Performance Gap: The Impact of Broker Advice and Fund Valuation

Michael Finke
Division of Personal Financial Planning
Texas Tech University

Shaun Pfeiffer
Division of Personal Financial Planning
Texas Tech University

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Abstract:
Attention is a scarce resource. Financial intermediaries, agents of financial institutions, and reliance upon fund valuation can reduce the time investors spend on investment decisions. These factors also influence the timing and magnitude of mutual fund flows. Fund flows impact the return an investor receives over the investment horizon. This study uses the Morningstar database to explore the impact that these factors have on the performance gap of retail investors. Our study finds that the performance gap is positively related to broker sold funds with higher average fund valuation.

I. Literature Review

Mutual funds are the preferred means of stock investment in the U.S. for individual investors. Domestic equity funds managed $2.8 trillion in assets as of year-end 2008 (Investment Company Institute, 2009). Open-end equity funds provide investors with low cost access to diversification and liquidity. Investor performance in mutual funds has lagged annual fund performance by 1.27 per year between 1998 and 2008 with an increase in performance gap to 2.78 % for sector funds across the same investment horizon (Kaplan, 2009). The causes of this poor performance in mutual funds are not well understood. This study investigates why mutual fund investors have underperformed and which funds are most prone to experience a gap between time weighted and dollar weighted returns.

Individual investors have both limited time and ability to make effective fund choices. The most prominently displayed piece of information on a mutual fund prospectus that is reviewed to make fund choices is recent 1-year, 5-year, and 10-year return. Recent return is considered a primary source of information in popular media information sources such as Consumer Reports, Money Magazine, and Morningstar, and is featured prominently in mutual fund advertising (Huhmann and Bhattacharyya, 2005). The SEC mandates that recent fund performance be displayed prominently in both advertisements and in the fund prospectus (National Association of Securities Dealers, 2006). Fund performance also carries intuitive appeal as an objective signal of quality fund management.

Performance and Fund Flows

Investors continue to rely on past returns for investment decisions (Sapp and Tiwari, 2004) despite evidence that past returns cannot be used to predict future returns (Berk and Green, 2004). The relationship between fund flows and prior returns is asymmetrical. Specifically, investors exhibit return-chasing behavior where fund inflows increase at an increasing rate with respect to prior returns (Sirri and Tufano, 1998; Barber and Odean, 2000; Christoffersen, 2006; Jain and Wu, 2000). However, poor-performing funds are subject to less flow sensitivity (Sirri and Tufano, 1998).

Investors also fail to account for all associated fund expenses when purchasing a fund (Barber and Odean, 2005). However, the authors note that salient expenses such as front-end loads do influence the investors fund choice. Despite recent regulations[1] requiring cost information to be reported alongside performance, research suggests that investors continue to disregard costs and focus on past performance when selecting a fund (Pontari, Stanaland and Smythe, 2009). Search costs (Sirri and Tufano, 1998), behavioral influences such as the

[1] National Association of Securities Dealers (NASD) Notice to Members 06-48, Sept. 2006.

representativeness heuristic (Barber and Odean, 2009), and cognitive constraints (Finke, 2009) are all potential explanations for suboptimal investment choices.

Prior Returns and Future Performance

Despite the perceived importance of recent returns in fund choices, there is little evidence that making fund choices based on prior performance is wise. Jensen (1969) concludes that superior past performance is not a reliable indicator of good future performance. Expenses and turnover, rather than prior returns, are noted as consistently negative predictors of future fund performance (Carhart, 1997).

Similar findings by Fama and French (2008) suggest that any persistent outperformance is short-lived and is attributable to momentum. The authors conclude that persistence is a result of chance rather than a planned strategy. Investing in past winners for greater lengths of time potentially imposes a higher cost on mutual fund investors. Debondt and Thaler (1985), based on a 36 month investment horizon subsequent to portfolio formation, find that investing in prior losers provides an excess cumulative return of 24.6 % over investing in prior winner portfolios. Similarly, Lakonishok, Shiefler and Vishny (1994) use scaled price ratios to gauge prior outperformance and find that a contrarian approach can provide as much as a 90% cumulative return advantage over a five year investment horizon versus a momentum strategy.

Although some evidence suggests that persistence exists and is most prominent over 3 to 12 months after portfolio formation (Jegadeesh and Titman, 1993; Hendricks, Patel and Zeckhauser, 1993; Chan, Jegadeesh and Lakonishok, 1996; O'neal, 2000), this may be due to survivorship bias (Daniels, Grinblatt, Titman and Wermers, 1997), benchmark specification (Daniels et al., 1997), or prominent persistence among laggards (Brown and Goetzmann, 1995). Additional problems associated with return-chasing strategies are excessive implementation costs (Carhart, 1997), time variant effectiveness (Malkiel, 1995), and increased risk (Oneal, 2000; Brown and Goetzmann, 1995). However, some research finds that persistence does not exist in equity funds (Kahn and Rudd, 1995; Tufano and Sevick, 1997). Other research finds that the momentum portfolio is not an optimal portfolio and does not offer a sufficient Sharpe Ratio to be competitive with other portfolios (Pastor and Stambaugh, 2002).

Prior Returns and Current Valuation

In addition to findings that suggest prior returns to be poor predictors of future returns, there is evidence that high recent performance may indicate the existence of a hot, or overpriced, investment. Mutual funds with higher past performance are rewarded through fund flows and short term price appreciation. Price appreciation leads to changes in scaled price ratios such as price-to-book, price-to-earnings, and price-to-cash flow. In the event investors neglect less

salient information on a mutual fund (Barber and Odean, 2005) these ratios trend higher for glamour funds and lower for value funds.

Lakonishok, Shleifer, and Vishny (1994) find the average underperformance in the 1, 3, and 5-year returns for growth portfolios to be roughly 6%, 34%, and 84% respectively. The authors question the risk-based explanation for the existence of the premium associated with a value portfolio due to the relative strength of value strategies in recessions. Other studies, analyzing the impact flow has on portfolio holdings, have noted that risk premiums are reduced for higher beta portfolios as higher beta equities are purchased to induce fund inflows (Karceski, 2000).

Brown, Goetzmann, Hiraki, Shiraishi, and Watanabe (2002) suggest that mutual fund flows proxy investor sentiment. Research using aggregate market sentiment, or bullish over bearish commentary, finds that increasing sentiment is associated with a reduction in return of up to 12% over the subsequent 3 years (Brown and Cliff, 2005). These findings are robust to investment horizons of 6 to 24 months; however, momentum is not ruled out in the short run. Using individual stock trades, research finds stocks that are bought by investors underperform stocks that are sold by 20 to 94 basis points per month (Hvidkjaer, 2008). This underperformance holds for prior formation periods of 1 to 24 months; however, the underperformance is statistically insignificant for one year investment horizons beyond the second year. More recent studies suggest that an increase in investor sentiment leads to a -0.34 and -0.41 percentage point loss per month for value and equally weighted index returns (Baker and Wurgler, 2006). The author's findings suggest that the impact of sentiment on future returns is also greater for smaller stocks.

If investors direct their attention primarily towards prior returns when making fund choices, is it possible that they experience abnormal returns in the future? Gruber (1996) finds that sophisticated investors who base their investment decisions on a four factor[2] alpha receive abnormal returns of approximately 75 basis points per year. Similarly, Zheng (1999) finds a smart money effect that is confined to small funds and excess returns for following the fund flows are roughly 2.2 % per year. More importantly, these results assume the investor rebalances every three months. Carhart (1997) finds that any profits from a short term momentum strategy are depleted by transaction costs. Using investment data from a large discount brokerage firm on 78,000 households, Barber and Odean (2000) estimate the round trip cost[3] of a trade to be 2.4% of the transaction value. This research suggests that momentum is available to investors but implementing the strategy is costly.

[2] Factors are: variant of size and value factors, and excess return on an aggregate corporate/government bond index

[3] This stems from bid-ask spread, commissions, and price impact.

Not all authors suggest the existence of a smart money effect. Teo and Woo (2004) look at different styles of equities and find that momentum is much weaker than reversals. Similarly, Frazzini and Lamont (2008) find that investors are prone to behavioral biases that lead to consistent underperformance. This poor performance is attributable to portfolio formation periods greater than 3 months and ranges from 4% to 10% underperformance relative to low sentiment equities per year[4]. Additional research notes that the "smart money" effect can be explained by momentum in the short run (Sapp and Tiwari, 2004).

There is empirical evidence, consistent with the "dumb money" effect, which suggests investor returns consistently lag buy and hold returns. Using aggregate market flow data, Dichev (2007) finds that investors experience an annual performance gap of 1.3%, 1.5%, and 5.3% for NYSE, NASDAQ, and International stock exchanges respectively. The author notes that the performance gap is likely to be larger at lower levels of aggregation such as the direct and broker sold sales channels, for example. Ciccotello, Greene, Ling and Rakowski (2009) find that the performance gap is positively related to 12b1 fees, management fees, and turnover. However, load fees compress the performance gap possibly due to effective broker advice or to the liquidity cost these fees impose on investors.

Investor Behavior

Financial decisions are rarely simple. Investment decisions demand attention and cognitive resources. Attention is a scarce resource (Kahneman, 1973; Barber and Odean, 2008). Lower cognitive abilities and limited attention lead to poor financial decisions (Frederick, 2005; Barber and Odean, 2000; Finke, 2009).

As of December 31, 2008 there were 13,400 U.S. Mutual fund share classes for investors to choose from (Investment Company Institute, 2009). Many alternatives and the presence of bounded rationale lead to a difficult process of discerning which information is useful for investment decisions. Research indicates that advertising (Jain and Wu, 2000), higher past returns (Barber and Odean, 2000), and broker advice (Lee, 1992) lead to increased attention. However, Barber and Odean (2008) note that rational investors are less likely to value information that leads to increased attention. Specifically, the theory predicts that attention-grabbing events lead to superior results when the emphasis of the event is also critical to investor utility.

It is possible that the features emphasized in advertising and by brokers lead to suboptimal investment decisions. Overconfidence, potentially attributable to advice or reliance on past returns, is shown to reduce returns by as much as 6% per year (Barber and Odean, 2000). Attention on past performance leads investors to poor evaluation of the fund fee structure

[4] The authors create synthetic returns from shorting the bottom 20% of stocks and holding top 20%

(Wilcox, 2003; Barber and Odean, 2005). Specifically, investors fail to recognize the impact of ongoing fees.

Distribution Channels

Mutual funds may be divided between funds that are chosen in a direct sales channel and those that are sold by brokers who receive a commission from each sale. It is easier to sell a fund that has experienced high recent performance. Funds that have performed well recently within a fund family are more likely to be advertised (Sirri and Tufano, 1998). Post advertisement performance, or the median one year four factor alpha, has been estimated to be -3% (Jain and Wu, 2000). The authors suggest that advertising is a method to attract new funds, not a method to signal superior talent. Bergstresser, Chalmers, and Tufano (2006) find that broker sold funds have higher distribution fees (12b1 fees, loads), higher non-distribution fees (expense ratio), and provide lower returns to investors when compared to the direct channel funds. The authors also find that higher fees are positively associated with flow.

Conflicts of interest provide some brokers the incentive to sell clients a share class that will provide a lower annualized holding period return. For example, a broker has a monetary incentive to sell Class C shares to investors with a longer investment horizon despite a reduced holding period return for the investor (Oneal, 2004). The author also suggests that the brokers expecting to leave the industry have an incentive to disregard the client's investment horizon and sell Class A or B shares.

It seems plausible that the objective for offering multiple share classes is to have products that are in line with a variety of client preferences. On the other hand, the primary objective may include increasing fund flows. The new money growth attributable to offering additional share classes is estimated to be 12 % over a three year period (Nanda, Wang and Zheng, 2004). More importantly, the authors find that Class B and C share investors are more responsive to recent performance than are Class A investors. These no-load investors (Class C shares) are found to be less likely to redeem money in the event of poor performance (Christoffersen, Evans and Musto, 2006). The authors find that brokers, either affiliated or unaffiliated, fail to direct investors toward funds with higher future returns. The authors also find that broker aided flows are positive and statistically significant for higher return funds (i.e., easier to sell recent winners).

More recent findings suggest that load funds and funds with higher risk adjusted returns experience lower realized returns (Friesen and Sapp, 2007). Thus, while brokers may aid in directing investors to funds that experience higher future returns the eventual outcome is that these investors perform worse than the direct channel. The problem is pervasive in active or index funds. Additional studies find that pure no load index funds experience no performance

gap and that broker aided investments, especially B class shares, experience poor timing that results in a performance drag of anywhere from .47% to 2.28% (Bullard, Friesen and Sapp, 2007).

Our main contribution is to identify more specifically where the gap is most significant and also analyze whether the performance gap is related to overvalued fund holdings. This will entail analysis pertaining to scaled price ratios at the fund level. Our study is similar to recent studies pertaining to the impact that different fund distribution channels have on performance gap and fund flows[5]. We seek to add to the literature by examining the collective impact of the sales channel and fund valuation on performance gap. Additionally, our study intends to shed light on the common fund characteristics associated with larger gaps that may be contributing to poor performance for fund investors.

II. Hypotheses

Prior literature notes that attention grabbing events impact investment decisions (Barber and Odean, 2006). Recent findings suggest that investors do not benefit from broker advice (Bergstresser et al., 2006). As we see it, investment decisions are influenced by broker advice and fund attributes such as price-to-earnings ratios. Given these factor we expect:

1) Mutual fund flows are positively related to broker advice. This relationship should proxy for an attention grabbing event.
2) Performance gap, or the difference between the geometric and dollar-weighted return, is positively related to broker advice in funds with higher fund valuation.

III. Methods

Following Yan (2006), we compute fund flow for each mutual fund in the Morningstar database for each month from January 2000 to December 2009 as follows:

$$\mathrm{Flow_t} = \frac{\mathrm{TNA_t} - \mathrm{TNA_{t-1}}(1+\mathrm{Ret_t}) - \mathrm{MGTNA_t}}{\mathrm{TNA_{t-1}}} \quad (1)$$

TNA_t is the fund's total net assets reported at the end of month t in millions of dollars. Ret_t is the fund's return during month t net of management fees and expenses and excluding front and rear load fees. $MGTNA_t$ is the change in the fund's total net assets attributable to fund mergers. Consistent with Friesen and Sapp (2007), we exclude non-U.S. equity mutual funds and we

[5] Friesen and Sapp(2007); Bullard, Friesen, and Sapp(); and Christoffersen(2006)

further limit our sample by excluding institutional funds. After excluding these funds, our sample contains 398,596 fund-month observations. Similar to Barber et al. (2005), we winsorize fund flow at the 1st and 99th percentiles to reduce the impact of outliers.

Following Friesen and Sapp (2007) we construct performance gap from monthly return data in Morningstar as follows:

$$\text{Performance Gap}_t = \left(\prod(1 + \text{Ret}_t)^{\frac{1}{t}} - 1\right) - (\text{TNA}_0\ (1 + \text{Ret}_d)^T + \sum_{i=1}^{n} \Delta\text{TNA}_t\ (1 + \text{Ret}_d)^{T-t} = \text{TNA}_T)$$

(2)

Ret_d is the monthly dollar-weighted return that equates ending size of the fund (TNA_T) with beginning size of the fund (TNA_0) once intermittent cash flows are considered. ΔTNA_t accounts for the intervening cash flows. The remaining elements of equation 2 are consistent with descriptions in equation 1. Equation 2 simplifies to the geometric return minus a dollar-weighted return over a specified investment horizon.

We next attempt to explain the variation in fund flows in the cross-section by altering the fund flow model provided in Barber, Odean and Zheng (2005).

$$\text{Flow}_t = a_0 + b_2\text{Expenses}_t + b_3\text{Cnt}_t + b_4\ln(\text{TNA}_{t-1}) + b_5\text{Alpha}_{t-12} + b_6\sigma(R) + d_1\text{FLOW}_{t-1} + d_2\text{Load} + \text{turnover}_t$$

(3)

Attention_t is the interaction of broker sold funds interacted with positive trailing 12 month four factor alpha. We proxy for broker sold funds through the existence of a positive front-end load and a positive 12b-1 fee. The four-factor alpha is constructed as in Carhart (1997) and is calculated as follows:

$$\alpha_{it} = R_{i,t} - R_{f,t} - \beta_{i,t-1}\text{MKTRF} - \beta_{i,t-1}\text{SMB} - \beta_{i,t-1}\text{HML} - \beta_{i,t-1}\text{UMD}$$

(4)

TNA_{t-1} is log-transformed due to the attributes having a positively skewed distribution. MKTRF is the excess return of fund_i over the one-month treasury bill rate. SMB is the factor associated with holding equities with a lower market capitalization in a particular month. HML is the

premium for holding higher price-to-book equities in a certain month. UMD is the momentum factor associated with holding equities that have performed well over the past 12 months.

Our second model is similar to the performance gap model put forth in Friesen and Sapp (2007) and is constructed as follows:

$$\text{Performance Gap}_{t+12} = a_0 + b_1\text{Top Distribution}_t + b_2\text{Expenses}_t + b_3\text{Cnt}_t + b_4\ln(\text{TNA}_{t-1}) + b_5\,\sigma(\text{R}) + b_6\text{FLOW}_{t-1} + b_7\text{Alpha}_{t-12} + b_8\text{load}_t + b_9\text{turnover}_t + b_{10}\text{PE}_t \quad (5)$$

The PE regressor represents fund-level price-to-earnings ratio. The price-to-earnings ratios[6] represents the price divided by the average earnings over the past 12 months. For equation 3 and 5 we accumulate the cross-sectional parameter estimates and take the mean of this time series for the specified number of months following Fama and Macbeth (1973). Equation 3 contains 108 months of cross-sectional estimates. Equation 5 is limited to 96 cross-sectional estimates due to the ex-post performance gap calculation of leading 12 and 24 months.

IV. Results

Table I presents summary statistics on domestic open-end mutual funds used in regression analysis. Over the sample period extending from January 2001 to January 2009 we see an average annual performance gap of 64 basis points and 81 basis points for the leading 1 year and 2 year calculations respectively. The average mutual fund shows positive growth. Greater than 75% of the funds in our sample do not impose a front-end load on investors. The average four factor alpha over the trailing twelve months is roughly 7 basis points before fees are considered (i.e., investors lose fees plus 7 basis points). The average cumulative return over the trailing 12 months is roughly 1.5%.

Table II provides insight on the attention grabbing effect of broker advice relative to mutual fund flows. Unlike Barber, Odean and Zheng (2005), we observe a positive coefficient on front-end loads and a negative coefficient on expense ratios. Despite the insignificant results of the standard deviation coefficient, our results are consistent with prior literature in direction and significance. The positive coefficient on front-end loads signals an attention effect. This result can be explained by two competing forces. Specifically, increasing the load makes the fund more costly and less attractive to investors. Second, a higher load provides more incentive to the broker to sale the fund.

[6] PE ratios gathered from http://www.econ.yale.edu/~shiller/data.htm

Table III sheds light on the unconditional performance gap across the sample according to a leading 1 year and 2 year rolling basis. The figure represents monthly performance gap. Our sorts are consistent with the direction of gap in prior literature; however, the magnitude of our findings smaller by roughly 50 basis points per year. Notice the consistently positive gap, except for 2002, indicating poor cash flow timing by investors.

Figure I provides the annualized median gap and interquartile range. The interquartile range is compressed in times of lower volatility and vice versa. Figure II demonstrates the higher Price-to-Earnings level of broker sold funds relative to the direct sold channel. Figure III displays the conditional performance gap. Specifically, the annual gap is viewed from the broker and direct sold channel. This figures displays no consistent relationship between performance gap and channel; however, certain time periods show increased detrimental effects of broker advice. This inconsistency is potentially due to smaller sample size, greater influence of outliers, from the broker channel.

Table IV represents the Fama MacBeth (1973) regression analysis. Performance gap for the leading 12 months is the dependent variable. We control separately for front-end load (up-front advice) and 12b-1 fees (ongoing advice) to better explain the cross-sectional variation in performance gap. 12 b-1 fees are captured through the Top Distribution variable, which represents the top quintile of distribution expenses (12 b-1 fee + 1/7 front-end load) similar to Huang (2007). The findings suggest that ongoing broker advice, proxied through the top distribution variable, magnifies the performance gap. However, the findings for load coefficient are insignificant. This may suggest that up front advice has little impact on subsequent investor timing of cash flows. Lastly, the top distribution variable suggests that those brokers with the highest incentive, or largest ongoing fee, are most detrimental to investor performance.

Our main contribution is to examine the impact of broker advice, conditioned on higher fund price-to-earnings ratio, on the performance gap. Table V, and the Broker_PE variable, suggest that broker advice is more detrimental to investor performance in funds with a higher valuation (PE ratio). Specifically, broker advice that is ongoing (12 b-1 fees) and provides greater incentive (top quintile of cost) magnifies the gap of investors in high Price-to Earnings funds(Top quintile). The other parameter estimates are primarily consistent with prior literature in the sense that standard deviation and past alpha are positively and significantly affecting the performance gap. Model I through III test the robustness of the interaction between broker advice at various incentive levels and higher fund PE levels. The coefficient is statistically significant and positive across all three models.

V. Conclusions

Prior literature documents broker advice as providing negative or no tangible benefit to investors. It is also important to consider the incentive level and fund attributes associated with broker advice when ascertaining the marginal impact it has on investor returns. We find that broker advice associated with funds having higher price-to-earnings ratios is more detrimental to investor performance. Additionally, broker advice coupled with higher incentives and ongoing 12 b-1 fees in higher price-to-earnings funds is also positively associated with the performance gap.

In sum, the impact of broker advice appears to be conditioned on the time period, level of incentives, and valuation levels of the associated mutual fund. Investors should be concerned with advice that is directed toward higher valuation funds where the distribution fees are ongoing and high relative to other investment alternatives within the mutual fund universe.

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Table I
Summary Statistics for Full Sample (January 2000 - December 2009)

Performance Gap_{t+12} is calculated following Friesen and Sapp (2007) and represents the difference between the geometric return (fund return) and the internal rate of return (investor return) over the subsequent 12 months on a rolling basis. Similarly, Performance Gap_{t+24} represent the difference between fund return and investor return over the subsequent 24 months. Geometric Return is calculated as follows: $\prod(1 + Ret_t)^{1/t} - 1$. Ret_t is monthly return of fund. Investor return is defined as $TNA_0 (1+R_d)^T + \sum \Delta TNA_t (1+R_d)^{T-t} = TNA_T$, where R_d represents the investor return. $Broker_t$ represents the number of distinct brokerage companies that sell a particular investment. This value is updated on a quarterly basis and represents the cross-sectional dispersion for the latest update in Morningstar. $Flow_t$ is calculated according to Barber et al. (2005) and is defined as $\Delta TNA_t / TNA_{t-1}$, where TNA_{t-1} is total net assets of the fund at the end of the prior month in millions of dollars and $\Delta TNA_t = TNA_t - TNA_{t-1} (1+Ret_t)$. Ret_t is the net of expense return. Flow is winsorized at the 1st and 99th percentiles. Price to earnings is the monthly price divided by the trailing twelve months earnings. Negative price-to-earnings are not used and price-to-earnings greater than 60 are capped at 60. Age of fund is an annual figure. Actual 12b1 fee is a distribution fee that is accounted for in the expense ratio. Front end load is the maximum sales commission charged by the fund. Expense Ratio is the management fee in decimal format. $\sigma(R)_{t-12}$ represents the variability in monthly returns for funds with at least 12 returns in the sample over the trailing twelve months on a rolling basis. 4-Factor α_{t-12} is the monthly four factor alpha for the prior year for a given fund on a rolling basis. $Return_{t-12}$ represents the cumulative return for the fund over the trailing twelve months. Summary statistics are reported based on the time-series average of the cross-sectional attributes.

	Mean	Median	Std. Dev.	1st Quartile	3rd Quartile
Performance Gap_{t+12}	0.0064	0.0051	0.0561	-0.0021	0.0156
Performance Gap_{t+24}	0.0081	0.0061	0.0511	-0.0032	0.0191
$Broker_t$	21.9338	13.0000	24.4611	1.0000	37.0000
$Flow_t$	0.0020	-0.0060	0.0591	-0.0200	0.0130
Price-to-$Earnings_{t-12}$	19.2100	18.5700	4.3480	16.2900	21.8700
Age_t	9.1680	7.1480	7.9760	4.2780	11.1390
$Load_t$	0.0095	0.0000	0.0208	0.0000	0.0000
$\sigma(R)_{t-12}$	0.0478	0.0451	0.0133	0.0387	0.0545
12-b1 Fee_t	0.0049	0.0028	0.0035	0.0025	0.0100
Expense $Ratio_t$	0.0143	0.0137	0.0057	0.0109	0.0184
Total Net $Assets_{t-1}$	556.4100	44.7200	2894.1100	6.8960	229.4230
4-Factor α_{t-12}	-0.0007	-0.0007	0.0057	-0.0039	0.0025
$Return_{t-12}$	0.0151	0.0074	0.0872	-0.0410	0.0668
$Turnover_{t-12}$	0.9600	0.6500	0.7990	0.3300	1.1300

Table II
Fama Macbeth Regression of Monthly Fund Flow
On Fund Attributes (January 2000- December 2009)

The dependent variable, $Flow_t$, is calculated according to Yan(2006) and is defined as $\Delta TNA_t/TNA_{t-1}$, where TNA_{t-1} is the total net assets of the fund at the end of period *t-1* in millions of dollars and $\Delta TNA_t = TNA_t - TNA_{t-1}(1 + Ret_t) - MGTNA_t$. Ret_t is the net-of-expense return as reported by CRSP and $MGTNA_t$ is net assets attributable to mergers between funds in month *t*. $Flow_t$ is winsorized at the 1st and 99th percentiles. Non-U.S. equity mutual funds and funds which liquidated or merged in month *t* are excluded. Sqrt($Broker_t$) is the distinct number of brokerage firms selling a fund. This metric is updated quarterly and represents the most recent data point for the fund. α_{t-12} is the trailing twelve month 4-factor alpha. $Count_t$ is the number of returns the fund has for the given time-series analysis. Expense $Ratio_t$ is the average annual expense ratio in decimal form. $Flow_{t-1}$ is mutual fund flow lagged by one month. $\sigma(R)_{t-12}$ is the trailing twelve month standard deviation of monthly returns. $Ln(Size)_{t-1}$ represents the natural logarithm of fund's total monthly net assets. $Turnover_t$ represents the level of portfolio manager activity and is updated annually. Regressions are estimated each month from January 2001 to May 2009 to form a time-series of monthly coefficients. These parameter estimates are then accumulated following Fama and MacBeth (1973) with *t*-statistics reported in parenthesis.

	Estimate
Intercept	0.275
	(21.54)***
Sqrt($Broker_t$)	0.003
	(18.55)***
α_{t-12}	1.62
	(16.51)***
$Count_t$	-0.0011
	(-12.34)***
Expense $Ratio_t$	-1.41
	(-18.45)***
$Flow_{t-1}$	0.2598
	(31.22)***
$Ln(Size_{t-1})$	-0.0085
	(-26.41)***
$\sigma(R)_{t-12}$	0.0076
	0.15
$Turnover_t$	0.0024
	(2.69)***
Avg. Adjusted R^2	0.192
Avg. Number of Funds	3929.2

Table III

Monthly Returns and Performance Gap

For each year the cross-sectional average is reported for Dollar-Weighted Return and the Geometric Return. Following Friesen and Sapp (2007) a fund must have 12 net cash flow observations and monthly return observations to be included. Fund –years represents the number of funds for a given year or the total number of yearly observations for all funds if the full sample is considered. The performance gap represents the mean monthly percentage difference between a geometric return and the dollar weighted return. A positive value indicates that a buy and hold value provides more return to the investor than a timing cash flows approach and vice versa. Panel A provides performance gap on a 1 year rolling basis. Panel B provides performance gap on a 2 year rolling basis.

Year	All	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Panel A: Leading 1yr Gap											
Number of Fund-Years	38,312	2854	3007	3667	3928	3989	4130	3992	3998	4517	4230
Geometric Return	0.131	-1.001	-1.04	-0.19	1.77	0.89	0.94	1.07	-1.27	-2.18	2.32
Dollar-Weighted Return	0.064	-1.17	-1.16	-0.14	1.67	0.85	0.88	1.02	-1.4	-2.19	2.28
Performance Gap	0.067	0.169	0.12	-0.05	0.1	0.04	0.06	0.05	0.13	0.01	0.04
Panel B: Leading 2yr Gap											
Geometric Return	-0.045	-1.04	-0.62	0.78	1.32	0.91	1.002	-0.11	-1.74	-0.91	-
Dollar-Weighted Return	-0.116	-1.22	-0.65	0.79	1.21	0.85	0.95	-0.24	-1.81	-0.92	-
Performance Gap	0.071	0.18	0.03	-0.01	0.11	0.06	0.052	0.13	0.07	0.01	-

Figure I

1 Year Leading Performance Gap (Annualized)

Median annualized performance gap is measured each month from January 2000 through January 2009 on a rolling 1 year basis. The interquartile range displays the variability in performance gap across retail fund investors for a given month. Negative median values represent superior timing ability for a given month. Positive median values represent poor timing ability for a particular month.

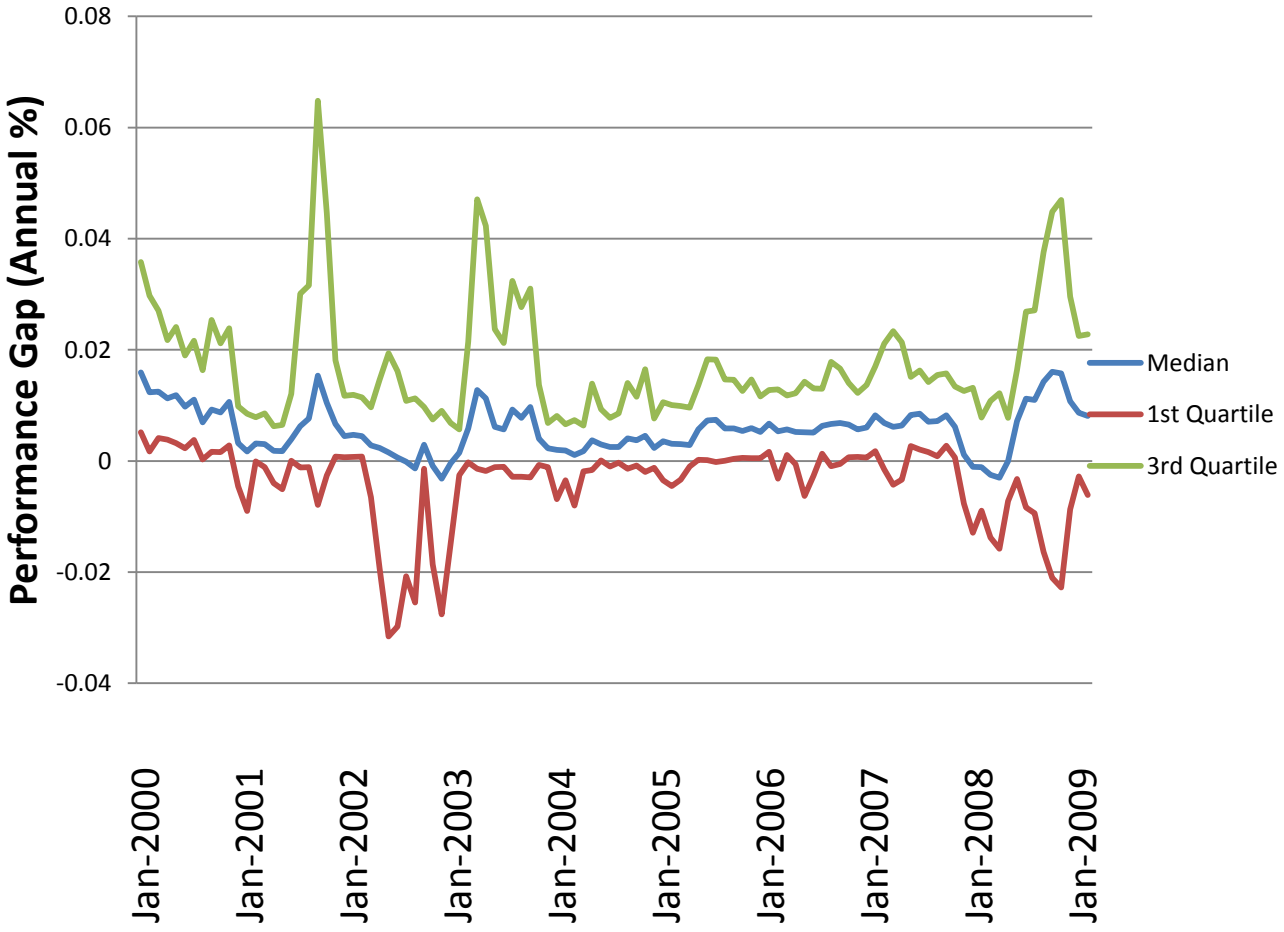

Figure II
Price-to-Earnings by Channel

Price to Earnings represents the monthly price over the trailing twelve month earnings. Negative Price to Earnings is not used. Price-to-Earnings above 60 are capped at 60. The broker channel PE is captured through the top quintile of distribution fees (i.e., highest 12-b1 fees and front end loads). The PE for each channel represents a value weighted metric for each month from January 2001 to January2009.

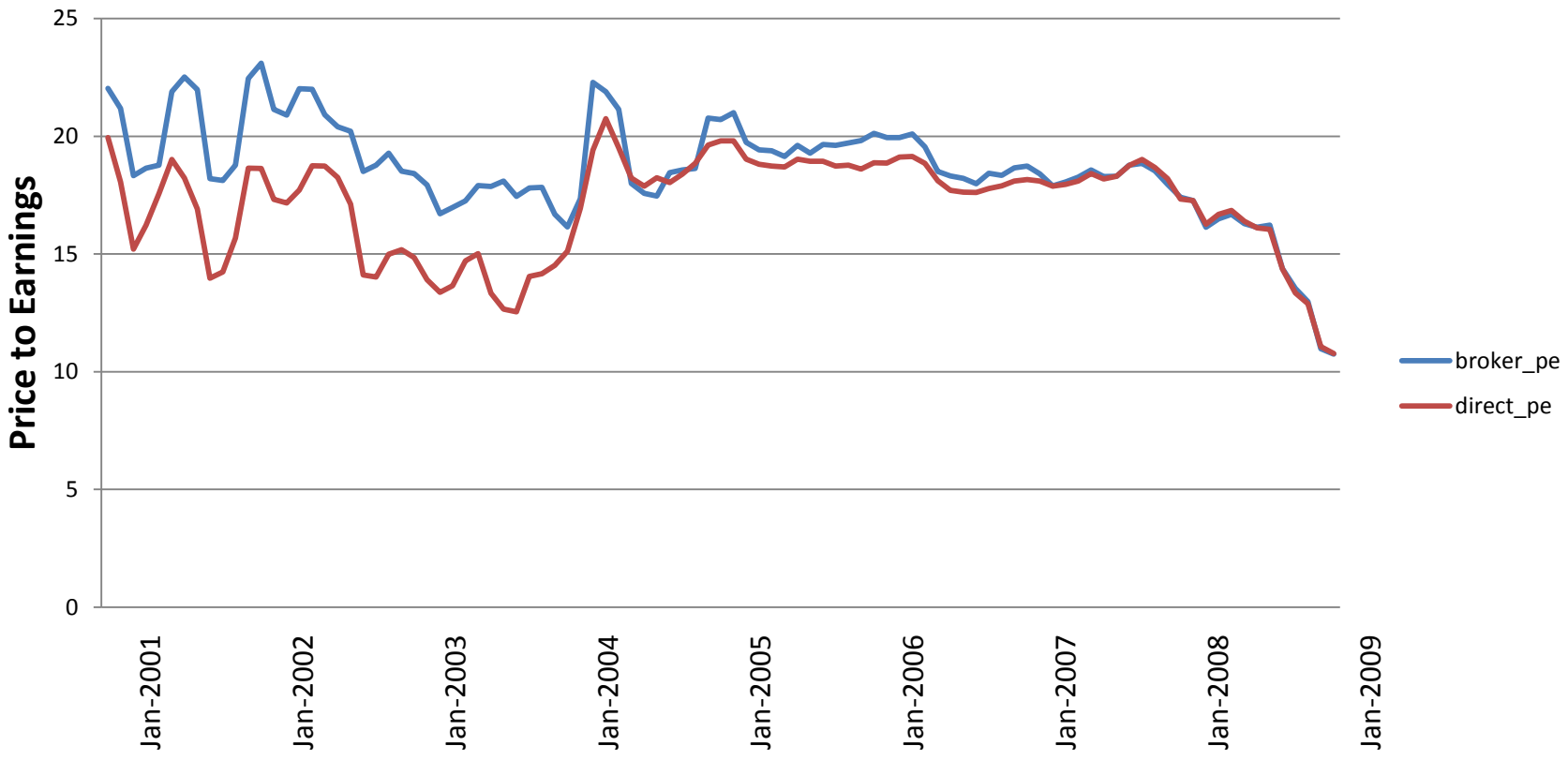

Figure III
Performance Gap Differential

Performance gap represents the mean annual percentage difference between a buy and hold return and the investor return. This is measured on a leading 12 month basis, which is a rolling moving average. Ann_gap_brok represents the gap for broker sold funds with high Price-to-Earnings Ratios. Specifically, those brokers with the most incentive, or in the top quintile of distribution fees, are captured here. High Price-to-Earnings is represented by funds having PE multiple in the top quintile for a given month. The direct channel is represented by funds, across all price-to-earnings that do not have a front-end load or a 12b-1 fee. The average is value- weighted in the cross-section.

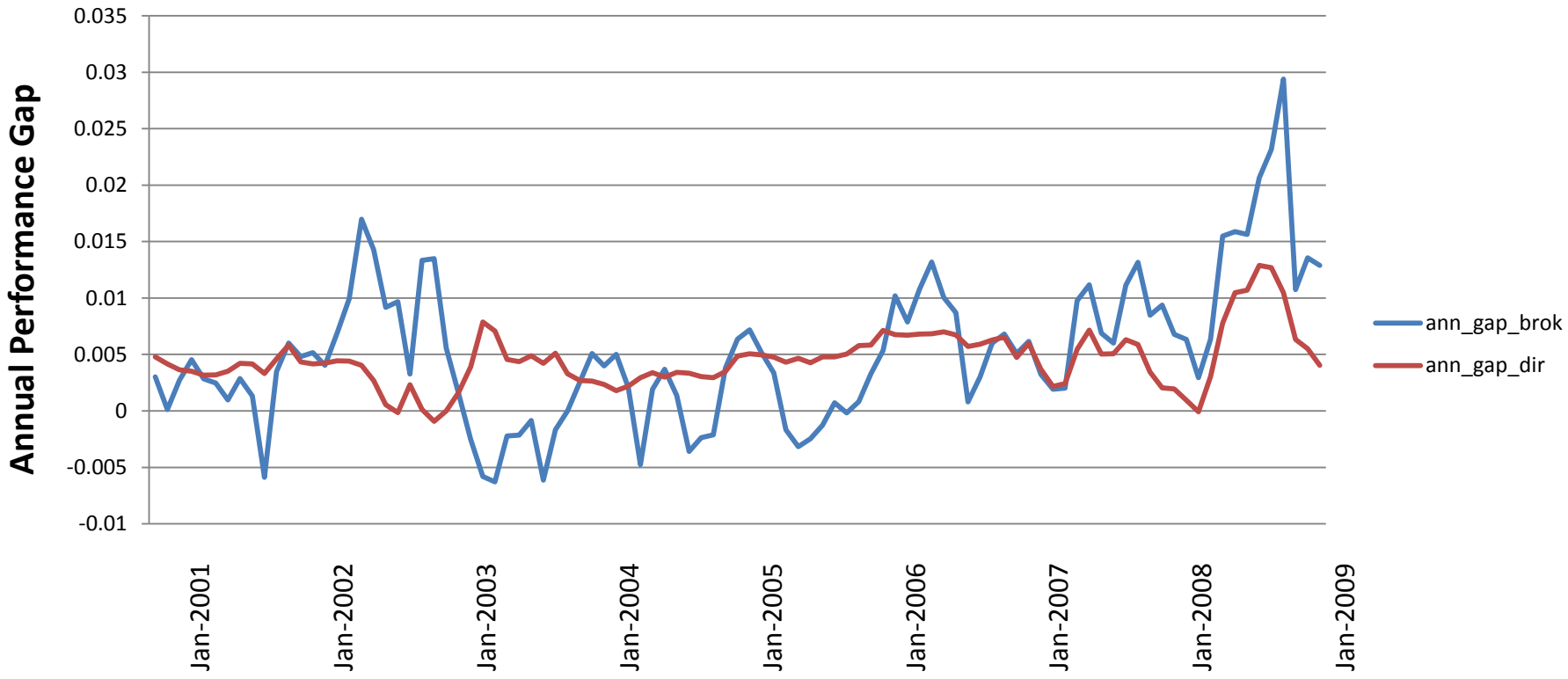

Figure IV
Distribution of Annual Gap: Broker Sold Funds

Gap_b represents the annual percentage gap for broker sold funds. Broker sold funds are determined by those funds within the top quintile of distribution fees (12-b1 fees and front-end loads) and are within the top quintile of Price-to-earnings. The gap is measured by taking an equal weighted mean within each cross-section and represents the mean difference between the fund return and investor return on a 12 month rolling basis. The distribution provides insight as to what investors are experiencing due to broker advice with higher incentives to sell funds.

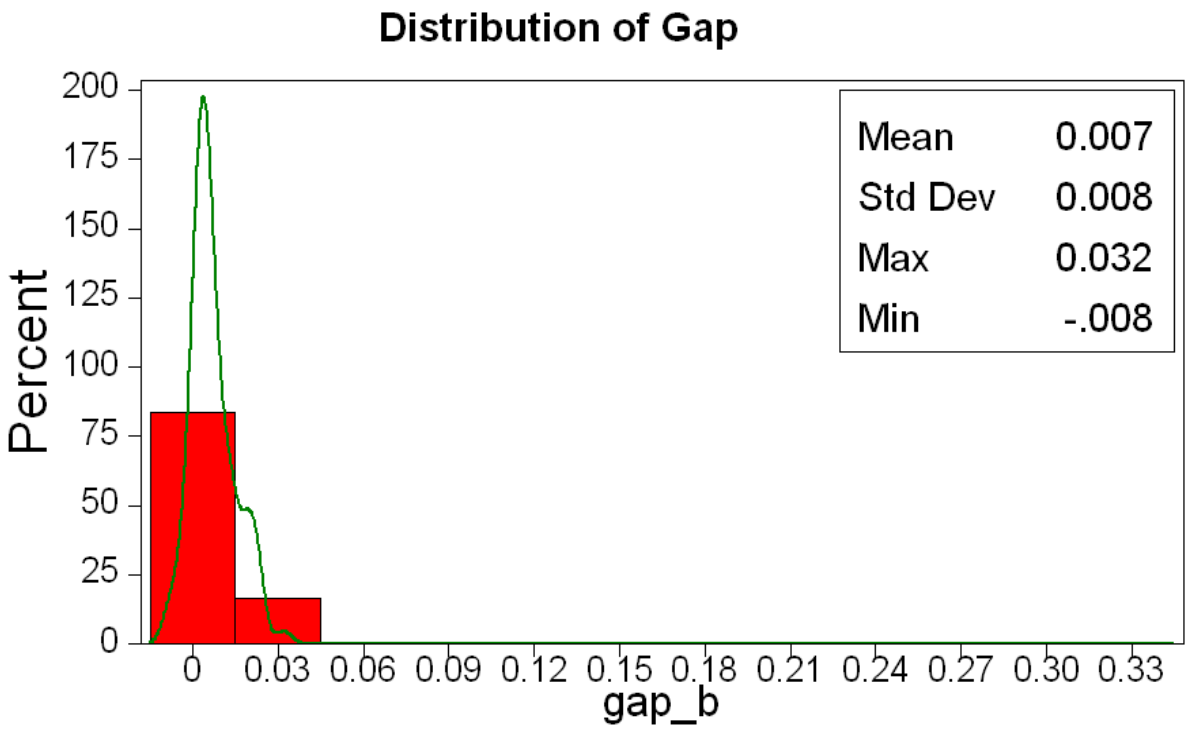

Figure V
Distribution of Annual Gap: Direct Channel Funds

Gap_d represents the annual percentage gap for direct sold funds. Direct sold funds are determined as those which do not have a front-end load or a 12b-1 fee. The gap is measured by taking an equal weighted mean within each cross-section and represents the mean difference between fund return and investor return on a rolling 12 month basis.

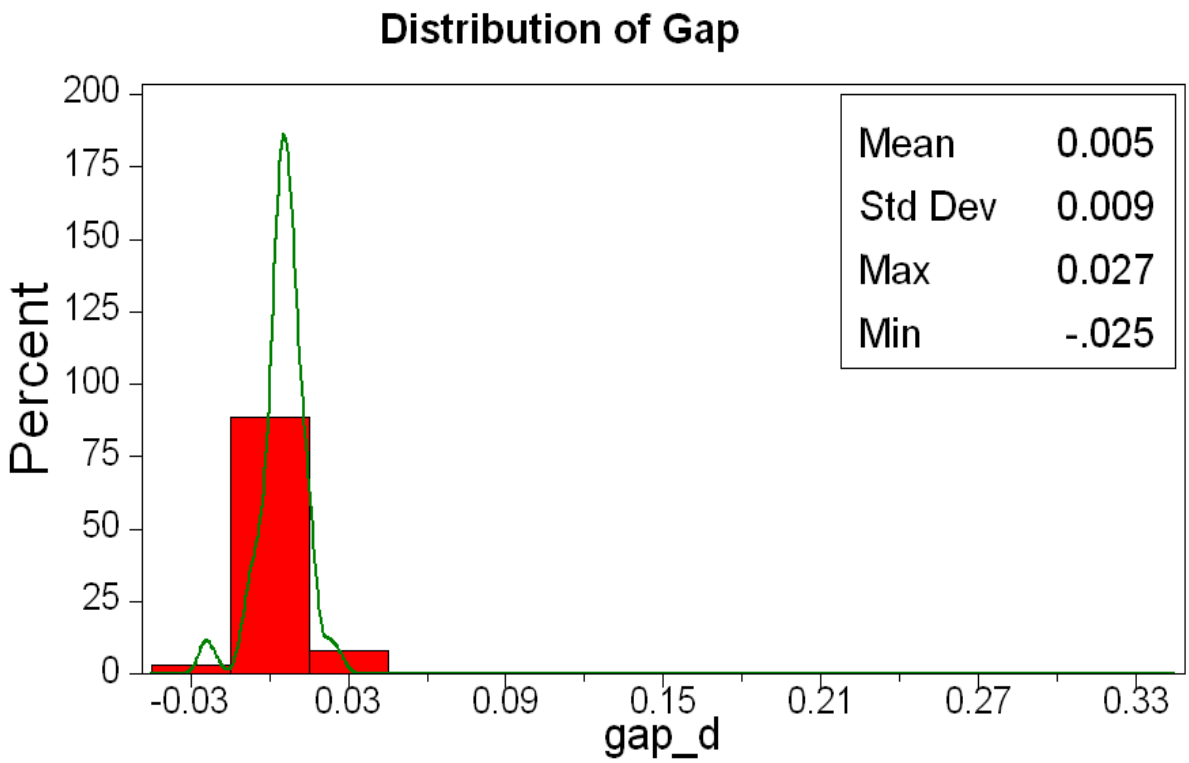

Table IV
Fama Macbeth Regressions of Monthly Performance Gap
Across All Price-to-Earnings Levels

The dependent variable, *Performance Gap*$_{t+1}$, is calculated according to Friesen and Sapp (2007) and is defined as the fund return less the investor return. The fund return is calculated as follows: $\prod(1 + Ret_t)^{1/t} - 1$. The investor return is arrived at by accumulating the initial Total Net Assets (TNA) plus intermittent cash flows to arrive at the ending TNA. Specifically, investor return is Rd in the following equation: $TNA_0 (1+Rd)^T + \sum \Delta TNA_t (1+Rd)^{T-t} = TNA_T$. $Flow_t$ is calculated according to Barber et al. (2005) and is defined as $\Delta TNA_t / TNA_{t-1}$, where TNA_{t-1} is total net assets of the fund at the end of the prior month in millions of dollars and $\Delta TNA_t = TNA_t - TNA_{t-1}(1+Ret_t)$. Ret is the net of expense return. Flow is winsorized at the 1st and 99th percentiles. $Alpha_{t-12}$ is the four-factor alpha on a rolling twelve month basis. $\sigma(R)_{t-12}$ is the standard deviation of monthly returns for the previous twelve months. Top $Distribution_t$ represents the top quintile of distribution expenses (front-end loads and 12 b-1 fees).

	Estimate
Intercept	-0.0004
	(-0.41)
Top $Distribution_t$	0.0001
	(5.09)***
$Alpha_{t-12}$	0.01671
	(1.87)**
$Count_t$	-0.0001
	(-0.48)
Expense $Ratio_t$	0.0118
	(1.35)
$Flow_{t-1}$	0.0005
	(0.92)
$Ln(Size)_{t-1}$	0.0001
	(0.56)
$Load_t$	-0.0008
	(-1.59)
$\sigma(R)_{t-12}$	0.0148
	(5.35)***
$Turnover_t$	0.0001
	(2.81)***
Avg. Adjusted R^2	0.1139
Avg. Number of Funds	3929.2

Table V
Fama Macbeth Regressions of Monthly Performance Gap
Controlling for Price-to-Earnings of Fund

The dependent variable, *Performance Gap*$_{t+12}$, is calculated according to Friesen and Sapp (2007). Broker_PE$_t$, in model I, is the interaction between those funds with the top quintile of Price-to-Earnings and marketing fees as defined by Huang (2007). In model II, Broker_PE$_t$ is the interaction between funds in the top quintile of Price-to-earnings and the top quintile of distribution fees (12-b1 fees plus 1/7 of the front-end load). Model III retains the interaction variable, which represents broker sold funds(either a positive load or 12-b1 fee) that are in the top PE quintile. Price –to-Earnings$_t$ is the Morningstar PE where negative PE's are not used and PE's above 60 are capped at 60. Fund return is calculated as follows: $\prod(1 + Ret_t)^{1/t} - 1$.Investor return is arrived at by accumulating the initial Total Net Assets (TNA) plus intermittent cash flows to arrive at the ending TNA. Investor return is Rd in the following equation: $TNA_0 (1+Rd)^T + \sum \Delta TNA_t (1+Rd)^{T-t} = TNA_T$. Flow$_t$ is calculated according to Barber et al. (2005) and is defined as $\Delta TNA_t / TNA_{t-1}$, where TNA_{t-1} is total net assets of the fund at the end of the prior month in millions of dollars and $\Delta TNA_t = TNA_t - TNA_{t-1} (1+Ret_t)$. Ret is the net of expense return. Flow is winsorized at the 1st and 99th percentiles. Alpha$_{t-12}$ is the four-factor alpha on a rolling twelve month basis. $\sigma(R)_{t-12}$ is

	I	II	III
Intercept	0.0003	0.0001	0.0001
	(0.31)	(0.1)	(0.16)
Broker_PE$_t$	0.0111	0.0002	0.0001
	(1.94)**	(5.57)***	(3.30)***
Price-to-Earnings$_t$	-0.0001	-0.00003	-0.0001
	(-4.72)***	(-5.64)***	(-5.42)***
Load$_t$	-0.0004	-0.00059	-0.0003
	(-0.57)	(-1.11)	(-0.47)
Alpha$_{t-12}$	0.0151	0.0145	0.0148
	(1.63)*	(-1.61)	(1.64)
Count$_t$	-0.0001	-0.0001	-0.0001
	(-0.80)	(-.18)	(-0.2)
Expense Ratio$_t$	0.0084	0.0107	0.0097
	(1.02)	(1.21)	(1.11)
Flow$_{t-1}$	0.0004	0.0004	0.004
	(0.78)	(0.79)	(0.79)
Ln(Size)$_{t-1}$	0.0001	0.0001	0.0001
	(0.55)	(0.47)	(0.48)
$\sigma(R)_{t-12}$	0.0187	0.0166	0.0167
	(7.07)***	(7.42)***	(7.38)***
Turnover$_t$	0.00005	0.0001	0.0001
	(2.11)**	(2.70)***	(2.70)***
Avg. Adjusted R^2			0.1211
Avg. Number of Funds			3929.2