004
Number of observations	558	287

Table 4

Panel C: Determinants of the monthly number of positive ("buy" or "strong buy") recommendations from lead-affiliated analysts—Poisson regression coefficients

	Dependent variable: number of positive recommendations from lead-affiliated analysts for this firm/month	
Explanatory variables	Bookbuilding	Auction
Exchange	0.353	—
	(1.15)	
Log(market capitalization)	−0.045	−0.036
	(−0.36)	(−0.09)
Months since IPO	−0.048	−0.238***
	(−1.19)	(−2.77)
Performance change	0.708**	0.031
	(2.15)	(0.03)
Constant	−2.053	−1.794
Number of observations	1221	792

Panel A presents the number and average type of analyst recommendations within 1 year of the IPO by type of analyst affiliation for bookbuildings versus auctions, depending on prior performance. Recommendations can be of five types: 1, 2, 3, 4, and 5 correspond to "strong buy," "buy," "hold," "underperform," and "sell," respectively. An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non-lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated. Past performance* is the average daily buy-and-hold return adjusted using the size/book-to-market portfolios between the IPO date and the recommendation date minus 2 days. This variable is divided into thirds, and each analyst recommendation is assigned to one third. The number in parentheses is the percentage of recommendations in the corresponding category.

Ordered Probit regressions appear in Panel B. For each analyst recommendation, the type of recommendation is the dependent variable. Book-built IPOs are in column 1, auctions in column 2. The independent variables are *Exchange*, a variable equal to 1 for Second Marché IPOs and 0 for Nouveau Marché IPOs; *Log(market capitalization); Lead-affiliated,* a variable equal to 1 if the analyst is lead affiliated and 0 otherwise; and two interaction variables obtained by multiplying *Lead-affiliated* and 1-*Lead-affiliated* by 1 if past performance is negative and 0 otherwise.

Panel C presents Poisson regressions. The dependent variable is the number of positive recommendations (type 1, "strong buy", or 2, "buy") from lead-affiliated analysts for a given firm/month. The explanatory variables are *Exchange; Log(market capitalization); Months since IPO*, or the number of months between the IPO date and the beginning of the month considered; and *Performance change*, equal to 1 in a month when the stock's cumulative adjusted price performance had been positive since the IPO but turned negative in the prior month.

z-Statistics, calculated assuming independence across companies using Huber's robust variance estimator, are in parenthesis. Coefficients with a superscript a, b, and c are significantly different from one another at the 1%, 5%, and 10% level, respectively.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

performance is equal to 1 when the analyst is lead affiliated and the adjusted past performance since the offering is negative, and 0 otherwise. In addition, (*1-Lead-affiliated*)**negative past performance* is equal to 1 when the analyst is not lead affiliated and the adjusted past performance since the offering is negative, and 0 otherwise.

For book-built offerings, the coefficient for the *Lead-affiliated*negative past performance* variable is negative, whereas the coefficient for the (*1-Lead-affiliated*)**negative past performance* variable is significantly positive at the 1% level. That is, after bad performance, lead-affiliated analysts

issue more favorable recommendations, while other analysts issue less favorable recommendations. These coefficients are significantly different at the 1% level. This result thus confirms that booster shots are prevalent and significant for lead-affiliated analysts in book-built IPOs. The picture is opposite for auctions, for which the signs are reversed—that is, following poor stock price performance, lead-affiliated analysts issue *less* favorable recommendations, while other analysts issue *more* favorable recommendations. Lead-affiliated analysts administer booster shots in book-built IPOs, not in auctions.

In another variant of the booster shot tests, Table 4, Panel C, examines the total number of positive recommendations (''buy'' or ''strong buy'') given to an IPO by its lead-affiliated analysts in each month of the first post-IPO year. Our objective is to track whether analysts decide to issue positive recommendations on the basis of recent stock price performance. We run Poisson regressions in which the dependent variable is the number of positive recommendations for each firm/month pair. In addition to the usual set of control variables, we include a variable named *Performance change* and the number of months since the IPO. *Performance change* is equal to 1 in a month in which the stock's price performance had been positive since the IPO but turned negative in the prior month.[21] (This represents exactly the time when a booster shot by the underwriter would be expected.)

The results in Table 4, Panel C, reinforce the impression conveyed by Panels A and B. For book-built offerings, a recent negative change in stock price performance is associated with an increase in the monthly number of positive recommendations issued by lead-affiliated analysts. Book-built IPOs receive about twice as many positive recommendations from lead-affiliated analysts when their recent performance changes from positive to negative (the coefficient of the *Performance change* variable is significantly positive at the 5% level). But the same is not true for auctioned offerings.[22] Overall, the results presented in Table 4 are consistent with the booster shot hypothesis that lead-affiliated analysts support book-built IPOs (but not auctioned IPOs) by issuing favorable recommendations after poor stock price performance.

4.5 Do unaffiliated analysts try to curry favor with the underwriter?

Our attention so far has focused mostly on affiliated analysts. Next, we consider unaffiliated analysts and their incentives to provide research

[21] Past performance is calculated as the buy-and-hold abnormal return since the IPO, with comparable size and book-to-market portfolios as benchmarks.

[22] For auctioned offerings, we also find that the number of positive recommendations issued by lead-affiliated analysts decreases with the number of months since the IPO. We do not observe this phenomenon for book-built IPOs, which indicates that support by lead-affiliated analysts, in addition to being stronger for bookbuildings than for auctions, lasts longer.

support for IPO stocks. Our conjecture (as suggested to us by conversations with practitioners) is that bookbuilding underwriters, who choose share allocations, may also influence the behavior of unaffiliated analysts. In France, banks act as intermediaries between their clients and the issuer in book-built IPOs. They collect orders from clients and submit them to the lead underwriter. Presumably, this process allows the banks' clients, who are otherwise virtually excluded from bookbuilding allocation, to receive larger allocations. Thus, even when they are not members of the IPO syndicate, banks directly participate in the offering as bidders, and it is in their interest to be allocated as many shares as possible in the offering process.

For their clients to obtain generous share allocations in a deal, unaffiliated analysts may be induced to curry favor with the lead underwriter of the deal. One way of doing so is by issuing favorable recommendations to the recent IPOs made by the underwriter. We expect unaffiliated analysts to be especially prone to this ingratiating behavior when it is most valuable for the underwriter, that is, when the IPO has been doing poorly. This hypothesis, which we label the "currying favor" hypothesis, is only relevant for book-built IPOs, because the allocation of auctioned IPO shares is nondiscriminatory.

In Table 5, we test this hypothesis by counting the number of positive ("buy" or "strong buy") recommendations issued by unaffiliated analysts in two distinct situations:

- when the lead underwriter of the IPO is underwriting another IPO before the end of the next month; and[23]
- when the lead underwriter of the IPO is *not* underwriting another IPO before the end of the next month.

Table 5, Panel A, shows that book-built IPOs receive more positive recommendations from unaffiliated analysts in the months when their lead underwriter is about to underwrite another book-built offering than in the months when this is not the case. This phenomenon is most pronounced for firms in the bottom one-third of prior performance; poorly-performing IPOs receive three times as many unaffiliated positive recommendations per month when their lead underwriter is doing another bookbuilding in the next month as when it is not (the difference is statistically significant at the 5% level).

We also find that when unaffiliated analysts' incentives to curry favor with the lead underwriter are low—that is, when the lead underwriter is not about to do another IPO—unaffiliated analysts issue more positive recommendations when prior IPO performance is stronger. This

[23] We believe that one month is a natural window to consider. Allocation decisions for book-built IPO shares are presumably not made more than a month in advance.

association breaks down when unaffiliated analysts' incentives to curry favor with the underwriter are high, that is, when the lead underwriter is due to take another company public in the coming month.

Unlike book-built offerings, auctioned IPOs do not exhibit this result. The number of unaffiliated positive recommendations per month is quite similar, independently of whether the underwriter is doing another IPO in the following month.

These results are confirmed in the Poisson regressions presented in Table 5, Panel B. In the first column of the table, we consider book-built IPO firms. The *New IPO in the next month* variable, equal to 1 when the lead underwriter of the offering is underwriting an IPO the next month and 0 otherwise, is positively associated with the monthly number of unaffiliated positive recommendations received by an IPO firm (p-value = 6%). The coefficient is larger and statistically significant at the 5% level when we consider firm/month pairs in the bottom one-third of prior performance only (third column): Book-built IPOs in the bottom one-third of prior performance receive 53% more positive recommendations from unaffiliated analysts when their underwriter is about to underwrite another bookbuilding in the next month. Again, no such pattern appears for auctioned IPOs (see columns 2 and 4 of Table 5, Panel B).

4.6 Do investors disentangle analysts' incentives?

Next, we consider whether investors disentangle analysts' incentives by looking at stock price reactions to positive ("strong buy" or "buy") recommendations for all types of security analysts and the two types of IPO mechanisms. If investors are suspicious of analysts' incentives,

Table 5
Tests of the "currying favor" hypothesis

Panel A: Number of unaffiliated analyst positive recommendations per month depending on past performance and whether the underwriter is underwriting another IPO in the next month

		Is the lead underwriter doing another IPO in the next month?			
		No IPO in the next month		IPO in the next month	
IPO mechanism	Third of prior performance	Number of firm/month pairs	Average number of positive recommendations	Number of firm/month pairs	Average number of positive recommendations
	All	1153	0.17	215	0.22
Bookbuilding	1 (bottom)	467	0.10[b]	54	0.30[b]
	2 (middle)	365	0.17	70	0.17
	3 (top)	321	0.28	91	0.22
	All	740	0.13	339	0.11
Auction	1 (bottom)	272	0.03	99	0.02
	2 (middle)	226	0.08	125	0.13
	3 (top)	242	0.27	115	0.17

Table 5

Panel B: Determinants of the monthly number of positive recommendations from unaffiliated analysts

Dependent variable: number of positive recommendations this month	All firm/month pairs		Firm/month pairs in the bottom one-third of prior performance	
Explanatory variables	Bookbuilding	Auction	Bookbuilding	Auction
Exchange	0.123	—	0.152	—
	(0.73)		(0.54)	
Log(market capitalization)	0.822***	1.437***	0.840***	1.898***
	(13.66)	(11.69)	(8.13)	(2.65)
Months since IPO	0.007	−0.094**	−0.005	−0.037
	(0.34)	(−2.08)	(−0.14)	(−0.35)
Past performance	0.454***	0.858***	0.915***	0.375
	(9.95)	(8.81)	(2.80)	(0.31)
New IPO in the next month	0.303*	−0.110	0.427**	−0.107
	(1.86)	(−0.48)	(2.25)	(−0.14)
Constant	−12.865	−20.138	−13.075	−26.933
Number of observations	1368	1079	521	371

Panel A presents the average number of positive recommendations (type 1, "strong buy" or 2, "buy") from unaffiliated analysts for a given firm/month, depending on past performance of the company and whether the underwriter of the IPO is underwriting another IPO between the beginning of this month and the end of next month. An analyst is considered *unaffiliated* if he or she does not work for any of the IPO underwriters. *Past performance* is the average monthly buy-and-hold return adjusted using the size/book-to-market portfolios between the IPO date and the beginning of the month considered. This variable is divided into thirds, and each firm/month pair is assigned to one of the thirds. In the first row of Panel A, we consider only book-built IPOs and break down the sample of firm/month pairs depending on whether the lead underwriter of the IPO is underwriting another book-built IPO in the next month. In the second row of Panel A, we consider auctioned IPOs and separate the sample of firm/month pairs depending on whether the lead underwriter of the IPO is underwriting another IPO (auctioned or book-built) in the next month. A superscript a and b indicates significant differences between column 2 and column 4 numbers at the 1% and 5% level, respectively, in tests of the equality of means with unequal variance.

Panel B presents Poisson regressions, in which the dependent variable is the number of positive recommendations for a given firm/month pair from unaffiliated analysts for all firm/month pairs (columns 1 and 2) and for firm/month pairs in the bottom one-third of past performance (columns 3 and 4). The explanatory variables are *Exchange; Log*(*market capitalization*); *Months since IPO*, or the number of months between the IPO date and the beginning of the month considered; *Past performance*; and *New IPO in the next month*, equal to 1 if the lead underwriter of the IPO is underwriting another IPO in the next month and 0 otherwise. z-Statistics, calculated assuming independence across companies using Huber's robust variance estimator, are in parentheses.

*Significance at the 10% level.

**Significance at the 5% level. ***Significance at the 1% level.

they should discount positive recommendations by lead-affiliated analysts, especially when these recommendations are likely to be booster shots meant to prop up an IPO's faltering price.

Table 6, Panel A, reports the stock price reaction to positive recommendations, as measured by performance between the recommendation date minus 1 day and the recommendation date plus 1 day and adjusted using size and book-to-market portfolios. This reaction is significantly positive in two situations: when non-lead-affiliated analysts issue positive recommendations about book-built IPO firms and when unaffiliated analysts issue positive recommendations about auctioned IPO firms. This finding is consistent with the "skeptical market" hypothesis of Bradley, Jordan, and Ritter (2004), that is, with investors' rationality and our previous findings that these analysts seem to provide honest recommendations. More

surprising is the positive mean reaction to positive recommendations from lead-affiliated analysts for book-built IPOs.

We explore this point in greater detail. Our previous results indicate that lead-affiliated analysts issue (presumably biased) positive recommendations to support the stock price of their IPO firms only when their performance has been disappointing. In Table 6, Panel B, we examine reactions to lead-affiliated analysts' positive recommendations for bookbuildings, depending on the prior performance of the IPO. Consistent with the skeptical market view, we find a large difference between reactions to recommendations following bad performance and those that follow good performance: −0.65% versus 5.79% on average and −0.62% versus

Table 6
Stock price reaction and 1-year stock price performance following positive analyst recommendations

Panel A: Stock price reaction to positive recommendations by analyst affiliation

Analyst affiliation		Bookbuilding	Auction
Lead-affiliated	Mean	1.12%	1.10%
	Median	0.07%	1.20%
	# of recommendations	88	22
Non–lead-affiliated	Mean	1.57%*	−0.67%
	Median	1.12%*	−0.51%
	# of recommendations	61	46
Unaffiliated	Mean	0.28%	0.88%**
	Median	−0.37%	0.44%
	# of recommendations	245	130

Panel B: Stock price reaction to positive recommendations depending on past performance (lead-affiliated analysts only)

Third of prior performance		Bookbuilding	Auction
1 (Bottom)	Mean	−0.65%[b]	−1.13%
	Median	−0.62%[c]	1.18%
	# of recommendations	43	7
2 (Middle)	Mean	1.18%	4.30%
	Median	0.26%	4.35%
	# of recommendations	26	4
3 (Top)	Mean	5.79%*[b]	1.34%
	Median	1.95%[c]	−0.43%
	# of recommendations	17	11

Panel C: 12-month stock price performance following positive recommendations by analyst affiliation

Analyst affiliation		Bookbuilding	Auction
Lead-affiliated	Mean	−5.02%	2.22%
	Median	−13.67%**	−21.91%
	# of recommendations	89	22
Non-lead-affiliated	Mean	−6.27%	−5.81%
	Median	−19.85%*	−22.67%
	# of recommendations	63	48
Unaffiliated	Mean	2.61%	−0.31%
	Median	−9.20%**	−0.26%
	# of recommendations	253	129

Table 6

Panel D: Determinants of 12-month performance following positive recommendations by type of analyst affiliation

	Dependent variable: 12-month stock price performance		
Explanatory variables	Lead-affiliated	Non-lead-affiliated	Unaffiliated
Exchange	−0.517*	0.036	−0.420
	(−1.73)	(0.14)	(−1.45)
Log(market capitalization)	0.215*	−0.080	0.070
	(1.84)	(−0.83)	(0.93)
Past performance	6.752	−4.242	6.641
	(0.28)	(−0.65)	(1.15)
Bookbuilding	−0.392**	0.003	−0.345*
	(−2.16)	(0.19)	(−1.88)
Constant	−1.398	0.262	0.679
R^2	0.322	0.392	0.228
Number of observations	107	107	365

Panel A presents the mean and median immediate stock price reactions to positive recommendations (type 1, "strong buy" 2, "buy") for the three types of analyst affiliation. Stock price reaction is the buy-and-hold return adjusted using the size/book-to-market portfolios between recommendation date minus 1 day and recommendation date plus 1 day. An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non-lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated*.
Panel B presents the mean and median of immediate stock price reaction to positive recommendations by lead-affiliated analysts only, depending on prior stock price performance. *Past performance* is the average daily buy-and-hold return adjusted using the size/book-to-market portfolios between IPO date and recommendation date minus 2 days. This variable is divided into thirds, and each recommendation is assigned to one third. A superscript a, b and c indicates significant difference between numbers at the 1%, 5%, and10% level, respectively, in tests of the equality of means with unequal variance.
Panel C presents the mean and median of 12-month stock price performance following positive recommendations by type of analyst affiliation. Stock price performance is the buy-and-hold return adjusted using the size/book-to-market portfolios between recommendation date plus 2 days and recommendation date plus 2 days plus 12 months.
Panel D presents ordinary least-squares regressions of 12-month stock price performance following recommendations against the following variables, for the three types of analyst affiliation: *Exchange*, a variable equal to 1 for Second Marché IPOs and 0 for Nouveau Marché IPOs; *Log*(*market capitalization*); *Past performance*; and a *bookbuilding* dummy variable. The IPO year and industry dummy variables are used as control variables, but their coefficients are not reported. z-Statistics, calculated assuming independence across companies using Huber's robust variance estimator, are in parenthesis.
* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

1.95% for the median, respectively. The average (median) price reactions for firms in the top and bottom one-thirds of prior performance are statistically significantly different from each other at the 5% (10%) level. This difference suggests that investors understand the incentives of lead-affiliated analysts and react favorably to their positive recommendations only when they follow good prior performance. Auctioned offerings exhibit no such effect.

Panels C and D of Table 6 examine the 1-year stock price performance following positive recommendations. One-year performance starting

2 days after the recommendation is calculated as a buy-and-hold return, adjusted using size and book-to-market portfolios. Median one-year performances following positive recommendations are statistically significantly negative for all types of analysts for book-built IPO companies (at the 5%, 10%, and 5% level for lead-affiliated, non-lead-affiliated, and unaffiliated analysts, respectively).

In Table 6, Panel D, we present multiple regressions in which the dependent variable is one-year stock price performance following positive recommendations. We find that the coefficient of the bookbuilding dummy variable is significantly negative at the 5% level when we consider lead-affiliated recommendations. After a positive recommendation from a lead-affiliated analyst, book-built IPOs underperform auctions by 39% on average. This result is consistent with our previous findings regarding the behavior of lead-affiliated analysts.

5. Robustness Checks and Alternative Theories

5.1 Robustness checks

In this section, we check the robustness of our results. We recognize that it is possible that firm characteristics drive choices of IPO procedures, as well as the amount of coverage IPOs receive. The endogeneity of the choice of the IPO mechanism may bias the coefficients obtained in ordinary least-squares regressions. To correct this possible bias, we use an endogenous switching Poisson model to replicate some of the main results depicted in the previous tables while considering the endogenous choice of IPO procedure. This model enables us to account for the endogeneity of a binary regressor in count models. It estimates two equations simultaneously: The first (the "switching" equation) explains the choice of the endogenous binary variable (the bookbuilding dummy variable in our case), and the second regresses a count variable (number of recommendations) on a set of exogenous variables and on the endogenous binary variable of the first equation while accounting for the endogeneity of this variable.[24]

Our first goal is to verify that our main results for the different behaviors of analysts vis-à-vis auctions and bookbuilding are robust.[25] To do so, we regress the variables of coverage intensity (number of lead-affiliated and unaffiliated analysts covering the company, number of recommendations issued by these analysts) on a set of controls and a bookbuilding dummy, as we did for Table 2, Panel B. We would also like to replicate the main result of Table 3, that is, that lead-affiliated analysts provide better

[24] See Wooldridge (2002, Ch. 18) for a discussion of switching models, Terza (1998) for a presentation of this model, and Miranda (2004) for a presentation of the model's implementation.

[25] We present replications of our main results only to save space. We verified that all the results for the behavior of analysts vis-à-vis auctions versus bookbuilding are robust.

recommendations to book-built IPOs. Unfortunately, we cannot apply the previous methodology to this test because the dependent variable (type of recommendation) is not a count variable. Therefore, we use another strategy. In the year following a company's IPO, we count the number of favorable ("strong buy" or "buy") recommendations that the lead underwriter issues for the company. We regress this variable on several controls and the total number of recommendations issued by the lead underwriter for the company. This approach enables us to control for the intensity of coverage from the lead underwriter, which we know is greater for book-built IPOs, and to focus on the quality of the coverage.

For the endogenous switching model to be well specified, we must find good instruments for the choice of IPO procedure. In Table 1, Panel C, we observe that the companies that choose bookbuilding are different from those that choose auctions in two major aspects. First, they are bigger. Second, they sell more shares to the public. Thus, the variables *Log*(*Market capitalization*) and *Shares in the public* should be good instruments for the choice of IPO mechanism.

The results appear in Table 7.[26] In all five regressions, the bookbuilding dummy variable has significantly positive coefficients, which confirms that lead-affiliated analysts provide more and better recommendations to book-built IPOs than to auctions. These results also confirm that unaffiliated analysts provide more coverage to book-built offerings. We note that the null hypothesis that the two equations are independent is rejected in most cases and that both instruments have a significant impact on the decision to use the bookbuilding mechanism. The coefficients on the bookbuilding dummy variable in columns 1–4 are similar to those in Table 2, Panel B, columns 1, 3, 7, and 9, respectively.[27] This finding suggests that the endogeneity of the choice of IPO procedure does not significantly affect the coefficients on the bookbuilding dummy variable. Overall, these results suggest that endogeneity is present but does not affect our results substantially.

Our second goal is to verify that our results are not driven by underwriter characteristics. We reported in Panel B of Table 1 that some underwriters specialize in bookbuilding, some specialize in auctions, and others use both IPO procedures. If underwriters that specialize in auctions differ systematically from those that do only book-built IPOs, it could affect the level of analyst coverage they provide and explain our results.

[26] We eliminate IPOs on Nouveau Marché, where the IPO procedure is not a choice variable. Nouveau Marché firms are also intrinsically different from Second Marché firms (they are typically young, growth companies that operate in high-tech industries), which might affect our results. We also eliminate the IPOs for which the lead underwriter could not be identified or is not followed by I/B/E/S. We thus have 123 observations.

[27] The coefficients of the last column of Table 7 are not directly comparable to those that appear in Table 3 owing to differences in the design of the tests.

We analyze this possibility by examining the behavior of the underwriters that do not specialize in either IPO procedure. If our results are confirmed for this subsample of underwriters (i.e., if we find that these underwriters provide better coverage to their book-built IPOs than to their auctions), it will confirm that the two mechanisms come with a different level of service, regardless of underwriter characteristics. From Table 1, Panel B, we isolate eight underwriters that performed at least one auction and one bookbuilding during our study period and whose recommendations appear in I/B/E/S.[28] We compare the analyst coverage of auctions versus bookbuildings done by these underwriters to test the robustness of the main results we presented previously. Therefore, the variables we consider are the fraction of offerings covered by the lead underwriter, the average number of recommendations received from the lead underwriter, the average type of these recommendations, and the number of recommendations received from unaffiliated analysts. Some underwriters are more active than others. For instance, Banques Populaires did about one-third of all the auctions in our sample. To avoid giving more weight to more active underwriters, we first calculate, for each underwriter, the mean of our variables for its auctions and bookbuildings. Then we average these numbers across underwriters.

[28] These underwriters are BNP, Banques Populaires, Crédit Agricole, Crédit Industriel et Commercial, Crédit Lyonnais, Crédit National, Paribas, and Société Générale.

Table 7
Controlling for endogeneity of the choice of IPO procedure

	Dependent variables				
Explanatory variables	Analyst coverage by lead underwriter	Number of recommendations by lead underwriter	Coverage by unaffiliated analysts	Number of recommendations by unaffiliated analysts	Total number of favorable lead-affiliated recommendations
Log(market capitalization)	0.115	0.007	0.795***	0.835***	0.089
	(0.71)	(0.04)	(9.12)	(11.08)	(0.59)
Initial return	0.719	0.576	1.054***	1.348***	0.831
	(1.40)	(1.03)	(3.29)	(4.90)	(1.61)
Number of underwriters	0.095	0.189*	0.057	0.015	—
	(0.92)	(1.70)	(0.89)	(0.33)	
Bookbuilding	0.835**	0.835**	0.341*	0.477**	0.718**
	(2.38)	(2.15)	(1.67)	(2.04)	(2.07)
Total number of lead-affiliated recs	—	—	—	—	0.639***
					(8.89)
Constant	−3.043	−1.599	−10.093	−10.563	−3.077

Table 7
(Continued)

	Switching regression–dependent variable: Bookbuilding dummy				
Explanatory variables					
Log(market capitalization)	1.215***	1.209***	1.207***	1.293***	1.211***
	(4.64)	(4.64)	(5.18)	(5.36)	(4.60)
Shares in the public	19.060***	19.076***	17.855***	17.703***	19.146***
	(5.13)	(5.16)	(5.03)	(4.86)	(5.15)
Correlation between the two equations (ρ)	−0.805	−0.225	−0.884	−0.823	−0.831
p-Value of chi-square test of $\rho = 0$	0.088	0.582	0.000	0.000	0.369

This table presents robustness checks of some of the results to account for the endogeneity of the choice of IPO procedure. The model used in this table is a Poisson model with endogenous switching, and the full information maximum likelihood is used to estimate the model. Only Second Marché IPOs for which the lead underwriter is known and followed by I/B/E/S are considered, so the number of observations is 123 in all regressions.

In the first part of the table, the dependent variables are *Analyst coverage by lead underwriter*, equal to 1 if the lead underwriter provides analyst coverage to the company within a year of its IPO and 0 otherwise (column 1); *Number of recommendations by lead underwriter*, the number of recommendations issued by lead-affiliated analysts within a year of the company's IPO (column 2); *Coverage by unaffiliated analysts*, the number of unaffiliated analysts who issued recommendations within a year of the company's IPO (column 3); *Number of recommendations by unaffiliated analysts*, the number of recommendations issued by these analysts (column 4); and *Total number of favorable lead-affiliated recommendations*, the total number of favorable recommendations (I/B/E/S code equal to 1 "strong buy" or 2 "buy") issued by lead-affiliated analysts within a year of the company's IPO (column 5). An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non-lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated.* The explanatory variables are *Log*(*market capitalization*); *Initial return,* the percentage difference between the IPO price and the closing price at the end of the tenth trading day; *Number of underwriters;* and a *bookbuilding* dummy variable. In the last column of the table, the variable *Total number of lead-affiliated recommendations* is also used as an independent variable.

In the second part of the table, the results of the switching regression are presented, in which the dependent variable is the *bookbuilding* dummy. The independent variables are *Log*(*market capitalization*) and *Shares in the public*, the fraction of the company's shares owned by the public after the IPO, equal to the total number of shares sold in the offering divided by the total number of shares outstanding after the IPO. The last two rows of the table are the coefficient measuring the correlation between the two equations (ρ) and the p-value of the test of independence of the two equations. z-statistics are in parenthesis.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

The results that appear in the second column of Table 8 confirm our previous findings. Nonspecialized underwriters provide coverage to 35% of their auctions versus 63% of their bookbuildings. They issue more recommendations for book-built IPOs than for auctions (0.89 vs. 0.74, on average). These recommendations are more favorable for bookbuildings (average recommendation type is 1.83 vs. 2.08 for auctions). Furthermore, more unaffiliated analysts issue recommendations for book-built IPOs (2.67 vs. 1.76 for auctions, on average), and these unaffiliated analysts issue more recommendations for book-built IPOs (3.42 vs. 2.31 for auctions, on average). Overall, Table 8 suggests that our findings are not driven by underwriter characteristics.[29]

5.2 Alternative explanations

The analyst hype hypothesis predicts that issuers, who believe in the virtues of analyst coverage, are willing to pay an extra cost to go public using the bookbuilding mechanism, which is associated with better analyst coverage. In this section, we explore alternative theories of the choice of the IPO procedure that might explain the analyst coverage differential we observe between bookbuilding and auctions. We test whether other predictions of these theories are supported by the data.

First, the observed differences in analyst coverage between the two mechanisms may come from the different natures of the two mechanisms. Whereas banks are very involved in book-built IPOs, for which they organize road shows, manage the order book, and provide a firm commitment guarantee, they provide more limited services to companies that choose auctions. This distinction can have two consequences. First, banks may select bookbuilding candidates more carefully than auction issuers. Second, they may be more inclined to support bookbuilding IPOs because the bad performance of these firms affects their reputation more than if auctioned IPOs fail. We call this theory the ''underwriter involvement'' theory. It is consistent with our findings that lead underwriters provide more abundant and more generous analyst coverage to book-built IPOs than to auctions. If this theory is true and banks are able to identify better issuers, then book-built IPOs should be of higher ''quality'' than auctions.

Second, an alternative theory, which we call the ''information coordination'' theory, can be derived from Sherman (2004), who claims that the information coordination role exercised by underwriters in bookbuilding reduces the risk for the issuer. She writes: ''With sealed bid auctions, the lack of investor coordination leads to increased risk for both issuers and investors, because both sides must make decisions

[29] In unreported tests, we replicated the tests of Tables 2–5 considering only IPOs done by our eight nonspecialized underwriters. Our qualitative results are virtually unchanged.

without knowing how many bidders will participate" (Sherman 2004). If underwriters can guarantee that enough information is produced at the time of book-built IPOs, whereas the amount of information produced in auctions is unpredictable, the outcome of auctions should also be less predictable than that of book-built IPOs. If this is the case, we should observe more aftermarket variation in the performance of companies that choose to do an auction. If more information production leads to more analyst coverage, this theory also predicts that book-built IPOs receive better analyst coverage.

These two alternative theories predict that analyst coverage will be more abundant following book-built IPOs than auctions. However, only the underwriter involvement theory predicts that lead underwriters will be more generous with bookbuildings than with auctions. These theories

Table 8
Analyst coverage of auctions and bookbuildings done by nonspecialized lead underwriters

	Whole sample	Eight underwriters that used both mechanisms
	% With coverage by lead underwriter	
Auctions	25.3%	34.9%
Bookbuildings	51.9%	63.4%
	# of recommendations by lead-affiliated analysts	
Auctions	0.50	0.74
Bookbuildings	0.87	0.89
	Type of recommendations by lead-affiliated analysts	
Auctions	1.93	2.08
Bookbuildings	1.54	1.83
	# of unaffiliated analysts following the firm	
Auctions	1.62	1.76
Bookbuildings	2.42	2.67
	# of recommendations by unaffiliated analysts	
Auctions	2.08	2.33
Bookbuildings	3.08	3.42

This table presents statistics on analyst coverage of IPO firms within one year of their IPO. The reported statistics are percentages *with coverage by lead underwriter*, the fraction of IPOs with coverage from their lead underwriter; # *of recommendations by lead-affiliated analysts*, the average number of recommendations received from analysts affiliated with the lead underwriter within a year of the IPO; *Type of recommendations by lead-affiliated analysts*, the average type of these recommendations, for which 1, 2, 3, 4, and 5 correspond to "strong buy," "buy," "hold," "underperform," and "sell," respectively; # *of unaffiliated analysts following the firm;* and # *of recommendations by unaffiliated analysts*, the average number of recommendations received from unaffiliated analysts within a year of the IPO. An analyst is considered *lead-affiliated* if he or she works for the lead underwriter of the IPO, one of its subsidiaries, or its mother company. An analyst is considered *non–lead-affiliated* if he or she works for one of the underwriters of the IPO (but not the lead underwriter), one of its subsidiaries, or its mother company. All other analysts are considered *unaffiliated*. The statistics are reported separately for auctioned and book-built IPOs. For each IPO mechanism, the average of the variables is calculated first for each underwriter, and then the average across underwriters.
The first column presents the statistics for the entire sample of underwriters.
In the second column, only the eight underwriters that did at least one bookbuilding and one auction and whose recommendations are in I/B/E/S are considered. These underwriters are BNP, Banques Populaires, Crédit Agricole, Crédit industriel et Commercial, Crédit Lyonnais, Crédit National, Paribas, and Société Générale.

also generate predictions of their own. The underwriter involvement theory predicts that higher-quality companies will use the bookbuilding mechanism; the information coordination theory predicts that auctions should exhibit more variation in their aftermarket performance than book-built IPOs.

We next test these predictions. To do so, we first need to measure an issuer's quality. Presumably, higher quality means higher intrinsic value, which can correspond empirically to higher value at the offering and/or better stock market performance. Moreover, after the market recognizes a firm's quality, the firm's shares may be more liquid, and the firm may have better access to the equity market. Therefore, we compare the book-to-market ratios, one-year stock performance, aftermarket liquidity, and subsequent equity issues of bookbuildings and auctions.

The results appear in Table 9, Panel A. First, we regress the book-to-market value of our IPO firms calculated 10 days after the offering[30] on a set of control variables and a bookbuilding dummy variable. Our previous results indicate that controlling for the endogeneity of the choice of IPO mechanism is appropriate. Therefore, we use a two-stage treatment effect model that enables us to account for the endogeneity of a binary treatment (the bookbuilding dummy in our case).[31] The coefficient on the bookbuilding variable is equal to 0.128 and significantly positive at the 1% level, indicating that, other things being equal, book-built offerings have book-to-market values 12.8% above those of their auctioned counterparts at the IPO date. Thus, contrary to the prediction of the underwriter involvement theory, book-built offerings have relatively lower IPO valuations than auctions.

Second, we compare the one-year stock performance of the two types of offerings (Table 9, Panel A, column 2). One-year performance starting 10 days after the IPO is calculated as a buy-and-hold return, adjusted using size and book-to-market portfolios. Book-built IPOs slightly underperform auctions but not significantly. The two measures of liquidity we use in the next regressions are the average trading volume and the average bid–ask spread (normalized by the mid-price) in the year following the IPO. Bookbuilding companies have higher trading volumes than auctions (the coefficient in column 3 is significant at the 1% level) and smaller bid–ask spreads (column 4).

Third, we consider seasoned equity offerings in the 5-year period following the IPO, in terms of both the number of SEOs done during this period and the total amount raised. In Panel C of Table 1, we

[30] We consider market value of equity using the stock price at the end of the tenth trading day instead of the IPO price because a higher degree of underpricing (i.e., a lower IPO price) may be chosen by bookbuilding issuers to elicit information production [Chemmanur and Liu (2004).

[31] See Greene (2003, Ch. 22) for a description of the model.

observed that book-built offerings did more SEOs in the subsequent 5 years than did auctions, on average. However, this result does not hold up in the multivariate analysis of Table 9, Panel A, columns 5 and 6. Overall, book-built IPOs appear to be more liquid on the aftermarket, but this tendency does not seem to translate into higher valuation or better performance. Thus, we find very little support for the underwriter involvement theory.

We now turn to the prediction of the information coordination theory, namely, that auctions should exhibit more variation in their aftermarket characteristics than bookbuildings. We consider the performance, liquidity, and subsequent equity issues variables used in Table 9, Panel A. We replace these variables with measures of the contribution to the variance of the variables of each IPO. An IPO's contribution to the variance of a given variable is the squared difference between the mean of the variable and its realization for the IPO considered. We repeat the tests from Table 9, Panel A, using these contribution to the variance variables.[32] If the aftermarket characteristics of book-built IPOs are less variable than those of auctions, the coefficient on the bookbuilding dummy variable will be negative.

In Table 9, Panel B, none of the coefficients of the bookbuilding dummy variable is significantly negative at standard levels. This finding suggests that the aftermarket performance of book-built IPOs, whether measured by stock performance, liquidity, or subsequent equity issues, is not less

[32] For these tests, we eliminate Nouveau Marché offerings, which are presumably intrinsically riskier than Second Marché IPOs.

Table 9
IPO valuation, stock performance, liquidity, and SEO activity of book-built versus auctioned IPOs

Panel A: Dependent variables are IPO valuation, stock performance, liquidity, and SEO activity variables

	Dependent variable					
Explanatory variables	Book-to-market	One-year performance	Log(volume)	Spread	Number of SEOs	Log(amount raised)
Exchange	0.173***	−0.115	−0.073	−0.004	−1.474***	0.151
	(5.13)	(−0.85)	(−0.50)	(−1.16)	(−3.44)	(0.23)
Log(market capitalization)	—	−0.017	0.862***	−0.002	−0.004	0.630**
		(−0.28)	(12.04)	(−1.36)	(−0.02)	(2.45)
Initial return	—	0.319*	1.348***	−0.013***	0.577	0.173
		(1.86)	(7.47)	(−3.89)	(1.65)	(0.39)
Bookbuilding	0.128***	−0.054	0.872***	−0.015	−0.547	0.528
Constant	(3.49)	(−0.31)	(5.42)	(−1.32)	(−1.08)	(0.76)
Number of observations	−0.174	0.578	−7.112	−9.457	−0.151	9.921
	201	204	141	141	204	59

Table 9

Panel B: Dependent variables are the IPOs' contribution to variance of stock performance, liquidity, and SEO activity variables

	Dependent variable				
Explanatory variables	One-year performance	Log(volume)	Spread	Number of SEOs	Log(amount raised)
Log(market capitalization)	−0.198	0.303	0.0007	0.243	1.645
Initial return	(−1.53)	(0.75)	(0.39)	(0.79)	(1.44)
	−0.400	0.920	−0.0001	−0.147	−3.973**
	(−1.53)	(0.76)	(−1.34)	(−0.36)	(−2.01)
Bookbuilding	−0.182	1.308	−0.0003	−0.534	1.052
	(−0.88)	(1.35)	(−0.78)	(−0.68)	(0.46)
Constant	4.955	−0.417	0.0002	−2.649	−18.291
Number of observations	143	98	98	143	27

Panel A present regressions of market value, liquidity, and secondary equity offerings on controls and the *Bookbuilding* dummy variable. The model used is a treatment effect model (except in column 5, in which the dependent variable is a count variable and the model used is a Poisson model with endogenous switching). The treatment is the choice of IPO procedure. In the first stage, the dependent variable is the *bookbuilding* dummy. The independent variables are *Log*(*market capitalization*) and *Shares in the public*, the fraction of the company's shares owned by the public after the IPO, equal to the total number of shares sold in the offering divided by the total number of shares outstanding after the IPO. In the second stage, the dependent variables are *book-to-market*, where market capitalization is calculated at the end of the tenth trading day (column 1); *One-year performance*, calculated from the tenth trading day after the IPO as a buy-and-hold return, adjusted using size and book-to-market portfolios (column 2); *Log*(*volume*), equal to the natural logarithm of the average daily trading volume in the year following the IPO (column 3); *Spread*, the average daily bid–ask spread in percent of the mid-price in the year following the IPO (column 4); *Number of SEOs*, the number of seasoned equity offerings in the five-year period following the IPO (column 5); and *Log(amount raised)*, the natural logarithm of the total amount raised in equity in the five-year period following the IPO for firms with at least one SEO in this period (column 6). The independent variables are *Exchange*, a variable equal to 1 for Second Marché IPOs and 0 for Nouveau Marché IPOs; *Log(market capitalization); Initial return,* the percentage difference between the IPO price and the closing price at the end of the tenth trading day; and the *bookbuilding* dummy variable. The IPO year and industry dummy variables are used as control variables, but their coefficients are not reported. Only results of the second-stage regression are presented.

Panel B presents similar regressions to those presented in Panel A, except that the dependent variable is the IPOs' contribution to the variance of the variable. For each observation (i.e., for each IPO), it is the squared difference between the mean of the variable and its realization for the IPO considered.

z-Statistics are in parenthesis.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

variable than that of auctions,[33] possibly because the riskiest firms self-select and choose bookbuilding instead of an auction to reduce the risk of their IPO. However, summary statistics suggest this possibility is unlikely; on Second Marché, book-built IPOs typically operate in the same industries as auctions, and they are larger, older firms than those of auctions.

[33] For this analysis to be complete, we would need to know the rates of withdrawal of book-built versus auctioned IPOs. We were unable to obtain these data, but anecdotal evidence suggests that book-built IPOs are as likely to be withdrawn as auctions.

Overall, the two alternative theories are not supported by the data. Another limitation of these theories is that they do not help us answer our central question: Why has the auction mechanism disappeared? Indeed, none of these theories predicts that bookbuilding will *always* be preferred to an auction. Consider, for instance, the information coordination theory. Even though using bookbuilding allows issuers to reduce the risk of their IPOs, some low-risk issuers that have little to gain from the information coordination provided by bookbuilding will still prefer to use the cheaper auction mechanism. On the contrary, the analyst hype story, together with the analyst lust hypothesis proposed by Loughran and Ritter (2004) (which argues that issuers' perceived importance of analyst coverage increased in the 1990s), is consistent with the observed disappearance of auction mechanisms in France and other countries.

6. Conclusion

Two facts appear indisputable. First, bookbuilding as a selling procedure for IPOs has captured most of the market share in most important global equity financing markets in the past decade. Second, and not inconsequentially, bookbuilding is by far the most costly procedure available in terms of direct fees and indirect initial underpricing. Together, these points beg an important question of what benefits issuers must believe they are receiving for paying extra. The answer is not obvious at first blush.

Our evidence supports the claim that in France, where bookbuilding and auctions were equally popular for much of the 1990s, underwriters and issuers had a noncontractual arrangement in which bookbuilding underwriters promoted the issuing company through more positive research coverage. Not only were the lead underwriters involved, but unaffiliated analysts were as well. We document that analysts at unaffiliated investment banks also were more likely to promote a book-built issue if they stood to gain shares in future deals from the bookbuilding underwriter.

We find no evidence that the extra compensation paid to bookbuilding underwriters has any other significant consequences for the issuer. Book-built IPOs are no more likely to have longer-term higher returns relative to auctioned shares following positive recommendations. In other words, in the long run, investors appear able to disentangle analysts' and their banks' incentives in book-built IPOs. Moreover, even though book-built IPOs have higher aftermarket liquidity, it does not translate into higher valuation or better long-term performance. We cannot rule out the possibility that some companies choose bookbuilding because they anticipate (and fear) low post-IPO analyst coverage. If that were the case, those firms that chose bookbuilding might have had an even lower level of aftermarket liquidity had they chosen to go public through an auction.

Thus, from the issuers' point of view, the main significant difference between the bookbuilding and auction mechanisms seems to be the more abundant and more generous analyst coverage they enjoy when they choose bookbuilding. Therefore, we conclude that the demise of auctions can be explained by the concurrence of this difference in analyst coverage and an increase in the issuers' perceived importance of analyst coverage in the 1990s.

References

Aggarwal, R. K., L., Krigman, and K., Womack, 2002, "Strategic IPO underpricing, information momentum, and lockup expiration selling," *Journal of Financial Economics*, 66, 105–137.

Benveniste, L., and P., Spindt, 1989, "How investment bankers determine the offer price and allocation of new issues," *Journal of Financial Economics*, 24, 343–361.

Benveniste, L., and W., Wilhelm, 1990, "A comparative analysis of IPO proceeds under alternative regulatory regimes," *Journal of Financial Economics*, 28, 173–207.

Biais, B., and A. M., Faugeron-Crouzet, 2002, "IPO auctions: English, dutch,. . ., French, and internet," *Journal of Financial Intermediation*, 11, 9–36.

Biais, B., P., Bossaert, and J. C., Rochet, 2002, "An optimal IPO mechanism," *Review of Economic Studies*, 69, 999–1017.

Bradley, D., B., Jordan, and J., Ritter, 2003, "The quiet period goes out with a bang," *Journal of Finance*, 58, 1–36.

Bradley, D., B. Jordan, and J. Ritter, 2004, *Analyst Behavior Following IPOs: The 'Bubble Period' Evidence,"*, working paper, University of Florida.

Chemmanur, T. J., and H. Liu, 2004, "How should a firm go public?" *A Dynamic Model of the Choice Between Fixed-price Offerings and Auctions in IPOs and Privatizations*, working paper, Boston College.

Cliff, M. T., and D. J., Denis, 2003, "Do IPO firms purchase analyst coverage with underpricing?" *Journal of Finance*, 59, 2791–2901.

Derrien, F., and K. L., Womack, 2003, "Auctions vs. book-building and the control of underpricing in hot IPO markets," *Review of Financial Studies*, 16, 31–61.

Dunbar, C. G., 2000, "Factors affecting investment bank initial public offering market share," *Journal of Financial Economics*, 55, 3–41.

Ellis, K., R., Michaely, and M., O'Hara, 2000, "When the underwriter is the market maker: An examination of after-market trading in IPOs," *Journal of Finance*, 55, 1039–1074.

Greene, W. H., 2003, *Econometric Analysis*, Prentice Hall, Upper Saddle River, New Jersey.

Huber, P. J., 1967, "The behavior of maximum likelihood estimates under non-standard conditions,", in *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*, University of California Press, Berkeley, California, 221–233.

James, C., and J. Karceski, 2006, "Strength of analyst coverage following IPOs," *Journal of Financial Economics*, 82(1), 1–34.

Kahneman, D., and D., Lovallo, 1993, "Timid choices and bold forecasts: A cognitive perspective on risk taking," *Management Science*, 39, 17–31.

Kaneko, T., and R. H., Pettway, 2003, "Auctions versus book building of Japanese IPOs," *Pacific-Basin Finance Journal*, 11, 439–462.

Krigman, L., W., Shaw, and K. L., Womack, 2001, "Why do firms switch underwriters?" *Journal of Financial Economics*, 60, 245–284.

Kutsuna, K., and R., Smith, 2004, "Why does book-building drive out auction methods of IPO issuance? Evidence from Japan," *Review of Financial Studies*, 17(4), 1129–1166.

Ljungqvist, A., T., Jenkinson, and W., Wilhelm, 2003, "Global integration in primary equity markets: the role of U.S. banks and U.S. investors," *Review of Financial Studies*, 16(1), 63–99.

Loughran, T., and J., Ritter, 2004, "Why has IPO underpricing changed over time?" *Financial Management*, 33(3), 5–37.

Michaely, R., and K. L., Womack, 1999, "Conflicts of interest and the credibility of underwriter analyst recommendations," *Review of Financial Studies*, 12, 653–686.

Miranda, A., 2004, "FIML estimation of an endogenous switching model for count data," *The Stata Journal*, 4, 40–49.

Rajan, R., and H., Servaes, 1997, "Analyst following of initial public offerings," *Journal of Finance*, 52, 507–530.

Sherman, A., 2000, "IPOs and long-term relationships: an advantage to book-building," *Review of Financial Studies*, 13, 697–714.

Sherman, A., 2005, "Global trends in IPO methods: Book building versus auctions with endogenous entry," *Journal of Financial Economics*, 78, 615–649.

Terza, J. V., 1998, "Estimating count data models with endogenous switching: Sample selection and endogenous treatment effects," *Journal of Econometrics*, 84, 129–154.

Womack, K. L., 1996, "Do brokerage analysts' recommendations have investment value?" *Journal of Finance*, 51, 137–157.

Wooldridge, J. W., 2002, *Econometric Analysis of Cross-section and Panel Data*, MIT press, Boston, Massachusetts.