

Product Market Advertising and New Equity Issues

Abstract

We analyze the interaction between a firm's product market advertising and its corporate financing decisions. We consider a firm which faces asymmetric information in both the product and financial markets, and which needs to raise external financing to fund its growth opportunity (new project). Any product market advertising undertaken by the firm is visible to the financial market as well. In equilibrium, the firm uses a combination of product market advertising, equity underpricing, and underfinancing (raising a smaller amount of external capital than the full information optimum) to convey its true product quality and the intrinsic value of its projects to consumers and investors. The following two predictions arise from our theoretical analysis for the relationship between product market advertising and equity underpricing around new equity issues. First, firms will choose a higher level of product market advertising when they are planning to issue new equity, compared to situations where they have no immediate plans to do so. Second, product market advertising and equity underpricing will be substitutes for a firm issuing new equity. We empirically test the above two predictions and find supporting evidence in the context of firms making initial public offerings (IPOs) and seasoned equity offerings (SEOs).

1 Introduction

The role of the underpricing of initial public offerings (IPOs) in signaling firm insiders' private information to the equity market has been extensively analyzed (see, e.g., Allen and Faulhaber (1989) or Welch (1989)). However, recently, some authors have questioned whether underpricing is the most efficient way to signal firm value, and have raised the possibility that it may be more efficient for firms to use other signals around new equity issues. For example, Ritter and Welch (2002) comment in their review of the IPO literature: "On theoretical grounds, however, it is unclear why underpricing is a more efficient signal than, say, ... advertising." Advertising is a particularly interesting signaling alternative to underpricing, since there is some anecdotal evidence that, in practice, some managers may indeed attempt to convey their firm's intrinsic value to the financial market making use of product market advertising (particularly in the context of an upcoming IPO). Consider, for example, the following quote from an article in the *Wall Street Journal* ("In Web Firms' Ad Blitz, an Eye on Wall Street," August 19, 1999): "As they plaster ads everywhere consumers might turn, companies are hoping to catch investors' eyes too...businesses are often as interested in selling stock as in selling products; a high voltage advertising spree could serve as a critical prelude to an initial public offering."¹ Of course, whether these and similar anecdotes reflect the special situation, during a special time period, of only a few companies (e.g., internet firms going public during the bubble period), or whether they reflect the general situation of firms making equity issues (either an IPO or a seasoned equity offering (SEO)), is an empirical question which has been unanswered so far in the literature.

The objective of this paper is to explore how the extent of product market advertising undertaken by a firm may affect (and be affected by) the prospect of an upcoming new equity issue. The economic environment that we analyze is a setting where insiders of a firm, with information about its intrinsic value superior to outsiders, raise external financing to fund its positive net present value project by making a new equity issue. We address several related questions in the above setting. First, how will a firm choose the extent of its product market advertising in a setting where this advertising is visible to the financial market as well as the product market?

¹ Another article, in the *Boston Globe* ("Internet Firms Bet on Super Bowl Ads to Reach Investors, Consumers," January 23, 2000), deals with television advertising during the Super Bowl. We quote: "Hoping to impress Wall Street as well as fans, advertisers with names such as Pets.com, Lifeminders.com, and Ourbeginning.com will pony up at least \$2.2 million for each 30 second slot on next Sunday's football game. Skip Pile, of Pile and Co., a Boston firm that helps companies hire ad agencies, offers the following appraisal: 'A Super Bowl ad can legitimize a brand among multiple constituencies: the company's employees, venture capitalists, the investment community, and lastly, the target audience of football fans.'"

Second, will the equilibrium level of advertising chosen by a firm be different in situations where the firm plans to make a public offering of new equity (either an IPO or an SEO) compared to a situation where it has no immediate plans to make such an offering of equity or other financial assets?² Third, of three alternative signals easily available to firm insiders, namely, underpricing, advertising, or “underfinancing” (raising a smaller amount of equity than the optimal amount in a full information setting), under what conditions will each signal be employed (either individually, or in combination with the other signals)?³ In particular, are advertising and underpricing substitutes for a firm in the context of new equity issues? While our primary objective in this paper is to answer the above questions empirically, we first briefly develop a theoretical analysis that generates testable hypotheses which we subsequently test in this paper. In particular, we empirically document how firms alter the extent of their advertising in the context of an upcoming new equity issue, and how the extent of advertising relates to the extent of underpricing in IPOs as well as SEOs.

We consider a firm that has an existing product, an ongoing project, and a growth opportunity (new project). Firm insiders have private information not only about the quality of the firm’s products, but also about the true value of its projects: in other words, the firm faces asymmetric information in both the product and financial markets. While the firm has some internal capital available, this capital is not adequate to cover both the investment required in its ongoing project and to fund its growth opportunity. The firm therefore needs to raise external financing for investment by making a new equity issue. We assume that any product market advertising undertaken by the firm is visible to financial market investors as well.

In the above setting, product market advertising can be thought of as playing two different roles. The first role played by advertising is that of signaling quality to the product market, thereby allowing consumers to price the firm’s products correctly in equilibrium.⁴ In our setting, however, product market advertising plays a second role: that of signaling the true value of a firm’s projects to potential stock market investors, thus allowing them to price the firm’s equity correctly in equilibrium. Since a firm’s product quality and the value

² For concreteness, we will present much of our theoretical analysis in the context of a private firm raising external capital by making an IPO of equity. However, our analysis goes through with minor modifications for the case of a publicly traded firm making a seasoned issue of equity or other information-sensitive financial assets. Our theory therefore has implications for these situations as well, and we will test the implications of our model not only for IPOs, but also for SEOs.

³ If a firm underfinances, it is forced to underinvest in its growth opportunity. Further, even though outsiders may not be able to directly observe the investment level chosen by a firm, they can infer its investment level by observing the amount of external capital raised by it. Thus, underfinancing and underinvestment are equivalent signals in our setting.

⁴ This product market role of advertising in our analysis is similar to the role played by advertising in the industrial organization literature, which has long argued that product market advertising plays an important role in conveying information about product quality to consumers (see, e.g., Nelson (1974), Kihlstrom and Riordan (1984), or Milgrom and Roberts (1986)).

of its projects may not be perfectly correlated, an outsider (consumer or potential investor) who knows only the true quality of a firm's existing product cannot perfectly infer the true value of its projects; conversely, an outsider who knows only the true value of its projects cannot infer existing product quality perfectly. However, the firm need not use product market advertising alone as a signal, either to the product market or to the financial market: in a setting where the firm interacts with the equity market as well as the product market, it can also signal by underpricing equity in its new equity issue, or by underfinancing.

In equilibrium, the firm uses the least-cost combination of the above three signals to convey its product quality as well as project value to outsiders. The equilibrium choice of signaling mix by the firm depends on the extent of asymmetric information facing the firm and the internal capital available to it. Consider first the case where the extent of asymmetric information facing the firm is relatively small. In this case, firms with superior quality products and higher intrinsic value projects (which we refer to as higher type firms) will use underfinancing alone as a signal, since, by itself, underfinancing is a less costly signal for the higher type firm to use than either advertising or underpricing. While underfinancing requires the higher type firm to scale back its investment in its growth opportunity, the cost of this underinvestment is partially offset by the reduced dilution in insiders' equity holdings (which results from its raising a smaller amount of external financing).⁵ Therefore, if the extent of underfinancing required to deter mimicking by lower type firms (those with either inferior products, lower intrinsic value projects, or both) is small enough that the higher type firm has to sacrifice investment only in the less productive range of its growth opportunity, then it can be shown that the firm will use only underfinancing as a signal.

Consider now the case where the extent of asymmetric information facing the firm is more severe, so that, if the firm were to use only underfinancing as a signal, the reduction in investment required would be significant enough that the firm would have to sacrifice investment in the higher productivity ranges of its growth opportunity. In this case, the cost of signaling by underfinancing alone becomes prohibitive, and the higher type firm can lower its aggregate signaling cost by adding either advertising, underpricing, or both, to its signaling mix. The firm's choice between advertising and underpricing as the signal to add to underfinancing depends upon the internal capital available to it prior to the equity issue. In order to advertise, the higher type firm needs to cut

⁵ By dilution, we refer to the fact that when a firm sells equity at a lower price, insiders have to give up a greater share of the firm's equity to new investors in return for external financing. If the firm raises only a smaller amount of external financing, this dilution in insiders' equity holdings will be smaller.

back on investment in its ongoing project, thereby reducing firm value and diluting insiders' equity holdings. If the internal capital available to the firm is large enough that only investment in the lower productivity ranges of the ongoing project has to be sacrificed to fund the required amount of advertising, then it can be shown that the firm will add only advertising to the signaling mix. If, however, the internal capital available to the firm is smaller, so that the firm has to sacrifice investment even in the higher productivity ranges of its ongoing project to undertake the required amount of advertising, then minimizing the signaling cost involves the firm adding both advertising and IPO underpricing to the signaling mix, thus using all three signals to convey its true type to outsiders.⁶

Our paper is the first in the literature to analyze how product market advertising can serve as a signal to the financial market in the context of new equity issues. It is also the first to study the interaction between product market advertising and underpricing in the context of either IPOs or SEOs, and the conditions under which various combinations of advertising and underpricing will be employed by firms to signal their private information. Thus, we provide insight into the ongoing debate in the IPO literature (mentioned earlier) regarding the efficiency of using underpricing as a signal. Our analysis indicates that it is indeed efficient for firms which are financially constrained to include both underpricing and advertising in their signaling mix.⁷ Our paper makes an additional contribution by demonstrating how underpricing can allow the firm to signal quality more effectively to the product market by reducing the amount of advertising required.

Two testable predictions emerge from our theoretical analysis for product market advertising in the context of new equity issues, as well for equity underpricing (IPOs or SEOs). The first prediction is that firms will choose a higher level of product market advertising when they are planning to issue new equity compared to

⁶ The relative cost of underfinancing, advertising, and underpricing as signals depends upon how expensive it is for the higher type firm to undertake each activity, relative to the cost to lower type firms undertaking the same activity to a similar extent (i.e., their cost of mimicking). When the extent of asymmetric information facing the firm is relatively small, underfinancing will be used alone as a signal, since the cost of a given extent of underfinancing is lower for a higher type firm compared to the same cost for a lower type firm which seeks to mimic it. In contrast, if a higher type firm funds advertising by cutting back only on investment in the lower productivity ranges of its ongoing project, then the cost of advertising for the higher type firm will be similar in magnitude to the cost for a lower type firm which seeks to mimic it. Thus, advertising alone will be a costlier signal compared to underfinancing in our setting. Finally, for underpricing alone to serve as a signal, the higher type firm has to price equity in its IPO below the intrinsic value of the equity of the lower type firm (since, otherwise, the lower type would not incur any cost from mimicking). Given this, the cost to a higher type firm of diluting insiders' equity holdings arising from underpricing will always be greater than the cost to a lower type firm which seeks to mimic the higher type firm. This means that underpricing alone will be a costlier signal than either underfinancing or advertising.

⁷ The existing literature (e.g., Allen and Faulhaber (1989) and Welch (1989)) has demonstrated that underpricing can signal insiders' private information about firm value to the financial market. In this literature, IPO underpricing works as a signal only because insiders price equity in the IPO in anticipation of a second round of financing subsequent to the IPO and the possibility of true firm value being revealed exogenously between the two rounds of financing. In contrast to the above literature, here IPO underpricing serves as a signal in the context of a one-shot equity offering.

situations where they have no immediate plans to sell new equity. The second prediction is that, in the context of a new equity issue, product market advertising and equity underpricing are substitutes: the greater the extent of product market advertising, the lower the extent of underpricing.

We test the above two predictions, using advertising (and other product market) data as well as the financial market data from firms making new equity issues. In particular, we study two different samples of firms making new equity issues: a sample of firms going public (IPOs) and a sample of firms making seasoned equity offerings (SEOs). We test the first prediction by studying the change in a firm's advertising level in response to its plan to issue new equity in the financial market. In this test, we first compare a firm's advertising level in its IPO or SEO year with its advertising level in non-IPO and non-SEO years (i.e., in years when the firm had no immediate plans to make an equity offering). We find that a firm's advertising expenditures in its IPO or SEO year are greater than those in its non-IPO and non-SEO years, even after controlling for product market considerations. In other words, in the five year span around the equity issue year (i.e., from two years before the equity issue to two years after), the peak advertising level is reached in the year of a new equity issue. We also construct a matching sample of non-equity issuing firms, both for our IPO as well as for our SEO sample, using the matching algorithm of Loughran and Ritter (1997). We find that a firm's advertising expenditures in its IPO year or SEO year are higher than the advertising expenditures of its matching firm. In contrast to the case in IPO and SEO years, the advertising expenditures of the firms in our IPO and SEO samples in non-IPO and non-SEO years (respectively) are generally similar to the advertising expenditures of their matching firms. Thus, our findings are consistent with the first prediction above, since they confirm that firms indeed increase their product market advertising in the years when they plan to issue new equity. They also suggest that such increases are indeed related to firms' decisions to issue new equity, rather than being driven by product market considerations.

We test the second prediction by studying the substitution effect between advertising and underpricing for firms making IPOs and SEOs. In addition to an OLS regression analysis, we also present results from seemingly unrelated regressions (SURE) to address any potential simultaneity issues involved in a firm's choice of advertising expenditures and the pricing of its new equity.⁸ Consistent with the second prediction discussed

⁸ To further address the endogeneity and simultaneity issues, we have tried other econometric techniques such as two-stage least square regressions (2SLS) and three-stage least square regressions (3SLS). Our results from both the 2SLS and 3SLS techniques are similar to those presented in the paper. They are available in the working paper version of the article.

above, we find that product market advertising and underpricing are indeed substitutes: controlling for various other relevant variables, we find that the extent of underpricing in a firm’s IPO or SEO is smaller as the extent of its product market advertising is greater.

Our finding that advertising and underpricing are substitutes is particularly interesting in light of behavioral notions that product market advertising around a firm’s IPO might generate a media “buzz” among retail investors regarding the IPO, inducing them to buy the IPO firm’s equity at any price on the first trading day (thus generating excess demand for it and further driving up its price). However, such behavioral arguments would predict that a higher level of advertising around a firm’s IPO will be associated with larger initial returns (underpricing) for its equity, which is directly contradicted by our empirical finding that advertising and underpricing are substitutes.⁹ In sum, while our theoretical analysis predicts that the product market advertising of a firm affects its equity issues in important ways even in an equity market dominated by rational investors, our empirical results indicate that these effects are indeed consistent with the predictions of our theory. In other words, firm managers do indeed take into account the effect of their product market advertising on the financial market when making their advertising and corporate financing decisions.

Our research is related to several strands in the theoretical corporate finance literature. Apart from the theoretical literature (discussed earlier) demonstrating the use of underpricing to signal insiders’ private information at the time of an IPO, this paper is perhaps most closely related to the theoretical literature on the interaction between the product and financial markets in the context of IPOs: see, e.g., Bhattacharya and Ritter (1983), who point out that one cost of going public arises from the need to release information in a firm’s IPO prospectus (since this information may be used adversely by competitors in the product market); and Maksimovic and Pichler (2001)), who study how the possibility of such an information release to product market competitors may affect the timing of a firm’s going public decision.¹⁰ Stoughton, Wong, and Zechner (2001) argue that the decision of a firm to go public may serve to signal high quality to the product market.¹¹ None of the above papers, however, address the role of product market advertising in IPOs (or SEOs); neither

⁹ We thank an anonymous referee for pointing out these behavioral arguments, and the fact that our empirical findings contradict the implications of these arguments.

¹⁰ The broader theoretical literature on the going public decision (e.g., Chemmanur and Fulghieri (1999)), and the broader theoretical literature on IPO underpricing (e.g., Chemmanur (1993)) are also indirectly related to this paper.

¹¹ Our paper is also indirectly related to the literature on product and financial market interactions outside the context of equity issues: see, e.g., Gertner, Gibbons, and Scharfstein (1988), who analyze an informed firm’s choice of financial structure when the financing contract is observed not only by the capital market but also by a competing firm.

do they study how product market advertising interacts with equity underpricing.

Our research is also related to the large empirical literature on IPO underpricing (see Ritter and Welch (2002) for a review).¹² Two empirical papers related to ours are Grullon, Kanatas, and Weston (2004) and Demers and Lewellen (2003). The former paper documents that firms with a greater level of product market advertising have a significantly larger number of both individual and institutional investors in their equity, lower bid-ask spreads (indicating a smaller amount of adverse selection in the market for these stocks), smaller price impacts, and greater market depth. In contrast to the above paper, which focuses on the behavior of stock market *investors* in response to increased product market advertising by a firm, our empirical analysis focuses on how *firms* choose their advertising levels in the context of a new equity issue. However, our results suggest that product market advertising plays a role in conveying firm insiders' private information to equity market investors, and are thereby consistent with the findings in Grullon, Kanatas, and Weston (2004) on the reduction in adverse selection associated with a greater level of product market advertising. Demers and Lewellen (2003) document that, for a sample of internet firms, IPO underpricing is associated with a post-IPO increase in their website traffic. Unlike their paper, where the focus is on how internet firms' IPOs affect their product market demand, our empirical analysis focuses on how the prospect of a firm's IPO affects its choice of advertising level, and how its choice of product market advertising affects underpricing in its IPO.

The rest of this paper is organized as follows. In order to provide a theoretical framework for our empirical analysis and develop testable hypotheses, section 2 and section 3 briefly develop a theoretical analysis of a firm's choice of signaling mix in a setting of asymmetric information in the product and financial markets. Section 4 discusses the sample selection and the econometric methodology used in our empirical analysis. Section 5 presents our empirical results for IPO firms and section 6 presents our empirical results for SEO firms. Section 7 discusses potential alternative explanations that could explain some of our empirical findings. Section 8 concludes.

2 Theoretical Framework

In order to provide a theoretical context for our empirical tests and develop testable hypotheses, we will now briefly describe the essential features of the economic environment studied here. Consider an entrepreneur

¹² There is also a substantial empirical literature demonstrating the underpricing of SEOs, which is also indirectly related to this paper. See, e.g., Corwin (2003).

owning a private firm, which has available to it a certain amount of internal capital. For concreteness, we will conduct our discussion in the context of a firm going public, though our results apply to firms making SEOs as well. Our model has four dates (time 0, 1, 2, and 3). At time 0, the firm has an existing positive net present value project which it plans to fund using (part of) this internal capital.¹³ The firm has an existing product, which it plans to sell in the product market in two rounds of sales, at time 1 and time 2, respectively.¹⁴

A new positive net present value project (growth opportunity) becomes available to the firm at time 1. In order to fund this new project, the firm has the opportunity to go public at time 1. If it chooses to go public, outsiders come to know this decision right away. The firm chooses the price of the equity to be issued in the IPO, as well as the amount of the external capital to be raised in the IPO, at this time. If the firm goes public at time 1, it invests the external capital raised, in addition to any amount left over from its internal capital, in the new project. If, however, the firm does not go public at time 1, it invests only the left-over capital in the new project at time 1.

At time 0, the firm chooses the amount of investment to be made in the existing project, as well as the amount of product market advertising to undertake. Any advertising the firm undertakes in the product market will be observable not only by potential consumers in the product market, but also by potential investors in the financial market.

All cash flows to the firm are realized at time 3 including the cash flows from the two rounds of sales of the firm's product and that from the firms' investments in its two projects. We assume that all agents (entrepreneurs, consumers, and investors) are risk-neutral, and that the risk-free rate of return is zero. The sequence of events is depicted in figure 1.

2.1 Information Structure in the Product and Financial Markets

Both the product and financial markets are characterized by asymmetric information. In particular, we assume that there are products of two quality levels in the product market: Superior and Poor, with the quality of superior products being higher than that of poor products. We also assume that there are two kinds of

¹³ Our assumption of an existing project merely serves to capture the notion that the firm has other ongoing business activities for which it also requires funding. In other words, the assumption of an existing project allows us to endogenize the fact that the firm has an opportunity cost of internal funding, with this opportunity cost increasing as the amount of internal financing available is smaller. All our results go through even in the absence of an existing project if we make the above assumption about the opportunity cost of the firm's internal financing exogenously.

¹⁴ We assume that issuing equity is the only source of external financing, so that firms cannot fund their projects by issuing debt or other financial assets.

Table 1: Distribution of Initial Public Offerings and Seasoned Equity Offerings across Years. Panels A and B of this table present the number of firms, and the mean and median amounts of IPO and SEO proceeds each year, first day return, and advertising expenditures for a sample of firms going public and a sample of firms issuing seasoned equity, respectively, between 1990 and 2000.

Panel A: A sample of firms going public

Year	Number of firms	IPO Amount (million \$)		First Day Return		Advertising Exp. (million \$)	
		Mean	Median	Mean	Median	Mean	Median
1990	41	19.83	18.10	0.09	0.04	1.88	0.16
1991	99	28.47	25.00	0.15	0.11	1.82	0.32
1992	115	38.89	24.80	0.11	0.04	1.98	0.22
1993	154	35.65	26.50	0.15	0.09	1.57	0.42
1994	47	30.05	22.00	0.12	0.09	1.74	0.65
1995	46	33.23	22.65	0.17	0.10	6.20	0.98
1996	85	34.01	27.00	0.20	0.13	2.34	0.60
1997	74	55.43	31.95	0.17	0.11	9.29	1.15
1998	51	45.30	32.40	0.22	0.08	5.51	1.00
1999	115	84.83	51.20	0.66	0.35	6.86	1.41
2000	57	109.39	60.00	0.51	0.29	4.78	1.13
Total	884	47.32	29.90	0.24	0.10	3.76	0.63

Panel B: A sample of firms issuing seasoned equity

Year	Number of firms	SEO Amount (million \$)		First Day Return		Advertising Exp. (million \$)	
		Mean	Median	Mean	Median	Mean	Median
1990	31	53.55	29.70	0.014	0.005	6.97	0.00
1991	93	105.52	34.10	0.023	0.010	44.07	0.43
1992	98	87.15	37.95	0.022	0.010	30.13	0.10
1993	121	87.21	44.80	0.025	0.016	17.50	0.15
1994	29	69.30	42.60	0.024	0.009	19.90	4.52
1995	38	115.54	52.95	0.015	0.000	112.56	3.19
1996	40	82.65	49.20	0.030	0.021	11.83	4.05
1997	36	99.42	65.35	0.027	0.004	73.65	4.03
1998	41	132.98	84.50	0.020	0.010	69.28	10.50
1999	74	214.41	123.65	0.020	0.004	37.59	9.56
2000	62	308.95	169.65	0.033	0.027	34.89	1.75
Total	663	127.19	56.00	0.024	0.010	37.93	2.11

Table 2: Summary Statistics of IPO Sample and SEO Sample. This table presents sample statistics of all variables used in the paper. RET is the percentage change from the offer price to the first day closing price. ADV_t/SLS_t and ADV_t/SLS_{t-1} are advertising expenditures in the IPO or SEO year t scaled by sales in year t or year $t-1$. $LOGSLS_t$ is the log of sales revenue. $\Delta LOGSLS$ is the change in LOGSLS from year $t-1$ to year t . AMOUNT is the amount of money raised from IPO or SEO scaled by the book value of assets in year $t-1$. SYND is a dummy variable equal to one if underwriting is syndicated. $SIZE_{t-1}$ is the log of the book value of assets. $EBIT_{t-1}$ is EBIT scaled by the book value of assets. TECH is a dummy equal to one for a high technology firm. RANK is the proxy for underwriter ranks. EXCHANGE is a dummy equal to one if a firm is listed in NYSE or AMEX. VENTURE is a dummy equal to one if the issuer is backed by venture capitalists. AGE is the difference between the IPO year and the founding year. LDR_{t-1} is the ratio of long-term debt to the book value of assets. MRUN is the compounded return of an equally-weighted market index during 60 days prior to the IPO or SEO offer date. BUBBLE is a dummy equal to one if the year of IPO or SEO is 1999 or 2000. NIPO is the log of the numbers of IPO deals. FSALE is the fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. MB_{t-1} is the ratio of the market value to the book value of assets. REVISION is calculated as the IPO or SEO offer price minus the mid point of filing range scaled by the IPO or SEO offer price.

	(1) IPO Sample			(2) SEO Sample		
	# of Obs.	Mean	Median	# of Obs.	Mean	Median
RET	884	0.244	0.100	663	0.024	0.010
ADV_t/SLS_t	884	0.059	0.019	663	0.031	0.015
ADV_t/SLS_{t-1}	730	0.379	0.029	602	0.053	0.022
<i>Variables related to IPO or SEO in financial market</i>						
VENTURE	869	0.459	0	663	0.053	0
SYND	884	0.868	1	663	0.848	1
RANK	866	7.033	8	649	8.022	8.425
EXCHANGE	884	0.092	0	663	0.474	0
AMOUNT	730	3.720	1.549	602	0.718	0.364
BUBBLE	884	0.195	0	663	0.205	0
NIPO	884	6.216	6.232	663	6.176	6.232
MRUN	884	0.101	0.098	651	0.116	0.105
REVISION	873	0.370	0.000	663	-0.074	-0.044
<i>Variables related to advertising in product market</i>						
ADV_{t-1}/SLS_{t-1}	719	0.049	0.019	602	0.030	0.015
$\Delta LOGSLS$	730	0.521	0.355	602	0.418	0.287
$LOGSLS_t$	884	3.454	3.589	663	5.195	5.204
FSALE	730	0.011	0.002	602	0.050	0.012
<i>Other variables</i>						
TECH	884	0.381	0	663	0.253	0
AGE	861	13.235	7			
$SIZE_{t-1}$	730	2.875	2.837	602	4.965	4.804
MB_{t-1}				542	3.151	1.966
LDR_{t-1}	730	0.262	0.097	601	0.234	0.177
$EBIT_{t-1}$	728	-0.056	0.124	602	0.075	0.123

Table 3: Comparison of Firms Issuing New Equity and Matching Firms. This table presents sample statistics of selected variables for firms issuing new equity, their matching firms, and the pair-wise difference between issuing firms and their matching firms. Panel A is for IPO sample and panel B is for SEO sample. A matching firm is constructed for each IPO firm and each SEO firm following the method in Loughran and Ritter (1997), by industry, size, and sales revenue at the new equity issue year t . $EBIT_{t-1}$ is EBIT scaled by the book value of assets. MB_{t-1} is the ratio of the market value to the book value of assets. $LOGSLS_t$ is the log of sales revenue in the year of new equity issue. $\Delta LOGSLS$ is the change in LOGSLS from year $t-1$ to year t . $FSALE$ is the fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. Tests on means and medians are based on t-tests and Wilcoxon tests, respectively. *, **, and *** in superscript indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively, using two-tailed tests.

	# of Obs.	Mean	Median	# of Obs.	Mean	Median	# of Obs.	Mean	Median
<i>Panel A: Selected firm characteristics of IPO firms and their matching firms</i>									
	(1) IPO Sample			(2) Matching firms for IPO Sample			(3) IPO firms - Matching firms		
MB_{t-1}				818	1.715	1.272			
$EBIT_{t-1}$	728	-0.056	0.124	834	0.069	0.106	720	-0.120***	-0.007***
$\Delta LOGSLS$	730	0.521	0.355	837	0.052	0.064	724	0.470***	0.313***
$LOGSLS_t$	884	3.454	3.589	884	3.404	3.569	884	0.0492***	0.002***
$FSALE_{t-1}$	837	0.014	0.002	730	0.011	0.002	724	-0.002***	-0.000***
<i>Panel B: Selected firm characteristics of SEO firms and their matching firms</i>									
	(1) SEO Sample			(2) Matching firms for SEO Sample			(3) SEO firms - Matching firms		
MB_{t-1}	542	3.151	1.966	663	1.532	1.248	663	1.208***	0.717***
$EBIT_{t-1}$	602	0.075	0.123	624	0.113	0.120	579	-0.033***	-0.001
$\Delta LOGSLS$	602	0.418	0.287	624	0.053	0.055	579	0.353***	0.248***
$LOGSLS_t$	663	5.195	5.204	663	4.907	4.947	663	0.288***	0.100***
$FSALE_{t-1}$	602	0.050	0.012	624	0.044	0.011	579	0.005***	0.000

Table 4: Summary Statistics of the Change in Advertising Expenditures between the IPO Year and non-IPO Years: Univariate Results. Panel A reports the levels of advertising intensity in the five years around the IPO year and the difference in advertising intensity between non-IPO years and the IPO year. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. A matching firm is constructed for each IPO firm following the method in Loughran and Ritter (1997), by industry, size, and sales revenue in the IPO year t . Panel B reports the change in advertising intensity for IPO firms surviving both years $t-1$ and $t-2$ and their matching firms. Panel C reports the change in advertising intensity for IPO firms surviving both years $t+1$ and $t+2$ and their matching firms. Panel D reports the change in advertising intensity for IPO firms surviving the pre-change year (surviving firms) and IPO firms not reporting advertising intensity in the pre-change year (entering firms). Panel E reports the change in advertising intensity for IPO firms surviving the subsequent year (surviving firms) and IPO firms not reporting advertising intensity in the subsequent year (exiting firms). Panel F reports $ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$ for subsamples of matching firms and the differences between subsamples. We create subsamples based on whether a matching firm's $EBIT_{t-1}$, calculated as EBIT scaled by the book value of assets, is higher or lower than the sample median (high and low $EBIT_{t-1}$) and on whether a matching firm's MB_{t-1} , the ratio of the market value to the book value of assets, is higher or lower than the sample median (high and low MB_{t-1}). Tests on means and medians are based on t -tests and Wilcoxon tests, respectively. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively, using two-tailed tests.

	# of obs.	Mean	Median	# of obs.	Mean	Median	# of obs.	Mean	Median
Panel A: Pair-wise difference in advertising intensity: IPO firms versus matching firms									
	(1) IPO firms			(2) Matching firms			(3) IPO firms - Matching firms		
ADV_{t-2}/SLS_{t-2}	189	0.055	0.021	693	0.043	0.023	189	0.014**	-0.002
ADV_{t-1}/SLS_{t-1}	719	0.049	0.019	837	0.040	0.021	719	0.009**	-0.003
ADV_t/SLS_t	884	0.059	0.019	884	0.039	0.021	884	0.020***	-0.003
ADV_{t-1}/SLS_{t-1}	459	0.049	0.019	749	0.039	0.023	459	0.011***	-0.003
ADV_{t+2}/SLS_{t+2}	376	0.036	0.018	636	0.038	0.023	376	-0.001	-0.003
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	189	0.012**	0.000	693	-0.004***	-0.001***	189	0.012**	0.001
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	719	0.008***	0.000**	837	-0.001	0.000	719	0.009***	0.001***
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	459	0.007***	0.000**	749	0.001	0.000	459	0.005*	0.000
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	376	0.022***	0.001***	636	0.002*	0.001***	376	0.020***	-0.001
Panel B: Change in advertising intensity, IPO firms and matching firms surviving two years prior to the IPO year									
	(1) IPO firms			(2) Matching firms			(3) IPO firms - Matching firms		
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	189	0.012**	0.000	189	-0.001	-0.001	189	0.012**	0.001
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	189	0.011***	0.000*	189	0.000	0.000	189	0.011***	0.001
Panel C: Change in advertising intensity: IPO firms and matching firms surviving two years subsequent to the IPO year									
	(1) IPO firms			(2) Matching firms			(3) IPO firms - Matching firms		
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	275	0.007**	0.000*	275	0.000	0.000***	275	0.007***	0.000
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	275	0.021***	0.001***	275	0.001	0.001	275	0.019**	0.000
Panel D: Change in advertising intensity: IPO firms entering the sample versus IPO firms surviving the past year									
	(1) Entering IPO firms			(2) Surviving IPO firms			(3) Entering - Surviving firms		
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	530	0.006**	0.000	189	0.011***	0.000*	719	-0.004	0.000
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	78	0.004	0.000	381	0.007***	0.000***	459	-0.003	0.000
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	64	0.019*	0.000	312	0.023***	0.001***	376	-0.003	0.000
Panel E: Change in advertising intensity: IPO firms exiting the sample versus IPO firms surviving the subsequent year									
	(1) Exiting IPO firms			(2) Surviving IPO firms			(3) Exiting - Surviving firms		
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	88	0.006	0.000	101	0.017**	0.000	189	-0.011	0.000
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	338	0.009***	0.000	381	0.006**	0.000**	719	0.003	0.000
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	184	0.006	0.000	275	0.007**	0.000*	459	-0.001	0.000
Panel F: Change in advertising intensity of matching firms: $ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$									
	Matching firms			Matching firms			Matching firms		
Firms with high MB_{t-1}	409	-0.001	0.000	Firms with high $EBIT_{t-1}$	417	0.002**	0.001***		
Firms with low MB_{t-1}	409	-0.001	-0.000	Firms with low $EBIT_{t-1}$	417	-0.004***	-0.001***		
Diff. (high MB_{t-1} -Low MB_{t-1})	818	0.000	0.001	Diff. (high $EBIT_{t-1}$ -Low $EBIT_{t-1}$)	834	0.006***	0.002***		

Table 5: Change in Advertising Expenditures from Non-IPO Years to IPO Year: Multivariate Results.

This table reports the results from the regressions on advertising intensity of IPO firms in the IPO year and non-IPO years. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. The non-IPO year in regressions (1) and (5) is the year two years prior to the IPO year, i.e., year $t-2$. It is the year one year prior to the IPO year, i.e., year $t-1$, in regressions (2) and (6); one year subsequent to the IPO year, i.e., year $t+1$, in regressions (3) and (7); and two years subsequent to the IPO year, i.e., year $t+2$, in regressions (4) and (8). The independent variables consist of *ISSUE*, a dummy variable equal to one if a firm is in its IPO year and zero if a firm is in the non-IPO year; $1/SLS$, where *SLS* is sales revenue in the current year; $\Delta LOGSLS$, the change in the log of sales revenue from the past year to the current year; lagged advertising intensity; and *FSALE*, fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. Regressions (1) to (4) use samples with unbalanced panels. Regressions (5) to (8) use samples with balanced panels. We run a random effect model for all the regressions. Standard errors are reported in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively.

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>	<u>(7)</u>	<u>(8)</u>
Benchmark Year	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$
Constant	0.045*** [0.006]	0.004 [0.004]	0.010*** [0.003]	-0.005 [0.004]	0.050*** [0.007]	0.007 [0.006]	0.008** [0.003]	0.001 [0.004]
ISSUE	0.010* [0.005]	0.008** [0.003]	0.009*** [0.003]	0.012*** [0.004]	0.014** [0.006]	0.010** [0.004]	0.011*** [0.003]	0.014*** [0.005]
1/SLS	0.015*** [0.002]	0.010*** [0.002]	0.013*** [0.002]	0.013*** [0.002]	0.032*** [0.008]	0.016** [0.007]	0.006** [0.002]	0.006** [0.003]
$\Delta LOGSLS$		0.007** [0.003]	0.005* [0.003]	0.014*** [0.003]		0.009 [0.007]	0 [0.004]	0.011** [0.005]
FSALE		-0.142 [0.097]	-0.164* [0.090]	-0.046 [0.082]		-0.139 [0.134]	-0.101 [0.092]	0.001 [0.098]
Lagged Adv. Intensity		0.829*** [0.026]	0.691*** [0.023]	0.814*** [0.023]		0.819*** [0.039]	0.752*** [0.023]	0.657*** [0.033]
Balanced Panel	No	No	No	No	Yes	Yes	Yes	Yes
# of Obs.	1,073	908	1,178	970	378	378	762	422
# of Films	884	719	797	759	189	189	381	211
R²	0.04	0.68	0.67	0.67	0.05	0.73	0.69	0.54

Table 6: Change in Advertising Expenditures of Matching Firms for the IPO Sample: Multivariate Results. This table reports the results from regressions on advertising intensity of the matching firms in the IPO year t and the non-IPO years. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. A matching firm is constructed for each IPO firm following the method in Loughran and Ritter (1997), by industry, size, and sales revenue in the IPO year t . The sample in regressions (1) and (5) consists of matching firms in year t and year $t-2$. The sample in regressions (2) and (6) consists of year $t-1$ and year t . The sample in regressions (3) and (7) consists of year $t+1$ and year t ; and the sample in regressions (4) and (8) consists of year $t+2$ and year t . The independent variables consist of ISSUE, a dummy variable equal to one if the corresponding dependent variable is measured in its IPO year and zero if measured in the non-IPO year; $1/SLS$, where SLS is sales revenue in the current year; $\Delta LOGSLS$, the change in the log of sales revenue from the past year to the current year; lagged advertising intensity; and $FSALE$, fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. Regressions (1) to (4) use samples with unbalanced panels. Regressions (5) to (8) use samples with balanced panels. We run a random effect model for all the regressions. Standard errors are reported in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively.

Benchmark Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$
Constant	0.042*** [0.002]	0.007*** [0.001]	0.008*** [0.001]	0.006*** [0.001]	0.042*** [0.002]	0.007*** [0.001]	0.008*** [0.001]	0.005*** [0.001]
ISSUE	-0.004*** [0.001]	0.001 [0.001]	0 [0.001]	0 [0.001]	-0.004*** [0.001]	0.002 [0.001]	0.001 [0.001]	0 [0.001]
1/SLS	0.001*** [0.000]	-0.001*** [0.000]	-0.003*** [0.000]	0 [0.000]	0.001** [0.000]	-0.001*** [0.000]	-0.004*** [0.000]	0 [0.000]
$\Delta LOGSLS$		-0.002 [0.001]	-0.001 [0.001]	0.002 [0.001]		-0.002 [0.002]	-0.002 [0.001]	-0.003* [0.002]
FSALE		-0.005 [0.016]	-0.03 [0.019]	-0.005 [0.017]		-0.007 [0.015]	-0.034* [0.020]	-0.006 [0.017]
Lagged Adv. Intensity		0.775*** [0.013]	0.789*** [0.014]	0.818*** [0.013]		0.789*** [0.013]	0.800*** [0.015]	0.869*** [0.013]
Balanced Panel	No	No	No	No	Yes	Yes	Yes	Yes
# of Obs.	1,577	1,520	1,585	1,400	1,386	1,366	1,418	1,066
# of Films	884	837	876	867	693	683	709	533
R²	0.01	0.77	0.73	0.76	0.01	0.78	0.73	0.80

Table 7: Substitution Effect between IPO Underpricing and Product Market Advertising. This table presents the results from ordinary least square (OLS) and seemingly unrelated (SURE) regressions in the full sample and the restricted sample of firms with data available in both year t and year $t-2$. The dependent variable is RET, calculated as the first day equity return, or ADV_t/SLS_{t-1} , calculated as the amount of advertising expenditures in the IPO year t divided by sales revenue in year $t-1$. The independent variables include ADV_{t-1}/SLS_{t-1} ; $\Delta LOGSLS$, change in the log of sales revenue from year $t-1$ to year t ; AMOUNT, the amount of money raised from IPO scaled by the book value of assets in year $t-1$; SYND, a dummy equal to one if underwriting is syndicated; $SIZE_{t-1}$, the log of the book value of assets; $EBIT_{t-1}$, EBIT scaled by the book value of assets; TECH, a dummy equal to one for a high technology firm; RANK, the proxy for underwriter ranks; VENTURE, a dummy equal to one if the issuer is backed by venture capitalists; EXCHANGE, a dummy equal to one if a firm is listed in NYSE or AMEX; LDR_{t-1} , the ratio of long-term debt to the book value of assets; FSALE, fraction of a firm's sales revenue to industry sales revenue in year $t-1$; BUBBLE, a dummy equal to one for years 1999 and 2000; MRUN is the compounded return of an equally-weighted market index 60 days prior to the IPO date; NIPO, the log of the number of IPO deals; AGE, the difference between the IPO year and the founding year, and REVISION, the difference between IPO price and the mid point of filing range scaled by IPO price. Standard errors are provided in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively. Coefficients of EXCHANGE, RANK, VENTURE, AGE, FSALE, and MRUN are insignificant and not reported.

Variables	(1) OLS with the full sample (I)		(2) OLS with the full sample (II)		(3) OLS with the limited sample		(4) SURE with the full sample	
	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}
Constant	-0.077 [0.169]	-0.382*** [0.061]	0.061 [0.176]	-0.313*** [0.114]	-0.505 [0.573]	-0.521*** [0.137]	0.079 [0.174]	-0.209* [0.113]
ADV_t/SLS_{t-1}	-0.015** [0.006]		-0.021*** [0.007]		-0.054** [0.024]		-0.027*** [0.007]	
RET		-0.489*** [0.145]		-0.562*** [0.152]		-0.438*** [0.134]		-0.780*** [0.152]
SYND	-0.072** [0.030]		-0.061** [0.031]		-0.055 [0.067]		-0.052* [0.031]	
AMOUNT	0.003** [0.001]		0.003 [0.002]		0.011* [0.006]		0.002 [0.002]	
REVISION	-0.199*** [0.019]		-0.198*** [0.019]		-0.223*** [0.043]		0.199*** [0.027]	
BUBBLE	0.239*** [0.024]		0.195*** [0.027]		0.132*** [0.050]		0.028 [0.028]	
NIPO	0.051* [0.027]		0.029 [0.028]		0.126 [0.095]		-0.198*** [0.019]	
ADV_{t-1}/SLS_{t-1}		7.380*** [0.497]		7.470*** [0.553]		5.565*** [0.521]		7.146*** [0.543]
$\Delta LOGSLS$		0.814*** [0.069]		0.782*** [0.074]		0.334*** [0.109]		0.709*** [0.073]
$1/SLS_{t-1}$		0.023*** [0.006]		0.022*** [0.006]		2.118*** [0.280]		0.023*** [0.006]
TECH			0.062*** [0.021]	-0.044 [0.090]	0.073 [0.052]	0.044 [0.099]	0.061*** [0.021]	-0.033 [0.089]
$SIZE_{t-1}$			0.005 [0.011]	0.001 [0.033]	0.009 [0.022]	0.060* [0.033]	0.003 [0.011]	-0.004 [0.033]
$EBIT_{t-1}$			-0.034 [0.026]	-0.137 [0.111]	-0.092 [0.062]	0.062 [0.115]	-0.041 [0.025]	-0.214* [0.110]
LDR_{t-1}			-0.113*** [0.038]	-0.293* [0.165]	-0.159* [0.081]	-0.075 [0.155]	-0.118*** [0.037]	-0.315* [0.162]
# of Obs. (R^2)	706 (0.301)	719 (0.467)	682 (0.339)	698 (0.476)	177 (0.421)	187 (0.657)	675 (0.337)	675 (0.462)

Table 8: Summary Statistics of the Change in Advertising Expenditures between the SEO Year and Non-SEO Years: Univariate Results. Panel A reports the level and the change of advertising intensity in the five years around the SEO year. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. A matching firm is constructed for each SEO firm following the method in Loughran and Ritter (1997), by industry, size, and sales revenue in the SEO year t . Panel B reports the change in advertising intensity for SEO firms surviving both years $t-1$ and $t-2$ and their matching firms. Panel C reports the change in advertising intensity for SEO firms surviving both years $t+1$ and $t+2$ and their matching firms. Panel D reports the change in advertising intensity for SEO firms surviving the past year (surviving firms) and SEO firms not reporting advertising in the past year (entering firms). Panel E reports the change in advertising intensity for SEO firms surviving the subsequent year (surviving firms) and SEO firms not reporting advertising in the subsequent year (exiting firms). Panel F reports $ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$ for subsamples of matching firms and the difference between subsamples. We create subsamples by comparing a matching firm's $EBIT_{t-1}$, calculated as EBIT scaled by the book value of assets, with the sample median (high and low $EBIT_{t-1}$) and by comparing a matching firm's MB_{t-1} , the ratio of the market value to the book value of assets, with the sample median (high and low MB_{t-1}). Tests on means and medians are based on t -tests and Wilcoxon tests, respectively. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively, using two-tailed tests.

	# of obs.	Mean	Median	# of obs.	Mean	Median	# of obs.	Mean	Median
Panel A: Pair-wise difference in advertising intensity: SEO firms versus matching firms									
	(1) SEO firms			(2) Matching firms			(3) SEO firms - Matching firms		
ADV_{t-2}/SLS_{t-2}	311	0.025	0.014	540	0.026	0.014	311	0.001	0.000
ADV_{t-1}/SLS_{t-1}	286	0.023	0.013	587	0.026	0.014	286	-0.001	0.000
ADV_t/SLS_t	663	0.031	0.015	663	0.025	0.013	663	0.005***	0.000**
ADV_{t-1}/SLS_{t-1}	256	0.031	0.014	535	0.025	0.015	256	0.005	0.000
ADV_{t+2}/SLS_{t+2}	191	0.024	0.015	417	0.028	0.017	191	-0.003	0.000
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	311	0.003*	0.000	540	-0.001**	0.000***	311	0.004**	0.000**
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	286	0.001*	0.000	587	-0.001	0.000***	286	0.002**	0.000**
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	256	-0.003**	0.000***	535	0.001***	0.000***	256	-0.004***	-0.001***
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	191	0.006***	0.000**	417	0.001	0.000	191	0.005**	0.000
Panel B: Change in advertising intensity: SEO firms and matching firms surviving two years prior to the SEO year									
	(1) SEO firms			(2) Matching firms			(3) SEO firms - Matching firms		
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	177	0.002	0.000	177	-0.002*	0.000***	177	0.003*	0.000**
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	177	0.001	0.000	177	-0.001	0.000***	177	0.002*	0.000
Panel C: Change in advertising intensity: SEO firms and matching firms surviving two years subsequent to the SEO year									
	(1) SEO firms			(2) Matching firms			(3) SEO firms - Matching firms		
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	137	-0.004***	0.000**	137	0.002*	0.000**	137	-0.006***	-0.001***
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	137	0.004**	0.000	137	0.002	0.000**	137	0.002	0.000
Panel D: Change in advertising intensity: SEO firms entering the sample versus SEO firms surviving the past year									
	(1) Entering SEO firms			(2) Surviving SEO firms			(3) Entering - Surviving firms		
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	109	0.002*	0.000	177	0.001	0.000	286	0.002	0.000
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	108	-0.003	-0.000***	148	-0.002*	0.000	256	-0.001	0.000
$ADV_t/SLS_t - ADV_{t+2}/SLS_{t+2}$	91	0.010***	0.001*	100	0.003**	0.000	191	0.007*	0.001
Panel E: Change in advertising intensity: SEO firms exiting the sample versus SEO firms surviving the subsequent year									
	(1) Exiting SEO firms			(2) Surviving SEO firms			(3) Exiting - Surviving firms		
$ADV_t/SLS_t - ADV_{t-2}/SLS_{t-2}$	166	0.001	0.000	146	0.004*	0.000	311	-0.003	0.000
$ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$	138	0.001	0.000	148	0.002**	0.000	286	-0.001	0.000
$ADV_t/SLS_t - ADV_{t+1}/SLS_{t+1}$	119	-0.002	0.000*	137	-0.004***	0.000**	256	0.002	0.000
Panel F: Change in advertising intensity of matching firms: $ADV_t/SLS_t - ADV_{t-1}/SLS_{t-1}$									
	Matching firms			Matching firms					
Firms with high MB_{t-1}	277	-0.000	-0.000*	Firms with high $EBIT_{t-1}$	286	-0.000	0.000		
Firms with low MB_{t-1}	296	-0.001**	-0.000***	Firms with low $EBIT_{t-1}$	301	-0.001	-0.000***		
Diff. (high MB_{t-1}-Low MB_{t-1})	573	-0.001	0.000	Diff. (high $EBIT_{t-1}$-Low $EBIT_{t-1}$)	587	0.001	0.001***		

Table 9: Change in Advertising Expenditures from Non-SEO Years to SEO Year: Multivariate Results.

This table reports the results from the regressions on advertising intensity of SEO firms in the SEO year and non-SEO years. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. The non-SEO year in regressions (1) and (5) is the year two years prior to the SEO year, i.e., year $t-2$. It is the year one year prior to the SEO year, i.e., year $t-1$, in regressions (2) and (6); one year subsequent to the SEO year, i.e., year $t+1$, in regressions (3) and (7); and two years subsequent to the SEO year, i.e., year $t+2$, in regressions (4) and (8). The independent variables consist of ISSUE, a dummy variable equal to one if the corresponding dependent variable is measured in its SEO year and zero if measured in the non-SEO year; $1/SLS$, where SLS is sales revenue in the current year; $\Delta LOGSLS$, the change in the log of sales revenue from the past year to the current year; lagged advertising intensity; and $FSALE$, fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. Regressions (1) to (4) use samples with unbalanced panels. Regressions (5) to (8) use samples with balanced panels. We run a random effect model for all the regressions. Standard errors are reported in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Benchmark Year	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$
Constant	0.002 [0.002]	0.001 [0.001]	0.004** [0.002]	-0.002 [0.002]	0 [0.001]	0.002 [0.001]	0.003** [0.001]	0 [0.002]
ISSUE	0.004*** [0.001]	0.002** [0.001]	0.001 [0.001]	0.005*** [0.001]	0.004*** [0.001]	0.002* [0.001]	0.002 [0.001]	0.005*** [0.002]
1/SLS	0.008 [0.016]	0.058*** [0.021]	0.025 [0.022]	0.001 [0.027]	-0.038** [0.017]	0.025 [0.020]	0 [0.019]	0.019 [0.030]
$\Delta LOGSLS$	-0.002 [0.002]	0 [0.002]	-0.011*** [0.002]	0.004 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.018*** [0.003]	-0.003 [0.003]
FSALE	0.001 [0.010]	0.002 [0.010]	-0.003 [0.012]	0.015 [0.010]	0.002 [0.007]	0.001 [0.009]	-0.005 [0.009]	-0.002 [0.008]
Lagged Advertising Intensity	0.820*** [0.024]	0.881*** [0.024]	0.998*** [0.025]	0.846*** [0.025]	0.899*** [0.020]	0.884*** [0.022]	1.083*** [0.023]	0.902*** [0.029]
Balanced Panel	No	No	No	No	Yes	Yes	Yes	Yes
# of Obs.	488	529	542	473	276	486	296	198
# of Films	350	286	394	374	138	243	148	99
R^2	0.81	0.86	0.84	0.77	0.88	0.87	0.92	0.84

Table 10: Change in Advertising Expenditures of Matching Firms for the SEO Sample: Multivariate Results. This table reports the results from regressions on advertising intensity of the matching firms in the SEO year t and non-SEO years. Advertising intensity is advertising expenditures scaled by sales revenue in the same year. A matching firm is constructed for each SEO firm following the method in Loughran and Ritter (1997), by industry, size, and sales revenue in the SEO year t . The sample in regressions (1) and (5) consists of matching firms in year $t-2$ and year t . The sample in regressions (2) and (6) consists of year $t-1$ and year t . The sample in regressions (3) and (7) consists of year $t+1$ and year t ; and the sample in regressions (4) and (8) consists of year $t+2$ and year t . The independent variables consist of ISSUE, a dummy variable equal to one if the corresponding dependent variable is measured in the SEO year and zero if measured in the non-SEO year; 1/SLS, where SLS is sales revenue in the past year; ΔLOGSLS , the change in the log of sales revenue from the past year to the current year; lagged advertising intensity; and FSALE, fraction of a firm's sales revenue to industry sales revenue in the past year. Industries are identified using two-digit SIC codes. Regressions (1) to (4) use samples with unbalanced panels. Regressions (5) to (8) use samples with balanced panels. We run a random effect model for all the regressions. Standard errors are reported in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively.

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>	<u>(7)</u>	<u>(8)</u>
Benchmark Year	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$	Year $t-2$	Year $t-1$	Year $t+1$	Year $t+2$
Constant	0.000 <i>[0.001]</i>	0.001** <i>[0.001]</i>	0.001* <i>[0.001]</i>	0.001** <i>[0.001]</i>	0.000 <i>[0.001]</i>	0.001 <i>[0.001]</i>	0.000 <i>[0.002]</i>	0.001 <i>[0.002]</i>
ISSUE	0.000 <i>[0.001]</i>	0.001 <i>[0.001]</i>	0 <i>[0.001]</i>	-0.001 <i>[0.001]</i>	0.000 <i>[0.001]</i>	0.001 <i>[0.001]</i>	0.002 <i>[0.002]</i>	0.000 <i>[0.002]</i>
1/SLS	0.016*** <i>[0.005]</i>	0.010* <i>[0.006]</i>	0.013* <i>[0.007]</i>	0.024*** <i>[0.007]</i>	0.011 <i>[0.010]</i>	0.005 <i>[0.008]</i>	0.082*** <i>[0.022]</i>	0.060*** <i>[0.019]</i>
ΔLOGSLS	-0.003** <i>[0.001]</i>	-0.005*** <i>[0.001]</i>	-0.003 <i>[0.002]</i>	-0.008*** <i>[0.002]</i>	-0.004 <i>[0.003]</i>	-0.007*** <i>[0.002]</i>	0.002 <i>[0.004]</i>	-0.002 <i>[0.005]</i>
FSALE	0.003 <i>[0.003]</i>	0.004 <i>[0.003]</i>	0.000 <i>[0.004]</i>	-0.001 <i>[0.004]</i>	0.000 <i>[0.006]</i>	0.000 <i>[0.005]</i>	-0.001 <i>[0.009]</i>	-0.001 <i>[0.010]</i>
Lagged Advertising Intensity	0.960*** <i>[0.010]</i>	0.893*** <i>[0.010]</i>	0.906*** <i>[0.011]</i>	0.943*** <i>[0.011]</i>	0.975*** <i>[0.021]</i>	0.875*** <i>[0.016]</i>	0.902*** <i>[0.027]</i>	0.869*** <i>[0.032]</i>
Balanced Panel	No	No	No	No	Yes	Yes	Yes	Yes
# of Obs.	1,012	1,120	998	998	296	418	260	252
# of Films	858	907	864	870	148	209	130	126
R²	0.9	0.9	0.89	0.88	0.88	0.9	0.87	0.76

Table 11: Test of Substitution Effect between SEO Underpricing and Product Market Advertising. This table presents the results from ordinary least square (OLS) and seemingly unrelated (SURE) regressions. The dependent variable is RET, the percentage change from the offer price to the first day closing price, or ADV_t/SLS_{t-1} , the amount of advertising expenditures in the SEO year t divided by sales in year $t-1$. The independent variables include ADV_{t-1}/SLS_{t-1} ; $1/SLS_{t-1}$; $\Delta LOGSLS$, change in the log of sales revenue from year $t-1$ to year t ; AMOUNT, the amount of money raised from SEO scaled by the book value of assets in year $t-1$; SYND, a dummy variable equal to one if the underwriting of a SEO is syndicated; $SIZE_{t-1}$, the log of the book value of assets; $EBIT_{t-1}$, EBIT scaled by the book value of assets; TECH, a dummy equal to one for a high technology firm; RANK, the proxy for underwriter ranks; EXCHANGE, a dummy equal to one if a firm is listed in NYSE or AMEX; MB_{t-1} , the ratio of the market value to the book value of assets; LDR_{t-1} , the ratio of long-term debt to the book value of assets; VENTURE, a dummy equal to one if the issuer is backed by venture capitalists; REVISION, the difference between SEO price and the mid point of filing range scaled by SEO price; MRUN, compounded returns of an equally-weighted market index during 60 days prior to the SEO issuing date; BUBBLE, a dummy equal to one if the SEO year is 1999 or 2000; NIPO, the log of the number of IPO deals; FSALE, fraction of a firm's sales revenue to industry sales revenue in the past year. Standard errors are provided in parentheses. *, **, and *** indicate significant difference from zero at the 10, 5, and 1 percent levels, respectively. Coefficients of EXCHANGE, TECH, SYND, MRUN, BUBBLE, MTOB, REVISION, and EXCHANGE are insignificant and not reported.

Variables	(1) OLS		(2) OLS		(3) SURE		(4) SURE	
	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}	RET	ADV_t/SLS_{t-1}
Constant	0.008 [0.038]	-0.010*** [0.003]	-0.014 [0.040]	-0.027*** [0.010]	0.008 [0.037]	-0.009*** [0.003]	-0.014 [0.039]	-0.026*** [0.010]
ADV_t/SLS_{t-1}	-0.056** [0.028]		-0.033 [0.030]		-0.073*** [0.028]		-0.041 [0.030]	
RET		-0.022 [0.038]		-0.002 [0.039]		-0.063* [0.038]		-0.016 [0.039]
RANK	-0.004*** [0.001]		-0.003* [0.002]		-0.004*** [0.001]		-0.003* [0.002]	
AMOUNT	0.005 [0.003]		0.004 [0.005]		0.005* [0.003]		0.004 [0.005]	
VENTURE	0.005 [0.009]		-0.007 [0.010]		0.005 [0.009]		-0.007 [0.010]	
NIPO	0.008 [0.006]		0.009 [0.006]		0.008 [0.006]		0.01 [0.006]	
ADV_{t-1}/SLS_{t-1}		1.422*** [0.046]		1.452*** [0.048]		1.428*** [0.047]		1.443*** [0.049]
$\Delta LOGSLS$		0.056*** [0.004]		0.048*** [0.005]		0.054*** [0.005]		0.045*** [0.005]
$1/SLS_{t-1}$		0.001 [0.024]		-0.022 [0.025]		0.003 [0.024]		-0.019 [0.025]
FSALE		-0.067** [0.028]		-0.042 [0.045]		-0.048* [0.028]		-0.046 [0.045]
$SIZE_{t-1}$			-0.001 [0.002]	0.004*** [0.001]			-0.001 [0.002]	0.004*** [0.001]
$EBIT_{t-1}$			-0.003 [0.014]	0.012 [0.015]			-0.003 [0.014]	0.008 [0.016]
LDR_{t-1}			0.01 [0.010]	-0.018** [0.009]			0.009 [0.010]	-0.018** [0.009]
# of Obs. (R^2)	584 (0.036)	602 (0.700)	530 (0.031)	541 (0.708)	584 (0.035)	584 (0.688)	530 (0.031)	530 (0.697)