Article
Offer Price and Post-IPO Ownership Structure

Martin Abrahamson [1,2]

1   Department of Business Studies, Uppsala University, Campus Gotland, Cramergatan 3, 621 57 Visby, Sweden;
     martin.abrahamson@fek.uu.se
2   Faculty of Business, Kristianstad University, Elmetorpsv. 15, 291 88 Kristianstad, Sweden

Abstract: In an initial public offering (IPO) the firm can set the offer price of its shares, based on the valuation of the firm, by changing the number of shares. This study uses stock ownership records and hand-collected IPO data to analyze the offer prices, the underpricing of IPO shares (measured as the initial return, IR) and the relationship with the post-IPO ownership structure. Specifically, the paper focuses on individual IPO investors. The results show that for the lowest priced IPOs the IR is significantly higher priced IPOs. Furthermore, for the low-priced IPOs, there is a negative relationship between offer price and breadth of ownership. This implies that stocks with a low price can attract more investors than stocks with higher offer prices. However, for high-priced IPOs the relationship is positive, suggesting that also the IPOs with highest price attract more investors. Overall, this study shows that the offer price of an IPO firm may have a moderate effect on its post-IPO ownership structure.

Keywords: finance; IPO; ownership structure; offer price

1. Introduction

The initial public offering (IPO) is one occasion when firms can set their share prices directly, e.g., Baker et al. (2009) report that the IPO is one of two actions through which firms manage their stock prices to cater to investor demands. Lowry et al. (2017) describe the possible conflicts of interests when pricing IPOs considering preferred allocations of shares. Field and Sheehan (2004) state that at the time of an IPO, the original owners can affect the ownership structure. Fernando et al. (2004), Kumar (2009), and De Ridder and Burnie (2016) report that a share's nominal price level can affect the firm's ownership structure. Chang et al. (2017) state that the pricing of the share is the most important issue of an IPO. Hence, this study analyzes offer prices of IPOs and post-IPO ownership structures. Specifically, this study analyzes the relationship between offer price and the breadth of ownership. In previous studies, the breadth of ownership is defined as the number of shareholders holding the stock or as a relative measure of shareholders holding the stock divided by shareholders on the market within the respective investor category. In this study both definitions of breadth of ownership are tested to explore the relationship to offer price.

Birru and Wang (2016) show that investors overestimate the importance of the nominal price level in their stock return expectations. Baker et al. (2009) and Birru and Wang (2016) argue that firms try to manage their stock prices to cater to investor demands. Reading through the prospectuses of firms in the sample of the current study, three years were selected (2011, 2013, and 2014). In these years, more than 80% of all IPOs either performed a stock split or a reversed stock split during the year prior to the IPO, that is, they changed the number of shares in the firm, possibly to set an offer price they desired.

Kim et al. (2018, 2019) show that there is a relationship between stock price and number of shareholders. Hence, this study examines whether offer price affects the ownership structure of IPO firms. Sandhu and Guhathakurta (2020) study the effects of the offer price on post-IPO ownership structure but on the IPO market in India. With focus on individual investors, Kao et al. (2022) study offer price and individual investor attention in Taiwan,

showing the relationship of offer price to individual investor attention. Together, this study adds to that knowledge on offer price and ownership structure with evidence from European IPO markets, in Sweden.

Although individuals can invest in a variety of financial products, approximately one-fifth of all Swedish citizens hold shares (Abrahamson 2020). Hence, together with the availability of detailed ownership data, Sweden is an interesting data source to study individual stock market investors. This study uses hand-collected data on IPOs and an ownership registry containing the stock holdings for all publicly listed firms in Sweden. Hence, this study adds to previous work on IPO pricing and ownership structure (of, e.g., Fernando et al. (2004); Abrahamson (2018, 2020); Sandhu and Guhathakurta (2020); and Kao et al. (2022)), using a sample containing not only the main market but also two smaller multilateral trading facilities (MTFs). This study also adds to that study by using two alternative definitions of breadth of ownership, something mentioned as a possible reason for deviating results in previous studies.

Bouzouita et al. (2015) argue for a positive relationship between initial return (IR) and ownership dispersion. Michaely and Shaw (1994) and Pham et al. (2003) show that the level of underpricing (or commonly used, initial return, IR) is strongly connected to the ownership concentration. This study aims to contribute to this area by analyzing the breadth of ownership of individuals, as well as IR.

Several studies on the topic of offer price have studied the efficiency of the price setting, e.g., Boulton et al. (2017), Chang et al. (2017), Duong et al. (2021), Brockman et al. (2023), and Neghab et al. (2023). However, Xuan et al. (2023) state that previous studies have focused on the efficiency of the IPO pricing but argue for more studies on factors besides the efficiency. Other factors being for example underpricing, ownership structure and related issues regarding these factors. In addition, Joshipura et al. (2023) provides directions for future IPO research, where they list the need for research both considering agency issues and behavioral issues.

The results in this paper show that there is a relationship between offer price and IR, where the highest IR is found in the group with the lowest priced IPOs. Furthermore, offer price is related to ownership structure, both the fractions and the breadth of ownership. In this way, firms might affect their ownership structure by choosing the offer price that encourages the ownership structure that the firm seeks.

The remainder of this paper is structured as follows. In the next Section 2, I formulate the two hypotheses, based on previous research. Section 3 describes the data and methodology. Section 4 shows the results and compares the findings with previous research. The last section concludes the paper.

2. Hypotheses

In IPO prospectuses, attracting new capital and drawing new investors are examples of what are mentioned as reasons for going public. Hence, the number of investors holding stock after IPOs might be a concern for firms, although firms can have various preferences for their ownership structure. Breadth of ownership has previously been used to study IPO firms' ability to attract investor attention. Grullon et al. (2004) use marketing expenses to measure possible investor attention to study how the latter affects both the breadth of ownership and the liquidity of firms. Abrahamson (2018, 2020) use breadth of ownership to analyze institutional investors' ability to invest in IPOs with high IR. In this present paper, breadth of ownership is used mainly as an indicator of investor attention. Hence, whether IPO firms can affect breadth of ownership through offer price level of shares is investigated. The null hypotheses being that there is no linear relationship between IR (offer price) and ownership structure.

Brennan and Franks (1997) show that insiders can use underpricing to retain control, as larger underpricing is meant to ensure oversubscription and rationing in share allocation. Therefore, the block size of new shareholders is reduced. However, Bouzouita et al. (2015) show that increased ownership dispersion may be due to increased information production.

They test the ownership dispersion hypothesis that underpricing and analyst coverage cause more public information to be produced, which leads to less information asymmetry and increases stock liquidity. In his theoretical paper, Chemmanur (1993) argues that the larger the number of bidders in the IPO is, the greater the underpricing is. Furthermore, in a recent study on the Chinese market, Huang and Zhang (2020) report that increased individual investor attention is significantly positive to offer price and IR. Bouzouita et al. (2015) argue that ownership dispersion should increase with underpricing. Thereby, with increased liquidity in the stock and oversubscription, we expect a high IR IPO to be rationed among several shareholders. Furthermore, Chen et al. (2002) posit that breadth of ownership is expected to be positively correlated with other stock valuation indicators. Cao and Wu (2022) show that future breadth of ownership is related to stock returns, for mature firms already on the stock market. Hence, in the case of IPOs, we might expect breadth of ownership to be positively correlated with IR. I formulate the first hypothesis:

H1: *There is a positive relationship between IR and breadth of ownership.*

Dyl and Elliott (2006) argue that in frictionless markets, nominal share prices do not affect firm value. However, they also declare that market friction exists and that firms manage share price levels to increase firm value. Baker et al. (2009) state that firms manage their stock prices to cater to investors. They show that mature firms take actions to reach or maintain a desirable price level depending on investor demand for securities in different price ranges.

Compared with institutions, individuals generally tend to hold more lower-priced stocks (e.g., Gompers and Metrick 2001; Fernando et al. 2004; and Kumar and Lee 2006). West et al. (2017) claim that the general public may treat IPO investing like a lottery. This could be due to uncertainty connected to the market pricing of an IPO and the general lack of information on the IPO share (compared with a seasoned share with a history of annual reports, etc.). Kumar (2009) shows that individual investors prefer stocks with lottery features. Furthermore, he shows that investors in lottery-type stocks and lottery ticket buyers have similar socioeconomic characteristics. Thus, we expect individual investors holding IPOs with low nominal offer prices to have lower income compared to IPOs with higher prices.

Abrahamson (2020) show that institutional investors have the capacity to "cherry-pick" among Swedish IPOs, where institutional investors hold IPOs with high IR to a larger extent than do individual investors. Fernando et al. (2004) report a U-shaped relationship between offer price and IR. Therefore, it is reasonable to expect that institutional investors hold large proportions of IPOs with both the lowest and the highest offer prices.

At the IPO, firms can set the offer price and thereby possibly affect their post-IPO ownership structure. Moreover, Yong (2016) argues that IPOs with low offer prices will attract more potential buyers, especially individual investors. Tsukioka et al. (2018) show that high investor attention and optimistic investor communication positively affect IR and offer prices. Birru and Wang (2016) show that investors overestimate the growth potential of low-priced stocks compared with high-priced stocks. Rapp (2023) show that unsophisticated (individual) investors are likely to invest in IPOs with low offer prices. Together with the knowledge that individuals have a preference for lower-priced stocks in general, we expect IPOs with low offer prices to attract more individual investors. Therefore, I formulate the second hypothesis:

H2: *There is a negative relationship between offer price and breadth of ownership among individual investors.*

To study IR of IPOs, data from the webpage of Jay Ritter is a valuable source of information open to researchers. However, for detailed ownership structure there is a lack of openly available global data, at least known to the author of this paper. Therefore, there is a need for studies based on data from several sources and countries to study questions

connected to ownership structures in IPO firms. Recently research use data from Asian markets (e.g., Kao et al. (2022) Taiwanese data, Chi et al. (2023), and Xuan et al. (2023) use Chinese data) and European markets (e.g., Bouzouita et al. (2015) French data, Rapp (2023), German data, Abrahamson (2020) Swedish data), where data on both stock market prices and ownership structure are available.

Duong et al. (2021) show, based on IPO studies across 37 countries, that there are similarities in IR but that European IPOs have smaller IR on average, due to stronger shareholder protection. For studies on individual stock market investors it is especially interesting to find data from countries with a stock market open to the public, where direct stock holdings are common, e.g., in Sweden it is almost twice as common for individuals to hold shares than in the UK and the US (Abrahamson 2020).

3. Data and Methodology

Information on IPOs for the period 2006–2016 were hand-collected from prospectuses, annual reports, press releases, the stock registry at the Swedish Tax Agency, and IPO firm webpages. Data on annual income were obtained from the Swedish Tax Agency. The sample contains firms in Sweden that went public on the main market, the Nasdaq Stockholm (Stockholm Stock Exchange (SSE)), or on two small market segments, First North (FN) and Aktietorget (AT), (AT changed their name to Spotlight in May 2018). To identify IPOs, I sought out public offers where existing or new shares were offered publicly to investors. IPOs were required to have remained listed for at least one year to be included in the sample. Starting with a list of new firms, listings with prior listings, list or name changes, hive-offs, spin-offs, dividends, and listings of preferred stocks were excluded. Together, these criteria yielded a sample of 325 IPOs.

Although using Swedish stock market data gives an opportunity to study ownership structure in detail, there are limitations that require for some clarifications on Swedish IPO data compared with other markets. Firstly, compared with previous studies on IPOs that use for example US or Asian data to, e.g., measure IR, Swedish IPOs appear to have a rather wide range of the nominal price (see Table 1, from SEK 0.1 to SEK 320). This shows that firms have a possibility to set their price at various levels, which might affect the ownership structure. Secondly, the sample of Swedish IPOs contain firms that have been publicly offered to all investors, i.e., not just selected by institutional investors. Thirdly, in Sweden the ownership records are not available until after the IPO, where data on ownership is reported for publicly traded firms. Thereby, it limits the IPO analysis to post the ownership structure.

Table 1. Summary statistics of IPO firms.

Panel A: Full Sample					
	Mean	**Median**	**St.dev.**	**Min**	**Max**
Firm Characteristics:					
SIZE	958	837	251	0.25	24,432
OP	25.84	9.00	37.77	0.10	320
FRAC.	0.32	0.28	0.19	0.04	1.00
IR	0.11	0.03	0.36	−0.66	3.11
SHAREHOLDERS	1622	656	2439	54	16,111
DAYS	42	35	30	1	144
N	325				
Panel B: Lowest Offer Prices					
	Mean	**Median**	**St.dev.**	**Min**	**Max**
Firm Characteristics:					
SIZE	45	34	41.2	0.25	342.1
OP	3.36	3.70	1.89	0.50	6.00
FRAC.	0.29	0.26	0.16	0.04	1.00

Table 1. *Cont.*

Panel B: Lowest Offer Prices					
	Mean	**Median**	**St.dev.**	**Min**	**Max**
IR	0.17	0.07	0.44	−51.3	3.11
SHAREHOLDERS	701	423	943	63	6693
DAYS	44	40	28	1	127
N	113				
Panel C: Highest Offer Prices					
	Mean	**Median**	**St.dev.**	**Min**	**Max**
Firm Characteristics:					
SIZE	2785	1343	385	38.1	24,432
OP	65.37	55.00	45.83	26.50	320
FRAC.	0.40	0.36	0.25	0.01	1.00
IR	0.08	0.05	0.16	−0.32	0.78
SHAREHOLDERS	3357	2279	3437	59	16,111
DAYS	41	31	32	3	130
N	104				

This table reports summary statistics for initial public offerings (IPOs) in Sweden for 2006–2016. The table shows the mean, median, standard deviation, minimum and maximum values for firm characteristics for the respective exchange. Panel A shows the full sample. Panel B (C) shows the sample of IPOs with the lowest (highest) offer prices, after dividing them into three offer price groups. The characteristics are *SIZE* (the market cap at the time of the IPO, reported in millions of Swedish Krona (SEK)), *OP* (the share price offered to shareholders in the IPO in SEK), *FRAC.* (the fraction of shares offered to new shareholders in the IPO), *IR* (return for the first trading day on the stock market), *SHAREHOLDERS* (the total number of shareholders of the IPO firm at the first registry, and *DAYS* (the number of calendar days from the IPO date to the first appearance in the ownership registry). N is the number of IPO firms.

Previous research on ownership structure uses several definitions and groups based on stock price levels. Kumar (2009) reports that individuals prefer lottery-like stocks, and West et al. (2017) argue that individuals may treat investing in IPOs as lotteries. Kumar (2009) uses previous stock price volatility and stock price level to define lottery stocks. However, Nofsinger and Varma (2014) use a similar definition but stricter inclusion criteria than Kumar, yielding fewer lottery stocks. Meanwhile, Bali et al. (2011, 2017) use MAX, which is maximum daily return in the previous month, to define lottery instead of volatility. In the case of IPOs, the historic volatility of the share price cannot be used because the first trading date is the IPO. Therefore, the offer price indicates whether the stock is lottery-like.

Even though this sample exceeds the number of IPOs in Sandhu and Guhathakurta (2020), there was a concern of thin offer price groups. Therefore, instead of 10 groups, I form 3 roughly equal sized groups based on the offer price: low-, medium-, and high-priced IPO stocks. Hence, I use the names low- and high-priced groups, rather than lottery and nonlottery groups, although the results are compared with the results of previous studies using lottery and nonlottery stocks in the analysis. The classification is based on a relative measure within the sample period across all lists and, also for each list separately due to possible differences related to regulated exchange regarding MTFs. As an alternative to relative price groups, I divide the sample based on whether the stocks are considered penny stocks. Penny stocks are defined differently in previous research where low-priced issues are either analyzed separately or excluded from the analysis. (Ritter (1991) defines a penny stock as a stock with a price of less than USD 1, Ritter and Welch (2002) and Ljungqvist and Wilhelm (2003) as one with a price of less than USD 5, and Bradley et al. (2006) as one with a price of less than USD 5 if the stock is not listed on the main market). With these definitions in mind, I consider IPOs on FN and AT as penny stocks if the offer price is less than SEK 10 and as ordinary stocks otherwise.

Previous studies performed using breadth of ownership are, e.g., from breadth related to return in Choi et al. (2013), who use the number of accounts holding the stock over total accounts, Yang and Hu (2019), who use trading over a period to measure breadth, and Kim et al. (2018, 2019), who use investor base. In this paper, definitions are used which are

similar to those in Abrahamson (2020), testing breadth of ownership both as number of shareholders but also number of shareholders relative to all shareholders.

In Table 1, Panel A shows the summary statistics of the full sample while Panels B (C) shows the highest (lowest) price group, after sorting the sample in three groups based on their offer price. One may notice the variation within the sample when comparing the price groups. As expected, the group with a higher offer price on average contains larger firms, are less underpriced (lower IR), have a higher number of shareholders and sell a larger fraction of the firm in the IPO. This seems contradictory to the first hypothesis but seems to support the second.

To analyze the relationship between offer price and ownership, the sample is divided into groups, to control for size. The method is similar to the one used in Grullon et al. (2004), where the sample is first divided into groups based on market value of the firm, thereafter on the desired variable. I divide the sample into quintiles based on size, and each quintile is further divided into five sub-groups based on OP. Thereafter, the difference between the lowest and highest subgroup is analyzed.

Further analyses are made through OLS-regressions. The number of shareholders or the relative measure breadth of ownership as dependent variable OWNERSHIP is used in order to compare the results of the two ways of measures. Ordinary least squares (OLS) regression models are estimated by the following equations:

$$\text{OWNERSHIP} = \begin{aligned} &\alpha + \beta_1 \text{OFFER PRICE}_i + \beta_2 \text{FRACTION OFFERED}_i + \beta_3 \text{INITIAL RETURN}_i \\ &+ \beta_4 \text{FIRM SIZE}_i + \varepsilon_i, \end{aligned} \tag{1}$$

where the explanatory variable OFFER PRICE is the share price offered in the prospectus, FRACTION OFFERED is the number of shares offered divided by the total number of shares for the firm, INITIAL RETURN is defined as the difference between the first day's closing price and the offer price, divided by the offer price, and FIRM SIZE is the market value of all shares in the firm the time of the IPO based on the closing price on the first day of trading.

Using OLS-regression to understand the relationship on ownership structure together with IR or offer price limits the analysis to linear relationships. Therefore, future studies with similar interest using ownership records might also consider non-linear methods. Another limitation of the present study is that it only considers data from one western country, whereas for future studies adding complete ownership data from larger markets e.g., US or UK might enhance the knowledge further. At present, complete ownership data is unavailable for these markets, at least for this study.

4. Results

In Table 2, univariate analyses are presented for groups divided based on the offer price (OP) of the IPO. If high OP signals quality, we would expect differences between the OP groups that indicate that higher OP is associated with higher values of all studied variables except for IR, where investors would demand higher IR for higher risk.

Panel A shows differences between highest and lowest OP, out of three OP groups. For all variables, the results come out as expected and all but one show statistically significant differences between the OP groups (the z-stat for IR is not significant, which is expected considering Fernando et al. (2004)). These results show that there are differences between the OP groups and that OP can reflect more than just the value of the firm.

Panel B shows differences between penny stocks and ordinary stocks, which divided the sample into two groups based on the offer price. The results are similar to those in Panel A, with significant differences between the groups for all variables (except that z-stat for IR is not significant).

Together this shows that the results are robust to at least two different ways of categorizing the OP groups. Hence, higher OP is associated with larger firms with higher breadth of ownership. The average investor income is higher for IPOs with high OP, which is consistent with and adds to Kumar (2009) and the idea that investors with lower so-

cioeconomic characteristics invest in stocks with lower prices. The results of IR, that low OP is associated with higher IR, is consistent with Yong (2016) and adds the results of a developed market showing similar results.

Table 2. Univariate analyses of offer price groups.

	Panel A: Relative Offer Price Level					
Variable	**Low**	**Low**	**High**	**High**	**Difference in Mean *t*-Stat**	**Wilcoxon (Mann–Whitney) *z*-Stat**
	Mean	**Median**	**Mean**	**Median**	**[*p*-Value]**	**[*p*-Value]**
FRAC.	0.29	0.26	0.40	0.36	−3.89 [<0.001]	−3.40 [<0.001]
IR	0.17	0.07	0.08	0.05	2.03 [0.043]	0.52 [0.600]
SIZE	45	34	2785	1343	−7.57 [<0.001]	−12.40 [<0.001]
INCOME	541	509	1339	958	−6.13 [<0.001]	−10.76 [<0.001]
BoO	0.04	0.02	0.16	0.11	−7.56 [<0.001]	−7.90 [<0.001]
N	113		104			
	Panel B: Penny Stocks vs. Ordinary Stocks					
Variable	**Penny**	**Penny**	**Ordinary**	**Ordinary**	**Difference in Mean *t*-Stat**	**Wilcoxon (Mann–Whitney) *z*-Stat**
	Mean	**Median**	**Mean**	**Median**	**[*p*-Value]**	**[*p*-Value]**
FRAC.	0.29	0.26	0.35	0.31	−2.99 [0.003]	−2.35 [0.019]
IR	0.16	0.05	0.06	0.03	2.62 [0.009]	1.28 [0.199]
SIZE	55	43	1935	389	−7.25 [<0.001]	−13.07 [<0.001]
INCOME	562	538	1139	840	−6.34 [<0.001]	−10.51 [<0.001]
BoO	0.04	0.02	0.12	0.07	−7.21 [<0.001]	−7.17 [<0.001]
N	169		156			

This table reports the results of univariate analyses of the mean (median) investor characteristics based on the offer price of the IPO. In Panel A, the sample is divided into three groups. The table contains the groups with the lowest/highest offer prices. In Panel B, IPOs are considered penny stocks if they are traded out of the main market and have an offer price below 10 Swedish Krona (SEK); all other stocks are classified as ordinary. Both panels show results for *FRAC.* (the fraction of shares offered to new shareholders in the IPO), *IR* (the return on the first trading day on the stock market), *SIZE* (the market cap at the time of the IPO, reported in millions of SEK), and *BoO* (*BREADTH of OWNERSHIP*, the number of investors holding the stock divided by the total number of stock market investors within its category and multiplied by 100 to decrease zeros). *INCOME* is the yearly average income of all Swedish individuals holding the stock (reported in thousands of SEK). N is the number of IPO firms in each group.

Table 3 presents an analysis of the relationship between OP and breadth of ownership. Specifically, I examine whether breadth of ownership increases with OP after controlling for size. The equally-weighted group means are shown in the table. Panel A shows that for the smallest IPOs the number of shareholders is higher in IPOs with the lowest OP. For the largest IPOs, it is the opposite, with on average 3403 shareholders more in the group with highest OP. For both the smallest and largest IPOs the differences are significant at the 1%-level. Panel B shows similar results, as instead of the number of shareholders the desired variable is the breadth of ownership, measured as the relative number of shareholders in the IPO compared to the total number of shareholders in the market at the time of the IPO.

Table 3. Effects of offer price on shareholders.

			Effects of Offer Price on BREADTH of OWNERSHIP		
OFFER PRICE			**Market Value**		
	Smallest	**2**	**3**	**4**	**Largest**
	Panel A: Number of Individual Investors				
Lowest	1206	697	390	1012	1697
2	499	451	555	929	4637
3	400	381	1345	1521	3932
4	599	676	832	1362	3714
Highest	350	687	914	2856	5100
Difference	−855 **	−10	523 **	1844	3403 ***
(Highest–Lowest)	(−2.27)	(−0.04)	(2.02)	(1.58)	(3.82)
	Panel B: Breadth of Ownership Individual Investors				
Lowest	0.0689	0.0379	0.0219	0.0540	0.0956
2	0.0271	0.0253	0.0308	0.0520	0.2681
3	0.0233	0.0216	0.0780	0.0861	0.2235
4	0.0353	0.0382	0.0452	0.0786	0.2074
Highest	0.0197	0.0369	0.0498	0.1623	0.2812
Difference	−0.0492 **	−0.0010	0.0279 **	0.1083	0.1856 ***
(Highest–Lowest)	(−2.19)	(−0.07)	(1.97)	(1.61)	(3.76)

This table reports a comparison of equally weighted group means for different measures of BREADTH of OWNERSHIP (BoO) by FIRM SIZE and OFFER PRICE groups. Groups are formed by dividing the sample of 325 IPOs into quintiles based on market capitalization calculated from the closing price on the first trading day. Each quintile is then the divided into five subgroups each year based on the OFFER PRICE. Panel A shows the equally weighted average number of individual investors in each group. Panel B shows the equally weighted average BoO of individual investors in each group; to decrease the number of zeros, BoO is multiplied by 100. The *t*-stats are reported in parentheses. ***, and ** denote significance at 1%, and 5%, respectively.

Together, the results both support and contradict the second hypothesis, as the smallest firms and largest firms show opposing relationships between OP and ownership. Hence, these results suggest a U-shape also for breadth of ownership and not just for IR, as shown in Fernando et al. (2004).

Table 4 shows regression results on post-IPO ownership, using the number of shareholders but also the relative measure breadth of ownership as dependent variables. This supports the first hypothesis in all Panels, where IR is significant in all models for the full sample and in most price groups. For the second hypothesis, there is no support in Panel A. However, Panels B and C show significant support for all price groups containing the lower priced IPOs. Together, the hypotheses are non-conclusive, suggesting that there is a relationship between offer price and breadth of ownership, but it appears to be non-linear. Further research is therefore suggested to address this issue for individuals but also for institutional investor groups.

Table 4. OLS regression results: shareholders and breadth of ownership.

			Regression Results			
			Panel A: Full Sample (Except Model 2)			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Int.	743.81 ***	1843.17 ***	394.08 *	0.0414 ***	0.1171 ***	0. 0204 *
	(4.43)	(2.59)	(1.89)	(4.25)*	(2.79)	(1.69)
OP	26.51 ***	22.69 *	14.52 *	0.01509 ***	0.00101	0.00081 *
	(3.45)	(1.79)	(1.89)	(3.39)	(1.38)	(1.78)
FRAC.			588.76			0.0372
			(1.05)			(1.17)

Table 4. *Cont.*

Regression Results						
Panel A: Full Sample (Except Model 2)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
IR		8943.32 ***	333.98 **		0.05406 ***	0.0196 **
		(3.22)	(2.14)		(3.38)	(2.15)
SIZE			0.452 ***			0.00003 ***
			(5.35)			(5.30)
*R**	0.21	0.22	0.47	0.22	0.23	0.48
N	325	64	325	325	325	325
Panel B: Offer Price Groups Number of Shareholders						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Int.	1057.26 ***	444.45	1957.18 **	361.75	388.86	484.68
	(3.90)	(1.60)	(2.52)	(0.53)	(1.61)	(1.24)
OP	−123.57 **	−138.62 **	14.54	13.26	−65.94 *	13.34
	(−2.06)	(−2.36)	(1.16)	(1.08)	(−1.84)	(1.33)
FRAC.		1105.15 **		682.06	1025.78 **	587.45
		(2.05)		(0.64)	(2.33)	(0.63)
IR		−205.21		3485.30 **	−163.36	1516.36 ***
		(−1.11)		(2.19)	(−0.92)	(2.94)
SIZE		8.36 ***		0.41 ***	5.60 *	0.43 ***
		(8.94)		(5.29)	(1.95)	(5.42)
*R**	0.07	0.22	0.05	0.39	0.13	0.44
N	113	113	104	104	169	156
Panel C: Price Groups Breadth of Ownership						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Int.	0.0579 ***	0. 0239	0.1092 **	0.0153	0.0202	0.0244
	(3.85) *	(1.60)	(2.37)	(0.38)	(1.53)	(1.07)
OP	−0.0066 **	−0.0074 **	0.0008	0.0008	−0.0034 *	0.0008
	(−1.98)	(−2.28)	(1.13)	(1.03)	(−1.71)	(1.26)
FRAC.		0.0643 **		0.0445	0.0595 **	0.0377
		(2.05)		(0.74)	(2.33)	(0.72)
IR		−0.0110		0.2055 **	−0.0096	0.0895 ***
		(−1.03)		(2.25)	(−0.94)	(3.03)
SIZE		0.0004 ***		0.00002 ***	0.0031 **	0.00003 ***
		(8.16)		(5.33)	(1.93)	(5.41)
*R**	0.07	0.21	0.05	0.40	0.12	0.45
N	113	113	104	104	169	156

This table reports the regression results with *SHAREHOLDERS* as the dependent variable for initial public offerings (IPOs) in Sweden for 2006–2016. *OP* (is the share price offered to shareholders in the IPO in Swedish Krona (SEK)), *FRAC* (is the fraction of shares offered to new shareholders in the IPO), *IR* (is the return on the first trading day on the stock market), and *SIZE* (is the market cap at the time of the IPO, reported in millions of SEK). For Panel A, columns one through three present the results for the number of shareholders, four through six for the breadth of ownership (where breadth of ownership is the number of shareholders in the firm divided by number of shareholders holding any stock). Panel A shows the full sample except for model two, which only consists of the main market IPOs. Panel B (C) shows the results for number of shareholders (breadth of ownership) with the sample divided into groups based on *OFFER PRICE*, where columns one and two (three and four) contain the IPOs within the lowest (highest) offer price groups of the three. Column five (six) shows the results for penny (ordinary) stock IPOs. N is the number of IPO firms. White-Huber robust standard errors are used, and *t*-stats are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

5. Discussion and Conclusions

The main finding of this paper is the effect of offer price on post-IPO ownership structure. For low-priced IPOs, there is a negative relationship between the offer price and the breadth of ownership among individual investors. The results also show that the average income is lower among individuals holding an IPO with a low offer price compared with those holding IPOs with higher offer prices, which implies a more lottery-type investment. This is consistent with previous studies showing individuals' preference for low-priced stocks. For individuals, the results show a positive relationship between IR and breadth of ownership. Using two previous definitions of breadth of ownership gives consistent results on offer price, showing that both definitions can be used. Together, the results show that firms can affect their post-IPO ownership structure by means of their offer price.

There is a firm size effect, with large firms having more shareholders than smaller firms. However, the results show that even when controlling for size, the offer price affects the number of shareholders. Thereby, when firms set their offer price, they can affect their future ownership structure and thereby likely also their monitoring.

These results have practical implications for firms, showing that the ownership structure can be affected by their choice of offer price. These results together with knowledge from previous studies, that ownership dispersion affects the risk of the firm and that unsophisticated investors have poor capacity to monitor the firm, show the importance of awareness of corporate actions related to ownership structure. The practical implication of the relationship between ownership structure and offer price also holds for investors and it might affect the monitoring of the firm.

Data Availability Statement: I thank Adri De Ridder and Daniel Hallgren for providing access to the ownership data through the Visby Research in Stock Ownership (VIRSO) database. However, data on ownership and income is unavailable. Data on IPOs was collected from Nasdaq and Spotlight exchanges and are publicly available.

Conflicts of Interest: The author declares no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

References

Abrahamson, Martin. 2018. Birds of a Feather Flock Together: A Study of New Shareholders and Swedish IPOs. *Journal of Behavioral and Experimental Finance* 18: 1–17. [CrossRef]

Abrahamson, Martin. 2020. Shareholders and Cherry-Picking IPOs. Ph.D. dissertation, Acta Upsaliensis, Uppsala, Sweden; pp. 1–58.

Baker, Malcolm, Robin Greenwood, and Jeffrey Wurgler. 2009. Catering through Nominal Share Prices. *Journal of Finance* 64: 2559–90. [CrossRef]

Bali, Turan G., Nusret Cakici, and Robert F. Whitelaw. 2011. Maxing out: Stocks as lotteries and the cross-section of expected returns. *Journal of Financial Economics* 99: 427–46. [CrossRef]

Bali, Turan G., Stephen J. Brown, Scott Murray, and Yi Tang. 2017. A Lottery-Demand-Based Explanation of the Beta Anomaly. *Journal of Financial and Quantitative Analysis* 52: 2369–97. [CrossRef]

Birru, Justin, and Baolian Wang. 2016. Nominal Price Illusion. *Journal of Financial Economics* 119: 578–98. [CrossRef]

Boulton, Thomas J., Scott B. Smart, and Chad J. Zutter. 2017. Conservatism and International IPO Underpricing. *Journal of International Business Studies* 48: 763–85. [CrossRef]

Bouzouita, Nesrine, Jean-François Gajewski, and Carole Gresse. 2015. Liquidity Benefits from IPO Underpricing: Ownership Dispersion or Information Effect. *Financial Management* 44: 785–810. [CrossRef]

Bradley, Daniel J., John W. Cooney, Jr., Steven D. Dolvin, and Bradford D. Jordan. 2006. Penny Stock IPOs. *Financial Management* 35: 5–29. [CrossRef]

Brennan, M. J., and J. Franks. 1997. Underpricing, Ownership and Control in Initial Public Offerings of Equity Securities in the UK. *Journal of Financial Economics* 45: 391–413. [CrossRef]

Brockman, Paul, Xianjie He, Shuwei Sun, and Huan Zou. 2023. The Role of Individual Investment Bankers in IPO Pricing: Evidence from Investor Bidding Behavior. *Journal of Corporate Finance* 82: 1–23. [CrossRef]

Cao, Zhiqi, and Wenfeng Wu. 2022. Ownership Breadth: Investor Recognition or Short-sale Constrains? *Finance Research Letters* 47: 102847. [CrossRef]

Chang, Chun, Yao-Min Chiang, Yiming Qian, and Jay R. Ritter. 2017. Pre-Market Trading and IPO Pricing. *The Review of Financial Studies* 30: 835–65. [CrossRef]

Chemmanur, Thomas J. 1993. The Pricing of Initial Public Offerings: A Dynamic Model with Information Production. *Journal of Finance* 58: 285–303. [CrossRef]

Chen, Joseph, Harrison Hong, and Jeremy C. Stein. 2002. Breadth of Ownership and Stock Returns. *Journal of Financial Economics* 66: 171–205. [CrossRef]

Chi, Yeguang, Jingbin He, Xinru Ma, and Fei Wu. 2023. Institutional Investor Inattention Bias in Auctioned IPOs. *Journal of Banking and Finance* 150: 106831. [CrossRef]

Choi, James J., Li Jin, and Hongjun Yan. 2013. What does Stock Ownership Breadth Measure? *Review of Finance* 17: 1239–78. [CrossRef]

De Ridder, Adri, and David A. Burnie. 2016. Managerial Actions and Nominal Stock Price Levels. *Journal of European Finance* 22: 1435–66. [CrossRef]

Duong, Huu Nhan, Abhinav Goyal, Vasileios Kallinterakis, and Madhu Veeraraghavan. 2021. Marketing Manipulation Rules and IPO Underpricing. *Journal of Corporate Finance* 67: 101846. [CrossRef]

Dyl, Edward A., and William B. Elliott. 2006. The Share Price Puzzle. *Journal of Business* 79: 2045–66. [CrossRef]

Fernando, Chitru S., Srinivasan Krishnamurthy, and Paul A. Spindt. 2004. Are Share Price Levels Informative? Evidence from the Ownership, Pricing, Turnover, and Performance of IPO Firms. *Journal of Financial Markets* 7: 377–403. [CrossRef]

Field, Laura Casares, and Dennis P. Sheehan. 2004. IPO Underpricing and Outside Blockholders. *Journal of Corporate Finance* 10: 263–70. [CrossRef]

Gompers, Paul A., and Andrew Metrick. 2001. Institutional Investors and Equity Prices. *Quarterly Journal of Economics* 116: 229–59. [CrossRef]

Grullon, Gustavo, George Kanatas, and James P. Weston. 2004. Advertising, Breadth of Ownership and Liquidity. *Review of Financial Studies* 17: 439–61. [CrossRef]

Huang, Yuqin, and Haoran Zhang. 2020. Does Individual Investors' Attention Influence Underwriters' IPO Pricing? *Applied Economics* 52: 3680–87. [CrossRef]

Joshipura, Mayank, Sachin Mathur, and Hema Gwalani. 2023. Decrypting IPO Pricing: An Integrated Bibliometric and Content Analysis Approach. *Managerial Finance* 49: 135–62. [CrossRef]

Kao, Lanfeng, Anlin Chen, and Cheng-Shou Lu. 2022. Retail Investor Attention and IPO Prices with a pre-IPO Market. *International Review of Economics and Finance* 82: 416–32. [CrossRef]

Kim, Jeong-Bon, Bing Li, and Zhenbin Liu. 2018. Does Social Performance Influence Breadth of Ownership? *Journal of Business Finance and Accounting* 45: 1164–94. [CrossRef]

Kim, Jeong-Bon, Bing Li, and Zhenbin Liu. 2019. Information-Processing Costs and Breadth of Ownership. *Contemporary Accounting Research* 36: 2408–36. [CrossRef]

Kumar, Alok. 2009. Who Gambles in the Stock Market? *Journal of Finance* 64: 1889–933. [CrossRef]

Kumar, Alok, and Charles M. C. Lee. 2006. Retail Investor Sentiment and Return Comovements. *Journal of Finance* 61: 2451–86. [CrossRef]

Ljungqvist, Alexander, and William J. Wilhelm, Jr. 2003. IPO Pricing in the Dot-Com Bubble. *Journal of Finance* 58: 723–52. [CrossRef]

Lowry, Michelle, Roni Michaely, and Ekaterina Volkova. 2017. Initial Public Offerings: A Synthesis of the literature and directions for further research. *Foundations and Trends in Finance* 11: 154–320. [CrossRef]

Michaely, Roni, and Wayne H. Shaw. 1994. The Pricing of Initial Public Offerings: Tests of Adverse Selection and Signaling Theories. *The Review of Financial Studies* 7: 279–319. [CrossRef]

Neghab, Davood Pirayesh, Reza Bradrania, and Robert Elliott. 2023. Deliberate Premarket underpricing: New Evidence on IPO Pricing Using Machine Learning. *International Review of Economics and Finance* 88: 902–27. [CrossRef]

Nofsinger, John R., and Abhishek Varma. 2014. Pound Wise and Penny Foolish? OTC Stock Investor Behavior. *Review of Behavioral Finance* 1: 2–25. [CrossRef]

Pham, Peter K., Petko S. Kalev, and Adam B. Steen. 2003. Underpricing, Stock Allocation, Ownership Structure and Post-Listing Liquidity of Newly Listed Firms. *Journal of Banking and Finance* 27: 919–47. [CrossRef]

Rapp, Albert. 2023. Empirical Evidence of Attribute Framing: The Case of Unsophisticated IPO Investors. *Review of Behavioral Finance* 15: 811–26. [CrossRef]

Ritter, Jay R. 1991. The Long-Run Performance of Initial Public Offerings. *Journal of Finance* 46: 3–27.

Ritter, Jay R., and Ivo Welch. 2002. A Review of IPO Activity, Pricing and Allocations. *Journal of Finance* 56: 1795–828. [CrossRef]

Sandhu, Harsimran, and Kousik Guhathakurta. 2020. Effects of IPO Offer Price Ranges of Initial Subscription, Initial Turnover and Ownership Structure- Evidence from Indian IPO Market. *Journal of Risk and Financial Management* 13: 279. [CrossRef]

Tsukioka, Yasutomo, Junya Yanagi, and Teruko Takada. 2018. Investor Sentiment Extracted from Internet Stock Message Boards and IPO Puzzles. *International Review of Economics and Finance* 56: 205–17. [CrossRef]

West, Jessica, Giovanni Fernandez, and K. C. Ma. 2017. IPOs: The Third Year On. *Journal of Portfolio Management* 43: 137–51. [CrossRef]

Xuan, Ziyue, Wenting Guo, and Faqin Lan. 2023. Underwriters Interest Binding and IPO Underpricing. *Finance Research Letters* 57: 104425. [CrossRef]

Yang, Chunpeng, and Xiaoyi Hu. 2019. Breadth of Ownership and Stock Excess Returns. *Pacific-Basin Finance Journal* 55: 259–69. [CrossRef]

Yong, Othman. 2016. Cheap IPO: Does it Matter. *Journal of Developing Areas* 50: 453–60. [CrossRef]