

# **Competition in Investment Banking: Proactive, Reactive, or Retaliatory?**

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# **Competition in Investment Banking: Proactive, Reactive, or Retaliatory?**

## **Abstract**

We examine how investment banks compete for follow-on equity offerings along the dimensions of services offered by banks to issuers: fees, underpricing discount, analyst coverage, market making, overall reputation, and debt relationship. Firms who switch underwriters (44% of issuing firms) do not always move to a better quality underwriter. When reputation is not the reason for switching, the new underwriters appear to compete for clients via optimistic analyst recommendations prior to the offering. Switching firms are not being lured by lower fees or lower underpricing discounts. We devise a measure of competition that encompasses all of these competitive aspects and show that underwriters who are able to retain clients provide superior overall service to their clients.

## Competition in Investment Banking: Proactive, Reactive, or Retaliatory?

This paper investigates the nature of competition in investment banking. Previous research has documented the puzzling, and robust, result that price competition is not a competitive factor for many investment banking activities. For example, Chen and Ritter (2000) find that fees for moderate-size IPOs are virtually always at 7%. Yet, the investment banking industry has many participants, and firms often change underwriters for events such as follow-on offerings. How do investment banks compete for this new business?

In their survey of issuing firms, Krigman, Shaw, and Womack (2001) (KSW), find that one explanation offered for switching underwriters is quality: firms "graduate" to investment banks of greater prestige. For example, firms that have gone public with a regional underwriter, and have done well since the time of the IPO, may prefer to enlist a nationally known, bulge bracket underwriter for their follow-on offering. This demand side explanation is consistent with the lack of price competition noted above, but it is incomplete. For example, in our sample of follow-on offerings (1996-2003) we find that many firms switch to underwriters of similar quality: Are these issuers being pushed to switch by poor performance by the current underwriter, or are they pulled by competitive actions of new underwriters? And even those firms who "graduate" to higher quality banks face the problem of choosing between alternative providers: what determines who wins this business? Finally, what about firms who don't switch? Recent allegations of underwriter retaliation suggest that perhaps firms remain for less benign reasons (Smith and Anand, (2002)).<sup>1</sup>

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<sup>1</sup> This article reports allegations of underwriter retaliation in regards to the follow-on offering of Antigenics Inc. In particular, Antigenics went public with U.S. Bancorp Piper Jaffrey, but chose UBS Warburg to handle its subsequent stock offering. Antigenics claims that Piper threatened to drop analyst coverage of the stock and to stop making a market for the company's shares if it was not given the underwriting mandate. A Piper spokesman stated

In this research we focus on supply-side competition by looking at how investment banks compete for follow-on equity offerings. Our focus is individually and collectively on the services offered by banks to issuers: underwriting, analyst coverage, market making, reputation, prior debt underwriting and lending relationship, fees, and underpricing discounts.<sup>2</sup> We investigate how bankers compete with each other along these specific dimensions, and we also devise a measure of competition that encompasses all of these services. Taken together, our analyses give a comprehensive view of the nature of competition for follow-on offerings in investment banking.

To evaluate the complex nature of competitive behavior, we ask whether competition between underwriters for follow-on offerings is consistent with proactive, reactive, or retaliatory strategies. A proactive strategy is an effort to solicit new business via cutting fees, adding analyst coverage, increasing analysts' optimism, and augmenting or initiating market making capability. Reactive strategies, similar in spirit, are by current underwriters working to retain business via increasing the scale of market making or the optimism of analyst coverage to fend off potential competition. We would expect to find evidence of both proactive and reactive activities in advance of the follow-on issue. Alternatively, retaliatory strategies are *ex post*: Jilted underwriters can drop coverage, lower optimism, or reduce market making activities following the new offering.

Our results reveal several intriguing dimensions of investment banking competition.

Overall, we find many firms change underwriters for follow-on offerings, suggesting an active

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the firm's subsequent decision to drop analyst coverage of Antigenics "was an individual, company specific decision, based on a variety of factors".

<sup>2</sup> Ellis, Michaely and O'Hara (2000), Aggarwal (2000) show a link between IPO underwriting and market making activities. Chen and Ritter (2000), analyze fee structure of equity offerings; Womack (1996) and Barber et al (2000, 2001) analyze the value of analysts recommendations. Michaely and Womack (1999) show a link between analysts' recommendations and underwriting of IPOs, and Ljungqvist, Marston and Wilhelm (2005) investigate the link between analysts' recommendations and the likelihood of winning underwriting mandate.

market for underwriting business: of the 1277 offerings in our sample, 44% change lead underwriters from their previous equity offering. Surprisingly, only 34% of switching firms move to an underwriter of substantially better reputation, with the other 66% moving to a similar or lesser quality bank.

We find that underwriters who retain clients are consistently providing optimistic analyst coverage and active market making in the months prior to the offering. Rather than this being last-minute window dressing to prevent the client from moving to another underwriter, it appears that these underwriters provide long-term support for these clients. We do find evidence consistent with the notion that underwriters cut fees to retain clients. This reactive behavior is consistent with Burch, Nanda, and Warther's (2003) finding that "loyal" customers pay lower fees.

Underwriters who attract switching firms exhibit a variety of strategies. Firms who move to a highly ranked underwriter pay for the gain in reputation: fees are higher, and pricing discounts (the difference between the offering price and the last closing price) are steeper. Also, prior to the offer, these underwriters do not compete on any dimension, but immediately following the offering they do provide active market-making, and optimistic analyst recommendations. Alternatively, to attract firms switching for reasons other than improving underwriter reputation, we find that investment banks proactively compete via analyst recommendations prior to the offering. The new underwriter's analysts are more optimistic than either the old underwriter's or the average analysts' consensus several months in advance of the offering. By contrast, there is no evidence of competition along the market making dimension: investment banks do not attempt to gain new business by becoming more active as market makers in the month leading to the follow-on offering. We do find, however, that underwriters

have a harder time retaining business (keeping their old clients) if their market making activity is below the norm.

Underwriters who lose clients to other bankers appear to take the loss in stride. Despite allegations of retaliatory behavior, we do not find reliable evidence of such behavior in our overall sample. Dropped underwriters do reduce their market making activities, but generally they remain in the market with activity levels similar to other market makers. Similarly, their analysts' forecasts, while less optimistic than previously, revert generally to the mean of other analysts' recommendations.

In addition to examining the various separate dimensions of competition (fees, underpricing, analysts' recommendations, market making activity, underwriters' reputation, and prior debt underwriting relationship), we construct a comprehensive measure of competition that accounts for interaction between factors. Constructing such a measure is important for two reasons. First, it allows us to assess the extent of competition with one single number; and second, it accounts for the potential interaction across variables. For example, it is possible that investment banks that charge higher fees will, at the same time, offer a lower underpricing discount. We construct a z-score for each variable (e.g., the fees charged for a specific deal minus the average fees charged relative to the cross sectional standard deviation of fees across deals) and then sum up those z-scores. Thus, if investment banks compensate for the high fees by lower underpricing discount, our competitive measure will capture this behavior.

Our aggregate measure shows non-switching clients have the most competitive underwriters and receive better service on all dimensions. Firms that switch to similarly ranked underwriters receive average overall service: the higher fees they pay are largely offset by competitive analyst recommendations and pricing. Firms that switch to a lesser-quality

underwriter receive worse overall underwriting service: competitive analyst recommendations, but poor pricing and high fees. Finally, firms graduating to highly ranked underwriters receive the lowest overall service: no analyst coverage prior to the offering, high fees and steep price discounts. These results are consistent with investment banks adjusting competition to reflect specific market elasticities.

Our analysis of the competitive forces in investment banking joins a large, and growing literature looking at the complex role of banks in capital raising . Our analysis of fee competition complements recent research by Burch, Nanda, and Warther (2003), Corwin (2003), Fernando, Gatchev and Spindt (2005) on price-setting and fees in follow-on offerings.<sup>3</sup> Michaely and Womack (1999), Loughran and Ritter (2004), Bradley, Jordan and Ritter (2004) and Bradshaw, Richardson and Sloan (2003) document pervasive evidence of overoptimism in sell side analysts earning forecasts and stocks recommendations that are systematically related to the firms' likelihood to engage in capital raising activities.

In an interesting paper, Ljungqvist, Marston, and Wilhelm (2005) concentrate on the link between analyst recommendations, banking relationships and underwriting. Our investigation is wider in scope (though at a cost of smaller sample than theirs) as we investigate additional aspects of competitions such as fees, pricing, and market making, and we arrive at a comprehensive measure of competition. Additionally, our focus differs from Ljungqvist, Marston, and Wilhelm (2005) in that we differentiate between investment banks that retain current clients versus investment banks that win underwriting mandates by gaining new clients from other investment banks, as well as explicitly differentiating between those firms that upgrade to a

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<sup>3</sup> A related literature investigates the price behavior around the announcement of follow-on offering (e.g., Asquith and Mullins (1986), Mikkelsen and Partch (1985), Masulis and Korwar (1986), and Barclay and Litzenberger (1990) and around the offer day (e.g., Smith (1977), Loederer, Sheehan and Kaldec (1991) and Altinkiliç and Hansen

better reputation underwriter (as in KSW) versus those firms for whom underwriter reputation was not the major motive for the switch. Consistent with our results they find that lead underwriter investment banks do have higher recommendations than non-lead-underwriter investment banks. They go a step further and suggest that this outcome stems from analysts' career concerns that -- when accounted for -- no relation is found between the probability of winning an underwriting deal and the level of recommendations. Ljungqvist et al (2005) also find that prior underwriting and lending relationships are important determinants of winning underwriting mandates, which is consistent with underwriters retaining clients. However, their analysis does not address how underwriters gain new clients. Consistent with their results, we find that prior relationship through debt underwriting and bank loans matters, but its overall effect is relatively small.

Another paper that connects analyst recommendations to investment banking activity is Clarke, Khorana, Patel and Rau (2004), who examine whether investment banking relationships move from one bank to another as all-star analysts move. They find no direct link that the all-star analyst brings deals to the new bank, or that the all-star analyst changes his or her behavior to become more optimistic about firms with whom the new bank already has relationships. However, they do find that equity underwriting volume increases at banks that gain all-star analysts, compared to the banks from which the analyst departs. Our analysis differs from theirs in that we focus on the differences in switching and non-switching firms and consider the relative ranks of the old and new underwriters as well as a wider range of competitive dimensions.

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(2003). Corwin (2003) reports that the bulk of the offer day underpricing can be attributed to price rounding and bid-ask spread effects.

The rest of this paper is organized as follows. The next section describes the follow-on offering process and it details the competitive dimensions of the follow-on offerings we investigate in this paper. Section 2 then sets out our sample, the data, and details the characteristics of the issuing firms and the underwriters of these issues. In this section we provide results on overall switching behavior, and the movement of issuers to better quality, lateral quality, and lower quality underwriters. In Section 3 we investigate the roles of fees, price competition, analyst competition, and market making competition, with a specific focus on the behavior of potential underwriters (proactive), of existing underwriters (reactive), and retaliatory behavior by jilted underwriters. Section 4 merges the univariate results into an overall measure of underwriter competition and examines the determinants of gaining or losing underwriter clients. Section 5 summarizes our results and provides some conclusions on the nature of competition in investment banking.

## **1. Follow-on Offerings: Process and Competitive Behavior**

### *A. The Competitive Calculus*

In a follow-on offering, underwriters provide a wide range of services to the issuing firms. Certainly, one such service is the direct underwriting of the issue, and this involves a wide range of activities such as pricing the issue, marketing the issue, and distributing the shares to the buyers. But the investment banking firm also provides ancillary services such as analyst coverage and market maker support, and these can be equally important to the success of the issuance. It seems likely that the competitive strategy of investment banks to attract and retain business must also incorporate these facets.

One direct method of competition is to offer lower fees for underwriting and related services. Fees are typically calculated based partly on the size of the offering, and investment banks have considerable discretion in setting these fees. One downside of price competition, however, is that the fees must be disclosed in the offering documents. This allows all other clients of the investment bank to see what the bank has charged issuers of similar offerings. Chen and Ritter (2000) provide a detailed discussion of why competition among underwriters is not generally fee-based. They also present evidence that for moderate-size IPOs, comprising the majority of IPOs, fees are almost always exactly seven percent. For follow-on offerings, however, the evidence they present show a wider cross-sectional variability in fees, consistent with competition along this dimension.

Another direct aspect of competition is the follow-on offering issue price, measured as the discount relative to the previously traded price. Unlike in IPOs, the discretion of the investment bank about pricing is rather limited since a market price for the securities exists long before the announcement or the pricing of the follow-on offering. Existing evidence (e.g., Corwin, 2003) indicates an average discount of about 2 percent, and a significant cross sectional variation in the underpricing. How this variation is related to competition is an issue we explore.

A more indirect, and less transparent, method of competition is to provide differing levels of analyst coverage and market maker support. Analysts' coverage involves both the provision of reports and the making of recommendations. While it is virtually always the case that an investment bank provides analyst coverage for the clients it takes public, the bank may also opt to provide analyst coverage for other firms. In general, analyst coverage is considered a benefit for a firm. There is greater prestige attached to having a larger analyst following, and the greater information dissemination and coverage may enhance the firm's attractiveness to institutional investors (e.g., see Brennan and Subrahmanyam (1995) and Easley, O'Hara, and Paperman (1998)). Thus, one

competitive variable for the bank is to add, or conversely to drop, analyst coverage for an issuer. Initiating coverage of a company in the hopes of winning an upcoming underwriting mandate could be a natural competitive strategy for an investment bank to pursue.

How the investment bank's analyst views the firm is also important. In particular, the enthusiasm with which the analyst reports on the firm, and his enthusiasm about the firm as an investment potential (for example, strong buy, buy, etc.) is important to the issuer. Recent research (see, for example, Michaely and Womack (1999)) suggests that underwriter's analyst recommendations are often positively biased when compared to the recommendations of other analysts following the firm. This may reflect the natural enthusiasm of the bank for its clients, but it may also be due to a conscious competitive strategy to boost the stocks of firms who are compensating them. The degree of analyst optimism is thus another potential competitive variable for an underwriter seeking mandates. Ljungqvist, Marston and Wilhelm (2005) also examine this issue and find unconditionally, that winning banks provide more optimistic recommendations than losing banks, however they attribute this result to economic incentives, i.e., career concerns of analysts, and pressure from investment banks, and conclude that optimistic analyst recommendations do not affect the probability of winning underwriting business. In their analysis, analyst recommendations are determined endogenously by the competing forces of pressure from the investment bank to recommend a potentially lucrative client, versus the analyst's interest in protecting his or her reputation. Since our focus is the overall competition for underwriting business, we do not focus on why an analyst is providing a recommendation.

Liquidity provision is also an important consideration for publicly traded firms, particularly for smaller firms. For a Nasdaq traded firm, a relevant liquidity factor is the number (and depth of commitment) of its market makers. Acting as a market maker in the stock allows the underwriter to

provide price support (or stabilization) in the period immediately following the firm's offering (see Ellis, Michaely, and O'Hara (2000) for more analysis of these activities). But market maker support is also valuable to the issuing firm on an on-going basis. Generally, the more market makers in a stock, the greater is its liquidity, and the easier it is for investors to trade without inducing large movements in the price. As with analyst coverage, the investment bank can opt to act as a dealer in a stock as a competitive strategy, or to drop such market making activities.

An interesting feature of many Nasdaq stocks is that while they may have many market makers setting a daily quote, the actual trading activity of each dealer can vary dramatically. Indeed, Ellis, Michaely, and O'Hara (2002) found in a sample of Nasdaq IPO stocks that almost a third of all dealers did not trade in the stock even once a week, and the top three market makers in a stock handle the majority of trading. This suggests that the level of market maker activity may be more important to a firm than an investment bank's willingness to act as a dealer.

Other dimensions upon which investment banks may compete are providing loans, underwriting debt offerings, and advising on merger activity. Several papers have examined the link between bank lending and equity underwriting (e.g., Drucker and Puri (2003), Ljungqvist, Marston and Wilhelm (2005)). Drucker and Puri (2003) provide evidence that investment banks that underwrite debt offerings around the time of equity deals reduce the amount they charge for issuing equity for the firm. Ljungqvist, Marston and Wilhelm (2005) suggest that prior debt underwriting relationships and lending relationships increase the likelihood of winning deals. Consistent with their results, we find that underwriters who retain clients are more likely to have a prior debt underwriting or lending relationship with the firm compared to other underwriters. However, we find that when a firm switches investment banks, the new lead underwriter does not have a stronger debt relationship with the firm than the old lead underwriter did. Overall, we find limited public-debt-issuance activity

around the time of the equity offering (around 6% of the sample) for the follow-on offerings in our sample. Many of the firms in our sample (1148) have private debt initiated during the 5 years before the follow-on offerings but of these, only 31 are with the underwriter of the follow-on offering.<sup>4</sup> Nonetheless, we include prior debt relationship as one of the variables in the competitive calculus.

Our discussion above suggests that investment banks may compete for underwriting mandates over a number of dimensions. One important feature of a follow-on offering is that the issuing firm already has had an experience with an underwriter in its prior equity offering. The firm's decision with its follow-on offering, therefore, is whether to stay with the old underwriter, or to switch to a new one. And if it decides to switch, it still faces the question who the new underwriter should be.

Certainly, to the extent that some investment banks are viewed as higher quality, simply being willing to take on a client may be inducement enough to secure its business. Krigman et al (2001) find that reputation effects are important to some issuers, and so these issuers switch underwriters simply to be connected with a higher quality underwriter.<sup>5</sup> For such "graduating" issuers Krigman et al (2001) show that the actual performance of their old underwriter is of a lesser importance than the overall underwriter reputation. Nevertheless, even those firms have to select their new lead underwriter among those underwriters of higher quality. For other issuers, the decision to stay with their current underwriter or to engage in a lateral switch must surely reflect their satisfaction with their current underwriter thus far.

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<sup>4</sup> The reason for the different relation between debt/equity offering we find and what Drucker and Puri (2003) find is related to the sample selection. Given our objective of examining investment banks activities before the issuance, we excluded shelf registration from the sample.

<sup>5</sup> Another view is that firms and banks select each other. Not only do firms look at the quality of the investment bank they are hiring, but investment banks examine the quality of the firms they are underwriting. Firms that improve (decline) in quality will switch to a higher (lower) reputation underwriter, whereas firms with no large change in quality are likely to form a stable relationship with an underwriter. Similarly, if the quality of the underwriter changes over time, then firms may switch if the quality of the current underwriter no longer matches the firm's quality (see for example, Fernando, Gatchev and Spindt (2005))

To examine how investment banks compete for underwriting business, we focus on what those banks do prior to the offering: proactive strategies by new underwriters and reactive strategies of ongoing underwriters. In the event that the existing underwriter is not able to retain the issuing firm as its client, it could pursue *retaliatory strategies* such as dropping analyst coverage, lowering analysts' recommendations regarding the company, or reducing their market making activities. As these actions are taken after the loss of the underwriting mandate, it is the threat of these actions that should influence the decision to switch or not. For such a threat to be credible, however, it must be the case that for at least some switching firms the underwriter actually behaves as if threatened: (Without such a follow-through, the equilibrium in the game between the underwriter and the issuer could not be sub-game perfect.)

## **2. Sample: Offerings, Underwriters, and Issuers**

### *A. Offering Data*

We obtained a sample of U.S. seasoned equity offerings during the period 1996-2003 from the SDC global offerings data base (4365 offerings). To ensure comparability across sample firms, we exclude offerings that were registered as shelf offerings under SEC Rule 415 (1203 offerings). Because of the different process governing disclosure and distribution of shelf-registered offers, the underpricing discount, analysts' and market making activity prior to the offerings can not be compared to non-shelf offering; and thus we exclude them from the sample. Similarly, we exclude offerings that were entirely secondary shares (380 offerings). Such offerings are more akin to large block trades by insiders desiring liquidity, as opposed to the more standard offering motivation of firms seeking to raise capital. 41 firms that had joint lead underwriters were excluded as these underwriters share the responsibility for the offering, and

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thus some of the underwriter behavior that we are studying could be divided among joint lead underwriters.

We also excluded offerings by foreign firms (169 offerings); OTCBB or Nasdaq small cap offerings (105 offerings); closed-end funds, and real estate investment trusts (153 offerings); as well as offerings for securities other than common stock, for example, ADRs, or securities with warrants attached (310 offerings). Finally, we also deleted a number of offerings due to missing data: 53 were not underwritten; 520 had no identifiable underwriter in previous equity deals; 154 were outside the dates of the data availability. The final sample is 1277 follow-on offerings. Table 1 gives summary statistics of these sample firms.

For these equity offerings, we examined the SDC database for previous equity offerings by the same issuer since 1990, and noted the identity of the lead underwriter in the most recent equity offering prior to the sample event. This allows us to examine whether the firm switched underwriters or not. For market making data we obtained monthly market making volume from the Nasdaq for January 1996 - March 2002 for a subset of 922 Nasdaq firms in our sample. Analyst coverage and recommendations were provided by IBES. Daily trading price data are from CRSP.

### *B. Underwriters*

There are 79 distinct lead underwriters for the 1277 offerings in our sample. To focus on the effects of underwriter reputation, we ranked lead underwriters of the universe of equity offerings during 1996-2003 by dollar volume underwritten (see Meggison and Weiss (1991)), and applied these ranks to our sample 79 underwriters. The lowest ranked underwriter in our sample was 337<sup>th</sup> in the overall rankings. As a first step, we segment our underwriters into three reputation tiers to capture the idea that there are comparable quality underwriters within the

market: Tier 1 (ranks 1-10), Tier 2 (ranks 11-25), and Tier 3 (all other underwriters). Table 2 gives the composition of the Tier 1 and Tier 2 investment banking firms and the number of offerings they each brought to market in our sample. As is apparent, no one underwriter completely dominates the market, suggesting the potential for competition among firms. Collectively, the 10 most active underwriters cover approximately 76% of the dollar value of follow-on offerings in our sample, and the next 15 most active underwriters cover 20% leaving the remaining 54 underwriters covering 4% of our sample.

Because we are interested in the retention and defection of issuers, we tracked the underwriting history of each issuer in our sample. One difficulty in doing so is that over this sample period there were a number of mergers of investment banking firms. We collected information on all of these mergers, and we then designated as part of the successor investment bank any merger partners. Thus, an issuer using Alex Brown as the underwriter for its IPO and Deutsche Bank as the underwriter for its follow-on offering after 1998 would be classified as a non-switcher for purposes of this analysis because Alex Brown became part of Deutsche Bank in 1999.<sup>6</sup>

For the individual investment banks, we calculate a loyalty index of their issuers, defined as the percentage of issuers who use the same bank for their next offering. Amongst the top tier underwriters, these loyalty ranks range from a high of 83.6% for Goldman Sachs to a low of 48.3% for UBS Warburg (see Table 2.) Thus, even within the top-tier underwriters, there are substantial differences in underwriters' abilities to retain investment banking clients across issues.

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<sup>6</sup> Alex Brown was purchased by Bankers Trust in 1997. Banker's Trust was then taken over by Deutsche Bank in 1999.

In addition to retaining issuing firms in follow-on equity offerings, underwriters attract new business as issuing firms switch from one underwriter to another. In Table 2 we see that for Goldman Sachs, two-thirds of the deals underwritten in our sample come from old clients, and the remaining one-third come from new clients. For the other Tier 1 underwriters, there is considerable variation, ranging from UBS Warburg with 73% of its deals being from new customers, to Deutsche Bank which has 24% of its deals coming from new customers. For the second tier of underwriters, we also see a wide variation in the ability to retain underwriting clients, and attract new clients.<sup>7</sup>

### *C. Switching and Non-Switching Issuers*

The issues surrounding the retention of existing clients and attracting new ones can be developed more fully by considering the frequency with which issuing firms switch underwriters for the follow-on offerings in our sample. Table 3 shows that switching is a frequent event: 44% of the issuing firms (557 out of 1277) switched underwriters from their previous offering. This figure is higher than the 31% reported by KSW, and it is consistent with changes in the investment banking industry landscape such as the demise of the Glass-Steagall Act having increased competition in the more recent sample period we study here.<sup>8</sup> For our purposes, the fact that almost half of the follow-on offerings are being led by a new underwriter suggests that there is significant underwriting competition for follow-on offerings.

Where do these switching firms go? We find that 42% of switching firms move to a better reputation underwriter (e.g. move from a Tier 3 underwriter to a Tier 2 underwriter), 46% switch to a comparably ranked underwriter, and 12% switch to a poorer quality underwriter.

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<sup>7</sup> For example, AG Edwards acted as lead underwriter for only three of our sample firms in a prior offering, but retained these clients for the follow-on offering, resulting in a 100% loyalty rating. In addition AG Edwards attracted 6 new clients for whom they were lead underwriter in a follow-on offering.

Another way of examining this movement is to look at each bank's individual ranking. We find that 69% of switching firms move to an underwriter of higher rank than their current underwriter. However, 101 issuers move to an underwriter who is less than six ranks better, and half (191 out of 382) switch to an underwriter who is less than 13 ranks higher. Thus, despite an average move of 31 ranks higher, the median is only 13 ranks higher, indicating that half of the firms switch to an underwriter who is only ranked marginally higher than their old underwriter. For the 31% of firms that switch to a lower ranked underwriter, the mean change in ranks is -12, with a median change of -6. Again, the median change is smaller than the average change, reflecting the fact that over one quarter of the firms move down to an underwriter one or two ranks below their current underwriters.

In the next section we analyze the competitive strategies that investment banks use to attract or retain clients, but as a useful preliminary we consider the characteristics of the 557 switching firms and the 720 non-switching firms in our sample. These data are given in Table 4. We split the switching sample into four groups by dividing the upgrading firms and the downgrading firms into the large rank movers and the small rank movers. The categories are based on the median rank changes for upgrading switchers (13 ranks higher than old underwriter) and downgrading switchers (6 ranks lower than old underwriter). Examining the composition of each group, we find that the large upgraders and large downgraders are the smaller firms, and their follow-on offering size is also smaller. These deals generally take slightly longer to complete, and involve a higher proportion of primary shares than is the case for the non-switching firms or for the firms switching to comparably ranked underwriters.

Consistent with prior studies, the announcement effect of a seasoned equity issuance is negative

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<sup>8</sup> If we limit our sample to the 754 equity offerings that are the first seasoned offering since the firm's IPO, our rate of switching is 38% which is still higher than the KSW study, suggesting that switching may have increased over

(a mean abnormal return of -2.27 percent), but there is no significant difference in the announcement effect between switchers and non-switchers. Also, the firms that switch up are more likely to retain the old underwriter as a co-manager.

Six percent of the non-switching firms had a public debt offering underwritten by the equity lead underwriter in the five years prior to the equity offering. This low incidence of both debt and equity underwriting suggests that it is most likely not the primary reason that firms stay with their equity underwriter, however it is interesting that the incidence of debt underwriting by the new or old equity underwriters for the switching firms is much lower. In particular, for the graduating switchers, only 1% have a debt relationship with their new underwriter, and only 0.5% had a debt relationship with their old underwriter. We also find similar results for private debt relationships in the five years prior to the offering: 6% of the non-switching firms have borrowed from their equity underwriter, whereas for the switchers less than 4% have borrowed from their new equity underwriter. Lateral upgrading switchers are an exception to this pattern, as their frequency of borrowing from their old (new) equity underwriter, 5.24% (6.81%), is not significantly different from the non-switchers. However, as the old equity underwriter was as likely to have a debt relationship with the firm as the new equity underwriter, it is unlikely that this is a reason for firms to switch.

Overall, this preliminary analysis indicates that there is an active and competitive market for the underwriting of follow-on offerings. What is not clear is how the underwriters compete for new business, or retain the clients they have previously served. In the next section, we address these issues by examining the competitive behavior of the underwriters.

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time.

### 3. The Competition for Follow-on Offerings

Earlier we noted that, in addition to reputation, banks can compete along several dimensions: fees and pricing, analyst coverage, and market making capabilities.<sup>9</sup> Should the banks choose to compete on a given dimension, there are several possible strategies they can follow. Our analysis focuses on three such strategies: proactive, reactive or retaliatory. In this section, we now turn to investigating these behaviors.

#### *A. Fee and Price Competition*

For equity offerings, firms pay direct fees to the underwriter as well as indirect fees via the discount of the offer price relative to the prevailing market price. Whereas direct fees for IPOs are generally fixed at seven percent, fees for follow-on offerings vary widely suggesting they are negotiable. Also, unlike IPOs, the pricing discount can be precisely negotiated (and observed) prior to the offering since the stock is traded prior to the offering.

We collect data on the fees paid to the lead underwriter for each of the follow-on offerings in our sample and calculate the close-to-offer return as the pricing discount. The data, presented in Table 5, show that on average fees are 5.18% of the proceeds<sup>10</sup>, and the average discount is -2.8%. There is a considerable spread in the fees paid, ranging from 1.45% to 8.91% and the pricing discount ranges from -26% to +13%.

Consistent with Burch, Nanda and Warther (2004), non-switching firms pay lower fees than switching firms, and this difference of 40 basis points is statistically significant. These lower fees for repeat clients are consistent with a strategy by the underwriter to retain loyal

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<sup>9</sup> Investment banks could also compete via the pricing of the issue, but because there is already actively trading stock there is less flexibility here than for an initial public offering. For an analysis of underpricing of follow-on offerings see Burch, Nanda, and Warther (2003), and Corwin (2003).

<sup>10</sup> Gande, Puri, and Saunders (2002) find that underwriting fees have declined over time, however we do not find this to be the case. This difference is possibly due to the exclusion of shelf offerings from our sample.

business. Loyal firms are also rewarded via a smaller pricing discount: -2.37% versus -3.35% for firms that switch underwriters.

Looking at the fee competition across switching firms, lateral upgraders face fees that are not significantly different from the non-switchers ( $F=2.24$ ), and also pricing discounts that are commensurate with non-switchers ( $F=0.12$ ), suggesting that underwriters for these firms are competing on both direct and indirect fees. For all other firms, the fees are significantly higher, and the discounts significantly steeper, than those faced by non-switchers. In particular, firms that dramatically change their underwriter, either graduating to a better quality underwriter, or falling to a much less reputable underwriter face higher fees and steeper discounts than firms that merely move laterally. Thus fee competition by underwriters is not consistent across deals: for most deals, switching is costly for the firm as underwriters do not appear to compete on fees.

We can further investigate underwriter competition via direct and indirect fee levels in multivariate regressions with each fee as the dependent variables. As independent variables, we control for: the difficulty of the marketing efforts and the due diligence required for the deal via size, measured as the log of the offering proceeds and stock price uncertainty, proxied by the standard deviation of the stock price over three trading months prior to the announcement of the offering. Small firms and firms with high variance are likely to require more marketing efforts and due diligence (per dollar issued). We also control for the change in firm outlook proxied by one year cumulative abnormal return prior to offering announcement ( $CAR=\sum(r_{it} - r_{mt}), t=1, \dots, 252$ ); and, as suggested in KSW (2001), the time since the last offering since the underwriter may be required to do more due diligence on the firm, and hence charge a higher fee, if substantial time has passed. We also include the underwriting ranking and the loyalty index variables, and dummy variables for our four categories of switching (large downgrade, lateral

downgrade, lateral upgrade, large upgrade). Finally, to control for time variations, the regression also includes year dummy variables.

From Table 6 we see that deal complexity does affect fees: smaller deals and firms with higher price volatility have higher fees (in relative terms) and more pricing discount. High reputation underwriters charge lower fees, but larger pricing discounts, while underwriters with high loyalty provide lower fees and less discount. Perhaps the most important result of Table 6 is that after controlling for size and risk (and the other control variables), in general, underwriters do not compete proactively on fees: fees for switching firms are significantly higher than for non-switching firms, except for the large downgrading switchers. Thus the univariate result that underwriters for lateral switchers provide competitive fees is indicative of the large size and reduced riskiness of these deals rather than underwriter competition. By contrast, after controlling for deal attributes that result in higher fees, underwriters for large downgrading switchers are indeed charging competitive fees. On the dimension of underpricing, after controlling for deal attributes, we find that the underwriters for lateral upgraders do provide pricing that is comparable to the underpricing discount for non-switchers, whereas underwriters for all other switching firms provide worse underpricing discounts. Overall, it is those firms that have a big upgrade in underwriter reputation who pay significantly higher fees and face steeper pricing discounts, even after controlling for size and risk.

Overall, the evidence is underwhelming for proactive competition along the fee and underpricing discount dimensions: Compared to those firms who do not switch, those who switch in general, pay higher fees and steeper underpricing discounts. It is also evident however, that for lateral switchers, fees and underpricing discounts are smaller than when firms switch to higher quality underwriters.

### *C. Analyst Coverage*

The second aspect of competition for follow-on offerings is related to analyst coverage of issuers. The role of research analysts has been a subject of much recent interest and controversy. That investment banks have used their research expertise as a lure to generate more business was a standard industry practice. As the recent Global Settlement made clear, however, in some cases the research analyst took on the more dubious role of salesman for the firm's issues. In this capacity, the level of effort and the degree of analyst enthusiasm could be used as strategic variables for the bank to gain business.

As an initial starting point, we first consider the overall analysts' interest in our sample of firms. Table 7 shows the total number of analysts covering the sample firms before and after the offering. Three months before the offering date, the firms have on average 4.37 analysts providing buy/sell recommendations, with the firms that make a lateral switch to a new underwriter having the most analyst coverage. Following the offering, all firms on average add 1.46 analysts<sup>11</sup> and thus have 5.83 analysts making recommendations three months after the offering. Hence, regardless of whom the firm chooses as an underwriter, total analyst coverage increases following an equity offering.

KSW (2001) make the argument that firms may switch underwriters to add quality analyst coverage, and so we examine the number of top tier analysts (analysts associated with a top 10 underwriter) for each firm. Prior to the offering, the firms have on average 0.77 top tier analysts providing coverage. After the offering, all firms increase the number of quality analysts making recommendations, but the increase is only significant for the large upgrading firms and the non-switching firms. Our results corroborate the evidence in KSW that firms who switch to a

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<sup>11</sup> Across the subgroups there is no statistically significant difference in the change in the number of analysts post-offering.

significantly better rated underwriter also increase their coverage by top-tier analysts.

Surprisingly, despite the increase in the number of analysts following a firm, most switching firms do not gain top-tier coverage whereas non-switching firms do.

To focus on whether underwriters strategically provide analyst recommendations around the offering to attract or retain business, we compare the average recommendation 90 days before and after the offering date for the new lead underwriter and old lead underwriter. For non-switchers, there is a slight increase (significant at the 10% level) in the lead underwriter's recommendation around the offering, suggesting no large reaction by the underwriter in advance of follow-on offerings. Comparing the level of the underwriter's recommendation to other analysts, the lead underwriter is significantly more positive than unaffiliated analysts. These results complement KSW's finding that a prime reason why firms switch underwriters is dissatisfaction with their research coverage.<sup>12</sup> Here, the non-switchers enjoy consistently high recommendations and so have little reason to seek them elsewhere.

But what of firms who switch underwriters? Are underwriters employing proactive strategies with respect to analysts to lure these issuers away? Ninety days before the offering, the new underwriter is only providing analyst coverage in 226 (41%) of 553 firms. Many new underwriters only commence coverage after the offering, with 450 (81%) providing a recommendation at day 90.<sup>13</sup> The recommendation after the offering is significantly higher than the prior recommendation, suggesting that new underwriters do not lure firms with optimistic

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<sup>12</sup> KSW find that only 68% of the lead IPO managers for the switched firms covered the target firm ahead of the follow-on offering, compared with 80% coverage for the non switchers. They also examined the number of research reports issued for the follow-on offering firms, finding that for switchers the old lead provided only 1.27 reports in the 6 months prior to the follow-on offering while for non-switcher the lead provided 3 reports. They conclude that firms will more likely to switch when research coverage is minimal. Finally, they also documented another dimension of the competition for follow-on offering: A substantially greater increase in All-Star lead manager analysts for the switchers than the non-switchers.

<sup>13</sup> In line with KSW's results, we see that the old underwriter was only providing coverage 46% of the time for switchers, much lower than the frequency of coverage by ongoing underwriters.

recommendations prior to the offering, but deliver them after. While the new underwriter subsequently begins coverage, there is little evidence to suggest that this is done in advance of getting the underwriting mandate. This pattern is most evident for the firms that graduate to a much higher reputation underwriter: only 26% of the firms are covered by the new underwriter prior to the offering, but this jumps to 82% following the offering. These results support the notion that graduating switchers are largely drawn by reputation.

For the lateral switchers, a more complex picture emerges. For these offerings, there is no clear gain in underwriter reputation via switching, so we expect more proactive competition via analyst recommendations. Figure 1 presents analysts' recommendations for firms that switch to a marginally higher ranked underwriter.<sup>14</sup> Although the new underwriter's recommendation is not significantly more optimistic than the old underwriter's recommendation 90 days prior to the offering, it is significantly higher than the unaffiliated consensus.<sup>15</sup> Also the new underwriter is more active than in the case of the large upgrades: in 52% of the offerings the new underwriter is already providing analyst coverage 90 days prior to the offering. These results suggest analyst recommendations may be part of a proactive strategy to attract underwriting clients.

For the downgraders, the new underwriter is providing analyst coverage 90 days prior to the offering more frequently than the old underwriter, and is also providing recommendations significantly more optimistic than those of the old underwriter and other analysts. Given that issuers are moving to a lower prestige underwriter, these proactive results are not surprising; there must be some inducement to switch underwriters, and our earlier results suggest that it is not price-based.

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<sup>14</sup> For comparison, the Appendix presents figures showing analysts' recommendations of underwriters and consensus of similarly ranked unaffiliated analysts for all of the subgroups in the sample (non-switchers, large down/up-graders, and lateral switchers).

What then to conclude regarding underwriter proactive and reactive strategies with respect to analysts? We find little evidence to support the notion that underwriters reactively add analysis coverage or optimism to retain underwriting mandates. However, the level of recommendation by ongoing underwriters is higher than that of underwriters that are dropped in the follow-on offering, which suggests that maintaining optimistic recommendations helps investment banks retain underwriting business.

We find much stronger evidence in support of proactive competition with respect to analyst recommendations to secure new underwriting mandates. This competition appears for the non-graduating issuers (65% of the switching issuers), with new lead underwriters providing analyst coverage better-than, or equivalent-to, the coverage of old lead underwriters.

An issue we have not yet addressed is whether underwriters also act in a retaliatory manner. We reported earlier that before the new offering, jilted underwriters were generally providing less coverage and less optimistic recommendations than were underwriters whose clients remained loyal. But what happens after the offering? To determine this, we focus on the old underwriters recommendations 90 days before to 90 days after the new offering. Following KSW (2001), we split the sample of jilted underwriters into those that are retained as co-manager (essentially a demotion) and those who are dropped entirely (or fired).

From Table 7, there is no difference in the average recommendation of old underwriters before and after the offering. However, over this time period the consensus recommendation from unaffiliated analysts is increasing and new underwriters are adding coverage, so the lack of positive response from the old underwriter is at odds with other analysts. Table 8 compares the analyst recommendations in the case where the old underwriter is retained as a co-manager

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<sup>15</sup> This result also holds if we restrict the comparison to other analysts from similarly ranked investment banks to the new underwriter.

versus being fired and shows the average distance from the consensus recommendation for the old underwriter as well as the old underwriter recommendations.

For old underwriters retained as a co-manager, the recommendations prior to the offering are above the consensus, and 90 days after the offering are in line with consensus recommendations. Also, there is a high level of analyst coverage by old underwriters who are retained as co-managers: prior to the offering they are providing recommendations in 146 (72%) of 202 stocks. Examining the sub-groups based on the change in underwriter ranking, it is apparent that the significantly positive recommendations are only present in the large up-grader group. Perhaps this positive recommendation is an attempt to retain underwriting clients, but it fails when there is a much higher reputation underwriter available. For all others the old underwriter/co-manager is providing a recommendation in line with the consensus.

For old underwriters who are fired, there is a low level of analyst coverage prior to the offering, which could contribute to the firm switching underwriters: only 110 (31%) of 351 stocks are covered by the fired old underwriter 90 days prior to the offering. After the offering the recommendation by fired old underwriters is significantly below the consensus, and of the 110 fired old underwriters providing recommendations 90 days prior to offering 39 of these (35%) lowered their recommendation or ceased coverage around the offering, whereas only 10 (9%) raised their recommendation and 2 commenced coverage. This suggests some fired underwriters do react with a retaliatory negative analyst recommendation, however the majority do not change their recommendations at all.

Examining the sub-groups, we find that the large downgraders and lateral upgraders appear to have a negative change in recommendation after the offering. For the firms that downgrade to a lower ranked underwriter, the lower-than-consensus opinion by the old lead

could more likely be interpreted as a signal of a decline in firm quality and the lower rating by the analyst at the old bank could be interpreted as reflecting this change in firm quality. The old analyst would be in a better position than most to understand the change in firm quality; especially if the old bank declined to underwrite the offering due to the declining quality of the deal. For the lateral upgraders, the decline in recommendation could indeed represent retaliation by these banks, as they have lost an underwriting mandate to a comparable bank.

Overall, these data provide only marginal support for the allegations of underwriter retaliation, particularly when firms fire an underwriter of similar reputation to the new underwriter. However, while we find that some jilted underwriters do drop or lower coverage after the offering, many continue unchanged.

#### *D. Market Making Capabilities*

The third aspect of competition relates to the market making activities of underwriters in Nasdaq stocks doing follow-on offerings. Ellis, Michaely and O'Hara (2000) show that the lead underwriter in a Nasdaq IPO always makes a market for the stock and is almost always the dominant market maker for the first few months the stock is traded, controlling more than 50% of the order flow. It certainly seems that making a market, and being an active market maker for the stock, is part of the implicit understanding between the issuer and the lead underwriter.

Given the importance of the market making activity, one conjecture is that investment banks hoping to win the lead role in the follow-on offering will proactively attempt to become an important market maker, perhaps even the most important market maker in the firm's stocks. Moreover, using the same rationale, it is possible that firms with weak market making activities

by the current underwriter are more likely to consider switching to a different underwriter that will be more committed to making a market for its stocks.

To analyze each underwriters' market making activities, we collected data from NASD on the volume of trade in the issuing company stock executed by each underwriter in the period 3 months before to 3 months after the offering. Our sample is restricted to 922 Nasdaq offerings. Again, we segregated the sample by whether the underwriter retained the business, acted as a co-manager in the follow-on offering, or was replaced completely. We also divided the sample by whether firms graduated, downgraded, moved laterally, or remained at the same underwriter. These data are given in Table 9.

The data reveal an interesting feature of virtually all follow-on offerings: the underwriter is doing a relatively small percentage of the daily trading volume. Instead, unaffiliated market makers are trading the bulk of the trades three months before the offering, and this percentage generally increases after the offering. These unaffiliated market makers are typically the "wholesaler" firms, such as Herzog or Knight Securities, who do not underwrite securities but instead specialize in making markets. This finding of wholesaler dominance suggests a maturity to the trading of these issuers. Ellis, Michaely, and O'Hara (2002) found that as time passes after the IPO, wholesalers gradually replace the underwriter in market making importance. From our perspective here, this finding suggests that market making activities are not as important a factor for follow-on offerings as they are for IPOs.

Turning now to the overall trading patterns, Table 9 and Figure 2 show distinct differences between the market making importance of on-going and replaced underwriters. The data show that on-going underwriters had a larger, and more stable, trading presence than replaced underwriters. On average, retained underwriters controlled around 30% of the trade

volume in the months leading to the follow-on offering, compared with around 15% for those who were fired. The difference is statistically significant.

Focusing on firms who change underwriters, we find that the new lead underwriter controlled less than 10% of the trading volume in the month leading to the follow-on offering. In the months after the follow-on offering, his share of volume increased to around 20%.<sup>16</sup> Moreover, as Figure 2 shows, there is a dramatic, and statistically significant, increase in the trading activity of the new underwriter at the time of the offering. Similarly, there is a statistically significant decrease in the trading of the old underwriter, particularly if the old underwriter is not acting as co-manager. In part, this change should be expected, as the new underwriter is responsible for handling the distribution of the new offering, and this can involve substantial trading. However, the increase in on-going underwriters' trading activity at this time is much less, suggesting that the new underwriter is supplanting trading activities of the old underwriter.

Are these changes in trading patterns evidence of proactive, reactive, or retaliatory strategies? Evidence to address this question can be found in the time-series of trade executions. Looking 3 months before the issue, we see little evidence of increased market making on the part of any underwriter. The old underwriters do not appear to be bolstering their activities, and underwriting hopefuls show little initiative either in terms of increasing market share. At the time of the issue there are large changes in trading patterns, but it is not clear whether these are strategic choices or are the natural outcome of the issue process. Certainly, being fired as opposed to demoted does change trading behavior. Demoted underwriters execute approximately 11-17% of the trades on the offering day; fired underwriters average 3-6%.

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<sup>16</sup> Krigman et al. (2001) also report that in their sample underwriters of firms that switched had a lower trading volume than the underwriters of firms who did not switch.

Could this be evidence of retaliatory behavior? Examining trading in the seven-month period surrounding the issues provides a better perspective to evaluate this question. As shown in Table 9, in virtually all cases the old underwriter is doing significantly less volume three months after the offering than it was doing three months before the offering. And as noted, jilted underwriters are doing far less. However, the data also show that the old underwriters tend to increase their market activity in the three months after the offering. Retaliatory behavior would seem much more consistent with continued decreases in trading activity. Thus, we find little to support the retaliatory hypothesis.

#### **4. A Comprehensive Measure of Competition**

Our analysis thus far has separately analyzed the extent to which fees, discounts, market making, prior debt offering, reputation, and analyst coverage and recommendations play a role in the competition for follow-on offerings. In this section, we take a broader perspective on the nature of competition by allowing each of these dimensions to enter into a comprehensive measure of competition. This approach allows us to capture any interactions between competitive variables, for example banks offsetting charging high fees by providing better service. along other dimensions such as recommendations or market making. To accomplish this, we first examine the correlations between the dimensions and then construct an overall competitive score for each deal.

##### *A. Calculating the overall measure of competition*

To gauge the interaction between attributes, we calculate z-scores for fees ( $Z_{\text{fee}}$ ), pricing discount ( $Z_{\text{discount}}$ ), recommendation 90 days prior to offering ( $Z_{\text{rec}}$ ), market making volume three months prior to offering ( $Z_{\text{MM}}$ ), reputation ( $Z_{\text{reputation}}$ ), and prior debt

relationship ( $Z_{debt}$ ). The z-scores are calculated using the mean and standard deviation for the whole sample. As some of our variables are inverted (for example, higher reputation is measured by lower rank) we standardize the z-scores so that a positive z-score implies the underwriter is “better” than the mean. A positive z-score on reputation means a higher reputation underwriter, and a positive z-score on pricing discount means a lower discount. A negative correlation between z-scores means there is a substitute between a pair of variables. Table 10 shows the correlations between the standardized measures for the switchers and non-switchers separately.

For the non-switchers, most correlations are positive, and in many cases the correlation are also significant. An exception is market making, which has significant negative correlations with four variables: reputation, fees, pricing discount and prior debt offerings. Thus deals with higher fees and steeper underpricing tend to have above average market making services. This latter result suggests that market making activity provided by the lead underwriter prior to the offering may be a substitute for fees, reputation and prior debt relationship.

Reputation is significantly positively correlated with fees and underpricing discount, suggesting that high reputation banks charge lower fees and price follow-on offerings at a lower discount. Also fees and underpricing discount are positively correlated. Thus paying higher fees is not a substitute for also suffering a steeper discount.

For the switchers, all significant correlations are positive, except for a negative correlation between analyst recommendation and private debt relationship. Thus there is little evidence that underwriters compensate for non-competitive behavior on one dimension with competitive behavior on another. High reputation underwriters charge lower fees and provide lower pricing discounts, similar to the non-switchers, but reputation is not related to prior debt relationship, as graduating switchers are least likely to have a debt relationship with new high-

reputation underwriters. Lower fees are related to better pricing, better recommendations, and debt underwriting. Thus, underwriters charge lower fees on equity deals when they are underwriting debt offerings for the firm as well. Better pricing discounts are related to better market making activity, perhaps because of underwriter-market makers' ability to absorb large trading volumes with minimal price movements. Also better market making activity is related to better recommendations prior to the offering.

Overall, the correlation analysis does not seem to suggest any significant substitution among the dimension of underwriters' services. Could features of the deals themselves explain this finding? For example, if small riskier deals tend to be handled by lower-reputation underwriters, as the results suggest, then these deals might require more marketing efforts and also expose the investment bank's capital to a greater risk. These issues are addressed in the analysis below.

To develop this analysis further, we now combine our z-scores to provide a single comprehensive measure ( $score_i$ ) of the extent of the competition for follow-on offerings.

$$score_i = a_1 * Z\_fee_i + a_2 * Z\_discount_i + a_3 * Z\_reputation_i + a_4 * Z\_MM_i + a_5 * Z\_rec_i + a_6 * Z\_debt_i$$

An immediate problem in constructing this measure is how to weight the various dimensions. As a first approximation, we assume each (standardized) measure has the same impact and use equal weights to combine the six standardized measures of underwriter activity into a single measure of overall underwriter activity for each deal. Thus each attribute gets a weight of 16.7%. The sample mean of our comprehensive measure is zero and its standard deviation of 0.49, narrower than the standard deviation of one for the individual z-scores. Follow-on offerings associated with a more positive measure should be considered deals with overall better terms and hence a more competitive lead underwriter.

The equal-weighting may be problematic in that different elements may have different importance in the overall deal competitiveness. There is no a priori reason to believe that, say, fees and market making will have the same impact on how competitive a deal is. Thus the second measure we use finds the weights that maximize the overall level of competition in the market for follow-on offerings. The intuition here is that in a perfectly competitive market, the overall measure for each deal will be equal to zero: in equilibrium, all deals provide the same service when all elements are considered. To find the optimal weights, we solve for a system of equations where the weights minimize the squared deviation from zero for each deal<sup>17</sup>:

$$\begin{aligned} \text{Min}_{a_1, \dots, a_6} \sum_{i=1}^{1277} (\text{score}_i)^2 &= (a_1 * Z\_fee_i + a_2 * Z\_discount_i + a_3 * Z\_reputation_i \\ &\quad + a_4 * Z\_MM_i + a_5 * Z\_rec_i + a_6 * Z\_debt_i)^2 \\ \text{s.t. } \sum_{j=1}^6 a_j &= 1 \\ a_j &\geq 0, j = 1, \dots, 6 \end{aligned}$$

The outcome of this optimization is presented in Panel A of Table 11. Interestingly, when we maximize the degree of market overall competitiveness, reputation, market making and debt relationship receive slightly higher weights than in the equal weighting scheme and fees receive a lightly lower weight. But overall, the weighting of the variables is not radically different between the two weighting schemes.

Since each action (e.g. fees) may be related to deal attributes (size of deal, volatility of stock price, time since last deal, stock price performance prior to offering) we examine the underwriter activity net of these effects. To do so, we regress these overall measures against deal attributes and time dummies. The regression results (Table 11, Panel B) show that features of the

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<sup>17</sup> Rather than using the public debt and private debt relationships separately, we form one variable that takes the value one if the lead underwriter has a prior public or private debt relationship, and zero otherwise. Then we calculate z-scores for this single debt variable.

deal are important determinants of the standardized score of underwriter activity, in ways consistent with prior result we present: larger deals have higher scores, risky deals have lower scores, and the longer the time since last offering make the term of the deals less attractive.

More importantly, to examine the competitiveness of the deals after controlling for the deal's features, we average the residuals for non-switchers, and the four categories of switchers. Those results are presented in Table 11, Panel C. Underwriters that retain clients are providing superior overall service to those clients, as indicated by the higher average residual. Follow-on offerings by firms that move to new underwriters receive overall significantly lower scores than those who do not move. Underwriters that gain clients without any large change in reputation are providing competitive levels of service for their clients, indicated by insignificant residuals. When switching involves a significant change in reputation, either up or down, underwriters do not compete on the dimensions we have outlined, rather providing worse service overall than for other deals. For firms that graduate to a high reputation underwriter, the less than average service prior to the deal (i.e., little analyst coverage or market making), does not translate into less than average coverage after the deal, rather it shows that high reputation underwriters do not have to prove their ability to firms prior to the deal, instead they wait until after the deal is completed. These results are consistent across the weighting schemes and are robust to the exclusion of prior debt offering as one of the competitive variables.

#### *B. The determinants of gaining and losing underwriting business*

The analysis above suggests that underwriters who retain clients are providing superior aggregate service to their clients, and the optimized weighting scheme suggests that all dimensions of underwriter behavior that we include are important. An alternative approach that

we follow in this section is to examine the dimensions along which underwriters compete for deals via a probabilistic regression to determine the likelihood of an underwriter losing an existing client or gaining a new client.

In the last subsection we standardized the variables of interest via z-scores to allow us to aggregate them together. Here we are interested in measuring how the underwriter is competing on each dimension relative to other possible underwriters, and so we standardize the variables by measuring them relative to relevant benchmarks. For some variables there is a natural benchmark (for example, analyst recommendation versus the consensus), but for other variables we calculate a benchmark based on deal size and the year the deal was executed. To do this we split all offerings in our sample by year and into quintiles each year based on the size of the offering. We use the median value for the year-size-quintiles as our benchmark for several independent variables as discussed in detail below.

When analyzing the probability of losing a client, the dependent variable takes the value of one if the underwriter loses the issuing client and zero if the issuing firm remains with the underwriter. The following independent variables are used: (i) the old underwriter reputation which is based on the dollar volume of underwriting deals. Reputation is measured relative to the year-size-quintile median lead underwriter reputation ranking, thus we are focusing on the reputation of the old underwriter relative to the reputation of other lead underwriters for similarly sized deals in the same calendar year; (ii) Market making volume of the old lead underwriter measured 3 months prior to the offering. Market making volume is measured relative to the median market making volume of all old lead underwriters. This variable enables us to assess the relative commitment of the old lead to market making activity in the stock; (iii) The level of analyst recommendation of the old lead 90 days prior to the offering date. Old lead underwriters'

recommendations are measured relative to the consensus for the stock. Not all underwriters provide research coverage and recommendations for the stock. In general lack of coverage by the lead underwriter is a certainly a negative. Erring on the conservative side, rather than setting a missing recommendation to 0 (which represents a very negative recommendation, given that a ranking of 1 represents a sell recommendation), we assigned a neutral recommendation (ranking of 3) for all missing observations;<sup>18</sup> (iv) Fees for the offering, (v) Underpricing discount and (vi) prior debt relationship. We measure fees and discount relative to the median year-size-quintile fee and discount. For the prior debt relationship we use a dummy variable that takes the value one if the old lead underwriter had either a private loan or public debt relationship with the firm.

The probit regression results in Table 12, Panel A show that underwriters who fail to provide an acceptable level of service to their clients (via reputation, analyst recommendations and market making activity) have a greater likelihood of losing future underwriting business. Similarly, charging lower fees for their services and leaving more money on the table (lower discount) increases the likelihood of being retained as the lead banker. Rather than one dimension, all services, except prior debt underwriting relationship, are important in the competitive calculus of retaining existing clients. Several control variables for attributes of the deal are also important: smaller deals, firms with infrequent equity deals, and firms with recent price run-ups are less likely to be retained by underwriters.

How competitive behavior affects the likelihood of gaining a new client is modeled via a probit regression with the dependent variable taking the value of one if the lead underwriter is new, and zero if the lead underwriter remains the same from the last offering. The explanatory variables capture the relative competitiveness of the new lead underwriter compared to the old

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<sup>18</sup> Assigning a negative recommendation, rather than a neutral recommendation to all cases where the underwriter did not provide research coverage to the stock, makes our results (reported below) even stronger.

lead underwriter on the dimensions of reputation, analyst recommendation 90 days prior to the offering, market making activity three months before the offering, and prior debt relationship. If the lead underwriter remains the same from one offering to the next, these relative measures will be zero. Also, to examine whether underwriters compete on price, the fee and underpricing discount relative to the year-size-quintile median are included. The regression results are in Table 12, Panel B.

As 382 of the 557 switching firms upgrade their underwriter, the probability of gaining a client is positively related to reputation. Also the positive and significant coefficient on the recommendation variable indicates that as the new lead underwriter's recommendation gets stronger (relative to the old underwriter), its chances of becoming the lead underwriter significantly improve. As seen in the univariate results, competition on market making is not important: new underwriters are less active market makers than current underwriters, and underwriters do not compete on the pricing dimension: new lead underwriters charge fees that are higher than the median fees charged for similar size deals, however pricing discounts are not different from the median. Deal attributes are significant: underwriters gain smaller deals, deals by firms with high recent price returns, and infrequent equity issuers. Due to the infrequent number of debt-equity links, a prior debt underwriting relationship is not important to gaining equity underwriting business.

In summary, the competitive environment for retaining clients appears to rely on all dimensions, whereas the competitive environment for attracting new underwriting clients appears to rely on the lead underwriter dominating the old underwriter on two aspects: having a better reputation than the old underwriter, and providing more optimistic recommendations

several months prior to the offering. There is no evidence that the new lead competes by offering greater involvement in liquidity provisions or lower fees on the offering.

## **5. Conclusions**

Is the market for investment banking services competitive? In this research we focus on supply-side competition by looking at how investment banks compete for follow-on equity offerings. While our results reveal several important aspects of the extent of market competition for follow-on offerings, they do not fully resolve the issue.

Several results suggest extensive competition in follow-on offerings. First, of the 1277 offerings in our sample, 44% change lead underwriters from their previous equity offering. We find that while many changing firms “graduate” to better underwriters, most of the changing firms are moving laterally or are down-grading in terms of the lead investment banker’s quality. This tendency to shift rather than graduate in term of underwriters’ quality gives greater importance to understanding how underwriters compete for business.

A second indicator of competition is the cross sectional variability in fees. Unlike IPOs where fees for moderate size deals are constant at 7% (Chen and Ritter, 2000) the cross-sectional variability in fees (and discount) is related to economic fundamentals (like the size of the issue and its riskiness). Much in line with Chen and Ritter’s argument, such variability is consistent with competition.

Third, the evidence suggests that the decision to retain an underwriter is based on what the underwriter has been doing for some time and not on last-minute maneuvering just before the follow-on offering. An underwriter that maintains a positive outlook on the firm and is a dominant market maker is less likely to be replaced. We do not see existing underwriters changing their behavior just before the SEO: they do not become more active as market makers

nor do they boost their recommendations about the firm. From the perspective of underwriters the finding is clear: if existing underwriters deliver along dimensions important to the firm, they will not be replaced.

Fourth, we do not find reliable evidence of retaliatory behavior in market making or in recommendations by jilted underwriters. Retaliation is much more likely to exist in concentrated markets or in markets that are non-competitive for other reasons. Our results are consistent with the argument that on average individual underwriters do not have sufficient market power to “punish” departing issuers, a finding we believe supports the notion of a competitive market.

Several other aspects of our findings have more bothersome implications concerning the extent of competition: after controlling for the size and risk of the deal, new underwriters do not compete on fees (their fees are higher than the existing underwriter), and pricing discounts are only competitive for underwriters who are gaining clients from underwriters who are similarly, though slightly lower, ranked. These findings do suggest that underwriters have significant power over firms who wish to be associated with higher reputation issuers. Firms that graduate to a higher reputation underwriter must pay a premium for the privilege (above the fee that the same underwriter charges an existing client for a similar deal). Similarly, firms that have to resort to a low reputation underwriter to underwrite their equity offering also must pay a premium, suggesting that these underwriters profit despite their low reputation. These results suggest that perhaps investment banks are simply as competitive as they have to be.

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**Table 1**  
**Descriptive Statistics**

Summary statistics of the sample of 1277 NYSE, AMEX and Nasdaq Follow-On Equity Offerings during 1996 to 2003.

Variable	#Obs	Mean	Standard Deviation	Minimum	Maximum	Median
Market Cap at Announcement of Offering (millions)	1277	1007.9	2417.7	15.5	28920.8	414.6
Offering amount (millions)	1277	133.39	199.89	2.06	2782.50	79.75
Shares Offered (millions)	1277	4.16	4.17	0.20	70.00	3.00
Offer Price	1277	31.42	25.32	3.00	247.00	25.00
Primary Shares Offered (millions)	1277	3.06	3.01	0.05	30.00	2.30
Secondary Shares Offered (millions)	1277	1.10	2.63	0.00	50.00	0.31
Percent primary shares	1277	76.87	27.42	1.82	100.00	88.89
Overallotment shares (millions)	1277	0.61	0.61	0.00	10.50	0.45
Overallotment shares as percent of shares offered	1277	14.81	1.19	0.00	15.00	15.00
Float <sup>a</sup>	1277	23.15	16.47	0.65	222.36	19.92
Primary Float	1277	17.64	15.02	0.38	222.36	14.64
Shares Outstanding Before Offering (millions) <sup>b</sup>	1277	36.02	58.97	1.45	643.96	19.12
Shares Outstanding After Offering (millions) <sup>b</sup>	1277	39.08	60.36	2.22	658.96	21.83
Length of lock-up period in days	1054	106	38	30	365	90
Gross Spread as a Percent of the Offering Amount	1277	5.19	0.79	1.45	8.91	5.23
Shares Filed (millions)	1274	4.15	4.09	0.25	60.00	3.00
Raw Return from Stock Price at Filing to Offer Price	1277	-4.04%	20.23%	-65.91%	163.85%	-4.76%
Last Trading Price Reported Prior to Offering	1273	32.21	25.74	3.31	249.13	25.75
Days between filing and completion	1277	35	23	4	354	29

<sup>a</sup> Float = amount offered / market capitalization

<sup>b</sup> Often missing in SDC and unreliable (see Ljungqvist's webpage <http://pales.stern.nyu.edu/-aliungqv/research.html>)

**Table 2**  
**Lead Underwriters for Follow-on Offerings**

The lead underwriters for all equity offerings during 1996 to 2003 were ranked based on the dollar volume of underwriting following Megginson and Weiss (1991). This table presents the top 25 ranked underwriters during this time period. We identify the top 10 as Tier 1 underwriters and the next 15 as Tier 2 underwriters. In total there were 79 underwriters for our sample of 1277 follow-on equity offerings. The first column displays the market share for all equity offerings (data from SDC) during 1996 to 2003, not only our sample. The remaining columns relate to our sample. The number of deals and percent of sample (n=1277) is the number of follow-on equity offerings for which this underwriter acted as lead. Each deal is identified as “old” or “new”. For an old deal, the underwriter was the lead underwriter in the prior equity offering. For a new deal, the underwriter was not the lead on the previous equity offering. The loyalty of previous deals is calculated within our sample, it is the number of old deals divided by the total number of deals that the underwriter was lead in a prior equity offering (includes the old deals plus firms that used a different underwriter in the next equity offering).

Lead Underwriter	Market Share (all equity offerings 96-03)	Number of Deals in Sample	Dollar Share of Sample	Old Deals	New Deals	Loyalty of Previous Deals
<b>Tier 1 Underwriters</b>						
Goldman Sachs	15.8%	80	11.5%	51	29	83.6%
Merrill Lynch	13.2%	98	9.9%	51	47	79.7%
Morgan Stanley	12.3%	88	14.8%	47	41	66.2%
Salomon Smith Barney	11.3%	75	4.9%	36	39	52.2%
Credit Suisse First Boston	7.6%	95	11.8%	58	37	77.3%
Hambrecht & Quist / JP Morgan	5.4%	66	5.0%	42	24	63.6%
Lehman Brothers	4.5%	50	3.7%	33	17	58.9%
Donaldson Lufkin & Jenrette <sup>19</sup>	3.9%	61	5.1%	39	22	65.0%
Deutsche Bank / BT Alex Brown	3.3%	97	7.2%	74	23	69.2%
UBS Warburg	3.2%	51	2.0%	14	37	48.3%
<b>Tier 1 Total</b>	<b>80.6%</b>	<b>761</b>	<b>75.9%</b>	<b>445</b>	<b>316</b>	<b>67.6%</b>
<b>Tier 2 Underwriters</b>						
BA Securities / Montgomery	2.5%	81	4.2%	47	34	62.7%
Bear Sterns	2.4%	44	3.6%	23	21	67.6%
Robertson Stephens	1.8%	55	4.5%	41	14	65.1%
Prudential Volpe	1.3%	28	1.0%	10	18	26.3%
Freidman Billings Ramsey	0.9%	13	0.3%	7	6	63.6%
PaineWebber	0.9%	13	0.5%	8	5	32.0%
CIBC Oppenheimer	0.9%	29	1.7%	13	16	50.0%
SG Cowen	0.6%	16	1.0%	9	7	52.9%
AG Edwards	0.6%	9	0.2%	3	6	100.0%
Us Bancorp Piper Jaffrey	0.3%	12	0.3%	6	6	54.5%
ING Furman Selz	0.3%	11	0.5%	1	10	14.3%
William Blair	0.3%	8	0.5%	5	3	38.5%
Thomas Weisel	0.3%	11	0.6%	2	9	50.0%
Raymond James	0.3%	17	0.8%	5	12	50.0%
RBC Dominion	0.3%	2	0.1%	1	1	100.0%
<b>Tier 2 Total</b>	<b>13.5%</b>	<b>349</b>	<b>19.8%</b>	<b>181</b>	<b>168</b>	<b>53.6%</b>
<b>Tier 3 Total</b>	<b>5.9%</b>	<b>167</b>	<b>4.2%</b>	<b>94</b>	<b>73</b>	<b>28.1%</b>

<sup>19</sup> This reflects deals underwritten by DLJ during 1996-August 2000. DLJ was acquired by CSFB August 30, 2000.

**Table 3**  
**Frequency of Switching and Change in Underwriter Quality**

This table shows the number of firms that change lead underwriters from the prior equity offering to the sample offering. Non-switcher firms retain the same lead underwriter from the prior offering. Panel A shows the frequency of switching between and within Underwriter Tiers (as identified in Table 2.) In Panel B the summary statistics of the difference in rank between the prior lead underwriter and the current lead underwriter is displayed. Downgrading (upgrading) firms are those that move to an underwriter with a smaller (larger) market share of equity offering underwriting. The rankings are ordinal rankings based on the dollar volume of equity offering underwriting during 1996 to 2003.

Panel A: Between Tiers and Within Tiers

	Total	Follow-On Offering Underwriter Quality		
		Tier 1	Tier 2	Tier 3
Non-switcher Firms	720	445	181	94
Switcher Firms	557	316	168	73
Previous Offering Underwriter Quality	Tier 1	155	48	10
	Tier 2	97	49	11
	Tier 3	64	71	52

Panel B: Difference in Ranking For Firms that Switch Lead Underwriter

	N	Mean	Min	25%	Median	75%	Max
Non-switcher Firms	720	0	0	0	0	0	0
Downgrading Firms	175	-11.9	-168	-11	-6	-3	-1
Upgrading Firms	382	34.4	1	5	13	48	335

**Table 4**  
**Switchers versus Non-Switchers**

This table presents the descriptive statistics for the sample split into switchers and non-switchers. The means and medians are presented with test statistics for differences between the groups. Firms who retain the same lead underwriter from one equity offering to the next are defined as “non-switchers”, and firms who change lead underwriters are “switchers”. Lead underwriter rank is calculated from the population of equity offerings during 1996-2003. Underwriters are ranked on the market value of deals for which they acted as the lead underwriter (Megginson and Weiss 1991). The old lead is the lead underwriter from the prior offering, and the new lead is the lead underwriter for the current offering. The sample of switchers is split into large and lateral (small) upgraders and downgraders, with large down(up)graders having a change in rank from the prior underwriter to the current underwriter below (above) the median change in rank. The price volatility is calculated as the standard deviation of CRSP returns for the 90 day period prior to the announcement of the equity offering.

	Large Down	Lateral Down	Non Switcher	Lateral Up	Large Up	F Stat	Large Down	Lateral Down	Non Switcher	Lateral Up	Large Up	Chi Sq
	Mean	Mean	Mean	Mean	Mean		Median	Median	Median	Median	Median	
N Obs	89	86	720	191	191		89	86	720	191	191	
Market Cap (millions)	415	1047	1220	1135	342	6.6	217	438	475	526	199	118.2
90 day price volatility	4.54%	4.33%	4.50%	4.19%	4.08%	2.0	4.13%	4.12%	3.79%	3.97%	3.63%	3.3
Amount (millions)	69.5	132.0	153.6	155.5	65.2	10.6	52.0	78.3	92.4	89.1	51.1	108.2
Offer Price	22.51	26.65	34.92	32.41	23.49	12.1	18.00	21.75	27.00	24.50	20.00	72.6
Shares Offered (millions)	3.37	5.07	4.26	4.91	2.96	7.6	2.75	3.36	3.20	3.05	2.50	46.1
Primary shares	84.1%	81.8%	71.9%	82.3%	84.5%	14.2	100%	100%	80%	96%	97%	57.6
Float	25.9%	20.6%	22.5%	21.1%	27.4%	5.4	22%	18%	19%	18%	25%	28.9
Primary Float	21.0%	15.9%	16.2%	17.1%	22.7%	8.7	16%	15%	13%	15%	20%	51.6
Over allotment	15.0%	14.8%	14.8%	14.8%	15.0%	1.7	15%	15%	15%	15%	15%	13.1
Length of lock-up (days)	115	98	104	104	116	5.0	90	90	90	90	90	20.0
Gross Spread	5.7%	5.2%	5.0%	5.1%	5.7%	39.9	5.7%	5.3%	5.0%	5.0%	5.7%	158.6
Shares Filed (millions)	3.41	5.04	4.25	4.81	3.04	6.7	2.82	3.50	3.07	3.37	2.50	36.4
Days from filing to offer	39	38	32	33	43	11.1	32	30	27	29	35	73.8
Days since last offering	1348	1457	547	1133	1113	83.0	1295	1374	343	985	940	295.4

**Table 4 cont.**

	Large Down	Small Down	Non Switcher	Small Up	Large Up		Large Down	Small Down	Non Switcher	Small Up	Large Up	
	Mean	Mean	Mean	Mean	Mean	F Stat	Median	Median	Median	Median	Median	Chi Sq
N Obs	89	86	720	191	191		89	86	720	191	191	
Old Lead Rank	19.2	7.4	13.7	12.4	80.4	173.0	9	6	9	11	62	418.8
New Lead Rank	40.0	10.1	13.3	6.8	17.2	37.2	21	10	9	4	11	200.3
Filing excess return (3 days)	-1.38	-2.76	-2.40	-2.24	-2.04	0.5	-0.83	-3.30	-2.52	-2.43	-2.54	4.3
Filing to offer excess return	3.12	2.83	-1.14	-0.2	-0.83	1.6	2.0	-1.03	-1.74	-2.06	-1.50	6.9
One year CAR prior to filing	88.5%	92.9%	68.5%	83.5%	77.8%	5.5	69.4%	79.7%	56.7%	69.3%	64.4%	17.0
Old Lead is Co Manager	20.2%	30.2%		41.3%	42.4%	5.6						
Prior Public Debt with New Lead	3.37%	3.49%	5.97%	3.14%	1.05%	2.6						
Prior Public Debt with Old Lead	1.12%	4.65%	5.97%	5.76%	0.52%	3.3						
Prior Private Debt with New Lead	3.37%	3.49%	5.97%	6.81%	3.14%	1.1						
Prior Private Debt with Old Lead	2.25%	2.33%	5.97%	5.24%	0%	3.8						

**Table 5**  
**Direct and Indirect Fees**

This table presents the fees charged by the underwriting syndicate across various sub-groups of the sample. The fee (gross spread) is calculated as a percent of the offering amount. In the last columns are test statistics for differences between the means and medians of the groups.

				Switchers			
	Whole sample	Non-Switchers	Switchers	Large Down	Lateral Down	Lateral Up	Large Up
N	1277	720	557	89	86	191	191
Mean fee	5.19	5.01	5.41	5.65	5.25	5.10	5.68
Median fee	5.23	5.00	5.50	5.71	5.26	5.03	5.74
F statistic		84.2		21.1			
Mean discount	-2.79%	-2.37%	-3.35%	-4.44%	-3.65%	-2.29%	-3.76%
Median discount	-1.96%	-1.62%	-2.38%	-3.18%	-2.90%	-1.51%	-2.67%
F statistic		29.10		9.05			

**Table 6**  
**Determinants of Fees and Pricing Discount**

Dependent Variable is the fees (gross spread as a percent of amount offered) and the pricing discount (return from the close price the day before the offering to the offer price). Size is measured by the log of the offering proceeds; risk is the stock price standard deviation measured over the 90 days prior to filing. Four dummy variables are used for the four categories of switching (large downgrade in underwriter reputation, lateral downgrade in underwriter reputation, lateral upgrade in underwriter reputation and large upgrade in underwriter reputation). The tier rank of the underwriter for the current offering is 1, 2 or 3 (larger number indicates lower rank) and the time since prior offering is in years. Year dummies were also included. Sample size is 1277 offerings. T Statistics are in Parentheses.

	Fees	Discount
Intercept	15.59 [40.63]	-17.59 [-8.09]
Log Amt	-0.5750 [-29.09]	0.8394 [7.50]
Large Downgrade	0.1057 [1.61]	-1.2393 [-3.33]
Lateral Downgrade	0.1132 [1.76]	-0.9802 [-2.70]
Lateral Upgrade	0.0917 [1.99]	0.1348 [0.52]
Large Upgrade	0.2752 [5.90]	-0.7688 [-2.91]
Stock Price Volatility	5.63 [5.76]	-39.18 [-7.08]
Rank of Underwriter	0.0441 [1.72]	0.2558 [1.76]
Time since prior offering	-0.0124 [-1.37]	-0.0708 [-1.38]
New Underwriter's Loyalty Index	-0.3584 [-3.43]	1.2549 [2.12]
One Year Return Prior to Offering	0.0914 [2.91]	-0.1032 [-0.58]
R Square	55.8%	15.1%

**Table 7**  
**Underwriter Analyst Recommendations Around Offering**

This table presents the analyst recommendations from the lead underwriter in the prior equity offering (old lead), the lead underwriter in the current equity offering (new lead), and the consensus of all other analysts (unaffiliated consensus). For non-switching firms, the old lead and the new lead are the same underwriter. The analyst recommendations are on a scale of 1 (low) to 5 (high). Sample size is 1265 firms as 12 had no analyst coverage.

		Whole Sample (n=1265)	Non-switchers (n=712)	Switchers (n=553)	Switchers			
					Large Downgrade (n=87)	Lateral Downgrade (n=86)	Lateral Upgrade (n=189)	Large Upgrade (n=191)
Number of Analysts	90 days prior	4.37	4.31	4.45	3.76	5.01	5.45	3.51
	90 days post	5.83	5.82	5.84	5.2	6.29	6.78	5
T test (over time)		-10.31	-8.44	-6.12	-2.88	-2.26	-2.99	-4.58
Number of Top Tier Analysts	90 days prior	0.77	0.9	0.6	0.4	0.6	0.96	0.32
	90 days post	1.07	1.27	0.81	0.6	0.79	1.22	0.51
T test (over time)		-5.64	-5.13	-2.76	-1.18	-0.96	-1.61	-1.94
New lead Underwriter recommendation	90 days prior	4.46	4.47	4.43	4.46	4.45	4.43	4.41
	N	793	567	226	46	49	82	49
	90 days post	4.54	4.53	4.55	4.64	4.53	4.51	4.57
		N	1050	600	450	66	75	152
T test (over time)		2.85	-1.69	-2.36	-1.55	-0.81	-0.98	-1.44
Old lead Underwriter Recommendation	90 days prior	4.42	4.47	4.31	3.92	4.11	4.33	4.55
	N	823	567	256	36	38	99	83
	90 days post	4.47	4.53	4.32	3.94	4.09	4.33	4.60
		N	833	600	233	34	34	92
T test (over time)		1.51	-1.69	-0.15	-0.13	0.1	0.07	-0.52
T-test (lead vs. old underwriter)	90 days prior	1.25	0	1.98	3.42	2.31	0.95	-1.23
	90 days post	2.53	0	4.31	4.53	3.09	2.26	-0.44
Unaffiliated Consensus Recommendation	90 days prior	4.31	4.35	4.26	4.09	4.22	4.27	4.35
	N	1121	645	476	71	80	176	149
	90 days post	4.35	4.39	4.31	4.17	4.27	4.34	4.37
		N	1232	702	530	83	86	184
T-test (lead vs. consensus)	90 days prior	5.48	3.67	3.53	2.85	2.29	2	0.5
	90 days post	8.40	4.95	7.04	5.1	3.23	2.93	3.39

**Table 8****Retaliation by Old Underwriters in Analyst Recommendations: Comparing Demotion to Firing**

This table shows the average distance that the underwriter's recommendation is from the consensus recommendation for that stock. The sample is the 553 switching offerings with analyst coverage from our total sample of 1277. The offerings are split into four groups based on the change in ranking from the old (prior) lead underwriter to the new (current) lead underwriter. Large up (down) changes in rankings are higher (lower) than the median. The consensus recommendation is the average recommendation across all analysts for the firm. Recommendations are on a scale from 1 (low) to 5 (high). \*, \*\*, \*\*\* indicates the t statistic is significant at the 10%, 5%, 1% level.

Day	Old Lead Stays as Co Manager			Old Lead Is Not Co Manager		
	N	Recommendation	Distance From Consensus Rec	N	Recommendation	Distance From Consensus Rec
All	202			351		
-90	146	4.45	0.08*	110	4.13	-0.09
90	149	4.44	0.05	84	4.12	-0.19***
Large Down	18			69		
-90	15	4.07	-0.24	21	3.81	-0.18*
90	17	4.24	-0.03	17	3.65	-0.38**
Lateral Down	26			60		
-90	20	4.20	-0.06	18	4.00	-0.23
90	21	4.19	-0.07	13	3.92	-0.36
Lateral Up	77			112		
-90	57	4.44	0.07	42	4.19	-0.06
90	58	4.45	0.06	34	4.12	-0.22**
Large Up	81			110		
-90	54	4.67	0.22***	29	4.34	0.02
90	53	4.58	0.11	20	4.65	0.14

**Table 9**  
**Market Making activity around Follow on Equity Offerings**

Monthly share of trading volume for the sample of 922 Nasdaq offerings during 1996-2001 is from the Nasdaq Monthly Market Making Volume Statistics. For each firm the share of volume done by the old and new underwriters is presented, along with the share of volume by all other market makers (unaffiliated). The volume statistics are calculated in the month of the equity offering as well as three months before and after the offering. T statistics for differences in the pair wise means are in the last three columns. The sample is split into five subgroups: the non-switchers use the same underwriter from offering to offering, and the switching firms are split into four groups based on the change in ranking from the old lead underwriter to the new lead underwriter. Within each switching group, the sample is split into two based on whether or not the old lead underwriter was retained as a co-manager in the current offering.

	Month Around Offering	-3	0	3	Test for difference (-3, 0)	Test for difference (0, 3)	Test for difference (-3, 3)
Non switchers	New lead	30.5%	32.3%	26.8%	-1.77	5.75	3.23
	Unaffiliated	67.9%	67.2%	72.5%	0.66	-5.31	-3.81
Old Lead Stays as Co Manager							
Large Down (n=15)	Old lead	22.7%	16.6	13.8	1.01	0.6	1.66
	New lead	16.3	26.8	27.9	-1.94	-0.14	-1.61
	Unaffiliated	61.0	56.6	58.2	0.48	-1.48	0.28
Lateral Down (n=24)	Old lead	23.0%	13.3	16.1	2.9	-0.92	1.85
	New lead	9.3	28.0	17.5	-5.34	2.69	-2.29
	Unaffiliated	67.6	58.7	66.4	1.78	-2.19	0.23
Lateral Up (n=67)	Old lead	21.2%	11.1	15.0	4.14	-1.94	2.24
	New lead	10.1	24.1	17.2	-6.69	2.75	-2.79
	Unaffiliated	68.8	64.7	67.8	1.24	-0.9	0.25
Large Up (n=68)	Old lead	22.2%	12.2	12.1	4.15	0.06	3.79
	New lead	6.2	27.6	21.0	-10.34	2.76	-6.62
	Unaffiliated	71.6	60.2	66.9	3.85	-2.36	1.47
Old Lead Is Not Co Manager							
Large Down (n=46)	Old lead	11.1%**	5.5**	5.9**	2.27	-0.18	1.96
	New lead	8.9*	23.9	18.3	-5.7	2.01	-3.55
	Unaffiliated	79.9***	70.5*	75.8**	2.55	-5.4	1.08
Lateral Down (n=34)	Old lead	11.3%***	5.5***	6.2***	2.69	-0.37	2.01
	New lead	6.4	23.7	15.5	-6.86	2.79	-3.44
	Unaffiliated	82.4***	70.8***	78.3**	3.61	-0.17	1.21
Lateral Up (n=73)	Old lead	10.8%***	5.6***	5.4***	3.26	0.24	3.39
	New lead	7.9	21.3	15.7	-7.5	2.9	-3.97
	Unaffiliated	81.4***	73.0***	77.6***	3.99	-1.9	1.48
Large Up (n=67)	Old lead	10.4%***	3.0***	4.4***	3.97	-1.14	2.81
	New lead	5.0	27.5	17.7	-10.75	4.43	-6.31
	Unaffiliated	83.1***	69.5***	76.4***	4.68	-2.54	2.07

\*\*\*, \*\*, \* indicate that the percent volume done by the market maker when the old underwriter is retained as a co-manager is significantly different from the percent volume when the old underwriter is not retained as a co-manager at the 1%, 5%, 10% level.

**Table 10**  
**Correlations between Underwriter Characteristics**

Each variable is measured as a z-score based on the mean and standard deviation for the sample of 1277 offerings. Each z-score is calculated so that a positive score represents “better” than the mean. Thus the reputation and discount variables are inverted from the raw measures used in other tables. Recommendation and market making are measured as the recommendation and market making volume of the new underwriter three months prior to the offering. (\*\*\*, \*\*, \* indicate that the Pearson correlation coefficients are significant at the 1%, 5% and 10% level).

**Non-Switchers (n=720)**

	Fees	Pricing Discount	Market Making	Recommendation	Public Debt relationship	Private Debt Relationship
Reputation	0.322***	0.114***	-0.082**	-0.024	0.068*	0.069*
Fees		0.217***	-0.243***	0.173***	0.198***	0.118***
Pricing Discount			-0.062*	0.038	0.083**	0.064*
Market Making				-0.023	-0.147***	-0.017
Recommendation					0.097***	0.072*
Public Debt Relationship						0.233***

**Switchers (n=557)**

	Fees	Pricing Discount	Market Making	Recommendation	Public Debt relationship	Private Debt Relationship
Reputation	0.413***	0.108**	0.001	-0.034	0.020	0.063
Fees		0.317***	0.042	0.127***	0.074*	0.075*
Pricing Discount			0.121***	0.046	0.062	0.032
Market Making				0.141***	-0.022	0.002
Recommendation					0.040	-0.071*
Public Debt Relationship						0.242***

**Table 11**  
**Overall Underwriter Quality**

The underwriter score for each deal is the summation of the z-scores for reputation, fees, discount, recommendation three months prior, market making volume three months prior to the offering, and prior debt relationship. Panel A shows the weights used in calculating the comprehensive underwriter score using both equal weighting and optimal weighting that satisfies the following: minimize  $\Sigma \text{score}^2 = \Sigma (\text{weights} * \text{competition variables})^2$  given that the  $\Sigma$  weights = 1 and each weight  $\geq 0$ .

Panel B shows the regression results when the underwriter score is regressed on deal characteristics. Offering size is measured as the log of global proceeds, price volatility is the 90 day price volatility prior to announcement of the offering, and the cumulative abnormal return is calculated over 252 trading days prior to the announcement of the offering using the CRSP value-weighted index as the market return. Panel C provides results across the five subgroups of non-switchers, large downgrading switchers, lateral downgrading switchers, lateral upgrading switchers, and large upgrading switchers. The sum of scores is the sum of each deal score in the group; the average abnormal score is the average residual from the regression in Panel B, and the t-statistic tests the significance of difference of the average abnormal score from zero.

Panel A Weights used for each variable

Score =	Fees	Discount	Reputation	Market making	Recommendation	Debt relationship
Equal Weight	16.7%	16.7%	16.7%	16.7%	16.7%	16.7%
Optimized Weight	5.6%	15.0%	18.3%	22.4%	19.9%	18.8%

Panel B

Score =	Intercept	Offering Size	Price Volatility	Years since last offering	CAR one year prior	Year Dummies	R square
Equal Weight	-5.535	0.302	-3.924	-0.024	-0.043	yes	38.4%
T-statistic	-23.12	24.00	-5.50	-3.91	-1.91		
Optimized Weight	-4.106	0.220	-2.950	-0.029	-0.027	yes	26.2%
T-statistic	-16.20	16.52	-3.91	-4.55	-1.11		

Panel C

		Non-switchers (n=720)	Large Downgraders (n=89)	Lateral Downgraders (n=86)	Lateral Upgraders (n=191)	Large Upgraders (n=191)
Equal Weighting	Sum of Scores	105.0	-36.5	-9.7	0.9	-59.7
	Abnormal Score (mean residual)	0.07	-0.17	-0.03	-0.01	-0.15
	T statistic	5.01	-3.04	-0.89	-0.62	-5.85
Optimal Weighting	Sum of Scores	104.0	-33.1	-10.9	-6.6	-53.3
	Abnormal Score (mean residual)	0.08	-0.17	-0.03	-0.04	-0.15
	T statistic	5.04	-2.97	-0.9	-1.61	-6.07

**Table 12**  
**Likelihood of losing or gaining an underwriting client**

The dependent variable takes the value of one in Panel A (Panel B) if the underwriter loses (gains) a client and zero if the underwriter keeps a client. In Panel A the reputation, market making volume, fee, and discount variables are measured relative to year-deal size quintile medians. Recommendations are measured relative to the consensus for the firm, and debt relationship is one if the underwriter had either a private or public debt relationship with the firm in the five years prior to the equity offering. In Panel B the reputation, market making volume, fee, discount, recommendation, and debt relationship variables are measured relative to the old underwriter. Thus underwriters who keep clients have values of zero for these variables. Deal size is measured as the log of the deal proceeds in millions; price volatility is the standard deviation of returns 90 days prior to the filing date; one year abnormal return is the cumulative abnormal return measured over the year prior to the filing date using the CRSP value-weighted index as the market; time since last offering is measured in years.

	Prob (lose a client)	P value
Intercept	2.816	0.09
Reputation	-0.016	0.00
Market Making Volume	-3.108	0.00
Recommendation vs. consensus	-0.483	0.00
Fee	-34.164	0.01
Discount	-4.668	0.06
Deal Size	-0.226	0.01
Price Volatility	-11.854	0.02
1 year abnormal return	0.338	0.03
Time since last offering	0.436	0.00
Debt relationship	-0.358	0.19
Pseudo R-square	31.4%	

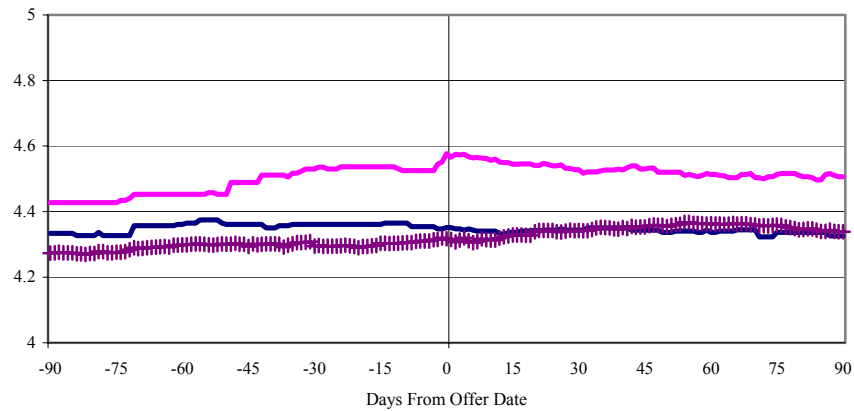
	Prob (gain a client)	P value
Intercept	4.050	0.01
Reputation vs. Old Und	0.042	0.00
Market making volume vs. Old Und	-5.881	0.00
Recommendation vs. Old Und	0.186	0.08
Fee	-36.881	0.00
Discount	-3.326	0.20
Deal Size	-0.306	0.00
Price Volatility	-9.529	0.06
1 year Abnormal Return	0.460	0.00
Time since last offering	0.564	0.00
New Und Debt relationship vs. Old Und	-0.306	0.39
Pseudo R-square	34.9%	

**Figure 1**  
**Analyst Recommendations Around Offering for Lateral Upgrading Firms**

These figures show the analyst recommendations for the firms in a 90 day window before and after the offering. Analyst recommendations are on a scale of 1 (low) to 5 (high). The sample is 189 firms that switch underwriters and move to an underwriter whose ranking is similar to the old underwriter, but slightly higher (lateral upgraders). The dark line represents the old lead underwriter, the pale line represents the new lead underwriter and the hatched line represents the consensus of other analysts. Panel A displays the average recommendations, and Panel B displays how the sample size underlying Panel A is changing by showing the fraction of firms in the group that have a recommendation.

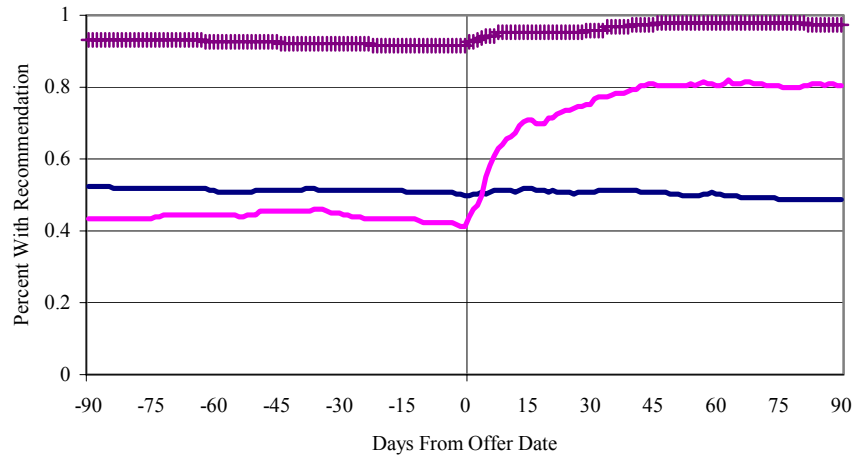
Panel A

Analyst Recommendations



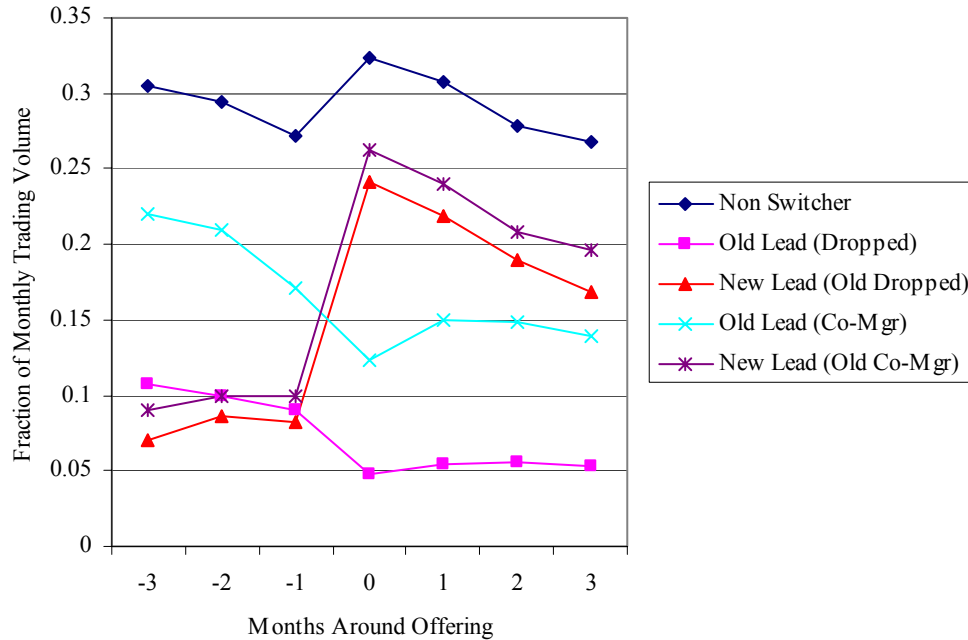
Panel B

Fraction of Sample with Observations



**Figure 2**  
**Market Maker Volume for Switching Firms**

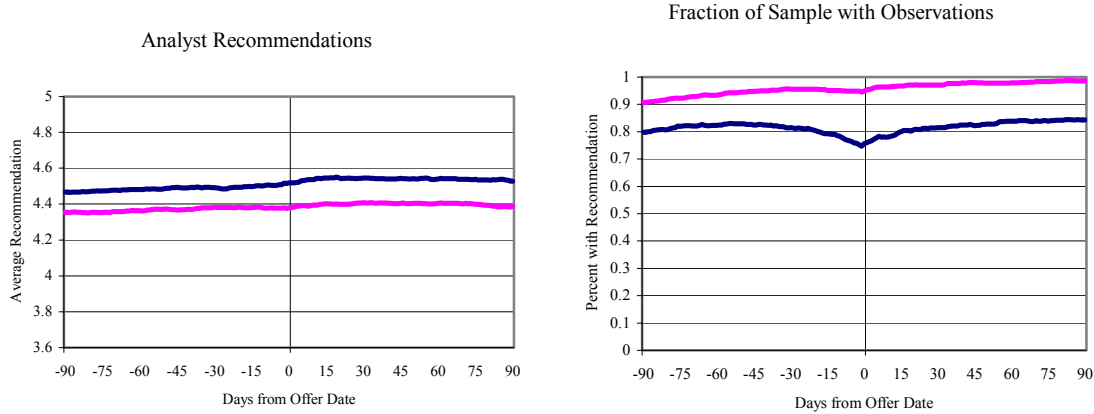
The share of the monthly trading volume done by the old and new lead underwriters is calculated for the three months surrounding the equity offering. Sample size is 922 Nasdaq equity offerings. The sample is split into three groups: non-switchers (528 firms) retain the same lead underwriter from the prior offering to the current offering, and switchers (394 firms) change from the old lead underwriter (prior offering) to the new lead underwriter (current offering). The switchers are further split into those that retain the old lead underwriter as a co-manager (174) and those that do not (220 firms).



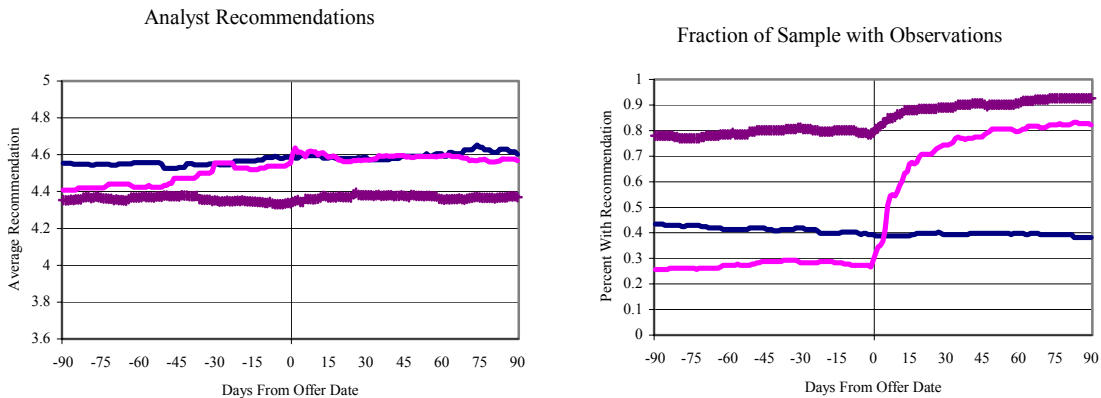
## Appendix Figure A1 Analyst Recommendations Around Offering

These figures show the analyst recommendations for the firms in a 90 day window before and after the offering. Analyst recommendations are on a scale of 1 (low) to 5 (high). The sample of 1277 offerings is split into sub-samples based on whether the firm switches underwriters (720 firms) or retains the same underwriter from the prior offering to the current one (557 firms). For the non-switching firms (Panel a) the dark line represents the lead underwriter, and the light line is the consensus of all other analysts. For the switching firms (Panels b-e) the dark line represents the old lead underwriter, the pale line represents the new lead underwriter and the hatched line represents the consensus of all other analysts. Each Panel has two figures, the one on the left displays the average recommendations, and the figure on the right displays how the sample size underlying the left figure is changing by showing the fraction of firms in the group that have a recommendation.

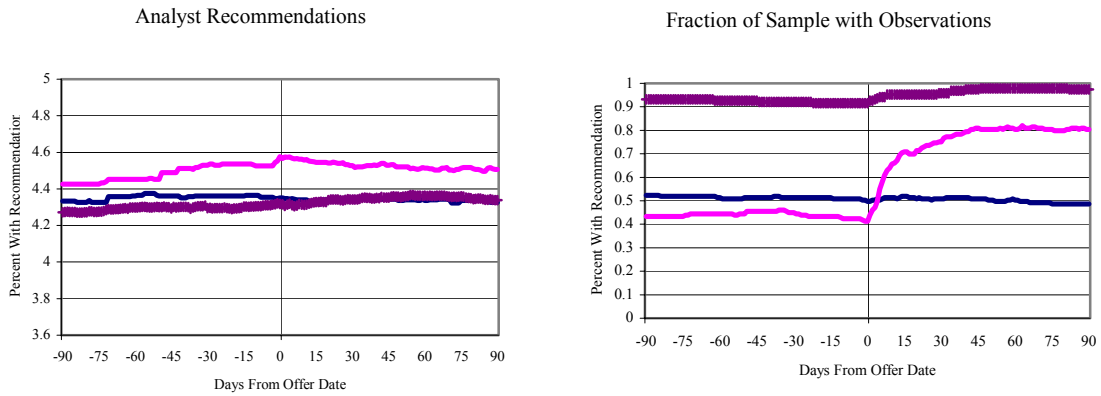
### A1a Non-Switching Firms (n=712)



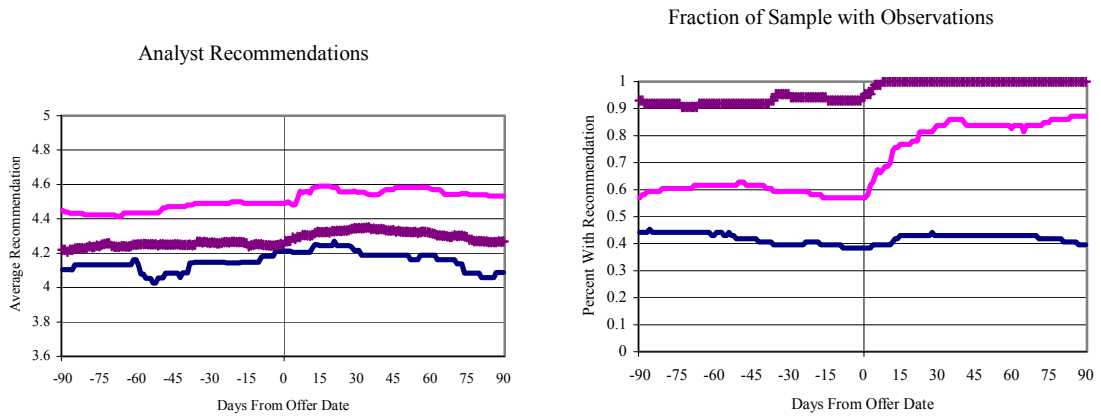
### A1b Switching Firms, Large Upgrade in Underwriter Rank (n=191)



### A1c Switching Firms, Lateral Upgrade in Underwriter Rank (n=189)



### A1d Switching Firms, Lateral Downgrade in Underwriter Rank (n=86)



### A1e Switching Firms, Large Downgrade in Underwriter Rank (n=87)

