

# **Selection Bias and the Underwriter Certification of the Largest Shareholders in Seasoned Equity Offerings\***

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## **ABSTRACT**

The largest shareholders of issuing firms in Hong Kong are eligible to underwrite rights issues and open offers. We hypothesize that the largest shareholders as underwriters who possess more information are better than investment banks in certifying firm value. Our analyses show that the largest shareholders self-select into their preferred issuing firms, and a selection bias in the choice of underwriters arises. After controlling for firm and issue characteristics and addressing the selection bias, our findings support our hypothesis. We also find that investment banks with greater access to information through prior underwriting relationship provide better certification than investment banks without such relationship.

JEL Codes: G14; G24; G38

Accepted: 11 July 2017

## **I. INTRODUCTION**

Rights issues and open offers are the two types of rights-preserving seasoned equity offerings (SEOs) used by public firms in Hong Kong to raise funds. Both rights offerings allow the existing shareholders of a firm to purchase new common stock on a pro rata basis. The existing shareholders who do not wish to take up their entitlements of new shares are allowed to sell their rights in rights issues, but their entitlements in open offers cannot be sold. As required by the local listing rules in Hong Kong, these two issuance methods must be fully

\* We would like to thank Sudipto Dasgupta, the managing editor, and the anonymous referee for constructive recommendations. We have also benefited from Chee-Ghee Teh and Gary John Rangel for the comments and suggestions on previous versions of this paper. All the remaining errors are our own.

underwritten and the underwriters of these SEOs can be investment banks, the largest shareholder of an issuing firm, blockholders or directors of an issuing firm, or others. The unique feature of rights issues and open offers in Hong Kong gives an opportunity to compare the underwriter certification provided by the largest shareholders and by investment banks.<sup>1</sup>

The negative announcement effect of rights issues is tremendously large, and it is more crucial for issuing firms in Hong Kong to alleviate the substantial price decline.<sup>2</sup> The large negative announcement effect could be due to the asymmetric information between issuers and investors as pointed out by Myers and Majluf (1984) and Eckbo and Masulis (1992). To reduce the information gap, current literature suggests that reputable underwriters, either commercial banks or investment banks, can be employed as information intermediaries to certify that the offer price is consistent with inside information about future earnings prospects of issuing firms and not mispriced.<sup>3</sup>

The largest shareholders of issuing firms as SEO underwriters, similar to commercial banks and affiliated investment banks, have information advantages about their firms. Commercial banks and affiliated investment banks with prior access and superior information acquired through credit evaluation and loan monitoring are found to have information advantages about issuing firms in securities underwriting activities (Puri 1996; Gompers and Lerner 1999; Benzoni and Schenone 2010). Chemmanur and Fulghieri (1994) also argue that investment banks as middlemen do not have as much information as entrepreneurs. This is especially true to those largest shareholders of family-controlled firms in Hong Kong because these largest shareholders have deep involvements in the operation of these firms (Claessens *et al.* 2000). As largest shareholders possess more valuable firm-specific information than investment banks, we thus posit that the largest shareholders as underwriters could better certify firm value and reduce the negative SEO announcement effects more than investment banks.

A number of studies, however, find that conflicts of interest and expropriation of minority shareholders are the main concerns in equity offerings. For example, Fong and Lam (2014) and Cheung *et al.* (2006) provide evidence that controlling

- 1 Chapter 7 of the listing rules in Hong Kong requires that all rights issues and open offers must be fully underwritten in normal circumstances. In this study, the offers underwritten by both investment banks and securities brokerage companies are grouped under the category of investment banks. On the other hand, the offers underwritten by the largest shareholders of issuing firms and their associates are grouped under the category of the largest shareholders.
- 2 Lee *et al.* (2014), Ching *et al.* (2006), and Wu and Wang (2005b) find that the 3-day cumulative average abnormal return from day -1 to day 1 is more than -7.5%, but the average announcement return of the corresponding rights issues for industrial firms in the US and in the UK is only about -2.09% (Hansen 1988; Eckbo and Masulis 1992; Slovin *et al.* 2000).
- 3 See Booth and Smith (1986), Blackwell *et al.* (1990), Denis (1991), Hansen and Torregrosa (1992), Eckbo and Masulis (1992), Kumar and Tsetsekos (1993), Puri (1996), and Pandes (2010) for more details.

shareholders of the companies with high ownership concentration expropriate the interests of minority shareholders in Hong Kong SEOs. The potential conflicts of interest also arise in the process of the securities underwriting when commercial banks and affiliated investment banks are the underwriters (Puri 1996; Gompers and Lerner 1999). As a result, investors might question the credibility of the due diligence process conducted by commercial banks and affiliated investment banks.

Taken together, given significant evidence that the substantial shareholders or managers might pursue their own private benefits of control and expropriate wealth from minority shareholders in equity offerings, to examine whether the underwriter certification provided by the largest shareholders could outweigh potential conflicts of interest is of our interest. While the largest shareholder of an issuing firm in Hong Kong, the UK, and Australia is eligible to be the SEO underwriter, currently, there is limited research in this area, and this study aims to fill the gap in the literature.<sup>4</sup> The direct comparison between the largest shareholder-underwritten offers and the investment bank-underwritten offers helps sharpen the test of the conflict of interest effect versus the underwriter certification effect.

Our study differs from the previous literature with respect to the type of underwriters we test. Unlike commercial banks and affiliated investment banks, the largest shareholders hold a significant portion of outstanding shares. Their large shareholdings might further exacerbate the potential conflicts of interest and entrenchment effects in SEO underwriting activities.<sup>5</sup> While the largest shareholders who have great influences over firm decisions are eligible to be the underwriters for Hong Kong SEOs, the mutual choice pointed out by Fernando *et al.* (2005) between investment banks as underwriters and an issuing firm might not be applicable. In a nutshell, the significant equity ownership of the largest shareholders provides a sharper test of the two trade-off effects.

- 4 Fong and Lam (2014) provide the mixed results for the underwriter certification roles of the controlling shareholders. Specifically, they document the finding of the conflicts of interest in rights issues, but they do not find such evidence in open offers and in the pooled sample. There are at least three differences between this study and Fong and Lam (2014): (i) The controlling shareholders of public firms might self-select to underwrite the SEOs of their preferred firms. We address this endogeneity problem of the underwriter choice in studying the determinants of SEO announcement returns, but Fong and Lam (2014) do not address this endogeneity problem; (ii) the criteria for sample selection are different. The offers not underwritten specifically by the largest shareholders might be part of the sample of Fong and Lam (2014), but these offers are not chosen by this study; and (iii) the study period is different.
- 5 A number of studies in Hong Kong SEOs report that the average proportion of shares held by the largest shareholders is nearly 38% (Wu *et al.* 2005; Fong and Lam 2014; Lee *et al.* 2014). This significant portion of outstanding shares might lead to a greater likelihood of wealth expropriation by the largest shareholders from minority shareholders (La Porta *et al.* 1999; Claessens *et al.* 2002; Cheung *et al.* 2006).

We further generalize our hypothesis to the rights offerings underwritten specifically by investment banks. If the underwriters who possess more information about issuers could provide better certification of SEO offer prices, we posit that the investment bank that has prior SEO underwriting relationship with an issuing firm could certify firm value of the issuer better than the investment bank without prior SEO underwriting relationship.

The findings of this study make three contributions to the current literature. First, to the best of our knowledge, this paper is the first empirical analysis to investigate the determinants of the underwriter choice between the largest shareholder of an issuing firm and investment banks. The analysis shows that the largest shareholders generally underwrite the SEOs issued by the firms with lower information asymmetries and higher quality. This indicates that the largest shareholders as underwriters are concerned about potential conflicts of interest and only choose to underwrite less information-sensitive issues in order to limit potential conflicts of interest. Second, under the circumstance where the potential conflicts of interest are more severe, our findings indicate that the largest shareholders as insiders provide better underwriter certification than investment banks as information intermediaries. This mechanism might avoid the drawbacks of the current security underwriting pointed by Bortolotti *et al.* (2008) in the USA and Europe (more details in the last section), and this suggests an alternative of equity underwritings to regulators and issuers.

Third, in addition to the various prior relationships that play the crucial underwriting roles in the literature, we are among the first to show that prior SEO underwriting relationship established between issuing firms and investment banks matters in terms of its impact on reducing the negative announcement effects of the subsequent SEOs.<sup>6</sup> In sum, under the circumstance where the potential conflicts of interest are severe, the findings of this study support that the underwriters who possess more information about issuing firms are still better certifiers to lower more negative SEO announcement effects.

This paper is organized as follows. Section II discusses the theory and develops the hypotheses. Section III describes the data and presents the descriptive statistics. By applying the treatment effects models, Section IV presents the empirical findings that compare the underwriter certification provided by the largest shareholders and by investment banks. Section V studies the influence of prior SEO underwriting relationship on underwriter certification in the offers underwritten specifically by investment banks. Finally, our conclusion and policy implications are presented in Section VI

6 The various prior relationships proposed in the literature include the lending relationship between underwriters and issuing firms prior to debt or equity underwritings (e.g., Puri 1996; Gande *et al.* 1997; Hebb 2002; Schenone 2004), the equity stake of underwriters prior to equity underwritings (e.g., Gompers and Lerner 1999), and the initial public offering (IPO) underwriting relationship prior to SEOs (e.g., James 1992).

## **II. THEORY AND HYPOTHESES DEVELOPMENT**

### **A. Two trade-off effects: underwriter certification and potential conflicts of interest**

The negative information effect in relation to SEO announcements would be alleviated if an issuing firm supplies verifiable details sufficiently to indicate the true state of nature itself or to reduce the uncertainty about firm value by using the costly external certification roles of investment banks or commercial banks (Booth and Smith 1986; McLaughlin *et al.* 2000; Morrison and Wilhelm 2007). Besides this costly external certification, there are other mechanisms available to an issuing firm. For example, Leland and Pyle (1977) argue that the willingness of an entrepreneur to invest may serve as an observable signal to outside investors regarding the true quality of a project for which the entrepreneur seeks financing. High willingness of the entrepreneur to take a stake personally in his own project could lead to high willingness of outside investors to pay for their shares in the project. We argue that the largest shareholder of an issuing firm in Hong Kong, being an SEO underwriter, plays the similar role. The willingness of the largest shareholder to accept the price risk, conveyed by public announcements to market participants, reveals that his private information about future earnings prospects of his firm is favorable. While investment banks as underwriters have an incentive to avoid high certification costs, as argued by Hebb (2002), the largest shareholder who has information advantages about his issuing firm could provide better credibility than investment banks for seasoned issues.<sup>7</sup>

Underwriters who have information advantages about issuing firms, on the other hand, might have incentives to misuse their private information. Because the commercial banks might misrepresent the quality of issuing firms in order to raise funds for the repayment of the debts owed to the commercial banks, the underwriting services provided by commercial banks in debt issues and equity issues raise the concern of conflicts of interest (Drucker and Puri 2007; Gande 2008). Furthermore, Fong and Lam (2014) also report that controlling shareholders of issuing firms as SEO underwriters may increase their ownership by setting deep price discounts in Hong Kong rights issues and open offers, and the announcements of their underwritings lead to greater negative market reactions.

The empirical results from Puri (1996) and Gande *et al.* (1997), however, show that underwriter certification provided by commercial banks outweighs the potential conflict of interest. This certification effect of commercial banks is

7 Claessens *et al.* (2000) document that the largest shareholder or his relatives of more than two-thirds of the family-controlled firms in East Asian countries usually are the managers of their firms (see also La Porta *et al.* 1999). Holderness (2007) also reports that on average 61% (median 76%) of the ownership owned by blockholders of those firms from emerging market has identified board representation. The certification costs could thus be reduced by routinely apprising the underwriter of private information through the placement of the underwriter on the board of directors of issuing firms, as pointed out by Booth and Smith (1986).

stronger for junior and information-sensitive securities (Puri 1996; Gande *et al.* 1997). Similar results are found in information-sensitive equity issues, including both IPOs and SEOs.<sup>8</sup> These results arrive at a similar conclusion that the certification effect outweighs the conflict of interest effect in the underwritten public securities by the underwriters who possess more information about the issuing firms. Taken together, whether the underwriter certification of the largest shareholders more than offsets the potential conflicts of interest becomes an empirical question in our study. Our first hypothesis in relation to the announcement returns of rights issues and open offers is therefore

**Hypothesis 1.** *The largest shareholders are better certifiers of firm value than investment banks if the announcement returns of the largest shareholder-underwritten offers are greater than the announcement returns of the investment bank-underwritten offers.*

### ***B. Investment banks as underwriters for non-switching and switching issuing firms***

Because the SEOs in most of the Western and Asian countries are underwritten by investment banks or commercial banks, we aim to generalize the hypothesis that the underwriter that possesses more information about an issuing firm provides better certification in the investment bank-underwritten offers. Our question is “which investment bank, among others, is expected to have information advantages about a particular issuing firm?”

A number of studies point out that the underwriter with prior relationship to issuing firms has information advantages and lower costs of information production than the underwriter without such prior relationship.<sup>9</sup> We argue, in the context of the relationship-specific information as pointed out by James (1992), that the investment banks with greater access to information through prior SEO underwriting relationship have information advantages about issuing firms and could better certify subsequent SEOs than those without prior underwriting relationship. In the process of certifying an equity offer, the investment banks as underwriters of non-switching firms have acquired the useful relationship-specific

8 For IPOs, Hebb (2002) and Schenone (2004) find that the IPOs underwritten by commercial banks, which have a pre-IPO banking relationship with issuing firms, are significantly less underpriced than IPOs underwritten by investment banks without the relationship. For SEOs, Drucker and Puri (2005) report that issuing firms benefit from reduced underwriting fees if the underwriters, including commercial banks and investment banks, concurrently lend to the issuing firms and underwrite their public securities offerings.

9 James (1992) argues that the securities issuance process requires an investment banker to invest in relationship-specific information. If the acquired information in the underwriting process is durable, there are economies of scale for investment banking in the course of repeated dealings (see also Narayanan *et al.* 2004; Gande 2008).

information for subsequent SEOs but the new underwriter of switching firms might not have such useful information.<sup>10</sup> Our second hypothesis, which studies the influence of prior SEO underwriting relationship on underwriter certification in the offers specifically underwritten by investment banks, is therefore

**Hypothesis 2.** *The SEOs underwritten by investment banks with prior SEO underwriting relationship are associated with smaller stock price declines than the SEOs underwritten by investment banks without prior SEO underwriting relationship.*

### III. DATA AND DESCRIPTIVE STATISTICS

We first identified the issuing firms for rights issues and open offers over the period from the year 2003 to 2012 in the Main Board and Growth Enterprise Market of Hong Kong stock market using Fact Book published by Hong Kong Exchange and Clearing Limited (HKEx). There is a total of 591 rights issues and open offers. Table 1 provides the details of sample exclusion, and the final uncontaminated sample consists of a total of 361 offers (217 rights issues and 144 open offers).<sup>11</sup> The details of the distribution of these rights issues and open offers from the year 2003 to 2012 are presented in Table 2. A total of 226 offers (133 rights issues and 93 open offers) underwritten specifically by investment banks and a total of 135 offers (84 rights issues and 51 open offers) underwritten specifically by the largest shareholders are identified. Table 2 also shows that the sample is widely distributed from the year 2003 to 2012.

The data on announcement dates, offer prices, gross proceeds, ownership structures, the identity of the underwriter, subscription precommitments and underwriting fees were collected from the company announcements, which are available for viewing at HKExnews of HKEx. The daily stock prices and financial statement data were retrieved from DataStream. Table 3 reports the firm and issue characteristics of 217 rights issues and 144 open offers. As shown in panel A of Table 3, the issuing firms of open offers on average have younger firm age (AGE) and smaller firm size (F\_SIZE, measured by the book value of total assets) than the issuing firms of rights issues. Younger and smaller firms indicate a

10 The non-switching firm has the existing underwriter from its previous SEO for its more recent SEO while the switching firm has the new underwriter for its more recent SEO.

11 We excluded those offers that were not fully underwritten by the underwriter and those that had been announced simultaneously with the proposed issue of, or the termination of the proposed issue of, other types of securities, including warrants, convertible bonds, public offerings, convertible preference shares, and Taiwan depositary receipts. H shares, foreign companies, and companies that had not provided underwriting fees and ownership structures were also excluded. To sharpen the test of our hypotheses, we further excluded the open offers and rights issues, which were not underwritten either by the largest shareholders alone or by investment banks alone.



**Table 1** The details of sample exclusion

Reasons	Number of offers				Sub-total
	Rights issues		Open offers		
	Main	GEM	Main	GEM	
All rights issues and open offers from year 2003 to 2012 before exclusions	299	54	181	57	591
Less:					
Not underwritten or partial underwritten	1	2	1	4	8
The identity of the underwriter unavailable	0	1	2	0	3
Total number of underwritten offers (this data is used to calculate the reputation of investment banks)	298	51	178	53	580
Less:					
H shares	9	1	0	1	11
Long trading halt around the announcement period	4	1	9	2	16
Financial statements not stated in Hong Kong dollar	8	0	9	0	17
Accounting/share price data unavailable	4	3	0	0	7
Announced simultaneously with the proposed issue of or the termination of the proposed issue of other types of securities, including warrants, debts, options, Taiwan Depositary receipts, or preference shares	24	3	13	6	46
Underwriting fee unavailable	6	2	7	5	20
Multiple underwriting fee available	3	0	0	0	3
Ownership structure unavailable	10	2	0	0	12
Not purely underwritten by investment banks or the largest shareholder	45	7	29	6	87
Final uncontaminated sample	185	32	111	33	361

*Note:* The selection of rights issues and open offers that are underwritten by investment banks alone and by the largest shareholders alone over the period from the year 2003 to 2012. The selection of both rights issues and open offers is further split according to the board where an issuing firm is listed, either the Main Board (Main) or Growth Enterprise Market (GEM).

higher level of asymmetric information about firm value (Armitage 2000; Cronqvist and Nilsson 2005).

Moreover, the issuing firms of rights issues have significantly higher median dividend yield (DIV), lower growth potential (see the median of market-to-book ratio, M/B, as measured by the sum of market value of equity and book value of total liabilities divided by the book value of total assets), lower firm-specific risk (SE; measured by the standard deviation of the market-model residuals), and higher systematic risk (BETA; measured by the slope of the characteristic line) than the issuing firms of open offers. The issuing firms of rights issues are not



**Table 2** Summary of the distribution of rights issues and open offers

Year	Investment banks				The largest shareholders			
	Rights issues		Open offers		Rights issues		Open offers	
	Main	GEM	Main	GEM	Main	GEM	Main	GEM
2003	5	0	5	1	5	2	0	1
2004	8	3	4	1	5	0	4	0
2005	13	1	9	0	8	1	2	0
2006	11	3	7	1	9	1	3	2
2007	12	1	8	4	7	2	5	0
2008	10	1	3	1	7	1	4	1
2009	10	3	16	5	10	0	6	2
2010	17	3	8	2	2	3	6	1
2011	15	3	4	1	11	1	4	1
2012	11	3	7	6	9	0	6	3
sub-total	112	21	71	22	73	11	40	11
Total	133		93		84		51	

*Note:* Summary of the distribution of rights issues and open offers that are underwritten by investment banks alone and by the largest shareholder alone over the period from the year 2003 to 2012. The distribution of both rights issues and open offers is further split according to the board where an issuing firm is listed, either the Main Board (Main) or Growth Enterprise Market (GEM).

significantly different from the issuing firms of open offers in terms of control margin (MARGIN; measured by the vote ownership of the largest shareholder minus the total vote ownership by other blockholders who own at least 10% of outstanding shares), return on assets (ROA), the systematic risk adjusted using the Scholes–Williams (1977) method (A\_BETA), and the free cash flows-to-total assets ratio (FCF).

Panel B of Table 3 reports issue characteristics of rights issues and open offers. The average gross proceeds (SIZE) raised from rights issues is \$HK556.72m while it is \$HK203.11m for open offers. Open offers, on average, raised less cash proceeds than rights issues. The offer-price discounts (DIS) on average are 42.01% and 43.16% for rights issues and open offers, respectively. The difference of price discounts is not significant ( $p$ -value = 0.737). Compared with the price discounts of SEOs in the USA and in the UK (e.g., Armitage 2000; Slovin *et al.* 2000; Altinkılıç and Hansen 2003), we observe a deep discount in offer prices of rights issues and open offers in Hong Kong.<sup>12</sup> Furthermore, Table 3 indicates that issuing firms of rights offers are not statistically different from the issuing firms of open offers in terms of the precommitment of substantial shareholders

12 One of the main reasons of the deep price discount in our sample is that the issuing firms that are involved in share consolidations (CONS) as part of their capital reorganizations provide tremendously large price discounts. For rights issues in our sample, the average price discount of the issuing firms that are involved in share consolidations is 62.29%, but those that are not involved in share consolidations is 39.40% (not tabulated). The difference of price discounts between the sub-groups is significant ( $p$ -value = 0.000). For open offers, the result is similar but the size of the difference is smaller (not tabulated).

**Table 3** Descriptive statistics for 217 rights issues and 144 open offers

	Rights issues (N = 217)		Open offers (N = 144)		Difference		
	Mean	Median	Mean	Median	In mean	In mean <i>p</i> -value	In median <i>p</i> -value
Panel A: firm characteristics							
AGE (years)	12.61	11.25	10.47	8.79	2.14	0.002	0.002
F_SIZE (\$HKBil)	4.75	0.44	1.94	0.36	2.81	0.083	0.024
MARGIN (%)	32.15	30.77	29.01	27.47	3.14	0.183	0.246
DIV (%)	1.08	0.00	0.68	0.00	0.39	0.110	0.033
ROA (%)	-13.76	-2.72	-18.67	-2.37	4.90	0.755	0.708
M/B	1.66	0.65	1.86	0.80	-0.20	0.732	0.024
SE (%)	5.00	4.03	5.59	5.04	-0.59	0.035	0.005
A_BETA	0.61	0.65	0.60	0.62	0.01	0.888	0.548
BETA	0.61	0.62	0.51	0.47	0.10	0.075	0.080
FCF	-0.09	-0.02	-0.05	-0.01	-0.04	0.286	0.788
Panel B: issue characteristics							
SIZE (\$HKMil)	556.72	125.11	203.11	72.73	353.61	0.001	0.000
R_SIZE	0.47	0.22	0.34	0.22	0.13	0.023	0.357
PRECOM (%)	32.88	33.70	29.57	29.09	3.31	0.175	0.154
DIS (%)	42.01	41.62	43.16	45.22	-1.14	0.737	0.661
FEES (%)	2.11	2.50	2.01	2.40	0.10	0.371	0.252
EX_DAY (days)	22.22	21.00	22.15	19.50	0.07	0.971	0.676
CAR(0,1)	-15.85	-15.04	-8.25	-8.67	-7.60	0.002	0.000
CAR(-10, 10)	-15.13	-13.88	-6.61	-7.89	-8.52	0.022	0.006

*Notes:* This table provides the *p*-value of parametric *t*-test statistics/non-parametric Mann-Whitney test statistics for the different in mean/median of variables between rights issues and open offers. Variable definitions are presented in the appendix.

to subscribe new shares (PRECOM) and the expected time period to address preemptive rights of current shareholders (EX\_DAY).<sup>13</sup> The full list of variable definitions is presented in the Appendix.

We further split the equity offerings into two sub-groups: One is the largest shareholder-underwritten offers, and another is the investment bank-underwritten offers. The firm and issue characteristics of these two sub-groups are presented in Table 4. For both rights issues and open offers, as shown in panel A, the issuing firms of the largest shareholder-underwritten offers on average have a greater control margin (MARGIN) and lower firm-specific risk (SE) than those of the investment bank-underwritten offers. Moreover, compared with the investment bank-underwritten rights issues, the firm characteristics in panel A of Table 4 further indicate that the largest shareholder-underwritten rights issues are made by the issuers that have higher dividend yield (DIV),

13 EX\_DAY is available on SEO announcement dates, and it is the expected number of business days over the period from the announcement day to the first day of dealings in shares on an ex-rights basis (rights offer) or an ex-entitlement basis (open offer), and a longer expected subscription period is required for an offer with higher complexity level and price risk.

**Table 4** Descriptive statistics for 217 rights issues and 144 open offers across different groups: The largest shareholders versus investment banks

	Rights issues				Open offers									
	The largest shareholders N = 84		Investment banks N = 133		Difference		The largest shareholders N = 51		Investment banks N = 93		Difference			
	Mean	Median	Mean	Median	In mean	In mean	In mean	Mean	Median	Mean	Median	In mean	In mean	p-value
Panel A: firm characteristics														
AGE (years)	12.79	12.04	12.49	10.75	0.30	0.751	12.70	12.25	9.25	8.08	3.45	0.002		
F_SIZE (\$HKMil)	8.99	0.80	2.07	0.33	6.92	0.031	4.55	4.92	0.51	0.21	4.04	0.159		
MARGIN (%)	47.42	51.94	22.51	20.00	24.91	0.000	38.72	36.94	23.69	21.24	15.03	0.000		
DIV (%)	1.59	0.00	0.75	0.00	0.84	0.017	0.77	0.00	0.64	0.00	0.13	0.740		
ROA (%)	-11.58	0.00	-15.14	-3.46	3.56	0.886	-10.73	0.35	-23.01	-4.50	12.28	0.356		
M/B	1.49	0.82	1.77	0.58	-0.28	0.690	2.70	0.71	1.40	0.83	1.30	0.358		
SE (%)	4.19	3.43	5.51	4.86	-1.32	0.000	4.72	4.62	6.07	5.28	-1.35	0.001		
A_BETA	0.54	0.57	0.65	0.69	-0.11	0.280	0.73	0.79	0.53	0.52	0.20	0.116		
BETA	0.54	0.58	0.66	0.62	-0.12	0.105	0.60	0.60	0.45	0.43	0.15	0.141		
FCF	-0.02	-0.01	-0.14	-0.02	0.12	0.002	-0.05	-0.01	-0.06	-0.02	0.01	0.838		
Panel B: issue characteristics														
SIZE (\$HKMil)	988.26	139.15	284.17	114.02	704.09	0.002	360.00	99.92	117.07	63.56	242.93	0.033		
R_SIZE	0.31	0.15	0.57	0.25	-0.26	0.003	0.25	0.15	0.38	0.24	-0.13	0.091		
PRECOM (%)	43.87	51.42	25.94	24.25	17.93	0.000	38.55	43.73	24.64	24.27	13.91	0.000		
DIS (%)	34.84	31.00	48.82	48.00	-13.98	0.000	35.91	36.51	46.55	48.72	-10.64	0.036		
FEES (%)	1.54	2.00	2.47	2.50	-0.93	0.000	1.16	1.50	2.48	2.50	-1.32	0.000		
EX_DAY (days)	20.57	19.50	23.26	21.00	-2.69	0.243	23.43	23.00	21.45	15.00	1.98	0.503		
CAR(0, 1)	-13.75	-10.75	-17.18	-18.61	3.43	0.273	-7.24	-5.67	-8.81	-10.00	1.57	0.651		
CAR(-10, 10)	-11.65	-11.15	-17.33	-19.83	5.68	0.226	-7.24	-9.16	-6.26	-6.85	-0.98	0.842		

Notes: This table provides the *p*-value of parametric *t*-test statistics for the different in the mean of variables between offers underwritten specifically by the largest shareholder and offers underwritten specifically by investment banks for both rights issues and open offers. Variable definitions are presented in the appendix.

larger firm size (F\_SIZE), and larger amount of free cash flow (FCF). For open offers, however, the issuing firms of the largest shareholder-underwritten open offers do not provide these similar results, and these firms instead have higher firm age (AGE) than the issuing firms of the investment bank-underwritten open offers.

Panel B of Table 4 shows the issue characteristics of the largest shareholder-underwritten offers and investment bank-underwritten offers. For both rights issues and open offers, as compared with the investment bank-underwritten offers, the largest shareholder-underwritten offers are the issues that generally have larger gross proceeds (SIZE), smaller ratio of gross proceeds to firm market value (R\_SIZE), higher subscription precommitments (PRECOM), lower price discounts (DIS), and lower underwriting fees (FEES). Price discounts could be a substitute for the underwriting, and larger price discounts reduce the need of investment banks to underwrite SEOs (Armitage 2002). While our result shows that the investment bank-underwritten offers generally have deeper price discounts than the largest shareholder-underwritten offers, it might indicate that investment banks set larger price discounts in order to lower their needs to take up unsubscribed new shares. The rest of firm and issue characteristics of the largest shareholder-underwritten offers reported in Table 4, including EX\_DAY, ROA, M/B, A\_BETA, BETA, cumulative abnormal return CAR(0, 1), and CAR(−10, 10), are not significantly different from those of the investment banks-underwritten offers.

The correlation matrix of the variables in this study for rights issues and open offers is reported in the lower triangle and the upper triangle of Table 5, respectively. As shown in Table 5, none of the correlations are large, except for the one between the subscription precommitments (PRECOM) and control margin (MARGIN). To ensure that the estimation of the regression results is not affected by multicollinearity problems, as recommended by Hair *et al.* (2010), PRECOM is excluded as one of the explanatory variables in our multivariate analysis.

#### **IV. SELECTION BIAS ADJUSTMENT AND DETERMINANTS OF SEO ANNOUNCEMENT RETURNS**

##### ***A. Selection bias adjustment***

The results in Table 4 indicate that the largest shareholders act as SEO underwriters for those firms that have higher margin (MARGIN), lower firm-specific risk (SE), lower price discount (DIS), larger gross proceeds (SIZE), and smaller ratio of gross proceeds to firm market value (R\_SIZE). This provides initial evidence that the largest shareholders of publicly listed companies might self-select into their preferred firms to be the SEO underwriters, and usually, these choices are not randomly determined. This leads to self-selection problems and causes the ordinary least squares (OLS) estimate to be biased.

**Table 5** The correlation matrix for 217 rights issues (lower triangle) and for 144 open offers (upper triangle)

	TYPE	SE	Ln(M/B)	CONS	DIS	FCF	FIN	Ln(F_SIZE)	Ln(AGE)	R_SIZE
TYPE	1	-0.265	-0.055	0.044	-0.166	0.017	0.055	0.280	0.255	-0.141
SE	-0.232	1	0.028	0.159	0.026	-0.180	0.175	-0.443	-0.195	0.273
Ln(M/B)	0.095	0.224	1	0.034	-0.006	-0.432	-0.076	-0.463	-0.014	-0.140
CONS	-0.142	0.081	-0.015	1	0.171	-0.030	0.048	-0.148	-0.009	0.040
DIS	-0.168	0.188	0.010	0.304	1	-0.035	-0.040	-0.227	0.007	0.051
FCF	0.183	-0.343	-0.234	-0.275	-0.108	1	0.035	0.310	-0.009	-0.081
FIN	-0.090	-0.006	-0.302	-0.021	-0.014	-0.046	1	-0.095	0.112	0.077
Ln(F_SIZE)	0.174	-0.561	-0.428	-0.198	-0.198	0.396	0.121	1	0.338	-0.213
Ln(AGE)	0.004	-0.280	-0.244	-0.042	-0.096	0.189	0.195	0.418	1	-0.105
R_SIZE	-0.185	0.036	-0.133	0.297	0.195	-0.297	0.236	-0.333	-0.036	1
DIV	0.168	-0.293	-0.095	-0.077	-0.065	0.181	-0.066	0.373	0.144	-0.190
ROA	0.010	-0.062	0.153	-0.129	-0.012	0.296	-0.021	0.085	0.045	-0.132
MARKET	0.037	-0.224	-0.272	-0.048	-0.134	0.089	0.261	0.357	0.451	0.033
MARGIN	0.514	-0.240	0.083	-0.181	-0.278	0.161	-0.014	0.303	0.078	-0.221
Ln(EX_DAY)	-0.008	0.179	-0.049	0.502	0.257	-0.230	0.067	-0.254	-0.104	0.395
A_BETA	-0.074	-0.256	-0.152	0.077	-0.079	0.129	0.041	0.303	0.185	-0.066
PRECOM	0.358	-0.258	0.117	-0.175	-0.222	0.150	-0.107	0.290	-0.028	-0.254
CAR(0, 1)	0.067	0.067	0.129	-0.257	-0.190	-0.064	0.071	0.005	-0.136	-0.047

Notes: Variable definitions are presented in the appendix.

**Table 5** (continued)

	DIV	ROA	MARKET	MARGIN	Ln(EX_DAY)	A_BETA	PRECOM	CAR(0,1)
TYPE	0.028	0.077	0.024	0.350	0.166	0.131	0.312	0.038
SE	-0.281	-0.191	-0.155	-0.276	0.046	-0.188	-0.246	0.202
Ln(M/B)	-0.224	-0.234	-0.314	0.060	-0.079	-0.011	0.070	0.236
CONS	-0.107	0.014	-0.005	-0.132	0.477	-0.062	-0.138	-0.180
DIS	-0.013	0.075	-0.079	-0.069	0.130	-0.231	-0.033	-0.023
FCF	0.072	0.437	0.203	0.065	0.051	0.070	0.020	0.056
FIN	-0.091	-0.054	0.164	-0.033	0.012	0.213	-0.029	0.019
Ln(F_SIZE)	0.224	0.243	0.478	0.186	0.008	0.282	0.114	-0.163
Ln(AGE)	-0.039	0.058	0.392	0.145	0.083	0.176	0.049	-0.035
R_SIZE	-0.004	-0.101	0.055	-0.107	0.126	0.035	-0.094	-0.018
DIV	1	0.123	0.167	0.087	-0.103	-0.013	0.072	-0.160
ROA	0.040	1	0.214	0.202	0.004	-0.022	0.209	-0.059
MARKET	0.161	0.060	1	0.135	-0.011	0.185	0.070	-0.194
MARGIN	0.211	0.055	0.161	1	-0.091	0.105	0.693	0.144
Ln(EX_DAY)	-0.204	-0.220	-0.052	-0.265	1	0.061	-0.078	-0.174
A_BETA	0.049	0.011	0.111	-0.040	-0.045	1	0.007	-0.114
PRECOM	0.253	-0.014	0.030	0.720	-0.231	0.015	1	0.134
CAR(0, 1)	0.023	0.038	-0.035	0.124	-0.173	-0.090	0.233	1

Following Tucker (2010) and Cameron and Trivedi (2005, pp. 862–863), the average treatment effect (ATE) is estimated by using the potential-outcome framework (also known as the counterfactual framework). In this study, this framework involves two processes: The first process that models the decision of the largest shareholder to be or not to be the SEO underwriter is our selection model, and the second process that models the determinants of the SEO price reaction is our outcome model. Our outcome model is written as follows:

$$CAR_i = \alpha + \theta TYPE_i + \sum_{k=1}^K \beta_k X_{ik} + u_i \quad (1)$$

where  $TYPE_i$  is a dummy variable. It equals one if the largest shareholder is the SEO underwriter of Firm  $i$  and zero otherwise. The dependent variable  $CAR$  ( $CAR_i$ ) measures the SEO announcement effect of Firm  $i$ .  $X_{ik}$  is an exogenous variable of Firm  $i$  that affects  $CAR_i$ , and the number of the exogenous variables is  $k$ . Whether the largest shareholder of an issuing firm chooses to be an underwriter ( $TYPE$ ) is estimated using a binary selection model as follows:

$$TYPE_i^* = \alpha^* + \pi MARGIN_i + \sum_{k=1}^K \beta_k^* X_{ik} + v_i \quad (2)$$

where  $TYPE_i^*$  is a latent variable and it measures how likely the largest shareholder of Firm  $i$  will choose to be an SEO underwriter.<sup>14</sup>

The same set of regressors could be used in both the selection model and outcome model. After inclusion of regressors, any remaining errors ( $u$  and  $v$  in our study) may be correlated or uncorrelated. In the context of our study, the largest shareholders of issuing firms might self-select into their preferred firms on the basis of unobservable factors, and these unobservable factors are correlated with the SEO announcement effects. The treatment variable ( $TYPE^*$ ) or the error term ( $v$ ) in the binary selection model is thus correlated with the error term ( $u$ ) in the outcome model, and a selection bias arises. The OLS estimate of  $\theta$  in equation (1) is thus biased, and it could no longer be interpreted as estimating the marginal effect on the dependent variable  $CAR$  of an exogenous change in  $TYPE$ . The treatment effects model could be applied to correct for this type of selection bias and to estimate the ATE. On the other hand, when the two errors ( $u$  and  $v$ ) are not correlated after we condition on enough observable variables, the ATE could be estimated by using inverse-probability-weighted regression adjustment or other methods (for more details, see Wooldridge 2010, Chapter 21; Cameron and Trivedi 2005, Chapter 25).

14 Following Guo and Fraser (2015), if  $TYPE_i^*$  is higher than a threshold (normalized to 0 in the model), the largest shareholder will be the underwriter and the dummy variable  $TYPE$  is 1. Otherwise, the largest shareholder will not be the underwriter and the dummy variable  $TYPE$  is 0. Put it another way,  $TYPE = 1$  if  $TYPE^* \geq 0$  and  $TYPE = 0$  if  $TYPE^* < 0$ .



Having an exclusion restriction in the selection model could generate nontrivial variation in the treatment variable ( $TYPE_i^*$ ) but does not affect the outcome variable ( $CAR_i$ ). In this study, control margin (MARGIN) is used as the exclusion restriction variable, which must meet the instrument relevance and instrument exogeneity pointed out by Wooldridge (2013). In order words, MARGIN must be positively associated with TYPE, but it must be uncorrelated with CAR except through TYPE.<sup>15</sup> Other than the exclusion restriction variable, as compared with investment banks, we argue that the largest shareholders will underwrite the SEOs (i) issued by better quality issuing firms; (ii) made by older, larger, and better-known issuers with lower information asymmetries; (iii) with a longer period of subscription period; and (iv) with higher private benefits of control due to the rent-protection motive of the largest shareholder.<sup>16</sup> Our binary selection model in equation (2) is then developed as follows:

- 15 It is recommended by both Lennox *et al.* (2012) and Larcker and Rusticus (2010) to provide justifications or economic theory for the selection of exclusion restriction variables. As an exclusion restriction variable, MARGIN must have good explanatory power for the choice of the underwriter. Cronqvist and Nilsson (2005) point out that the control considerations are important to controlling families. Potential threat to family control is significant when the control margin, measured by the controlling family's vote ownership minus the sum of votes by all other blockholders, is small. We thus argue that while a higher control margin makes the largest shareholder of an issuing firm easier to organize an SEO, lower flotation costs, and/or avoid control dilutions, the largest shareholder is more likely to be the SEO underwriter. Does MARGIN also meet the requirement of instrument exogeneity? When estimating the causal link between schooling and hourly wage, Card (1995) uses geographic differences in the accessibility of college as an instrumental variable for schooling choices of individuals. In the same vein, we argue that the largest shareholder of an issuing firm, who has high control margin (MARGIN), faces a higher cost of not being the SEO underwriter because the flexibility option in designing a self-interest plan and/or the setting of accurate offer prices based on the information advantages might be precluded. MARGIN provides an exogenous source of variation for the analysis of the causal link between announcement returns and types of underwriters.
- 16 Specifically, we expect that the largest shareholder is more likely to underwrite the SEOs of (i) an issuing firm with lower DIS, higher DIV, higher ROA, and/or no involvement in share consolidation as part of its capital reorganization (CONS). For example, offer-price discounts (DIS) are used as one of the proxies for firm quality (e.g., Balachandran *et al.* 2008). Moreover, dividend yields (DIV) and return on assets (ROA) also serve as the proxies of quality and growth opportunities (Denis 1994; Lee *et al.* 2014); (ii) an older firm ( $Ln(AGE)$ ) that has larger firm size ( $Ln(F\_SIZE)$ ), smaller ratio of gross proceeds to its market value ( $R\_SIZE$ ), lower market-to-book ratio ( $Ln(M/B)$ ), lower firm-specific risk (SE), and/or lower underwriting risk that cannot be reduced by diversification ( $A\_BETA$ ). See Kroszner and Rajan (1994) and Gompers and Lerner (1999) for the discussion of the types of securities underwritten by the affiliates of commercial banks and affiliated investment banks; (iii) a longer subscription period ( $Ln(EX\_DAY)$ ). Investment banks as underwriters are more concerned about the long duration of the subscription period and aim to avoid high price risk by reducing these days (see also Holderness and Pontiff 2016); and (iv) higher free cash flows-to-total assets ratio (Wu *et al.* 2016 for the rent-protection motive). The rest of explanatory variables, including FIN (Bøhren *et al.* 1997), METHOD (Armitage 2002), and MARKET (Slovin *et al.* 2000), are control variables, and we do not predict the signs of their slope coefficients.

Probability(TYPE<sub>i</sub> = 1)

$$= \Phi(\alpha_0 + \alpha_1 \text{MARGIN}_i + \alpha_2 \text{SE}_i + \alpha_3 \text{A\_BETA}_i + \alpha_4 \text{Ln(M/B)}_i + \alpha_5 \text{CONS}_i + \alpha_6 \text{LN(EX\_DAY)}_i + \alpha_7 \text{DIS}_i + \alpha_8 \text{FCF}_i + \alpha_9 \text{FIN}_i + \alpha_{10} \text{Ln(F\_SIZE)}_i + \alpha_{11} \text{Ln(AGE)}_i + \alpha_{12} \text{R\_SIZE}_i + \alpha_{13} \text{DIV}_i + \alpha_{14} \text{ROA}_i + \alpha_{15} \text{MARKET}_i + \alpha_{16} \text{METHOD}_i + u_i) \quad (3)$$

where  $\Phi$  represents the probit distribution function. Table 6 reports the findings of our selection models. The key results for rights issues (column 1), open offers (column 2), and the pooled sample (column 3) are as follows. First, the findings indicate that MARGIN is a significant determinant for the choice of SEO underwriters. The higher the control margin, the higher the likelihood that the largest shareholders will be the SEO underwriters. Similarly, Gompers and Lerner (1999) also find that an investment bank who is also the venture capital investor of an issuing firm is more likely to be the IPO underwriter of the issuing firm if the investment bank owns a larger amount of equity.

Second, the largest shareholders are more likely to be the underwriters of higher quality firms (as indicated by the negative association between DIS and the likelihood of having the largest shareholders as underwriters in columns 2 and 3) with lower level of information asymmetries (as both

**Table 6** The selection model: the choice of underwriters between the largest shareholder and investment banks

Column Type of offers	1 Rights issues	2 Open offers	3 Pooled sample
INTERCEPT	-2.766** (-2.16)	-4.731** (-2.37)	-3.268*** (-3.35)
MARGIN	0.029*** (5.12)	0.020*** (2.65)	0.024*** (6.01)
Ln(EX_DAY)	0.701*** (3.20)	0.446* (1.80)	0.603*** (3.83)
SE	-8.589* (-1.69)	-9.229 (-1.28)	-6.330* (-1.70)
A_BETA	-0.160 (-1.07)	-0.094 (-0.51)	-0.103 (-0.94)
Ln(M/B)	0.162 (1.28)	-0.018 (-0.09)	0.096 (0.97)
CONS	-0.144 (-0.41)	0.376 (0.90)	0.045 (0.18)
DIS	-0.253 (-0.88)	-1.057** (-2.15)	-0.522** (-2.23)
FCF	0.950* (1.67)	-0.341 (-0.58)	0.557 (1.48)
FIN	-0.182 (-0.81)	0.617 (1.37)	-0.078 (-0.42)
Ln(F_SIZE)	0.010 (0.14)	0.231* (1.72)	0.067 (1.15)
Ln(AGE)	0.058 (0.30)	0.410* (1.90)	0.212 (1.57)
R_SIZE	-0.269 (-1.38)	-0.125 (-0.33)	-0.353** (-2.20)
DIV	0.037 (0.92)	-0.033 (-0.52)	0.017 (0.54)
ROA	-0.024 (-0.25)	0.028 (0.16)	-0.038 (-0.32)
MARKET	-0.063 (-0.19)	-0.688 (-1.64)	-0.276 (-1.19)
METHOD			-0.087 (-0.55)
N	217	144	361

*Notes:* The dependent variable for the selection models is TYPE. \*, \*\*, and \*\*\* indicate that the coefficient is significantly different from zero at the 10%, 5%, and 1% level in two-tailed tests, respectively, according to the z-statistics, which are shown in parentheses below the corresponding coefficient estimates. Variable definitions are presented in the appendix.

$\ln(\text{F\_SIZE})$  and  $\ln(\text{AGE})$  are positively associated with the likelihood of having the largest shareholders as underwriters in column 2). Consistent with the findings of Kroszner and Rajan (1994) for the affiliates of commercial banks and Gompers and Lerner (1999) for investment banks, the finding indicates that the largest shareholders are concerned about potential conflicts of interest and only choose to underwrite less information-sensitive issues in order to limit potential conflicts. The results of the pooled sample provide the similar implication as the signs of slope coefficients for  $\text{SE}$  and  $\text{R\_SIZE}$  are in line with our prediction.

Third,  $\ln(\text{EX\_DAY})$  has a positive and statistically significant coefficient. This result supports our prediction that investment banks are more concerned with reducing price risk in securities underwritings than the largest shareholders. Last but not least, the coefficient of  $\text{FCF}$  is significant at the 10% level for rights issues, and it supports the rent-protection motive of the largest shareholder argued by Wu *et al.* (2016) and Wu and Wang (2005a).

## ***B. Determinants of seasoned equity offering announcement returns***

In this section, we examine the market reaction to the announcements of rights issues and open offers in Hong Kong using an event study methodology and regression analysis. The event study technique as in Patell (1976), Mikkelsen and Partch (1986), and Schipper and Smith (1986) is applied to measure the announcement effects of both rights issues and open offers over the period from the year 2003 to 2012 in Hong Kong stock market. The cumulative 2-day abnormal returns from day 0 to day 1 are averaged across the SEO firms.<sup>17</sup> For both rights issues and open offers, as shown in Table 4, the results indicate that the potential conflicts of interest are not pronounced.<sup>18</sup> However, the mean difference is not the ATE as it is not calculated under the potential-outcome framework.

The outcome model is then further developed in order to properly estimate the ATE using the maximum likelihood estimation. The outcome model analyzes cross-sectional relations between 2-day announcement returns  $\text{CAR}(0, 1)$  as the dependent variable and a set of relevant independent variables that may affect

17 Abnormal returns are calculated using the market model, with the estimation window from day  $-200$  to day  $-40$ . Day 0 is the announcement day. The beta is adjusted using the Scholes-Williams (1977) method due to the problem of thin trading.

18 The mean (median) of the 2-day abnormal returns  $\text{CAR}(0, 1)$  of the largest shareholder-underwritten rights issues is  $-13.75\%$  ( $-10.75\%$ ) and the mean (median) of that of the investment bank-underwritten rights issues is  $-17.18\%$  ( $-18.61\%$ ). The  $p$ -values for the mean difference and median difference are 0.273 and 0.050 (not tabulated), respectively, and only the median difference is significant at the 10% level. For open offers, the mean difference and median difference of the 2-day abnormal returns between the largest shareholder-underwritten offers and the investment bank-underwritten offers are not statistically significant.

the price reaction, which includes our key variable TYPE and other explanatory variables in the literature of SEO announcement effects.<sup>19</sup> Our outcome model that studies the determinants of SEO announcement returns is therefore presented as follows:

$$\begin{aligned} \text{CAR}_i = & \beta_0 + \beta_1 \text{TYPE}_i + \beta_2 \text{SE}_i + \beta_3 \text{A\_BETA}_i + \beta_4 \text{Ln(M/B)}_i + \beta_5 \text{CONS}_i \\ & + \beta_6 \text{Ln(EX\_DAY)}_i + \beta_7 \text{DIS}_i + \beta_8 \text{FCF}_i + \beta_9 \text{FIN}_i + \beta_{10} \text{Ln(F\_SIZE)}_i + \beta_{11} \text{Ln(AGE)}_i \quad (4) \\ & + \beta_{12} \text{R\_SIZE}_i + \beta_{13} \text{DIV}_i + \beta_{14} \text{ROA}_i + \beta_{15} \text{MARKET}_i + \beta_{16} \text{METHOD}_i + v_i. \end{aligned}$$

While we focus on the findings of the outcome models, the findings of OLS regression model are also reported in Table 7 for the purpose of comparison, as recommended by Larcker and Rusticus (2010). For the results of OLS regression models, all reported significance levels are for the two-tailed tests based on White's heteroskedasticity-consistent standard errors. There are several key findings. First, without controlling for selection bias, the slope coefficient of TYPE is statistically significant in OLS models for open offers (column 3), but not for rights issues (column 1) and the pooled sample (column 5). The results basically show that the certification roles of the largest shareholders are as good as investment banks, and there is no evidence of conflicts of interest. On the other hand, our results from the outcome models, which control for selection bias, are different. The likelihood-ratio tests (see *p*-value for Chi-square) for rights issues (column 2), open offers (column 4), and the pooled sample (column 6) are all statistically significant. The results confirm that there is an endogeneity problem of the underwriter choice (TYPE) for both rights issues and open offers, and the largest shareholders self-select into their preferred issuing firms to be the SEO underwriters.<sup>20</sup> After

19 These variables include (i) the standard deviation of the residuals (SE) from a standard market-model regression as a proxy for the firm-specific risk (Denis 1991; Balachandran *et al.* 2008; Pandes 2010); (ii) Beta (A\_BETA), a proxy for underwriting risk that cannot be reduced by diversification (Ng and Smith 1996); (iii) the market-to-book ratio (Ln(M/B)), a proxy for potential growth prospects (D'Mello *et al.*, 2003; Balachandran *et al.* 2008); (iv) free cash flows-to-total assets ratio (FCF) is the corporate finance variable to examine the potential conflict between the largest shareholder and minority shareholders in a family-controlled firm, as proposed by Jensen (1986); (v) a dummy variable CONS that equals to one if the offer is involved in share consolidations as part of capital reorganizations of an issuing firm and zero otherwise. It serves as a proxy for financing conditions and firm quality (Armitage 2002; Ursel 2006); (vi) Ln(EX\_DAY) could measure the complexity level and price risk of an offer; (vii) the dividend yield (DIV), a firm quality proxy (Denis 1994; Wu *et al.* 2005); (viii) return on assets (ROA), a proxy for firm quality; (ix) price discount (DIS), a proxy for firm quality (Heinkel and Schwartz 1986; Slovin *et al.* 2000); (x) both the firm age (Ln(AGE)) and the firm size (Ln(F\_SIZE)) are used as the proxies for the level of information asymmetries (Wu *et al.* 2005); (xi) the ratio of gross proceeds to the market value of an issuing firm (R\_SIZE) to measure the size of investment opportunities relative to firm size (Slovin *et al.* 2000); and (xii) METHOD, MARKET, and FIN, as defined earlier, are the rest of control variables.

20 This paper does not address the endogeneity problems among all explanatory variables, including FEES and DIS. As pointed out by Li and Prabhala (2007), while ignoring other selection biases seems a little ad hoc, controlling for all selection biases also seems infeasible. Moreover, FEES is excluded in our treatment effects models as it is not the determinant of underwriter choices and it is highly correlated with TYPE (the correlation coefficients between FEES and TYPE are -0.642 and -0.429 for open offers and rights issues, respectively. Not tabulated).

**Table 7** Ordinary least squares (OLS) regression models and outcome models for endogenous treatment effects estimation: the determinants of the SEO announcement returns CAR(0, 1)

Column	1	2	3	4	5	6
Dependent variable	CAR(0, 1)					
Exclusion restriction	Nil	MARGIN	Nil	MARGIN	Nil	MARGIN
Type of offers	Open offers (METHOD = 0)					
Estimation approach	Rights issues (METHOD = 1)					
	OLS	Maximum likelihood	OLS	Maximum likelihood	OLS	Maximum likelihood
INTERCEPT <sup>a</sup>	-10.151 (-0.42)	-8.869 (-0.42)	-18.350 (-0.98)	-7.725 (-0.34)	-8.499 (-0.54)	0.004 (0.00)
TYPE	0.015 (0.42)	0.257*** (3.84)	0.065* (1.83)	0.244*** (3.17)	0.028 (1.16)	0.253*** (5.67)
Ln(EX_DAY)	-0.030 (-0.80)	-0.065* (-1.83)	-0.046 (-1.45)	-0.070** (-2.02)	-0.034 (-1.28)	-0.071*** (-2.73)
SE	0.621 (0.56)	1.357 (1.62)	2.307*** (2.79)	3.015*** (3.54)	1.095** (1.47)	1.720*** (2.86)
A_BETA	-0.016 (-0.53)	0.006 (0.22)	-0.028 (-1.35)	-0.026 (-1.10)	-0.025 (-1.32)	-0.012 (-0.67)
Ln(M/B)	0.033 (1.28)	0.007 (0.28)	0.073*** (3.85)	0.076*** (3.31)	0.043** (2.44)	0.027 (1.58)
CONS	-0.125** (-1.98)	-0.094* (-1.66)	-0.111** (-2.03)	-0.125** (-2.18)	-0.108** (-2.47)	-0.088** (-2.12)
DIS	-0.101* (-1.69)	-0.059 (-1.04)	0.028 (0.39)	0.078 (1.26)	-0.061 (-1.49)	-0.013 (-0.30)
FCF	-0.081 (-0.84)	-0.134** (-1.97)	0.211*** (3.39)	0.243*** (3.38)	0.006 (0.09)	-0.017 (-0.34)
FIN	0.062* (1.91)	0.070* (1.75)	0.015 (0.34)	-0.016 (-0.30)	0.062** (2.40)	0.061** (1.97)
Ln(F_SIZE) <sup>a</sup>	1.484 (1.26)	0.638 (0.49)	1.005 (0.84)	-0.029 (-0.02)	1.298 (1.48)	0.388 (0.38)
Ln(AGE)	-0.066** (-2.35)	-0.053 (-1.53)	0.012 (0.48)	-0.015 (-0.47)	-0.029 (-1.47)	-0.038 (-1.61)
R_SIZE	0.016 (0.30)	0.019 (0.62)	0.021 (0.65)	0.028 (0.69)	0.013 (0.31)	0.024 (0.95)
DIV	0.003 (0.77)	-0.002 (-0.19)	-0.005 (-0.43)	-0.004 (-0.52)	-0.002 (-0.37)	-0.004 (-0.76)
ROA	0.002 (0.31)	0.006 (0.60)	-0.013 (-1.12)	-0.022 (-0.91)	-0.002 (-0.32)	-0.001 (-0.07)
MARKET	-0.009 (-0.12)	-0.017 (-0.30)	-0.060 (-1.05)	-0.017 (-0.33)	-0.036 (-0.73)	-0.021 (-0.54)
METHOD					-0.073*** (-2.91)	-0.076*** (-2.79)
N	217	217	144	144	361	361
Adj. R-squared	0.0889		0.1594		0.1176	
F-statistic	2.4050		2.8072		3.9996	
p-value for F-statistic	0.0032		0.0008		<0.0001	
Chi-square		5.97		2.73		14.01

**Table 7** (continued)

Column	1	2	3	4	5	6
Dependent variable		CAR(0, 1)		CAR(0, 1)		CAR(0, 1)
Exclusion restriction	Nil	MARGIN	Nil	MARGIN	Nil	MARGIN
Type of offers	Rights issues (METHOD = 1)		Open offers (METHOD = 0)		Pooled sample	
Estimation approach	OLS	Maximum likelihood	OLS	Maximum likelihood	OLS	Maximum likelihood
<i>p</i> -value for Chi-square		0.0146		0.0985		0.0002
Wald chi-square		46.51		46.68		86.05
<i>p</i> -value for Wald chi-square		<0.001		<0.001		<0.001

*Notes:* The dependent variables are CAR(0, 1), a 2-day standard cumulative abnormal return of each issuing firm from day 0 to day 1. \*, \*\*, and \*\*\* indicate that the coefficient is significantly different from zero at the 10%, 5%, and 1% level, respectively, according to the *t*-value using White heteroskedasticity-consistent standard errors for the OLS regression models and *z*-value for the outcome models using maximum likelihood estimation, which are shown in parentheses below the corresponding coefficient estimates. Variable definitions are presented in the appendix. <sup>a</sup> indicates all coefficient estimates on Ln(F\_SIZE) and INTERCEPT should be multiplied by 10<sup>-2</sup>.

controlling for other firm and issue characteristics and correcting for selection bias, our key variable TYPE is a significant explanatory variable for the announcement returns of rights issues (column 2), open offers (column 4), and the pooled sample (column 6). These results confirm that the largest shareholders could provide better certification than investment banks for rights offerings in Hong Kong, and Hypothesis 1 is thus supported. The underwriter certification of the largest shareholders outweighs the potential of conflicts of interest, and the largest shareholders who possess more firm-specific information than investment banks can better certify firm value.

What is the possible reason behind the better underwriter certification of the largest shareholders in rights-preserving offers? The generalized Myers–Majluf model developed by Wu and Wang (2005a) decomposes the announcement effect of an SEO into two underlying information effects, either from assets-in-place or new investments. For stock prices of an issuing firm to drop, as shown by our findings of  $CAR(0, -1)$  for rights issues and open offers in Hong Kong in Tables 3 and 5, one negative information effect must outweigh a positive information effect, or both information effects must be negative.<sup>21</sup> The possible scenario to those offers, especially those underwritten by the largest shareholders, is that the negative information about new investments outweighs the positive information about assets-in-place, and it implies the undervaluation of the existing assets of issuing firms. Heron and Lie (2004) find that a firm that needs outside funds but is temporarily undervalued will choose rights offers. They further point out that the choice of rights offers can minimize the transfer of wealth from the existing shareholders to outside new investors. Our analysis supports the finding of Heron and Lie (2004), especially when the largest shareholders act as the SEO underwriters.

Second, investors react more adversely to rights issues (columns 1 and 2), open offers (columns 3 and 4), and the pooled sample (columns 5 and 6) that have simultaneously announced share consolidations as part of capital reorganizations (CONS). In the univariate analysis of Armitage (2002), the equity offers with larger price discounts are associated with crisis (the issuing firm could not continue at all without cash proceeds from equity offerings) and distress (poor performance), and these offers have larger price drops around the announcement dates. Our result is consistent with his finding.  $\text{Ln}(\text{EX\_DAY})$  provides similar

21 Specifically, three possible scenarios are (i) the negative information about new investments outweighs the positive information about assets-in-place (e.g., an undervaluation of the existing assets), (ii) the negative information about assets-in-place outweighs the positive information about new investments (e.g., good news about investments), and (iii) information effects from both assets-in-place and new investments are negative. We rule out scenario (iii) because the largest shareholders are unlikely to underwrite and purchase the overvalued stock. We also rule out scenario (ii) because Wu and Wang (2005a) point out that usually small firms with high uncertainty of good growth prospects have the positive information about new investments. As shown in Tables 5 and 7, the largest shareholders are more likely to be the SEO underwriters of larger issuing firms ( $\text{Ln}(\text{F\_SIZE})$ ) with lower levels of uncertainty (SE).



results and the slope coefficients of  $\text{Ln}(\text{EX\_DAY})$  in the outcome models (columns 2, 4, and 6) are all negative and statistically significant. The result indicates that higher complexity level and higher price risk of an offer will lead to larger negative announcement returns.<sup>22</sup>

Third, the coefficient of FCF is significantly positive at the 1% level for open offers (columns 3 and 4) but significantly negative at the 5% level for rights issues (column 2). Wu and Wang (2005a) point out that one factor that helps to cure both overinvestment and underinvestment problems of free cash flows is the growth prospects of the issuing firms. As noted earlier, the issuing firms of open offers generally have higher growth opportunities than those of rights issues. Table 7 indicates that investors react favorably to the announcements of open offers by high-growth firms with larger free cash flows. Furthermore, as Jensen (1986) points out that conflicts of interest between managers and shareholders are more severe in firms with larger free cash flows, the slope coefficient of FCF is expected to be negative. Our finding of the coefficient of FCF for rights issues confirms his prediction.

Last but not least, the slope coefficients of the rest of explanatory variables in the outcome models, including METHOD, SE,  $\text{Ln}(\text{M/B})$ , and FIN, are consistent with the literature.<sup>23</sup> The coefficients of other variables in Table 7 for the outcome models, including  $\text{Ln}(\text{F\_SIZE})$ ,  $\text{Ln}(\text{AGE})$ ,  $\text{R\_SIZE}$ , DIV, ROA, and MARKET, are not significant. These variables have no explanatory power on the announcement effect of rights issues and open offers in Hong Kong.

### **C. Robustness check**

Eckbo *et al.* (2007) point out that accurate determination of the timing of an offer announced by an issuing firm is crucial to measure its market reactions. The majority of research papers in this area choose the CARs close to the

22 A longer period is expected if the approval of current shareholders for a specific event (e.g., share consolidation as part of capital reorganizations, the increase of the issued share capital by more than 50%) is required. To our best knowledge, the result of  $\text{Ln}(\text{EX\_DAY})$  has not seen in the literature of SEO announcement effects.

23 The coefficient of METHOD is negative, and it shows that that open offers provide better announcement returns than rights issues, consistent with Armitage (2002). Compared with the issuing firms of rights issues, Table 4 shows that the issuing firms of open offers relatively have smaller firm size ( $\text{F\_SIZE}$ ) and better growth prospects ( $\text{Ln}(\text{M/B})$ ) with a lot of uncertainty (SE). The positive slope coefficients of SE for open offers and the pooled sample in Table 8 are consistent with the theoretical prediction of Wu and Wang (2005a) and the empirical result of Denis (1991). The slope coefficient of  $\text{Ln}(\text{M/B})$  is positive and significant for open offers, consistent with Lee *et al.* (2014). The financial firms, which are normally highly regulated and have low level of information asymmetries, are associated with less negative announcement effects. It is consistent with the empirical result of Bøhren *et al.* (1997).

announcement date (day 0) as the dependent variable.<sup>24</sup> However, Fong and Lam (2014) use  $CAR(-10, 10)$  to study the announcement effects of rights issues and open offers in Hong Kong, and their findings conflict with our results for Hypothesis 1. Without controlling for the selection bias of underwriter choice, they find that the certification role of the controlling shareholders is statistically weaker than other types of underwriters for rights issues at the 10% level (but the results of open offers and the pooled sample show indifferent underwriter certification between the controlling shareholders and other underwriters). For the purpose of comparison, it might be helpful to present our results also using  $CAR(-10, 10)$  as the dependent variable. We do not aim to replicate the results of Fong and Lam (2014) as we lack sufficient information to do so.

Our key results remain the same in Table 8 for the pooled sample (column 3), and the coefficients of TYPE are significantly positive at the 1% level. Using  $CAR(-10, 10)$  as the dependent variable, our results still indicate that the largest shareholders as SEO underwriters can better certify firm value than investment banks, and Hypothesis 1 is thus supported. For right offers (column 1) and open offers (column 2), the  $p$ -value for Chi-square test indicates that there is no problem of endogeneity. After conditioning on observable variables as in equation (3) and (4), the potential outcomes are conditionally independent of the selection process, and we now have selection on observables. When the conditional independence holds, the ATE is then estimated by the inverse-probability-weighted regression adjustment estimator in this study, as mentioned earlier. We use a probit regression adjustment model as in equation (3) to predict the choice of underwriters and use a linear regression model as in equation (4) to estimate the ATE. For open offers, the ATE is 0.083 and the  $p$ -value for the  $z$ -statistics is 0.051 (not tabulated). Hypothesis 1 is still supported. For rights issues, the result of ATE is not significant (not tabulated). This indicates that the underwriter certification of the largest shareholders is as good as investment banks, and the potential conflict of interest is not pronounced. The results of the rest of explanatory variables in Table 8, especially for column 3, remain qualitatively the same with our findings in Table 7, and they are not further discussed to save space.

## **V. THE CERTIFICATION OF FIRM VALUE: WHO CAN DO A BETTER JOB AMONG INVESTMENT BANKS?**

We hypothesize that the largest shareholders as SEO underwriters who possess more information could better certify firm value, and we find the support for

24 For example, Pandes (2010), Balachandran *et al.* (2008), and Wu *et al.* (2005) use  $CAR(-1, 1)$ , Slovin *et al.* (2000) and Armitage (2002) use  $CAR(-1, 0)$ , and Cheung *et al.* (2006) and Lee *et al.* (2014) use  $CAR(0, 1)$ . There are two reasons why  $CAR(0, 1)$  is chosen as our dependent variable. First, the time of the announcements announced by the publicly listed firms in Hong Kong is up-to-minute accuracy, and announcement date (day 0) could be precisely identified. Second, there is no circuit breaker during our study period in Hong Kong, and prolonged price reactions from investors should not be expected.

**Table 8** The determinants of the SEO announcement returns: robustness check

Column	1	2	3
Dependent variable	CAR(−10,10)		
Exclusion restriction	MARGIN		
Type of offers	Rights issues (METHOD = 1)	Open offers (METHOD = 0)	Pooled sample
Estimation approach	Maximum likelihood	Maximum likelihood	Maximum likelihood
INTERCEPT	−0.018 (−0.06)	0.259 (0.74)	0.162 (0.70)
TYPE	0.326* (1.93)	0.277** (2.16)	0.299*** (3.06)
Ln(EX_DAY)	−0.069 (−1.24)	−0.069 (−1.29)	−0.074* (−1.85)
SE	1.271 (0.99)	2.516* (1.89)	1.415* (1.57)
A_BETA	−0.018 (−0.44)	−0.008 (−0.21)	−0.017 (−0.63)
Ln(M/B)	0.024 (0.65)	0.074** (2.07)	0.041* (1.65)
CONS	−0.132 (−1.58)	−0.336*** (−3.82)	−0.192*** (−3.16)
DIS	−0.008 (−0.09)	0.081 (0.84)	0.022 (0.34)
FCF	−0.122 (−1.18)	0.341*** (3.07)	−0.002 (−0.02)
FIN	0.127** (2.21)	−0.028 (−0.35)	0.104** (2.29)
Ln(F_SIZE)	−0.001 (−0.06)	−0.022 (−0.88)	−0.006 (−0.42)
Ln(AGE)	−0.064 (−1.26)	−0.072 (−1.49)	−0.075** (−2.17)
R_SIZE	−0.026 (−0.06)	−0.088 (−1.39)	−0.004 (−0.10)
DIV	−0.007 (−0.64)	−0.001 (−0.08)	−0.007 (−0.81)
ROA	0.002 (0.12)	−0.117*** (−3.18)	−0.014 (−1.06)
MARKET	0.044 (0.54)	0.153* (1.95)	0.083 (1.46)
METHOD			−0.077* (−1.93)
N	217	144	361
Chi-square	1.70	2.27	5.01
p-value for Chi-square	0.1917	0.1319	0.0252
Wald chi-square	29.36	46.30	60.56
p-value for Wald chi-square	0.0145	<0.001	<0.001

Notes: The dependent variables are CAR(−10, 10), a 21-day standard cumulative abnormal return of each issuing firm from day −10 to day 10. \*, \*\*, and \*\*\* indicate that the coefficient is significantly different from zero at the 10%, 5%, and 1% level, respectively, according to the z-statistics, which are shown in parentheses below the corresponding coefficient estimates. Variable definitions are presented in the appendix.

Hypothesis 1 in Hong Kong rights offerings. However, this result cannot be widely applied because the largest shareholders of issuing firms are eligible to be the SEO underwriters only in a few countries. In this section, we generalize Hypothesis 1 to only those offers underwritten specifically by investment banks and examine Hypothesis 2.

The tombstone ranking of underwriters developed by Carter and Manaster (1990) and the market share of completed offerings brought to market by an investment bank developed by Megginson and Weiss (1991) are widely used to measure the underwriter reputation in the literature (e.g., Krigman *et al.* 2001; Fernando *et al.* 2005; Pandes 2010). Because we lack sufficient information to

rank underwriters using the tombstone ranking in Hong Kong, following Megginson and Weiss (1991), we measure the underwriter reputation of an investment bank using the market share that is expected to be positively associated with underwriter quality. Table 9 presents the OLS linear regression estimates of the offers underwritten specifically by investment banks, including rights issues (column 1), open offers (column 2), the pooled sample (column 3), and the 79 valid offers (column 4). The dependent variable is  $CAR(0, 1)$ , and we report the results of our three key variables, including *PRIOR\_SHIP*, *REPUTATION\_IB*, and  $\ln(\text{TIME})$ . *PRIOR\_SHIP* is a dummy variable, which is equal to one if an underwriter has prior SEO underwriting relationship with an issuing firm and zero otherwise, *REPUTATION\_IB* measures underwriter reputation based on the market share, and  $\ln(\text{TIME})$  is the natural logarithm of business days between two SEOs (from the announcement date of the previous SEO to the announcement date of the more recent SEO).

There are three key points from our analyses in Table 9, and all reported significance levels are for the two-tailed tests based on White's heteroskedasticity-consistent standard errors. First, after controlling for firm and issue characteristics, the slope coefficient of *PRIOR\_SHIP* as reported in column 4 of Table 9 is significantly positive at the 5% level for the sample of 79 valid offers that meet our selection criterion. As shown in Table 10, only those issuing firms whose second, third, fourth, and more than fourth offer has been underwritten specifically by investment banks are selected, and a total of 79 valid offers (46 offers by non-switching firms and 33 offers by switching firms) are available for our analysis.<sup>25</sup> This result indicates that the investment banks with prior SEO underwriting relationship can certify firm value in SEOs better than the investment banks without prior SEO underwriting relationship. The investment banks that possess more information of issuing firms are associated with less price declines around the SEO announcements, and Hypothesis 2 is supported. Moreover, the interaction variable  $\text{PRIOR\_SHIP} \times \ln(\text{F\_SIZE})$  in column 4 has a negative and statistically significant coefficient, and this indicates that the certification of the investment banks with prior SEO underwriting relationship has a larger effect for smaller firms. Fernando *et al.* (2012) find that equity underwriting appears to be more relationship-based in nature, and an equity underwriting relationship is more valuable for smaller and younger firms with a high degree of dependence on the investment bank services. These smaller and younger firms have a greater need for the information production and monitoring function provided by an underwriter. Our results of *PRIOR\_SHIP* and the interaction variable support their findings.

25 To examine Hypothesis 2, we select the subsequent offers underwritten by investment banks after the first SEOs in our study period. There are a total of 226 rights issues and open offers underwritten by investment banks over our study period. The underwriter turnover percentage based on the investment bank-underwritten offers is nearly 42% ( $= 33/79$ ), which is relatively higher than the 30% reported in the USA (James 1992; Krigman *et al.* 2001) but far lower than the 89% reported in China (Luo *et al.* 2010).

**Table 9** The determinants of the SEO announcement returns of the offers purely underwritten by investment banks

Column	1	2	3	4
Type of offers	Rights issues (METHOD = 1)	Open offers (METHOD = 0)	Pooled sample	79 valid offers <sup>a</sup>
INTERCEPT	-0.039 (-0.09)	0.056 (0.18)	0.024 (0.10)	-1.518* (-2.23)
REPUTATION_IB	-0.727** (-2.49)	0.102 (0.32)	-0.381* (-1.71)	-0.906** (-2.17)
PRIOR_SHIP				1.545** (2.27)
PRIOR_SHIP × Ln(F_SIZE)				-0.136** (-2.66)
PRIOR_SHIP × Ln(AGE)				0.149 (1.35)
Ln(TIME)				0.034 (0.85)
Ln(EX_DAY)	-0.031 (-0.63)	-0.067 (-1.53)	-0.031 (-0.84)	0.060 (1.11)
SE	0.573 (0.36)	2.639** (2.30)	1.244 (1.27)	4.023** (2.55)
A_BETA	0.002 (0.06)	-0.011 (-0.39)	-0.017 (-0.67)	-0.031 (-0.57)
Ln(M/B)	0.040 (1.01)	0.066** (1.99)	0.044 (1.51)	0.041 (1.42)
CONS	-0.156** (-2.16)	-0.041 (-0.51)	-0.108* (-1.82)	0.005 (0.064)
DIS	-0.061 (-1.03)	0.022 (0.22)	-0.040 (-0.88)	-0.133 (-0.82)
FCF	-0.102 (-0.99)	0.247*** (3.34)	-0.009 (-0.12)	0.034 (0.34)
FIN	0.082 (1.51)	-0.057 (-0.72)	0.075* (1.88)	0.188** (2.58)
Ln(F_SIZE)	0.016 (0.73)	-0.005 (-0.21)	0.005 (0.37)	0.066 (1.46)
Ln(AGE)	-0.116** (-2.52)	0.011 (0.29)	-0.056* (-1.91)	-0.074 (-0.713)
R_SIZE	0.009 (0.14)	0.001 (0.03)	-0.006 (-0.11)	-0.063** (-2.04)
DIV	0.005 (0.67)	-0.004 (-0.34)	-0.003 (-0.38)	-0.016 (-1.38)
ROA	0.002 (0.19)	-0.010 (-0.85)	-0.002 (-0.22)	0.024 (0.45)
MARKET	0.061 (0.59)	-0.076 (-0.89)	0.003 (0.04)	0.199 (1.67)
METHOD			-0.048 (-1.22)	-0.134* (-1.70)
N	133	93	226	79
Adj. R <sup>2</sup>	0.1101	0.1222	0.1113	0.3193
F-statistic	2.09	1.85	2.76	2.83
p-value for F-statistic	0.015	0.042	<0.001	0.001

Notes: The dependent variables are CAR(0, 1), are a 2-day standard cumulative abnormal return of each issuing firm from day 0 to day 1. \*, \*\*, and \*\*\* indicate that the coefficient is significantly different from zero at the 10%, 5%, and 1% level, respectively, according to the *t*-value using White heteroskedasticity-consistent standard errors shown in parentheses below the corresponding regression coefficient estimates. Variable definitions are presented in the appendix. <sup>a</sup> see Table 10 for the details of the selection of these 79 offers underwritten specifically by investment banks.

**Table 10** The valid sample of SEOs which switch or do not switch their underwriters

1. Sequence of SEOs over the Study Period (2003–2012)	2. Number of offers	3. Non-switching firms		4. Switching firms		Valid samples <sup>a</sup>
		(a) Same investment banks	(b) Same largest shareholder	(a) From one investment bank to another investment bank	(b) From the largest shareholder to investment banks	
First	234	N/A	N/A	N/A	N/A	0
Second	75	27	28	15	5	42
Third	33	12	10	11	0	23
Fourth	10	3	3	4	0	7
More than Fourth	9	4	2	3	0	7
Sub-total	361	46	43	33	5	79

*Notes:* The non-switching firm is defined as an issuing firm, which has the existing underwriter from its previous SEO for its more recent SEO, while the switching firm is defined as an issuing firm, which has the new underwriter for its more recent SEO. N/A, not applicable. <sup>a</sup> The valid samples are the issuing firms that do not switch their investment banks from the previous SEO to the more recent SEOs (column 3(a)) and the issuing firms that switch their investment banks from the previous SEO to the more recent SEOs (column 4(a)). It is noted that there is no case that switches the underwriter from an investment bank to the largest shareholder.

Second, it is interesting that the slope coefficients of the underwriter reputation of investment banks (REPUTATION\_IB) are significantly negative for rights issues (column 1), the pooled sample (column 3), and sub-sample (column 4). We measure the underwriter reputation of an investment bank on an annual basis using the market share in the year of the completed rights issues and open offers brought to market by the investment bank, and it is updated annually. Our results in Table 9 for the variable REPUTATION\_IB show that the offers underwritten by an investment bank with a larger market share are associated with larger price drops around the announcement dates. The finding is consistent with the evidence from Pandes (2010) who also documents that the book runner who has the market share ranked in the top 10 in the year of the completed offers leads to greater price declines around the announcements of firm commitment public offerings and bought deals in Canada. These results question the validity of the market share of an investment bank as a measure of underwriter quality.<sup>26</sup> Ln(TIME), on the other hand, has no explanatory power to the announcement returns as its slope coefficient is not significant.<sup>27</sup> In summary, we use three different variables to measure the underwriter certification of investment banks, and our results show that the prior SEO underwriting relationship (PRIOR\_SHIP) is better than the market share of investment banks (REPUTATION\_IB) and the time interval between two SEOs of an issuing firm (Ln(TIME)) as an indicator for the underwriter certification of firm value in Hong Kong SEOs.

## **VI. CONCLUSION AND POLICY IMPLICATIONS**

This paper examines whether the largest shareholders provide better underwriter certification than investment banks in Hong Kong rights issues and open offers over the period from the year 2003 to 2012 using hand-collected data. There are several important findings in our analyses. First, the largest shareholders as SEO underwriters self-select into their preferred issuing firms, and selection bias arises. By applying the treatment effects models to correct for selection bias, our findings show that the largest shareholders as SEO underwriters are able to lower the negative announcement returns of rights issues and open offers more than investment banks.

The better underwriter certification of the largest shareholders in Hong Kong has important implications for the current underwriting of securities. The largest

26 See Krigman *et al.* (2001) and Chu *et al.* (2014) who also question the validity of using the market share of offerings as a proxy for underwriter quality.

27 James (1992) finds that, because of the devaluation of relationship-specific information, a longer period of months between the IPO and the subsequent offer of an issuing firm leads to a higher probability of the switching from one investment bank to another investment bank in equity offerings. Using a similar variable, we find that the coefficient of Ln(TIME) is not significant.



shareholders as SEO underwriters in Hong Kong are not bounded to the requirement of large capital base, retail investors are still able to participate in the SEO market, and the small and young firms that have high level of information asymmetries are still able to raise funds from investors. This alternative mechanism of equity underwritings in Hong Kong could avoid the three drawbacks pointed by Bortolotti *et al.* (2008) for accelerated deals (including block trades, bought deals, and accelerated book-built offerings) in the USA and Europe, including the increasing concentration of investment banking industry, the domination of institutional investors and more financial transactions with low information asymmetries.

Second, we hypothesize that the investment banks who possess more information about issuing firms through the prior SEO underwriting relationship could better certify firm value, and we find evidence to support this hypothesis. Being SEO underwriters, the investment banks with prior underwriting relationship can better reduce the price declines around the SEO announcements than the investment banks without prior underwriting relationship. We conclude that our findings are broadly consistent with the existing literature that underwriters who have information advantages about issuing firms provide better certification, and an alternative mechanism of equity underwritings seems applicable.

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**APPENDIX A****Table A1** Variable definitions

Symbol	Variable	Definition
AGE	Firm age	The number of years since the issuing firm was incorporated. $\ln(\text{AGE})$ is the natural logarithm of AGE.
A_BETA	Adjusted beta	The adjusted BETA using the Scholes–Williams (1977) method.
BETA	Beta	The slope of the characteristic line using daily stock returns from day $-200$ to day $-40$ prior to the announcement date.
CONS	Capital reorganization	Dummy variable that equals one if the issuing firm is involved in share consolidation as part of its capital reorganization and zero otherwise.
CAR(0, 1)	Announcement return	The 2-day standard cumulative abnormal return of an SEO firm from the announcement date (day 0) to the event day 1 relative to the announcement date.
CAR( $-10, 10$ )	Announcement return	The 21-day standard cumulative abnormal return of an SEO firm from the event day $-10$ to the event day 10 relative to the announcement date.
DIS	Price discount	The price discount that is calculated as $[(\text{closing price} - \text{offer price}) / \text{closing price}]$ and the closing price is the stock price on the event day $-5$ relative to the announcement day.
DIV	Dividend yield	The dividend yield.
EX_DAY	Price risk	The expected number of days over the period from the announcement day to the first day of dealings in shares on an ex-rights basis (rights offer) or an ex-entitlement basis (open offer). $\ln(\text{EX\_DAY})$ is the natural logarithm of EX_DAY.
FCF	Free cash flow	The free cash flow-to-total assets ratio and it is calculated as the net cash receipts and disbursements resulting from the operations of the company divided by the book value of total assets.
FEES	Underwriting fees	The percentage of the gross proceeds paid as the underwriting fees by the issuing firm to its SEO underwriter.
FIN	Financial firm	Dummy variable that equals one if the issuer is a financial firm (based on the Industry Group from 4300 to 4395 in DataStream) and zero otherwise.
F_SIZE	Firm size	The firm size of the issuing firm measured by the book value of the issuing firm's total assets. $\ln(\text{F\_SIZE})$ is the natural logarithm of F_SIZE.
$\ln(\text{TIME})$	Underwriter reputation proxy	The natural logarithm of business days from the announcement date of the previous SEO to the announcement date of the more recent SEO.

# Certification of the Largest Shareholders in SEOs

**Table A1** (continued)

Symbol	Variable	Definition
M/B	Market-to-book ratio	The market-to-book ratio where M is the sum of end-of-year market value of equity and end-of-year book value of total liabilities and B is the sum of end-of-year book value of total assets. $\ln(M/B)$ is the natural logarithm of M/B.
MARGIN	Control margin	The difference between the proportion of shares held by the largest shareholder and the proportion of shares held by other blockholders who own at least 10% of shares prior to the announcement date.
MARKET	Listing board	Dummy variable that equals one if the issuing firm is listed in the Main Board and zero otherwise.
METHOD	Flotation method	Dummy variable that equals one if the SEO issuance method is a rights offer and zero otherwise.
PRECOM	Precommitments	The sum of the proportions of new shares to be pre-subscribed irrevocably by substantial shareholders (precommitments) on the announcement date.
PRIOR_SHIP	Underwriter reputation proxy	Dummy variable that equals one if an offer of an issuing firm is underwritten by the investment bank with prior underwriting relationship or zero otherwise.
REPUTATION_IB	Underwriter reputation proxy	The underwriter reputation of an investment bank using the market share <i>in the year</i> of the completed rights issues and open offers brought to market by the investment bank. The market share of an underwriter is calculated on an annual basis based on the 580 rights issues and open offers over the period from the year 2003 to 2012 as shown in Table 1.
ROA	Return on assets	The return on assets, which is calculated as the annual net income to book value of total assets.
R_SIZE	Relative offer size	The ratio of gross proceeds to the market value of an issuing firm.
SE	Firm-specific risk	The standard deviation of the residuals from a standard market model regression of daily stock returns from day -200 to day -40 prior to the announcement date.
SIZE	Offer size	The gross proceeds raised by the issuing firm in an SEO.
TYPE	Underwriter dummy	Dummy variable that equals one if the largest shareholder of an issuing firm is the SEO underwriter and zero otherwise.

Notes: All financial statement data refer to the previous year, if not specifically mentioned.