

THE INFLUENCE OF PRIOR ISSUER-UNDERWRITER RELATIONSHIPS ON UNDERPRICING IN EQUITY CARVE-OUTS

Corresponding author: Julian Gabler, julian.gabler@student.unisg.ch

ABSTRACT

While most IPO underpricing research focuses on information asymmetries between the issuer and investors, this study emphasizes the importance of the issuer-underwriter relationship due to the prevalent firm commitment structure of major US offerings. Drawing on social exchange theory and agency theory, we argue and find that prior interactions between the issuer and the underwriter lead to lower underpricing by reducing information asymmetries and lowering the inclination for opportunistic behavior. We further examine how the relationship between prior interactions and underpricing changes in contexts of large offerings in which there is much to gain from opportunistic underpricing by the underwriter, and in contexts of low underpricing in the IPO market so that opportunistic underpricing becomes easier to detect. Results from our empirical analysis of 202 equity carve-outs conducted on US stock exchanges between 1990 and 2010 suggest that in contexts of large offerings and low average underpricing in the IPO market, prior trustful interactions gain in importance, leading to increasingly lower levels of underpricing. Our study contributes to the IPO underpricing literature by identifying prior parent firm-underwriter relationships as a determinant of underpricing in equity carve-outs. Furthermore, our study contributes to divestiture performance research by highlighting the critical role of a well-connected parent firm on divestiture success.

Keywords: underpricing, equity carve-outs, agency theory

INTRODUCTION

In the course of initial public offerings (IPOs), a surprising phenomenon occurs on the first trading day of newly listed issues: Returns are substantially above zero, averaging 18.8 percent compared to an average daily market return of only 0.05 percent for the US from 1980 to 2001 (Ritter & Welch, 2002). For the more recent period of 2000 to 2005, Engelen and van Essen (2010) observe similar average first day returns of 21.1 percent. These positive first day returns are termed “underpricing” since they can be interpreted as the initial share offer price being set too low (Ibbotson, 1975).

One of the primary explanations for IPO underpricing in the management and finance literatures is that underpricing results from information asymmetries between the central exchange partners in the IPO process (e.g., Ljungqvist, 2007). The three central actors in an IPO are the issuer (i.e., the company going public), the investment bank acting as the lead underwriter of the new issue, and the investors buying shares in the offering (Pollock, Porac & Wade, 2004). For the purpose of our study and its contribution, it is critical to understand that most studies explaining underpricing with information asymmetries have focused on information asymmetries between the issuer and the investors buying the shares of the issue (cf. the reviews of Ritter & Welch, 2002, and Daily, Certo, Dalton & Roengpitya, 2003). This is surprising since virtually all major IPOs in the US are conducted on a firm commitment basis. (Dunbar, 1998; Lowry, Officer & Schwert, 2010; Jagannathan, Jirnyi & Sherman, 2010). The firm commitment structure involves that the underwriter first purchases all shares offered in the prospective IPO from the issuer and then subsequently sells them to the investor community (so called public placement) (Benveniste & Spindt, 1989; Sherman, 1992). Thus, shares are sold from the issuer to the underwriter and then passed on from there to the investors,

instead of being directly sold from the issuer to the IPO investors. The prevalence of firm-commitment IPOs implies that when trying to explain the occurrence of underpricing from an information processing perspective, the extent of information asymmetries between the issuing firm and the underwriter becomes of primary interest (rather than the information asymmetries between issuer and investors).

Another major implication of the firm commitment structure is that the underwriter is interested in underpricing the issue to minimize its risk exposure and to facilitate its efforts to pass on the shares to investors. Clearly, less marketing efforts have to be expended on parts of the underwriter if the underpricing is substantial. In contrast, underpricing translates to “money left on the table” for the issuer (Loughran & Ritter, 2002; Derrien, 2005). The exchange relationship and the associated information asymmetries between underwriter and issuer thus becomes of crucial importance. Consequently, we make the exchange relationship between underwriter and issuer the focus of our theoretical argument and empirical analysis.

The emphasis on the exchange relationship between issuer and underwriter seems most relevant for explaining underpricing given the firm commitment transaction structure of IPOs. Additionally, the focus on this exchange relationship is intriguing given that it is characterized by bilateral rather than unilateral information (dis)advantages. On the one hand, the issuer is at an informational advantage over the underwriter regarding the specific characteristics of the company going public. As a result of this information disadvantage on part of the underwriter, agency theory suggests that the underwriter will insist on a higher risk premium leading to greater underpricing (Hughes, Liu, & Liu, 2007; Lambert, Leuz, & Verrecchia, 2012). On the other hand, the underwriter possesses superior knowledge about actual market demand, about interested investor clienteles’ willingness to pay, or about the favorable timing of the placement.

These knowledge and information advantages allow the underwriter to opportunistically underprice an issue to facilitate the sale of shares to investors and to maximize its own returns from the offering (Baron, 1982).

Collectively, information asymmetries in the exchange relationship between issuer and underwriter thus generally seems to induce underpricing. In this paper, however, we extend research on underpricing not only by focusing on the key information asymmetries between issuer and underwriter (rather than between issuer and investors) but also by considering the “history” of issuer-underwriter exchanges. Drawing on social exchange theory and agency theory, we explore whether repeated interactions between the issuer and the underwriter lead to lower levels of underpricing. Social exchange theory and agency theory suggest that repeated exchanges increase information sharing and trust (Uzzi, 1996), enable more effective monitoring (Dore, 1983), and reduce the likelihood of opportunistic behavior (Uzzi, 1997). In the context of IPOs, repeated prior interactions between issuer and underwriter in other major capital market transactions (i.e., acquisitions, divestitures) create familiarity and help build trust leading to increased information sharing. Among others, this reduces the underwriter’s request for an extensive risk premium, lowering underpricing. Moreover, repeated interactions create bonds between the exchange partners and their interest in preserving ties for the future becomes greater. As a consequence, the likelihood for opportunistic behavior on parts of the underwriter decreases as the value of future exchanges is considered.

Finally, we consider important moderating effects on the prior interaction-underpricing relationship. Agency and social exchange theory suggest that the likelihood to behave opportunistically in the face of information asymmetries is contingent on the “stakes” as well as on the risk of detection (e.g., Datar & Alles, 1999). Thus, we also examine how the relationship between prior interactions and underpricing changes in

contexts of large offerings in which there is much to gain from opportunistic underpricing by the underwriter, and in contexts of low underpricing in the IPO market so that opportunistic underpricing becomes easier to detect.

We situate our theoretical and empirical analysis in the context of equity carve-outs. Equity carve-outs are IPOs which involve the listing of a unit or subsidiary of mostly large multi-business firms (Schipper & Smith, 1986).

Our study contributes to existing research in several ways. First, we refine our understanding of the influence information asymmetries on underpricing by focusing on information asymmetries between the issuer and the underwriter (rather than between the issuer and investors). We thereby acknowledge the most prevalent structure of IPOs in form of a firm commitment deal structure. More importantly, we consider prior interactions between the issuer and the underwriter as a new explanation for underpricing of equity carve-outs. While previous studies on underpricing in equity carve-outs predominantly focused on subsidiary characteristics (Prezas, Tarimeilar & Vasudevan, 2000; Hogan & Olson, 2004), we present an explanation stressing the pattern of interactions between issuer and underwriter as a determinant for underpricing. In doing, our work complements prior work on the prominent role and ties of underwriters in IPOs. Pollock, Porac and Wade (2004) and Arthurs, Hoskisson, Busenitz, and Johnson (2008), for instance, report that institutional investors and venture capital funds benefit from having ties to the underwriter based on joint offerings prior to the focal IPO. Our findings provide even stronger evidence for the impact of such ties. Unlike venture capital funds and institutional investors which both prefer higher underpricing like the underwriter, the issuing parent company in an equity carve-out prefers lower underpricing to maximize their proceeds from the offering. Thus, the underwriter accommodates not only interests in line with its own due to having a trustful relationship as in the case of venture capital

funds and institutional investors, but also opposing interests as in the case of the parent companies in our study.

Moreover, our study contributes to literature on divestiture outcomes (cf. Brauer, 2006; Lee & Madhavan, 2010). Specifically, we identify ties to underwriters as a valuable lever for parent companies to increase returns from equity carve-outs. This finding adds to prior divestiture research exploring the performance outcomes of equity carve-outs and the performance differences between the various modes of divestiture (i.e., sell-offs, spin-offs, carve-outs) (e.g., Hulburt, Miles, & Woolridge, 2002; Slovin, Sushka, & Ferraro, 1995; Vijh, 2002).

The remainder of this paper is organized as follows. In the next section, we give an overview of the IPO process and review prior research on the influence of information asymmetries on underpricing. Based on our critical discussion of prior literature, we then develop our hypotheses regarding the influence of prior exchange relationships between issuer and underwriter on underpricing in equity carve-outs. Subsequently, we present our empirical design and discuss the results of our empirical analysis. We conclude with an outline of the study's implications, its limitations, and resulting avenues for further research.

BACKGROUND AND HYPOTHESES

The IPO process and IPO underpricing

When a previously unlisted company intends to go public, it has to undergo an extensive and demanding process to become listed on a US stock exchange (Pollock, Porac & Wade, 2004). Therefore, the company hires professional advisors such as investment banks, auditors, and lawyers as assistance for preparing the initial public offering (IPO). The process of going public starts with drafting and filing a registration statement with the SEC, followed by preparing and distributing a preliminary prospectus to potential investors. This preliminary prospectus contains important information for prospective investors regarding the offering, but leaves out yet to be determined details as in particular the final initial offering price and the number of shares being sold. After filing the preliminary prospectus, the top management of the prospective IPO firm and its advisors conduct a roadshow to meet with potential investors and answer their questions regarding the information in the prospectus. Meanwhile, the lead investment bank contacts potential investors to determine an initial offering price and estimate demand for the stock. Finally, shortly before the intended offering the prospective IPO company files an amendment to the preliminary prospectus revealing – among other information – the initial offering price, the amount of shares being offered, and the effective date of the offering (Daily, Certo, Dalton & Roengpitya, 2003).

As the going public process culminates in the IPO, an empirically well-documented phenomenon occurs on the first trading day of the new issue: The share price typically increases considerably (Ibbotson, 1975; Beatty & Ritter, 1986). Research has termed these rising share prices on the first day of a new issue “underpricing” since they can be interpreted as the initial offering price being set too low (Ljungqvist, 2007). Underpricing

of IPOs has been consistently observed in the US as well as non-US contexts (Judge et al., 2015). Specifically, IPOs in the US were reported to be, on average, underpriced by 18.8 percent between 1980 and 2001 (Ritter & Welch, 2002). Similarly, Engelen and van Essen (2010) found an average underpricing of 21.1 percent in the US for time period 2000 to 2005. Underpricing of this magnitude is striking since it represents a discount to the fair value of a stock (Leitterstorf & Rau, 2014). For the company going public as well as its pre-IPO owners, underpricing translates to foregone proceeds in the form of “money being left on the table” (Loughran & Ritter, 2002). In contrast, investors participating in the offering profit from rising share prices on the first trading day (Krigman, Shaw & Womack, 1999). Thus, underpricing can be perceived as a wealth transfer from the company and its pre-IPO owners to the IPO investors (Ljungqvist, 2007).

Information asymmetries and IPO underpricing

The phenomenon of underpricing and its origins have been of considerable interest to both strategic management and finance scholars for many years now (see Daily, Certo, Dalton & Roengpitya, 2003; Certo, Holcomb & Holmes, 2009 for a discussion in the management literature; see Ritter & Welch, 2002; Ljungqvist, 2007 for reviews in the finance literature). One of the primary explanations for IPO underpricing in the management and finance literatures is that underpricing results from information asymmetries between the exchange partners in the IPO process (e.g., Rock, 1986; Beatty & Ritter, 1986; Welch, 1989; 1992; Loughran & Ritter 2002; 2004). In their meta-study of underpricing research in the management literature, Daily, Certo, Dalton, and Roengpitya (2003, p. 275) thus concisely state that “at the root of underpricing is information asymmetry”.

Information asymmetries exist between the three key exchange partners in the IPO process: the issuer (i.e., the company going public), the underwriter (i.e., the investment bank administrating the IPO process), and the investors purchasing shares in the IPO (Ljungqvist, 2007). All explanations for IPO underpricing based on information asymmetries have in common that the degree of asymmetric information is expected to be positively related to the magnitude of underpricing (Ritter & Welch, 2002). A main argument in the literature has been that investors face substantial information asymmetries vis-à-vis the issuing firm making it difficult to tell “high-quality offerings” apart from “low-quality offerings”. To attract investors but also in order to “leave a good taste in investors’ mouths so that future underwritings from the same issuer could be sold at attractive prices” (Ibbotson, 1975: 264), issuers have been argued to underprice. Research argues and shows, however, that only high-quality issuers are subsequently able to recoup the initial underpricing in the form of future issuing activities (Welch, 1989), or in the form of more favorable market reactions to later dividend announcements (Allen & Faulhaber, 1989).

For the purpose of our study and its contribution, it is critical to understand that most studies explaining underpricing with information asymmetries have focused on information asymmetries between the issuer and the investors buying the shares of the issue (e.g., Benveniste & Spindt, 1989; Benveniste & Wilhelm, 1990; Welch, 1992). Though the information asymmetries between the issuer and investors are undisputed, the focus on these two exchange partners in IPOs fails to accurately reflect how IPOs are typically processed. Major IPOs on US stock exchanges are virtually always conducted on a firm commitment basis (Dunbar, 1998; Lowry, Officer & Schwert, 2010; Jagannathan, Jirnyi & Sherman, 2010). This means that the underwriter first purchases all shares offered in the prospective IPO from the issuer and then subsequently sells them

to the investor community (so called public placement) (Benveniste & Spindt, 1989; Sherman, 1992). Thus, shares are sold from the issuer to the underwriter and then passed on from there to the investors, instead of being directly sold from the issuer to the IPO investors. The prevalence of firm-commitment IPOs implies that when trying to explain the occurrence of underpricing from an information processing perspective, the extent of information asymmetries between the issuing firm and the underwriter becomes of primary interest (rather than the information asymmetries between issuer and investors). Consequently, we make information asymmetries between the issuer and the underwriter the exclusive focus of our theoretical reasoning and empirical analysis.

The second major assumption of most prior IPO research on the link between information asymmetries and underpricing has been that information advantages (disadvantages) are one-sided. Generally, the issuer is expected to be more informed about the true market potential of the new issue than the investors purchasing shares as part of the offering (Welch, 1989; Allen & Faulhaber, 1989). Assuming that an actor is universally more informed than another across all stages of the complex IPO process, however, seems overly simplistic. More realistically, actors possess informational advantages only regarding a specific aspect of the IPO, while knowing less than other actors about alternative aspects. Specifically, in the exchange between the issuer and the underwriter, the issuer likely knows more than the underwriter about the nuanced characteristics and intrinsic value of the to-be issued subsidiary (e.g., through proprietary knowledge about internal projects or non-obvious accounting practices). Though a certain amount of financial and market data is obviously provided to the underwriter to create the prospectus, the fact that the unit has been part of the multi-business firm without segment reporting provides an opaque information environment (Brauer &

Wiersema, 2012)¹. As a result of the opaque information environment, the underwriter faces informational disadvantage regarding the specific characteristics of the carved-out assets. Thus, the underwriter is likely to insist on a risk premium. This risk premium takes the form of a low offering price since an unreasonably high issue price in a firm commitment IPO means that the underwriter – whose own capital is already fully invested and tied up in the issue – faces the substantial risk of not being able to sell on the shares to public investors.

While being at an informational disadvantage regarding specific characteristics of the assets to be issued, at the same time the underwriter also very likely holds information advantages regarding market demand and chances for placing the shares at a certain price in the market. Specifically, due to its much more frequent engagements in IPO processes across different industries the underwriter reasonably possesses an informational advantage with respect to actual investor demand for a particular type of asset, the type of investor most interested in the offering, and the most favorable timing of the placement (Pollock, Porac & Wade, 2004). This information advantage creates the opportunity for opportunistic behavior on part of the underwriter by greater underpricing the issue to be better able to sell shares in the offering as well as to extend favors to institutional investors which can realize short-term benefits from the allocation of underpriced shares to their portfolios (Pollock, 2004).

¹ Brauer and Wiersema (2012) argue that the opaqueness mainly results from the fact that the financial figures of the carved out unit are consolidated in the parent firm's financial statement (Nanda & Narayanan, 1999). The lack of transparency regarding financial key indicators (i.e., operational cash flow, EBIT, sales) of the carved out unit precludes the use of standard valuation techniques (i.e., comparable transactions analysis) to infer the fair value of the unit.

Influence of prior issuer-underwriter relationships on underpricing

In the preceding sections, we reviewed prior IPO literature and discussed how information asymmetries in the issuer-underwriter relationship induce underpricing. Prior discussions on underpricing of “ordinary” IPOs and equity carve-outs, however, have widely abstracted from the fact that issuer and underwriter may hold prior ties. This is particularly likely for large issuing parent firms since these firms frequently engage in other major capital market transactions (i.e., mergers and acquisitions, sell-offs) which involve investment banks as advisors. In the following, we reason that prior interactions between the issuer and the underwriter lower the level of underpricing by reducing information asymmetries and by reducing the overall inclination of the underwriter to engage in opportunistic underpricing in order not to jeopardize future relations with the large issuing parent firm.

Social exchange theory and agency theory suggest that repeat interactions between the underwriter and the issuer provide a remedy for the lack of information sharing and opportunistic behavior due to information asymmetries (Gulati, 1995; Uzzi, 1996, 1999). If two actors engage in repeat exchanges, they move over time from at arm’s-length transactions to a trustful relationship (Lee, 2013). Vanneste, Puranam, and Kretschmer (2012) claim that this transition occurs because actors learn during repeat interactions whether the other is trustworthy, they come to identify with each other, and they internalize the other’s preferences. Further, Rousseau, Sitkin, Burt, and Camerer (1998, p. 395) characterize such a trustful relationship as being in “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another”. As actors in a trustful relationship are willing to act beyond their self-interests (Dore, 1983; Uzzi, 1997), they refrain from behaving opportunistically (Uzzi, 1999).

For the IPO context, this implies that repeat interactions increase information sharing between the issuing parent firm and the underwriter. As a consequence of the less opaque information environment, the underwriter is not able to charge an excessive risk premium which would lead to significant underpricing of the issue. Moreover, the fact that repeat interactions lead to the emergence of trustful relationships, the concern for endangering future exchanges with the parent firm by excessively underpricing the issue is likely to become a central consideration for the underwriter. In the issuing process involving units or subsidiaries of large, multi-business firms this consideration figures even more prominently (Benveniste, Fu, Seguin & Yu, 2008). Large, multi-business firms represent the most important clientele for advisory companies. This is also because these large firms are the most active firms when it comes to conducting mergers and acquisitions and other forms of divestiture (i.e., sell-offs, spin-offs). Similar to IPOs, firms usually engage advisory firms to complete these portfolio transactions (Hayward, 2002, 2003). This reasoning about the concern for future exchanges is supported by Ljungqvist and Wilhelm's (2005) observation that companies retain the underwriter of their IPO for subsequent seasoned equity offerings if they were satisfied with the underwriter's services during the IPO process.

In summary, we argue that prior repeated interactions between issuer and underwriter lead to reduced information asymmetries and thus lower risk premia, greater trust (accompanied with more open and better information sharing), and a heightened concern for preserving future relations, resulting in lower levels of underpricing. Thus, we hypothesize:

Hypothesis 1: The number of prior interactions between issuer and underwriter is negatively related to underpricing in equity carve-outs.

Moderating influences of offering size and IPO market environment

For establishing our main hypothesis, we argued that repeated, prior interactions between the underwriter and the issuing parent firm limit the risks for the parent firm that the underwriter opportunistically underprices the issue, resulting in an at least temporary wealth transfer from the issuing parent company to investors. Agency and social exchange theory further suggest that the likelihood to behave opportunistically in the face of information asymmetries is contingent on the “stakes” associated with the opportunistic behavior. The “stakes” refer to the benefits of the opportunistic actor as well as to the costs for the deprived exchange partner. Agency theory further predicts that monitoring efforts of an actor depend on its stake in a transaction; the smaller it is, the less effort the actor will display (Arthurs, Hoskisson, Busenitz & Johnson, 2008). Because monitoring is generally costly since it requires directed effort and thus the commitment of resources (Williamson, 1987). Hence, actors need to have sufficient incentive to exert monitoring (Maug, 1998). In line with this argument from agency theory, Ljungqvist and Wilhelm (2003) observe that IPO underpricing is negatively related to the pre-IPO share ownership of inside directors and officers in the company going public since these actors closely monitor underwriters’ pricing behavior to protect the value of their stakes.

Since managerial attention to exert monitoring is valuable and limited (D'Aveni & MacMillan, 1990), corporate managers of the issuing parent company are likely to direct particular high levels of attention to equity carve-outs of significant importance. Importance to the parent company in turn is largely determined by the size of the equity carve-out relative to the size of the parent firm. Aside from the greater strategic importance which is commonly associated with units of larger size, greater attention allocation can be assumed simply because the absolute foregone proceeds for the parent

firm resulting from underpricing are dramatically higher for larger offerings (Vijh, 2002). Instead of just relying on better knowledge about and familiarity with the underwriter because of repeated, prior exchanges, in context of very large offerings the issuing parent company is likely to complement friendly regular exchanges with monitoring efforts to ensure sufficient returns from the IPO.

Given the expected greater monitoring effort by the issuing parent in the context of large offerings, the underwriter also runs a greater risk when opportunistically underpricing an equity carve-out. As outlined above, underwriters honor trustful relationships with a parent company to ensure their continued engagement as advisors in future deals by the parent company. Thus, we expect underwriters with ties to the parent company to increasingly refrain from opportunistic underpricing the larger the relative offering size. The bonds between the underwriter and the issuing parent company are also likely to be considerably strengthened when a “mega” IPO is successfully staged by the underwriter. Breaches of trusts in large transactions on the other hand are likely to resonate very negatively for the future (Rousseau, Sitkin, Burt, & Camerer, 1998).

In summary, we hypothesize that relative offering size strengthens the influence of prior parent company-underwriter interactions on underpricing. With increasing relative offering size parent companies are expected to increasingly use their ties to underwriters for monitoring their price setting, while underwriters are expected to become even more reluctant to jeopardize the trustful relationship by opportunistically underpricing an offering.

Hypothesis 2: Relative offering size positively moderates the relationship between the number of prior issuer-underwriter interactions and equity carve-out underpricing.

IPO market environment

Agency and social exchange theory suggest that the likelihood to behave opportunistically in the face of information asymmetries is contingent not only on the “stakes” but also on the risk of detection as well as the opportunity to “hide” or cover up opportunistic behavior (Jensen & Meckling, 1976). Both the ability of the underwriter to conceal its opportunistic underpricing of the issue as well as the ability of the parent firm to detect opportunistic underpricing is dependent on the reference points available to the issuing parent firm. Concurrent market activity – in particular the average level of underpricing in the IPO market - provides for the most likely reference point.

Prior research has shown that IPO markets exhibit severe cyclicity with respect to average underpricing and total market volume (Ljungqvist, 2007). For instance, Loughran and Ritter (2004) find an average underpricing of 65 percent during the “internet bubble” of 1999 to 2000 compared to only 15 percent for the remaining years of the 1990s prior to the bubble. Equity carve-outs display a similar pattern with Hogan and Olson (2004) reporting 48 and 9 percent for the aforementioned periods. Ritter (1984) labels patterns of high average first day returns to new equity offerings as “hot issue markets”. Behavioral IPO research argues that underpricing during periods of “hot issue markets” is predominantly driven by overoptimistic investors (Ljungqvist, Nanda & Singh, 2006). Derrien (2005) finds empirical support for the notion of overoptimistic behavior by investors during time periods of frequent IPO activity by observing that bullish noise traders bid up prices during those periods. Relatedly, Dorn (2009) finds that retail investors in IPOs overpay after periods of high average IPO underpricing. Interestingly, Ritter (1991) reports that the IPOs with the highest underpricing exhibit the worst long-term performance.

Important for our purposes, the average level of underpricing in the IPO market is likely to impact on the nature of the relationship between prior issuer-underwriter interactions and underpricing. We argued that prior interactions decrease the likelihood to engage in opportunistic behavior due to greater mutual trust and the increased interest in preserving relations. The effectiveness of prior exchanges in limiting opportunistic behavior is further increased in environments of low average underpricing because it becomes easier for the trusting partner – in this case the issuer – to detect whether the underwriter misuses this trust. Also in times of fewer IPO market activity and lower levels of underpricing, underwriters can be expected to have considerably greater discretion over the degree of underpricing due to their pivotal role in the going public process and their knowledge about the “fair market value” of a new issue (Baron, 1982). Not only the issuer but also the underwriter are aware of this greater detection risks. The issue that prior interactions increase the downside of breaking up these established ties paired with the greater risk of detection thus make underpricing less likely in low underpricing IPO environments.

In high underpricing IPO environments, on the other hand, prior interactions are likely to be less effective in leading to significantly lower levels of underpricing for the focal IPO. This is due to the fact that market dynamics overpower the strength of the established ties between issuer and underwriter. Even if the underwriter means well, and likes to serve its client in the best possible way, investor demand for considerable underpricing of the issue leaves the underwriter with no option than to assure placement by also opting for a significant underpricing of the focal issue. The underwriter is also likely to find less fault with significantly underpricing the issue given the general market dynamics. Also when underpricing seems predominantly the result of market herding behavior rather than deliberate underwriter opportunistic behavior, trust between the

parent and underwriter to maintain cooperation in future transactions remains untarnished by underpricing.

In sum, we thus expect prior interactions between the issuing parent firm and the underwriter to have greater influence on underpricing during market periods characterized by low average underpricing than during “hot issue periods” characterized by high average underpricing. Consequently, we hypothesize:

Hypothesis 3: The average level of underpricing in the IPO market negatively moderates the relationship between prior issuer-underwriter interactions and equity carve-out underpricing.

METHODS

Sample and data collection

For our empirical analysis, we draw on the new issues database of the Securities Data Corporation (SDC) and collect data on equity carve-outs that occurred on the New York Stock Exchange (NYSE), the American Stock Exchange (Amex), and the NASDAQ between 1990 and 2010. To ensure sufficient data availability and reliability, we only consider equity carve-outs which have been completed by parent companies which are publicly traded on one of the aforementioned US stock exchanges. In addition, we eliminate multiple filings, which typically occur in the SDC database when an issue is sold both in the US and another country (Ghosh, Petrova, Feng & Pattanapanchai, 2012). We furthermore eliminate offerings other than public issues of common stock as for example stocks with warrants to rule out price distortions from the attached derivatives (Hogan & Olson, 2004). Our final sample includes 202 equity carve-outs.

We obtain data on acquisitions and divestitures from the Thomson ONE database. Accounting and financial market data are retrieved from Worldscope. Data on underwriter reputation and IPO market volume stem from Ritter's IPO database², which provides updated data from Loughran and Ritter (2002, 2004).

Dependent variable

Underpricing. Underpricing is the first day trading return of a new issue (in percent). Following broad consensus in prior research (e.g., Ritter & Welch, 2002; Pollock, 2004; Ljungqvist, 2007; Arthurs, Hoskisson, Busenitz & Johnson, 2008; Certo, Holcomb & Holmes, 2009), underpricing is calculated as the first-day closing price

² <http://bear.warrington.ufl.edu/ritter/ipodata.htm>

minus the initial offer price, divided by the initial offer price. We multiply this score with 100 to generate a percentage value.

Explanatory variables

Number of prior parent-underwriter interactions. To assess the extent of prior interactions between the parent company and the underwriter, we use the number of all business portfolio related transactions (i.e., acquisitions, divestitures) of the parent firm in which the underwriter of the focal equity carve-out acted as a lead advisor to the parent firm. From the perspective of the parent firm, acquisitions and divestitures are of key long-term strategic importance. As such, they receive considerable top management attention. According to Lee (2013), the firm's management tends to keep the same advisor for these deals. Hence, a close group of key people at both the parent firm and the underwriter frequently interact when planning acquisitions and divestitures. Consequently, these transactions are likely to contribute to the development of a trustful relationship. Following Arthurs, Hoskisson, Busenitz, and Johnson (2008), we count these deals over the last three years prior to the focal equity carve-out. For robustness purposes, we also used several alternative operationalizations to assess the frequency of prior underwriter-parent firm exchanges. First, we counted the number of prior deals over a five year period instead of three years. Second, we used the log of the total number of ties over three as well as five years. Last, we construct dummy variables (coded 1 if ties exist, 0 otherwise) for both the three and five year period.

Relative offering size. Following prior research (Ghosh, Petrova, Feng, and Pattanapanchai (2012)), we use relative offering size to assess the importance of the issue for the parent company. We calculate relative offering size as the ratio of total offering size divided by the total assets of the parent company at the end of the quarter preceding

the equity carve-out. Since prior research (e.g., Allen and McConnell, 1998; Vijh, 2002) found a direct positive influence of relative offering size on the parent company's stock when announcing the equity carve-out, we also use relative offering size as a standard control variable.

IPO environment. Previous research observed that both the total number of offerings as well as average underpricing are affected by market cyclicality (Loughran & Ritter, 2004; Hogan & Olson, 2004; Ghosh, Petrova, Feng & Pattanapanchai, 2012). In “hot issue markets” characterized by a large number of offerings, average underpricing has been found to be high while periods with few offerings have been found to be associated with significantly lower average underpricing. Therefore, we use the average level of underpricing of all IPOs in the US in the twelve months preceding the focal equity carve-out to account for the condition IPO market environment.

Control variables

We include two major sets of control variables in our regression models. The first set of controls captures characteristics of the issuing parent company, while the second set of controls accounts for deal characteristics which have been argued and found to affect underpricing.

Parent firm performance. Equity carve-outs motivated by poor parent firm financial performance have been found to receive a different market reaction than offerings by financially well performing firms (Allen & McConnell, 1998). Following Allen and McConnell (1998), we assess *parent firm financial performance using both an accounting and market-based performance measure*. *Firm accounting performance* is assessed using the parent firm's return on assets (ROA) in the year prior to the equity carve-out. Return on assets is calculated as earnings before interest and taxes (EBIT in

the year preceding the carve-out) divided by total assets at the end of the quarter preceding the equity carve-out. For parent firm market performance, we use the market-to-book ratio which is the parent company's market value of common equity divided by the book value of common equity measured at the last quarter preceding the offering.

Parent firm size. Larger companies have been argued to be perceived as less risky for investors (Daily, Certo, Dalton & Roengpitya, 2003). In line with prior IPO research, we use the *parent firm's market capitalization* (in billions of dollars) at the announcement of the equity carve-out as a proxy for parent firm size.

The second set of controls refers to deal characteristics.

Underwriter prestige. Theoretical predictions as well as empirical results for the influence of underwriter prestige on equity carve-out underpricing are ambiguous, with studies reporting a negative (Prezas, Tarimcilar & Vasudevan, 2000; Thompson, 2010), positive (Hogan & Olson, 2004), or no influence (Ghosh, Petrova, Feng & Pattanapanchai, 2012). To assess underwriter prestige we draw on Loughran and Ritter's (2004) revised version of Carter and Manaster's (1990) underwriter ranking. This ranking assigns values ranging from 1.1 (least prestigious) to 9.1 (most prestigious) to each underwriter based on their relative order in Tombstone advertisement announcing offerings. According to this ranking procedure, underwriters with scores above 8 are considered as prestigious. Following Hogan and Olson (2004), we use an *underwriter prestige* dummy variable that equals 1 if the focal equity carve-out's underwriter is prestigious, and 0 otherwise.

Share overhang. Furthermore, we include *share overhang* as a measure of ownership dilution. Following Bradley and Jordan (2002), we calculate share overhang as the ratio of shares retained by the pre-IPO owners to the shares issued for sale in the IPO (i.e., the public float). In an equity carve-out, the parent company is virtually always

the exclusive pre-IPO owner. Since underpricing only affects the shares actually sold in the offering, higher share overhang alleviates the adverse effects of underpricing for pre-IPO owners (Loughran & Ritter, 2004). Thus, as expected Hogan and Olson (2004) as well as Ghosh, Petrova, Feng, and Pattanapanchai (2012) report a positive relationship between share overhang and underpricing.

Fraction of parent firm carved-out. Following Schipper and Smith (1986), we control for the *fraction carved-out* by measuring the percentage of the parent firm's assets being carved-out and established as a separate entity.

Share offer price. Prior research argued that a low offer price per share (in US dollars) is more likely to fluctuate and thus constitutes a proxy for uncertainty (Booth and Chua, 1996; Prezas, Tarimcilar & Vasudevan, 2000). Consequently, we expect the share offer price to be negatively related to underpricing.

Use of proceeds. Following Benveniste, Fu, Seguin & Yu (2008), we control for the use of proceeds of the issuance since different motivations by a parent firm for carving-out a former subsidiary could receive different reactions and thus first day returns by investors. Use of proceeds is coded 1 if the proceeds from the equity carve-out are used for investment and operational improvements, and 0 otherwise.

Relatedness of carved-out unit. We further follow Benveniste et al. (2008) and include a dummy variable for the relatedness of the carved out unit. Carve-outs unrelated to the parent firm's primary industry have a different risk profile than related offerings and thus might experience differing investor reactions. The equity carve-out is perceived as related if the parent company and the subsidiary being carved-out share the same first two-digit SIC code.

Industry background of carved-out unit. Offerings involving units from high-technology industries have been reported to be more severely underpriced due to the

frequently highly speculative nature of the business model (Loughran & Ritter, 2004; Hogan & Olson, 2004). The higher underpricing has been explained by the greater risks associated with high-technology firms. We employ Field and Hanka's (2001) classification scheme for high-technology industries and label an IPO as coming from a high-technology industry background if the issuing unit's first three-digit SIC codes are 357, 367, 369, 382, 384, or 737.

Year dummies. We also use year dummies to control for the effect of different time periods on underpricing.

RESULTS

Descriptive statistics

Table 1 (see appendix) displays descriptive statistics including the means, standard deviations, and correlations for all variables used in our regression models. To test for multicollinearity among our variables, we compute the variation inflation factors (VIFs). With all VIFs below 2 and thus the commonly accepted threshold of 10 (Neter, Wasserman & Kutner, 1985), we believe multicollinearity is not a major issue in our analysis. The equity carve-outs in our study experience an average underpricing of roughly 18 percent for the time period from 1990 to 2010. This level of underpricing corresponds well with the findings by Ghosh, Petrova, Feng, and Pattanapanchai (2012) who also report an average level of underpricing of 18 percent in their study of equity carve-outs completed between 1985 and 2010. Similarly, Thompson (2010) finds an average underpricing of 19 percent for the same period of 1988 to 2006. Descriptive analysis of our empirical data further reveals that, on average, parent companies engage with the same underwriter in roughly five major capital market transactions in the three years prior to the focal equity carve-out. This finding also aligns with prior research on firm-advisory relationships which has suggested that firms and advisory companies often build up persisting ties (Lee, 2013).

Hypotheses testing

To test our hypotheses, we employ ordinary least squared (OLS) regression analysis. Table 2 (see appendix) provides the results of our successive linear regressions. All models include underpricing as the dependent variable. Following Aiken and West (1991), we mean-center the independent and moderator variables prior to calculating the interaction terms to facilitate interpretation of the interaction terms. In addition, we plot graphs for the interaction results to ensure correct interpretation.

Model 1 of Table 2 includes the control variables. We observe parent firm market performance, parent firm size, share overhang, and industry background of carved-out unit to be positively related to underpricing. These findings are consistent with our theoretical predictions as well as the empirical findings of prior literature (Loughran & Ritter, 2004; Hogan & Olson, 2004; Ghosh, Petrova, Feng & Pattanapanchai, 2012).

Hypothesis 1 proposed a negative relationship between the number of prior parent-underwriter interactions and equity carve-out underpricing. As shown in Model 2, the number of prior parent-underwriter interactions variable is found to have a negative and significant relationship with underpricing ($b = -0.75$; $p < 0.05$). Hypothesis 1 thus finds support.

Hypothesis 2 predicted that relative offering size positively moderates the prior interactions-underpricing relationship. Model 3 shows that the interaction between number of prior parent-underwriter interactions and relative offering size is negative and marginally significant ($b = -6.89$; $p < 0.1$). Hypothesis 2 is thus supported by our empirical data. Figure 1 offers a graphical illustration of the effect. As indicated by the differences in slopes, it shows that prior interactions between issuing parent company and underwriter have a stronger effect on underpricing when the offering size and thus its importance are high. Interestingly, Figure 1 (see appendix) also highlights that for

issuing parent companies with a relatively high number of prior interactions with the underwriter a large relative offering size (i.e., one standard deviation above the mean) leads to an overpricing rather than an underpricing of the issue. While this overpricing maximizes proceeds from the equity carve-out for the issuing parent company, it also disappoints investors participating in the offering and thus is potentially associated with reputational damages for the issuing parent company as well as the underwriter in the investor community.

Finally, Hypothesis 3 suggested that the average level of underpricing in the IPO market negatively moderates the prior interactions-underpricing relationship. The respective interaction term in Model 4 is found to be positive and significant ($b = 0.04$; $p < 0.01$). This leads us to accept Hypothesis 3. Figure 2 (see appendix) illustrates that a large number of prior interactions are associated with lower underpricing during times of below average market underpricing. Surprisingly, underpricing is higher in carve-outs with a high number of prior interactions than in offerings with a low number of prior interactions during times of above average market underpricing. This finding, however, can be explained by the fact that periods of high average underpricing are also characterized by a high number of mergers and acquisitions as well as divestitures. Thus, parent companies pursuing lots of deals during hot markets accumulate a high number of prior interactions. Consequently, carve-outs with a high number of prior parent-underwriter interactions are more likely to take place during times of high average underpricing. The significant positive correlation ($r = 0.13$; $p < 0.10$; cf. Table 1) between prior interactions and average underpricing supports this explanation. This selection effect also strengthens our observation that prior parent-underwriter interactions reduce underpricing since there is a systematic bias against observing this relationship.

Model 5 constitutes the full model including both interaction terms. The positive moderating effect of relative offering size on our main relationship is found to become slightly more significant ($b = -8.65$, $p < 0.05$), while the negative moderating influence of average underpricing is found to be highly consistent both in terms of effect size and significance ($b = 0.04$, $p < 0.01$). The results of the full model thus provide additional support for Hypotheses 2 and 3, and the reliability of our empirical results.

DISCUSSION AND CONCLUSION

In prior IPO research, information asymmetries between underwriter and investors have been argued to explain levels of underpricing. The given study qualifies and extends prior IPO research by directing attention to the fact that the most important information asymmetry which has been neglected by prior IPO research is between the *issuing firm* and the *underwriter*. This is because by far the largest fraction of IPOs is conducted on a firm commitment basis. The firm commitment structure involves that the underwriter first purchases all shares offered in the prospective IPO from the issuer and then subsequently sells them to the investor community (so called public placement) (Benveniste & Spindt, 1989; Sherman, 1992). Thus, shares are sold from the issuer to the underwriter and then passed on from there to the investors, instead of being directly sold from the issuer to the IPO investors.

The novel focus on information asymmetries between the issuer and the underwriter then leads us to analyze the influence of the number of prior interactions between parent companies and underwriters on underpricing. This focus is motivated by the dominant proposition in social exchange theory and agency theory that the frequency of interactions between exchange partners helps build trust and thus is an effective means to diminish the negative side-effects associated with information asymmetries. In line with the predictions of social exchange theory and agency theory, we find that frequent, prior interactions between the issuing parent company and the underwriter are associated with lower underpricing, and thus help the parent company to increase its proceeds from the offering.

Agency and social exchange theory further suggest that the likelihood to behave opportunistically in the face of information asymmetries is contingent on the “stakes” as

well as on the opportunity to “hide” or cover up opportunistic behavior (Jensen & Meckling, 1976). We therefore further examined how the offering size as well as the general IPO environment – in terms of average IPO underpricing – influence our main relationship. Regarding the moderating influence of offering size, we observe that the underpricing-reducing effect of prior parent firm-underwriter exchanges is more pronounced in carve-outs involving relatively large units. This is consistent with insights derived from social exchanges theory that opportunistic underpricing by the underwriter increasingly damages the future relationship of the two actors as the offering becomes more important to the parent company. Furthermore, this finding is consistent with the prediction of agency theory that the monitoring intensity of an actor is a function of its incentives to compensate for the costs associated with monitoring efforts.

Regarding the moderating influence of the general IPO environment, we find that prior parent-underwriter exchanges have a dampening effect on underpricing during periods of low average underpricing in the IPO market. In IPO environments characterized by low levels of underpricing, the engagement of an underwriter with whom corporate managers of the issuing parent firms have had multiple, prior exchanges seems helpful in increasing returns for the parent company. More importantly, this empirical finding also suggests that contexts in which the likelihood to detect breaches of trust becomes greater increase the effectiveness of prior exchanges in limiting opportunistic behavior. Interestingly, however, empirical results for IPO environments characterized by high levels of underpricing indicate that the frequency of prior exchanges no longer helps reduce the level of underpricing. Conversely, our findings show that in “hot issue markets” the equity carve-outs backed by frequently engaging exchange partners are associated with significantly higher levels of underpricing. This unexpected effect may suggest that underwriters are unable to protect the interests of the

issuing parent in hot issue markets because the competition by alternative stock placements is too extensive. An alternative interpretation is suggested by research on the influence of industry waves on a firm's stock market performance (e.g., Carow, Heron & Saxton, 2004; McNamara, Haleblan & Dykes, 2008). Investors have been argued to discount capital market transactions which occur at the peak of waves (e.g., McNamara et al., 2008; Brauer & Wiersema, 2012). Similarly, one could argue that offer prices are discounted in hot issue markets so that underwriters become rather price takers instead of price makers.

Theoretical and practical contributions

With our study on the influence of prior issuing parent firm-underwriter relationship on underpricing, we contribute to several streams of research. First, we clarify the role of information asymmetries among key actors in the IPO process. With the notable exception of one of the earliest papers on underpricing (Baron, 1982), previous research focused on information asymmetries between the issuer and the investors participating in an IPO (cf. Ritter & Welch, 2002). We refine this perspective by stressing that due to the mechanisms of firm commitment offerings, the underwriter puts its own capital at risk by purchasing the offering from the issuer before passing it on to the investors instead of merely brokering the offering as an advisory agent for both issuer and investors. Consequently, the primary pricing conflict is directly between issuer and underwriter rather than between issuer and investors.

Second, our study identifies prior interactions between the parent firm and the underwriter as a determinant of the level of underpricing in equity carve-outs. Prior research predominantly focused only on characteristics of the issue (Hogan & Olson, 2004; Ghosh, Petrova, Feng & Pattanapanchai, 2012) or the parent firm (Benveniste, Fu,

Seguin & Yu, 2008) to explain the degree of underpricing. We extend this research by taking a relational perspective suggesting the issuing parent firm-underwriter relationship as an important determinant of underpricing in equity carve-outs. Our findings also shed new light on the hitherto open question in prior research on whether equity carve-outs are less severely underpriced than comparable standard IPOs (Prezas, Tarimcilar & Vasudevan, 2000; Hogan & Olson, 2004) or exhibit similar degrees of underpricing (Schipper & Smith, 1986). Although we do not empirically compare equity carve-outs to a matched sample of IPOs, our results indicate that only equity carve-outs where parent companies have an exchange history with the focal underwriter exhibit lower underpricing than standard IPOs.

Third, we contribute to management research analyzing IPOs from a deal network perspective. Pollock, Porac, and Wade (2004) depict IPOs as a deal network configured by the underwriter as the central agent connecting several key and peripheral factions. Arthurs, Hoskisson, Busenitz, and Johnson (2008) argue that the IPO deal network is prone to multiple principal-agent as well as principal-principal conflicts. The authors observe that underwriters enable venture capital funds they had already conducted offerings with prior to the focal IPO to easier dispose of their stake in an IPO by setting a low initial offering price. Relatedly, Pollock (2004) reports that underwriters extend favors to institutional investors they share embedded relationships with by underpricing an IPO to enable these investors to profit from rising share price on the first trading day of the new issue. Our observation that underwriters accommodate parent companies' preference of lower underpricing in case the two actors share a trustful relationship based on prior joint transactions fits aforementioned authors' results, but renders an important extension: Like underwriters, venture capital funds as well as institutional investors prefer higher underpricing. In contrast, parent companies' favor limited underpricing and

thus display conflicting preferences with underwriters regarding IPO pricing. Thus, our findings provide stronger evidence of the importance of ties between underwriters and an actor since underwriters are willing to honor a trustful relationship in the focal offering even against their own financial interests.

Fourth, we identify ties to an underwriter based on prior joint transactions as a valuable resource that a parent company provides to its subsidiaries. This yields important implications for research on divestiture success – in particular studies which have been interested in explaining differences in returns across various divestiture modes (i.e., sell-offs, spin-offs, equity carve-outs).

Limitations of this study and avenues for future research

Like any research, our study is not without limitations. First, we did not address outcomes relevant for a parent company in an equity carve-out other than underpricing. Besides limiting underpricing, however, a parent company might also want to use its relationship with an underwriter to achieve a specific post-IPO ownership structure (Zingales, 1995; Booth & Chua, 1996), influence long-term performance (Vijh, 1999), or to improve the odds for survival of the new issue as a standalone company (Hensler, Rutherford & Springer, 1997). Assessing these alternative outcomes as well as identifying potential trade-offs among these priorities appears a promising avenue for future research.

Second, we analyzed the relationship between the parent company and the underwriter in isolation of connections to other actors of the IPO process. As elaborated on in the preceding section, IPOs are a deal network comprising other influential factions as for example investors as well as various peripheral factions (Pollock, Porac & Wade, 2004). Although we feel that the issuer-underwriter relationship is most influential when

explaining underpricing based on information asymmetries due to its crucial role in the pricing of an IPO, future research could extend our study by including additional relationships to come up with a more comprehensive picture of how the level of underpricing is the result of an interplay among the various relationships of the deal network.

Finally, we assume in our study that parent companies prefer lower underpricing to maximize the proceeds from the offering. When analyzing moderator effects, we found that repeated prior parent-underwriter interactions result in IPO overpricing (i.e., declining share prices on the first trading day) for very large offerings. Although this maximizes proceeds for the parent company, it also has the potential to create negative repercussions from investors for both the underwriter and the parent company. Since investors participating in the offering experience a loss from declining share prices on the first trading day, they might be unwilling to participate in future offerings of the parent company or the underwriter (Beatty & Ritter, 1986). Thus, apart from maximizing proceeds from the offering parent companies also need to concede just enough underpricing to ensure continued participation of investors in future offerings. Balancing the wish to maximize offering proceeds with the necessity to prevent reputational damage, poses the question of an optimal level of underpricing for future research.

In conclusion, we thus believe that the phenomenon of IPO underpricing remains an intriguing research topic for years to come. With our work, we mean to direct attention to the importance of information asymmetries between issuer and underwriter, and how repeated prior interactions may generate trust and thus help to diminish the negative effects of information asymmetries in IPO transactions. Thereby, we hope to add another piece to the complex puzzle of underpricing.

TABLE 1
Means, standard deviations, and correlations^a

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Underpricing	17.66	45.27													
2. Number of prior parent-underwriter interactions	4.72	9.99	.10												
3. Relative offering size	0.11	0.14	-.06	-.12											
4. IPO environment	22.54	18.41	.32	.13	-.05										
5. Parent firm accounting performance	1.20	29.38	-.16	-.03	-.09	-.20									
6. Parent market performance	2.87	4.85	.45	.19	.00	.17	-.17								
7. Parent firm size	15.00	55.41	.30	.60	-.16	.18	.08	.19							
8. Underwriter prestige	0.80	0.40	.06	.15	-.25	.10	.03	.11	.12						
9. Share overhang	3.34	1.73	.29	.06	-.16	.10	.09	.17	.12	.14					
10. Fraction of parent firm carved-out	35.64	23.18	-.22	.22	.03	-.20	.04	-.08	.07	-.10	-.35				
11. Share offer price	16.09	7.46	-.06	.15	-.12	.03	.14	.03	.13	.40	.04	.06			
12. Use of proceeds	0.04	0.21	.01	.02	.02	.09	.02	.00	-.02	.11	.08	-.08	.18		
13. Relatedness of carved-out unit	0.32	0.47	.05	-.04	.05	-.02	.01	.11	-.12	-.04	-.02	.06	.11	.06	
14. Industry background of carved-out unit	0.39	0.49	.29	.03	.08	.24	-.13	.14	.05	-.01	.18	-.26	-.08	.07	.29

^a N = 202. Values greater than .14 are significant at $p < .05$.

TABLE 2
Results of OLS regression analysis^a

Dependent Variable: Underpricing	Model 1		Model 2		Model 3		Model 4		Model 5	
Relative offering size	-2.38	(19.38)	-4.25	(19.21)	-14.13	(19.92)	-9.84	(18.97)	-22.92	(19.67)
IPO environment	0.21	(0.84)	-0.04	(0.84)	-0.30	(0.85)	-0.27	(0.83)	-0.63	(0.84)
Parent firm accounting performance	-0.16†	(0.10)	-0.18†	(0.10)	-0.20*	(0.10)	-0.19*	(0.09)	-0.20*	(0.09)
Parent firm market performance	3.21***	(0.60)	3.30***	(0.59)	3.38***	(0.60)	3.26***	(0.58)	3.36***	(0.58)
Parent firm size	0.00**	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00**	(0.00)	0.00*	(0.00)
Underwriter prestige	0.20	(7.64)	1.57	(7.60)	2.56	(7.57)	1.15	(7.46)	2.36	(7.40)
Share overhang	4.64**	(1.72)	4.66**	(1.71)	4.57**	(1.70)	4.19*	(1.68)	4.02*	(1.67)
Fraction of parent firm carved-out	-0.12	(0.13)	-0.04	(0.14)	-0.07	(0.14)	-0.01	(0.13)	-0.04	(0.13)
Share offer price	-0.42	(0.42)	-0.43	(0.42)	-0.34	(0.42)	-0.38	(0.41)	-0.26	(0.41)
Use of proceeds	-9.07	(13.84)	-9.19	(13.70)	-9.56	(13.62)	-8.05	(13.46)	-8.37	(13.31)
Relatedness of carved-out unit	5.72	(5.82)	6.07	(5.77)	6.98	(5.76)	3.63	(5.73)	4.48	(5.68)
Industry background of carved-out unit	17.15**	(6.01)	17.15**	(5.95)	17.25**	(5.91)	17.40**	(5.84)	17.56**	(5.78)
Number of prior parent-underwriter interactions			-0.75*	(0.36)	-1.21**	(0.44)	-0.70*	(0.35)	-1.26**	(0.43)
Number of prior parent-underwriter interactions x relative offering size					-6.89†	(3.97)			-8.65*	(3.92)
Number of prior parent-underwriter interactions x average underpricing							0.04**	(0.01)	0.04**	(0.01)
R ²	0.45		0.46		0.47		0.48		0.50	
Adjusted R ²	0.35		0.36		0.37		0.39		0.40	
F	4.63***		4.71***		4.72***		4.97***		5.07***	
ΔR ²			0.01*		0.01†		0.02**		0.04**	

^a N = 202. Unstandardized regression coefficients are reported with standard errors in parentheses. Year dummies are included in all models, but not reported due to space limitations.

† p < .10

* p < .05

** p < .01

*** p < .001

FIGURE 1

Moderating effect of relative offering size on the relationship between number of prior parent-underwriter interactions and underpricing

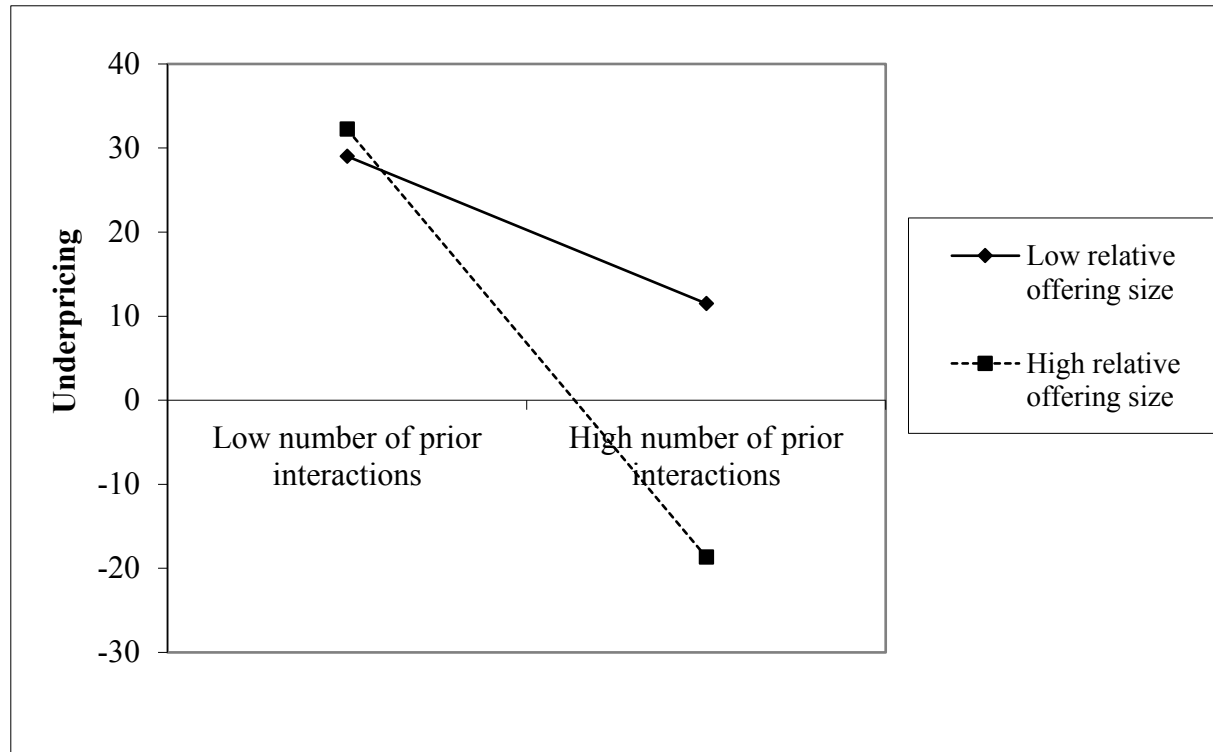
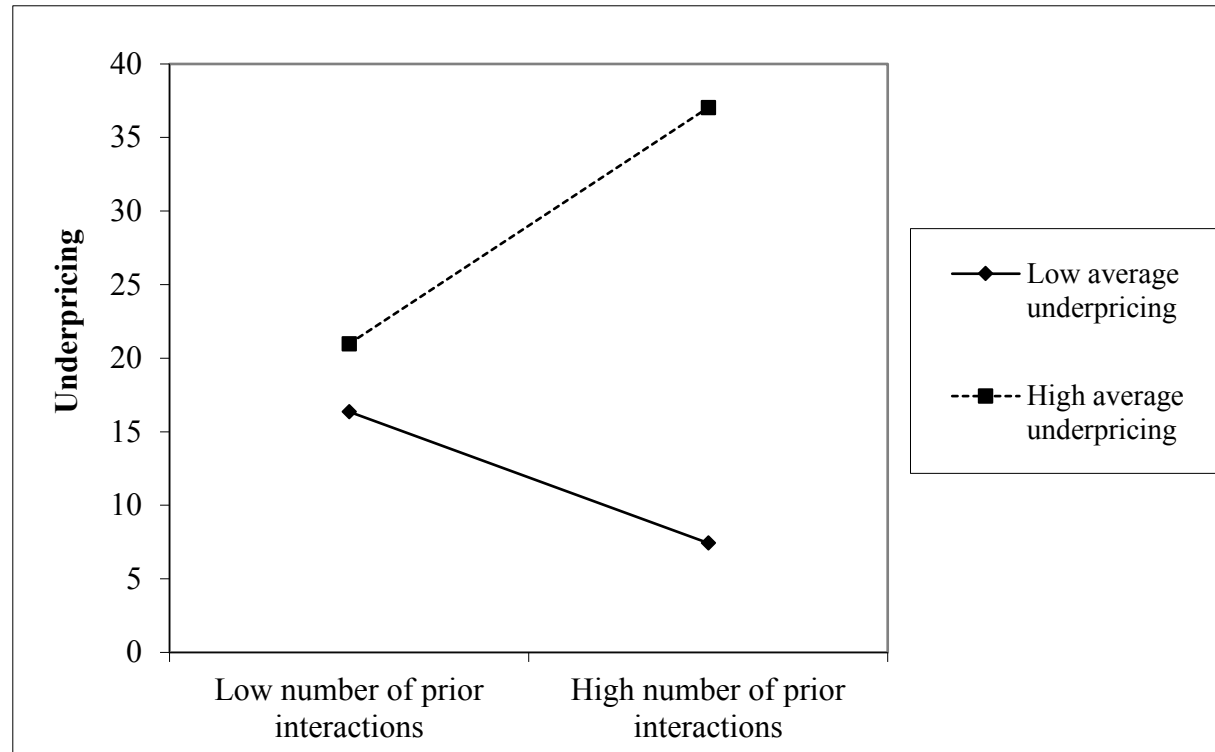


FIGURE 2

Moderating effect of average underpricing on the relationship between number of prior parent-underwriter interactions and underpricing



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