

Purchasing IPOs with commissions

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Abstract

Using a proprietary database of institutional trades we find direct evidence that institutions churn stocks, increase the average commission per share they pay, and pay unusually high commissions on some trades in order to send abnormally high commissions to lead underwriters of upcoming profitable IPOs. We show that these excess commission payments are a particularly effective way for transient investors to receive lucrative IPO allocations, and that the presence of abnormal commission payments is related to underwriter characteristics – including the concentration of the underwriter’s client base. Our results suggest that the underwriter’s concern for their long-term client relationships disciplines the payment-for-IPO practice. We estimate total market-wide abnormal commission payments are \$2.2 million per IPO for the most profitable issues, and that an additional \$1 excess commission payment to the lead underwriter results in \$2.76 in investor profits from allocated shares.

I. Introduction

Institutional investors are justifiably interested in receiving initial public offering (IPO) allocations given the historical profitability of these positions. The 1,555 firms that went public from 1999 to 2005 left more than \$82 billion on the table.¹ Since bookrunners (i.e. lead underwriters) have significant discretion in allocating shares when bookbuilding is used, much of the lobbying by institutional investors should be directed toward the lead underwriter.² Existing academic theories seeking to explain the allocation decisions of underwriters suggest that underwriters receive benefits (tangible or intangible) in return for allocating shares to certain investors. Benveniste and Spindt (1989) suggest that IPO allocations encourage privately-informed investors to reveal their information to the lead underwriter. While this intangible benefit may be a factor in allocation decisions, it is also possible that underwriters allocate IPO shares to investors who provide them with more tangible benefits. According to the agency view advocated by Loughran and Ritter (2002, 2004), investors will engage in rent-seeking behavior, such as sending trading commissions to the underwriter's brokerage arm, to increase their probability of being allocated profitable IPO shares.

Recent survey evidence by Jenkinson and Jones (2009) raises doubts concerning the extent of information production by institutional investors in the IPO process, and instead provides support for the agency view. Both large and small institutions responding to the survey indicate that brokerage commissions paid to the underwriter are the most important determinant in receiving IPO allocations. Similarly, NASD documents report that Robertson Stephens use an index, ranking investors by commissions paid over the previous eighteen months, to decide who would receive profitable IPO allocations.³ This evidence is consistent with empirical findings by Goldstein, Irvine, Kandel, and Wiener (2008) who suggest that

¹ Money left on the table is defined as the difference between the first day closing price and the offer price times the number of shares offered as in Loughran and Ritter (2002). We obtain information for the total dollar value of money left on the table from Jay Ritter's website: <http://bear.cba.ufl.edu/ritter/Moneybyyear.pdf>.

² Boehmer, Boehmer, and Fishe (2006) find the lead underwriter is responsible for allocating approximately 75% of the total number of shares offered.

³ According to the SEC, the allocation of IPO shares based on past or expected future commission business is legal. However, lead underwriters are restricted from sharing in any client profits that may result from underpricing. See Letter of Acceptance, Waiver, and Consent sent to the NASD (no. CAF030001).

institutions concentrate their trading with particular brokerage firms, and in return, receive preferential treatment with regard to brokerage services.

The purpose of this study is to directly investigate the relationship between trading commissions and IPO allocations. We are aware of only two other studies that attempt to investigate this relationship. Using semi-annual mutual fund reports, Reuter (2006) finds a positive correlation between the commissions paid to an underwriter and a mutual-fund family's holdings of recent profitable IPOs from that same underwriter. His findings suggest that lead underwriters allocate profitable IPOs to investors who provide a stable stream of commission revenue. Alternatively, Nimalendran, Ritter and Zhang (2007) (hereafter NRZ) find some evidence that aggregate trading volume in the 50 most liquid stocks is related to subsequent money left on the table. They suggest that transient investors are churning stocks in the period immediately preceding the IPO in order to send commissions to the lead underwriter.⁴ The stable and transient investor views of IPO allocation contracting are paradoxical, since two distinct investor groups receive preference in IPO allocations.⁵ In addition, both studies are constrained by both IPO allocation and commission data limitations. We reconcile Reuter's stable investor view and NRZ's transient investor evidence in a single stylized model, and provide new and more detailed evidence of commission payments for IPO allocations using a proprietary database of institutional trades.

Our paper makes several distinct contributions to the existing literature. First, we provide a theoretical model where both stable and transient investors coexist. Second, we are the first to provide direct evidence of excess lead underwriter commission revenues in the period immediately preceding the most profitable IPOs. Third, we are the first study to investigate trading strategies (e.g. stock churning or paying unusually high commissions on some trades) that institutions might use to increase the commissions they pay to lead underwriters. Fourth, we find that inflated commission payments depend on lead-underwriter characteristics, such as the concentration of its client base. Finally, we use our unique dataset to show that institutions are successful in using commissions to capture IPO profits.

⁴ NRZ (2007) do not have information on trading commissions or the brokerage firm involved in each trade, thus inference concerning the behavior of transient investors is circumstantial.

⁵ For clarity, we refer to stable and transient investor groups using different methods to pay for IPO allocation. In our paper these investor groups refer to two distinct payment contracts, a stable long-term commission payment and a transient spot payment at the time of IPO issuance. We find that stable clients tend to use the long-term commission payment and transient clients tend to use the spot contract, but the contracts are not mutually exclusive and both types of investors could use both methods of payment to a greater or lesser extent.

We begin our empirical investigation by dividing all IPOs into quartiles based on the amount of money left on the table. Using an event study methodology, we find significant increases in lead underwriter commission revenue for the two most profitable IPO quartiles. These excess commissions are concentrated in the ten-day period immediately preceding the IPO offer date. Post-issue commission payments in return for IPO allocations appear to be concentrated with one subsequently prosecuted brokerage firm rather than a general phenomenon.⁶ Our results are consistent with strategic decisions by transient investors to use commission dollars as a means of obtaining profitable IPO allocations. We confirm that these findings are robust to a variety of alternate specifications and cannot be attributed to market-wide changes in trading volume or the clustering of IPO issuance.

The economic significance of our finding is also important. For the most profitable quartile of IPOs, we estimate that the lead underwriter receives abnormal commission revenues of approximately \$2.2 million per IPO. Overall, for the two most profitable IPO quartiles, this translates to \$1.14 billion in excess lead underwriter commissions. Across all tests, we estimate that the lead underwriter receives between 2 and 5 cents in abnormal commission revenue for every \$1 left on the table.

We next investigate trading strategies that institutions might use to increase commissions paid to lead underwriters. Institutions may simply re-allocate “normal” trading volume to a lead underwriter with an upcoming IPO. Alternatively, institutions may inflate commission revenues by churning stocks, increasing the average commission per share paid, or paying unusually high commissions for some trades. These choices are not mutually exclusive; and in fact, we find that all of these strategies are used by institutions in our sample. We estimate that commissions from churn trades account for 25% of the total increase in commission revenue for the most profitable IPO quartile.

We empirically test a prediction unique to our theoretical model: transient investor commission payments decrease as the underwriter’s commission revenues become more concentrated with particular stable clients. Using a multivariate regression, we find robust

⁶ The SEC strictly prohibits *ex post* profit sharing. In 2002 the SEC charged Credit Suisse First Boston (CSFB) with receiving kickbacks in the form of inflated commissions from clients who received profitable IPO allocations. The SEC claimed that several of CSFB’s institutional clients kicked back up to 65% of the IPO profits to the brokerage in the form of excessive commissions.

support for this hypothesis. Our finding is consistent with the conjecture that stable investors effectively monitor the lead underwriter, and therefore keep excess commission activity small relative to the potential IPO profits available.

Finally, our data allow us to examine whether institutions are successful in using commissions to capture IPO profits. Specifically, we investigate whether increased commissions sent to the lead underwriter result in larger allocations of profitable IPOs. Since IPO allocations are not available in our data, we proxy for these allocations by examining net IPO selling by each institution in the 30 days after the offer date. We find that transient and stable institutions interact differently with lead underwriters. IPO allocations to stable institutions are primarily determined by the long-term commission revenue streams that these institutions provide. Alternatively, excess commissions sent to the lead underwriter in the period immediately preceding the IPO are more important for transient investor allocations. We estimate that \$1 dollar of abnormal commission revenue sent by transient institutions to the lead underwriter generates \$2.76 in IPO profits from allocated shares. It appears that transient institutions are successful in using commissions to capture excess IPO profits.

In the next section, we present the hypotheses that result from our theoretical model. Section III presents our data and Section IV presents the main empirical results of our investigation. Section V examines some trading strategies that institutions might employ to increase commission payments. Section VI examines the determinants of abnormal commissions, including client concentration and IPO profitability. Section VII examines the relation between abnormal commissions and IPO allocations more directly using data on post-IPO sales. Section VIII concludes.

II. Investors, Underwriters, and commissions payments prior to an IPO

Benveniste and Spindt (1989) and others develop models using information asymmetry to explain the IPO bookbuilding process. While information revelation may be a determinant in underwriters' allocation decisions, it is also probable that *quid pro quo* commission arrangements are of principle importance in the allocation process (Jenkinson and Jones (2009), Loughran and Ritter (2002, 2004)).

Prior literature suggests that there are stable institutional clients who pay a regular stream of commission dollars to the underwriter. As in Reuter (2006), Binay, Gatchev, and

Pirinsky (2007), and Goldstein, Irvine, Kandel and Wiener (2008), these investors enter into implicit long-term contracts where they agree to pay premium commissions (relative to ECN execution) and, in return, expect to receive premium services, including allocations of desirable IPOs. Alternatively, there may also be transient investors who attempt to buy their way into IPO allocations by directing abnormally high commissions to the underwriter in the period immediately surrounding a desirable IPO (NRZ (2007)).

The appendix presents a simple model focusing on the underwriter's allocation decision across both stable and transient investors. Both investor types use commission business to compete for the underwriter's attention. Given a limited supply of shares to allocate, the underwriter faces a tradeoff. The underwriter may allocate all shares to stable clients, or it may allocate some shares to transient investors and receive additional commission revenues. Any allocation to transient investors reduces the welfare of stable investors, and if detected, stable investors will punish the underwriter by withholding future commission business. Therefore, the underwriter will only allocate shares to transient investors if the additional commissions it receives (which are positively related to expected IPO profitability) are large enough to offset the potential losses from being caught and punished by stable investors.

The model provides a variety of testable empirical hypotheses. Our first hypothesis follows:

Hypothesis 1: The lead underwriter receives increased commission revenues in the period immediately surrounding the IPO that are increasing in the IPOs expected profitability.

When transient investors exist, we should observe elevated lead-underwriter commission revenues as investors compete for lucrative IPO allocations. As the expected profitability of IPO allocations increases, we should observe an increase in this type of rent-seeking behavior.

Our model also suggests that the composition of the underwriter's client base has implications for underwriter allocation decisions. Specifically, Hypothesis 2 states:

Hypothesis 2: The likelihood that an underwriter accepts increased commission payments in the period immediately surrounding an IPO is a decreasing function of the concentration of the underwriter's client base.

If stable investors catch the lead underwriter allocating lucrative IPO shares to transient investors, they will punish the lead underwriter by withholding future commission business. Thus, underwriters with a more concentrated base of stable investors will find it more costly if any one client decides to withhold future commission business.⁷ Empirically, we expect fewer excess commission payments to this type of underwriter.

The final hypotheses test key model assumptions about stable and transient investor behavior in the IPO market.

Hypothesis 3: Increased commission payments in the period immediately surrounding the IPO affect allocations to transient investors more than those to stable investors.

Hypothesis 4: Stable investors receive the majority of an underwriter's IPO allocations.

Hypotheses 2, 3 and 4 are unique to our paper; they are not contained in either Reuter (2006) or NRZ (2007). In the next section, we describe the data used to empirically test these hypotheses.

III. Data and methodology

III.A. Trading data

We obtain institutional trading data from ANcerno Ltd. (formerly the Abel/Noser Corporation), a widely recognized consulting firm that works with institutional investors to monitor their equity trading costs.⁸ ANcerno clients include pension plan sponsors such as the California Public Employees Retirement System (CalPERS), the Commonwealth of Virginia, and the YMCA retirement fund, as well as money managers such as MFS (Massachusetts Financial Services), Putman Investments, Lazard Asset Management, and

⁷ Larger clients may also monitor the lead underwriter more closely. Expecting to receive substantial IPO allocations, large stable clients can spread their monitoring costs over larger potential profits. Also, since large clients comprise a significant fraction of bookbuilding demand, they may have better information about total demand for the issue.

⁸ ANcerno provides consulting services for equity trading costs in a manner similar to the Plexus Group, whose data has been used extensively in academic studies. Other studies that have used ANcerno data include Chemmanur, He, and Hu (2008), Lipson and Puckett (2007), and Goldstein, Irvine, Kandel, and Wiener (2008).

Fidelity. The ANcerno sample contains trades from 840 institutions and covers the period from January 1, 1999 until December 31, 2005.

Summary statistics for the more than 87 million institutional trade executions in the ANcerno database are presented in Panel A of Table 1. For each execution, ANcerno provides the institution identity code, identity of the broker/dealer handling the execution, date, stock traded, the number of shares executed, execution price, whether the execution is a buy or sell, and commissions paid. While the name of the institution is not provided, the unique identity codes allow us to distinguish between different institutions' trades both in the cross-section and through time.⁹ The average number of shares per execution varies from 6,669 in 2005 to 11,159 in 2001, while commissions per execution range from \$176 in 2005 to \$428 in 2002. Over the entire sample period ANcerno clients trade more than 755 billion shares (\$22.9 trillion) and pay more than \$24.6 billion in commissions. On average, institutions in the sample are responsible for at least 7.97% of total CRSP daily dollar volume during the 1999 to 2005 sample period.¹⁰

In untabulated results, we aggregate trading by the brokerage firm (or ECN) and investigate commission revenues. All ten of the largest brokers (ranked by average commission revenues per day) also underwrite IPOs during our sample period. Merrill Lynch is the largest broker, earning an average of \$873,388 in commissions each trading day. The tenth largest broker is J.P. Morgan, who earns an average of \$362,881 per day in commission revenues.

III.B. IPO data

We use the Security Data Company's (SDC) new issues database to identify IPOs from March 31, 1999 to October 1, 2005 and the CRSP database to obtain first day closing prices for each IPO firm.¹¹ We exclude all ADRs, REITs, unit investment trusts, closed-end

⁹ ANcerno receives trading data directly from the Order Delivery System (ODS) of all money manager clients, and therefore includes all trades executed by managers. The method of data delivery for pension plan sponsors also includes all executed trades.

¹⁰ We calculate the ratio of ANcerno trading volume to CRSP trading volume during each day of the sample period. We include only stocks with sharecode equal to 10 or 11 in our calculation. In addition, we divide all ANcerno trading volume by two, since each individual ANcerno client constitutes only one side of a trade. We believe this estimate represents an approximate lower bound for the size of the ANcerno database.

¹¹ Although ANcerno trading data spans January 1, 1999 to December 31, 2005, we require all IPOs have sixty days of trading data before and after the offer date in order to calculate expected levels of commission revenue

funds, and IPOs with an offer price less than \$5. Our filters leave us with a sample of 1,183 IPOs. Finally, we require that the lead underwriter is a broker in the ANcerno database, which eliminates 27 firms and leaves us with a final sample of 1,156 IPOs involving 88 different lead underwriters.

Following Loughran and Ritter (2002) we calculate money left on the table (*Money*) for each IPO as the first day closing price minus the offer price multiplied by the number of shares offered. As such, *Money* represents the total first day IPO profits available to investors. From Hypothesis 1, we expect excess commissions paid to the lead underwriter around the IPO offer date to be positively related to *Money*. To examine this prediction, we rank all IPOs by *Money* and separate the sample into quartiles.

Summary statistics for each *Money* quartile are presented in Panel B of Table 1. IPOs in the highest *Money* quartile (quartile=4) present investors with an average of \$174.4 million in potential first day profits, which is more than six times the average first day profits of the third quartile, \$26.7 million. The second and first quartiles have *Money* averages of \$6.1 and -\$16.7 million respectively. IPO profitability is, of course, highly correlated with underpricing, which ranges from an average of 131.97 percent in the highest *Money* quartile to -6.90 percent in the lowest quartile. The extremely profitable IPOs in quartiles 3 and 4 appear large enough to entice some institutions to attempt to purchase IPO allocations with excess commission payments. We next investigate whether the empirical evidence supports this hypothesis.

IV. Main Results

IV.A. Event Study

We first use an event study to examine the existence and timing of abnormal lead underwriter commission revenues. For each IPO, we collect all trades executed by the lead underwriter during the [-60, +60] trading day period surrounding the IPO offer date and calculate total commission revenue earned each day. For each *Money* quartile we compute

for each broker. We also check Jay Ritter's IPO website: <http://bear.cba.ufl.edu/ritter/ipodata.htm> for possible SDC data errors and for the SDC data errors mentioned in footnote 4 of Ljungqvist and Wilhelm (2003); see <http://pages.stern.nyu.edu/~aljungqv/>.

the average commission revenue for each day in this time series.¹² As a basis for our statistical tests, we create a benchmark level of mean daily lead-underwriter commission revenue during the [-60, -21] and [+21, +60] non-event period. We then compare the average daily event-period commission revenue to the benchmark level using the standard deviation of commission revenues in both the benchmark and event periods to construct our test statistic. Since prior literature provides little guidance regarding the timing of abnormal commission payments, our initial investigation examines four ten-day event periods surrounding the offer date: [-20, 11], [-10, -1], [1, 10], and [11, 20]. If investors are risk averse, transient investors will wait until just before the IPO offer date to send extra commission payments to the underwriter. Because of the well-documented increase in trading activity that occurs on the offer date, the offer date itself is omitted in tests for abnormal commissions.¹³

Table 2 presents our event study results for abnormal commissions. We reiterate that our tests evaluate commissions paid to the lead underwriter only. Our findings suggest that some investors increase commissions sent to the lead underwriter in the period immediately preceding the most profitable IPOs. We also find some evidence of decreases in lead underwriter commission revenue around the least profitable IPOs. For the most profitable quartile, the average lead underwriter receives \$374,772 in commissions per day during the non-event benchmark period, and this amount increases by \$18,150 per day (t-statistic=4.54) during the [-10, -1] event period. This 5% increase per day cumulates to \$181,500 over the [-10, -1] period, or about another half-day's worth of commissions. For quartile 3, the increase in lead underwriter commissions during the [-10, -1] event period is \$13,342 per day (t-statistic=1.95). Our initial results support Hypothesis 1: excess commission payments exist and are increasing in the expected profitability of the IPO.¹⁴

¹² In unreported tests, we separate the IPO sample into quartiles based on *Underpricing* and repeat the event study with similar results. The benchmarking methodology is identical to that used in Corwin and Lipson (2004) and Irvine, Lipson, and Puckett (2007).

¹³ We examine separately whether commission revenue on the offer date (excluding IPO trading) is significantly different than non-event period commission revenue. We find that abnormal commission revenues are positive and statistically significant for quartile 4 (high *Money*) and quartile 3, but are insignificantly different from zero for quartiles 1 and 2. As these results are similar to and supportive of those found in our main results, we do not include them in our tabulated results.

¹⁴ We find no evidence of abnormal *ex post* commission payments for either of these quartiles. In separate tests, we analyze Credit Suisse First Boston (CSFB) alone since CSFB is an active underwriter specifically cited in SEC documents alleging ex-post settling-up behavior. In the CSFB-only sample, we find evidence of significant

NRZ (2007) present circumstantial evidence that these abnormal commission payments are observable only during the bubble period. To investigate this possibility, we divide our sample into bubble (1999 to 2001) and non-bubble (2002 to 2005) periods and repeat our analysis for both subperiods. For expositional convenience, we report only abnormal commissions during the [-10, -1] event period for these subperiods in Table 2.¹⁵ Abnormal lead underwriter commissions are \$14,608 per day (t-statistic=2.91) for quartile 4 IPOs during the bubble period and \$37,150 (t-statistic=2.48) in the non-bubble period. Controlling for the increase in overall commissions paid over our sample period, we find that in both bubble and non-bubble periods the abnormal lead underwriter commissions are about 5% more than the benchmark level.¹⁶ For quartile 3 IPOs, there are some differences between the time periods. Event period commissions for quartile 3 are not significantly different than benchmark levels during the bubble period, but during the non-bubble period abnormal commissions are \$32,712 (t-statistic=2.55) per day. Our results suggest that abnormal commission payments exist in both the bubble and non-bubble periods, and that in each case institutions pay approximately 5% more immediately prior to the offer date.

The economic value of these inflated commissions is significant. As noted previously, our estimates suggest that ten-day lead underwriter excess commission revenue per IPO is \$181,500 for IPOs in quartile 4 and \$133,420 for IPOs in quartile 3. However, our data represents only 7.97 percent of CRSP daily share volume. If we gross up our average abnormal commission per IPO (by $1/0.0797$), we estimate total market-wide abnormal commissions of \$2,277,000 (\$1,674,000) per IPO for lead underwriters of quartile 4 (quartile 3) IPOs. With 577 IPOs in quartiles 3 and 4 estimated aggregate abnormal commissions received by lead underwriters is \$1.14 billion.

abnormal commission payments in the [+1, +5] period after the IPO offer date for both quartile 3 and quartile 4 IPOs during the bubble period. By extrapolating our volume data to CRSP total volume levels, we estimate over \$46.7 million in excess commissions were received by CSFB in this period. Our estimates are consistent with the magnitude of SEC litigation release 17327 claiming \$70 million in improper gains that CSFB was ordered to disgorge.

¹⁵ In robustness tests we define the bubble period subsample as 1999 to 2000 and find results similar to those reported in Table 2.

¹⁶ There are two primary reasons why average daily non-event period commissions increased significantly between the bubble and non-bubble periods. First, the aggregate level of trading activity is increasing over our sample period for both the overall market and for our sample of ANcerno institutions. Second, and perhaps more importantly, trades on Nasdaq-listed stocks were generally not charged explicit commissions prior to 2002, but as a result of decimalization, commissions were charged on more than 90% of the trades for Nasdaq-listed stocks from 2002 onward.

The economic magnitude of this revenue is still small relative to the \$58 billion left on the table by these IPOs. It is puzzling why even higher abnormal commissions are not observed given the large profits available. Profit maximizing underwriters would be better served by raising the offer price of the IPO and capturing 7% of any additional proceeds in the form of underwriting fees (Chen and Ritter (2000)). However, this argument ignores externalities surrounding underpricing and allocation decisions including extracting valuable information from informed investors (Benveniste and Spindt (1989)), managing litigation risks (Tinic (1988), Lowry and Shu (2002)) and the long term nature of broker-client contracts (Goldstein et al. (2008)).¹⁷

It is notable that we do not observe excess commissions for quartile 2 IPOs, which are profitable *ex post*. Consistent with our model, these results suggest that expected profits must be large to engender transient investors to offer commission payments to obtain allocations. Only when IPO profits are extremely large can transient investors justify a large enough extra payment to induce lead underwriters to allocate shares away from their stable clients.

IV.B. Robustness tests

Event study results in Table 2 indicate that for the most profitable IPOs, lead underwriters receive increased commission revenues during the ten-day period immediately preceding the offer date. However, prior research reports that IPO activity is both clustered in calendar time and is related to aggregate market activity (Lowry (2003)). We investigate the potential effects of these trends in two robustness tests.

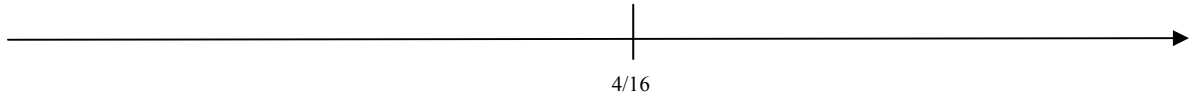
IV.B.1. Calendar-time regressions

If IPO events are clustered in calendar time, our event study may suffer from correlated errors and a tendency to over-reject the null. Although many prior studies document IPO clustering in hot markets (e.g. Ritter and Welch (2002)), we reiterate that our analysis investigates lead underwriter commission revenues only, thus mitigating the clustering problem. We present the following illustration to clarify this issue:

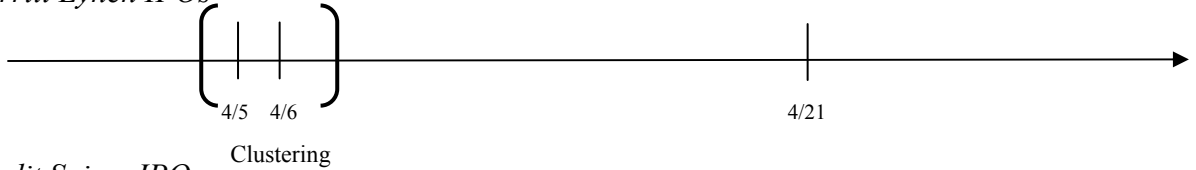
¹⁷ We note that our data excludes many hedge funds. Anecdotal evidence and regulatory statements suggest that hedge funds regularly paid large per share commissions in return for specific IPO allocations. Brokers could also receive greater rents from their clients if the Brennan and Chordia (1993) *ex post* risk-sharing contract were not proscribed (see footnote 6).

IPOs issued in April 1999

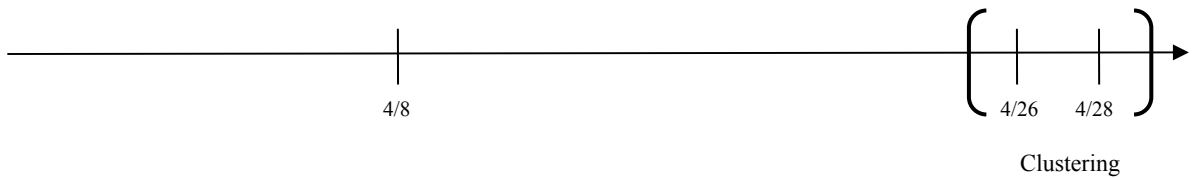
Goldman Sachs IPOs



Merrill Lynch IPOs



Credit Suisse IPOs



The above illustration presents timelines of IPOs issued in April 1999 by three of the largest investment banks in our sample. Viewing all seven of these IPOs on a single (market-wide) timeline, six fall in the [-10, -1] event period of another IPO and would appear to be clustered. However, when IPOs are separated by lead underwriter as shown above, we find only two IPOs where another IPO from the same lead underwriter exists in the [-10, -1] event period.

Although our unit of analysis clearly reduces the clustering problem, it is not eliminated completely. To address this issue, we employ a calendar-time regression approach. We proceed as follows: we aggregate commissions and money left on the table separately for each underwriter on each day of the sample period. We then specify the underwriters' daily commission revenue as a function of future money left on the table (*Money*):

$$\begin{aligned}
 Commission_{t,j} = & \alpha + \beta_1 \left(\sum_{n=1}^{5,10} Money_{t+n,j} \right) + \sum_{n=1}^4 \gamma_k Commission_{t-n,j} + \beta_2 |Mktret_t| \\
 & + \sum_{m=2}^{84} \delta_m Month_m + \varepsilon_t
 \end{aligned} \tag{1}$$

The dependent variable in Equation (1) is the commission revenue received on day t by lead underwriter j . The independent variable of interest, *Money*, is the aggregate amount of money left on the table by underwriter j , summed over days $t+1$ through $t+5$ (or $t+1$ through $t+10$).

We include four lags of the *Commission* variable to control for daily autocorrelation in the level of underwriter commissions (see NRZ (2007)) and the absolute value of the CRSP equally-weighted return ($|Mktret_t|$) since institutional volume is higher during large market movements (Dennis and Strickland (2002)). Finally, we include month fixed effects (*Month*) to control for any time-series changes in the frequency of trading in our data. We adjust all t-statistics using Newey-West standard errors.

Table 3 presents the results of these regressions for the full sample as well as the bubble and non-bubble subperiods. The key variables of interest are *Money[1,5]* (*Money[1,10]*), which represent underwriter j 's IPO profitability over the next five (ten) trading days. Results are consistent with our event study findings: commissions received today by lead underwriter j are positively related to future money left on the table by underwriter j . For the full sample, the coefficient on *Money[1,5]* is 0.004 (t-statistic=2.59) and for *Money[1,10]* the coefficient estimate is 0.003 (t-statistic=2.45). Our results suggest that for every \$1 left on the table, the lead underwriter receives between 0.3 and 0.4 cents in abnormal commissions. Again, we gross up our estimate by $1/0.079$, since the data represents only 7.97 percent of CRSP volume, and find market-wide abnormal commissions of between 3.79 and 5.06 cents for every \$1 left on the table.

IV.B.2. Difference-of-differences Test

Lowry and Schwert (2002) suggest that IPO activity is related to lagged market activity. If IPO issuance clusters during periods of high market volumes then aggregate commission payments to all brokerage firms, and not just the lead underwriter, would increase just prior to hot IPO offer dates. We address this concern using a difference-of-differences test to directly compare event-period commission revenues received by lead underwriters to the commissions received by other brokerage firms in the database.

For each IPO, we construct a comparative sample of non-lead underwriting brokers by requiring that a broker cannot act as a lead underwriter for any IPO during the [-10, +10] day period surrounding a sample IPO's offer date. By comparing the time-series of commission revenues for lead underwriters to that of non-lead brokers, we control for external market conditions affecting all brokers.

For each IPO, we calculate the average daily event-period commission revenue [-10, -1] minus the average daily non-event commission revenue from [-60, -21] and [21, 60], and divide this difference by the average daily non-event period commission revenue. As such, our measure is the percentage change in commission revenue a brokerage firm experiences in the ten-day period immediately preceding the IPO offer date. This normalization controls for cross-sectional differences across brokers in each group, and is similar to the methodology employed by Goldstein, Hotchkiss and Sirri (2007). We construct this measure for three groups: the lead underwriter, a matched-pair control sample (the lead underwriter is matched with one non-lead brokerage firm that is closest in average daily non-event commission revenue), and a control portfolio of all non-lead brokerage firms. For brevity we limit our tests to the [-10, -1] event period, since this is where we find a significant increase in lead underwriter commission revenue.

Our results are reported in Table 4, and are consistent with all earlier results. For the highest two *Money* quartiles, we find that lead-underwriter commissions increase by 10.62% (quartile 4) and 7.07% (quartile 3).¹⁸ Untabulated results demonstrate that these numbers are similar across the bubble and non-bubble sub-periods, so the magnitude of these increases is relatively consistent across time. For quartile 2 and quartile 1, lead underwriter commission revenues increase by 0.69% and decrease by -1.10% respectively. These findings are quite apparent when illustrated graphically as in Figure 1, which plots the change in daily commission revenue during the [-20, +20] period.

Comparing lead underwriter revenues to the control samples in Table 4 is particularly revealing. Non-lead brokers display little evidence of increased commission revenues around quartile 3 and quartile 4 IPOs. For the matched control sample, brokerage revenues decrease by -3.00% prior to quartile 3 IPOs, and increase by 0.13% prior to quartile 4 IPOs. Both of these changes are insignificant. For the control portfolio we find that the only significant change occurs prior to quartile 4 IPOs, where commissions increase by 3.49%.

To test for differences between the samples, we take the percentage commission change for each IPO-lead underwriter observation and subtract the percentage commission change for the appropriate control sample. For quartile 4 (quartile 3) IPOs, we find that lead

¹⁸ The results in Table 2 are aggregates of commission dollars to lead underwriters across all IPOs, while the statistics in Table 4 are constructed from ratios of each lead underwriter's event and non-event periods. The ratio of the aggregate numbers in Table 2 will be different than the average of the ratios shown in Table 4.

underwriters experience increases in commission revenues that are 10.48% (10.04%) larger than the matched control sample and 7.13% (5.78%) larger than the control portfolio sample. Overall, these robustness tests indicate that our primary results cannot be attributed to unusually high market-wide volume.

V. Trading Strategies

Institutions might employ a variety of trading strategies to increase the commission dollars sent to lead underwriters. These behaviors include: increasing the number of trades, increasing the average commission per share paid, paying unusually high commissions for some trades, or churning stocks with the explicit purpose of generating commissions. These alternatives are not mutually exclusive, and all would increase commission revenues. There is some anecdotal evidence that some institutions paid unusually high commissions per share or churned stocks (bought and sold the same stock simultaneously in order to generate commissions) in return for IPO allocations; however, we do not know whether these activities are pervasive.¹⁹ We investigate each of these trading behaviors to determine whether they contribute to elevated lead underwriter commissions.

We repeat the event study methodology outlined in Table 2 for the following lead underwriter variables: 1) shares traded, 2) average share-weighted commission, 3) percentage of trades paying unusually high commissions (greater than ten cents per share), and 4) commission revenues from churn trades. Table 5 reports average daily statistics for all variables in the non-event period and abnormal daily levels (event period minus non-event period) in the event period.

Our first measure (*shares traded*) in Table 5 is the average daily number of shares executed (in millions) by the lead underwriter. While NRZ (2007) also examine shares traded, they are restricted to aggregate trading, while we are able to distinguish trading through the lead underwriter. Consistent with our earlier results, we find evidence of elevated *shares traded* only during the period immediately preceding the most profitable IPOs. For the highest *Money* quartile, lead underwriters handle 10.16 million shares per day in the non-

¹⁹ Regulatory agents alleged that clients paid excess commissions to CSFB in return for IPO allocations by paying excessively high commissions per share and by churning large numbers of shares of very liquid stocks (SEC News Release 2002-14). We refer readers to Ritter and Welch (2002) for other anecdotal examples of these *quid pro quo* commission arrangements.

event period, and this amount increases by 0.35 million shares (t-statistic=2.86) per day in the ten-day period before the IPO. For quartile 3, the increase in share volume is 0.29 million shares per day (t-statistic=1.71). Our results are consistent for both bubble and non-bubble periods, and collectively indicate that lead underwriters' share volume increases prior to hot IPOs.

Institutions may increase trading volume sent to lead underwriter either by re-allocating "normal" trading volume or by churning stocks. Our results offer little support for the contention that institutions are simply re-allocating trading volume through time, since elevated shares in the [-10, -1] period would imply significant decreases in shares traded during other periods (e.g. in the twenty days after the IPO). Alternatively, institutions may churn stocks by simultaneously entering buy and sell orders for the same stock. We test for the existence of abnormal churning by collecting all transactions where institutions purchase and sell the same stock on the same day. For each IPO we then select all churn trades where at least one side of the transaction is executed by the lead underwriter and aggregate trading commissions each day for each IPO's lead underwriter. We recognize that institutions may buy and sell the same stock for reasons other than commission generation. For this reason, we control for the base level of churn trading by subtracting non-event period levels, as we are only concerned with *changes* in this type of activity routed through the lead underwriter.

Panel A of Table 5 shows that commissions from churn trades (*churn commissions*) increase by \$4,520 per day (t-statistic=4.42) in the [-10, -1] period for the highest *Money* quartile. By comparing these results with overall changes in commission revenue reported in Table 2, we find that churn commissions account for approximately 25 percent of the total increase in commission revenue. However, we find no evidence of significant increases in churn for any other quartile. We also examine the bubble and non-bubble periods separately and find some evidence of churning during both subperiods. Our results are consistent with circumstantial evidence presented by NRZ (2007), but also suggest that churning represents only a fraction of the pay for IPO picture.

Institutions can also increase the per-share commissions paid on trades. We use two variables in our tests: average per-share commission (*commission per share*, measured in cents) received by the lead underwriter, and the frequency of trades paying greater than 10 cents per share. A commission over 10 cents a share is unusually large (Goldstein et al.

(2008)) but paying a large commission is an effective way to increase underwriter commission revenues.

For the *commissions per share* measure, we calculate the share-weighted daily average commission for all commission-paying trades executed by the lead underwriter. In Panel B of Table 5 we find some evidence that average commissions per-share increases in the [-10, -1] period for quartile 3 and 4 IPOs. In the most profitable quartile, lead underwriters receive average commissions of 5.04 cents per share in the [-10, -1] period, compared to the non-event average of 4.95 cents. For quartile 3, commissions per share increase from 4.81 cents in the non-event period to 4.85 cents during the [-10, -1] period.

The final variable in our analysis investigates the frequency of lead underwriter trades where commissions are greater than 10 cents per share. For quartile 4 IPOs, the frequency of high commission trades increases by 32%, from the 0.53% non-event mean to 0.70% during the [-10, -1] event period. Unlike other measures, this ratio remains elevated (0.69%) during the ten days following the IPO, which is consistent with *ex post* settling up after IPO allocations (see footnotes 6 and 14). However, the lack of confirming evidence in total commission revenue in Table 2 cautions against concluding that widespread *ex post* settling up occurred. Our subperiod analyses indicate that these increases occurred only during the excesses of the bubble period.

Collectively, our results indicate that institutions use a variety of trading strategies to increase lead underwriter commissions. The total number of shares traded, commissions from churn trades, average commission per share, and the frequency of trades paying greater than 10 cents per share are all significantly elevated in the pre-offer period for the most profitable IPOs. In addition, the results in Tables 2, 4, and 5 provide some evidence that institutions reallocate trades from brokerages that did not have a hot IPO to those that did.

VI. Determinants of abnormal commissions

The event study, calendar-time portfolio regression, and the difference-of-differences test results establish that, across a broad sample of lead underwriters, abnormal commission payments occur primarily in the ten days preceding the most profitable IPOs. Here we extend our analysis by investigating the determinants of pre-issue abnormal commission payments (*AC*) to the lead underwriter:

$$AC_i = \alpha + \beta_1 Price\ Runup_i + \beta_2 Underpricing_i + \beta_3 Offer\ Size_i + \beta_4 Herf_{i,j} + \beta_5 Scarcity_i + \beta_6 Bulge_j + \sum_{m=1}^6 \delta_m Year_{1999+m} + \varepsilon. \quad (2)$$

The dependent variable, abnormal commissions (AC), is the natural logarithm of the lead underwriter's average daily commissions during the [-10, -1] event period divided by the average daily commission during the [-60, -21] and [+21, +60] non-event period for the i^{th} IPO. This normalization captures the relative magnitude of the underwriter's incentive to allocate IPO shares to transient investors.

Equation (2) allows us to test Hypothesis 2 by forming a Herfindahl index ($Herf$) for each lead underwriter based on commission revenue during the non-event period. A higher Herfindahl index indicates a more concentrated client base, and therefore a larger punishment for the lead underwriter if one of their clients discovers an allocation to transient investors. Hypothesis 2 predicts a negative relation between client concentration ($Herf$) and abnormal commissions (AC).

To control for IPO profitability we include the variables *Price Runup*, *Underpricing* and *Offer Size*. Total *ex post* profitability (*Money*) is calculated as *Underpricing* times *Offer Size*, and we include each of these components separately in Equation (2). A larger *Offer Size* could provide greater opportunities for transient investors to obtain an allocation. However, since institutions send abnormal commission payments prior to the IPO offer date, the relevant construct in our model is *ex ante* (i.e. expected) profitability. Hanley (1993) provides evidence that pre-offer price adjustment is highly correlated with *ex post* IPO profitability. Our measure of *ex ante* profitability is *Price Runup*, which is the offer price less the midpoint of the filing range divided by the midpoint of the filing range. We expect that *Price Runup*, *Underpricing* and *Offer Size* will be positively related to abnormal commissions. However, due to the high positive correlation ($\rho=0.64$) between *Underpricing* and *Price Runup*, we include them both separately and together in different specifications of Equation (2).

We control for several other characteristics of the IPO and lead underwriter. *Scarcity* attempts to measure pre-issue demand for the IPO and is calculated as the final offer size divided by the first filed offer size. We include the variable *Bulge*, a dummy variable equal to one if the lead underwriter is ranked in the top ten using Megginson and Weiss (1991) rankings, to control for underwriter reputation. Finally, we include year fixed effects to

control for changing market conditions across the sample period. We estimate the regression using GMM to control for any potential correlation in the error structure across observations.

Panel A of Table 6 presents our cross-sectional regression results for the entire sample.²⁰ We find both *Underpricing* and *Price Runup* are significantly positively related to abnormal commissions when examined independently. The coefficient on *Underpricing* is 0.35 (t-statistic=2.26) and the estimate for *Price Runup* is 1.14 (t-statistic=2.77). The other component of total IPO profitability, *Offer Size*, is positive and significant in all specifications. These results confirm that abnormal commissions are positively related to IPO profitability.

Herf, a key variable of interest in this regression, is negative and significant in all regression specifications. The coefficient estimate is -4.34 (t-statistic=-3.13) in the first regression specification, and is similar in both magnitude and statistical significance in specifications (2) and (3). Consistent with Hypothesis 2, the negative coefficient indicates that underwriters with a concentrated client base receive lower abnormal commissions.

To ensure that clustering does not affect our inferences in situations where an underwriter issues another IPO during the [-10, -1] event period, we run the above regressions using a control sample that excludes clustered IPOs. We construct a sample of 467 IPOs for which the lead underwriter did *not* serve as the lead underwriter on *any* other IPO during the [-10,+10] period. In this control sample, underwriters may issue another IPO in the [-60,-21] and [+21, +60] non-event period, which will only elevate non-event commissions and bias our tests against rejection of the null hypothesis. Figure 2 shows the distribution by year of the overall sample of 1,156 IPOs and the control sample of 467 IPOs.²¹

Panel B of Table 6 presents regression results for the control sample. These results are similar to the results in the full sample. Specifically, we find that all measures of IPO profitability: *Underpricing*, *Price Runup*, and *Offer Size*, have similar significance to the results in Panel A. The primary difference between control and full sample results is that

²⁰ We lose six observations due to data requirements for the creation of the Herfindahl index. As a result, our full sample in Panel A of Table 6 drops by six to 1,150 observations, and the sample in Panel B also drops by six from 467 to 461.

²¹ We run empirical tests presented in Tables 2, 4, and 5 on the unclustered control sample and all of the results continue to hold. Due to the construction of the calendar time regressions, we did not re-run Table 3 on this sample.

Bulge is now insignificant. We continue to find strong support of Hypothesis 2, in that the coefficient on *Herf* continues to be negative and significant in all three regression specifications.

Overall, we continue to find that higher abnormal commissions are associated with the more profitable IPOs as predicted by Hypothesis 1. As suggested by Hypothesis 2, we find direct confirmation that this effect is mitigated the more concentrated the underwriter's client base. Both results are robust to a variety of regression specifications and to a restricted sample of unclustered IPOs.

VII. Abnormal commissions and IPO allocations

Stable investors who regularly send commission dollars to the underwriter expect to receive IPO allocations as a part of their business relationship. Transient investors opportunistically send commission revenues to the lead underwriter with expectations that these revenues will result in an allocation. Although we present empirical evidence that some investors send elevated commission revenue to lead underwriters, we have not yet established whether these excess payments result in a larger allocation of profitable IPO shares.

Unfortunately, IPO allocation data are not generally available. Reuter (2006) uses mutual fund family holdings as a proxy for IPO allocations. Since we cannot identify the institutions in our sample by name, this proxy is not available to us. However, we can supplement Reuter's (2006) analysis by examining net selling in the 30 days after the IPO. Using a methodology similar to Chemmanur and Hu (2007), we contend that net selling is a reliable proxy for initially allocated shares, and a particularly good proxy for immediately realized profits.

We are interested in whether an institution's abnormal commissions paid to the lead underwriter are related to the size of that institution's IPO allocation and whether the relation between abnormal commissions and IPO allocation varies across investor types as predicted in Hypotheses 3 and 4. To investigate these hypotheses we first run the following regression:

$$\begin{aligned}
 Allocation_{i,k} = & \alpha + \beta_1 Client\ Size_{i,k} + \beta_2 Underpricing_i + \beta_3 Abnormal\ Commission_{i,k} \\
 & + \beta_4 Transient_{i,k,j} + \beta_5 AC_{i,k} \times Transient_{i,k,j} + \varepsilon
 \end{aligned}
 \tag{3}$$

We construct the dependent variable, *Allocation*, by tracking trading in IPO, i , by each institution, k , from the moment the IPO is listed for public trading through thirty calendar days following the IPO offer date. We calculate the net imbalance for each IPO-institution pairing and assume that all institutions who are net sellers receive an allocation equal to the magnitude of net sales.²² Empirically, our measure captures only allocated shares that institutions choose to flip in the month following the IPO, therefore, our measure will understate the total shares allocated when institutions hold these shares for more than thirty days. This measurement error biases against finding results in our regression specification. We normalize our allocation estimate by the number of shares offered to control for cross-sectional differences in net selling activity related to the size of the IPO. Clients with a positive buy-sell imbalance are assumed to receive no allocation, and therefore we estimate Equation (3) using a truncated regression specification.

Client Size is the average daily commission revenue sent by institution k to the lead underwriter during the [-60, -21] and [+21, +60] non-event period divided by the total average daily commission revenue received by the lead underwriter from all institutions. As such, *Client Size* captures the importance of a particular institution to the commission revenue of the lead underwriter. If stable relationships between underwriters and their major clients are an important determinant of IPO allocations, we expect to see a positive relation between *Client Size* and IPO allocation size.

We also include *Underpricing*, which reflects the magnitude of actual profits available to IPO flippers and, all else equal, we expect more IPO flipping in hot IPOs. We calculate institution k 's *Abnormal Commissions* for each IPO as the aggregate ten-day abnormal commissions divided by the lead underwriter's non-event average commission revenue. This normalization addresses our central economic question of how important an institution's abnormal commission payments are to the lead underwriter's revenue, as larger underwriters are less influenced by a given dollar amount of abnormal commissions.

²² It is also possible that this measure will include short-sales by these institutions. While Hanley, Lee, and Seguin (1996) suggest that short-sales are constrained immediately after an IPO, Edwards and Hanley (2008) demonstrate otherwise. Given that ANcerno clients are pension funds and money managers, it is unlikely that there is significant short-selling in the data. Even so, it is highly unlikely that any short-selling by clients would cause them to send abnormal commissions to the lead underwriter *ex ante*. As a result, any inclusion of short-selling in our data would bias against finding results.

We construct the dummy variable *Transient* using Equation (4) which estimates an autocorrelation coefficient based on the past six months relationship between underwriter *j* and institution *k*:

$$Commission_{j,k,t} = \alpha + \rho_{j,k} Commission_{j,k,t-1} + \varepsilon. \quad (4)$$

We contend that stable clients pay regular commissions to the underwriter, so they will have relatively high month-to-month correlation in their commissions. To construct the dummy variable *Transient* we divide the sample into two groups based on the median autocorrelation coefficient from Equation (4). Institutions whose autocorrelation coefficient is less than the median are assigned a *Transient* value equal to one, and zero otherwise.²³

All else equal, we expect significantly fewer IPO shares are allocated to transient institutions. However, we are particularly interested in the interaction of *Abnormal Commissions (AC)* and *Transient: AC×Transient*. A significant positive coefficient on this variable indicates that abnormal commissions are more effective at generating IPO allocations for transient investors compared to stable investors. We also estimate Equation (3) separately for transient and stable investors, and expect that *Client Size (AC)* will be a relatively more important explanatory variable for predicting allocations to stable (transient) investors.

Table 7 presents the results of maximum likelihood estimation for Equation (3).²⁴ The positive and significant coefficient on *Client Size* in the first regression indicates that lead underwriters value stable commission relationships and reward these institutions with IPO allocations. However, we also find that *Abnormal Commissions* are positively related to IPO allocations. The coefficient on *Abnormal Commissions* is 0.011, and is statistically significant (t-statistic=11.3). It appears that allocations (or at least net selling soon after the IPO) are determined by both the size of the client's stable commission payments and transient commissions sent opportunistically to the underwriter.

²³ The results associated with the *Transient* dummy variable are robust to alternative definitions of trading regularity.

²⁴ Since we are now dealing with a dependent variable that represents an institution's trading in a particular stock, rather than brokerage-wide commissions, we do not have the same level of concern regarding overlapping event periods. Thus, we do not present the control period regressions in this table. Because the dependent variable net selling is truncated at zero, we estimate this regression using a truncated likelihood function.

Our second regression specification includes the dummy variable *Transient* and the multiplicative variable $AC \times Transient$. Consistent with Hypotheses 3 and 4, we find a negative and significant coefficient on *Transient*, and a positive and significant coefficient on $AC \times Transient$. Results indicate that transient investors are less likely than regular investors to receive an IPO allocation, consistent with the long-term contracting ideas of Reuter (2006) and Goldstein et al. (2008). However, if a transient institution sends commissions prior to the IPO, the number of shares they receive increases significantly. These results are in accordance with our model and our hypotheses.

We further explore these effects by separating the sample into transient and stable investors. In columns (3) and (4) we find that *Client Size* is an important determinant for IPO allocations for both transient and stable clients. However, opportunistic short-term abnormal commission payments are much more important for transient investors, as demonstrated by the difference in magnitude between the coefficient on *Abnormal Commissions* in the stable institution regression of 0.0076 (t-statistic =4.81) and that of the Transient Institutions of 0.0140 (t-statistic=14.48). These results provide support for our model's explanation of how both stable and transient investors can receive IPO allocations, albeit through different mechanisms.

The coefficient on abnormal commissions in Table 7 and our data on IPO profitability allow us to estimate the elasticity accruing to short-term institutions that send commissions to the lead underwriter. Using these, we estimate that transient institutions receive approximately \$2.76 in IPO profits from allocated shares for each \$1 in abnormal commissions sent to the lead underwriter. Sending more commissions to a lead underwriter is therefore a profitable activity for both the client and the lead underwriter.

To conclude we examine the allocation of IPOs to transient and stable institutions. Hypothesis 4 maintains that stable institutions receive the bulk of IPO allocations and our allocation estimate confirms this assumption. Of the IPO allocations that go to institutional investors, 76.5 percent of IPOs are allocated to stable institutions, with transient institutions receiving only 23.5 percent of our estimated allocations.

VIII. Conclusion

Recent literature suggests that *quid pro quo* arrangements are of principal importance in lead underwriter IPO allocation decisions. The agency view advocated by Loughran and Ritter (2002, 2004) as well as survey evidence by Jenkinson and Jones (2007) support the idea that lead underwriters allocate lucrative IPO shares to clients who provide them with commission revenues. Reuter (2006) suggests that these institutional clients provide long-term streams of commission revenues, whereas Nimalendran, Ritter, and Zhang (2007) find circumstantial evidence consistent with investors opportunistically sending short-term commission payments to lead underwriters in the period immediately surrounding the IPO offer date.

We find significant increases in lead underwriter commission revenues during the ten-day period before the most profitable IPOs. For the most profitable IPO quartile, commission revenues increase by 10.62%, and we estimate the total market-wide abnormal commission payments to be \$2.2 million per IPO for the most lucrative IPOs and \$1.14 billion over the entire time period. We confirm that these findings are robust to a variety of alternate specifications and cannot be attributed to market-wide changes in trading volume or IPO clustering. Our results are consistent with strategic decisions by some institutions to use commission dollars as a means of obtaining profitable IPO allocations.

Our findings suggest that the institutions in our sample strategically employ a variety of trading strategies to increase lead underwriter commissions including churning stocks, increasing commissions per share, and paying unusually high commissions for some trades. We estimate that commissions from churn trades account for 25 percent of the total increase in commission revenue for the most profitable IPO quartile. In addition, for this quartile the average commission paid for all trades increase from 4.95 cents per share to 5.04 cents per share, and the frequency of trades paying greater than 10 cents per share goes from 0.53% to 0.70%.

Institutions with stable long-term relationships with the underwriter expect to receive IPO allocations as part of their normal business relationship with the lead underwriter. Transient institutions, lacking this relationship, rely more on increasing underwriter commission revenues prior to the IPO. As stable institutions lose when transient institutions receive allocations, they have incentives to monitor the lead underwriter. We find that stable

institutions do receive the bulk of the IPO allocation and that the amount of abnormal commissions paid by institutions to the lead underwriter is inversely related to the concentration of the underwriter's client base. We interpret the latter finding as consistent with our assumption that institutions can discipline underwriters and this disciplinary mechanism limits the practice of paying for allocations with abnormal commissions.

Finally, our data also allows us to examine whether particular institutions are successful in using commissions to capture IPO profits. Specifically, we investigate whether increased commissions sent to the lead underwriter result in larger allocations of profitable IPOs. We find evidence that stable and transient institutions interact differently with lead underwriters. Our findings indicate that profitable IPO allocations to stable institutions are primarily determined by the long-term commission revenue streams that such institutions provide. Alternatively, excess commissions sent to the lead underwriter in the period immediately preceding the IPO offer date are relatively more important for transient institution allocations. We estimate that \$1 dollar of abnormal commission revenue sent by transient institutions to the lead underwriter generates approximately \$2.76 in IPO profits from allocated shares. It appears that transient institutions are successful in using commissions to capture excess IPO profits.

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APPENDIX

We present a simple model of the underwriter's IPO allocation decision across different client types. Specifically, we assume a risk-neutral underwriter has two types of clients: S and T . The first type, S , are stable investors who pay a regular stream of commission dollars, C , to the underwriter's brokerage arm, and, in return, expect to receive premium services, including allocations of desirable IPOs.²⁵ Transient type T investors attempt to buy their way into IPO allocations by directing commissions, c , to the underwriter. The type T commission stream, c , is short-term in nature. That is, transient clients have no interest in continuing to pay large commissions to the underwriter once the IPO is allocated.

After the underwriter wins the IPO underwriting mandate, it is considered a monopolist over the allocation process. The underwriter's problem is to decide whether to allocate all IPO shares to its stable investors, S , and receive C , or cheat on the implicit contract and allocate part of the offering to type T investors and receive c as well. Allocating shares to transient investors increases the underwriter's profit but reduces the total profits of type S investors. Stable investors that detect cheating will punish the underwriter by withholding future commissions. Therefore, the underwriter will allocate shares to transient investors only if the commissions they receive, c , are large enough to offset the potential losses from being caught and punished by stable investors. The underwriter's revenues if caught cheating by a type S investor are reduced by $(1-k)C$ (where k is $\in [0, 1]$); which represents the fraction of the underwriter's commissions received from the type S investor who detects cheating.²⁶

Transient investors' commissions, c , are increasing in the expected profitability $E(\pi)$ of their IPO allocation:

$$E(\tilde{\pi}) = E(\tilde{F}) \times A \quad (1)$$

Where \tilde{F} is the expected first day closing price less the known IPO offer price, and A is the number of shares expected to be received in the allocation process. While A is unknown *ex*

²⁵ Intuitively, C could be considered the present value of all future commissions generated from the type S investors.

²⁶ Alternatively, we could assume that if the underwriter cheats, all stable investors find out, and all of them lower the commissions sent to that underwriter by k . Our presentation assumes that one, or a subset, of type S investors discovers the underwriter's cheating behavior. Under our assumption, the composition of the underwriter's client base could affect their decision.

ante, it is determined endogenously in our model and thus can be predicted by the transient investor given the excess commissions they pay and the exogenous elements of the underwriter's problem. Transient investors will offer an extra payment when expected profits are positive:

$$A \times E(\tilde{F}) - c > 0 \quad (2)$$

Clearly, there is an ongoing bargaining problem between the underwriter and the transient investor over the division of potential profits. However, the bargaining problem adds complexity without adding additional insight into our main results. Therefore, we assume that the underwriter extracts all possible rents from the transient investor and thus the size of the bribe can be defined directly as a function of expected IPO underpricing:

$$c = A \times E(\tilde{F}). \quad (3)$$

Faced with the possibility of additional revenue from transient investors, the underwriter's choice is to allocate all IPO shares to stable investors S and receive C or to allocate A shares to transient investors T . If they are not caught by their stable investors, the underwriter will continue to receive C and also pocket c . If they are caught, the underwriter will receive c , but only kC from their stable customers.

The postulated function $p(A)$ represents the probability that stable investors S detect cheating and punish the underwriter. Hence $p(A)$ determines the underwriter's willingness to allocate shares to transient investors. The probability of being caught cheating is assumed to be increasing and convex in the size of the allocation, A , to type T investors. Given this assumption, the underwriter's decision on whether to cheat depends on the relative payoffs of the two strategies:

$$C < c + [1 - p(A)]C + p(A)(kC), \quad (4)$$

or:

$$p(A)(1 - k)C < c. \quad (5)$$

If the underwriter's participation constraint in Equation (5) is met, the underwriter will allocate shares to type T investors.

A type S investor may be unhappy with their allocation and suspect the underwriter of renegeing on their long-term agreement. However, since the actual demand function for IPO shares is determined in the pre-issue bookbuilding process, only the underwriter sees the true

aggregate demand curve. Therefore, verification of cheating is costly and uncertain. The underwriter will be more likely to cheat and allocate IPOs to type T investors, the greater the short-term commission payment c , the lower the probability of being caught cheating $p(A)$, and the less severe the punishment fraction $(1-k)$.

The underwriter's problem is to maximize revenue (R) from Equation (4) conditional on the allocation size, A , to the transient investor:

$$\text{Max}_A R = [1 - p(A)]C + p(A)(kC) + c \quad (6)$$

Substituting Equation (3) for c produces the first order condition:

$$\frac{\partial R}{\partial A} = -p'(A)(1-k)C + E(\tilde{F}) = 0 \quad (7)$$

or:

$$p'(A)(1-k)C = E(\tilde{F}). \quad (8)$$

The solution to the underwriter's problem in Equation (8) trades off the marginal benefit from sending one more share to type T investors, $E(\tilde{F})$, against the marginal cost, $p'(A)(1-k)C$, which is the change in the probability of detection multiplied by the cost of the punishment.

Table 1 - Summary statistics

Table 1 (Panel A) presents descriptive statistics for the ANcerno institutional trading data. The trades in the sample are placed by 840 different institutional clients of ANcerno during the time period from January 1, 1999 to December 31, 2005. *Trades* refers to executions of orders placed by institutions in the database. Panel B presents summary statistics for the 1,156 sample IPOs with offer dates between March 31, 1999 and October 1, 2005. IPOs are divided into quartiles based on the variable *Money*, which is the difference between the first day closing price and the offer price times the number of shares offered. *Underpricing* is the gross return on the first day of issue calculated as the (first day closing price – offer price) divided by the offer price; *Offer size* is the dollar size of the IPO offered (measured as the number of shares offered times the offer price); and *Lead Broker Size* is the average daily commissions executed through the issuing broker over the [-60 to +60] period surrounding the IPO issue date. Summary statistics presented in Panel B are mean values, standard errors are presented in parentheses, and t-statistics are presented in brackets.

Panel A: Abel/Noser Data

	Year of Observations						
	1999	2000	2001	2002	2003	2004	2005
<i>Number of Institutions</i>	382	376	404	430	405	406	376
<i>Number of Stocks</i>	6,150	5,906	5,082	4,692	4,736	4,927	4,763
<i>Number of Trades (millions)</i>	5.64	7.56	9.05	12.32	12.35	21.43	19.10
<i>Share Volume (billions)</i>	50.69	73.44	100.99	135.04	112.30	155.92	127.40
<i>Dollar Volume (\$trillion)</i>	2.25	3.20	3.06	3.23	2.76	4.46	3.95
<i>Commissions (\$million)</i>	1,751	2,147	2,905	5,273	3,667	5,571	3,361
<i>Mean Shr. Volume / Trade</i>	8,988	9,714	11,159	10,961	9,093	7,276	6,669
<i>Median Shr. Volume / Trade</i>	1,700	1,500	1,400	1,300	1,050	700	453
<i>Mean \$ Volume / Trade</i>	398,803	423,726	337,633	262,359	223,126	208,027	206,902
<i>Median \$ Volume / Trade</i>	60,030	54,970	39,200	30,300	27,297	20,568	14,232
<i>Mean \$ Commission / Trade</i>	310	284	321	428	297	260	176
<i>Median \$ Commission / Trade</i>	25	20	21	40	20	17	8

Panel B: IPO data

	Quartile 1 (Low Money)	Quartile 2	Quartile 3	Quartile 4 (high Money)	Q4 - Q1
<i>N</i>	289	290	288	289	
<i>Money (\$thousand)</i>	-16,713 (3,770)	6,127 (250)	26,680 (593)	174,398 (11,332)	188,111*** [16.00]
<i>Underpricing (%)</i>	-6.90 (0.73)	11.26 (0.57)	40.24 (1.55)	131.97 (6.43)	138.87*** [21.45]
<i>Offer size (\$thousand)</i>	150,568 (22,386)	85,374 (6,181)	113,738 (7,105)	331,022 (50,259)	180,452*** [3.28]
<i>Lead Broker Size (\$)</i>	337,687 (19,595)	312,072 (18,686)	384,667 (18,915)	375,300 (16,166)	37,613 [1.48]

Table 2 – Brokerage commission revenue around IPO issuance

Table 2 presents event study results for abnormal commissions received by lead underwriters around the IPO offer date. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. IPOs are divided into quartiles based on the variable *Money*, which is the difference between the first day closing price and the offer price times the number of shares offered. We report the average daily commissions received by the lead underwriter during the non-event period, which is the period [-60, -21] and [+20, +60] surrounding the IPO offer date (event day 0). We then present the average abnormal daily commission revenue (event period commissions per day minus non-event period commissions per day) for four event periods surrounding the IPO offer date: [-20, -11], [-10, -1], [+1, +10], and [+11, +20]. We separate the sample of IPOs into the bubble period (1999 to 2001) and non-bubble period (2002-2005) and repeat our analysis of abnormal commissions for the event period [-10, -1]. T-statistics are presented in parenthesis.

	Quartile 1 (low Money)	Quartile 2	Quartile 3	Quartile 4 (high Money)
All Periods: 1999-2005				
<i>Number of IPOs</i>	289	290	288	289
<i>Non-event (commissions/day)</i>	333,785	314,759	383,793	374,772
<i>Abnormal (commissions/day)</i>				
[-20, -11]	4,520 (0.89)	-4,957 (-1.68)	6,135 (0.92)	6,321 (0.85)
[-10, -1]	8,619 (1.61)	-6,452** (-1.98)	13,342** (1.95)	18,150*** (4.54)
[+1, +10]	-7,691 (-1.53)	-15,213** (-3.14)	-3,267 (0.82)	-8,235 (-1.06)
[+11, +20]	-8,654* (-1.73)	-3,626 (-0.74)	4,470 (0.67)	3,756 (0.77)
Bubble Period: 1999-2001				
<i>Number of IPOs</i>	154	167	190	245
<i>Non-event (commissions/day)</i>	208,173	228,876	265,998	303,448
<i>Abnormal (commissions/day)</i>				
[-10, -1]	6,189 (0.87)	-9,373 (1.53)	3,241 (0.52)	14,608*** (2.91)
Non-Bubble Period: 2002- 2005				
<i>Number of IPOs</i>	135	123	98	44
<i>Non-event (commissions/day)</i>	480,332	430,209	609,687	757,330
<i>Abnormal (commissions/day)</i>				
[-10, -1]	11,455 (1.29)	-2,526 (0.31)	32,712*** (2.55)	37,150*** (2.48)

***, **, * indicates significance at the 1, 5 and 10% levels respectively. **BOLD** indicates a statistically positive difference; *italics* indicate a statistically negative difference.

Table 3 – Calendar Time Approach

Table 3 presents calendar-time regressions where brokerage commissions received by the lead underwriter ($Commissions_t$) is the dependent variable. Lead underwriter brokerage commissions are regressed against the following independent variables: $Money$ is the first day closing price minus the offer price times the number of shares offered, and for each lead underwriter we aggregate $Money$ over the [+1, +5] period or the [+1, +10] period; $Commissions_{-1}$, $Commissions_{-2}$, $Commissions_{-3}$, and $Commissions_{-4}$ are the four prior days of lead underwriter daily commissions; and $|Market Return_{0t}|$ is the absolute value of the equal-weighted CRSP market return on that day. All regressions include month fixed effects. Numbers in parentheses are Newey-West t-statistics.

Independent Variable	Dependent Variable: $Commissions_t$					
	All Periods: 1999 to 2005		Bubble Period: 1999 to 2001		Non-Bubble Period: 2002 to 2005	
<i>Intercept</i>	149.902 (0.15)	79.556 (0.08)	2,231.242* (1.95)	2,216.043* (1.93)	26,249.30** (4.42)	26,218.14*** (4.42)
<i>Money[1,5]</i>	0.004*** (2.59)		0.004*** (2.71)		0.015 (1.43)	
<i>Money[1,10]</i>		0.003** (2.45)		0.003** (2.25)		0.016** (2.37)
<i>Commission₋₁</i>	0.411*** (11.07)	0.412*** (11.06)	0.378*** (9.11)	0.378*** (9.12)	0.417*** (9.05)	0.417*** (9.03)
<i>Commission₋₂</i>	0.185*** (7.27)	0.184*** (7.23)	0.199*** (7.20)	0.199*** (7.20)	0.182*** (5.75)	0.180*** (5.71)
<i>Commission₋₃</i>	0.165*** (7.46)	0.165*** (7.44)	0.137*** (5.85)	0.137*** (5.85)	0.173*** (6.28)	0.173*** (6.26)
<i>Commission₋₄</i>	0.181*** (8.79)	0.181*** (8.76)	0.213*** (10.00)	0.212*** (10.00)	0.172*** (6.86)	0.172*** (6.83)
$ Market Return_{0t} $	929,611*** (10.40)	935,022*** (10.44)	749,451*** (7.38)	751,742*** (7.39)	1,177,383*** (7.35)	1,185,910*** (7.38)
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ² %	79.59	79.56	74.38	74.37	79.87	79.85

***, **, * indicates significance at the 1, 5 and 10% levels respectively.

Table 4 – Difference of Differences

Table 4 presents a difference-of-differences test for abnormal commissions in the ten-day period before the IPO offer date. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. IPOs are divided into quartiles based on the variable *Money*, which is the difference between the first day closing price and the offer price times the number of shares offered. For each IPO, we calculate *Abnormal Commissions (%)* for three groups: the lead underwriter, a matched control sample, and a control portfolio; where *Abnormal Commissions* are calculated as the average daily commission during the [-10, -1] event period minus the average daily commission during the [-60, -21] and [+21, +60] non-event period, divided by the average daily non-event period commission. Control sample brokerage firms cannot act as lead underwriter for any IPO during the [-10, +10] period around the IPO offer date. The *Matched Control Sample* includes the control brokerage firm with average daily non-event commissions that are closest to the lead underwriter. The *Control Portfolio* sample includes all control sample brokerage firms. The difference of differences is the Abnormal Commission (%) for the lead underwriter minus the Abnormal Commission (%) for either the *Matched Control* or *Control Portfolio* sample. By construction, t-statistics for our difference of differences tests normalize commission dollars using non-event period levels. T-statistics are presented in parentheses.

	Abnormal Commissions (%)		(t-stat)	Difference of differences		(t-stat)
Quartile 1 (low Money)						
<i>Lead Underwriter Sample</i>	-1.10%		(-0.40)			
<i>Matched Control Sample</i>	-4.90%	**	(-2.58)	4.04%		(1.29)
<i>Control Portfolio</i>	-0.40%		(-0.42)	-0.70%		(-0.25)
Quartile 2						
<i>Lead Underwriter Sample</i>	0.69%		(0.14)			
<i>Matched Control Sample</i>	-4.50%	**	(-2.41)	4.93%		(0.92)
<i>Control Portfolio</i>	-0.60%		(-0.65)	1.30%		(0.26)
Quartile 3						
<i>Lead Underwriter Sample</i>	7.07%	**	(2.43)			
<i>Matched Control Sample</i>	-3.00%		(-1.58)	10.04%	***	(2.95)
<i>Control Portfolio</i>	1.29%		(1.30)	5.78%	**	(2.14)
Quartile 4 (high Money)						
<i>Lead Underwriter Sample</i>	10.62%	***	(3.97)			
<i>Matched Control Sample</i>	0.13%		(0.07)	10.48%	***	(4.00)
<i>Control Portfolio</i>	3.49%	***	(2.91)	7.13%	**	(3.05)

***, **, * indicates significance at the 1, 5 and 10% levels respectively. **BOLD** indicates a statistically positive difference; *italics* indicate a statistically negative difference.

Table 5 – Trading Strategies around IPO issuance

Table 5 presents event study results for four different lead underwriter trading variables around the IPO offer date. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. IPOs are divided into quartiles based on the variable *Money*, which is the difference between the first day closing price and the offer price times the number of shares offered. We report the average daily statistics for four variables during the non-event period, which is the period [-60, -21] and [+20, +60] surrounding the IPO offer date (event day 0). The four variables are: 1) *Shares Traded (M)*, which is the number of shares traded through the lead underwriter in millions, 2) *Churn Commissions* is the commission revenue received by the lead underwriter for round-trip intra-daily trades, 3) *Commissions per share* is the share-weighted daily average commissions per share (in cents) for all trades executed by the lead underwriter that pay an explicit commission, and 4) *Frequency >0.10* is the fraction of trades executed by the lead underwriter that pay commissions greater than 10 cents per share. We then present the average abnormal daily statistics for all four measures (event period daily average minus non-event period daily average) for four event periods surrounding the IPO offer date: [-20, -11], [-10, -1], [+1, +10], and [+11, +20]. We separate the sample of IPOs into the bubble period (1999 to 2001) and non-bubble period (2002-2005) and repeat our analysis for the event period [-10, -1]. T-statistics are presented in parenthesis.

Panel A: Shares Traded and “Churn” Commissions

	Quartile 1 (low Money)		Quartile 2		Quartile 3		Quartile 4 (high Money)	
	Shares Traded (M)	Churn Commissions	Shares Traded (M)	Churn Commissions	Shares Traded (M)	Churn Commissions	Shares Traded (M)	Churn Commissions
All Periods: 1999-2005								
<i>Non –event period</i>	8.65	57,937	8.24	53,794	10.09	66,015	10.16	65,019
<i>Abnormal Activity</i>								
<i>[-20, -11]</i>	0.20 (1.65)	-2,242 (-1.56)	0.01 (0.05)	-205 (-0.23)	0.15 (1.33)	1,380 (0.71)	-0.06 (-0.57)	-541 (-0.26)
<i>[-10, -1]</i>	0.18 (1.47)	463 (0.32)	-0.20 (-1.35)	-500 (-0.45)	0.29* (1.71)	2,745 (1.36)	0.35*** (2.86)	4,520*** (4.42)
<i>[+1, +10]</i>	-0.15 (-1.22)	-1,410 (-1.04)	<i>-0.30**</i> <i>(-2.07)</i>	<i>-4,080***</i> <i>(-3.68)</i>	-0.13 (-0.71)	-1,810 (-0.93)	-0.10 (-0.50)	<i>-3,529**</i> <i>(-2.56)</i>
<i>[+11, +20]</i>	-0.18 (-1.44)	-2,296 (-1.07)	0.01 (0.02)	-2,504 (-1.47)	0.10 (0.95)	1,724 (1.11)	0.23 (1.41)	1,205 (0.87)
Bubble: 1999-2001								
<i>Non –event period</i>	6.04	32,832	6.74	36,981	7.78	43,454	8.66	49,892
<i>Abnormal Activity</i>								
<i>[-10, -1]</i>	0.13 (1.18)	935 (0.71)	<i>-0.33*</i> <i>(-1.91)</i>	-1,343 (-0.75)	0.14 (1.08)	-1,120 (-0.75)	0.23** (2.39)	3,526*** (3.02)
Non-Bubble: 2002-2005								
<i>Non –event period</i>	11.68	87,226	10.26	76,393	14.51	109,276	18.21	146,153
<i>Abnormal Activity</i>								
<i>[-10, -1]</i>	0.25 (1.18)	-87 (-0.02)	-0.02 (-0.07)	633 (0.31)	0.59* (1.83)	10,157** (2.20)	0.89** (2.23)	9,856 (1.28)

Panel B: Commissions per share and Frequency > 0.10

	Quartile 1 (low)		Quartile 2		Quartile 3		Quartile 4 (high)	
	Commission per share	Frequency > 0.10 (%)	Commission per share	Frequency > 0.10 (%)	Commission per share	Frequency > 0.10 (%)	Commission per share	Frequency > 0.10 (%)
All Periods: 1999-2005								
<i>Non –event period</i>	4.73	0.23	4.77	0.21	4.81	0.32	4.95	0.53
<i>Abnormal Activity</i>								
<i>[-20, -11]</i>	-0.06 (-1.63)	0.08 (1.08)	-0.06 (-1.49)	-0.01 (-0.34)	0.01 (0.30)	-0.10** (-1.99)	-0.01 (-0.64)	-0.04 (-1.36)
<i>[-10, -1]</i>	-0.06 (-0.87)	0.09 (1.40)	0.03 (1.16)	0.06 (1.06)	0.04* (1.69)	0.07 (1.42)	0.09*** (2.71)	0.17** (2.18)
<i>[+1, +10]</i>	-0.15*** (-2.59)	0.09* (1.84)	0.00 (0.14)	-0.04 (-0.99)	0.02 (0.47)	-0.01 (-0.14)	0.04 (0.98)	0.16*** (3.19)
<i>[+11, +20]</i>	-0.09* (-1.88)	0.01 (0.18)	-0.03 (-0.85)	0.01 (0.21)	-0.03 (-0.94)	-0.01 (-0.10)	-0.05 (-1.39)	-0.03 (-0.60)
Bubble: 1999-2001								
<i>Non –event period</i>	5.06	0.23	5.04	0.21	5.04	0.32	5.08	0.52
<i>Abnormal Activity</i>								
<i>[-10, -1]</i>	-0.09 (-0.59)	0.10 (1.28)	0.03 (0.71)	0.06 (0.82)	0.05 (1.38)	0.18 (1.41)	0.09*** (2.65)	0.18** (2.40)
Non-Bubble: 2002-2005								
<i>Non –event period</i>	4.35	0.01	4.40	0.05	4.35	0.07	4.29	0.03
<i>Abnormal Activity</i>								
<i>[-10, -1]</i>	-0.05 (-1.50)	0.00 (0.42)	0.04 (1.13)	0.01 (0.81)	0.03 (1.10)	0.02 (0.94)	0.03 (0.54)	0.01 (0.97)

Table 6 – Cross-sectional regression

Table 6 presents cross-sectional regressions of the determinants of abnormal lead underwriter commissions during the [-10, -1] event period immediately preceding the IPO offer date. The dependent variable, *Abnormal Commissions*, is the natural logarithm of average daily commissions during the [-10, -1] event period divided by the average daily non-event period commission during the [-60, -21] and [+21, +60] non-event period. Our regressions use the following independent variables: *Price Run Up* is the percentage difference between the offer price and the midpoint of the filing range; *Underpricing* is the gross return on the first day of issue calculated as the (first day closing price – offer price) divided by the offer price; *Offer size* is the dollar size of the IPO offered (measured as the number of shares offered times the offer price); *Herfindahl* is the Herfindahl index of the issuing brokers' client base calculated using client total commissions; *Scarcity* is the offer size divided by the initial filing size of the offer; and *Bulge Underwriter* is a dummy variable coded as 1 if the lead underwriter is ranked in the top 10 underwriters by total dollar value of IPOs offered during the 1999 to 2005 period, and 0 otherwise. We include year fixed effects in all regression specifications, and estimate each regression using a standard GMM estimation procedure with Newey-West conditions on the calculated variance-covariance matrix. We present results for the full sample (1,150 IPO observations) in Panel A. We present a control sample of 461 observations in Panel B. The control sample is limited to IPOs where the issuing lead underwriter does not issue any other IPOs in the [-10, +10] day period surrounding the IPO offer date (offer date=0). T-statistics are in parentheses below each coefficient estimate.

Panel A: Full Sample

Independent Variables	Full Sample					
	Dependent Variable = <i>Abnormal Commissions</i>					
	(1)		(2)		(3)	
<i>Intercept</i>	-7.982 *** (-3.33)		-6.261 *** (-2.62)		-6.494 *** (-2.60)	
<i>Price Run Up</i>			1.136 *** (2.77)		0.993 * (1.87)	
<i>Underpricing</i>	0.353 ** (2.26)				0.099 (0.48)	
<i>Offer Size</i>	0.401 *** (2.99)		0.308 ** (2.29)		0.319 ** (2.28)	
<i>Herfindahl</i>	-4.343 *** (-3.13)		-4.328 *** (-3.11)		-4.337 *** (-3.12)	
<i>Scarcity</i>	0.117 (0.17)		0.115 (0.16)		0.111 (0.16)	
<i>Bulge Underwriter</i>	0.604 ** (1.98)		0.623 ** (2.05)		0.609 ** (2.01)	
<i>Year Fixed Effects</i>	Yes		Yes		Yes	
# observations	1,150		1,150		1,150	
Adjusted R ² %	8.26		8.60		8.54	

***, **, * indicates significance at the 1, 5 and 10% levels respectively.

Panel B: Control Sample

Independent Variables	Control Sample Sample					
	Dependent Variable = <i>Abnormal Commissions</i>					
	(1)		(2)		(3)	
<i>Intercept</i>	-18.409	***	-15.537	***	-17.587	***
	(-4.09)		(-3.27)		(-3.69)	
<i>Price Run Up</i>			1.979	**	0.519	
			(1.98)		(0.48)	
<i>Underpricing</i>	1.709	***			1.602	***
	(3.94)				(3.36)	
<i>Offer Size</i>	0.964	***	0.828	***	0.921	***
	(4.00)		(3.19)		(3.55)	
<i>Herfindahl</i>	-5.284	***	-4.972	***	-5.299	***
	(-3.04)		(-2.78)		(-3.06)	
<i>Scarcity</i>	0.085		0.006		0.028	
	(0.07)		(0.01)		(0.02)	
<i>Bulge Underwriter</i>	-0.219		-0.038		-0.198	
	(-0.57)		(-0.10)		(-0.51)	
<i>Year Fixed Effects</i>	Yes		Yes		Yes	
# observations	461		461		461	
Adjusted R ² %	12.04		10.23		11.98	

***, **, * indicates significance at the 1, 5 and 10% levels respectively.

Table 7 – Determinants of IPO Allocations

Table 7 presents cross-sectional regressions where *Allocation*, a proxy for IPO shares allocated to each institution, is the dependent variable. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. *Allocation* is constructed by first calculating the net trading imbalance in an IPO for each institution-IPO observation during the 30 calendar days following the IPO offer (this includes the offer date). Institutions with a negative net imbalance are assumed to have received an allocation equal to the magnitude of net sales, and institutions who are net buyers are assumed to receive zero allocation. The absolute value of this measure normalized by shares offered in the IPO is our proxy for IPO allocation (*Allocation*). *Client size* is the percentage of lead underwriter commission revenues that are sent to the underwriter by each institution in the [-60 to -21] and [+21 to +60] non-event period. *Underpricing* is the gross return on the first day of issue calculated as the (first day closing price – offer price) divided by the offer price. *Abnormal Commissions* is the abnormal average daily commissions paid by a particular client to the lead underwriter in the -10 to -1 period normalized by the average daily commissions received by the lead underwriter in the non-event period. *Transient* is a dummy variable set to one if a client is a less regular customer with the lead underwriter, where estimates of customer regularity are obtained by estimating the first-order autocorrelation coefficient for commission revenues between a lead underwriter and institution. *AC×Transient* is a multiplicative slope dummy variable affecting the coefficient on abnormal commissions; it is calculated by multiplying abnormal commissions by the dummy variable for transient clients. All regressions account for the truncated nature of our dependent variable. T-statistics are presented in parentheses.

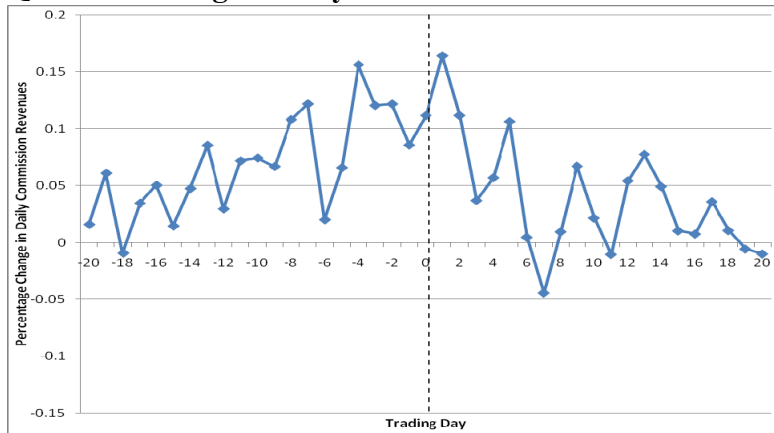
Independent Variables	Dependent Variable= <i>IPO Allocation</i>							
	All Institutions		Non-transient Institutions		Transient Institutions			
<i>Intercept</i>	-0.0022 (-22.00)	***	-0.0020 (-20.00)	***	-0.0026 (-26.56)	***	-0.0015 (-15.18)	***
<i>Client size</i>	0.0469 (68.92)	***	0.0462 (66.77)	***	0.0475 (52.56)	***	0.0396 (28.90)	***
<i>Underpricing</i>	0.0006 (12.94)	***	0.0006 (12.88)	***	0.0008 (9.19)	***	0.0005 (8.69)	***
<i>Abnormal Commissions</i>	0.0105 (11.31)	***	0.0074 (5.74)	***	0.0076 (4.81)	***	0.0140 (14.48)	***
<i>Transient</i>			-0.0004 (5.12)	***				
<i>AC×Transient</i>			0.0061 (3.35)	***				
Number Obs	34,677		34,677		17,820		16,858	
Pseudo R ² %	3.56		3.60		4.13		1.67	

***, **, * indicates significance at the 1, 5 and 10% levels respectively.

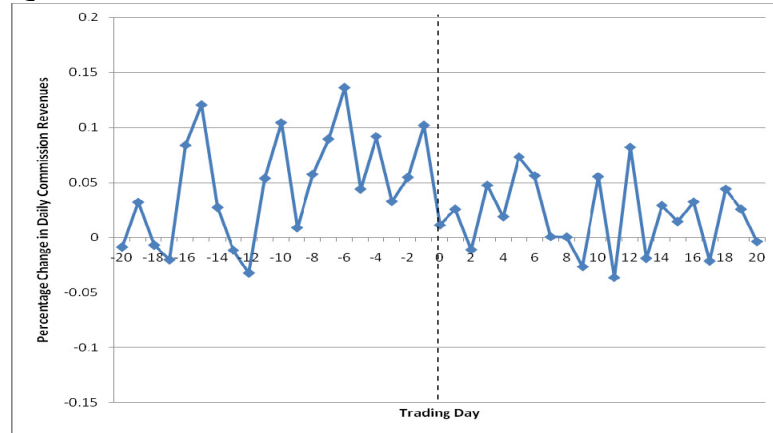
Figure 1 – Lead Underwriter Commission Revenues

Figure 1 presents abnormal commissions received by lead underwriters around the IPO offer date. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. IPOs are divided into quartiles based on the variable *Money*, which is the difference between the first day closing price and the offer price times the number of shares offered. For each day we calculate abnormal commissions by subtracting the average daily non-event commission revenue during the [-60, -21] and [+20, +60] period, and then divide this difference by the non-event mean. We present the average abnormal daily commission revenue during the [-20, +20] period for each quartile.

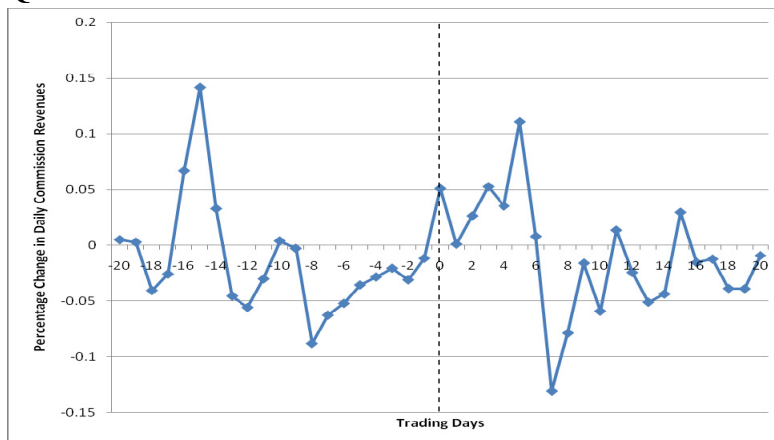
Quartile 4 – High Money



Quartile 3



Quartile 2



Quartile 1 – Low Money

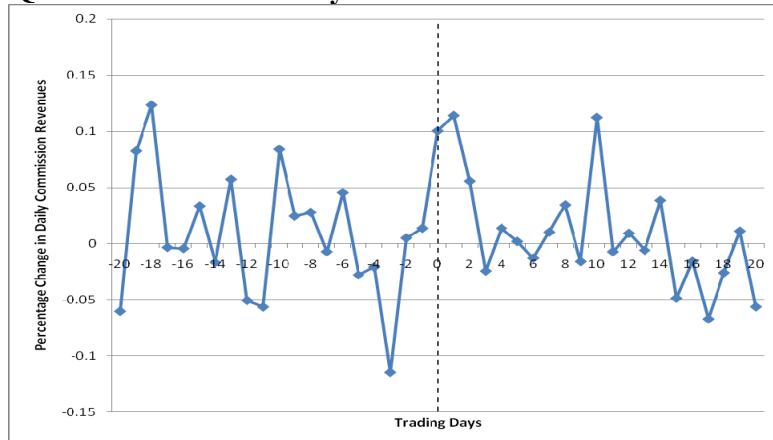


Figure 2 – Distribution of IPOs through time

Figure 2 presents the distribution of IPOs by year for our sample. Our sample contains 1,156 IPOs with offer dates between March 31, 1999 and October 1, 2005. In addition, the distribution of the 467 Control IPOs, IPOs for which there were no other IPOs issued by the same lead underwriter during the [-10,+10] period surrounding the IPO date, are also shown by year.

