Do Underwriters Matter?
The Impact of the Near Failure of an Equity Underwriter

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The financial crisis provides a natural experiment for testing theoretical predictions of the equity underwriter's role following an initial public offering. Clients of Bear Stearns, Lehman Brothers, Merrill Lynch, and Wachovia saw their stock prices fall almost 5 percent, on average, on the day it appeared that these institutions might collapse. The decline was more than 1 percent lower than the abnormal return of other newly public companies, representing a loss in equity value of almost $3 billion. The price impact was worse for companies with fewer monitors, suggesting that underwriters play an important role in monitoring newly public companies. The negative abnormal return remains even after adding controls for the role of the underwriter as market maker, lender and counterparty to investors.

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1. Introduction

Firms pay high fees to banks that underwrite their initial public offerings.[1] Beatty and Ritter (1986) and Carter and Manaster (1990) propose that that these fees are compensation for underwriter reputation to certify the offer price. Hansen and Torregrosa (1992) suggest that firms also pay for monitoring after the IPO, which underwriters undertake in order to protect their reputation. However, it is difficult to verify whether underwriting fees contain compensation for post- IPO monitoring because it is impossible to directly observe the monitoring component of the fee, which could be related to the certification component, and the choice of underwriter and fee are jointly determined.

In this paper I report results from testing for underwriter monitoring using the collapse of Bear Stearns, Lehman Brothers, Merrill Lynch and Wachovia in the financial crisis of 2008 as a natural experiment. Because these failures (and near failures) were largely unanticipated, the monitoring hypothesis predicts that clients of these firms should suffer unanticipated losses from the unexpected end of post-IPO underwriter monitoring. Event date returns are thus a plausible measure of the value of underwriter monitoring. However, this measure may understate benefits of monitoring because it leaves out benefits that could occur closer to the IPO and because monitoring done by individual investment bankers may continue when they move to other employers.

I find that troubled underwriters' clients stock prices fell by almost 5% when it appeared that their IPO underwriter might collapse. Market model predicted single day

[1] Jenkinson and Ljungvist (2001) cover aspects of IPOs in detail. Specifically, Chen and Ritter (2000) document spreads of 7% for equity offerings and Hansen (2001) finds evidence for 7% as an efficiently contracted price. Ritter (2003) tabulates initial returns ranging from 6.3% to 256.9% for 38 countries and of 18.4% in the US.

abnormal returns are 1% lower for troubled underwriter clients than for other newly public companies.[2] Excess equity value losses associated with underwriting clients of Bear Stearns, Lehman Brothers, Merrill Lynch and Wachovia amount to more than $3 billion, in total. This compares to a total of at most $2.5 billion in gross equity underwriting fees earned by these underwriters on these companies' IPOs.[3] This implies that post-IPO underwriter monitoring is worth more than the initial IPO underwriting fees earned.

There is variation in the amount of clients' underperformance. The amount of underperformance is related to cross-sectional differences in the importance of underwriter monitoring. Firms which need less monitoring, such as firms with high institutional investor ownership or large blockholders, have less negative returns. Abnormal returns are also less negative for clients the longer the time elapsed since the client's last equity issuance. This is consistent with the theoretical model of Hansen and Torregrosa (1992). Post-IPO monitoring is more than just equity analyst coverage, because companies with analyst coverage from but not underwritten by these troubled investment banks do not underperform by as much.

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[2] Expanding the event window to include -1 and 0 results in a cumulative abnormal return (CAR) of -0.7% vs. the DGTW characteristics model and -2.8% vs. the Fama French three-factor model. Expanding the event window to include -1, 0 and +1 results in a CAR of -1.5% vs. the DGTW characteristics model and -2.5% vs. the three-factor model. Expanding the event window to include -2, -1 and 0 results in a CAR of -1.2% vs. the DGTW characteristics model and -3.9% vs. the three-factor model. In each case the difference between the CAR and 0 is statistically significant.

[3] Detailed fee information was not available from SDC for every offering. Assumes underwriters earned 7% of gross IPO proceeds of $48 billion for the sample companies, divided by an average of 1.35 book underwriters per IPO. Fees earned by these underwriters are likely lower because aggregate fees are split among the underwriting syndicate, not just book underwriters.

The amount of underperformance also is associated with some proxies for clients' dependence on equity financing. Event day returns are less negative for companies with more cash. This finding is similar to James (1992) who proposed that underwriters possess relationship-specific information similar to that of commercial banks and auditors.

The loss of an equity underwriter appears to be more important than the possible loss of other services provided by the troubled underwriters. Event date returns for market making and lending clients of these banks are not consistently or statistically significantly negative. It is only equity underwriting clients that have statistically significant negative abnormal returns. This result is complementary to Fernando, May and Megginson's (2010) detailed analysis of the failure of Lehman Brothers, in which they find that the only clients affected by its failure were equity underwriting clients. Within IPO underwriting clients, companies that borrowed from their IPO underwriter have more negative returns, although returns for IPO clients that did not borrow from their underwriters are still negative and statistically significant. While Aragon and Strahan (2010) find reduced liquidity for investments of hedge funds that had Lehman Brothers as their prime brokers, IPO underwriting clients owned by prime brokerage clients of Lehman Brothers and Bear Stearns do not have disproportionally lower returns.

If negative event day returns reflect investors' reassessment of quality due to underwriters' distress, there should be no positive price impact from the resolution of this distress. While it appeared on the event dates that Bear Stearns, Lehman Brothers, Merrill Lynch and Wachovia might cease operations, each equity underwriter subsequently was acquired. Client firms' abnormal returns were more than 2% higher

than those of other newly public companies, on average, in the days following the acquisition of their troubled underwriters. This positive post-event return provides support for the assumption that banks' distress was exogenous to the banks' underwriting business. It also suggests that the measured negative event date returns were not the result of investor updating on underwriter quality.

This paper adds to the literature on the role of investment banks as financial intermediaries, providing empirical evidence for the post-IPO importance of equity underwriters. In addition, it the sole paper to use the financial crisis of 2008 to focus on the role of IPO underwriters and to examine all troubled banks, not just Lehman Brothers. This paper also sheds light on the financial crisis, looking at the potential impact of weakness in the investment banking industry on investment banking clients. If investment banks are too weak to commit credibly to monitor post-IPO companies, access to equity finance may be negatively impacted. The analysis also has implications for companies selecting an underwriter – IPO clients should consider the financial strength of their underwriter, not just the bank's underwriting capabilities.

In addition to Fernando, May and Megginson's (2010) finding that the failure of Lehman Brothers particularly impacted equity underwriting clients, the results are consistent with Suzuki (1999) who presents evidence that Japanese companies issue secondary offerings at lower prices when the bank affiliate of their underwriter has a loan portfolio that becomes distressed. It is similar in spirit to Carvalho, Ferreira and Matos (2011) who document a relationship between the abnormal return of firms and their relationship banks in the 2008 crisis.

The paper proceeds as follows. The literature and empirical predictions are in Section 2. Section 3 describes the data, Section 4 the methodology and Section 5 presents the empirical findings. Section 6 concludes.

2. Literature and Empirical Predictions

2.1. Do underwriters matter?

Does the exogenous near-failure of an equity underwriter affect the equity value of its clients? If the underwriter plays no special role for its post-IPO clients, there should be no impact on its clients' stock prices. The first empirical exercise is to document negative abnormal returns for troubled underwriters' clients.

2.2. Monitoring

Many studies highlight the importance of the equity underwriter in certifying clients, especially for initial public offerings. Easterbrook described the importance of underwriter monitoring of the manager-stockholder conflict: "When it issues new securities, the Company's affairs will be reviewed by an investment banker or some similar intermediary…" (Easterbrook (1984, p. 654)). Beatty and Ritter (1986) argue that the underpricing equilibrium is enforced by investment bankers who have reputation capital at stake. Carter and Manaster (1990) model the importance of exogenously determined underwriter reputation and show that underwriter prestige is negatively related to the magnitude and variance of post-IPO price run-up.

Hansen and Torregrosa (1992) extend these papers to a model where the certification role of underwriters mandates post-IPO monitoring. They theorize that banks receive rents from their reputations for monitoring, and that banks continue to

monitor since shirking would be unlikely to result in gains that offset the losses to reputational capital. Investment banks thus produce information about companies after they are public because they want to protect their reputation capital. This post-IPO monitoring would be discontinued if the value of the rents from that reputation went away, for example if the underwriter went bankrupt or if its IPO underwriting business was discontinued.

It is not necessary for the underwriter to possess non-transferable private information for its post-IPO monitoring to be valuable; it is only necessary that the underwriter be motivated to invest in information production to protect its reputation. Kelly and Ljungvist (2010) outline an asymmetric-information asset pricing model in which share prices and uninformed investors' demands fall as information asymmetry increases. In this model, the prospect for reduced information production by troubled underwriters should result in lower client stock prices.

Testing for post-IPO monitoring by underwriters is subject to concerns about endogeneity of company characteristics and underwriter selection, which might produce the observed positive relationship between underwriter reputation and post-IPO stock performance. It is also hard to empirically separate pre-IPO certification from post-IPO monitoring because pre- and post-IPO monitoring and information production should be very similar. Hansen and Torregrosa (1992) present indirect evidence that underwriting syndicates monitor corporate managers by finding that underwriting spreads are lower when management ownership is higher. Carter, Dark and Singh (1998) find a positive relationship between investment bank reputation and post-issue performance and Jain and Kini (1999) extend this result and conclude that there is demand for third party

monitoring in the IPO market. An important contribution of this paper is to estimate the importance of underwriter monitoring using underwriters' exogenous near failures to avoid the problem of endogeneity of underwriter selection.

An additional contribution of the paper is to test the importance of the underwriter affiliated research analyst to monitoring. Researchers have not found affiliated analysts to be the best predictors of stock price performance (Michaely and Womack (1999) and Das, Guo and Zhang (2006)). Fang and Yasuda (2008) find that the severity of conflict of interest has a negative effect on the performance of lower ranked analysts, regardless of bank reputation. These results implicitly question the value of underwriter monitoring, to the extent that underwriter monitoring is produced by affiliated analysts. Direct tests of the analyst's role are limited by the fact that published estimates are a noisy measure of analyst information production. For example, the *Wall Street Journal* notes that equity analysts at Goldman Sachs and Morgan Stanley disseminate daily information to institutional investors and trading clients, and that these tips may differ from analysts' published research.[4]

The exact mechanism for post-IPO monitoring is unclear. According to practitioners, there are four main ways that equity underwriters interact with and potentially monitor their post-IPO clients – financing, mergers and acquisitions, analyst coverage and post-deal roadshows. First, bankers continually meet with their post-IPO clients to discuss financing, market conditions, and business prospects. Companies may provide confidential information about their future capital needs, and review with their

[4] Craig, Suzanne, "Goldman's Trading Tips Reward its Biggest Clients," *Wall Street Journal*, August 24, 2009, p. A1.

bankers the performance of comparable companies, the prospects for follow-on equity offerings and the company's overall capital structure. The troubled IPO underwriters in this sample underwrote more than 70% of subsequent equity and bond offerings by their IPO underwriting clients. Second, bankers discuss merger and acquisition opportunities with clients. These conversations typically involve a discussion with senior management about the company's strategy and possible acquisition candidates. The sample underwriters advised their IPO underwriting clients on more than 25% of their clients' subsequent acquisitions. Third, underwriter analysts produce earnings estimates and research reports on underwriting clients. The troubled IPO underwriters published research recommendations on 86% of their IPO clients. Fourth, underwriters organize "non-deal road shows." Similar to the "road show" presentations given by company management to potential investors in the IPO process, the book underwriter continues to arrange presentations by company management to institutional investors after the IPO. Typically, in this process the underwriter-affiliated research analyst organizes visits by company management to institutional investors in the institutional investors' home city[5] or coordinates a visit to company headquarters. In addition, underwriting clients typically participate in industry investor conferences organized by their underwriter, and bankers may organize meetings for their clients at industry trade shows and other industry events. Information on non-deal road shows is not publicly available.

Practitioners also say that there is an exchange of information between analysts, investment bankers and the equity sales force / traders. Equity salespeople speak with

[5] This process, labeled "Local Investor Relations" is considered by Hong, Kubik and Stein (2005) as an explanation for the correlation of the trades of local fund managers.

investors about their investments and seek information on companies from analysts and bankers.

A factor which would bias against finding any results in the context of underwriter failures is that the reputation asset may be at the level of the senior investment bankers who worked on the underwriting rather than at the underwriter level. This monitoring might be portable even in the wake of an underwriter's collapse.

Unfortunately, there is no publicly available information on the extent or value of underwriter interactions with clients. Post-IPO monitoring is likely to involve similar skills and information production by the investment banks as did pre-IPO certification. Regardless of the mechanism, a monitoring explanation for the importance of the underwriter results in the following prediction:

Prediction 1*: Companies for which underwriter monitoring is important (more opaque operations or have fewer monitors/ information producers) will be the most negatively affected by the failure of their underwriter.*

2.3. Relationship Underwriting

In addition to acting as a post-IPO monitor, underwriters may possess valuable relationship-specific information that cannot be transferred easily. James (1992) posits that equity underwriters have durable relationship-specific information similar to that of commercial banks and auditors. He finds lower spreads for firms that make subsequent

issues and less underwriter switching when the time between an IPO and subsequent SEO is smaller.[6]

This paper adds to the literature on relationship underwriting by offering a more rigorous empirical test for the presence of underwriter-specific information. This test is similar in spirit to the literature which quantifies the importance of lenders by measuring the impact on clients of exogenous bank failures. For example, Slovin, Sushka and Polonchek (1993) found an average abnormal return of -4.2% on the stock prices of its lending clients during the impending insolvency of the Continental Illinois bank. More recently, Ashcraft (2005) estimated the impact on local activity of the failure of healthy subsidiaries of a multi-bank holding company. While these papers focus on lenders, this is the first paper to estimate the impact of exogenous near failures of equity underwriters.

If underwriters possess non-transferrable relationship-specific information and a company is likely to need access to equity capital markets in the near future, this leads to the second prediction:

Prediction 2*: Companies which are the most equity dependent will be the most negatively affected by the failure of their underwriter.*

2.4. Other Bank Functions

The finding of negative abnormal returns is necessary but not sufficient evidence to prove the existence of a special post-IPO role for underwriters. Underwriters are part of larger banks which may also be lenders, market makers, or investors in underwriting

[6] Krigman, Shaw and Womack (2000) reexamine client loyalty with evidence from the 1990s and find that while client loyalty had declined, 70% of firms completing a secondary equity offering (SEO) within three years of their IPO select the same lead underwriter.

clients. The larger bank may be a prime broker or counterparty to hedge funds which are likely to invest in the bank's underwriting clients and may also be forced to sell stocks when the bank becomes distressed. The prospective loss of these services or the indirect impact from bank counterparties who are investors, rather than the loss of underwriter monitoring, may be the source of the observed negative returns.

The first alternative explanation is that the prospective loss of a lending relationship causes negative abnormal returns. The importance of bank relationships is considered extensively in the literature.[7] If underwriters are the primary lenders for their clients, the loss of a lending relationship would result in a negative equity return.

Alternative 1: *Companies whose underwriter is their primary lender (relationship bank) will be the most negatively affected by the failure of their underwriter.*

A second explanation is that the underwriter is a market maker for its clients. As Stoll (2003) notes, "The price investors would pay for the new shares must undoubtedly depend on the ease with which those shares can be sold in the future." Ellis, Michaely and O'Hara (2000) document the existence of underwriter price support through the 20th day post-IPO. If underwriters are the primary market makers for their clients, the loss of a market maker would result in a negative equity return:

Alternative 2: *Companies whose underwriter is a post-IPO market maker will be the most negatively affected by the failure of their underwriter.*

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[7] For a detailed survey of the relationship banking literature see Ongena and Smith (2000) and Boot (2000). For empirical evidence, see Slovin, Sushka and Polonchek (1993) and Ashcraft (2005).

Next, if underwriters' asset management divisions liquidate shares because of parent company distress, the additional supply of shares may depress prices. While Ritter and Zhang (2007) do not find much evidence for systematic allocation of worse companies to underwriter-affiliated mutual funds, if the underwriter is an investor, the actual sale of shares by the underwriter-affiliate, or fear by other investors of liquidation would result in a negative equity return:

Alternative 3: *Companies whose underwriters are stockholders will be the most negatively affected by the failure of their underwriter.*

While Alternative 3 is based on the direct impact of the underwriter as an investor, it does not preclude a monitoring explanation. Affiliated divisions may invest because of a lower marginal cost of information production due to banks' ongoing information production about post-IPO clients.

Finally, the bank may be an important counterparty or prime broker to hedge funds that also invest in its underwriting clients. Aragon and Strahan (2010) find that stocks held by Lehman-connected funds experienced declines in market liquidity following Lehman's bankruptcy:

Alternative 4: *Companies with investors that are counterparties to the parent company of their underwriter, particularly hedge funds for which the underwriter is the prime broker, will be the most negatively affected by the failure of their underwriter.*

2.5. Ex Post Updating on Underwriter Quality

A final alternative hypothesis to explain negative event day returns is ex post updating by investors. If an underwriter's near failure causes investors to reevaluate the

underwriter's pre-IPO information production and certification process, sample companies should have negative event day abnormal returns. Negative returns would be evidence for pre-IPO certification then, but not necessarily for any post-IPO role for the underwriter.

For example, if an investor viewed Bear Stearns' March 2008 financial difficulties to be symptomatic of systematically poor decision making, the investor might reevaluate the certification provided by Bear Stearns on its IPO clients, even though Bear Stearns' financial difficulties stemmed primarily from its mortgage-related business. If an underwriter's difficulties led investors to update on its underwriting quality, negative reassessment of underwriters' clients should be permanent. If, instead, the observed negative abnormal return is due to concern about the continuation of the post-IPO functions of the underwriter, the post event abnormal return should be positive when uncertainty about the underwriter is resolved:

Alternative 5: *If underwriters' failures lead investors to update on the quality of underwriters' clients, post-event returns will be unaffected by the news that the banks' underwriting activities will continue.*

3. Data and Empirical Methodology

3.1. Sample

A sample of all recent initial public offerings is collected from Securities Data Corporation's (SDC) New Issues Database. The sample is restricted to companies taken public within 5 years of the underwriter failure because beyond that period, the company's performance may no longer reflect on the reputation of its IPO underwriter. It

excludes public offerings of financial products (defined as offerings in SIC codes 6726 and 6798 which include Unit Investment Trusts, Face-Amount Certificate Offices, Closed-End Management Investment Offices, and Real Estate Investment Trusts). In addition, it excludes very small offerings (firms with an offer price below $4.00 a share and below $10 million in total offering size). Finally, the sample excludes banks (SIC codes 6000-6299) since the events which led to underwriter distress were also likely to directly affect banks' stock price returns directly.

Newly public clients of troubled underwriters (TUW clients) are identified with a dummy variable ($FAIL_t$) equal to one for companies which listed Bear, Stearns, Lehman Brothers, Merrill Lynch or Wachovia as their book underwriter since January 1, 2004. The analysis uses book underwriter rather than lead underwriter or member of the underwriting syndicate, because book managers sell the largest proportion of the offering and receive the highest percentage of the commissions, and in order to maximize sample size without adding too much noise. The troubled underwriter was the lead manager of more than half of the companies for which it served as a book underwriter. The finding of negative abnormal returns is robust to using only companies where the troubled underwriter was the lead and to 4 and 6 year sample selection windows.

The resulting sample of troubled underwriter clients includes 92 IPOs underwritten by Lehman, 23 Bear Stearns, 16 Wachovia and 97 Merrill Lynch. This totals only 213 companies, because 15 companies had multiple troubled underwriters. Of companies with multiple troubled underwriters, 8 were taken public by both Lehman and Merrill Lynch, and thus have the same event date. NASDAQ is the primary stock exchange for 44% of the companies, NYSE for 55% and 1% on the American Stock

Exchange. The remaining 370 newly public companies (Other IPOs) did not have the troubled underwriter as their book underwriter or co-manager.[8]

Data on prices, trading volume and shares outstanding are from the Center for Research in Security Prices (CRSP). Accounting variables are from the COMPUSTAT Industrial Annual or Quarterly data file.

Table 1 presents summary statistics for companies with troubled underwriters (TUW clients) and other newly public companies (Other IPOs). Company characteristics are presented with one observation per company and calculated as of the quarter ended prior to the date of the company's earliest underwriter failure. On average, more than 2.5 years have elapsed since TUW clients' last equity issuance, and the minimum time between IPO and event date was more than 122 days. Like other newly public companies, TUW clients are relatively small, with mean (median) sales of $925 ($310) million and assets of $1,579 ($590) million. Debt levels are low relative to the average publicly traded company, with median leverage of 33%, although higher than other newly public companies. The most represented industries were Business Services (SIC codes beginning with 73), followed by Transportation Equipment (SIC code 37) and Chemicals and Allied Products (SIC code 28). Characteristics that depend on the underwriter such as whether the bank was a lender to the company are presented with one observation per company-underwriter, and TUW clients with different event dates are included as Other IPOs on these dates.

[TABLE 1]

[8] 105 companies with that had troubled underwriters as co-managers but not book underwriters are excluded from the analysis, since the troubled underwriter may play an important role in those company's IPOs.

Jain and Kini (1999) find that clients of higher ranked underwriters have better post-IPO returns. The four banks studied were relatively highly ranked in equity underwriting, thus the sample may be expected to be of slightly higher quality than a random sample of IPOs.[9] If the TUW clients are of higher quality than other newly public companies that would bias against finding any negative abnormal returns if higher quality companies perform better on market crisis days. Regardless, the mean valuation (measured by the price to earnings ratio or book to market) of the TUW clients is not significantly different from other newly public companies, suggesting that these companies may not necessarily be of higher quality.

3.2. Event dates

The analysis is based on four events, collectively referred to as "failures." Of course, each event ultimately resulted in very different outcomes for the relevant investment banks and their employees. In each case the event date may be understood as a day in which there was substantial market uncertainty about the probability that the bank would be in business the next day. Event dates, $t = 0$, are as follows:

1) Bear Stearns, March 14th, 2008 – Bear Stearns announces $30 billion in funding provided by JP Morgan and the Federal Reserve. March 14th is the last trading day before the JP Morgan announcement on Sunday March 16th that it would acquire Bear Stearns for $2 a share, representing just over 1 percent of the firm's

[9] The Carter-Manaster rank in equity underwriting for 1992-2000 as calculated by Loughlin and Ritter (2004) was 8.1 for Bear Stearns and Lehman, 9.1 for Merrill Lynch and 7.1 for Wachovia.

value at its record high close 14 months earlier. (Bear Stearns' stock price closed at $30 on March 14th, 2008)

2) Lehman Brothers, September 15th, 2008 – Lehman Brothers files for bankruptcy after failing to find a merger partner. (Lehman Brothers' stock price closed at $0.21 on September 15th, 2008)
3) Merrill Lynch, September 15th, 2008 – As Lehman Brothers goes bankrupt, Merrill Lynch announces that it would be acquired by Bank of America for approximately $50 billion, approximately half of its all-time peak value of early 2007 (Merrill Lynch's stock price closed at $17.06 on September 15th, 2008)
4) Wachovia, September 29th, 2008 – Citigroup announces an agreement brokered by the FDIC to acquire most of Wachovia for approximately $1 a share. The FDIC describes the transaction as "Not a failure," although the price was less than 14% percent of the high of $51 earlier that year. The following month, Wachovia is acquired by Wells Fargo. (Wachovia's stock price closed at $1.84 on September 29th, 2008)

On March 14th there are 569 observations, one for each TUW client and one for each newly public company. On the remaining event dates there are 555 observations as some companies are no longer public or are missing estimation window returns, for a total of 1,679 observations.

4. Methodology

4.1. Abnormal Returns

Daily abnormal (excess) returns are estimated for each company using market model methodology. Abnormal returns are the difference between the actual return and conditional expected return obtained from a least squares regression estimated over a 40 day pre-event period t = -45 through -6, with time measured in trading days. Because the relevant events occurred suddenly, but around a period of dislocation in the capital markets, days -1 through -5 are not included in the estimation period. Abnormal returns are calculated only on the day of the underwriter failure (t = 0), although the analysis is robust to a longer event window. The analysis is also robust to longer estimation periods and to including days -1 through -5 in the estimation period, although the estimation period is necessarily limited by the fact that the companies of interest are newly public. The basic specification is:

$$AR_{i,t} = \alpha + \beta(FAIL_{i,t}) + \varepsilon_{i,t}$$

where $AR_{i,t}$ is the abnormal return of company i at the event date t and $FAIL_{i,t}$ is a dummy variable equal to one if company i's book underwriter failed at date t. α measures the extent of the underperformance of all newly public companies on the event dates, while β measures incremental underperformance of the clients of troubled underwriters.[10] $FAIL_t$ is subscripted with t because it is equal to one only for companies with an underwriter failure on that date. Thus companies underwritten by Lehman and Merrill

[10] I am grateful to an anonymous referee for the suggestion of this approach which allows for the separation of the estimation of the impact of the events on all newly public companies and the impact of the underwriter's failure.

are part of the control group March 14th ($FAIL_{3/14/08}$=0) but not on September 15th ($FAIL_{9/15/08}$=1). The eight companies underwritten by both Lehman and Merrill are included only once on September 15th. Companies underwritten by underwriters with different failure dates (i.e. Merrill and Bear) will have multiple observations where *FAIL* is equal to one.

Since performance tests are joint tests of the null hypotheses of no abnormal performance and the pricing model (Fama (1976)), conditional expected returns are estimated relative to several possible measures of market performance. The following conditional returns are estimated: i) market indexes (S&P500, NASDAQ, NYSE, CRSP and exchange matched (to the company's primary exchange) ii) Fama French's three factors (1992) (size, book-to-market and growth)[11] iii) the DGTW characteristics model (1997) (size, book-to-market and momentum)[12] and iv) comparable companies (SIC code matched). Because of the disproportionate impact of the events on banking stocks, banks are excluded from all of the comparison portfolios and removed from the NASDAQ value weighted composite index and NYSE/AMEX value weighted index by subtracting the daily return of the bank stocks in those indexes weighted by those stocks' contribution to the index both in the estimation period and in the calculation of abnormal return. Results are similar when banks are not excluded from the market measures.

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[11] Factors are created using the Fama-French methodology. The three factors are market return, SMB (small minus big) and HML (high minus low), with data from: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[12] Created by assigning each company to one of 125 portfolios, based on methodology described in Wermers (2004) and Daniel, Grinblatt, Titman, and Wermers (1997), but excluding banks. The 125 portfolios are based on quintiles of market capitalization, industry-adjusted book-to-market ratio and momentum (return over the last 12 months), determined as of June 30th of each year. The company is assigned to each portfolio using the breakpoints given by: http://www.rhsmith.umd.edu/faculty/rwermers/ftpsite/dgtw/coverpage.htm.

4.2.Difference-in-differences

After establishing that newly public companies underperform on the date of their underwriter's distress, the remaining analysis explores the relationship between characteristics of clients and the event day abnormal decline in their stock prices. The equation estimated becomes:

$$AR_{i,t} = \alpha + \beta(FAIL_{i,t}) + \delta(X_{i,t-1}) + \eta(FAIL_{i,t})(X_{i,t-1}) + \varepsilon_{i,t}$$

where $AR_{i,t}$ is the abnormal return of company i at the event date t and $FAIL_{i,t}$ is a dummy variable equal to one if company i's book underwriter failed at date t. α is the fixed effect of the failure on the newly public companies and $X_{i,t-1}$ is a proxy for the characteristic of interest from the accounting period immediately prior to the event date. δ measures how important that characteristic is for all newly public companies on the event date, and η measures whether that characteristic is differentially important for firms whose underwriter fails. The specification thus calculates the importance of newly public company characteristics on the event dates. Then, by looking at the interaction of these characteristics and underwriter failure, we can estimate whether these factors matter more to companies with failed underwriters.

The estimations in the remainder of the paper present abnormal returns calculated relative to the DGTW characteristics model and to the appropriate market index. The DGTW model is used because it captures important differences between the companies that might be important on these dates. Results are similar if other benchmarks such as the Fama-French three factor model or a simple market model are used.

5. Empirical Results

5.1. Event date returns

Prices of newly public companies fall on the day that it is revealed that their underwriter may cease operation. Table 2 summarizes the stock market return for companies whose underwriters failed leading up to the event date. Mean daily returns of troubled underwriters' clients were lower than those of almost every benchmark on the event date and the three preceding days.

[TABLE 2]

The negative event date returns are not driven by severe underperformance of a single underwriter's clients. Table 3 tabulates event date abnormal returns by underwriter. On average and at the median, the sample companies underperformed relative to the conditional expected return, except for those underwritten by Wachovia. Lehman-underwritten companies had the lowest abnormal returns, perhaps because Lehman's failure was unconditionally the worst.

[TABLE 3]

Table 4 shows abnormal returns of newly public companies with conditional expected returns based on the following reference portfolios: i) S&P 500 Index, ii) NASDAQ Composite, iii) NYSE, iv) matched exchange (NASDAQ or NYSE), v) CRSP, vi) Fama French three factor model, vii) DGTW characteristics model, and viii) SIC-code matched. In each case, clients of failed underwriters perform significantly worse than their peers. Estimated coefficients on *FAIL* are negative and statistically significant, ranging from -2.6% to -1.0%. Relative to the NASDAQ Composite index, this implies an

excess decline in market value relative to other newly public companies of $19 million for a troubled underwriter client of mean size – implying total value destruction of more than $4 billion in aggregate.

Results are robust to revising the definition of *FAIL* to add as clients 12 companies that used the troubled underwriter as a book underwriter for a secondary offering and to subtract as clients 24 companies that did not use the troubled firm as their book underwriter on one of their secondary offerings. Negative abnormal returns for the eight companies underwritten by both Lehman and Merrill were twice as large, but including a separate dummy to account for these companies does not significantly change the estimated coefficient on *FAIL*. Statistical significance is lower when the standard errors are clustered by date or by underwriter.

[TABLE 4]

5.2. Post-IPO Monitoring – Opacity and Other Monitors

Underwriter monitoring should be more important when the company's operations are more opaque and when there are fewer other monitors (Prediction 1). The following table describes proxies for the importance of underwriter monitoring and the expected relationship with abnormal returns. Summary statistics for the measures are presented in Table 1. In each case the proxies are calculated as of the fiscal quarter preceding the event date:

Importance of Monitoring	Expected Sign
Opacity of company operations:	
1. Log days since last issue (*LISSUETIME*)	+
Dispersion of IBES analyst estimates:	
2. Dummy if top quartile SD of FY+1 EPS Estimates (*SD_FY1*)	-
3. Dummy if top quartile SD of FY+2 EPS Estimates (*SD_FY2*)	-
Importance of underwriter to monitoring:	
4. Number of book underwriters (*BOOK_N*)	+
5. Log number of equity analysts (*LNUMANALYST*)	+
Institutional block holders:	
6. Percentage held by institutions (*PINSTITUTION*)	+
7. Maximum percentage held by blockholders (*PBLOCKS*)	+
8. Presence of other intermediaries (*VCFIRM*)	+

The first measure is the log of days since last equity issue *(LISSUETIME)*. The longer the time since stock issuance, the less relevant the underwriter is likely to be (predicts a positive sign on *LISSUETIME x FAIL)*. The next two variables are dummy variables indicating if the company is in the top quartile of standard deviation of I/B/E/S analysts' one and two year forward earnings estimates measured as of the quarter preceding the event date (*SD_FY1* and *SD_FY2*). D'Mello and Ferris (2000) propose that when analysts' estimates diverge, a likely reason is that earnings for that company are difficult to estimate. Higher standard deviations of earnings estimates should be associated with more opaque companies and thus there should be a negative association between abnormal returns and the standard deviation of earnings estimates for TUW clients. Because this may not be a linear relationship, this is estimated as a dummy variable equal to one for companies in the top quartile of standard deviation of analyst estimates.

The remaining variables measure the relative importance of underwriter monitoring. If there are other monitoring intermediaries, the underwriter should be relatively less important. The first measure is the log of the total number of book underwriters according to SDC (*BOOK_N*). On average, each company has slightly more than two book underwriters. Each equity underwriter represents an additional source of monitoring and external information production. Thus there should be a positive coefficient on *BOOK_N x FAIL*.

Unaffiliated research analysts may serve the same purpose as equity underwriters. On average, each company has approximately eight research analysts. Higher returns (a positive coefficient) should be associated with the log of the number of I/B/E/S analysts with estimates for the TUW client *(LNUMANALYST x FAIL)*.

Investment banks and research analysts are not the only monitors of public companies. Institutional stockholders should invest in information acquisition, since they tend to hold larger blocks of stock and thus can spread their costs over a larger investment. Market microstructure research suggests that institutional holders are indeed informed traders (Seppi (1992), Hessel and Norman (1992), Lang and McNichols (1997)). Second, if there are large blockholders or high percentages of management ownership, agency problems may be lower and the company may require less monitoring. Institutional ownership is the percentage of shares outstanding held by institutions (13F filers). Blockholder ownership is the maximum of the percentage of shares outstanding held by each blockholder (13D and 13F filers) (*PBLOCKS*). Both ownership measures should be positively associated with abnormal returns and are calculated from the CDA Spectrum Institutional Holdings data as of the quarter ended prior to the event date.

Brav and Gompers (1997) note that another important financial intermediary for newly public companies is venture capital investors. Venture capitalists may have reputation concerns that lead them to continue to monitor the company post-IPO, and may continue to serve on the board of directors. While Krishnan, Ivanov, Masulis, and Singh (2010) find evidence that more reputable venture capital firms remain active in post-IPO corporate governance and earn higher returns, Lee and Masulis (2008) find that VC investment does not prevent earnings management by IPO issuers. The presence of a venture capital investor is measured by a dummy variable equal to 1 when SDC's IPO database indicates that a company was venture-backed. The VC-backed dummy (*VCFIRM x FAIL*) should be positively associated with abnormal returns.

The top half of Table 5 shows the results of specifications testing the relationship between these proxies and event day abnormal returns. The greater the time since last issue, the less negative were abnormal returns. The scale of the estimated coefficient suggests that 5.7 years after a company's last equity issuance, failure of its underwriter no longer matters. It is interesting to note that the sign of the coefficient on the interaction of *LISSUETIME* and *FAIL* was different from the sign of the coefficient on *LISSUETIME*. While the underperformance of clients of troubled underwriters is mitigated by time since last issue, in general, companies that issued equity less recently actually underperformed on the event dates.

The analysis supports Prediction 1. Institutional ownership, blockholder ownership and time since last issue are each positively and statistically significantly related to abnormal returns. A one standard deviation increase in institutional ownership mitigates the expected abnormal stock price decline by 31 percent (0.6 percentage

points). Similarly, a one standard deviation increase in block size mitigates the abnormal decline by almost 24% (0.8 percentage points). The importance of institutional shareholders, blockholders, and time since last issue has several interpretations. First, institutional shareholders and blockholders may actively monitor the company and reduce agency conflicts. Second, institutional shareholders and blockholders may produce information that is directly dispersed to the market, reducing the relative importance of the underwriter as an information provider. Finally, institutional shareholders and blockholders may be more likely to be long term investors and thus be less likely to sell into a sudden overall market decline, even if they are ultimately planning to exit a stock due to the prospects for reduced underwriter monitoring.

In addition, event day abnormal returns are more negative when the company's operations are more opaque, for example when analysts' estimates for the company are more dispersed, although the results are not statistically significant. The sign of the coefficients was not as predicted for the number of other book underwriters although the estimates were not statistically significant. This may reflect the fact that companies for whom monitoring is more important may also have more underwriters.

[TABLE 5]

5.3. Post-IPO Monitoring – Analyst Coverage

A critical part of underwriting is the acquisition of analyst coverage by the newly public company. Ljungqvist, Marston and Wilhelm (2006) do not find evidence that analysts tailor their recommendations to attract mandates. Similarly Cowen, Groysberg and Healy (2006) find less optimistic forecasts at bulge bracket firms, particularly for

bulge underwriter firm analysts. Thus, it is possible that underwriter monitoring is merely equity analyst monitoring. Kelly and Ljungvist (2010) find abnormal returns between -45 and -112 basis points on the day of an exogenous coverage termination and Demiroglu and Ryngaert (2010) find positive abnormal returns of 486 basis points on the date of initiation of analyst coverage. Mola, Rau and Khorona (2010) also find a negative price impact of termination of analyst coverage, but conclude that this reflects analysts' role in maintaining investor recognition, rather than analysts' role as information providers. If the only important event affecting TUW clients is the prospective loss of analyst coverage, all companies covered by troubled investment banks' research analysts should have negative event day returns. Underwriting clients should not have lower returns than any other covered company.

I estimate abnormal returns for 1,393 companies with recent analyst research coverage from the four troubled underwriters (2,044 observations). I add a control for whether the analyst is top-ranked by *Institutional Investor* magazine (All-star analysts). These top ranked analysts are more likely to get positions at other banks even if their own institution fails, and thus any information should not be lost even if the underwriter failed.[13]

Abnormal event day returns for companies covered by troubled underwriters' analysts ranged from -1.2% to +0.26% and varied in statistical significance depending on the market benchmark against which the conditional return was estimated. For each market benchmark, the estimated abnormal return for companies underwritten by

[13] I am grateful to Alexander Ljungqvist and Felicia Marston for their help in compiling the *Institutional Investor* data.

troubled investment banks was significantly lower than that of companies that had only analyst coverage from troubled investment banks. This result suggests either that the research analyst does differentially more monitoring of newly public companies that were underwritten by an affiliated investment bank or that the research analyst is not the sole monitoring agent. It is also consistent with Banerjee, Hansen and Hrnjic (2010) who position analyst monitoring as an enhancement of institutional investor monitoring. As expected, in most specifications, the negative effect of failure is mitigated if the analyst is top-ranked by *Institutional Investor* magazine.

[TABLE 6]

5.4. Relationship Underwriting

Companies that are equity dependent should also be affected by the loss of their underwriter if the underwriter possesses non-transferable information. The proxy used for equity dependence is based on Kaplan and Zingales (1997) as calculated by Lamont, Polk and Saa-Requejo (2001).[14] Baker, Wurgler and Stein (2008) find that firms that rank higher in this index have investment that is more sensitive to stock prices (although they exclude Q from the index given the nature of their tests).

Results on equity dependence are mixed. Specifications (9), (13) and (14) of Table 5 do not support Prediction 2. There is no consistent statistically significant

[14] The equity dependence measure is: $KZ_{it} = 1.002(CFit/Ait\text{-}1) - 39.367(DIVit/Ait\text{-}1) - 1.315(Cit/Ait\text{-}1) + 3.319(LEVit) + 0.283(Qit)$ where *CFit/Ait*-1 is cash flow (the sum of OIBDPQ for the 12 months trailing the event date) over lagged assets (ATQ); *DIVit/Ait*-1 is cash dividends (DV) over assets; *Cit/Ait*-1 is cash balances (CHEQ) over assets; *LEVit* is leverage ((DLCQ+DLTTQ)/assets); and *Qit* is the market value of equity (price (PRCCQ) times shares outstanding (CSHOQ)) plus assets minus the book value of equity (SEQQ +TXDITCQ-PSTKQ) all over assets. All items are calculated as of the last fiscal quarter end prior to the event date.

relationship between equity dependence and TUW clients' abnormal returns. This may either reflect noise in the measure of equity dependence or that underwriters do not possess valuable non-transferrable information. Only cash-to-capital is statistically significant, suggesting that underwriters may not be as important for companies with higher cash reserves. In theory, both cash-to-capital and dividends-to-capital should have the same sign, since both would indicate that the company should not need to access equity capital markets in the near future. To the extent that both measure equity dependence, dividends seem more likely to be associated with a lack of equity dependence, since paying cash dividends suggests that a company is not conserving cash, while companies with a lot of cash may have high investment needs.

5.5. Alternative Bank Functions

If the underwriter provides other services to its clients such as lending, market making and investing, the negative event day abnormal returns may arise from the loss of those services. Table 7 gathers the results of specifications which include controls for the underwriters' other roles. The continued statistical significance of the failed underwriter dummy variable despite the inclusion of these controls suggests that none of the alternative roles of the investment bank is responsible for the observed abnormal returns.

The first alternative tested is lending, measured with a dummy variable, *Troubled Bank was Lender*$_t$, equal to 1 if the troubled bank is a lender and failed on that date. Lenders are identified through Capital IQ's database of suppliers to public companies,

based on the company's most recent 10-K filing.[15] Of 201 clients of troubled underwriters matched to Capital IQ, only 31 companies (15%) listed the underwriter as a lender. An additional 18 TUW clients were lending clients of other troubled underwriters. Finally, of 363 other newly public companies matched to Capital IQ, 17 listed a failed bank as a lender. Consistent with the empirical literature on relationship lending, the coefficient on *Troubled Bank was Lender* is negative and statistically significant (Specification (1)).[16] The coefficient on *FAIL* remains negative and statistically significant. It is unlikely that Alternative 2, companies whose underwriters were their lenders underperform, explains the observed negative returns. Looking at a broader sample of all recent syndicated lending clients of these underwriters, it is the IPO underwriting clients that have the most negative abnormal returns.[17] Thus, while there is support for the lender channel, the observed negative abnormal returns do not arise solely arising from the lender channel. This finding is consistent with the relatively low debt levels of the sample and the fact that these underwriters were not large lenders.

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[15] Capital IQ maintains a list of current suppliers, but does not keep this information historically. The database was originally accessed on May 21, 2009 and identifies lenders to clients of troubled underwriters based on companies' most recent 10-K filings as of that date. If a company renegotiated its bank loan between the event date and May 21, 2009 and prior to filing its 10-K the lender may be incorrectly identified. The database was accessed on October 7, 2010 for other newly public companies, and thus may be less likely to accurately attribute lending relationships for those companies. The results are robust to expanding the definition of lender to include the ultimate acquirer of the underwriter (i.e. companies underwritten by Bear Stearns where JP Morgan is a lender). In this definition, 19.4% of the clients of troubled underwriters have the underwriter as lender and 17.6% of newly public companies have the ultimate acquirer as a lender.

[16] Alternative measures of lending importance such as a dummy variable for companies which had no debt produced similar results.

[17] I estimated abnormal returns for 1,061 companies with syndicated loans arranged in the 5 years prior to the event date and for which the troubled underwriters served in the loan underwriting syndicate. Within this group, the 12 companies with failed IPO underwriters had 2% lower abnormal returns, a difference significant at the 5% level (using the DGTW model).

Underwriters may also make markets in their clients' stocks post-IPO. Ellis, Michaely and O'Hara (2000) document underwriter price support for 20 days post-IPO, although the time elapsed between IPO and event date for this sample is much longer (minimum of 122 days). Unfortunately, the detailed trading information used in Ellis, Michaely and O'Hara (2000) is not widely available. Separate measures from the Nasdaq and NYSE/AMEX markets are combined to construct *Troubled Bank was Market Maker,* a proxy for the underwriter's importance as a market maker. For stocks traded on the Nasdaq market, *Troubled Bank was Market Maker*, is a dummy variable equal to 1 if the underwriter had an inside quote (the highest bid or the lowest ask at any one hour interval in the day).[18] For companies traded on the NYSE and AMEX, *Troubled Bank was Market Maker*, is equal to 1 if the underwriter was a specialist in the company's stock.[19] In summary, *Troubled Bank was Market Maker* is equal to 1 for Nasdaq companies when the underwriter had an inside quote and for NYSE/AMEX companies when the

[18] The quote data is from a random sample of one day of NASTRAQ quote data from December 31, 2007. The results are robust to selecting a different day to estimate these measures. I follow Huang (2002) in eliminating quotes with an ask price or bid price less than or equal to zero; quotes with an ask size or bid size less than or equal to zero; quotes with bid-ask spreads greater than $5 or less than zero; quotes associated with trading halts or designated order imbalances; before-the-open and after the-close trades and quotes; trades and quotes involving errors or corrections; trades with price or volume less than or equal to zero; ask quote, at, if $|(a_t - a_{t-1}) / a_{t-1}| > 0.50$; and bid quote, b_t, if $|(b_t - b_{t-1})/b_{t-1}| > 0.50$. When there are multiple quotes at the same second according to the time stamp the prevailing quote for each dealer is formed by taking the highest bid and the lowest offer.

[19] Of the four underwriters in the sample, only Bear Stearns and Lehman Brothers were NYSE specialists. I use the Internet Archive to access the client list of Bear Wagner (Bear Stearns' NYSE specialist subsidiary) as of June 2007. Bear Wagner information accessed at:
http://web.archive.org/web/20070608213639/www.bearwagner.com/companies.html
Lehman Brothers has blocked access to its historical website, so a similar historical list of its specialist clients is not available. In addition to operating Lehman's specialist subsidiary after 2009, Barclay's purchased Bear Wagner in March 2009 from JP Morgan. I accessed Barclay's website as of June 2009 to find its client list. If Barclay's is a specialist for a company as of June 2009, and Bear Wagner was not a specialist for the company, the dummy variable will be equal to 1 for Lehman's underwriting clients. This effectively assumes that no companies had both Lehman and Bear Wagner as specialists. The analysis is robust to relaxing this assumption.

underwriter was a specialist. By this definition, the troubled underwriter was a market maker for 24% of their clients and 12% of other newly public companies.

The relationship between underwriter distress and negative returns is robust to controlling for the underwriter's role as a market maker (specification (2)). Other measures of the underwriter's importance as a market maker such as the aggregate dollar volume of the underwriter's quotes in a day (the sum of the ask quotes plus the sum of the bid quotes) did not affect the negative statistically significant coefficient on FAIL. Looking at a broader sample of companies for which the underwriters are market makers, it is the IPO underwriting clients that have the most negative abnormal returns.[20]

Another way in which an underwriter's failure may impact its clients' prices is through investors. Investors may be the underwriter's direct affiliates or funds that that have relationships with the troubled banks, such as hedge funds who are prime brokerage clients of the troubled underwriters. The measure of importance as an investor is *PER,* the percentage of shares held by the troubled bank. This data is collected from CDA Spectrum data from the quarter preceding the event dates.[21] In 95% of the troubled underwriter sample, underwriters held less than 3% of the companies' stock. The percentage of client stock held by the underwriter is negatively associated with abnormal

[20] I estimated abnormal returns for 995companies for which the troubled underwriters served as a market maker (either as a NYSE specialist or with an inside quote on Nasdaq). Relative to this group, companies with failed underwriters had 1% lower abnormal returns (statistically significant at the 10% level using the DGTW model). This may be either because specialists are not important or because market participants assumed that the underwriters' specialist functions would continue regardless of the outcome for the investment bank.

[21] If a company is not in the Spectrum database, the underwriter holding is assumed to be 0.

returns, but not significantly. Including this as a control does not alter the negative statistically significant coefficient on *FAIL*.[22]

Finally, Aragon and Strahan (2010) find that stocks owned by hedge funds that used Lehman Brothers as a prime broker experience greater declines in market liquidity after Lehman's bankruptcy. Following Aragon and Strahan (2010), I create *% Shares Held by Failing Bank's HF,* the percentage of shares outstanding held by hedge funds affiliated with Bear Stearns and Lehman Brothers. Because I only have information on Bear Stearns and Lehman Brothers, the Wachovia and Merrill Lynch underwritten companies are dropped from this analysis and subsequent specifications do not include this control which limits the number of observations.[23] Similar to Aragon and Strahan's results on price impact, there is no statistically significant relationship between shares held by hedge funds with troubled prime brokers and abnormal returns (specification (4)). The observed TUW client underperformance is not driven by stocks held by hedge fund clients of the troubled banks.

[TABLE 7]

5.6. Combined analysis

The relationship between underwriter monitoring and negative event returns is revisited to combine controls for other investment bank functions with the monitoring proxies that were statistically significant in the previous analysis. Specifications (5) through (8) of Table 7 include the log of days since last issue, institutional ownership,

[22] This result is robust to alternative specifications such as using only a dummy indicating if the underwriter holds any shares (*UDUMMY*).
[23] I am grateful to George Aragon and Philip Strahan for sharing their hand collected dataset with me.

blocksize and cash to capital, and the interactions of these variables with *FAIL*. Estimated relationships are consistent with previous results – other monitors continue to mitigate the negative abnormal return for clients of failed underwriters. The estimated coefficients remain statistically significant only for institutional investor ownership and days since last equity issue. Cash to capital also remains an important mitigating factor.

5.9. Ex Post Updating

The preceding cross-sectional analysis assumes a post-IPO role for the underwriter, be it information-based or not. Another alternative (Alternative 5) is that underwriters' distress caused investors to update their beliefs negatively about the quality of the underwriters' clients. If this is the cause of the negative event date returns, there should be no price impact when it is revealed that the underwriters will continue. This proposition can be tested by examining the post-event cumulative abnormal returns (*POSTCAR)* for 3 days following the event, t = +3 through +5.

The test of the proposition that post-event cumulative abnormal returns are equal to zero is estimated as:

$$POSTCAR_{i,t+3,t+5} = \alpha + \beta(FAIL_{i,t}) + \varepsilon_{i,t}$$

where $POSTCAR_{i,t+3\ to\ t+5}$ is the sum of daily abnormal returns of company i from $t+3$ through t+5 and $FAIL_{i,t}$ is a dummy variable equal to one if company i's book underwriter failed at date t. α measures the post event performance of all newly public companies on the event dates, while β measures performance of the clients of troubled underwriters.

As shown in Table 8, regardless of the benchmark, once it is revealed that the investment banks will continue operations in some format, companies have positive

abnormal returns and appear to earn back the negative event day returns. Post event abnormal returns of TUW clients are significantly negatively correlated with event day abnormal returns (i.e. clients with high negative event date abnormal returns experience high positive post-event returns), suggesting that the reversal is driven by the resolution of the underwriter's distress.

[TABLE 8]

6. Conclusion

For at least one day in 2008, the market believed that Bear Stearns, Lehman Brothers, Merrill Lynch and Wachovia might no longer be in business the following day. These "failures" were exogenous to the banks' equity underwriting operations, and thus offer a natural experiment to estimate the impact of the loss of an equity underwriter. On average, companies recently taken public by these banks suffered an abnormal decline in equity value more than 1% lower than that of other newly public companies, a total loss of almost $3 billion and more than the gross underwriting spread earned on the initial public offerings. This negative abnormal return implies that investment banks are important to their clients even after the IPO, and provides empirical support for theoretical models that predict monitoring based on the importance of investment bank reputation (including Hansen and Torregrosa (1992)).

This paper presents evidence that investment banks are important because they monitor their post-IPO clients. Low abnormal returns for clients of troubled underwriters were mitigated when companies had more alternative monitors. These negative abnormal returns were not driven by the underwriters' function as a lender, market maker, investor or counterparty to investors. Despite initial uncertainty, the operations of

all four underwriters were acquired by other banks and their underwriting function continued. Once it was known that banks' monitoring and information production function would be continued, their clients' abnormal price decline was reversed.

While none of these investment banks have ceased underwriting, these findings have important implications for future investment banking clients and investors in initial public offerings. These stakeholders should carefully evaluate the financial health of the underwriter's entire business, not just its underwriting skills. Uncertainty about the overall health of underwriters may reduce access to equity capital markets if underwriters can no longer credibly execute their certification and monitoring role because investors fear that the underwriter may not be around to monitor the newly public company.

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TABLE 1: SUMMARY STATISTICS FOR SAMPLE AND IPO INDEX, BY EVENT DATE

The sample consists of 213 newly public companies with an IPO from 2004 to 2007 for which the failed underwriter was a book underwriter (TUW Clients) and 370 newly public companies that did not have a failed underwriter as their book underwriter or co-manager (Other IPOs) at each of the three fail dates for a total of 1,679 company-event day observations. Accounting and ownership variables are measured as of the fiscal quarter preceding the event date, price variables are measured as of 5 days prior to the event date, and market making variables are measured as of December 31, 2007. The earliest event date is used in cases of the same company underwritten by multiple failed underwriters. The statistics for Company Descriptors, Monitoring, and Equity Dependence are estimated using a sample of one observation per company. The statistics for Other Underwriter Functions are estimated using one observation per company-event date.

	TUW Clients				Other IPOs			
	N	Mean	SD	Median	N	Mean	SD	Median
Company Descriptors								
Sales LTM - $M	203	925.2	2327.1	309.7	352	317.3	643.8	108.5
Total Assets - $M	210	1578.8	2990.1	590.2	359	470.4	935.9	186.4
Equity Market Value - $M	213	863.9	1109.2	487.6	370	493.9	1125.1	224.3
Total Debt - $M	212	624.8	1387.3	183.4	367	118.0	299.4	5.0170
Monitoring								
Days Since Last Equity Issue	213	587.8	376.0	487	370	735.1	436.9	653
Number of Equity Analysts	213	4.0	3.4	3	370	3.2	3.1	3
SD IBES EPS Estimates (1 yr) Top Quartile Dummy	191	0.1571	0.3648	0	331	0.2447	0.4306	0
SD IBES EPS Estimates (2 yr) Top Quartile Dummy	190	0.1474	0.3554	0	326	0.2546	0.4363	0
% of shares held by institutions	213	0.5113	0.3373	0.4701	370	0.4307	0.3204	0.3841
Max Blocksize Percentage	213	0.0078	0.0060	0.0070	370	0.0112	0.0154	0.0084
Venture Backed Dummy	213	0.3380	0.4742	0	370	0.4919	0.5006	0
Number of Book Underwriters	213	2.0141	0.8494	2	370	1.3595	0.5539	1
Equity Dependence								
KZ Index	192	0.5971	3.1065	0.6408	335	0.8246	3.3883	0.4402
Debt to Capital	190	0.4204	0.5366	0.3279	332	0.2815	0.6119	0.0601
Cashflow to Capital	192	0.0789	0.3124	0.1295	335	-0.0805	0.5737	0.0714
Cash to Capital	191	0.5820	0.9885	0.1132	335	0.7896	0.9817	0.4753
Tobin's Q	190	4.9390	8.8357	1.9575	331	5.3342	9.5158	2.4221
Dividends to Capital	192	0.0318	0.0715	0	335	0.0149	0.0546	0
Other Underwriter Functions								
Troubled Bank was Lender (Assume Not Lender for Other IPOs)	201	0.1542	0.3621	0	1422	0.0127	0.1118	0
Troubled Bank was Lender (Assume Current Lender for Other IPOs)	201	0.1542	0.3621	0	1422	0.0246	0.1550	0
Troubled Bank was Market Maker	220	0.2455	0.4313	0	1459	0.1199	0.3250	0
Dummy if Underwriter Holds Shares	220	0.5182	0.5008	1	1459	0.2440	0.4296	0
% Shares Held by Troubled Bank	220	0.0101	0.0405	0	1459	0.0014	0.0070	0
% Shares Held by Troubled Bank's HF	115	0.0177	0.0318	0.0035	915	0.0144	0.0310	0.0012

TABLE 2: MEAN EVENT DAY RETURN

The troubled underwriter client return is the mean of event date returns for 213 newly public companies with an IPO from 2004 to 2007 for which a failed underwriter was a book underwriter, a total of 220 event date returns. *Difference from Benchmark* is the difference between the sample return on the event date and the return of the listed benchmark. Listed benchmarks are: The S&P 500, NASDAQ Composite and NYSE indexes. The Matched Exchange benchmark compares each company's return to the return of the index where it is listed (either NASDAQ or NYSE). The DGTW benchmark is created using the DGTW (1993) methodology. The SIC benchmark portfolio return is generated by value weighting all public companies in the same two-digit SIC code as each sample company. Other IPOs is a portfolio of 370 companies with an IPO from 2004 to 2007 for which none of the failed underwriters were a book underwriter or co-manager.

	t	t-1	t-2	t-3
Troubled Underwriter Client Return	-0.0492	0.0012	-0.0067	0.0047
Standard Deviation	*0.0462*	*0.0462*	*0.0468*	*0.0413*
Difference from Benchmark				
S&P 500	-0.0019	-0.0013	-0.0186	-0.0040
NASDAQ Composite	-0.0113	0.0000	-0.0181	-0.0064
NYSE	-0.0037	-0.0077	-0.0131	-0.0084
Matched Exchange	-0.0073	-0.0040	-0.0155	-0.0076
CRSP	-0.0094	-0.0055	-0.0161	-0.0073
DGTW	-0.0077	-0.0031	-0.0111	-0.0057
SIC matched	-0.0096	-0.0034	-0.0146	-0.0055
Other IPOs	-0.0014	-0.0088	-0.0126	-0.0161

TABLE 3: ABNORMAL RETURN BY UNDERWRITER

Abnormal returns are the difference between the actual event day return and the conditional expected return calculated based on the listed benchmarks. The Matched Exchange model calculates the conditional expected return using the return of the index where the company is listed (either NASDAQ or NYSE) as the market measure. The three factor model is the Fama-French three factor model, with the return of the index where the company is listed (either NASDAQ or NYSE) as the market measure. DGTW is the conditional return estimated using the DGTW characteristics model (1993). ***, ** and * indicate that t-statistic is significant at the 1%, 5%, and 10% levels, respectively.

		Matched Exchange Adjusted		Three Factor Model (Adjusted by Exchange)		DGTW	
	Mean	-0.0213	***	-0.0407	***	-0.0248	***
Lehman	Median	-0.0133		-0.0229		-0.0173	
	N	92		92		92	
	SD	0.0510		0.0894		0.0387	
	Mean	-0.0152		-0.0114		-0.0193	
Bear	Median	-0.0039		-0.0044		-0.0060	
	N	23		23		23	
	SD	0.0663		0.0634		0.0633	
	Mean	0.0381	*	0.0286		-0.0065	
Wachovia	Median	0.0284		0.0199		-0.0031	
	N	16		16		16	
	SD	0.0771		0.0667		0.0733	
	Mean	-0.0126	***	-0.0260	***	-0.0176	***
Merrill	Median	-0.0082		-0.0233		-0.0148	
	N	97		97		97	
	SD	0.0378		0.0861		0.0384	
	Mean	-0.0123	***	-0.0254	***	-0.0192	***
Total	Median	-0.0079		-0.0158		-0.0132	
	N	220		220		220	
	SD	0.0521		0.0861		0.0447	

TABLE 4: EVENT DATE ABNORMAL RETURNS

The sample consists of 213 newly public companies with an IPO from 2004 to 2007 for which the failed underwriter was a book underwriter and 370 newly public companies that did not have a failed underwriter as their book underwriter or co-manager at each of the three fail dates for a total of 1,679 company-event day observations. The dependent variable is *Abnormal return*, the difference on the event day ($t = 0$) between the actual event day return and the conditional expected return calculated based on the listed benchmarks. *Fail* is a dummy variable equal to one if the company's book underwriter failed at date *t*. Abnormal returns are calculated relative to the following benchmarks: The S&P 500, NASDAQ Composite and NYSE indexes. The Matched Exchange benchmark compares each company's return to the return of the index where it is listed (either NASDAQ or NYSE). The three factor model is the Fama-French three factor model, with the return of the index where the company is listed (either NASDAQ or NYSE) as the market measure. The DGTW benchmark is created using the DGTW (1993) methodology. The SIC matched portfolio return is generated by value weighting all public companies in the same two-digit SIC code as each sample company. Statistics calculated with standard errors robust to heteroskedasticity. ***, ** and * indicate t-statistic is significant at the 1%, 5%, and 10% levels, respectively.

	Fail	*[t-stat]*		Constant	*[t-stat]*		R-Squared	N
S&P 500	-0.0148	*[3.57]*	***	0.0021	*[1.08]*		0.0049	1679
NASDAQ Composite	-0.0219	*[5.45]*	***	0.0039	*[1.95]*	*	0.0103	1679
NYSE	-0.0126	*[3.16]*	***	0.0039	*[2.06]*	**	0.0036	1679
Matched Exchange	-0.0166	*[4.14]*	***	0.0043	*[2.24]*	**	0.0061	1679
CRSP	-0.0133	*[3.37]*	***	0.0023	*[1.20]*		0.0041	1679
Three Factor Model	-0.0260	*[4.15]*	***	0.0006	*[0.25]*		0.0095	1679
DGTW	-0.0101	*[2.90]*	***	-0.0091	*[5.16]*	***	0.0028	1679
SIC matched	-0.0148	*[4.17]*	***	-0.0029	*[1.53]*		0.0052	1679

TABLE 5: MONITORING

The sample consists of 213 newly public companies with an IPO from 2004 to 2007 for which the failed underwriter was a book underwriter and 370 newly public companies that did not have a failed underwriter as their book underwriter or co-manager at each of the three fail dates for a total of 1679 company-event day observations. The dependent variable is *Abnormal return*, the difference on the event day ($t = 0$) between the actual event day return and the conditional expected return calculated based on the DGTW characteristics model. Expected sign indicates the expected relationship between the monitoring proxy and *Abnormal returns*. *Fail* is a dummy variable equal to one if the company's book underwriter failed at date *t*. The monitoring proxies are: *Log Days Since Last Equity Issue* is the logarithm of the number of days between the file date of the last equity issue and the event date. *Log Number of Equity Analysts* is the logarithm of the number of equity analysts for the company. *SD IBES EPS Estimates (1 yr)* is the standard deviation of the one year forward earnings per share estimates in IBES as of the event date. *SD IBES EPS Estimates (2 yr)* is the standard deviation of the two year forward earnings per share estimates in IBES as of the event date. *% of Shares Held by Institutions* is the percentage of total shares outstanding held by institutions as of the quarter preceding the event date. *Log Number of Book Underwriters* is the logarithm of the number of book underwriters for the company at its IPO filing. Log Number of Equity Analysts is the logarithm of the number of equity analysts. *Max Blocksize Percentage* is the maximum block size divided by shares outstanding as of the quarter preceding the event date. *Venture Backed Dummy* is a dummy variable equal to one if the company was venture backed at its IPO filing. The equity dependence proxies are: *KZ Index* is an index of equity dependence based on Kaplan and Zingales (1997) as calculated by Lamont, Polk, and Saa-Requejo (2001). *Debt to Capital* is total debt divided by total assets. *Cashflow to Capital* is operating income before depreciation divided by total assets. *Cash to Capital* is cash and equivalents divided by total assets. *Tobin's Q* is the ratio of total equity market value plus total assets minus book value all over total assets. *Dividends to Capital* is yearly cash dividends divided by total assets. Statistics calculated with standard errors robust to heteroskedasticity. Absolute value of t-statistics is in brackets. ***, ** and * indicate *p*-values of 1%, 5%, and 10%, respectively.

	Reference Portfolio		DGTW											
	Monitoring Proxy	Expected Sign	Fail x Proxy		Fail		Proxy		Constant		R-Squared	N
1)	Log of Days Since Last Equity Issue	+	0.0087	*	-0.0665	**	-0.0038	*	0.0158		0.0047	1679
			[1.77]		*[2.05]*		*[1.95]*		*[1.27]*			
2)	SD IBES EPS Estimates (1yr)	-	-0.0049		-0.0087	**	0.0000		-0.0096	***	0.0029	1573
	is in Top Quartile		*[0.49]*		*[2.42]*		*[0.00]*		*[6.40]*			
3)	SD IBES EPS Estimates (2yr)	-	-0.0035		-0.0087	**	-0.0015		-0.0097	***	0.0028	1565
	is in Top Quartile		*[0.34]*		*[2.45]*		*[0.27]*		*[6.56]*			
4)	Log Number of Book Underwriters	+	-0.0109		-0.0051		0.0065		-0.0113	***	0.0044	1679
			[1.51]		*[0.97]*		*[1.59]*		*[5.03]*			
5)	Log Number of Equity Analysts	+	0.0032		-0.0158		-0.0023		-0.0052		0.0035	1679
			[0.59]		*[1.32]*		*[0.89]*		*[1.16]*			
6)	% of Shares Held by Institutions	+	0.0190	**	-0.0207	***	0.0078	*	-0.0127	***	0.0068	1679
			[2.02]		*[3.47]*		*[1.66]*		*[3.92]*			
7)	Max Blocksize Percentage	+	1.4432	**	-0.0218	***	-0.3277	*	-0.0059	**	0.0067	1679
			[2.57]		*[4.04]*		*[1.96]*		*[2.50]*			
8)	VC Firm	+	0.0030		-0.0103	**	0.0075	**	-0.0124	***	0.0065	1679
			[0.44]		*[2.22]*		*[2.13]*		*[5.28]*			
	Equity Dependence Proxy											
9)	KZ Index	-	0.0003		-0.0099	***	0.0004		-0.0109	***	0.0035	1522
			[0.27]		*[2.93]*		*[0.93]*		*[6.57]*			
10)	Debt to Capital	-	-0.0114		-0.0051		-0.0054	*	-0.0086	***	0.0068	1468
			[1.32]		*[1.11]*		*[1.76]*		*[4.32]*			
11)	Cashflow to Capital	+	0.0075		-0.0097	***	-0.0074	*	-0.0108	***	0.0057	1522
			[0.65]		*[2.79]*		*[1.82]*		*[6.54]*			
12)	Cash to Capital	+	0.0061	*	-0.0115	***	0.0057	***	-0.0140	***	0.0114	1520
			[1.88]		*[2.92]*		*[3.71]*		*[7.06]*			
13)	Tobin's Q	-	0.0010	*	-0.0123	***	0.0007	***	-0.0134	***	0.0111	1494
			[1.79]		*[3.01]*		*[3.85]*		*[6.74]*			
14)	Dividends to Capital	+	-0.0634		-0.0082	**	-0.0064		-0.0106	***	0.0038	1522
			[1.38]		*[2.18]*		*[0.34]*		*[5.93]*			

TABLE 6: EQUITY ANALYSTS

The sample consists of 141 companies (149 observations) that were covered by the failed underwriter that underwrote them and 1252 companies (1895 observations) that were covered by the analysts of the failed underwriter, but were not underwritten by the failed underwriter in their last equity issue. *Fail* is a dummy variable equal to one if the company's book underwriter failed at date *t*. *Ranked* is a dummy variable equal to one if the analyst covering the company was ranked by *Institutional Investor Magazine.* The dependent variable is *Abnormal return*, the difference on the event day ($t = 0$) between the actual event day return and the conditional expected return calculated based on the listed benchmarks. Abnormal returns are calculated relative to the following benchmarks: The S&P 500, NASDAQ Composite and NYSE indexes. The Matched Exchange Adjusted benchmark compares each company's return to the return of the index where it is listed (either NASDAQ or NYSE). The three factor model is the Fama-French three factor model, with the return of the index where the company is listed (either NASDAQ or NYSE) as the market measure. The DGTW benchmark is created using the DGTW (1993) methodology. The SIC matched portfolio return is generated by value weighting all public companies in the same two-digit SIC code as each sample company. Statistics calculated with standard errors robust to heteroskedasticity. ***, ** and * indicate t-statistic is significant at the 1%, 5%, and 10% levels, respectively.

	Fail	*[t-stat]*		Ranked	*[t-stat]*		Fail x Ranked	*[t-stat]*	Constant	*[t-stat]*		R-Squared	N
S&P 500	-0.0154	*[2.56]*	**	0.0071	*[3.09]*	***	0.0088	*[0.88]*	-0.0004	*[0.28]*		0.0096	2044
NASDAQ Composite	-0.0181	*[3.05]*	***	0.0011	*[0.48]*		0.0147	*[1.57]*	-0.0032	*[2.08]*	**	0.0056	2044
NYSE	-0.0138	*[2.50]*	**	0.0019	*[0.92]*		0.0107	*[1.10]*	0.0026	*[1.88]*	*	0.0045	2044
Matched Exchange Adjusted	-0.0165	*[2.98]*	***	0.0017	*[0.82]*		0.0112	*[1.16]*	0.0020	*[1.38]*		0.0059	2044
CRSP	-0.0135	*[2.44]*	**	0.0042	*[2.00]*	**	0.0106	*[1.12]*	-0.0006	*[0.45]*		0.0061	2044
Three Factor Model	-0.0214	*[2.16]*	**	-0.0124	*[3.42]*	***	0.0176	*[1.16]*	-0.0044	*[2.27]*	**	0.0088	2044
DGTW	-0.0083	*[1.65]*	*	0.0062	*[2.94]*	***	0.0083	*[1.04]*	-0.0139	*[10.80]*	***	0.0068	2044
SIC matched	-0.0139	*[2.88]*	***	0.0021	*[1.10]*		0.0041	*[0.51]*	-0.0019	*[1.49]*		0.0064	2044

TABLE 7: COMBINED ANALYSIS

The sample consists of 213 newly public companies with an IPO from 2004 to 2007 for which the failed underwriter was a book underwriter and 370 newly public companies that did not have a failed underwriter as their book underwriter or co-manager at each of the three fail dates for a total of 1679 possible company-event day observations. The dependent variable is *Abnormal return*, the difference on the event day ($t = 0$) between the actual event day return and the conditional expected return calculated based on the DGTW characteristics model. *Troubled Bank was Lender* is a dummy variable that is equal to one if the underwriter is identified as a lender to the company as of the most recent 10-K filing. *Troubled Bank was Market Maker* is a dummy variable that is equal to one if the underwriter had an inside quote on NASTRAQ or was the NYSE or AMEX specialist for the company. *% Shares Held by Troubled Bank* is the number of shares held by the underwriter divided by total shares outstanding for the company as of the quarter preceding the event date. *% Shares Held by Troubled Bank's HF* is the percent of the shares held by the troubled bank's hedge funds as of the end of the quarter before failure, and only for the Bear Stearns and Lehman Brothers fail dates (Merrill Lynch-underwritten companies and all of the observations on Wachovia's fail date are excluded). *Log Days Since Last Equity Issue* is the logarithm of the number of days between the file date of the last equity issue and the event date. *% of Shares Held by Institutions* is the percentage of total shares outstanding held by institutions as of the quarter preceding the event date. *Max Blocksize Percentage* is the maximum block size divided by shares outstanding as of the quarter preceding the event date. *Cash to Capital* is cash and equivalents divided by total assets. Statistics calculated with standard errors robust to heteroskedasticity. Absolute value of t-statistics is in brackets. ***, ** and * indicate *p*-values of 1%, 5%, and 10%, respectively.

	DGTW							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-0.0099 ***	-0.0104 ***	-0.0103 ***	-0.0067 ***	0.0137	0.0112	0.0105	-0.0107
	[6.01]	*[5.83]*	*[5.76]*	*[3.33]*	*[1.13]*	*[0.92]*	*[0.88]*	*[0.78]*
Fail	-0.0081 **	-0.0086 **	-0.0079 **	-0.0146 ***	-0.0857 ***	-0.0847 **	-0.0844 **	-0.1190 ***
	[2.22]	*[2.37]*	*[2.15]*	*[2.96]*	*[2.62]*	*[2.53]*	*[2.49]*	*[3.13]*
Troubled Bank was Lender	-0.0119 *	-0.0123 *	-0.0123 *	-0.0161 **	-0.0127 **	-0.0148 **	-0.0151 **	-0.0118 *
(Assume Not Lender for Other IPOs)	*[1.89]*	*[1.94]*	*[1.96]*	*[2.25]*	*[2.05]*	*[2.46]*	*[2.50]*	*[1.88]*
Troubled Bank was Market Maker		0.0042	0.0042	0.0029	0.0040	0.0040	0.0030	0.0059 *
		[1.31]	*[1.32]*	*[0.87]*	*[1.25]*	*[1.26]*	*[0.95]*	*[1.77]*
% Shares Held by Troubled Bank			-0.0681	-0.1100	-0.0669	-0.0917	-0.1010	-0.1088
			[0.98]	*[1.37]*	*[0.95]*	*[1.24]*	*[1.31]*	*[1.64]*
% Shares Held by Troubled Bank's HF				0.0716				
				[1.40]				
Log of Days since Last Equity Issue					-0.0037 *	-0.0039 **	-0.0034 *	-0.0014
					[1.94]	*[2.00]*	*[1.79]*	*[0.68]*
Fail x Log of Days since Last Equity					0.0121 **	0.0103 **	0.0099 *	0.0144 **
Issue					*[2.42]*	*[1.98]*	*[1.90]*	*[2.53]*
% of Shares Held by Institutions						0.0077	0.0108 **	0.0147 ***
						[1.62]	*[2.28]*	*[2.89]*
Fail x % of Shares Held by						0.0191 **	0.0148	0.0168 *
Institutions						*[2.05]*	*[1.51]*	*[1.72]*
Max Blocksize Percentage							-0.3747 **	-0.2309
							[2.25]	*[1.22]*
Fail x Max Blocksize Percentage							0.5296	0.5664
							[1.01]	*[1.06]*
Cash to Capital								0.0065 ***
								[3.74]
Fail x Cash to Capital								0.0105 ***
								[2.74]
R-squared	0.0040	0.0045	0.0049	0.0177	0.0075	0.0118	0.0159	0.0269
N	1623	1623	1623	998	1623	1623	1623	1487

TABLE 8: POST EVENT DATE ABNORMAL RETURNS

The sample consists of 213 newly public companies with an IPO from 2004 to 2007 for which the failed underwriter was a book underwriter and 370 newly public companies that did not have a failed underwriter as their book underwriter or co-manager at each of the three fail dates for a total of 1679 company-event day observations. The dependent variable is *Abnormal return*, the cumulative difference on days $t = +3$ to $+5$ between the actual event day return and the conditional expected return calculated based on the listed benchmarks. *Fail* is a dummy variable equal to one if the company's book underwriter failed at date t. Abnormal returns are calculated relative to the following benchmarks: The S&P 500, NASDAQ Composite and NYSE indexes. The Matched Exchange benchmark compares each company's return to the return of the index where it is listed (either NASDAQ or NYSE). The three factor model is the Fama-French three factor model, with the return of the index where the company is listed (either NASDAQ or NYSE) as the market measure. The DGTW benchmark is created using the DGTW (1993) methodology. The SIC matched portfolio return is generated by value weighting all public companies in the same two-digit SIC code as each sample company. Statistics calculated with standard errors robust to heteroskedasticity. ***, ** and * indicate t-statistic is significant at the 1%, 5%, and 10% levels, respectively.

	Fail	*[t-stat]*		Constant	*[t-stat]*		R-Squared	N
S&P 500	0.0434	*[5.21]*	***	-0.0044	*[1.43]*		0.0152	1679
NASDAQ Composite	0.0344	*[4.68]*	***	0.0157	*[7.17]*	***	0.0176	1679
NYSE	0.0158	*[2.12]*	**	0.0194	*[8.50]*	***	0.0035	1679
Matched Exchange	0.0249	*[3.39]*	***	0.0171	*[7.82]*	***	0.0094	1679
CRSP	0.0269	*[3.29]*	***	0.0027	*[0.88]*		0.0061	1679
Three Factor Model	0.0319	*[4.03]*	***	0.0202	*[8.47]*	***	0.0129	1679
DGTW	0.0359	*[4.49]*	***	-0.0020	*[0.67]*		0.0112	1679
SIC matched	0.0259	*[3.75]*	***	0.0195	*[9.25]*	***	0.0110	1679