Auditors, Underwriters, and Firm Owners’ Interaction in an IPO Environment: The Case of OECD Nations

Sheela Sundarasen 1,*, Kamilah Kamaludin 1, Izani Ibrahim 2, Usha Rajagopalan 1 and Nevi Danila 2

1 Department of Accounting, Prince Sultan University, P.O. Box 66833, Riyadh 11586, Saudi Arabia; kkalaludin@psu.edu.sa (K.K.); urajagopalan@psu.edu.sa (U.R.)
2 Department of Finance, Prince Sultan University, P.O. Box 66833, Riyadh 11586, Saudi Arabia; profizani@psu.edu.sa (I.I.); ndanila@psu.edu.sa (N.D.)
* Correspondence: ssundarasen@psu.edu.sa

Abstract: This study explores the effects of interactions among key stakeholders, i.e., auditors, underwriters, and firm owners on IPOs’ first-day returns in selected OECD nations. It also examines the alteration effects of legal origin (Common law and Civil law) on the relationship between the interacted key stakeholders and IPOs’ first-day returns. A total of four thousand one hundred and sixty-four IPOs from twenty-eight OECD nations are included in this study. Since it is cross-sectional data, a two-stage least square regression is applied. The empirical outcomes indicate that, in general, the interacted reputable underwriters and auditors have a positive impact on IPOs’ first-day return. The relationship is modified between common law and civil law nations, whereby in civil law nations, no significance is demonstrated except for the interaction between the reputable auditors and underwriters. In the common law nation, interactions between reputable auditors and ownership retention have an impact on IPOs’ first-day return. The research findings provide outlooks into an IPO framework for issuers, investors, and regulators. Issuers may want to weigh carefully the costs and benefits of hiring credible auditors and underwriters when going public as they act as signaling agents. As for the investors, they should take into consideration the involvement of reputable underwriters and auditors and the degree to which the IPO firms retain ownership, as the interactive effects give clear signals on firm valuation and IPOs’ first-day returns. Regulators may find the findings informative concerning the creation of a more organized regulatory and financial system that could lead to a deeper and more open financial market.

Keywords: IPO; first-day return; auditors; underwriters; firm owners’ retention; OECD

1. Introduction

It is contended that auditors and underwriters are prominent players in the business world, and they are among the main stakeholders in an initial public offering (hereinafter IPO) setting. Due to information asymmetry, the roles of these stakeholders are further augmented as it signals the credibility of the firms going public. In that context, this study investigates the influence of interactions among these key stakeholders on the IPO’s initial returns in a multinational setting, i.e., OECD nations. Though these signaling variables have been extensively examined, the implications of an interplay between them on IPOs’ first-day returns are lacking in credible evidence, thus establishing the prime motive for this study. Correspondingly, since the study is conducted in a multi-national context, the occurrence of any variability to the above-mentioned relationship between civil law and common law nations is also explored.

A study on the interactive effects could give further insight and an enriched implication of the consolidated reputation capital of these stakeholders and their reciprocal influence, mainly in terms of investors’ perceptions of the IPO firm’s credibility. Likewise, the interactions between firm owners-auditors and firm owners-underwriters may affect the signals sent to potential investors in terms of IPO pricing, IPO firm reputation, and
its financial reports and accountability, and subsequently, mitigate perceived risks from private information. Having said that, different legal backgrounds, with different legal frameworks and levels of regulatory execution could alter the relationship between these stakeholders and the IPOs’ first-day returns. Thus, the occurrence of any variations to the established relationship will be an added value from a regulatory perspective. To this end, cross-sectional data is used which includes 4164 IPOs from 26 OECD nations. Testing of hypotheses is carried out using the two-stage least square regression.

The findings of this study suggest a positive association amid the interacted signaling variables (auditors’ and underwriters’ reputation) and IPOs’ first-day returns. The findings indicate that these signaling variables influence each other reciprocally and give indications to prospective stockholders on the future value of firms. This will eventually impact the IPOs’ first-day returns. As for further analysis, it is noted that the civil law nation has a greater association between the interacted auditors and underwriters, compared to the common law nation. On the other hand, interacted auditors’ reputation and ownership retention have an impact on IPOs’ first-day return in the common law nations.

The research findings offer insights to issuers, investors, and regulators. Issuers may want to be mindful when hiring credible auditors and underwriters when going public as it has a significant impact on the pricing and initial returns. Investors, on the other hand, should consider the involvement of reputable underwriters and auditors and the ownership retention, as the interactive effects give clear signals on firm valuation and IPOs’ first-day returns. The results may have also given some insights to regulators on the importance of an organized regulatory and financial system in ensuring long-term stability.

The paper proceeds as follows. Section 2 discusses the key theories and hypotheses. Section 3 discusses the development of the hypotheses, Section 4 outlines the methodology and deliberates on the measures of all variables to be tested. Sections 5 and 6 addresses the scientific observations and discussion, while Section 7 concludes.

2. Literature Review

This study uses signaling theory as the underpinning theory [1–3]. Signaling theory predominantly refers to the presence of asymmetric information between firm owners and stockholders [4] and the signals sent to these prospective stockholders by IPO firms regarding the quality of a firm [5–7].

2.1. Auditors’ Reputation

Before getting a firm listed in the secondary market, an external auditor would have to be appointed to perform a due diligence audit and report the results. This allows prospective investors to analyze the prospects of the said firm. The financial statement appearing in those companies’ prospectus minimizes information asymmetry between issuers and stockholders. Therefore, the auditors’ financial statement is vital in maintaining a well-functioning capital market and the auditor’s role is critical in maintaining that the evidence contained in the prospectus is accurate and is presented truly and fairly.

The investor pool entrusts prestigious auditors (especially the big-4) in providing a high standard of integrity and audit quality.

Studies on the reputations of auditors and IPOs by DeAngelo [8] and Shapiro [9] show that prestigious auditors are more likely to take on quality jobs with higher audit fees. Therefore, the reputation of auditors acts as an indicator of firm quality [10] which consistently assists in minimizing the asymmetric information between firm owners and all stakeholders. Audited results play a crucial role in addressing the information asymmetry between firms (private to public company information) and stockholders. In line with the notion that credible auditors reduce confusion surrounding the IPO environment and help resolve the information asymmetry, there is usually a negative correlation between the auditors’ reputation and initial returns [11]. Titman and Trueman’s [12] study on the credibility of auditors and IPO initial returns predicts that riskier companies prefer auditors of lower quality. Besides, Titman and Trueman [12] note that reliable auditors offer faster
and precise information but charge comparatively higher audit fees. This is useful for businesses that have positive details to report and are willing to pay the higher fee paid by qualified auditors. Thus, Titman and Trueman [12] conjecture that the superiority of a firm’s engaged auditor principally depends on the nature of the private information provided by the issuer.

Contrary to the aforementioned observations, the results of Titman and Trueman [12] are not entirely confirmed by Datar, Felthan and Hughes [13]. The writers argued that the auditors’ report would not include conclusive information on a company’s prospects and instead treated the audit as mere testimony. These authors believe that most auditors are giving a ‘good opinion’ to all public-going firms, arising from post-negotiations between issuers and auditors. The hiring of prestigious auditors only minimizes the likelihood of the prospectus being significantly falsified. Datar, Felthan and Hughes [13] (similar to Hughes [14]), emphasizes that the residual ambiguity is determined by the level of control held in the operation of the IPO by the original owners.

Datar’s model argues that the audited reports and the retention of ownership jointly signify the private information provided by the issuer. Ownership retention serves as a platform to address the uncertainty of an investor over private information not addressed by audited accounts. Simunic and Stein [15] and Beatty [16] provide credible evidence to support Titman and Trueman’s [12] predictions. It is argued that prestigious auditors who are interested in their reputation capital tend to reveal material misstatements or fraud in the financial statements. Otherwise, if any catastrophic accounting default is detected, it would greatly jeopardize the auditors’ reputation. Thus, the details reported by prestigious auditors in the financial statements will represent an accurate and fair view of the business performance, with lower ex-ante uncertainty and higher firm value for potential investors.

2.2. Underwriters’ Reputation

Similar to the reputation of auditors, prestigious investment banks are believed to be prolific underwriters, and they have extensive experience in having a business listed in stock exchanges. Due to their active participation in providing essential services in an IPO course such as legal issues, compliance, and validation, book-building, and valuing of an IPO [17–19], they have an impact on the IPOs’ first-day returns. The credibility of these underwriters appointed by a firm is a gauge of the firm’s prospects and value to prospective investors.

By contrast, since underwriting is a repeated business with relatively small competitors, their credibility significantly affects the longevity of an underwriter and future earnings potential. This reputation is deeply influenced by the secondary market post-issue price and the overall performance of their underwritings [18,20,21]. Underwriters could encounter obstacles in marketing potential IPO issues if investors in their prior IPO investments felt deceived by an underwriter. Financial reporting inaccuracy, misrepresentation, and manipulation make both issuers and underwriters susceptible to SEC enforcement policy and shareholder lawsuits. In reality, early studies have also documented that the magnitude of underpricing on the first day is due to the underwriters, i.e., their credibility, pricing strategies, and their association with the analyst [22–25].

Studies examining the association between the reputation of the underwriters and IPOs’ first-day returns have mixed results. Initial studies by Beatty & Ritter [26], Johnson & Miller [27], Carter & Manaster [28], Carter, Dark, & Singh, [29], Aggarwal [30], Kirkulak-Uludag and Davis [31] have shown that prestigious underwriters reflect firm competence and thus contribute to low first-day returns in the secondary markets. Recent studies by Widarlo et al. [32], Angelia and Basana [33], Albada, Low and Yong [18], Rumokoy et al. [17], and Ong, Mohd-Rashid, and Taufil-Mohd [19], using Malaysian and Indonesian data respectively, further supports the inverse relationship between underwriters reputation and first-day initial returns.

Contrary to the above, studies by Beatty and Welch [34]; Cooney et al. [35]; Bates and Dunbar, [36]; Loughran & Ritter, [37] document a positive relationship, whereby while
respectable underwriters still reflect firm efficiency, investors see it as an incentive to raise their demand for IPOs in the secondary market, prompting prices to surge upwards and thus a higher returns on these IPOs. It is noteworthy to highlight at this point a conflict of interest arising between underwriters and firm owners. As stated earlier, underwriting is a repeated business and its credibility significantly affects the future earnings potential. Underwriters prefer a lower offer price as they gain from ‘leaving money on the table’ due to favoring the buy-side clients and this to a certain extent, protects their reputation capital, whilst issuing firms desire a higher offer price. Nevertheless, in many IPO situations, issuers will sum the wealth loss from leaving money on the table with the much larger wealth gain from the first-day returns and seasoned equity offerings (SEOs). Underwriters then, take advantage of this correlation of the amount of money left on the table and the unanticipated wealth changes.

2.3. Firm Owners’ Retention

Another signaling variable evaluated in this analysis is the stockholding by firm owners. In general, high retention of ownership is anticipated to accelerate the firm’s value [38,39], thus signaling the prospects of the company going public to prospective buyers [6,7,40]. The firm owners’ readiness to hold more shares in the company that is going public will send a strong message to prospective buyers about a company’s future worth. This is because retained equity strengthens the firm owners’ trust in the company’s prospects and can help reduce information asymmetry concerns between firm owners and potential stockholders. This signal is supposed to cause investors on the first day of listing to raise demand for the shares, allowing the stock price to move upwards at the same time. The signaling hypothesis also illustrates the willingness of owners of high-quality firms to under-price their shares with the hope of recovering the “money left on the table” during seasoned equity bids. This contributes to a high closing price on the first day of the secondary market transaction and the potential for higher IPOs’ first-day returns.

Similarly, the signaling models of Allen and Faulhaber [6], Grinblatt and Hwang [40], and Welch [7] claim that prestigious firm owners indicate the superiority of their firms by maintaining high proportion ownership, whilst lowering the price of the bid (or similarly greater insider ownership and higher underpricing), while at the same time separating themselves from low-quality firms. Nonetheless, Hughes’—[14] bivariate signaling model argued against the above results and suggested a replacement effect between retention of ownership and underpricing and is subject to the relative marginal costs and benefits. High retention of ownership, according to the author, reduces the information asymmetry and lowers an IPO’s underpricing. The author also suggested that the quality of the bid would be higher, and that underpricing would be lower if the company maintains greater control of insiders. Jegadeesh, Weinstein, and Welch, [41], Krinsky and Rotenberg [42], and Darmadi & Gunawan [43] further defended this approach. In conclusion, past literature documents that high retention of ownership signals firm quality but differing in its impact on IPOs’ first-day returns.

3. Hypothesis Development

All of the above studies explored the impact of the signaling parameters, i.e., underwriters, auditors, and firm retention on IPOs’ first-day returns independently but did not recognize the interaction amongst these signaling variables and their effect on IPOs’ first-day returns. The credence of audited financial statements and disclosures by prestigious auditors, as stated earlier, acts as a quality assurance to minimize information asymmetry between firms and prospective stockholders. On the other hand, prestigious underwriters also prefer high-quality auditors to attest, verify, and fully integrate financial information into the IPO issuance process.

The relationship is further strengthened with the business owners’ high retention of equity, as it sends signals on the company’s future worth and outlook to potential investors. High retention of ownership signals increased certainty on the company prospects as they
have private insider information. As suggested by Datar, Felthan and Hughes [13], the audited reports and firm owners retention jointly signal the private information of the issuer as firm owners’ retention serves as a platform to solve the confusion of the investor over the private information not solved by audited reports. Also, three IPO underpricing signaling models that have gained the utmost attention [6,7,40] reveal that the first day’s positive returns are used as a device of firms’ superior quality. This reflects the opinion of the mainstream press that underpriced IPOs have a certain aura of success.

Thus, in this research, we conjecture that the association amongst ‘underwriters and auditors,’ ‘underwriters, and firm owners’ retention’ and ‘auditors and firm owners’ retention’ would have a direct impact on the IPOs’ first-day returns. Over and above the positive signals generated separately by credible auditors, underwriters, and firm owners, investors perceive such partnerships as an “extra-layer of assurance for high quality” [44]. Investors should take this chance to intensify the demand for the IPOs, effectively improving the initial returns. The combined effect of these partnerships, especially in terms of financial reporting, IPO pricing, and insider knowledge minimization, would eventually signal the reputation of the IPOs to prospective investors and thus the risks associated with IPO firms.

The combination of certification by credible auditors and underwriters and the existence of high retention of ownership would minimize the ex-ante uncertainty of investors and increase the demand for the bid, resulting in high first-day returns. If such a coalition does not exist, the desired effect may not be achieved. As Beatty and Welch [34], Cooney et al. [35], Bates and Dunbar [36], Loughran & Ritter [37], Liu & Ritter [45], Angelia and Basana [33], Albada, Low and Yong [18], and Ong, Mohd-Rashid, and Taufil-Mohd [19], have reported, investors view the above as a prospect to raise their demand for these secondary-market IPOs, pushing the value of the shares up and eventually leading to higher first-day returns.

As this analysis uses a multi-national dataset of different legal regimes, we further examine how the legal framework of each country (common and civil law) influences the relationship related to the interaction amongst ‘underwriters and auditors,’ ‘underwriters and firm owner retention’, and ‘auditors and firm owner retention’ on first-day returns of IPOs. Common law nation’s legal structure reduces investors’ expected IPO vulnerability due to uncertainty, compared to the weaker civil law system which has greater ex-ante volatility.

In the context of this analysis, we anticipate a larger association between the interacted signaling variables and first-day return on IPO, in civil law nations compared with common law nations. Prestigious underwriters and auditors play a critical role in promoting firm value in a nation with a weaker legal structure and poorer implementation of rules and regulations. Common law nation has more mature capital markets, stronger legal structures and protection for investors, more stringent regulation and compliance, and less government interference. In a civil law nation, those qualities may not be fully present. Thereby, in a civil law nation, the interplay between prestigious underwriters and auditors may raise the investors’ confidence in the firm quality and ultimately increased IPO transactions on the secondary market. The increased demand for IPOs causes the IPO prices and consequently to a stronger relationship. Increasing investor sentiment will generate added investment for civil law nations and further boost secondary market IPO purchases, thus increasing the demand for these IPOs. This upsurge in the request will indeed force the price of the IPO, and thus the first-day IPO returns. Furthermore, firms in common law nations may also choose to underprice to lessen the occurrence of litigation in a nation where the legal consequences are relatively context-dependent and therefore costly and complicated.

As for the interaction of the reputable auditors and underwriters with the ownership retention, it is anticipated that the presence of both underwriters and auditors in a high-ownership retention context may not mitigate uncertainty in the civil nation. This is mainly due to the fact civil law nation have a comparatively weaker legal system, investor protection, and enforcement of rules and regulations [46]. Thus, when the retention of
ownership is strong, the involvement of reputable auditors and underwriters may not have a major effect on the relationship. Investors may also be skeptical about rent-seeking practices and profit-expropriation possibilities in high-ownership firms [47]. This may have added to the insignificance. Combining the arguments presented above, we arrive at the following testable hypotheses:

**Hypothesis 1 (H1).** IPOs’ first-day returns are directly affected by the interaction between prestigious underwriters and auditors.

**Hypothesis 2 (H2).** IPOs’ first-day returns are directly affected by the interaction between prestigious underwriters and firm owners’ retention.

**Hypothesis 3 (H3).** IPOs’ first-day returns are directly affected by the interaction between prestigious auditors and firm owners’ retention.

**Hypothesis 4 (H4).** Interacted underwriters and auditors have a greater association with IPOs’ first-day returns in the civil law nation.

**Hypothesis 5 (H5).** Interacted underwriters and firm owner retention have a greater association with IPOs’ first-day returns in the common law nation.

**Hypothesis 6 (H6).** Interacted auditors and firm owner retention have a greater association with IPOs’ first-day returns in the common law nation.

4. Methodology

Bloomberg, and DataStream are used for data collection. Firms with incomplete data, delisted firms, and all trust funds and REITs were removed. This contributed to a final dataset of 4164 firms. The first-day returns calculation is based on the studies of Ibbotson and Jaffe [48] and Ibbotson, Sindelar, and Ritter [49].

\[ \text{IR}_i = \frac{\text{PC}_i - \text{PO}_i}{\text{PO}_i} \]

where:
- \(\text{PC}_i\) = first-day ending price
- \(\text{PO}_i\) = firm’s offer price
- \(\text{IR}_i\) = first-day returns for firm \(i\).

The initial returns of the IPO have not been adjusted for market return movements, as it is widely acknowledged that the daily market returns have no major effect on these initial returns [50]. As for the reputation of the underwriters, this study uses the technique of Megginson and Weiss [51] as information on Carter-Manaster’s [28] tombstone rating system is not accessible in many nations outside the U.S. Therefore, yearly market capitalization by the underwriters is used to calculate underwriters’ reputation. The approach used to classify the credibility of auditors is based on Titman and Trueman’s [12] and Beatty and Ritter’s [26] seminal studies, i.e., the big-4 audit firms versus the non-big-4 firms. For the reputation of auditors (AR), a dummy variable of 0 and 1 is generated; 1 for big-4 and 0 for non-big-4. The final signaling parameter is firm owners’ retention; Downes and Heinkel’s [52] method is used. As for the control variables, the age of the firm is obtained by subtracting the IPO date from the incorporation date. The firm size is based on the number of IPOs issued and the offer price. Concerning market conditions, it is premised on the stock market’s daily closing index in the respective nation. A binary variable is used for industry; 0 indicates non-IT firms, while 1 indicates IT firms. This analysis also uses two other proxies; financial leverage (represented by the ratio of debt to equity) and equity return (ROE). The ratio is determined using: Net after-tax profit/Common Equity. Both variables are collected from either of the websites of Bloomberg, OSIRIS, DataStream, or the companies.
Before hypotheses testing, a correlation test is carried out to ensure the data has no multicollinearity issues. The Breusch-Pagan Godfrey (BPG) is used to check for the existence of heteroscedasticity and is corrected using White’s method. The interacted variables are then regressed against IPOs’ first-day returns. The approach of Aiken and West [53] is adopted for the bidirectional interactions between the independent variables described above. A Two-Stage Least square regression is applied to the following regression,

\[
(\text{First-day return}) = \beta_0 + \beta_1 (\text{underwriter’s reputation}) + \beta_2 (\text{ownership retention}) + \beta_3 (\text{auditor’s reputation}) + \beta_4 (\text{underwriter’s reputation} \times \text{auditor’s reputation}) + \beta_5 (\text{underwriter’s reputation} \times \text{ownership retention}) + \beta_6 (\text{auditor’s reputation} \times \text{ownership retention}) + \beta_7 (\text{market condition}) + \beta_8 (\text{firm size}) + \beta_9 (\text{firm age}) + \beta_{10} (\text{corruption index}) + \varepsilon
\]

Instrumental variables (underwriter’s reputation \times corruption perception index) and (auditor’s reputation \times underwriter’s reputation \times ownership retention) are applied to (underwriter’s reputation) and (ownership retention) to test for endogeneity.

5. Results/Findings

5.1. Descriptive Statistics

Table 1 (a,b) displays the descriptive statistics for both the common law and civil law countries respectively. After adjusting for outliers, the initial returns range between −50% to 100%, suggesting dissimilarity in the IPOs’ first-day returns. The predictor variables, i.e., the reputation of underwriters and retention of ownership also show a fairly wide variation; 0.01% to 35% for the reputation of underwriters, and 0.01% to 97.37% for retention of ownership. As for the reputation of the underwriters, Goldman Sachs, JP Morgan, Morgan Stanley, Citi Bank, Credit Suisse, Bank of America and Deutsche Bank have high market shares in terms of underwriting services (throughout the study period). Smaller investment banks hold less than 5% of the overall market shares. The two tables below show the descriptive statistics of variables used in the regression.

| Variables               | Mean  | Median | Max.   | Min.  | Std. Dev. |
|-------------------------|-------|--------|--------|-------|-----------|
| Initial Returns (IR)    | 7.57  | 0.28   | 100.00 | −50.00| 20.24     |
| Underwriters’ Reputation (UWR) | 2.69  | 0.01   | 35.00  | 0.01  | 4.14      |
| Ownership Retention (Ortn) | 11.10 | 4.13   | 97.37  | −0.64 | 16.57     |
| Auditors’ Reputation (AudR) | 0.58  | 1.00   | 1.00   | 0.00  | 0.49      |
| Market Condition (MCon) | 0.05  | −0.04  | 22.88  | −11.68| 0.93      |
| Firm Size (FS)          | 19.93 | 19.75  | 27.75  | 6.56  | 2.40      |
| Firm Age (FA)           | 6.74  | 3.00   | 49.00  | 1.00  | 8.28      |
| Corruption Perception Index (CPI) | 8.13  | 8.50   | 9.60   | 5.90  | 0.64      |

Table 1. (a) Descriptive statistics of variables for Common-Law nation. (b) Descriptive statistics of variables for Civil Law nation.

| Variables               | Mean  | Median | Max.   | Min.  | Std. Dev. |
|-------------------------|-------|--------|--------|-------|-----------|
| Initial Returns (IR)    | 3.45  | 0.01   | 32.00  | 0.01  | 5.88      |
| Underwriters’ Reputation (UWR) | 16.04 | 7.15   | 92.41  | 0.00  | 19.24     |
| Ownership Retention (Ortn) | 0.53  | 1.00   | 1.00   | 0.00  | 0.50      |
| Auditors’ Reputation (AudR) | 0.20  | −0.01  | 25.29  | −9.77 | 1.77      |
| Market Condition (MCon) | 18.73 | 18.59  | 30.48  | 2.61  | 2.62      |
| Firm Size (FS)          | 13.50 | 10.00  | 49.00  | 1.00  | 11.02     |
| Firm Age (FA)           | 6.42  | 7.00   | 9.70   | 3.10  | 1.49      |

5.2. Correlation Analysis

The correlation values between the variables are determined before continuing with the regression analysis to ensure no multicollinearity issues. The correlation values between the variables are given in Table 2 (a,b). Overall, the correlation levels are below 0.70. Since the multicollinearity issue does not exist, the two-stage least square regression is applied.
Heteroscedasticity is checked to ensure BLUE (Best Linear Unbiased Estimators) estimates are used.

Table 2. (a) Correlation Matrix—Common Law Nation. (b) Correlation Matrix—Civil Law Nation.

|    | IR   | UWR  | ORTN | AUDR | MCON | FS   | FA   | CPI    |
|----|------|------|------|------|------|------|------|--------|
| (a) | IR   | 1.00 | 0.03 | 0.03 | 0.01 | 0.03 | −0.06| 0.03   | −0.05  |
|    | UWR  | 0.03 | 1.00 | −0.19| 0.31 | 0.00 | 0.10 | 0.19   | −0.39  |
|    | ORTN | 0.03 | −0.19| 1.00 | −0.19| 0.00 | 0.01 | 0.07   | −0.03  |
|    | AUDR | 0.01 | 0.31 | −0.19| 1.00 | 0.03 | 0.13 | 0.15   | −0.21  |
|    | MCON | 0.03 | 0.00 | −0.01| 0.03 | 1.00 | −0.02| 0.07   | −0.05  |
|    | FS   | −0.06| 0.10 | 0.07 | 0.13 | −0.02| 1.00 | −0.02  | −0.03  |
|    | FA   | 0.03 | 0.19 | −0.03| 0.15 | 0.07 | −0.02| 1.00   | −0.30  |
|    | CPI  | −0.05| −0.39| 0.20 | −0.21| −0.05| −0.03| −0.30  | 1.00   |

|    | IR   | 1.00 | 0.04 | 0.04 | 0.06 | −0.03| 0.16 | 0.07   | 0.06   |
|----|------|------|------|------|------|------|------|--------|
|    | UWR  | 0.04 | 1.00 | 0.03 | 0.26 | −0.01| 0.13 | 0.15   | 0.28   |
|    | ORTN | 0.04 | 0.03 | 1.00 | −0.16| −0.03| −0.19| 0.09   | −0.14  |
|    | AUDR | 0.06 | 0.26 | −0.16| 1.00 | 0.06 | 0.29 | 0.14   | 0.44   |
|    | MCON | −0.03| −0.01| −0.03| 0.06 | 1.00 | −0.12| 0.01   | −0.05  |
|    | FS   | 0.16 | 0.13 | −0.19| 0.29 | −0.12| 1.00 | −0.01  | 0.26   |
|    | FA   | 0.07 | 0.15 | 0.09 | 0.14 | 0.01 | −0.01| 1.00   | 0.16   |
|    | CPI  | 0.06 | 0.28 | −0.14| 0.44 | −0.05| 0.26 | 0.16   | 1.00   |

5.3. Regression Results: Interacted Signaling Variables and IPOs’ First-Day Returns

Table 3 shows the empirical results of hypotheses 1–3 respectively. The results indicate significance for the relationship between the interacted ‘reputable auditors and underwriters’ and IPOs’ first-day returns, thus H1 is supported, while H2 and H3 are not supported.

Table 3. Relationship between interacted signaling variables and first-day IPO initial returns.

|          | Coef. | Std. Err. | z     | p > z | [95% Conf. Interval] |
|----------|-------|-----------|-------|-------|----------------------|
| Underwriters’ Reputation (UWR) | 3.1278 | 3.0225 | 1.03  | 0.3010 | −2.7962 to 9.0517    |
| Ownership Retention (Ortn)     | −0.4761| 0.3780  | −1.26 | 0.2080 | −1.2171 to 0.2648    |
| Auditors’ Reputation (AudR)    | −20.2571| 5.8323 | −3.47 | 0.0010 | −31.6882 to −8.8260  |
| UWRxAUDR                        | 1.1045| 0.4224  | 2.61  | 0.0010 | 0.2766 to 1.9324     |
| UWRxOrtn                        | 0.0343| 0.0236 | 1.45  | 0.1460 | −0.0119 to 0.0805    |
| AudxOrtn                        | −3.9542| 3.0483 | −1.3  | 0.1950 | −9.9287 to 2.0203    |
| Market Condition (MCon)        | −2.8295| 1.4681 | −1.93 | 0.0540 | −5.7069 to 0.0479    |
| Firm Size (FS)                 | 3.4835| 0.7838 | 4.44  | 0.0000 | 1.9473 to 5.0196     |
| Firm Age (FA)                  | −0.0250| 0.0165 | −1.51 | 0.1310 | −0.0573 to 0.0074    |
| Corruption Perception Index (CPI) | 4.4666| 1.4977 | 2.98  | 0.0030 | 1.3512 to 7.4019     |
| _cons                           | −48.7194| 20.2008| −2.41 | 0.0160 | −88.3121 to −9.1266  |

Tests of endogeneity. Ho: variables are exogenous. Durbin (score) chi2(2) = 3.93821 (p = 0.1396). Wu-Hausman F(2,5570) = 1.96591 (p = 0.1401).

5.4. Further Test: Interacted Signaling Variables and IPOs’ First-Day Returns in the Common Law and Civil Law Nation

As a further step, the dataset is divided into two categories; civil law and common law. Table 4 (a) demonstrates the empirical evidence for the interacted signaling variables and IPOs’ first-day returns for civil law countries. The results for the ‘interacted reputable auditors and underwriters’ and IPOs’ first-day returns indicate a positive association, thus supporting H4.
Table 4. (a) 2SLS regression on first-day return for the Civil Law nation. (b) 2SLS regression on first-day return for Common-Law nation.

| Variables                          | Coef.  | Std. Err. | z   | p > z | [95% Conf. Interval] |
|------------------------------------|--------|-----------|-----|-------|----------------------|
| (a)                                |        |           |     |       |                      |
| Underwriters’ Reputation (UWR)     | −16.5188 | 6.1816   | −2.67 | 0.0080 | −28.6345 − 4.4031   |
| Ownership Retention (Ortn)         | −0.4001 | 0.4189 | −0.95 | 0.3400 | −1.2212 0.4210      |
| Auditors’ Reputation (AudR)        | 24.8022 | 13.1103 | 1.89 | 0.0590 | −0.8935 50.4978     |
| UWRxAUD                           | 14.4126 | 6.0734 | 2.37 | 0.0180 | 2.5089 26.3162      |
| UWRxORetn                         | −0.0667 | 0.0732 | −0.91 | 0.3620 | −0.2102 0.0768      |
| AudxORetn                         | 0.4884  | 0.4402 | 1.11 | 0.2670 | −0.3743 1.3511      |
| Market Condition (MCon)            | −1.0821 | 1.8918 | −0.57 | 0.5670 | −4.7899 2.6257      |
| Firm Size (FS)                    | −0.0969 | 1.1388 | −0.09 | 0.9320 | −2.3289 2.1350      |
| Firm Age (FA)                     | −0.0152 | 0.0256 | −0.59 | 0.5530 | −0.0654 0.0350      |
| Corruption Perception Index (CPI)  | 22.8986 | 5.6720 | 4.04 | 0.0000 | 11.7816 34.0155     |
| _cons                             | −119.88 | 53.1969 | −2.25 | 0.0240 | −224.1520 −15.6239  |
| (b)                                |        |           |     |       |                      |
| Underwriters’ Reputation (UWR)     | −0.0759 | 1.9691 | −0.04 | 0.9690 | −3.9353 3.7834      |
| Ownership Retention (Ortn)         | −1.4309 | 0.8343 | −1.72 | 0.0860 | −3.0660 0.2042      |
| Auditors’ Reputation (AudR)        | −29.3795 | 6.3122 | −4.65 | 0.0000 | −41.7513 −17.0078   |
| UWRxAUD                           | −0.0688 | 2.0161 | −0.03 | 0.9730 | −4.0203 3.8828      |
| UWRxORetn                         | 0.0158  | 0.0242 | 0.65 | 0.5140 | −0.0316 0.0631      |
| AudxORetn                         | 2.3237  | 0.8803 | 2.64 | 0.0080 | 0.5984 4.0491       |
| Market Condition (MCon)            | 5.1373  | 2.0871 | 2.46 | 0.0140 | 1.0466 9.2280       |
| Firm Size (FS)                    | 10.6470 | 1.1774 | 9.04 | 0.0000 | 8.3394 12.9547      |
| Firm Age (FA)                     | −0.0415 | 0.0185 | −2.24 | 0.0250 | −0.0778 −0.0052     |
| Corruption Perception Index (CPI)  | 1.0400  | 1.9459 | 0.53 | 0.5930 | −2.7739 4.8539      |
| _cons                             | −127.5281 | 35.8469 | −3.56 | 0.0000 | −197.7867 −57.2696  |

(a) Standard errors are adjusted for heteroskedasticity, using the White’s test. Tests of endogeneity. Ho: variables are exogenous. Durbin (score) chi2(2) = 5.74751 (p = 0.0565). Wu-Hausman F(2,3112) = 2.86707 (p = 0.0570). (b) Standard errors are adjusted for heteroskedasticity, using the White’s test. Tests of endogeneity for UWR and Ortn. Ho: variables are exogenous. Durbin (score) chi2(2) = 2.6495 (p = 0.2659). Wu-Hausman F(2,2459) = 1.3192 (p = 0.2675).

As for the common law countries, the results differ. There is a positive association between ‘reputable auditors and ownership retention’ and IPOs’ first-day returns. Thus, H6 is supported.

6. Discussion

As reported by Allen and Faulhaber [6], Grinblatt and Hwang [40], Welch [7], and Arora and Singh [10], the interaction between the auditors and the underwriters supports the IPO firm’s standing and signifies firm credence. The interaction outcomes are expressed by the higher initial returns due to a rise in the secondary market demand for IPOs. The reputation of auditors indicates firm value through quality and transparent reporting, while the reputation of underwriters is regarded by stockholders as an affirmation of the firm’s credence and the IPO pricing resulting from professional isomorphism. The studies strongly support the work of Beatty and Ritter [26], Kirkulak-Uludag and Davis [31], and Chua [54].
As for the alteration to the abovementioned relationships between the interacted signaling variables on IPOs’ first-day returns in the common law and civil law nation, the results imply that prestigious underwriters and auditors play a critical role in promoting firm value in the nation with a weaker legal structure and poorer implementation of rules and regulations. Common law nation has more mature capital markets, stronger legal structures and protection for investors, more stringent regulation and compliance, and less government interference. In a civil law nation, those qualities may not be fully present. Thereby, in a civil law nation, the interplay between prestigious underwriters and auditors has risen the investors’ confidence in the firm quality and ultimately increased IPO transactions on the secondary market. The increased demand for IPOs causes an increase in IPO prices in the secondary market on the first day of trading and consequently contributes to a stronger relationship in these markets.

Nevertheless, in the common law countries, the relationship between the interacted ‘auditors reputation and firm owners’ retention’ and IPOs’ first-day returns suggest a significant positive relationship, though, in the civil law nation, no significance is noted. In a mature capital market with robust legal structures and investor protections, high ownership further solidifies the collaborations as it reduces insider information, thereby boosting investor confidence in firm credibility. The relationship eventually induces a rise in demand for IPOs in the secondary market, thus leading to favorable first-day returns as reported by Allen and Faulhaber [6], Grinblatt and Hwang [40], Welch [7], Datar, Felthan and Hughes [13], Titman and Trueman [12], Loughran & Ritter [37], Rumokoy et al. [17], Albada, Low and Yong [18] and Ong, Mohd-Rashid and Taufil-Mohd [19]. As noted earlier, the civil law nation has a comparatively weaker legal system, investor protection, and enforcement of rules and regulations. Thus, when the retention of ownership is strong, the involvement of prestigious auditors and underwriters does not have a major effect on the relationship. Investors may also be skeptical about rent-seeking practices and profit-expropriation possibilities in high-ownership firms. This may have added to the insignificance. The results are consistent with the works by Shleifer and Vishny [46] and Sundarasen, Goel and Zulaini [47] who indicated that civil law nations have an increased concentration of ownership but low protection for investors.

7. Conclusions

This study aims to investigate the relationship between the interacted signaling variables and IPOs’ first-day returns in the OECD nations. As postulated, a positive association is reported for the relationship between interacted ‘underwriters’ and auditors’ reputation’ and IPOs’ first-day returns on the full sample. The alliance between prestigious auditors and underwriters is signaling the coalition to the marketplace; reducing uncertainty, asymmetric information, and firm risk [10,32,33] whilst effectively boosting firm value. As a result, the alliance creates an upsurge for the IPOs in the secondary market and consequently increases the IPOs’ first-day returns. A distinction between civil law and common law nation shows that in civil law nation, the relationship involving auditors and underwriters has an impact on the IPOs’ first-day returns. In the common law nations, a positive correlation is reported for the interacted ‘auditors and ownership retention and IPOs first-day returns.

The research findings provide perspectives into an IPO framework for issuers, investors, and regulators. The competence of auditors and underwriters eliminates ambiguity, information asymmetry, and indicates the firm value [55]. Thus, issuers may want to weigh carefully the costs and benefits of hiring credible auditors and underwriters when going public. In their selection of auditors and underwriters, issuers ought to be aware that the signaling agents (exclusively or mutually) tend to have a positive effect in the IPO setting. As suggested by Chua [54], Kirkulak-Uludag and Davis [31] and Welch [7] issuers might need to collaborate with highly respected auditors and underwriters to set a price that signals firm value, thus distinguishing themselves from low-quality firms. As for the investors, they should take into consideration the involvement of prestigious underwriters.
and auditors and the degree to which the IPO firms retain ownership, as the interactive effects give clear signals on firm valuation and IPOs' first-day returns. Regulators may find the findings informative concerning the creation of a more organized regulatory and financial system that could lead to a deeper and more open financial market which may ultimately draw global listings. Regulations regarding shareholdings and apportionment of shares could add further credibility and transparency to the IPO environment, particularly in civil law nations. This is crucial for the long-term stability and sustainability of firms and the economy of a country.

In conclusion, auditors and underwriters play various roles as mediators, inspectors, and providers of insurance. The results indicate that prestigious auditors, underwriters, and firm owners have integral roles, and their distinct endorsement and certification positions and their involvement in an IPO set are crucial. Likewise, legal origin as an institutional element is crucial in maintaining the existence of investor protection, openness, and a deep and sustainable financial market.

8. Limitation and Study Forward

This research can be expanded from several different viewpoints. The research may be applied from a behavioral point of view, analyzing market sentiment from an empirical perspective. Further study can be undertaken by looking into both the pre and post-listing market effects. This study was unable to separate the secondary market from the primary market effects, due to data constraints. Thus, the study used the final offer price and not the pre-price adjustments. As suggested by Guo, Lev and Zhou [56], Hanley and Hoberg [57], and Mazzoli and Cardi [58], the offer price with a higher premarket information content may have relatively minor changes in the final offer price compared to the filing price. If the initial offer price had been used in the underpricing calculations, the outcomes may have been different, subject to the extent of information expended during the premarket. The amount of information disseminated during the premarket may affect the final offer price and ultimately influence absolute underpricing. The interaction effect can also be analyzed in terms of the IPO’s long-term performance. Another area of interest would be to replicate this study across diverse geographical boundaries, i.e., emerging markets and the MENA region, and address the potential, cultural, and institutional impact on the relationship tested.

Author Contributions: Conceptualization, S.S.; Methodology, S.S. and I.I.; Formal Analysis, S.S. and I.I.; Writing—Original Draft, S.S. and K.K.; Writing—Review and Editing, U.R. and N.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data was obtained from paid data sources—bloomberg and datastream.

Acknowledgments: The Authors would like to acknowledge the support of Prince Sultan University for paying the Article Processing Charges (APC) of this publication.

Conflicts of Interest: The authors declare no conflict of interest.

References
1. Certo, S.T.; Daily, C.M.; Dalton, D.R. Signaling firm value through board structure: An investigation of initial public offerings. Entrep. Theory Pract. 2001, 26, 33–50. [CrossRef]
2. Bhattacharya, S. Corporation Imperfect Information, Dividend Policy, and The Bird in the Hand Fallacy. Bell J. Econ. 1979, 10, 259–270. [CrossRef]
3. Ross, S.A. The Determination of Financial Structure: The Incentive-Signaling Approach. J. Econ. 1977, 8, 23–40. [CrossRef]
4. Baron, D.P. A model of the demand for investment banking advising and distribution services for new issues. J. Financ. 1982, 37, 955–976. [CrossRef]
5. Leland, H.E.; Pyle, D.H. Informational Asymmetries, Financial Structure, and Financial Intermediation. J. Financ. 1977, 32, 371–387. [CrossRef]
6. Allen, F.; Faulhaber, G.R. Signaling by Underpricing in the IPO Market. J. Financ. Econ. 1989, 23, 303–323. Available online: http://finance.wharton.upenn.edu/~allenf/download/Vita/signalling.pdf (accessed on 28 May 2021). [CrossRef]
7. Welch, I. Seasoned offerings, imitation costs, and the underpricing of initial public offerings. J. Financ. 1989, 44, 421–449. [CrossRef]
8. De Angelo, L. Auditor size and auditor quality. J. Account. Econ. 1981, 3, 183–199. [CrossRef]
9. Shapiro, C. Premiums for high-quality products as returns to reputations. Q. J. Econ. 1983, 98, 659–681. [CrossRef]
10. Aurora, N.; Singh, B. Impact of Auditor and Underwriter Reputation on Underpricing of SME IPOs in India. Manag. Labour Stud. 2019, 44, 193–208. [CrossRef]
11. Chen, K.; Lin, A.; Siregar, D. Auditor Reputation, Auditor Independence, and the Underpricing of IPOs. J. Appl. Bus. Econ. 2018, 20. [CrossRef]
12. Titman, S.; Trueman, B. Information quality and the valuation of new issues. J. Account. Econ. 1986, 8, 159–172. [CrossRef]
13. Datar, S.M.; Feltham, G.A.; Hughes, J.S. The role of audits and audit quality in valuing new issues. J. Account. Econ. 1991, 14, 3–49. [CrossRef]
14. Hughes, P.J. Signaling by direct disclosure under asymmetric information. J. Account. Econ. 1986, 8, 119–142. [CrossRef]
15. Simunic, D.A.; Stein, M. Product Differentiation in Auditing: Auditor Choice in the Market for Un-seasoned New Issues; Monograph Prepared for the Canadian Certified General Accountant Research Foundation; Canadian Certified General Accountants’ Research Foundation: Vancouver, BC, Canada, 1987.
16. Beatty, R.P. Auditor Reputation and the Pricing of Initial Public Offerings. Account. Rev. 1989, 64, 693–709. [CrossRef]
17. Rumokoy, L.J.; Neupane, S.; Chung, R.Y.; Vithanage, K. Underwriter Network Structure and political connections in the Chinese IPO market. Pac. Basin Financ. J. 2017, 54, 99–214. [CrossRef]
18. Albada, A.; Low, S.W.; Yong, O. Prestige signals and heterogeneity of opinion regarding IPO values: Malaysian evidence. Int. J. Emerg. Mark. 2019, 15, 302–319. [CrossRef]
19. Ong, C.Z.; Mohd-Rashid, R.; Taufil-Mohd, K.N. Underwriter reputation and IPO valuation in an emerging market: Evidence from Malaysia. Manag. Financ. 2020. [CrossRef]
20. Dunbar, C.G. Factors affecting investment bank initial public offering market share. J. Financ. Econ. 2000, 55, 3–41. [CrossRef]
21. Fang, L.H. Investment Bank Reputation and the Price and Quality of Underwriting Services. J. Financ. 2005, 60, 729–2761. [CrossRef]
22. Reilly, F.K.; Hatfield, K. Investor Experience with New Stock Issues. Finance. Anal. J. 1969, 25, 73–80. [CrossRef]
23. McDonald, J.G.; Fisher, A.K. New-Issue Stock Price Behavior. J. Financ. 1972, 27, 97–102. [CrossRef]
24. Logue, D.E. On the Pricing of Unseasoned New Issues, 1965-1969. J. Financ. Quant. Anal. 1973, 8, 91–103. [CrossRef]
25. Neuberger, B.M.; Hammond, C.T. A study of underwriters’ experience with unseasoned new issues. J. Financ. Quant. Anal. 1974, 9, 165–177. [CrossRef]
26. Beatty, R.P.; Ritter, J.R. Investment banking, reputation, and the underpricing of an initial public offering. J. Financ. Econ. 1986, 15, 213–232. [CrossRef]
27. Johnson, J.M.; Miller, R.E. Investment banker prestige and the underpricing of initial public offerings. Financ. Manag. 1988, 19–29. [CrossRef]
28. Carter, R.B.; Manaster, S. Initial public offerings and underwriter reputation. J. Financ. 1990, 45, 1045–1067. [CrossRef]
29. Carter, R.B.; Dark, F.H.; Singh, A.K. Underwriter reputation, initial returns, and the long-run performance of IPO stocks. J. Financ. 1998, 53, 285–311. [CrossRef]
30. Aggarwal, R. Stabilization Activities by Underwriters after Initial Offerings. J. Financ. Manag. 2005, 13, 451–470. [CrossRef]
31. Widjarjo, W.; Rahmawati, R.; Bandi, B.; Widagd, A.K. Underwriter reputation, intellectual capital disclosure, and underpricing. Int. J. Bus. Soc. 2017, 18. [CrossRef]
32. Angelia, J.; Basana, S.R. The effect of auditor’s reputation, underwriter’s market share, and spread on underpricing of Indonesian initial public offerings. Proc. Icebam 2019, 1. Available online: http://ojs.umsida.ac.id/index.php/icebam/article/view/7/13 (accessed on 28 May 2021).
33. Beatty, R.P.; Welch, I. Issuer expenses and legal liability in initial public offerings. J. Law Econ. 1996, 39, 545–602. [CrossRef]
34. Cooney, J.; Singh, A.; Carter, R.; Dark, F.P. IPO Initial Returns and Underwriter Reputation: Has the Inverse Relation Flipped in the 1990s? Working Paper; University of Kentucky: Kentucky, UK, 2001.
35. Bates, T.; Dunbar, C. Investment Bank Reputation, Market Power, and the Pricing and Performance of IPOs. 2002. Available online: http://www.ivey.uwo.ca/faculty/TBATES/IPO (accessed on 17 February 2021).
36. Loughran, T.; Ritter, J.R. Why had IPO Underpricing Changed over Time? In Proceedings of the Chicago NBER Behavioral Finance Meeting, Chicago, IL, USA, 1 February 2002.
37. Chahine, S. Block-holder ownership, family control, and post-listing performance of French IPOs. Manag. Financ. 2007, 33, 388–400. [CrossRef]
38. Derouiche, I.; Sassi, S.; Toumi, N. The control-ownership wedge and the survival of French IPOs. J. Appl. Account. Res. 2018, 19, 271–294. [CrossRef]
39. Grinblatt, M.; Hwang, C.Y. Signaling and the pricing of unseasoned new issues. J. Financ. 1989, 44, 393–428. [CrossRef]
41. Jegadeesh, N.; Weinstein, M.; Welch, I. An empirical investigation of IPO returns and subsequent equity offerings. *J. Financ. Econ.* 1993, 34, 153–175. [CrossRef]
42. Krinsky, I.; Rotenberg, W. Signaling and the valuation of unseasoned new issues revisited. *J. Financ. Quant. Anal.* 1989, 24, 257–266. [CrossRef]
43. Darmadi, S.; Gunawan, R. Underpricing, board structure, and ownership: An empirical examination of Indonesian IPO firms. *Manag. Financ.* 2013, 39, 181–200. [CrossRef]
44. Yip, Y.; Su, Y.; Ang, J.B. Effects of underwriters, venture capital, and industry on long-term initial public offering performance. *Manag. Financ.* 2009, 35, 700–715. [CrossRef]
45. Liu, X.; Ritter, J.R. The Economic Consequences of IPO Spinning. *Rev. Financ. Stud.* 2011, 23, 2024–2059. [CrossRef]
46. Shleifer, A.; Vishny, R.W. Corruption. *Q. J. Econ.* 1993, 108, 599–617. [CrossRef]
47. Sundarasen, S.; Goel, S.; Zulaini, F.A. Impact of investors' protection, transparency level, and legal origin on initial public offering (IPO) initial returns. *Manag. Financ.* 2017, 43, 738–760. [CrossRef]
48. Ibbotson, R.G.; Jaffe, J.F. Hot issue markets. *J. Financ.* 1975, 30, 1027–1042. [CrossRef]
49. Ibbotson, R.G.; Sindelar, J.L.; Ritter, J.R. Initial Public Offerings. *J. Appl. Corp. Financ.* 1988, 1, 37–47. [CrossRef]
50. Engelen, P.; Essen, M.V. Underpricing of IPOs: Firm-, issue- and country-specific characteristics. *J. Bank. Financ.* 2010, 34, 1958–1969. [CrossRef]
51. Megginson, W.L.; Weiss, K.A. Venture capitalist certification in initial public offerings. *J. Financ.* 1991, 46, 879–903. [CrossRef]
52. Downes, D.H.; Heinkel, R. Signaling and the valuation of unseasoned new issues. *J. Financ.* 1982, 37, 1–10. [CrossRef]
53. Aiken, L.S.; West, S.G.; Reno, R.R. *Multiple Regression: Testing and Interpreting Interactions*; Sage: Newcastle upon Tyne, UK, 1991.
54. Chua, A. Market conditions, underwriter reputation, and first-day return of IPOs. *J. Financ. Mark.* 2014, 19, 131–153. [CrossRef]
55. Khurana, I.; Ni, C.; Shi, C. The role of big 4 auditors in the global primary market: Does audit quality matter most when investors are protected least? In *The Asian Bureau of Finance and Economic Research Annual Conference*; MDPI: Basel, Switzerland, 2017.
56. Guo, R.J.; Lev, B.; Zhou, N. The valuation of biotech IPOs. *J. Account. Audit. Financ.* 2005, 20, 423–459. [CrossRef]
57. Hanley, K.W.; Hoberg, G. The information content of IPO prospectuses. *Rev. Financ. Stud.* 2010, 23, 2821–2864. [CrossRef]
58. Mazzoli, C.; Cardi, C. Intellectual Capital Disclosure in IPOs: Is It Worth It? *J. Financ. Manag. Mark. Inst.* 2015, 3, 245–264. [CrossRef]