PEER ACCOUNTING INFORMATION AND THE USE OF PEER-BASED MULTIPLES FOR IPO VALUATION

by

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In memory of my father, Paul Darrach Brushwood

Contents

Abstract

Initial public offerings (IPOs) are primarily valued using the comparable firms approach, whereby underwriters rely heavily on multiples based on the accounting information and market prices of peer firms. Effective use of the comparable firms approach depends significantly on the underwriter's ability to estimate the expected future growth and profitability of the IPO firm and its peers and make appropriate adjustments to the multiples to arrive at a final offer price for the IPO shares. I find evidence that, in general, IPO valuations are decreasing relative to peers in the similarity of the peer group to the IPO firm, but this effect is moderated by accounting-based earnings attributes of the peer group, such as accruals quality, earnings persistence, and predictability.

1. Introduction

The pricing and valuation of initial public offerings (IPOs) is the subject of an extensive literature in finance, primarily focusing on well-documented pricing anomalies such as IPO underpricing and significant abnormal post-issuance returns. The IPO setting presents unique challenges with regard to the availability and uncertainty of firm-specific information at the time of issuance, creating significant information asymmetry problems thought to be at the root of these anomalies (Ljungvist 2007). This information asymmetry also extends to financial accounting information. Due to the dearth of accounting information related to the IPO firm, practitioners rely significantly on the comparable firms approach when attempting to value the IPO (Ritter and Welch 2002, pg. 1816). Rather than employing a theory-based valuation based on the issuer's characteristics, the comparable firms approach relies primarily on the accounting information of one or more public peer firms to estimate multiples that can be used to set the IPO offer price. Several prior studies examine the relative valuation of IPOs based on the extent that IPO offer prices deviate from prices predicted by expected peer multiples, finding that IPO offer price multiples are, on average, significantly higher than the multiples of their peers (Purnanandam and Swaminathan 2004; Kim and Ritter 1999). While these studies insinuate that IPO offer price multiples that deviate from peers may be indicative of valuation inaccuracy, principles of the comparable firms approach suggest that these differences may not necessarily be inappropriate. In this paper, I examine this phenomenon, which I refer to as IPO relative valuation, and find evidence

suggesting that peer group accounting information quality may play a role in determining how IPO offer prices deviate from those of their peers.[1]

To maximize its effectiveness, the comparable firms approach requires three key elements: 1) the availability and identification of appropriate comparable peers, 2) the identification of the appropriate multiples to be used, and 3) the ability of the valuation expert to make appropriate adjustments to the multiples before applying them to the target firm (Damodaran 2005; Meitner 2006). Unsurprisingly, empirical evidence demonstrates that the effectiveness of the comparable firms approach for achieving valuation accuracy is highly sensitive to challenges regarding all three of these elements. Kim and Ritter (1999, pg. 412) state that "the comparable firms approach works best when a highly comparable group is available." Further, multiple studies provide evidence of decreases in relative valuation as the criteria used to identify the peer group, such as industry, size, and expected growth, are more narrowly defined (Alford 1992; Kim and Ritter 1999; Purnanandam and Swaminathan 2004). These studies also document variation in relative valuation based on the type of multiple used. Lastly, relative valuation decreases significantly when adjustments are made to the valuation based on differences in forecasted (Kim and Ritter 1999) and ex-post (Purnanandam and Swaminathan 2004) growth and profitability between the comparable firms and the IPO firm. Unfortunately, "because of the high level of subjectivity that is associated with such adjustments, appraisers should be careful in applying premiums or discounts due to differences between the peer group and the target" (Meitner 2006). Taken as a whole,

[1] For the prposes of this study, "IPO relative valuation" is defined as the level of the IPO offer price multiples relative to peer firm multiples. More specifically, I measure IPO relative valuation as the proceeds of the IPO shares issued (offer price X shares issued) scaled by the estimated fair or intrinsic value of the IPO based on *unadjusted* multiples of the market value of priced peers at the time of issuance, based on the P/V ratio measure developed by Purnanandam and Swaminathan (2004).

these ideas suggest that peer accounting information is most useful for valuing IPOs when the peers are more comparable to the IPO firm and there is less uncertainty involved in the estimation of peer growth and profitability.

For peer accounting information to be relevant to the IPO firm, the peer should be similar enough in terms of risk and operating characteristics that the practical benefits of using the peer's multiple to value the IPO outweigh the benefit of using an alternative, more theory-based valuation method, such as a discounted cash flow model. In order for peer accounting information to be useful in assessing the magnitude and uncertainty of expected future cash flows, it should have relatively lower errors in accruals estimation. This ability is particularly important in the IPO setting, where underwriters and potential investors rely on peer accounting information to estimate the expected future growth and profitability of both the IPO firm and the peers. When peer accruals estimation error is lower, it not only assists with the identification of the most comparable peer firm(s) based on growth and profitability characteristics, but also facilitates the appropriate adjustments that must be made to the peer multiples chosen to arrive at the final offer price. In spite of the apparent dependencies on accounting information in the relative valuation process, to my knowledge there have been no studies examining the importance of peer accounting quality on IPO relative valuation.

For a sample of IPOs from 1980-2010, I identify a group of priced peer firms, matching the peer group to the IPO firm based on a combination of characteristics used by Purnanandam and Swaminathan (2004) intended to capture operating risk, size, and profitability. Similar to prior studies, an IPO's closest peer group is considered to be composed of the closest available public peers to the IPO firm in terms of these

characteristics.[2] It should be noted that, while the closest peer group is an estimate of the peers whose multiples are most likely to be used for relative valuation, the degree of closeness between an IPO firm and its peer group varies considerably across IPOs in the sample. That is, some IPOs' closest available peer group consists of peers that are very similar to the IPO firm, while other IPOs' closest available peer group consists of peers that are relatively dissimilar to the IPO firm. In contrast to prior studies, which hold the characteristics of the IPO firms' closest peer group constant, I observe the characteristics of the closest peer group and exploit variation in peer group similarity to the IPO firm and peer group accruals quality to understand how the decision-usefulness of peer accounting information affects IPO relative valuation.

I find evidence that peer group accruals quality have a significant effect on the relative valuation of IPOs. First, I show that, consistent with prior literature, the IPOs in my sample are priced higher than unadjusted peer group multiples, in general. Next, I assess the impact of peer group similarity to the IPO firm and peer group accruals quality on IPO relative valuation and on the likelihood that IPO valuations rely heavily on the multiples of the peers identified. I preliminarily show that when IPOs are more similar to their closest peer group they are priced closer to the multiples of that peer group, which is an unsurprising result that had been asserted by prior literature but not established empirically. Next, I examine the impact of peer group accruals quality on IPO relative valuation. While peer similarity is the primary driver of variation in IPO relative valuation, this effect appears to be moderated by peer group accruals quality. The

[2] For the purposes of this study, I frequently refer to the *closest peer group* or an IPO firm's *closest peers*. The *closest peer group* represents the peer group identified as the closest available peers based on the identification method described in Section 4.1.2. It does not, however, imply that the peers identified are, in fact, relatively close or similar to the IPO firm. Rather, I refer to the term *peer group similarity* when discussing the degree of similarity of the peer group chosen to the IPO firm.

moderating effect suggests that when peer group accruals quality is high, underwriters are able to estimate expected growth more effectively, resulting in more precise deviations from peer multiples. When their estimates about expected future growth are more precise, underwriters are less likely to deviate too much or adhere too much to peer multiples when valuing an IPO. Supplemental analyses support these findings by showing that IPOs with higher peer group accruals quality have a lower standard deviation of post-issue returns. The multivariate findings are robust to the use of alternative accounting-based measures of peer group accounting quality, such as earnings persistence and predictability. In contrast, additional analysis suggests that market-based measures of peer group information quality are associated with an accentuating effect on peer group similarity.

Lastly, when peer group accruals quality is high, IPO offer price multiples are more likely to be priced outside the range of the peer group multiples, consistent with the notion that underwriters will make more significant adjustments to multiples when it is easier to assess differences in expected future growth and profitability between the IPO firm and the peer firms. Lastly, while IPOs are priced higher than peer multiples on average, and higher peer group similarity is generally associated with decreases in IPO valuation, I show that the direction of the moderating effect of peer group accruals quality may vary based on the type of multiple used (e.g. price-to-sales versus price-to-EBITDA), a finding that demands further analysis.

This study contributes to the literature in three significant ways. First, I show that the accounting information quality of an IPO firm's peers has a significant impact on the extent that offer prices deviate from estimated fair values based on unadjusted multiples.

Prior studies investigating IPO relative valuation assert that deviations between the IPO offer price multiple and unadjusted peer firm multiples are related to inadequate or excessive adjustments to peer multiples to account for differences between IPO and peer firm growth and profitability (Kim and Ritter 1999; Purnanandam and Swaminathan 2004). My findings suggest that differences in the accounting information quality of the peer group may explain variation in IPO relative valuation because it may be easier for underwriters to estimate the growth and profitability of peer groups with higher accruals quality.

Second, I show that accounting information plays an important role in the issuance and pricing of initial public offerings, arguably the most important source of public company financing. The dramatic transition from a private firm to a public firm is a critical time for a public company, in many ways due to the increased demands on the information environment. I show that firms desiring to obtain capital through an IPO depend on more accounting information than just their own when transitioning from a relatively opaque to a relatively transparent information environment, such as the accounting information of their priced peers. Ecker (2014) estimates the pre-issuance information precision of IPO firms based on the accounting information quality of their industry, and shows that the difference between IPO firms' estimated information precision and realized information precision is correlated with post-issuance long-run performance. My findings complement those of Ecker (2014) by examining more narrowly how the accounting characteristics of a specific group of industry peers have a significant impact on initial IPO pricing and valuation.

Finally, my findings should help potential IPO investors monitor underwriters' valuation choices in settings where IPOs are more likely to be misvalued. Firms often time their decisions to go public based on when they feel they can maximize the proceeds of their shares, such as when they feel their shares are overvalued (Lucas and McDonald 1990) or during "hot" markets when overall investor sentiment is high (Derrien 2005; Loughran, Ritter, and Rydqvist 1994). In addition to market timing theories, prior research provides evidence suggesting that certain IPOs experience greater mispricing or misvaluation, such as those backed by venture capital or having all star analyst coverage (Liu and Ritter 2011), those hiring highly rated underwriters (Loughran and Ritter 2004; Chemmanur and Krishnan 2012), those in specific industries such as high tech or internet firms, or those located in countries with low aggregate earnings quality (Boulton, Smith, and Zutter 2011), among others. My results suggest another factor that may contribute to variation in IPO valuation, the accounting information quality of the IPO firm's closest peer group.

This paper proceeds as follows. Section 2 reviews the prior literature. Section 3 develops my primary hypothesis and establishes tension. Section 4 presents the IPO sampling and peer matching methodologies, and discusses the testing procedures and results. Section 5 outlines some supplementary analyses. Section 6 concludes.

2. Literature Review

An extensive body of research on the pricing of IPOs primarily focuses on IPO underpricing, or first trading day returns. IPOs, on average, experience extraordinarily high first day returns, suggesting that the IPOs are underpriced, "leaving money on the table" when they are first issued (Loughran and Ritter 2004). The vast majority of theories and related empirical evidence on underpricing suggest that IPO underpricing stems from information asymmetry problems, mostly between the IPO underwriter and potential investors (Benveniste and Spindt 1989; Lowry and Schwert 2004; Lowry, Officer, and Schwert 2010), but also between informed and uninformed investors (Rock 1986) and between underwriters and the managers of the firm (Loughran and Ritter 2002; Loughran and Ritter 2004). Interestingly, an extensive literature documents that a major reason for underpricing is the partial adjustment by underwriters to new information about the issue during the bookbuilding process (Benveniste and Spindt 1989; Benveniste and Wilhelm 1990; Lowry and Schwert 2004), including public information such as changes in market conditions and private information such as investor demand observed through investor bids. Studies document multiple ways the underpricing stemming from information asymmetry can be mitigated, including publishing more informative prospectuses (Hanley and Hoberg 2010; Hanley and Hoberg 2012) and less uncertain tone in the wording of strategy and plans in prospectuses (Loughran and McDonald 2013). In addition, accounting studies have shown that underpricing is higher in countries with lower aggregate earnings quality (Boulton, Smart, and Zutter 2011) and lower after adoption of IFRS (Hong, Hung, and Lobo 2014).

While the underpricing phenomenon is interesting, other studies examine the long-run returns of IPOs and document significant abnormal returns in the years subsequent to issuance (Ecker 2014; Purnanandam and Swaminathan 2004; Derrien 2005; Kutsuna, Smith, and Smith 2009). The significant aftermarket abnormal returns suggest that first day returns are not persistent and the IPO's first day closing market value is unlikely to be reflective of the firm's intrinsic value. As a result, rather than focus on first day returns, several studies have explored the valuation accuracy of IPOs, or the offer price set by the underwriter relative to fair or intrinsic value (Kim Ritter 1999; Purnanandam and Swaminathan 2004; Paleari, Signori, and Vismara 2014). Purnanandam and Swaminathan (2004) find that, in spite of the perceived underpricing based on first day returns, IPOs are actually overvalued on average relative to peers. These papers primarily cite challenges in identifying appropriate peers (Kim and Ritter 1999; Purnanandam and Swaminathan 2004), estimating expected future growth and profitability (Purnanandam and Swaminathan 2004), and conflicting underwriter incentives (Paleari et al. 2014) as the reasons for overvaluation.

The identification of appropriate peers is a significant source of variation in assessments of equity valuation, both in and out of the IPO setting. Methods employed to identify peers include the use of mechanical algorithms to identify peers by industry, size, and risk characteristics (Purnanandam and Swaminathan 2004; Bhojraj and Lee 2002; Alford 1992), reliance on peers identified more subjectively by a research boutique (Kim

and Ritter 1999), and peers explicitly identified by the underwriters in the prospectus[3] (Paleari et al. 2014).

Overall, prior research documents significant pricing and valuation anomalies before, during, and after the issuance of IPOs. This study is an extension of the literature on IPO pricing and valuation, as I explore how variation in IPO pricing is affected by two aspects of peer firm accounting information: the similarity of the IPO peer group to the IPO firm and the accruals quality of the IPO peer group.

[3] Paleari et al. (2014) observes peer firms and valuation methods explicitly identified by the underwriter in the prospectuses of Italian, French, and German IPOs. Publication of the specific peers or valuation methods used is typical of European IPOs in these countries, but extremely rare in the United States.

3. Hypothesis Development

For the purposes of this paper, and consistent with the definition established in prior literature, IPO relative valuation is defined as the deviation of the IPO price relative to the estimated fair or intrinsic value based on an *unadjusted* peer-based multiple. While prior studies such as Kim and Ritter (1999) and Purnanandam and Swaminathan (2004) assert that this deviation is a measure of "valuation accuracy" or "overvaluation" and these studies document significant post-issuance abnormal returns for IPOs where the deviation is large, the overall meaning of IPO price deviations from peer multiples is uncertain. IPO prices may deviate from an unadjusted estimate of fair value based on peer multiples as a result of several valuation choices: 1) the selection of different peers than those used to estimate fair value, or 2) the adjustment of the price based on differences between the peers and the IPO firm, 3) a combination of both. Neither of these valuation choices are necessarily inappropriate. As a result, IPO valuation "errors" related to deviations of the IPO offer price relative to peers may not necessarily be indicative of misvaluations. For the purposes of this study, I focus primarily on differences in IPO relative valuation, or the behavior of IPO pricing relative to peer multiples, and remain agnostic as to whether differences in IPO relative valuation are associated with IPO misvaluation.[4] In this section, I discuss how I expect the characteristics of peer group accounting information quality to affect IPO relative valuation, or the pricing of IPOs relative to unadjusted peer-based multiples.

[4] As prior research indicates that most IPOs are priced using multiples higher than the multiples of their peers, I generally regard IPO relative valuation as variation in the degree that IPOs are priced higher than their peers, unless otherwise stated.

3.1 IPO Peer Group Similarity

For the accounting information of an IPO firm's peers to be useful for valuation, the information must be relevant to the IPO firm. Kim and Ritter (1999, pg. 412) declare that "the comparable firms approach works best when a highly comparable group is available." That is, for a peer-based valuation to be most effective, peer accounting information must not only be available, but the selected peers must be highly comparable to the target firm (in this case, the IPO firm). Previous papers in this area focus on the identification of the closest possible peers, regardless of these peers' actual degree of comparability to the IPO firm.

Purnanandam and Swaminathan (2004), using a mechanical algorithm, show that the method of selecting peer firms that most closely match the IPO firm is a significant determinant of deviations between the IPO and peer multiples. Their study shows that, as the number of criteria used to match the IPO firm to its peer firms (e.g. industry, size, profitability, growth) increases, narrowing the criteria by which the firms are matched, the average deviation between IPO and peer multiples decreases. However, they find that IPO valuation multiples are significantly higher than peer multiples for even the most narrowly defined peer groups. In a limited setting, Kim and Ritter (1999) find that the multiples of peer firms chosen by a research boutique explain IPO price multiples better than the multiples of peers identified using a mechanical algorithm. Presumably, the peers chosen by the research boutique are selected more subjectively and with greater scrutiny than those chosen mechanically, so it is unsurprising that they might more closely match the characteristics of the IPO firm. As evidenced, the identification of the closest peers is challenging, whether conducted using a mechanical algorithm or a

subjective assessment, but more thorough methods of identifying peers appear to be associated with smaller deviations between IPO and peer multiples.

In spite of the apparent benefits of improved peer identification methods, many IPOs simply do not have peers available that closely match the characteristics of the IPO firm. Given the prevalence of the use of peer-based multiples for IPO valuation, it is possible that many IPOs are valued using their closest peers, even when the closest peers are not economically similar. Even if a sound identification method selects the best available peers for an IPO valuation, if the peers chosen are less similar to the IPO firm, I expect the use of peer-based multiples to be less effective, leading to larger deviations between IPO and peer multiples and higher IPO relative valuation.

3.2 IPO Peer Firm Accounting Quality

Damodaran (2005) states that even when the IPO firm has close peers available, adjustments must be made to the multiples used to account for estimated differences in growth and risk factors. Additionally, Kim and Ritter (1999) find that, even among firms chosen by a research boutique, there exist significant differences between the IPO firm and the peer firms chosen, and adjustment to the multiples using differences in forecasted earnings results in smaller deviations between IPO and peer valuations. Regardless of the similarity of the closest identified peers to the IPO firm, the application of peer-based multiples for IPO valuation and price setting involves a significant amount of discretion on the part of the underwriter. Given the extent of the reliance on peer accounting information and the discretion inherent in the IPO valuation process, I explore whether

the accounting quality of an IPO firm's closest peer group impacts IPO valuation accuracy.

A significant source of deviations between IPO and peer multiples is the overestimation of expected growth and/or profitability (Purnanandam and Swaminathan 2004; Kim and Ritter 1999). Even when the asset has relatively similar comparables, adjustments must be made by the underwriter valuing the asset, and these adjustments often involve subjective analyses or modified multiples based on assessments of peer and asset growth and risk (Damodaran 2005). The estimation of expected future growth is apparently critical for the valuation of IPOs, but it presents significant challenges. Analysts appear to overestimate IPO firms' growth even more than their industry peers (Rajan and Servaes 1997). Accounting information plays a role in the estimation of expected growth, as well, as firms with higher accruals have a higher degree of over-optimism in their analyst forecasts (Bradshaw, Richardson, and Sloan 2001). If higher degrees of IPO relative valuation are related to the overestimation of growth and profitability, as documented in the literature, then IPO relative valuation should decrease when peer accounting quality is higher, making it less difficult to estimate the expected future growth of both the peer group.

In the case of growth adjustments, it is unclear whether lower peer accounting quality would increase or decrease IPO relative valuation. If lower accounting quality is associated with overestimated peer growth and underwriters consistently overestimate IPO growth beyond that of industry peers, then lower accounting quality should may lead to an excessive upward adjustment for growth, resulting in overvaluation. Contrarily, if the overestimated growth of low accounting quality peers is priced, the estimated

intrinsic value of the firm peers may be overestimated, especially when estimating the intrinsic value based on the priced multiple of the peers chosen. Any overpricing impounded in the prices of the peers used to calculate the multiple could result in decreases in IPO relative valuation.

Further, as previously discussed, a certain degree of deviation from peer multiples is likely to be appropriate. If peers appear relatively similar to the IPO firm, but peer accounting information is poor, underwriters may not adjust enough for differences in growth, as they adhere more closely to the unadjusted peer multiple. To the extent that IPO firms have higher growth than their peers, the IPO price multiple should likely be higher than an unadjusted peer multiple. Stronger peer accounting information may ease the assessment of peer growth and profitability and facilitate adjustment of the multiple, resulting in higher IPO relative valuation.

Another way accounting quality could impact IPO overvaluation is by affecting the ability of potential investors to monitor underwriters' choice of peers for price setting. As underwriter fees are based on a percentage of the overall IPO proceeds, they have a significant incentive to sell at a higher price, but only to the extent that they can still sell the complete issue. Unsurprisingly, underwriters will select the highest possible multiple they can justify while still appearing conservative (Paleari et al. 2014). Rather than assuming a valuation role and pricing the issue based on their best estimate of intrinsic value, they are hired to obtain the highest possible valuation (Chemmanur and Krishnan 2012). During the bookbuilding process, underwriters typically partake in roadshows, pitching the IPO to potential investors and attempting to justify the anticipated offer price. Investors then place bids for the issue, either stating the number of shares they

wish to purchase or indicating the price they are willing to pay. Paleari et al. (2014) show underwriters will then select from the highest multiples they can justify to investors, presumably from the range of feasible peer multiples. As a result, higher IPO relative valuation may also be a function of the ability of potential investors to prevent underwriters from setting the offer price inappropriately high.

Prior studies show that higher information quality helps outsiders monitor managerial decision-making, serving to mitigate the effects of information asymmetry between investors and managers. For example, several studies show that higher accounting quality increases investors' ability to monitor investment decisions (Biddle and Hilary 2006; Biddle, Hilary, and Verdi 2009; Beatty, Liao, and Weber 2010). These studies focus on the financial reporting quality of the firm in question, rather that its peer firms, however, in the IPO setting, information availability regarding the IPO is limited such that the accounting information of the closest peer firms is likely to be a significant source of available information about the IPO firm.[5] The importance of peer firm accounting information in the IPO pricing process suggests that the quality of the peers' accounting system may play a role in the ability of potential investors to monitor underwriters' selection of IPO firms, mitigating the risk that underwriters select multiples justifying an offer price that is too high.[6]

[5] The financial reporting quality of peers may be the best ex-ante estimation of the *expected financial reporting quality* of the IPO firm. In a study examining the long run performance of IPOs as a function of the difference between expected information precision and realized information precision, Ecker (2013) measures the expected information precision of the IPO firm using a measure based on the accruals quality of all the firms in the IPO firm's industry.

[6] If the market is efficient, this effect would be less likely to occur, as lower financial reporting quality would likely induce potential investors to demand less shares, driving down the offer price (Myers and Majluf 1984). However, there exists significant evidence of inefficiencies in the IPO pricing process, both before and after issuance (See Section 2 for discussion of the prior literature). Regardless, I cannot rule out the possibility that

The financial reporting quality of an IPO firms' peer group likely affects both the estimation of expected growth and potential investors' ability to monitor underwriters. These phenomena are difficult to disentangle and there exists no basis to think they are mutually exclusive. Regardless, I expect the significance of IPO peer group financial reporting quality is conditional on the fundamental similarity of the peer group to the IPO firm. On average, I expect IPO's with very similar peer groups to be priced close to their peer multiples and IPO's with very dissimilar peer groups to be priced much higher than their peer multiples. If peer group financial reporting quality serves to assist with assessment and monitoring of the adjustments made to peer multiples by underwriters to arrive at IPO multiples, I expect high financial reporting quality to moderate the effect of peer group similarity on IPO relative valuation. As such, I present the following hypothesis:

> Hypothesis: Peer group accounting quality, as measured by accruals quality, moderates the effect of peer group similarity on IPO relative valuation.

poor information quality will lead to uninformed investors forcing the underwriter to lower the price of the issue.

4. Empirical Design and Results

4.1.1 IPO Sampling Methodology

I obtain data on IPOs from 1980 to 2010 from the Securities Data Corporation (SDC) database, making corrections where appropriate.[7] I have retained all U.S. IPOs for this period meeting the following criteria, consistent with the sampling methodology employed by Purnanandam and Swaminathan (2004):

1. The IPO should have stock price information available in CRSP.
2. The IPO should have financial statement information available in COMPUSTAT for the prior fiscal year, specifically for sales and EBITDA.
3. The IPO should issue ordinary common shares and should not be a unit offering, closed-end fund, real estate investment trust (REIT), or an American depository receipt (ADR).
4. The IPO should have positive EBITDA in the prior fiscal year.
5. The IPO must have an offer price of at least $5.

After filtering by these criteria, my sample contains 4,153 IPOs.

4.1.2 Peer Group Sampling Methodology

For each IPO in my sample, I identify a group of priced peer firms that represent the closest peers available to the IPO prior to issuance. My peer group identification procedure follows closely the methodology of Purnanandam and Swaminathan (2004), but rather than identify a single peer from the peer group, I examine the characteristics of

[7] Jay Ritter has a list of errors and appropriate corrections to the IPO data in SDC in a PDF on his web page found at the following web address: http://bear.cba.ufl.edu/ritter/SDCCOR.pdf.

the entire peer group. While membership in the same industry is not a necessary requirement to be a quality peer, I match first on industry because it is the most likely place to find similar operating risks, profitability, and growth. Additionally, I match on sales as an ex ante measure of size. Lastly, I match on EBITDA profit margin (*OPM* measured as EBITDA divided by sales*)* to control for differences in profitability across firms. The three matching criteria of industry, size, and profitability are consistent with the matching criteria used by Purnanandam and Swaminathan (2004).

I begin with all COMPUSTAT listed firms in the same Fama French 48 industry (Fama and French 1997) that did not go public in the three years prior to the IPO.[8] Consistent with my selection of IPO firms, I eliminate firms that are not ordinary common shares, REITs, closed-end funds, ADRs, and firms with a stock price less than $5 as of the prior June or December, whichever is later. Within each industry, I group firms into three portfolios based on prior fiscal year sales. From within these three industry-sales portfolios, I further group the portfolios based on prior fiscal year EBITDA profit margin (defined as EBITDA/sales). In total, each IPO should have nine potential peer groups based on industry, sales, and profitability. Purnanandam and Swaminathan (2004) match the IPO firm to one group and then, within that group, select the peer firm with the closest sales to the IPO firm. In contrast, I match the IPO firm to its closest peer group (of the nine groups), retaining all peers from that group. This group of peers

[8] The design choice to only include peer firms that have been public for at least three years has advantages and disadvantages. An extensive literature on post-IPO long run returns suggests that recent IPO firms may not have reached their equilibrium price and multiples based on these peers may be less reliable. In addition, my study requires the measurement of accruals quality of each firm in the peer group for the year prior to the IPO, and this measure requires at least several years of data. In contrast, Kim and Ritter (1999) identify recent IPOs as the group of potential peers which may best represent the economics of the IPO firm. To the extent that the best priced peers for an IPO are recent IPOs themselves, my results may be different.

represents a mechanical estimation of the closest available peers to the IPO firm in regards to risk, size, and profitability.

4.1.3 Estimating IPO Valuation Relative to Peer-Based Multiples

To estimate each IPO's valuation at issuance relative to its peers, I construct a price-to-value ("P/V") ratio, where *P* is the offer price at issuance and *V* is the estimated fair or intrinsic value calculated from peer market multiples at the time of the issuance, replicating the approach of Purnanandam and Swaminathan (2004). For each firm, including both IPO firms and peer firms, I compute a price-to-sales (P/S) ratio and a price-to-EBITDA (P/EBITDA) ratio[9] as such:

$$\left(\frac{P}{S}\right)_{IPO} = \frac{Offer\ price\ X\ CRSP\ shares\ outstanding}{Prior\ fiscal\ year\ sales}$$

$$\left(\frac{P}{EBITDA}\right)_{IPO} = \frac{Offer\ price\ X\ CRSP\ shares\ outstanding}{Prior\ fiscal\ year\ EBITDA}$$

$$\left(\frac{P}{S}\right)_{Peer} = \frac{Market\ price\ X\ CRSP\ shares\ outstanding}{Prior\ fiscal\ year\ sales}$$

$$\left(\frac{P}{EBITDA}\right)_{Peer} = \frac{Market\ price\ X\ CRSP\ shares\ outstanding}{Prior\ fiscal\ year\ EBITDA}$$

All fiscal year end data end at least three months prior to the IPO offer date. For the IPO firm multiples, *Offer price* refers to the final offer price for which the shares are sold and *CRSP shares outstanding* refers to the number of IPO firm shares outstanding at

[9] While there are many different multiples that an underwriter may use, I focus on price-to-sales and price-to-EBITDA multiples, consistent with Purnanandam and Swaminathan (2004). Price-to-sales multiples are appealing because sales data is commonly available and price-to EBITDA multiples are used because of the popularity of earnings multiples, in general, and EBITDA estimates operating cash flows and may be less subject to accounting distortions.

the close of the first day of trading (offer date). For the peer firm multiples, *Market price* and *CRSP shares outstanding* refer to the end of day stock price and number of shares outstanding, respectively, of the peer firm on the day of trading immediately prior to the IPO offer date. Using both the P/S and P/EBITDA multiples, I calculate P/V ratios for each IPO as such:

$$PVS = \left(\frac{P}{V}\right)_{Sales} = \frac{(P/S)_{IPO}}{((P/S)_{Peer})}$$

$$PVE = \left(\frac{P}{V}\right)_{EBITDA} = \frac{(P/EBITDA)_{IPO}}{((P/EBITDA)_{Peer})}$$

Interpretation of the P/V ratio is intuitive. Values of the P/V ratio greater than one indicate that the IPO offer price is overvalued relative to the peer multiple, while values between zero and one indicate relative undervaluation. *PVS_Mdn* and *PVE_Mdn* represent the primary measures of PVS and PVE ratios based on the median price-to-sales and price-to-EBITDA multiple of the closest peer group, respectively. In addition, I calculate *PVS_Close* and *PVE_Close*, based on the peer from the peer group that is closest to the IPO firm in sales, emulating the P/V ratio calculated by Purnanandam and Swaminathan (2004). Untabulated robustness tests using *PVS_Close* and *PVE_Close* yield virtually identical results to those of my primary tests using *PVS_Mdn* and *PVE_Mdn*.[10]

[10] Underwriters and issuers in the United States are not required to disclose the valuation method or the specific peers identified to price an IPO. As a result, both potential investors and academics are limited in terms of our ability to assess the IPO's valuation relative to the peer multiples used by the underwriter and must attempt to identify, with error, the peers who appear to be the most similar to the IPO firm. With the exception of Paleari et al. (2014), who use the actual list of peers identified by the underwriter for some European IPOs, this has been the approach of academics. Even in the event that the identification of the best peer group by potential investors and academics differs from the peer group identified by the underwriter, or in the event that the underwriter employs an alternative valuation method because no comparable peers exist, both potential investors and academics are left to assess the reasonableness of the offer price relative to the

While my primary measure of IPO relative valuation is based on the P/V ratios from Purnanandam and Swaminathan (2004), I explore two alternative measures of IPO pricing multiple behavior for robustness. First, I measure *Log(P/SIPO)* and *Log(P/EBITDAIPO)* as the natural logarithm of the IPO multiple. Compared to the P/V ratios, this measure eliminates the benchmark relative to peer multiples, focusing instead only the numerator effect. The intent of this measure is to control for the possibility that my results are driven by the effect of peer accounting quality on peer multiples. Second, I measure *Absolute PVS* and *Absolute PVE* as the absolute value of the difference between the IPO multiple and the peer multiple. While the majority of IPO's are priced with multiples greater than the median peer multiple, this measure allows for consideration of whether the results are driven by deviations in either direction.

4.1.4 Estimating Peer Similarity and Peer Group Accounting Information Quality

In addition to the calculation of the P/V ratios for sales and EBITDA, I also use peer group information to estimate my two primary explanatory variables: *MeanPeerSim* and *MeanPeerAQ*. *MeanPeerSim* is my primary measure of the degree of similarity, or comparability, that the peer group exhibits relative to the IPO firm. The measure is calculated as follows based on the average for all peers in the peer group of the differences between the IPO firm and each individual peer in terms of sales and EBITDA profit margin (*OPM)* in the prior fiscal year:

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best peers they can identify. If the peer group identified by my matching methodology represents a reasonable approximation of the peer group that potential investors identify, then the multiples of these peers should still represent the potential investors' expected value of the firm.

$$\text{MeanPeerSim} = -1 * \left[\frac{\Sigma \left[\sqrt{\left(\left(\frac{\text{Sales}_{\text{Peer}} - \text{Sales}_{\text{IPO}}}{\text{Sales}_{\text{IPO}}} \right)^2 + \left(\frac{\text{OPM}_{\text{Peer}} - \text{OPM}_{\text{IPO}}}{\text{OPM}_{\text{IPO}}} \right)^2 \right)} \right]}{\text{Number of peers in the peer group}} \right]$$

To proxy for peer group accounting information quality, I select measures associated with the difficulty in estimating peer firm expected future growth and profitability. Consistent with the finding that abnormal accruals are associated with lower earnings persistence (Dechow and Dichev 2002) and that higher accruals are associated with difficulty in estimating growth (Bradshaw, Richardson, and Sloan 1997), my primary proxy for peer firm accounting quality is based on abnormal working capital accruals. To obtain an estimate of abnormal accruals, I first estimate abnormal accruals using the Dechow and Dichev (2002) model combined with the Jones (1991) model, as used by McNichols (2002) and Francis et al. (2005). Specifically, for each Fama and French 48 industry and year (at least 10 observations required), I regress total accruals in year *t* on cash flow from operations in years *t-1*, *t*, and *t+1*, the change in sales over year *t*, and gross property, plant, and equipment in year *t*. Abnormal accruals are the residuals from this regression. *MeanPeerAQ* is the mean of the abnormal accruals for all firms in an IPO's peer group in the fiscal year prior to the IPO, multiplied times negative one.[11] Note that I multiply by *MeanPeerSim* and *MeanPeerAQ* by negative one to ease interpretation of the results. As a result, higher values of *MeanPeerSim* are intended to represent IPOs with peer groups that are, on average, more similar to the IPO firm, while

[11] In untabulated robustness tests estimating *MeanPeerSim* based on absolute differences in only sales or only EBITDA profit margin, results are virtually identical. Further, tests using *MeanPeerAQ* based on abnormal accruals estimates from only the Dechow and Dichev (2002) or Jones (1991) models produce very similar results.

higher values of *MeanPeerAQ* represent IPOs whose peer group has lower mean abnormal accruals, or higher accruals quality.

As secondary proxies for peer group accounting quality, I also measure peer group earnings persistence (*MeanPeerPers*) and peer group earnings predictability (*MeanPeerPred*) directly, based on the methodology identified by Francis, LaFond, Olsson, and Schipper (2004). *MeanPeerPers* is measured as the slope coefficient on a 10-year regression of earnings in the current year on earnings in the prior year. *MeanPeerPred* is measured as the square root of the error variance from the same regression, multiplied times negative one. All three measures of peer group accounting quality I use, accruals quality, persistence, and predictability, are based solely on peer firm accounting information and are shown to be associated with assisting in the estimation of expected future growth and profitability.

4.1.5 IPO Characteristics and Summary Statistics

For my primary sample, I retain only IPOs that match to a peer group containing at least one firm with enough data to perform the match and calculate my primary explanatory variables, *MeanPeerSim* and *MeanPeerAQ*, and dependent variables, *PVS_Mdn* and *PVE_Mdn*, reducing my sample to 2,776 IPOs. Consistent with prior studies, Table 1 shows that the mean and median *PVS_Mdn* and *PVE_Mdn* ratios are overvalued[12] on average, and the variables appear to be very similar for *PVS_Close* and *PVE_Close*. For both the PVS and PVE ratios, the mean values are significantly larger than the median values, suggesting that extremely large overvaluations may be driving

[12] When describing an IPO's valuation relative to peers, I sometimes refer to "overvaluation" consistent with the notion described by Purnanandam and Swaminathan (2004). In this case, it refers to IPO's with offer price multiples greater than that of their closest peers.

the average result. Also, the mean *PVE_Mdn* ratio of 11.01 is significantly larger than the mean *PVS_Mdn* ratio of 3.61. The standard deviation of *PVE_Mdn* ratio is also extraordinarily high compared to *PVS_Mdn*, suggesting that P/V ratios based on price-to-EBITDA multiples may have some extreme misvaluations relative to the price-to-EBITDA multiple. Of the offer price P/S multiples for the IPOs in the sample, 35% were greater than their maximum peer group P/S multiple, 51% were within the range of their maximum and minimum peer group P/S multiples, and 14% were less than their minimum peer group P/S multiple. Of the offer price P/EBITDA multiples for the IPOs in the sample, 38% were greater than their maximum peer group P/EBITDA multiple, 45% were within the range of their maximum and minimum peer group P/EBITDA multiples, and 17% were less than their minimum peer group P/EBITDA multiple.

The summary statistics in Table 1 show a mean value of *MeanPeerSim* of -4.55 that is much smaller than the median value of -1.12, suggesting that the distribution is skewed upward by IPOs whose closest peer groups are highly dissimilar to the IPO. In contrast, *MeanPeerAQ* appears to be less skewed with a mean of -0.04 and a median of -0.04.

Table 1 also includes summary statistics for the IPO-specific controls used in the study. *UnderwriterRank* is based on the Carter and Manaster (1990) ranking (on a scale of 1-10 where underwriters ranked 10 are the highest) of the lead underwriter. Prior studies have typically considered underwriters with rankings of 8 or above to be "top tier" underwriters (Liu Ritter 2011). The median underwriter ranking of the lead underwriter for the IPOs in my sample is 8 with a mean of 7.33. *Firm Age* is the number of years since the IPO firm was founded prior to the IPO. The median age of the firms in my

sample is 11 years. *Offer Price* is the final offer price for which the IPO shares are sold on the date of issuance. The median offer price of the firms in my sample is $12 per share. The median sales is approximately $42 million and the median EBITDA profit margin (*OPM)* is 13%. In my sample, approximately 37% of the firms were backed by venture capital (*Vcap*), 35% were considered to be high tech (*Tech*), and 4% were internet IPOs (*Internet*). See Appendix A for detailed variable definitions.

Table 2 shows year-by-year mean and median values of PVS and PVE from 1980 to 2010, the time period of my sample. Mean and median P/V ratios are greater than one in all periods and exhibit considerable variation year over year, but no obvious time trends. Notable, however, are the exceptionally large P/V ratios around the internet bubble in the late 1990's. Also interesting is the steady decline in the number of IPOs after the bubble. Every year from 1990 to 1996 had at least 100 IPOs represented in my sample, while none of the individual years after 1996 had 100 IPOs.

4.2 Univariate Tests

Initially, I perform univariate tests to examine variation in the PVS and PVE ratios based on *MeanPeerSim* and *MeanPeerAQ*. I split *MeanPeerSim* and *MeanPeerAQ* into two groups each dependent on whether they are above or below the median value, where IPOs with above median *MeanPeerSim* are classified as being similar to their closest group of peers and IPOs with above median *MeanPeerAQ* are classified as having a peer group with higher accruals quality. *PVS_Mdn* results for the partitioned samples are presented in Table 3, Panel A. Also presented in Panel A are univariate tests of the difference in medians and Wilcoxon rank sum tests indicating that the PVS ratios of the

groups are significantly different. Results suggest that IPOs with lower *MeanPeerSim* have significantly higher relative valuation than those below the median. Additionally, IPOs with higher *MeanPeerAQ* exhibit lower relative valuation than those below the median. Table 4, Panel A reports similar results for *PVE_Mdn*.

Further, I create four groups of firms based on a two-by-two matrix of *MeanPeerSim* and *MeanPeerAQ* using the partitioned samples above. The four groups created are classified as such:

1. High *MeanPeerAQ* and High *MeanPeerSim*
2. High *MeanPeerAQ* and Low *MeanPeerSim*
3. Low *MeanPeerAQ* and Low *MeanPeerSim*
4. Low *MeanPeerAQ* and Low *MeanPeerSim*

Table 3, Panel B displays the results of univariate tests between the two groups for the *PVS_Mdn* ratio, including difference in medians and Wilcoxon rank sum tests. The tests suggest that, on average, *MeanPeerSim* is a significant driver of higher relative valuation, as firms below the median *MeanPeerSim* exhibit high valuation relative to peers, regardless of the quality of the peer group's accrual quality. In contrast, the *MeanPeerAQ* partitions indicate that having peers with lower accrual quality may only have a significant impact on relative valuation in certain situations. For IPOs with lower *MeanPeerSim* (e.g. firms with a peer group more dissimilar to the IPO firm), results of the Wilcoxon rank sum and difference-in-medians tests suggest that the difference in the samples of IPOs with high *MeanPeerAQ* and low *MeanPeerAQ* are not statistically significant. In contrast, for IPOs with higher *MeanPeerSim* (e.g. firms with a peer group

more similar to the IPO firm), the Wilcoxon rank sum and difference-in-medians tests are both statistically significant at the 1% level. Table 4, Panel B yields slightly different results for values of *PVE_Mdn*, as the difference between the high and low *MeanPeerAQ* samples is statistically significant even for the low *MeanPeerSim* group.

The final two univariate tests in Tables 3 and 4 indicate that any partition of *MeanPeerSim*, regardless of the level of *MeanPeerAQ*, is associated with statistically different levels of relative valuation. In cases of both high *MeanPeerAQ* and low *MeanPeerAQ*, subsamples with below median values of *MeanPeerSim* (e.g. firms with a peer group more dissimilar to the IPO firm) exhibit higher P/V ratios than the sample with above median values of *MeanPeerSim*, statistically significant at the 1% level. Overall, the univariate tests suggest that both *MeanPeerSim* and *MeanPeerAQ* are associated with differences in the P/V ratio to some degree, however, the impact of *MeanPeerAQ* is strongest when the level of *MeanPeerSim* is higher. In addition, when peer group similarity is low, the difference between high and low accruals quality may only significantly impact valuation relative to the P/EBITDA multiple. Overall, the univariate results suggest that IPO relative valuation is largely driven by the similarity of the peer group's fundamentals to the IPO firm, and the accruals quality of the peer group is more likely to decrease IPO relative valuation when the peer group and the IPO are relatively similar.

4.3 Multivariate Tests

To test that the univariate results in Section 4.2 are not driven by other factors, I conduct multivariate tests of the impact of the similarity of the IPO firm to its closest peer

group (*MeanPeerSim*) and the closest peer group's accruals quality (*MeanPeerAQ*) on IPO relative valuation, as measured by the P/V ratio. Regression observations are at the IPO level, and I control for IPO-specific characteristics commonly shown to impact IPO pricing. Variable definitions are described in detail in Appendix A. To facilitate interpretation of the coefficients, I standardize all continuous variables. I use the following base regression for my initial multivariate tests:

$$PVS_{Mdn} \text{ or } PVE_{Mdn} = \beta_0 + \beta_1 * MeanPeerAQ + \beta_2 * MeanPeerSim + \beta_3 * MeanPeerSim * MeanPeerAQ + \beta_4 * UnderwriterRank + \beta_5 * LnAssets + \beta_6 * Vcap + \beta_7 * LnAge + \beta_8 * Tech + \beta_9 * Internet + Issue\ Year\ Fixed\ Effects + Industry\ Fixed\ Effects + \varepsilon$$

As *PVS_Mdn* and *PVE_Mdn* are measures of the IPO offer price multiple relative to peer multiples, for comparison purposes, I also perform tests using the IPO offer price multiple alone as the dependent variable without benchmarking it against a peer multiple. Multivariate results are presented on Table 4 with results for *PVS_Mdn* presented in Panel A and *PVE_Mdn* presented in Panel B. For all specifications, the coefficient on the main effect of *MeanPeerSim* is negative and significant, suggesting that the IPO valuations are decreasing as the similarity of the IPO's peer group increases, and that this effect does not only occur relative to peers. Likewise, as the degree of similarity between the IPO and its peer group decreases, IPO relative valuation increases. Also, the effect of *MeanPeerAQ* on *PVE_Mdn* and *PVS_Mdn* is positive but may not be statistically significant with respect to valuation relative to peers, and statistically insignificant with respect to the magnitude of the IPO offer price multiple. Additionally, across all specifications, the coefficient on the interaction between *MeanPeerSim* and *MeanPeerAQ* is positive and significant. Taken together, these results suggest that peer group accruals

quality may only minimally impact IPO relative valuation unilaterally, but it has a significant moderating effect on *MeanPeerSim*. When peer similarity is low, IPO relative valuation is higher, and this effect is either moderated by higher peer group accruals quality or accentuated by lower peer group accruals quality. While the univariate and multivariate results both suggest that higher levels of peer similarity are associated with lower IPO valuation, the impact of higher peer group accruals quality deduced from the multivariate results runs counter to the findings in the univariate results. Contrary to the univariate results, when the IPO firm and the peer group are more similar than average, higher peer group accruals quality moderates the decrease in relative valuation.

There are multiple potential explanations for the discrepancy between the univariate and multivariate results. For one, while the IPOs in my sample are overvalued relative to peers (priced higher than peers) on average, there are still a significant number of IPOs that are undervalued relative to peers (priced lower than peers). To the extent that undervalued IPOs are influential in the sample, it could be that peer group accruals quality mitigates the extent of undervaluations. Plus, it is not clear, ex ante, whether having dissimilar peers would be more likely to result in extremely high P/V ratios (overvalued relative to peers), extremely low P/V ratios (undervalued relative to peers), or both. While it appears as though having highly dissimilar peers leads to higher P/V ratios on average, if it also affects the incidence of IPOs that are undervalued relative to peers, the relationship could be non-linear.

Alternatively, the discrepancy could be driven by the skewness in *MeanPeerSim* noted previously. Upon re-examination of the distributions of the PVS and PVE values on Tables 3 and 4, I also observe extreme minimum and maximum P/V ratios in nearly

all subsamples. The use of the Wilcoxon rank sum and difference-in-medians tests, rather than t-tests, should mitigate the risk that these extreme values are driving the univariate results, but it is unclear the extent that extreme values may be driving the multivariate results. Given the emphasis of the study on explaining deviations between the IPO and peer firm multiples and the fact that extreme deviations are so common, I am hesitant to truncate my sample at an arbitrary point without gaining a better understanding of when extreme deviations occur.

Lastly, most of the controls load significantly for *PVS_Mdn* in Panel A, but not for *PVE_Mdn* in Panel B, suggesting that, on average, these factors explain variation in the offer price relative to the price-to-sales multiple, but not the price-to-EBITDA multiple. In addition, the adjusted r-squared values are considerably lower for the models explaining valuation relative to the median peer than they are for the models of the unscaled IPO valuation multiple, with the model of *PVE_Mdn* having incredibly low explanatory power. Taken as a whole, the multivariate results reported on Table 5 indicate that *MeanPeerSim* and *MeanPeerAQ* have a significant impact on the level of IPO pricing, but the extent and manner in which they impact IPO valuation relative to the peers identified by a mechanical algorithm is unclear. The results also suggest that valuation relative to sales multiples may be determined differently than pricing relative to earnings multiples.

On Table 6, I report multivariate results of the same regressions, instead using measures of earnings persistence (*MeanPeerPers*) and earnings predictability (*MeanPeerPred*) to proxy for peer group accounting quality. Regression results for these tests are nearly identical to those using peer group accruals quality. The interactions

between *MeanPeerPers* and *MeanPeerSim* are positive and statistically significant in explaining both *PVS_Mdn* and *PVE_Mdn*. The interactions between *MeanPeerPred* and *MeanPeerSim* are both positive, but only statistically significant for *PVE_Mdn*. Together, the results reported on Tables 5 and 6 are consistent with the hypothesis that high quality peer group earnings attributes have a moderating effect on IPO relative valuation. This moderating effect is specifically related to deviations based on the fundamental similarity of the IPO firm to the peer firms.

4.4 Logistic Tests

To further disentangle the results from the multivariate tests and understand the moderating effect of peer group accruals quality, I perform several logistic regressions to assess how underwriters set the offer price in relation to the closest available peer firms. Specifically, I examine how the same peer group and IPO-specific factors impact the likelihood of the IPO offer price multiple being: 1) greater than the maximum peer group multiple, 2) between the maximum and minimum peer group multiples, and 3) less than the minimum peer group multiple. This approach offers several distinct advantages. First, the approach mitigates the risk that extremely high or low values of PVS or PVE are biasing the results without removing these fundamentally important IPOs from the sample. Second, it allows me to assess whether factors such as *MeanPeerSim* affect the likelihood of both relative overvaluation and relative undervaluation, which could affect the multivariate results. Lastly, it may shed light on the validity of the peer firms identified as the IPO firm's closest peer group. Overall, this approach should provide insight into when underwriters rely significantly on the multiples of the peer group firms identified by my methodology.

Table 7 presents the results of the three logistic regressions for the price-to-sales (P/S) multiples in Panel A and the price-to-EBITDA (P/EBITDA) multiples in Panel B. Unsurprisingly, the coefficient on *MeanPeerSim* in column 4 of both Panel A and B predicts that the likelihood of an IPO being valued within the range of the peer group multiples is increasing in the similarity of the IPO firm to the peer group. It is intuitive that IPOs would be more likely to be priced close to peers when they are very similar. The coefficients on the main effects of *MeanPeerAQ* are consistent across both Panel A and Panel B, but are not so intuitive. The coefficient on *MeanPeerAQ* predicts a negative relationship between peer group accruals quality and the likelihood that the IPO is priced within the range of the identified peer group multiples. Considering the positive and significant relationship predicted for *MeanPeerAQ* in column 2, it appears that as peer group accruals quality increases, the likelihood of an IPO being valued outside the range of peer group multiples increases, most likely being valued at a price higher than the peer group. On one hand, this result seems counterintuitive because one would expect underwriters to rely more heavily on peer multiples when the peers' information is of higher quality. However, when I consider the assertions of Damodaran (2005) that even peer multiples from peers that are most similar to the IPO firm require adjustments based on differences in expected growth and profitability before arriving at a final valuation, the result makes more sense. If a peer group has higher accruals quality, it should be less difficult for underwriters or other valuation experts to estimate differences in growth and profitability, making them more likely to deviate from the unadjusted peer multiple. Stated conversely, when peer accruals quality is poor, making differences in growth and profitability more difficult to estimate, underwriters will be less likely to make

adjustments, instead setting the offer price closer to the unadjusted peer multiple. This result appears consistent with the moderating effect suggested by the multivariate results in Section 4.3. When *MeanPeerAQ* is high, not only does it potentially minimize large deviations from the peer multiple, but it may also minimize very small deviations.

The other notable result from the logistic regressions is a different sign on the interaction terms in column 4 between the PVS model in Panel A and the PVE model in Panel B. While the main effect of *MeanPeerSim* seems to dominate, on average, when the IPO's peer group is less similar, the likelihood of pricing within the range of peer P/S multiples is increasing in *MeanPeerAQ* while the likelihood of pricing within the range of P/EBITDA multiples is decreasing in *MeanPeerAQ*. Kim and Ritter (1999) find that valuation accuracy of IPOs relative to peers is greatly enhanced when benchmarking against forecasted peer multiples than peer multiples based on historical numbers. It is possible that the availability of earnings and/or sales forecasts is a significant driver of how peer accruals quality affects the extent that IPO valuations deviate from unadjusted multiples. At this time, I do not conduct any empirical analysis of peer firm sales or earnings forecast availability, but it may be an interesting area for further study.

Overall, the results of the logistic tests suggest that the accounting characteristics of the closest available peers play a significant role in determining the extent of underwriter reliance on unadjusted (or minimally adjusted) peer firm multiples to set the final IPO offer price. Particularly, the coefficients on the main effect of *MeanPeerAQ* provide additional support for the moderating effect suggested by the multivariate tests. Untabulated results of logistic tests using earnings persistence and earnings predictability produce similar results.

5. Additional Analyses

5.1 Post-Issue Returns

To complement my findings that the valuation of IPOs relative to peers is moderated by peer accounting quality, I conduct an analysis of the characteristics of post-issuance IPO firm returns. For each IPO firm, I calculate the buy-and-hold returns for the 12 and 24 month periods after the issuance as the percentage difference between either the monthly closing price and the IPO offer price. Additionally, for comparison purposes, I report first day returns, measured as the percentage difference between the closing price on the first day of trading and the offer price.[13]

I partition the IPO firms in my sample based on the same partitions of *MeanPeerAQ* and *MeanPeerSim* used for the univariate tests in Section 4.2. Table 8 reports the summary statistics of 12 and 24 month buy-and-hold returns and first day returns for each partition. While it is unclear how pre-issuance peer accounting quality would affect the direction of long-run IPO returns, I nonetheless report the mean and median returns for each partition. In turn, for the purposes of this analysis, I am primarily concerned with differences in the standard deviation of returns between partitions. The first section in Table 8 shows that IPOs having peers with higher pre-issue accounting quality have a lower standard deviation of returns, with the effect appearing larger after two years. Further, when partitioning on *MeanPeerSim* as in previous tests, the statistics indicate that *MeanPeerSim* may be the primary driver of the direction of post-issuance returns, but for both groups of *MeanPeerSim*, the magnitude and standard

[13] IPO first day returns are commonly used to measure IPO underpricing, as defined in the literature and discussed in Section 2 of this paper.

deviation of returns is smaller when *MeanPeerAQ* is high. These results are unsurprising, given the multivariate finding that peer accounting quality has a moderating effect on peer similarity when it comes to IPO relative valuation, mitigating the risk that IPOs are price very high or very low relative to peers. If high peer accounting quality allows underwriters and price setters to more easily incorporate estimates of future growth and profitability into the offer price, then post-issuance returns should be smaller when peer accounting quality is high. Any new information about firm growth and profitability realized after issuance should only result in a return if that information was not already incorporated into the offer price. As a result, the smaller standard deviations of long-run returns for high *MeanPeerAQ* firms may indicate that more information about growth and profitability was incorporated into the IPO offer price at the time of the IPO.

5.2 Market-Based Earnings Attributes

As discussed earlier, my primary measures of peer accounting quality (accruals quality, persistence, and predictability) rely only on peer accounting information, in that they are not based on peer stock returns. I rely on these measures primarily because they appear to best capture the ability to estimate expected growth and profitability, which is theoretically key to explaining differences between IPO and peer multiples. However, several market-based earnings attributes exist that may be related to peer information risk, namely value relevance and earnings timeliness. While prior literature has associated these constructs with lower information risk, it is unclear how they would be expected to impact IPO relative valuation. On one hand, if value relevance and timeliness assist with the estimation of growth and profitability, then I expect them to have a moderating effect on peer group similarity, much like the accounting-based measures. On

the other hand, if value relevance and timeliness only capture the reliability of current peer earnings and multiples, then I may find that they accentuate the effect of peer similarity on relative valuation, as underwriters may be less likely to deviate from peer multiples when those multiples appear more reliable.

Assuming market prices capture all public information relevant to investors, then earnings are considered to be more value relevant when they contain the same information. I measure value relevance (*MeanPeerVR*) using the same methodology as Francis et al. (2004), as the peer group mean adjusted R^2 from a regression of returns on the level and changes in current earnings. I also measure earnings timeliness (*MeanPeerTime*) based on the methodology used by Francis et al. (2004), as the peer group mean adjusted R^2 from the reverse regression of current earnings on returns and an indicator variable for negative returns. Table 9 reports the results of multivariate regressions of *PVS_Mdn* and *PVE_Mdn* on explanatory variables including *MeanPeerVR* and *MeanPeerTime*. When these variables are interacted with *MeanPeerSim*, the coefficient estimates are negative and significant across all specifications, indicating that peer group value relevance and timeliness accentuate the effect of *MeanPeerSim* on IPO relative valuation. In other words, to the extent that an IPO is similar to its peer group, underwriters select offer price multiples closer to those peer multiples, and this effect is even stronger when the correlation between returns and current earnings is high. While this may represent one aspect of peer information quality, it seems to be associated the reliability of the peer-based multiple and may not be associated with adjustments based on differences between the IPO and peer firm. Further, as no returns exist for the IPO

firm prior to issuance, it would be difficult for underwriters to make assessments about the differences in these earnings attributes between the peers and the IPO firm.

6. Conclusion

The comparable firms approach to IPO valuation depends largely on the availability of accounting information from peer firms already priced in the market, but to be most effective, the peer accounting information should be useful for making decisions about how to use the peer firms' accounting information to set the IPO price. Prior studies using peer-based multiples to evaluate the valuation accuracy of IPO offer prices largely hold peer group accounting characteristics constant. For a sample of IPOs from 1980-2010, I identify a group of priced peer firms and exploit variation in their average similarity to the IPO firm and their average accruals quality, earnings persistence, and earnings predictability to understand how the decision-usefulness of peer accounting information affects IPO valuation.

I find evidence suggesting that peer group similarity to the IPO firm and peer group accounting quality affect the valuation of IPOs relative to peers to varying degrees. First, I show that, consistent with prior literature, the IPOs in my sample are valued higher than unadjusted peer group multiples, on average. Next, I assess the impact of peer group similarity to the IPO firm and peer group accruals quality on IPO relative valuation and on the likelihood that IPO valuations rely significantly on the multiples of the peers identified. Overall, my findings suggest that the similarity of the peer group to the IPO firm is the primary driver of variation in IPO relative valuation, however, the accruals quality of the peer group has a significant moderating effect on peer group similarity. In addition, when peer group accruals quality is high, IPO offer price multiples are more likely to be priced outside the range of the peer group multiples, consistent with the notion that underwriters will make more significant adjustments to

multiples when it is less difficult to assess differences in expected future growth and profitability between the IPO firm and the peer firms.

This study contributes to the literature on IPO valuation by demonstrating that an IPO's information set is not limited to its own accounting information, but also includes that of its peers. I show that the accounting information quality of an IPO firm's peers has a significant impact on the extent that offer prices deviate from estimated fair values based on unadjusted multiples. My findings suggest that these accounting characteristics are associated with the need for adjustments to peer multiples and the ability to make them. Also, my study complements the work of Ecker (2014), reinforcing the notion that peer information precision is a key component of pre-issuance estimates of IPO information precision. Lastly, my findings may be of interest to potential IPO investors, as understanding how the accounting characteristics of peer firms affect IPO valuation may help them monitor underwriters' valuation choices.

Appendix A - Variable Definitions

MeanPeerAQ	The mean absolute value of abnormal accruals of the peer group firms based on the residual from a model of total accruals, as described in Section 4.1.4.
MeanPeerSim	The mean similarity of the peer group firms to the IPO firm based on the closeness of the IPO firm's sales and EBITDA profit margin to that of the peers in the peer group, as described in Section 4.1.4.
Offer Price	The final offer price in dollars per share of the IPO shares issued.
PVS_Mdn	The P/V ratio for the price-to-sales (P/S) multiple, as calculated in Section 4.1.3, where the peer multiple used in the denominator is the median P/S multiple from the peer group.
PVS_Close	The P/V ratio for the price-to-sales (P/S) multiple, as calculated in Section 4.1.3, where the peer multiple used in the denominator is the P/S multiple from the peer group firm whose sales are closest in absolute difference to the IPO firm's sales in the fiscal year prior to the IPO.
Log(P/S_{IPO})	The natural logarithm of the IPO offer price price-to-sales multiple, calculated as (offer price x shares issued) / sales in the prior fiscal year.
Absolute PVS	The absolute value of the percentage deviation from the median peer price-to-sales multiple, calculated as $\lvert(P/S_{IPO}-P/S_{Peer}) / P/S_{Peer}\rvert$
Gmax_PVS	An indicator variable equal to one if the IPO offer price P/S multiple (P/S_{IPO}) is greater than the maximum P/S multiple of the peer group, and zero otherwise.
WithinRange_PVS	An indicator variable equal to one if the IPO offer price P/S multiple (P/S_{IPO}) is between the maximum and minimum P/S multiples of the peer group, and zero otherwise.
Lmin_PVS	An indicator variable equal to one if the IPO offer price P/S multiple (P/S_{IPO}) is less than the minimum P/S multiple of the peer group, and zero otherwise.
PVE_Mdn	The P/V ratio for the price-to-EBITDA (P/EBITDA) multiple, as calculated in Section 4.1.3, where the peer multiple used in the denominator is the median P/EBITDA multiple from the peer group.
PVE_Close	The P/V ratio for the price-to-EBITDA (P/EBITDA) multiple, as calculated in Section 4.1.3, where the peer multiple used in the denominator is the P/EBITDA multiple from the peer group firm whose sales are closest in absolute difference to the IPO firm's sales in the fiscal year prior to the IPO.
Log($P/EBITDA_{IPO}$)	The natural logarithm of the IPO offer price price-to-EBITDA multiple, calculated as (offer price x shares issued) / EBITDA in the prior fiscal year.
Absolute PVE	The absolute value of the percentage deviation from the median peer price-to-EBITDA multiple, calculated as $\lvert(P/EBITDA_{IPO}-$

	$P/EBITDA_{Peer}$) / $P/EBITDA_{Peer}$ |
Gmax_PVE	An indicator variable equal to one if the IPO offer price P/EBITDA multiple ($P/EBITDA_{IPO}$) is greater than the maximum P/EBITDA multiple of the peer group, and zero otherwise.
WithinRange_PVE	An indicator variable equal to one if the IPO offer price P/EBITDA multiple ($P/EBITDA_{IPO}$) is between the maximum and minimum P/EBITDA multiples of the peer group, and zero otherwise.
Lmin_PVE	An indicator variable equal to one if the IPO offer price P/EBITDA multiple ($P/EBITDA_{IPO}$) is less than the minimum P/EBITDA multiple of the peer group, and zero otherwise.
Sales	Nominal IPO firm sales, in millions, in the fiscal year immediately prior to the IPO.
OPM	The ratio of EBITDA divided by sales for the fiscal year immediately prior to the IPO.
Underwriter Rank	The Carter and Manaster (1990) ranking (on a scale of 1-10 where underwriters ranked 10 are the highest) of the lead underwriter (obtained from Jay Ritter's website).
Ln_Assets	The natural logarithm of IPO firm assets in the fiscal year immediately prior to the IPO.
Firm Age	The nominal number of years since the IPO firm was founded, as of the IPO date (obtained from Jay Ritter's website).
Ln_Age	The natural logarithm of *Firm Age.*
Vcap	An indicator variable equal to one if the IPO was backed by venture capital, and zero otherwise (as identified in SDC).
Tech	An indicator variable equal to one if the IPO is identified as being in a "technology" industry, as described in Appendix D of Loughran and Ritter (2004).
Internet	An indicator variable equal to one if the IPO was considered to be an "Internet" IPO, as described in Appendix D of Loughran and Ritter (2004) (obtained from Jay Ritter's website with an updated listing through 2013).

Appendix B - List of Tables

Table 1: Summary Statistics

This table presents untransformed summary statistics for my primary sample of IPOs. Variables are defined in Appendix A.

	N	Mean	StdDev	25%	Median	75%
# Peers in Peer Group	2936	8.19	7.11	3.00	6.00	11.00
MeanPeerAQ	2935	-0.04	0.02	-0.06	-0.04	-0.03
MeanPeerSim	2860	-4.55	39.45	-2.56	-1.12	-0.64
MeanPeerPers	2990	0.17	0.32	-0.02	0.14	0.34
MeanPeerPred	2981	-0.80	0.51	-0.98	-0.67	-0.48
Offer Price	2936	12.65	5.64	9.00	12.00	15.50
PVS_Mdn	2752	3.61	9.60	0.94	1.73	3.41
PVS_Close	2752	3.57	8.25	0.78	1.65	3.46
GMAX_PVS	2936	0.35				
WITHIN_PVS	2936	0.51				
LMIN_PVS	2936	0.14				
PVE_Mdn	2752	11.01	185.02	0.85	1.60	3.39
PVE_Close	2752	10.03	181.69	0.79	1.63	3.56
GMAX_PVE	2936	0.38				
WITHIN_PVE	2936	0.45				
LMIN_PVE	2936	0.17				
MeanPeerVR	2987	0.22	0.19	0.11	0.22	0.34
MeanPeerTime	2985	0.17	0.23	0.04	0.16	0.30
Sales	2936	207.96	868.04	16.81	42.00	121.39
OPM	2860	0.16	0.13	0.08	0.13	0.20
UnderwriterRank	2936	7.33	2.10	7.00	8.00	9.00
Ln_Assets	2936	3.46	1.79	2.35	3.31	4.50
Firm Age	2910	18.40	22.11	6.00	11.00	20.00
Vcap	2936	0.37				
Tech	2936	0.35				
Internet	2936	0.04				

Table 2: P/V Ratios Over Time

		PVS_Close		PVS_Mdn		PVE_Close		PVE_Mdn	
IPO Year	N	Median	Mean	Median	Mean	Median	Mean	Median	Mean
1980	83	3.04	9.09	3.41	8.92	3.12	19.87	2.95	17.98
1981	28	2.38	4.45	2.63	5.17	1.99	5.85	1.84	5.06
1982	168	2.05	4.33	1.98	4.27	1.72	4.44	1.85	5.08
1983	73	1.61	3.33	1.44	3.29	1.35	5.32	1.17	3.95
1984	72	1.12	2.47	1.42	2.45	1.17	4.34	1.37	5.14
1985	157	1.65	2.76	1.64	2.79	1.28	2.36	1.33	2.33
1986	109	1.77	2.67	1.76	2.57	1.62	2.57	1.61	2.72
1987	43	1.79	2.31	2.11	2.51	1.84	2.79	1.87	2.86
1988	45	1.93	4.43	1.51	2.23	1.81	4.47	1.43	3.13
1989	44	1.83	2.40	2.03	2.98	1.63	2.78	1.65	2.90
1990	103	1.73	3.26	1.79	3.28	1.44	88.96	1.48	89.08
1991	144	1.30	2.58	1.46	2.34	1.47	3.45	1.35	4.56
1992	222	1.65	3.03	1.47	2.74	1.61	5.08	1.39	3.59
1993	196	1.57	3.16	1.80	3.19	1.58	3.66	1.71	5.05
1994	201	1.38	2.74	1.75	3.14	1.63	3.50	1.84	3.82
1995	264	1.47	2.91	1.74	3.78	1.71	3.73	1.78	4.57
1996	189	1.72	2.97	1.65	2.93	1.59	5.94	1.85	8.38
1997	96	1.28	4.02	1.65	3.89	1.45	3.22	1.36	3.69
1998	92	3.12	11.57	3.35	14.24	3.90	70.21	3.00	95.44
1999	68	1.85	5.03	2.81	4.46	2.53	10.45	2.59	7.95
2000	23	1.31	3.19	1.82	2.84	1.82	4.41	1.66	5.39
2001	31	1.14	2.24	1.20	1.54	1.20	2.36	1.03	1.19
2002	27	1.26	3.85	1.18	2.34	1.43	3.06	1.46	2.30
2003	67	1.40	2.84	1.41	2.12	1.52	4.45	1.42	3.36
2004	54	1.15	1.85	1.20	1.63	1.14	2.98	1.06	2.18
2005	58	1.67	3.63	1.32	2.51	1.61	4.52	1.33	3.60
2006	47	1.74	2.42	1.51	2.24	1.46	2.58	1.39	2.35
2007	9	2.07	3.94	1.97	3.77	1.83	8.54	1.83	9.44
2008	16	1.98	2.96	1.96	2.81	1.48	3.26	1.33	3.01
2009	20	1.40	2.21	1.22	1.75	1.78	2.46	1.17	1.79
2010	20	1.78	3.44	1.92	3.42	1.91	16.74	1.75	17.09
Total	2769	1.65	3.57	1.73	3.61	1.63	10.03	1.60	11.01

Table 3: Univariate Tests of PVS_Mdn

This table reports summary statistics of the values of the P/V Ratio related to the price-to-sales multiple (*PVS_Median*) for the primary sample partitioned by *MeanPeerSim* and *MeanPeerAQ*. The variables are partitioned at the above and below the median for the sample. Pearson chi-square results are the p-values from tests that the medians of PVS from two samples are equal. Variables are defined in detail in Appendix A. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A:

	N	Min	25	50	75	Max	Mean	Sign Rank Test P: PV_Sale = 1 z	Prob > |z|
High *MeanPeerSim*	1401	0.01	0.82	1.39	2.46	78.44	2.15	18.26	0.00***
Low *MeanPeerSim*	1375	0.01	1.16	2.26	4.89	263.09	5.11	26.47	0.00***
Total	2776	0.01	0.94	1.73	3.41	263.09	3.61		

P: PVS(High *MeanSalesDiff*) = PVS(Low *MeanSalesDiff*)
Rank Sum: z = -12.94 Diff-in-medians: Prob > |z| = 0.00***

								P: PVS_Median = 1 z	Prob > |z|
High *MeanPeerAQ*	1392	0.01	0.86	1.62	3.21	171.43	3.47	21.18	0.00***
Low *MeanPeerAQ*	1383	0.01	1.01	1.84	3.60	263.09	3.76	24.37	0.00***
Total	2775	0.01	0.94	1.73	3.41	263.09	3.61		

P: PVS(High *MeanDA*) = PVS(Low *MeanDA*)
Rank Sum: z = -3.37 Diff-in-medians: Prob > |z| = 0.00***

Panel B:

MeanPeerAQ	*MeanPeerSim*	N	Min	25	50	75	Max	Mean	P: PVS_Mdn = 1 z	Prob > |z|
High	High	729	0.01	0.74	1.33	2.31	78.44	2.02	11.62	0.00***
High	Low	669	0.01	1.06	2.19	4.93	171.43	5.03	17.75	0.00***
Low	High	675	0.07	0.88	1.47	2.67	41.88	2.28	14.20	0.00***
Low	Low	708	0.01	1.24	2.28	4.83	263.09	5.18	19.61	0.00***
Total		2781	0.01	0.94	1.73	3.40	263.09	3.61		

High *MeanPeerSim*

High *MeanPeerAQ*	729	0.01	0.74	1.33	2.31	78.44	2.02
Low *MeanPeerAQ*	675	0.07	0.88	1.47	2.67	41.88	2.28

P: PVS(High *MeanPeerAQ*) = PVS(Low *MeanPeerAQ*)
Rank Sum: z = -3.12 Diff-in-medians: Prob > |z| = 0.002*** Prob > |z| = 0.04**

Low *MeanPeerSim*

High *MeanPeerAQ*	669	0.01	1.06	2.19	4.93	171.43	5.03
Low *MeanPeerAQ*	708	0.01	1.24	2.28	4.83	263.09	5.18

P: PVS(High *MeanPeerAQ*) = PVS(Low *MeanPeerAQ*)
Rank Sum: z = -0.88 Diff-in-medians: Prob > |z| = 0.38 Prob > |z| = 0.42

High *MeanPeerAQ*

High MeanPeerSim	729	0.01	0.74	1.33	2.31	78.44	2.02
Low MeanPeerSim	669	0.01	1.06	2.19	4.93	171.43	5.03

P: PVS(High *MeanPeerSim*) = PVS(Low *MeanPeerSim*)
Rank Sum: z = -9.69 Diff-in-medians: Prob > |z| = 0.000*** Prob > |z| = 0.000***

Low *MeanPeerAQ*

High MeanPeerSim	675	0.07	0.88	1.47	2.67	41.88	2.28
Low MeanPeerSim	708	0.01	1.24	2.28	4.83	263.09	5.18

P: PVS(High *MeanPeerSim*) = PVS(Low *MeanPeerSim*)
Rank Sum: z = -8.44 Diff-in-medians: Prob > |z| = 0.000*** Prob > |z| = 0.000***

Table 4: Univariate Tests of PVE_Mdn

This table reports summary statistics of the values of the P/V Ratio related to the price-to-sales multiple (PVS_Median) for the primary sample partitioned by MeanPeerSim and MeanPeerAQ. The variables are partitioned at the above and below the median for the sample. Pearson chi-square results are the p-values from tests that the medians of PVS from two samples are equal. Variables are defined in detail in Appendix A. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A:

	N	Min	25	50	75	Max	Mean	Sign Rank Test P: PV_Sale = 1 z	Prob > |z|
High *MeanPeerSim*	1401	0.01	0.73	1.27	2.22	69.11	2.02	14.70	0.00***
Low *MeanPeerSim*	1375	0.01	1.08	2.19	5.35	8790.69	20.17	25.81	0.00***
Total	2776	0.01	0.85	1.60	3.39	8790.69	11.01		

P: PVE(High MeanSalesDiff) = PVE(Low MeanSalesDiff)
Rank Sum: z = -14.89 Diff-in-medians: Prob > |z| = 0.00***

							P: PVE_Median = 1 z	Prob > |z|
High *MeanPeerAQ*	1392	0.01	0.80	1.44	3.03	8790.69	14.47	18.94	0.00***
Low *MeanPeerAQ*	1383	0.01	0.93	1.74	3.73	1197.02	7.54	22.73	0.00***
Total	2775	0.01	0.85	1.60	3.39	8790.69	11.01		

P: PVE(High MeanDA) = PVE(Low MeanDA)
Rank Sum: z = -4.18 Diff-in-medians: Prob > |z| = 0.00***

Panel B:

MeanPeerAQ	*MeanPeerSim*	N	Min	25.00	50.00	75.00	Max	Mean	P: PVE_Mdn = 1 z	Prob > |z|
High	High	729	0.01	0.71	1.22	2.05	69.11	1.87	9.17	0.00***
High	Low	669	0.01	0.97	2.04	5.15	8790.69	28.07	16.89	0.00***
Low	High	675	0.05	0.75	1.35	2.42	42.97	2.17	11.59	0.00***
Low	Low	708	0.01	1.20	2.31	5.88	1197.02	12.66	19.47	0.00***
Total		2781	0.01	0.85	1.60	3.37	8790.69	10.99		

High *MeanPeerSim*

High *MeanPeerAQ*	729	0.01	0.71	1.22	2.05	69.11	1.87
Low *MeanPeerAQ*	675	0.05	0.75	1.35	2.42	42.97	2.17

P: PVE(High MeanPeerAQ) = PVE(Low MeanPeerAQ)
Rank Sum: z = -2.73 Diff-in-medians: Prob > |z| = 0.006*** Prob > |z| = 0.19

Low *MeanPeerSim*

High *MeanPeerAQ*	669	0.01	0.97	2.04	5.15	8790.69	28.07
Low *MeanPeerAQ*	708	0.01	1.20	2.31	5.88	1197.02	12.66

P: PVE(High MeanPeerAQ) = PVE(Low MeanPeerAQ)
Rank Sum: z = -2.42 Diff-in-medians: Prob > |z| = 0.02** Prob > |z| = 0.07*

High *MeanPeerAQ*

High MeanPeerSim	729	0.01	0.71	1.22	2.05	69.11	1.87
Low MeanPeerSim	669	0.01	0.97	2.04	5.15	8790.69	28.07

P: PVE(High MeanPeerSim) = PVE(Low MeanPeerSim)
Rank Sum: z = -10.21 Diff-in-medians: Prob > |z| = 0.000*** Prob > |z| = 0.000***

Low *MeanPeerAQ*

High MeanPeerSim	675	0.05	0.75	1.35	2.42	42.97	2.17
Low MeanPeerSim	708	0.01	1.20	2.31	5.88	1197.02	12.66

P: PVE(High MeanPeerSim) = PVE(Low MeanPeerSim)
Rank Sum: z = -10.61 Diff-in-medians: Prob > |z| = 0.000*** Prob > |z| = 0.000***

Table 5: Multivariate Results - Peer Group Accruals Quality

This table presents multivariate results of regressions of IPO relative valuation, as measured by P/V Ratios from Purnanandam Swaminathn (2004), on measures of the similarity of the IPO's closest peer group to the IPO and the mean accruals quality of the IPO's closest peer group. Variables are defined in Appendix A. All continuous variables are standardized. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. t-statistics are in parentheses.

Panel A: IPO price-to-sales (P/S) multiple

	DV = *PVS_Mdn*		DV = Log(P/S_{IPO})		DV = *Absolute PVS*	
	(1)	(2)	(4)	(5)	(7)	(8)
Intercept	0.333***	0.300***	7.285***	7.262***	6.104***	5.788***
	(3.03)	(2.77)	(84.52)	(85.12)	(5.79)	(5.57)
MeanPeerAQ	0.028	0.036*	0.019	0.024	0.259	0.330*
	(1.36)	(1.74)	(1.15)	(1.44)	(1.30)	(1.68)
MeanPeerSim	-0.184***	-0.751***	-0.080***	-0.426***	-1.775***	-7.194***
	(-9.93)	(-11.36)	(-5.47)	(-9.15)	(-9.98)	(-11.36)
*MeanPeerAQ * MeanPeerSim*		0.455***		0.289***		4.349***
		(8.92)		(7.82)		(8.90)
UnderwriterRank	0.109***	0.125***	0.273***	0.281***	0.973***	1.126***
	(4.52)	(5.24)	(14.36)	(14.95)	(4.20)	(4.92)
Ln_Assets	-0.237***	-0.214***	-0.604***	-0.586***	-2.064***	-1.846***
	(-7.87)	(-7.19)	(-25.29)	(-24.73)	(-7.16)	(-6.48)
Vcap	0.064	0.081**	0.132***	0.143***	0.543	0.702*
	(1.54)	(1.96)	(3.94)	(4.33)	(1.36)	(1.78)
Ln_Age	-0.101***	-0.096***	-0.201***	-0.195***	-0.925***	-0.878***
	(-4.81)	(-4.64)	(-11.89)	(-11.68)	(-4.62)	(-4.44)
Tech	0.022	0.021	0.286***	0.289***	0.079	0.072
	(0.30)	(0.30)	(5.03)	(5.14)	(0.11)	(0.11)
Internet	0.414***	0.365***	0.057	0.027	4.027***	3.566***
	(4.02)	(3.59)	(0.68)	(0.32)	(4.08)	(3.66)
N	2752	2752	2836	2836	2752	2752
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.125	0.150	0.353	0.367	0.118	0.143

Panel B: IPO price-to-EBITDA (P/EBITDA) multiple

	DV = *PVE_Mdn*		DV = Log($P/EBITDA_{IPO}$)		DV = *Absolute PVE*	
	(1)	(2)	(4)	(5)	(7)	(8)
Intercept	-0.051	-0.065	9.068***	9.026***	1.000***	0.990***
	(-0.43)	(-0.55)	(87.09)	(88.87)	(10.63)	(10.54)
MeanPeerAQ	0.023	0.026	-0.012	-0.003	-0.011	-0.009
	(1.02)	(1.16)	(-0.58)	(-0.16)	(-0.62)	(-0.50)
MeanPeerSim	-0.094***	-0.334***	-0.097***	-0.731***	-0.218***	-0.387***
	(-4.71)	(-4.64)	(-5.47)	(-13.19)	(-13.74)	(-6.76)
*MeanPeerAQ * MeanPeerSim*		0.193***		0.530***		0.135***
		(3.47)		(12.05)		(3.07)
UnderwriterRank	-0.018	-0.011	0.251***	0.267***	-0.008	-0.003
	(-0.70)	(-0.44)	(10.94)	(11.92)	(-0.37)	(-0.14)
Ln_Assets	-0.046	-0.036	-0.745***	-0.713***	0.023	0.030
	(-1.42)	(-1.12)	(-25.82)	(-25.25)	(0.91)	(1.17)
Vcap	0.020	0.027	0.264***	0.285***	0.004	0.009
	(0.44)	(0.60)	(6.53)	(7.22)	(0.11)	(0.25)
Ln_Age	-0.038*	-0.036	-0.207***	-0.197***	-0.003	-0.001
	(-1.69)	(-1.60)	(-10.14)	(-9.88)	(-0.15)	(-0.07)
Tech	-0.008	-0.009	0.281***	0.287***	-0.070	-0.070
	(-0.11)	(-0.11)	(4.10)	(4.29)	(-1.14)	(-1.15)
Internet	0.028	0.008	0.415***	0.359***	0.317***	0.303***
	(0.25)	(0.07)	(4.11)	(3.65)	(3.61)	(3.44)
N	2752	2752	2836	2836	2752	2752
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.002	0.006	0.368	0.400	0.082	0.085

Table 6: Multivariate Results - Peer Group Persistence and Predictability

This table presents multivariate results of regressions of IPO relative valuation, as measured by P/V Ratios from Purnanandam Swaminathn (2004), on measures of the similarity of the IPO's closest peer group to the IPO and the mean earnings persistence and earnings predictability of the IPO's closest peer group. Variables are defined in Appendix A. All continuous variables are standardized. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. t-statistics are in parentheses.

	DV = PVS_Mdn				DV = PVE_Mdn			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.085	-0.065	-0.107	-0.101	-0.083	-0.075	-0.126	-0.116
	(-0.48)	(-0.37)	(-0.61)	(-0.57)	(-0.74)	(-0.69)	(-0.69)	(-0.63)
MeanPeerPers	-0.041**	-0.043**			-0.020	-0.023*		
	(-2.15)	(-2.32)			(-1.64)	(-1.94)		
MeanPeerPred			-0.033	-0.031			-0.017	-0.024
			(-1.43)	(-1.33)			(-0.72)	(-0.98)
MeanPeerSim	-0.354***	-1.151***	-0.344***	-0.353***	-0.296***	-1.046***	-0.363***	-0.455***
	(-6.01)	(-12.10)	(-5.80)	(-5.91)	(-7.74)	(-16.26)	(-5.74)	(-6.13)
*MeanPeerPers * MeanPeerSim*		0.317***				0.283***		
		(10.53)				(14.22)		
*MeanPeerPred *MeanPeerSim*				0.054				0.262**
				(1.31)				(2.35)
UnderwriterRank	0.110***	0.132***	0.112***	0.112***	0.045***	0.063***	0.053**	0.057**
	(4.45)	(5.46)	(4.49)	(4.52)	(2.86)	(4.18)	(2.04)	(2.18)
Ln_Assets	-0.199***	-0.166***	-0.214***	-0.213***	-0.060***	-0.027	-0.073**	-0.070**
	(-6.41)	(-5.42)	(-6.71)	(-6.69)	(-3.04)	(-1.44)	(-2.20)	(-2.11)
Vcap	0.098**	0.105**	0.110**	0.109**	0.036	0.045*	0.067	0.066
	(2.31)	(2.53)	(2.57)	(2.54)	(1.32)	(1.72)	(1.49)	(1.48)
Ln_Age	-0.065***	-0.054**	-0.070***	-0.069***	-0.024*	-0.014	-0.065***	-0.062***
	(-3.04)	(-2.56)	(-3.24)	(-3.22)	(-1.74)	(-1.04)	(-2.90)	(-2.77)
Tech	-0.013	-0.028	-0.021	-0.021	0.076	0.061	0.056	0.058
	(-0.17)	(-0.39)	(-0.29)	(-0.28)	(1.63)	(1.37)	(0.72)	(0.75)
Internet	0.539***	0.508***	0.533***	0.533***	0.158**	0.130**	0.065	0.063
	(5.14)	(4.94)	(5.05)	(5.05)	(2.38)	(2.03)	(0.59)	(0.58)
N	2754	2754	2746	2746	2750	2750	2743	2743
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.090	0.126	0.094	0.094	0.063	0.129	0.043	0.045

Table 7: Logistic Regression Results

This table presents the results of logistic regressions of the likelihood that the IPO offer price multiple is greater than the maximum peer group multiple (Equations 1 and 2), between the maximum and minimum peer group multiples (Equations 3 and 4), and less than the minimum peer group multiple (Equations 5 and 6). Variables are defined in detail in Appendix A. All continuous variables are standardized. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Chi-square z-statistics are in parentheses.

Panel A: Logistic likelihood of IPO P/S multiple relative to peer group P/S multiples

	DV = Gmax_PVS Prob(IPO multiple is greater than the maximum peer group multiple)		DV = WithinRange_PVS Prob(IPO multiple is between the min and max peer group multiples)		DV = Lmin_PVS Prob(IPO multiple is less than the minimum peer group multiple)	
	(1)	(2)	(3)	(4)	(5)	(6)
MeanPeerAQ	0.060	0.374***	-0.258***	-0.365***	0.394***	0.052
	(0.97)	(5.25)	(-4.42)	(-5.70)	(3.93)	(0.49)
MeanPeerSim	-0.739***	-0.201	3.032***	2.829***	-0.038	-0.623*
	(-3.47)	(-1.02)	(6.84)	(5.87)	(-0.11)	(-1.83)
*MeanPeerAQ * MeanPeerSim*	0.830**	0.473	0.979***	0.921***	-0.647	-0.104
	(2.30)	(1.46)	(2.88)	(2.63)	(-1.08)	(-0.19)
UnderwriterRank		0.466***		-0.329***		-0.337***
		(6.78)		(-5.18)		(-3.33)
Ln_Assets		-1.003***		0.356***		0.806***
		(-10.35)		(4.31)		(6.26)
Vcap		0.085		-0.252**		0.599***
		(0.74)		(-2.37)		(3.24)
Ln_Age		-0.403***		0.226***		0.199**
		(-6.46)		(4.12)		(2.26)
Tech		-0.057		0.166		-0.677***
		(-0.47)		(1.48)		(-3.23)
Internet		0.358		-0.075		-1.867*
		(1.40)		(-0.31)		(-1.78)
N	2262	2245	2262	2245	2204	2165
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.008	0.107	0.035	0.063	0.022	0.102

Table 7, Panel B: Logistic likelihood of IPO P/EBITDA multiple relative to peer group P/EBITDA multiples

	DV = Gmax_PVE Prob(IPO multiple is greater than the maximum peer group multiple)		DV = WithinRange_PVE Prob(IPO multiple is between the min and max peer group multiples)		DV = Lmin_PVE Prob(IPO multiple is less than the minimum peer group multiple)	
	(1)	(2)	(3)	(4)	(5)	(6)
MeanPeerAQ	-0.048	0.242***	-0.109	-0.161**	0.241***	-0.095
	(-0.81)	(3.68)	(-1.64)	(-2.24)	(2.69)	(-0.99)
MeanPeerSim	-1.770***	-1.286***	4.335***	4.852***	0.136	-0.451
	(-6.10)	(-4.43)	(7.65)	(7.40)	(0.40)	(-1.28)
*MeanPeerAQ * MeanPeerSim*	2.680***	2.416***	-1.231*	-1.366*	-0.919	-0.387
	(5.28)	(4.73)	(-1.83)	(-1.95)	(-1.53)	(-0.65)
UnderwriterRank		0.365***		-0.248***		-0.306***
		(5.83)		(-4.02)		(-3.34)
Ln_Assets		-0.740***		0.077		0.859***
		(-9.50)		(0.98)		(7.49)
Vcap		0.157		-0.334***		0.511***
		(1.49)		(-3.24)		(3.15)
Ln_Age		-0.367***		0.200***		0.212***
		(-6.40)		(3.78)		(2.73)
Tech		0.125		0.028		-0.499***
		(1.14)		(0.26)		(-2.80)
Internet		0.288		-0.107		-0.743
		(1.27)		(-0.45)		(-1.34)
N	2262	2245	2262	2245	2226	2210
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.021	0.100	0.041	0.062	0.011	0.090

Table 8: Additional Analysis - Post-issue Returns

This table reports statistics of for three different post-IPO returns of IPO firms including 12 month buy-and-hold returns, 24 month buy-and-hold returns, and first day returns. Data are primarily partitioned by *MeanPeerAQ*, representing the average abnormal accruals of the peer group, and secondarily by *MeanPeerSim*, measuring the degree of similarity of the IPO to its peer group. The variables are partitioned above and below the median for the sample. Buy-and-hold returns are the simple return measured as the percentage difference between the monthly closing price either 12 or 24 months after the issuance and the IPO offer price on the date of the issuance. First-day returns is the percentage difference between the closing price on the first day of trading and the IPO offer price on the date of the issuance. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. t-statistics are in parentheses. Variables are defined in detail in Appendix A.

		12 Month Buy-and-Hold				24 Month Buy-and-Hold				First-day Returns			
		N	Mdn	Mean	Std Dev	N	Mdn	Mean	Std Dev	N	Mdn	Mean	Std Dev
High *MeanPeerAQ*		1509	0.03	0.19	0.75	1403	-0.09	0.12	0.87	1522	0.07	0.14	0.26
Low *MeanPeerAQ*		1402	0.08	0.24	0.80	1298	0.02	0.27	1.07	1419	0.09	0.17	0.31
Total		2911	0.05	0.21	0.77	2701	-0.04	0.19	0.97	2941	0.08	0.15	0.29
		ratio = Std Dev(High *MeanPeerAQ*) / Std Dev(Low *MeanPeerAQ*)											
		Ho: ratio = 1											
				f =	0.65			f =	0.88				
				Pr(F < f) =	0.02 **			Pr(F < f) =	0.00 ***				
MeanPeerAQ	*MeanPeerSim*												
High	High	742	0.07	0.25	0.80	691	0.03	0.22	0.87	751	0.06	0.13	0.28
High	Low	691	0.01	0.16	0.73	636	-0.19	0.05	0.88	695	0.07	0.15	0.25
Low	High	679	0.15	0.27	0.76	638	0.10	0.26	0.93	686	0.08	0.14	0.24
Low	Low	723	0.02	0.21	0.83	660	-0.09	0.28	1.19	733	0.10	0.20	0.36
	Total	2835	0.05	0.21	0.77	2625	-0.04	0.19	0.97	2865	0.08	0.15	0.29

Table 9: Additional Analysis - Peer Group Value Relevance and Timeliness

This table presents multivariate results of regressions of IPO relative valuation, as measured by P/V Ratios from Purnanandam Swaminathn (2004), on measures of the similarity of the IPO's closest peer group to the IPO and the mean value relevance and earnings timeliness of the IPO's closest peer group. Variables are defined in Appendix A. All continuous variables are standardized. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. t-statistics are in parentheses.

	DV = PVS_Mdn				DV = PVE_Mdn			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.115	-0.127	-0.112	-0.087	-0.131	-0.135	-0.127	-0.115
	(-0.66)	(-0.73)	(-0.64)	(-0.50)	(-0.72)	(-0.75)	(-0.70)	(-0.64)
MeanPeerVR	0.029	0.039**			0.050**	0.068***		
	(1.48)	(2.02)			(2.48)	(3.41)		
MeanPeerTime			0.028	0.034*			0.017	0.030
			(1.44)	(1.82)			(0.87)	(1.50)
MeanPeerSim	-0.357***	-0.667***	-0.352***	-0.709***	-0.370***	-0.772***	-0.368***	-0.892***
	(-6.02)	(-9.41)	(-5.96)	(-9.50)	(-5.87)	(-10.31)	(-5.85)	(-9.61)
*MeanPeerVR * MeanPeerSim*		-0.468***				-0.636***		
		(-7.79)				(-9.59)		
*MeanPeerTime * MeanPeerSim*				-0.329***				-0.418***
				(-7.69)				(-7.61)
UnderwriterRank	0.113***	0.121***	0.113***	0.128***	0.056**	0.066***	0.053**	0.070***
	(4.55)	(4.90)	(4.51)	(5.16)	(2.16)	(2.61)	(2.04)	(2.69)
Ln_Assets	-0.206***	-0.190***	-0.209***	-0.192***	-0.071**	-0.051	-0.070**	-0.044
	(-6.63)	(-6.16)	(-6.67)	(-6.18)	(-2.18)	(-1.60)	(-2.14)	(-1.36)
Vcap	0.107**	0.112***	0.105**	0.111***	0.064	0.071	0.065	0.075*
	(2.50)	(2.65)	(2.46)	(2.63)	(1.45)	(1.62)	(1.45)	(1.70)
Ln_Age	-0.071***	-0.065***	-0.073***	-0.065***	-0.065***	-0.056**	-0.066***	-0.056**
	(-3.30)	(-3.07)	(-3.38)	(-3.05)	(-2.91)	(-2.57)	(-2.94)	(-2.53)
Tech	-0.021	-0.019	-0.022	-0.024	0.054	0.055	0.054	0.051
	(-0.29)	(-0.26)	(-0.30)	(-0.33)	(0.70)	(0.73)	(0.70)	(0.67)
Internet	0.536***	0.520***	0.532***	0.515***	0.073	0.052	0.064	0.042
	(5.09)	(4.99)	(5.05)	(4.94)	(0.67)	(0.48)	(0.58)	(0.38)
N	2751	2751	2748	2748	2748	2748	2745	2745
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.095	0.115	0.096	0.115	0.045	0.077	0.044	0.064

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