Do Reputable Financial Intermediaries Help Firms in External Financial Markets? Effect of Auditor Reputation on SEO Transaction Costs

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I empirically investigate the differing certification effects of a firm employing financial intermediaries of varying reputation in external financial markets. Specifically, I use a treatment effects model to control for endogeneity in the selection of intermediary reputation, and I demonstrate that use of reputable auditors helps to mitigate transaction costs of seasoned equity offerings. This result is even stronger before the loss of reputational capital of an important intermediary (Arthur Andersen). My findings support the notion that firms may reduce negative impacts of informational frictions through their relations with reputable intermediaries, consistent with Diamond's (1989 and 1991) reputation argument.

INTRODUCTION

Informational problems are one of the main reasons for frictions that increase the cost of raising external funds for firms. One category of frictions is transaction costs. In particular, firms seek possible ways to assert the accuracy of the information they provide to investors and mitigate informational problems which increase transaction costs. One way to mitigate this friction is to exploit the effect of certification from reputable financial intermediaries. This paper examines whether firms' use of reputable financial intermediaries to certify firm information can help to reduce transaction costs of raising external funds. A firm's past performance conveys information about its current and future performance, and firms build reputation with their decisions and actions which accumulate credibility through time. Firms lacking reputation suffer from an adverse selection problem in accessing external finance (Chemmanur and Fulghieri (1994a) and (1994b)). However, firms lacking reputation can seek relationships with reputable intermediaries in order to earn more credibility and reduce informational problems (Diamond (1989)).[1] Reputational capital, which is not easy to earn or sustain, is an important asset in the financial markets. Market's trust to guarantees of financial institution is positively related to reputation of financial institution in terms of financial contracting (Boot et al. (1993)). Chemmanur and Fulghieri (1994a) endorse a reputation acquisition model for equity markets through the role of investment banks. A detailed and true empirical analysis of the impact of financial intermediaries on firms that seek external finance will show how powerful this impact for firms can be.

This study empirically investigates the differing certification effects of a firm employing financial intermediaries of varying reputation, and uses a treatment effects model to control for endogeneity in the selection of intermediary reputation. This paper shows that use of reputable financial intermediaries helps to reduce transaction costs in accessing external financial markets. This effect is economically large and statistically significant. After loss of reputational capital of one big intermediary (e.g. Arthur Andersen),

this effect becomes weaker whereas the effect is higher before the reputational loss scandal. My findings are consistent with Diamond's (1989 and 1991) reputation argument which suggests that firms lacking reputation use reputable intermediaries in reducing information asymmetry. This paper extends Diamond's work by showing magnitude of impact of financial intermediary reputation on firms in external financial markets in a well specified econometric analysis.

In my empirical analysis, I use auditors as a proxy for financial intermediaries in the seasoned equity offering (SEO) market. Auditors provide reports about accuracy of the financial information of a company and their opinion is valuable to investors. In particular, in explaining the role an auditor plays in an SEO, Fargher et al. (2005) state that the main duty of an auditor in SEOs is to confirm that a firm's financial statements meet legal requirements.[2] Specifically, I use a "Big5-status" auditor as a proxy for reputation of financial intermediaries in my empirical tests. The use of Big5-status auditor is a very common way to represent the reputation of auditors in the literature (DeAngelo (1981) among others) because these auditors have a large share of the market of auditing services and high prestige and are more likely to provide high quality service in return for the higher price that they charge for their services. Additionally, I use an intermediary dummy variable definition which I call Top N-1. This variable includes all the reputable auditors in my Big5-status definition except Arthur Andersen, which I treat separately in these analyses. Arthur Andersen contributed to a number of accounting scandals, the last which of was Enron in 2001. I use this variable to identify the impact of reputational loss on financial intermediary's certification.

Information asymmetry between the parties involved in an equity issuing process is a key factor in defining frictions in the issuance of equity (Myers and Majluf (1984), Rock (1986) and Beatty and Ritter (1986)).Therefore, the SEO market may provide a laboratory for researchers to investigate the effects of information asymmetry and transaction costs on firms (Beatty (1989) and Willenborg (1999) among others). Previous literature suggests that prestigious auditing firms can help to mitigate information asymmetry in IPOs through their information certification. These findings from previous studies motivate a similar analysis of financial intermediaries in SEOs.

After controlling for the endogeneity problem by using a treatment effects model in my empirical analysis, I quantify the value of the certification effect on investors' perception of informational problems by comparing transaction costs with and without certification of a reputable intermediary. Using a large sample of SEOs, I test two hypotheses: (i) Does the use of reputable auditors mitigate the SEO discount? And (ii) Does the use of reputable auditors reduce investment banking fees of SEOs? My empirical results show that use of a reputable financial intermediary mitigates SEO transaction costs by almost 5.3% for SEOs with high ranked underwriters. I use the close-to-offer return as a measure of the SEO discount and gross spread as percentage of offer price as a measure of investment banking fees.[3] Assuming an average SEO discount of 3.2% for the entire sample of SEOs, the effect is economically large. Later sections of this paper also suggest some cross sectional evidence for which firms the effect is stronger. In the subsample analysis for SEOs before the Arthur Andersen's reputational loss, my results suggest that the effect is higher and can go up to 6.5% lower SEO discount. However, the same effect after the Arthur Andersen scandal is about half the size of the effect before the scandal. In addition, the use of a reputable auditor is associated with 1% to 1.5% of offer price lower gross spread. This investment banking fees impact is about 20% of average gross spread of the sample. However, the result from investment banking fees is mixed and weaker compared to the SEO discount results.

A firm's financial intermediary choice is not exogenous. Prior literature tackles the endogeneity problem in an intermediary choice of firm in IPOs (Weber and Willenborg (2003) among others). For example, Weber and Willenborg (2003) use the Heckman adjustment for selectivity of auditor quality in their analysis of microcap IPOs. Hogan (1997) shows that tradeoff between cost and benefit of auditor quality is effective in firm's auditor choice in his IPO market analysis. Similarly, an SEO issuer does not exogenously make an auditor selection, where cost difference across auditor types is large (Hogan (1997)). Furthermore, differences in some SEO and firm characteristics variables (i.e. offer size, capital expenditures and asset tangibility) in this study are statistically significant based on intermediary choice. Because there is an endogeneity problem in the selection of intermediary reputation, I use a treatment

effects model to overcome this endogeneity problem when I test my hypotheses. The treatment in my analysis is the use of reputable financial intermediary. Prior literature does not address multiple potential endogeneity problems in the same empirical analysis framework. Similar to auditor choice, underwriter choice is also endogeneous (Menon and Williams (1991), Allen et al. (2005)). To address this point, I divide my sample into subsamples of SEOs with the same or very close underwriter rank. By doing so, I identify the causal impact of auditor choice within groups of firms choosing similar underwriters, and thereby I control for the potential endogeneity in underwriter choice of a firm too. By doing this, I overcome potential multiple endogeneity problems stemming from auditor and underwriter choices, providing more reliable results.

My paper contributes to the literature on the financial intermediary and firm relation in the following ways. The firm's use of a reputable intermediary helps firm to reduce informational problems, and thereby helps to reduce firm's costs in accessing external financing. The reputational scandal of financial intermediary suggests an undermined effect in reducing transaction costs associated with raising external funds. In addition, this paper controls for firm's endogenous choice of financial intermediary using a treatment effects model, and also addresses the potential multiple endogeneties in the same empirical analysis. The rest of this paper is organized as follows. The next section describes the data, sample selection and univariate results. The following section discusses the selection of intermediary reputation, endogeneity problems and the methodology used in this paper. Next, this paper presents and discusses empirical results as well as further empirical analysis. Last, this paper presents the conclusions.

DATA, SAMPLE SELECTION AND UNIVARIATE STATISTICS

Data and Sample Selection

The initial sample of this paper has observations of 3,648 seasoned equity offerings of U.S issuers listed on Securities Data Company (SDC) New Issue database over the period 1992-2006. The final sample of SEOs meets the following criteria: 1) excluding the SEOs which are not the common stocks by U.S. issuers listed on NYSE, NASDAQ, or AMEX, 2) excluding financial firms with SIC codes 6000-6999, 3) excluding SEOs with offer price lower than $5, 4) excluding the SEOs that have missing information on Compustat database or CRSP database in 150 days prior to issue day. Underwriter rank information comes from Jay Ritter's website. The final sample of SEOs consists of 1,881 SEOs. In this sample, I winsorize all the variables at 1% and 99% levels in order to eliminate the outlier effect and any potential data errors. As mentioned before, I divide my sample into two subsamples and do my empirical analysis within groups of firms choosing similar underwriters to overcome the potential endogeneity problem in underwriter choice. The underwriter rank variable is from Jay Ritter's website in which Ritter does minor adjustments on the Carter-Manaster ranking measure. The high ranked underwriter sample consists of SEOs whose underwriting rank is in the top two levels of out of the nine levels of ranking. This subsample has 1497 observations. The second subsample consists of SEOs with mid-level ranked underwriters. This subsample includes SEO issuers whose underwriting rank is from the three levels of ranking following my high ranked underwriter classification, and this subsample has 349 observations. The rest of the sample is classified under low-level ranked underwriters. I do not include 35 SEO observations with low-level ranked underwriters in the subsample analysis because treatment effects model does not allow implementing any analysis for samples with such small number of observations.

This paper defines Big5-status auditor dummy variable as a proxy for reputable financial intermediary and which takes value of 1 when the auditor is one of the Big5-status firms accepted in the literature and the industry, 0 otherwise. Big5-status definition is a common definition in literature when defining differences between big, prestigious auditors and the other auditors. "Big5-status" auditors actually includes top 6 or top 5 or top 4 audit firms in different time periods of my sample because the number of big reputable auditors changes due to the mergers, acquisitions and exits take place among these reputable auditors.[4] Top N-1 dummy variable includes all the reputable auditors in Big5-status definition except Arthur Andersen. Top N-1 dummy variable takes the value of one if Big5-status dummy variable is of one and the auditor is not Arthur Andersen, and takes value of zero otherwise.

Indirect costs of SEOs such as underpricing or discount are the subjects of many previous studies. Kim and Shin (2001) find the SEO discount increasing during the 1990s and the discount is at approximately 2% to 3%, consistent with empirical findings of this paper. In the Altinkilic and Hansen (2003) definition, SEO underpricing has two components which are the discount and the offer day return. The authors demonstrate that the SEO discount is lower when issuers have higher stock prices and lower stock return volatility. One of the dependent variables in my empirical analysis is the close-to-offer return. It is the ratio of offer price minus pre-issue day price to the pre-issue day where the offer price is from SDC and pre-issue day price is from CRSP. I employ this variable as a measure of SEO discount. More direct costs of SEOs can be seen in underwriting process. An important direct cost is gross spread. This paper's second dependent variable is named as gross spread in this paper's analysis. It is the gross spread divided by offer price, and it is from SDC database. This variable represents investment banking (or underwriting) fees in an SEO process. More detailed information of other variables used in my empirical analysis and the control variable descriptions are reported in the Appendix section.

Univariate Statistics

Table 1 reports mean, median, standard deviation, 5^{th} and 95^{th} percentile, and number of observations of the variables for empirical analysis. Table 1 displays comparative summary statistics for the entire sample based on the difference in intermediary reputation, where the difference stems from the choice of using a reputable financial intermediary (proxied by Big5-status variable). Furthermore, Table 1 shows the p-value for a difference of means test for each variable. The close-to-offer return has a mean value of -3.13% for firms that choose reputable intermediaries whereas other firms have -3.94% average close-to-offer returns. Difference of means test reports the difference as statistically significant. Recall that the interpretation of the close-to-offer return is as the following: higher close-to-offer return means lower SEO discount and vice versa. In addition, Figure 1 displays SEO discount whose measure is average close-offer return by year, and the figure shows some stable pattern which changes only between -2.5 % and -3.5 % (except the year 2000 when it is -4.8%). The different and high discount magnitude in year 2000 may depend on the dot.com bubble and IPOs in 1999 and 2000. Briefly, the univariate statistics suggest that firms that use reputable financial intermediaries experience lower SEO discount relative to the other firms.

Gross spread is another measure of SEO transaction costs. Companies hiring reputable intermediaries face average gross spread approximately 4.77% of offer price and other companies face average gross spread approximately 5.15% of offer price. The difference of means test has a p-value showing that this difference is statistically significant. Thus, univariate statistics imply that firms that use reputable financial intermediaries face lower underwriting fees than the others. Briefly, these univariate results on transaction costs difference motivate a further empirical analysis addressing this difference.

Other variables of Table 1 also point out some important results. For example, firms that work with reputable intermediaries have larger SEO offer sizes relative to the other SEO issuers. Difference of means test reports this difference as statistically significant at 1% level. This result implies that companies with big offer sizes may prefer to work with reputable financial intermediaries. Table 1 also reveals that capital expenditures, underwriter rank, share turnover, Nasdaq dummy, high tech firm dummy, low stock price dummy, low market capitalization dummy, high risk stock dummy, asset tangibility and NYSE dummy are statistically different between the companies that use reputable financial intermediaries and companies that do not. Taken together, all these differentials in variables increase the motivation for more detailed analysis of the effect of using reputable intermediaries on transaction costs.

TABLE 1
SUMMARY STATISTICS

Variable	Auditor	Mean	Median	Std. Dev.	5th %	95th %	N
Close-to-Offer Return	Non-Big5	-0.0394	-0.03	0.0447	-0.136	0.011	113
	Big5	-0.0313	-0.024	0.0411	-0.111	0.0257	1768
	p-value	(0.053)*					
G. Spread/Offer Price	Non-Big5	0.0515	0.053	0.0157	0.0185	0.0777	113
	Big5	0.0477	0.05	0.0125	0.0215	0.0619	1697
	p-value	(0.001)***					
Gross Proceeds (mil $)	Non-Big5	85.2	55.2	100.9	9.4	297.5	113
	Big5	148.1	80.8	233.7	16.4	506	1768
	p-value	(0.005)***					
Total Assets (mil $)	Non-Big5	789.5	145.8	2378.7	12.4	3554.8	113
	Big5	1211.2	217.9	3086.5	26.3	6314.1	1768
	p-value	1185.9	210.2	3049.7	24.2	5979	1881
Net Sales (mil $)	Non-Big5	615.5	128.1	1558.1	0.8	3421.2	113
	Big5	929.8	180.9	2402.1	5	5181	1767
	p-value	-0.17					
Leverage Ratio	Non-Big5	0.26	0.2	0.22	0	0.64	113
	Big5	0.25	0.22	0.23	0	0.66	1768
	p-value	-0.873					
Tobin's q	Non-Big5	2.7	2.07	2.13	1.04	6.5	112
	Big5	3.08	2.09	2.86	1.06	8.43	1745
	p-value	-0.174					
Capital Exp. / Tot.Assets	Non-Big5	0.1	0.04	0.12	0.01	0.4	113
	Big5	0.08	0.05	0.09	0.01	0.27	1768
	p-value	(0.006)***					
Underwriter Rank	Non-Big5	7.17	8.1	2.01	3.1	9.1	113
	Big5	8.22	8.1	2.2	5.1	9.1	1768
	p-value	(0.000)***					
Std. Dev. of Stock Ret.	Non-Big5	0.04	0.03	0.01	0.02	0.05	113
	Big5	0.04	0.03	0.02	0.01	0.07	176
	p-value	-0.957					
Share Turnover(mil)	Non-Big5	0.15	0.06	0.25	0.01	0.72	113
	Big5	0.25	0.09	0.47	0.01	0.98	1768
	p-value	(0.027)**					
Nasdaq	Non-Big5	0.71	1	0.46	0	1	113
	Big5	0.61	1	0.49	0	1	1746
	p-value	(0.000)***					
High Tech Firm	Non-Big5	0.2	0	0.4	0	1	113
	Big5	0.3	0	0.46	0	1	1768
	p-value	(0.023)**					
Low Stock Price	Non-Big5	0.39	0	0.49	0	1	113
	Big5	0.24	0	0.43	0	1	1768
	p-value	(0.000)***					
Low Market Cap.	Non-Big5	0.36	0	0.48	0	1	113
	Big5	0.22	0	0.42	0	1	1768
	p-value	(0.000)***					
High Risk Stock	Non-Big5	0.27	0	0.45	0	1	113
	Big5	0.26	0	0.44	0	1	1768
	p-value	-0.82					
Book-to-Market Value	Non-Big5	0.37	0.32	0.27	0.06	0.93	113
	Big5	0.34	0.28	0.27	0.03	0.82	1768
	p-value	-0.247					
Asset Tangibility	Non-Big5	0.005	0.004	0.004	0	0.014	113
	Big5	0.005	0.004	0.004	0.001	0.012	1768
	p-value	(0.052)*					
Credit rating	Non-Big5	0.2	0	0.4	0	1	113
	Big5	0.27	0	0.44	0	1	1768
	p-value	-0.131					

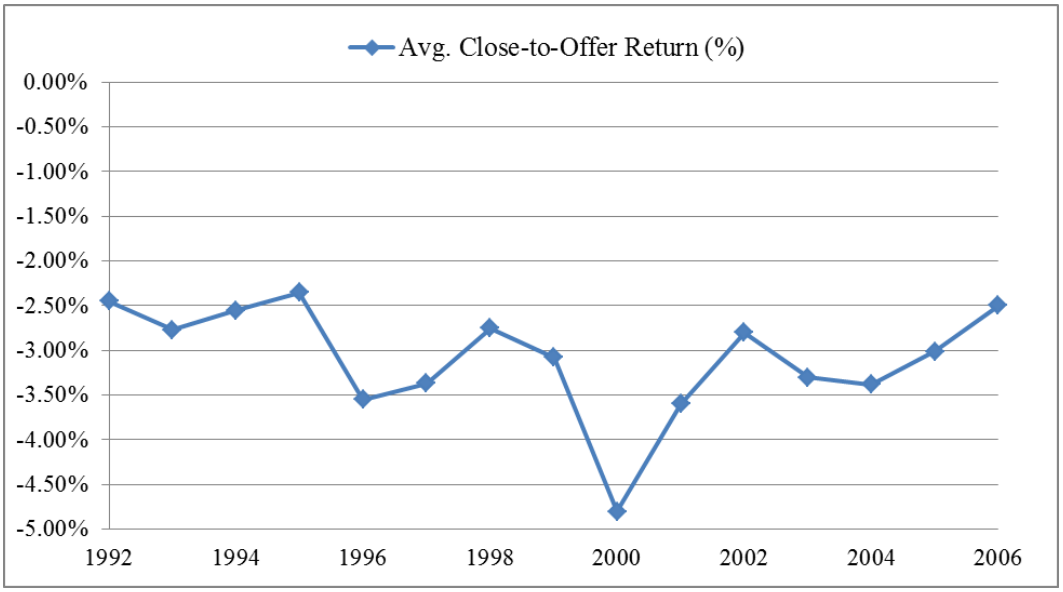
TABLE 1 cont.

Variable	Auditor	Mean	Median	Std. Dev.	5th %	95th %	N
NYSE	Non-Big5	0.25	0	0.43	0	1	113
	Big5	0.35	0	0.48	0	1	1768
	p-value	(0.026)**					

p-values are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%

Table 1 reports summary statistics for this paper's sample firms. The SEO sample consists of 1,881 SEO from 1992 to 2006. The sample of this paper consists of winsorized variables at 1% and 99% levels in order to eliminate the outlier effect and any potential data errors. Table 1 reports mean, median, standard deviation, 5th and 95th percentile, and number of observations for sample and sub-samples for each variable. Sub-samples are based on the use of Big5-status. Big5-status definition is based on whether SEO issuer firm hiring big auditing firm or not. This table also shows p-value for difference of means for each variable. Variable definitions are reported in the text and appendix. I report robust p-values in parentheses. (* significant at 10%; ** significant at 5%; *** significant at 1%).

FIGURE 1
AVERAGE CLOSE-TO-OFFER RETURN BY OFFER YEAR



This figure displays average close-to-offer return for a SEO by offer year for the years between from 1992 to 2006 for the sample. Note that the higher close-to-offer return means lower SEO discount and vice versa.

FINANCIAL INTERMEDIARY SELECTION AND METHODOLOGY

Selection of Auditor Reputation

Firms choose the auditor they would like to work with, so a firm's auditor choice is not exogenous. Previous studies (Menon and Williams (1991), Titman and Trueman (1986) and Hogan (1997) among others) that look at the relation between auditor and firm in security offerings also argue that auditor choice is endogenous. Specifically, Hogan (1997) uses a self selection method to see how firms choose auditors based on the cost/benefit tradeoff of auditor quality selection in the IPO market. Moreover, similarly in SEOs, firm characteristics may have an impact on any intermediary choice, a similar tradeoff

takes place in intermediary choice, and thereby there is selection bias problem. All these findings provide some evidence for that the use of OLS regression model introduces biased estimates because of the endogenous financial intermediary selection. Therefore, use of an OLS model is not expected to have reliable results, and therefore I use an average treatment effect model to eliminate the endogeneity problem.

Similar to auditor choice, underwriter choice also has a potential endogeneity problem. Allen et al. (2005) suggest that the client firm-bank relationship is endogenous. Recall that Menon and Williams (1991) report that investment bankers have preference to work with more credible auditors. Comparative statistics also supports this argument. Table 1 reports that underwriter's rank for SEO issuers hiring Big5-status auditors is higher than other SEO issuers. All these findings imply that underwriter choice is endogenous as well as the auditor choice or not. Therefore, in order to control for the potential endogeneity of underwriter choice, I examine the causal impact of auditor choice within subsamples of SEO issuers that work with similar ranked underwriter. Later, I apply the treatment effects model in each subsample. The appendix section of this paper presents more details on the treatments effects model of this paper. Overall, this paper overcomes the multiple endogeneity problems in the same empirical framework.

Auditor Selection Model

Now, I briefly discuss the probability of having treatment which is using reputable financial intermediary. Table 2 displays a probit model to predict the choice of hiring a reputable auditor in the analysis of SEO discount. This regression is equivalent to the prediction of having treatment regression (first regression of the Average Treatment Effect (ATE) model). All ATE models in this study use same variables, and obtain similar results. However, I do not report all of the results for brevity. Table 2 shows the

Probit regression of firms choosing TopN-1 auditors.[5] The regression of probability of using reputable financial intermediary uses some firm characteristic variables and underwriter fixed effects that help to determine the choice of intermediary. Recall that univariate statistics report firm characteristics are statistically significantly different based on intermediary reputation differentials. Hence, inclusion of firm characteristics variables, as well as the other required variables, into the first regression helps to predict to choice of reputable financial intermediary. Moreover, the probit model has 15% R-square value.

Recall that prior literature suggests that there is underwriter fixed effects in IPO returns which cannot be explained by existing literature (Hoberg (2007)). Similarly, this component may also affect the auditor choice of a company. Some underwriters may have preference to work with specific auditors. Thus, I use underwriter fixed effects in addition to other variables mentioned before in explaining the selection of financial intermediary reputation. I define underwriter fixed effects according to their frequencies in the sample. I include all these fixed effects into the regressions.

RESULTS

Empirical Results

At first, I discuss the certification effect of the use of reputable financial intermediaries through SEO transaction costs. First, Table 3 reports the OLS and ATE model regressions of the SEO discount (measured by the close-to-offer return) tests for both subsamples. Recall that, when the close-to-offer return is higher, it means that SEO discount is lower. The main variable of interest in both the OLS and ATE regressions is the use of reputable financial intermediary proxied by Big5-status or Top N-1 auditor, and how it affects the discount in SEOs.[6]

TABLE 2
PROBIT REGRESSION FOR FINANCIAL INTERMEDIARY SELECTION (DEPENDENT VARIABLE=1 IF FIRM USES TOPN-1)

Probit Regression	
Dependent Variable:	Top N-1
Hitech	0.378***
	(0.003)
Capital exp.	-1.522**
	(0.011)
Asset tangibility	-8.625
	(0.603)
Log(sales)	-0.0586
	(0.110)
Market Cap./total assets	0.515***
	(0.000)
NYSE	0.171
	(0.133)
Low stock price(Dlowprice)	0.0864
	(0.475)
High risk(Dhighrisk)	0.120
	(0.345)
Constant	0.719*
	(0.057)
Underwriter fixed effects	Yes
Year & SIC dummies	Yes
Observations	1486
Pseudo R-square	0.1508
p-values are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%	

Table 2 reports the first regression of SEO discount model with TopN-1. In this regression, the model uses some firm characteristic variables that help to determine the choice of auditor and underwriter fixed effects. Table 2 reports the first regression of SEO discount model with TopN-1 for brevity. When Big-5 status is used, it gives similar results for SEO discount model. Probit regressions for investment banking fees model also gives similar result. Variable definitions are reported in the text and appendix. The underwriter fixed effects, year and SIC dummies are not reported in the table for the brevity. I define underwriter fixed effects according to their frequencies in the sample. P-values are based on White's (1980) heteroskedasticity consistent standard errors.

In the OLS regressions of Table 3 auditor dummies are not statistically different from zero. In addition, the OLS regression has problems stemming from the endogenous choice of intermediary, and thereby OLS estimates are biased and inconsistent. The R-squares of the OLS regressions are about 13% and 22% for two subsamples. In addition, the test of independent equations rejects the hypothesis of independent equations at statistically significant levels for both subsample findings. This result documents that there is an explicit bias and it is more accurate to use an ATE model instead of an OLS. Column 1 suggests that the use of reputable financial intermediary proxied by Big5-status implies a 5.3% higher close-to-offer return for SEOs with high ranked underwriter subsample during the entire sample period. In other words, the use of reputable intermediary lowers the discount in SEOs and actually leads to a premium in SEOs with everything else being equal. This result is statistically significant at the 1 % level. Moreover, considering the sample average of a -3.2% close-to-offer return which means 3.2% SEO discount, these results are economically large. Column 5 also suggests the use of reputable intermediary implies 3.4% higher close-to-offer return for SEOs with mid-level ranked underwriter but this result is not statistically significant. This result reveals that the same effect cannot be considered for this subsample. One potential reason for the result may be the small sample problem.

TABLE 3
THE EFFECT OF REPUTABLE FINANCIAL INTERMEDIARY ON SEO DISCOUNT

Subsample	SEOs with high ranked underwriters				SEOs with mid-level ranked underwriters			
Auditor dummy	Big5-status		Top N-1		Big5-status		Top N-1	
Dependent Variable: SEO Discount (Close-to-Offer Return)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ATE	OLS	ATE	OLS	ATE	OLS	ATE	OLS
Auditor dummy	0.0531***	0.0048	0.0289*	0.0036	0.0344	0.0010	0.0614***	0.0015
	(0.000)	(0.421)	(0.060)	(0.215)	(0.211)	(0.871)	(0.000)	(0.755)
Credit rating	0.00642**	0.0063	0.00620**	0.0064**	-0.00456	-0.0022	-0.00671	-0.0025
	(0.023)	(0.038)**	(0.029)	(0.037)	(0.565)	(0.787)	(0.364)	(0.758)
Log(net proceeds)	0.00176	0.0020	0.00185	0.0021	0.00476	0.0059	0.00585	0.0059
	(0.437)	(0.438)	(0.567)	(0.440)	(0.516)	(0.621)	(0.684)	(0.619)
Log(total assets)	-0.00110	-0.0014	-0.00138	-0.0015	0.00747**	0.0072**	0.00875**	0.0073
	(0.426)	(0.299)	(0.320)	(0.270)	(0.028)	(0.048)	(0.011)	(0.048)**
Rule Shelf 415	-0.00756***	-0.0072***	-0.00757***	-0.0073***	-0.0107	-0.0105	-0.00908	-0.0105
	(0.006)	(0.009)	(0.006)	(0.009)	(0.113)	(0.109)	(0.165)	(0.108)
Return volatility	-0.772***	-0.7877***	-0.786***	-0.7929***	-0.842***	-0.908***	-0.706***	-0.9070
	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.004)	(0.007)	(0.005)***
Constant	-0.0400***	0.0044	-0.00818	0.0068	-0.0722**	-0.0521*	-0.089***	-0.0524
	(0.007)	(0.532)	(0.610)	(0.575)	(0.049)	(0.099)	(0.004)	(0.096)*
Observations	1496	1497	1496	1497	349	349	349	349
R-square		0.132		0.133		0.225		0.225
Year & SIC dummies	Yes	yes	yes	yes	yes	yes	yes	yes
Rho	-0.6148		-0.3841		-0.5283		-0.8289	
Sigma	0.0393		0.0392		0.0379		0.0441	
Lambda	-0.0241		-0.0151		-0.0201		-0.0365	
Test of independent equations p > chi-square	(0.005)***		(0.042)**		(0.087)*		(0.000)***	

Table 3 reports average treatment effect (ATE) model regressions of SEO discount in the first six models and OLS regressions for first subsample for brevity. Auditor dummy of a model is one of "Big5-status" and "Top N-1" definitions. The dependent variable is close-to-offer return which is the ratio of offer price minus pre-issue day price to the pre-issue day. Regression variables have been winsorized at the 1 % and 99% levels. Control variables in regressions are credit rating dummy, offer size, firm leverage, firm size, high tech firm dummy, SEO shelf registration dummy, standard deviation of stock returns, share turnover, Nasdaq dummy, underwriter's rank, low stock price dummy, low market capitalization dummy, interaction terms of offer size and low stock price, offer size and low market capitalization, offer size and high volatility, and year and industry dummies. Variable definitions are reported in the text and appendix. Only some important control variables are reported for brevity. P-values are based on White's (1980) heteroskedasticity consistent standard errors. I report rho, sigma and lambda for ATE. Only ATE estimations which are made by maximum likelihood method report p-value of chi-square test of independent equations.

Column 1 has some implications. The reputation and credibility effect stemming from the relationship with reputable intermediaries causes reduction in firm's transaction costs, and the same effect may imply better certification of firm transparency provided to investors. Additionally, untabulated results show that the effect on SEO discount is larger for firms with lower asset tangibility, low book-to-market ratios, smaller sizes whereas the effect is weaker and statistically insignificant for the other firms.[7] Despite the weak and limited evidence, these results still provide some evidence that small, growth and more opaque firms have lower transaction costs when they use reputable intermediaries.

An extra analysis to see how loss of reputational capital affects the certification from financial intermediaries is a natural implication based on my prior results. For this reason, I also examine the case of Top N-1 reputable intermediaries excluding Arthur Andersen. The Arthur Andersen scandal took place in 2001, and Arthur Andersen's exited from the market for auditing services in 2002. Moreover, previous studies mention that this scandal deeply affected the entire audit industry and resulted in regulatory change. Comparison of columns 1 and 3 of Table 3, and comparison of columns 5 and 7 of Table 3 reveal the following result. When considering the entire sample period for Top N-1 reputable financial intermediaries, Top N-1 reputable intermediaries are associated with higher close-to-offer returns for the second subsample of SEOs, and this means a lower SEO discount in SEOs with mid-level ranked underwriters, and the results are statistically significant. Top N-1 reputable intermediaries, which do not experience any reputational loss, have a better certification effect on SEOs in this subsample compared to the others.

Table 4 reports OLS and ATE regressions of the SEO investment banking fees (underwriting fees) model. In the OLS regressions, auditor dummies are not statistically different from zero except Column 6. On the other hand, all the ATE models except column 1 have statistically significant auditor dummies. These coefficients suggest that use of reputable intermediary reduces gross spread as a percentage of offer price by almost 1 % to 1.5% , where the average gross spread as a percentage of offer price is 4.8 % for the entire sample of SEOs. Although this result is not very strong in terms of economical magnitude compared to the SEO discount model in Table 3, it is still economically large when considering that this effect is almost 20 % of sample average. Briefly, evidence on the effect of use of reputable financial intermediary on underwriting fees exists although it is somewhat weaker than the evidence on SEO discount.

Examining column 1 and 3 reveals that use of reputable Top N-1 financial intermediaries reduce underwriting fees more than all the reputable intermediaries (proxied by Big5-status dummy) do in SEOs with high ranked underwriters. Moreover, the effect of Top N-1 is also higher than Big5-status for the second subsample. These findings reveal that the effect of reputable intermediaries excluding Arthur Andersen in reducing underwriting fees is higher than the effect coming from all the reputable intermediaries. The reason for this result may imply the following. The regression sample of the models in this table include the entire sample period which is 1992-2006.This sample period includes Arthur Andersen scandal. This scandal happened in 2001 and Arthur Andersen's exit from the industry was in 2002. Thus, the reason for why Big5-status effect is lower than Top N-1 may come from the influence of Arthur Andersen's scandal. Intuitively, underwriters of SEO issuers whose auditor is Arthur Andersen may consider the certification from Arthur Andersen as less credible during the scandal period. This issue may have negative impact on the effect of Big5-status compared to Top N-1 because Top N-1 consists of all the reputable auditors but Arthur Andersen. Furthermore, the evidence of this table again suggests that Arthur Andersen scandal may have a negative impact on the certification effect of reputable intermediaries. To sum up, the empirical evidence from Table 3 and Table 4 shows that impact of use of reputable financial intermediaries especially the ones without any reputational loss produces better certification effect and this may help firms to mitigate the problems related to the certification of firm transparency.

TABLE 4
THE EFFECT OF REPUTABLE FINANCIAL INTERMEDIARY ON SEO INVESTMENT BANKING FEES

Subsample	SEOs with high ranked underwriters				SEOs with mid-level ranked underwriters			
Auditor dummy	Big5-status		Top N-1		Big5-status		Top N-1	
Dep. Variable.: (Gross-Spread/Offer Price)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ATE	OLS	ATE	OLS	ATE	OLS	ATE	OLS
Auditor dummy	-0.00189	0.0004	-0.0108***	0.0007	-0.0101***	-0.0034***	-0.0146***	-0.0011
	(0.538)	(0.761)	(0.000)	(0.251)	(0.006)	(0.007)	(0.000)	(0.254)
Credit rating	-0.000447	-0.0004	-0.000367	-0.0004	-0.00657**	-0.0068**	-0.00549**	-0.0064**
	(0.575)	(0.615)	(0.637)	(0.621)	(0.016)	(0.028)	(0.048)	(0.041)
Log(net proceeds)	-0.000897	-0.0009	-0.000687	-0.0009	-0.00140*	-0.0016*	-0.00163**	-0.0017*
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)
Log(total assets)	-0.00462***	-0.0046***	-0.00461***	-0.0046***	-0.00393***	-0.0039***	-0.00432***	-0.0040***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rule Shelf 415	-0.00415***	-0.0042***	-0.00459***	-0.0041***	-0.00550***	-0.0055***	-0.00668***	-0.0055***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Return volatility	0.0787***	0.0777***	0.0841***	0.0768***	0.0530	0.0703*	0.0442	0.0712*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.150)	(0.082)	(0.216)	(0.082)
Constant	0.0752***	0.0730***	0.0798***	0.0730***	0.0906***	0.0874***	0.0936***	0.0868***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1426	1427	1426	1427	342	342	342	342
R-square		0.529		0.529		0.496		0.489
Year & SIC dummies	yes	yes	yes	yes	yes	yes	yes	
Rho	0.1358		0.7244		0.4940		0.725	
Sigma	0.0085		0.0095		0.0081		0.0096	
Lambda	0.0012		0.0066		0.0039		0.0084	
Test of independent equations p > chi-square	(0.446)		(0.000)***		(0.106)		(0.000)***	

Robust p-values in parantheses.* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 reports average treatment effect (ATE) model regressions of SEO investment banking fees and OLS regressions. Auditor dummy of a model is one of "Big5-status" and "Top N-1" definitions. The dependent variable is gross spread divided by offer price. Regression variables have been winsorized at the 1 % and 99% levels. P-values are based on White's (1980) heteroskedasticity consistent standard errors. The regression model is similar to the model in Table 3. Only some important control variables are reported for brevity. I report rho, sigma and lambda for ATE. Only ATE estimations which are made by maximum likelihood method report p-value of chi-square test of independent equations.

Further Analysis of Reputational Loss of a Financial Intermediary

To further clarify the impact of financial intermediary reputation on their certification effect, I compare the effect in a period before Arthur Andersen scandal and the effect after Arthur Andersen scandal. In particular, I redo the analysis of SEO discount for the years before Arthur Andersen scandal and after the scandal. I redo the analysis in SEO discount because previous analysis shows that the certification effect is economically large relative to the same effect on underwriting fees, and adverse selection effect is more severe on this type of transaction costs of SEOs. Table 5 reports the results of the SEO discount model for years 1992-2000 and 2002-2006.[8] The first four columns of Table 5 reports the findings of SEO discount model for the years between 1992 and 2000. Among the first four columns, column 1 and column 2 report the results for the subsample of SEOs with high ranked underwriters, and all these two models have statistically significant auditor coefficients and have 824 observations (they have bigger sample sizes compared to last columns). The effect of use of all reputable intermediaries results in 6.5% lower SEO discount whereas the use of Top N-1 reputable intermediaries is associated with a 4.4% lower SEO discount, everything else being equal. This interesting result not only supports the findings in earlier tables but also suggests some stronger evidence. For the years prior to the Arthur Andersen scandal, the effect of all reputable intermediaries (Big5-status dummy) is higher than then the effect of all reputable intermediaries but excluding Arthur Andersen (Top N-1 dummy). This result is consistent with the hypothesis that reputable financial intermediaries have a better certification effect, and this result holds in a bigger subsample. Note that, mid-level ranked SEOs subsample has a much smaller size.

In columns 3 and 4, all two auditor dummy coefficients are positive but only the Top N-1 dummy coefficient is statistically significant. Hence, the subsample of SEOs with mid-level ranked underwriters suggests that the use of Top N-1 reputable intermediaries helps to lower the SEO discount. Results from columns 3 and 4 represent mixed evidence compared to what first two columns find. This can be attributed to a small sample problem in these columns. However, empirical findings still imply that reputable intermediaries have better certification effect which may result in better display of firm transparency in accessing external financial markets.

Now, I examine the period after the Arthur Andersen scandal where the reputational scandal influences the entire industry. Specifically, this scandal had some impacts on investors' view on reputable auditors, and also the legislators later introduced Sarbanes-Oxley Act in 2002 to reorganize the market for auditing services after the scandal. In the analysis post scandal period, the auditor dummy coefficient of high ranked underwriter SEOs subsample for post scandal period is statistically significant whereas the same coefficient is statistically insignificant (Columns 5 and 6). Additionally, the coefficients are positive but have a smaller magnitude compared to the first time period. Briefly, these results suggest a negative effect of the Arthur Andersen scandal on the certification of other reputable financial intermediaries. In other words, the demise of Arthur Andersen appears to have somewhat weakened the certification effect of auditors. Reputation of intermediary is a very crucial factor on its certification effect. After any event that jeopardizes the reputation of an intermediary or the industry of reputation, the certification effect from financial intermediaries on firms may not be as effective and strong. These kinds of events may cause the loss of an important advantage of firm's use of reputable financial intermediaries when accessing external financial markets.

TABLE 5
SEO DISCOUNT MODEL BEFORE AND AFTER ARTHUR ANDERSEN'S SCANDAL AND EXIT

Sample Period	1992-2000				2002-2006	
Subsample	SEOs with high ranked underwriters		SEOs with mid-level ranked underwriters		SEOs with high ranked underwriters	SEOs with mid-level ranked underwriters
Auditor dummy	Big5-status	Top N-1	Big5-status	Top N-1	Top N-1	Top N-1
Dep. Var.: SEO Discount (Close-to-Offer Return)	(1)	(2)	(3)	(4)	(5)	(6)
	ATE	ATE	ATE	ATE	ATE	ATE
Auditor dummy	0.0655***	0.0438***	0.0255	0.0554***	0.0366*	0.0253
	(0.000)	(0.000)	(0.424)	(0.002)	(0.096)	(0.329)
Credit rating	0.00799**	0.00827**	-0.00950	-0.0171	0.00574	0.00262
	(0.046)	(0.042)	(0.402)	(0.181)	(0.215)	(0.851)
Log(net proceeds)	-0.000618	-0.000723	0.0105	0.00968	0.00397	0.00208
	(0.797)	(0.770)	(0.138)	(0.167)	(0.159)	(0.803)
Log(total assets)	-0.000635	-0.000810	0.00834**	0.0107**	-0.00228	0.00420
	(0.746)	(0.683)	(0.047)	(0.017)	(0.287)	(0.538)
Rule Shelf 415	-0.0124**	-0.0140***	-0.00183	-0.00391	-0.00475	-0.0106
	(0.011)	(0.004)	(0.904)	(0.786)	(0.184)	(0.183)
Return volatility	-0.733***	-0.737***	-0.762**	-0.691**	-0.779***	-1.029*
	(0.001)	(0.001)	(0.014)	(0.019)	(0.000)	(0.071)
Constant	-0.0480**	-0.00858	-0.102*	-0.121**	-0.0312	-0.0656
	(0.016)	(0.646)	(0.063)	(0.015)	(0.219)	(0.233)
Observations	824	824	211	211	577	120
Year & SIC dummies	yes	yes	yes	yes	yes	yes
Rho	-0.7604	-0.5973	-0.3535	-0.7744	-0.4426	-0.0504
Sigma	0.0397	0.0415	0.0359	0.0422	0.0368	0.0356
Lambda	-0.0302	-0.0248	-0.0127	-0.0327	-0.0163	-0.0180
Test of independent equations p > chi-square	(0.000)***	(0.008)***	(0.257)	(0.059)*		

Robust p-values in parantheses.* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 reports SEO Discount model for years 1992-2000 vs. 2002-2006. Note that, I only report the significant coefficients in the table for brevity. The model is same as the SEO discount model in the Table 3. Auditor dummy of a model is one of "Big5-status" and "Top N-1" definitions. The dependent variable is close-to-offer return which is the ratio of offer price minus pre-issue day price to the pre-issue day. Some important control variables are reported for brevity. Variables have been winsorized at the 1 % and 99% levels. P-values are based on White's (1980) heteroskedasticity consistent standard errors. I report rho, sigma and lambda for ATE. Only ATE estimations which are made by maximum likelihood method report p-value of chi-square test of independent equations. For subsample of 2002-2006, there is no report of p value for test of independent equations because two-step estimation is used instead of MLE method.

CONCLUSION

This paper investigates the impact of using reputable financial intermediaries on the certification of firm's financial information available to investors in external financial markets. My findings are consistent with Diamond's reputation building argument (1989 and 1991) because firms may build their reputation and credibility through their relationship with reputable intermediaries. After overcoming the endogenity problem in intermediary choice, this paper demonstrates that the use of reputable financial intermediaries helps firms that access external financial markets to undertake lower transaction costs. Specifically, I look at the impact of hiring reputational intermediaries (proxied by Big5-status auditors) on SEO transaction costs- through the SEO discount and investment banking fees. I also examine the impact of reputational loss of an intermediary on its certification effect of firm information.

In conclusion, findings of this paper suggest that reputable financial intermediaries have a positive effect on certification of firm information in accessing external finance. Investors and third parties consider the information that these intermediaries certify as more credible relative to what other intermediaries do so. Lastly, in the case of no reputational loss of intermediary, reduction in the costs of informational problems are larger. This result implies that the relationship between firm and reputable financial intermediary can help to mitigate negative outcomes of information asymmetry external financial markets.

ENDNOTES

1. Reputational capital, which is not easy to earn or sustain, is an important asset in the financial markets. Market's trust to guarantees of financial institution is positively related to reputation of financial institution in terms of financial contracting (Boot et al. (1993)). Chemmanur and Fulghieri (1994a) endorse a reputation acquisition model for equity markets through the role of investment banks.
2. In addition, Fargher et al. (2005) note that auditors usually give a comfort letter to the underwriter which becomes a part of the underwriter's due diligence process. Therefore an auditor partially shares the underwriter's litigation risk stemming from the expert opinion on financial information that helps investors in their evaluation of the firm.
3. Altinkilic and Hansen (2003) decompose the SEO underpricing into two components: discount and offer day return. This paper's SEO discount variable is consistent with the discount definition from Altinkilic and Hansen (2003) and the close-to-offer return defined by Kim and Shin (2004).
4. As consistent with previous studies, Big5-status dummy takes value of one if the auditor of SEO issuer company is one of the following audit firms for the corresponding years: 1) Arthur Andersen, Coopers & Lybrand, Deloitte & Touche , Ernst & Young, KPMG and Price Waterhouse over the sample period 1992-1998, 2) Arthur Andersen, Deloitte & Touche , Ernst & Young, KPMG and Price Waterhouse Coopers over the sample period 1998-2002, 3) Deloitte & Touche, Ernst & Young, KPMG and PriceWaterhouseCoopers over the sample period 2003-2006, and takes a value of zero otherwise.
5. I show the regression for TopN-1 because TopN-1 is the auditor dummy that is used in all models in Table III to Table V. The probit regression model for Big5-status gives similar result and this paper does not show it for brevity.
6. Control variables in regressions are credit rating dummy, offer size, firm leverage, firm size, high tech firm dummy, SEO shelf registration dummy, standard deviation of stock returns, share turnover, Nasdaq dummy, underwriter's rank, low stock price dummy, low market capitalization dummy, interaction terms of offer size and low stock price, offer size and low market capitalization, offer size and high volatility, and year and industry dummies. In Table III, some of the control variables are reported for brevity.

7. However, one needs to note that these untabulated results are based on an empirical analysis which only controls for the endogeneity in auditor choice (not choices in both auditor and underwriter). Thus, I do not report these findings in the paper.
8. The regression model is same as the model in Table III. For further details, please see the previous sections and endnote 6.

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APPENDIX

Control Variables and Their Descriptions

This first section gives detailed information on the control variables this study uses. Consistent with previous studies (Lee and Masulis (2009), Corwin (2003), Kim and Shin (2001) and Altinkilic and Hansen (2003) among others), this paper employs the following variables as control variables. In the model explaining SEO discount in terms of close-to-offer return, log (net proceeds) which is the logarithm of gross proceeds is from SDC explains offer size of an SEO. Leverage ratio is total long term debt plus current liabilities divided by total assets from the COMPUSTAT for the year prior to SEO. Log (total assets) is the logarithm of total assets from the COMPUSTAT for the year prior to SEO. High tech firm dummy takes value of one if SIC of SEO issuer firm is under the high tech firm classification mentioned in Jay Ritter's website and zero otherwise. Shelf Registration (Rule 415) dummy takes value of one if SDC reports the firm under shelf registration. Shelf registration makes it possible for an issuer to make offering in two years after registration. Standard deviation of daily stock returns measures stock volatility of a firm. This variable measures the standard deviation of stock returns using the CRSP tape for trading period of -150th day to -11th day prior to issue date (which is from SDC) where issue date is trading day zero. Butler et al. (2005) find that higher liquidity implies lower investment banking fees. In order to control for liquidity, I employ share turnover as a measure of liquidity. This paper uses the formula of [(*1*/*number of trading days*)*$\sum$(*daily stock volume*)/*1,000,000*] in order to calculate share turnover of firms where the trading period of share turnover for trading period of -150th day to -11th day prior to issue date. NASDAQ dummy takes a value of 1 if a firm is a NASDAQ listed firm and zero otherwise.

Consistent with Corwin (2003), I use the following interaction terms in SEO discount model: *Log (net proceeds)*Dlowstock, Log (net proceeds)*Dlowmkt*, *Log (net proceeds)*Dhighrisk*. Besides, I also employ *Dlowstock*, *Dlowmkt* and *Dhighrisk* dummies in the regression. Low stock price dummy (*Dlowstock*) is a dummy variable which takes value of 1 if pre-issue day (trading day "-1") stock price is in the lowest quartile and zero otherwise. Low market capitalization dummy (*Dlowmkt*) is a dummy variable which takes a value of one if SEO issuer firm is in the lowest quartile of market capitalization (market capitalization is the number of shares outstanding multiplied by stock price on the pre-issue day) and zero otherwise. High risk stock dummy (*Dhighrisk*) is dummy variable which takes value of one if

SEO issuer is in the highest quartile of standard deviation of stock returns during the trading period -150 to -11 prior to issue day and zero otherwise.

In investment banking fees model, I use Tobin's q is measured for the year prior to SEO by using the COMPUSTAT information. Tobin's q basically measures profitability and prospective growth of assets. Capital expenditures scaled by total assets is also used for the year prior to SEO. Consistent with Lee and Masulis (2009) I use credit rating dummy variable which takes value of one if SEO issuer firm has any rated bonds for the year prior to SEO based on the COMPUSTAT and zero otherwise. Asset tangibility is calculated as net plant, property, and equipment divided by using the COMPUSTAT. Log (net sales) is logarithm of net sales from the COMPUSTAT. Another variable used in this paper is book-to-market ratio. Book-to-market ratio is common equity divided by the term of year end price (item 24) times common shares outstanding from the COMPUSTAT. NYSE dummy variable takes value of one if a firm is a NYSE listed firm and zero otherwise. I also include year dummies and industry dummies into my regressions. I used one-digit SIC dummies as industry dummies because average treatment effect model does not let the use of two or more digit SIC dummies in my models.

Average Treatment Effect Model

In order to cure endogeneity problem in financial intermediary choice, this paper consults treatment effects model (Heckman (1976), Heckman (1978). Note that treatment effects model attracts more attention in the recent studies like Villalonga (2004), Villalonga and Amit (2006) and Butler and Goktan (2013). A treatment effect basically is the difference between the two groups, one with the treatment and the other one without treatment (Johnston and DiNardo (1997), Li and Prabhala (2005). Specifically, in my setting, I use average treatment effect model (ATE) where the treatment is the use of reputable financial intermediary in order to eliminate the bias and inconsistency of the estimates. In their paper, Li and Prabhala (2005) provide a detailed explanation as following; a treatment effect is the difference occurs in outcome when firm faces treatment (T) compared to not selecting treatment (NT) and average treatment effect is $E(Y_T-Y_{NT})$. In order to present more detailed illustration, I display the basic framework and the equations of Johnston and DiNardo (1997) for treatment effects model which uses Heckman's general model (Heckman (1990)) as following:

$$Y_{T,i}=X_{T,i}\,B_T+\varepsilon_{1,I} \tag{1}$$

$$Y_{NT,i}=X_{NT,i}\,B_{NT}+\varepsilon_{2,I} \tag{2}$$

$$T_{,i}=1(Z_{,i\gamma}+\varepsilon_{1,i}>0) \tag{3}$$

In this outline, T_i refers treatment and shows whether a firm has treatment or not by taking values of 1 or 0 respectively. $Y_{T,i}$ and $Y_{TT,i}$ measure the outcome based on the firm has treatment or not. Equation 1 and 2 indicate post-selection outcomes (SEO discount and underwriting fees in my analysis) for treated and untreated firms, respectively (Li and Prabhala (2005)). Because the choice of having treatment in my analysis (which is use of reputable financial intermediaries) is not random, my estimates will be "contaminated by selectivity bias" (Johnston and DiNardo (1997)) if I ignore this endogenous choice. Johnston and DiNardo (1997) suggest that running separate regressions as one of the main solutions. Note that ATE runs separate and simultaneous regressions in the analysis of financial intermediaries and transaction costs in this paper. Therefore, ATE results in consistent and unbiased estimates. First regression of ATE model analyzes the probability of having treatment which is use of reputable financial intermediaries by employing some set of variables that identify the use of reputable financial intermediaries. Additionally, ATE uses the probability of having treatment which is use of reputable financial intermediaries to estimate jointly with the second regression which is investment banking fees or SEO discount regression in this paper. The following remarks are also important for ATE model interpretation. Rho statistic is the correlation between the error terms of two equations which are first and second regressions of treatment effects model. Sigma statistic is the standard error of the error of the main

regression (second regression) of ATE model. Lambda statistic is the covariance of the errors (lambda is equal to rho multiplied by sigma). Moreover, test of independent equations reveals the likelihood for rho statistic and covariance equal to zero. This likelihood being zero means there is no selection bias and there is no obligation to use a treatment effects model. In addition, ATE model uses two estimation methods. One is maximum likelihood estimation (MLE), second method is two-step estimation. Both estimation methods yield consistent results but MLE reaches more efficient results. However, computer software uses two-step method when there is no convergence in MLE due to the reason of not enough number of observations in the sample. In my ATE model, except last two columns of Table V, estimation method is MLE method whereas estimation method of the model is two-step estimation in columns 5 and 6 of Table 5.