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Mutual fund performance when parent firms simultaneously manage hedge funds

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ABSTRACT

This study examines the performance of mutual funds managed by firms that simultaneously manage hedge funds. We find that the reported returns of mutual funds in these “side-by-side” associations with hedge funds significantly underperformed those of mutual funds that shared similar fund and family characteristics but differed in that they were not affiliated with hedge funds. Digging deeper into performance, we find that the underperformance was confined to return gaps, a return measure that captures the impact of unobservable managerial actions. Interestingly, mutual funds with investment styles that were most closely aligned to affiliated hedge funds generated reported-return alphas and return gaps that underperformed by the greatest amount. Finally, we find that side-by-side mutual funds received less of a contribution to performance from IPO underpricing than similar unaffiliated mutual funds or affiliated hedge funds. Evidence does not support the hypothesis that affiliations with hedge funds allow side-by-side mutual funds to attract superior stock-picking talent. Our evidence does not allow us to rule out the possibility that management firms maximized fee income by strategically transferring performance from mutual funds to hedge funds.

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Firms that engage in the simultaneous, or “side-by-side”, management of mutual funds and hedge funds often rely on common research teams to generate profitable trading ideas, shared trading personnel to execute trades, and mutual administrative staffs to carry out back-office functions. Industry proponents of side-by-side arrangements and a recent study by Nohel et al. (2008) argue that mutual

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fund investors benefit from their affiliation with hedge funds.¹ In particular, firms that also offer opportunities to work with hedge funds might be able to attract the best research analysts, traders, managers, and other employees. The argument is that hedge fund portfolios are less constrained, providing more intellectually stimulating and challenging environments than mutual funds. Moreover, hedge funds offer higher financial rewards owing to performance-based fees equal to 20% or more of realized capital gains and capital appreciation. This presumably places traditional mutual fund companies at a disadvantage relative to companies that also manage hedge funds.

At the same time, however, the differences in fees between mutual funds and hedge funds have led the US Securities and Exchange Commission (SEC) and others to express concerns about the welfare of mutual fund investors in side-by-side arrangements with hedge funds.² In particular, concerns have been voiced about incentives for management firms to increase fee income by strategically transferring performance to hedge funds from mutual funds. As articulated by the SEC and other commentators in the business press, favoritism can take many different forms. We list six examples: First, firms can front run the execution of hedge fund trades ahead of mutual fund trades. Second, in a practice known as “cherry-picking”, decisions about how a trade is allocated can be delayed, with trades experiencing favorable subsequent price movements allocated to hedge funds. Third, rather than allocating the average price paid in a bunched trade, shares bought at the lowest price and shares sold at the highest price can be allocated to hedge funds. Fourth, mutual funds can pay trade commissions inflated by soft dollar payments, but hedge funds can benefit from services purchased with the soft dollars.³ Fifth, firms can allocate disproportionately more underpriced IPO shares to hedge funds and fewer to mutual funds. In the sixth and final example, the favoritism is quid pro quo: For hedge fund investors who agree to commit assets for extended periods, firms extend stale-price or late-trading privileges in the mutual funds they oversee.⁴ In this last example, the wealth transfer may be more circuitous than in the other examples, but the end result is that hedge fund investors’ stale-price or late-trading profits come at mutual fund investors’ expense.

Given these two opposing views, the impact of side-by-side arrangements on mutual fund investors is an open question and lends itself to two testable hypotheses. The superior-talent hypothesis holds that better research and insights lead to better stock picks and better performance for the side-by-side mutual funds compared to otherwise similar mutual funds unaffiliated with hedge funds. In contrast, the favoritism hypothesis holds that side-by-side management firms transfer wealth from mutual funds to hedge funds, resulting in underperformance relative to otherwise similar unaffiliated mutual funds. In this paper, we examine the performance of side-by-side mutual funds relative to unaffiliated mutual funds, testing the opposing empirical predictions of the alternative hypotheses.

Well-known biases in hedge fund databases lead us to focus on the mutual funds in side-by-side relationships. Unlike mutual funds, hedge funds are not required to report returns or holdings at the fund level. To identify mutual funds run by firms that also run hedge funds, we design our sample construction methodology to mitigate biases caused by hedge funds only reporting voluntary. We use several sources to identify firms that manage hedge funds, including two directories that list hedge fund management firms even if they choose not to report to data vendors. Our final sample comprises 71 management firms that simultaneously ran 457 actively-managed US equity mutual funds side-by-side hedge funds between 1994 and 2004. The dollar amounts involved are substantial: During 2004, an average of \$448 billion was invested in actively managed side-by-side mutual funds, representing roughly ten percent of the amount invested in all US equity mutual funds.

Our first set of results show that the returns reported by side-by-side mutual funds significantly underperformed those of mutual funds that shared similar fund and family characteristics but differed in that they were not affiliated with hedge funds. The side-by-side funds’ reported-return Carhart alphas underperformed unaffiliated funds’ by an economically and statistically significant 4.0 basis

¹ See, for example, “Side-by-Side Funds Manage Around Conflicts”, *Absolute Return*, November 2006.

² US Securities and Exchange Commission (2003) articulates these concerns.

³ Greenwich Associates (2006) reports that in 2004, about 75% of mutual funds paid trade commissions that were inflated by soft dollar payments. More than 60% of US management firms that used soft dollars indicated that other departments within the firm benefited from services paid with equity trades.

⁴ The SEC’s case against Alliance Capital, discussed later, is a specific example of such favoritism.

points per month, or 48.1 basis points per year. The underperformance was not the result of differences in management fees. When expenses are added back to reported returns, side-by-side funds underperformed by 4.4 basis points per month, or 52.9 basis points per year. The reported-return results do not allow us to rule out the possibility that side-by-side mutual fund investors were adversely affected by favoritism in an economically meaningful way. Nor do the results allow us to rule out the possibility of superior stock-picking talent, as such benefits may be economically significant but overshadowed by the adverse consequences of favoritism or other factors.

To more directly test the superior-talent and favoritism hypotheses, we dig deeper into the performance of side-by-side mutual funds by decomposing reported returns into holdings returns and return gaps. We use holdings returns, calculated as the buy-and-hold return on a portfolio comprised of a fund's most recently disclosed securities, to more directly test the superior-talent hypothesis. Grinblatt and Titman (1989), the first to use holdings returns to study mutual fund performance, point out that holdings returns provide a measure of investment talent that is unaffected by transaction costs, fees, and other expenses. Under the superior-talent hypothesis, we would expect to find superior stock-picking ability reflected in holdings returns. We use return gaps, calculated as the fund's reported returns less its holdings returns, to more directly test the favoritism hypothesis. Kacperczyk et al. (2008) explain that return gaps estimate the impact of unobserved actions on funds' reported returns, including those related to agency costs. Our test of the favoritism hypothesis is based on the premise that all of the unobserved actions of favoritism described above affect reported returns but not holding returns. Thus, by stripping out the holdings return component from reported returns, return gaps offer more direct tests of favoritism.

Results show that holdings returns for side-by-side funds differ insignificantly from unaffiliated funds. Thus, we do not find support for the hypothesis that side-by-side funds attract and retain superior stock-picking talent. Return gaps for side-by-side funds, in contrast, significantly underperform those of unaffiliated funds. Side-by-side return gap underperformance is an economically and statistically significant 3.1 basis points per month, or 37.3 basis points per year. The drag on performance from unobserved actions is not driven by expenses, as return gap underperformance gross of expenses is 3.3 basis points per month, or 39.7 basis points per year. Thus, the underperformance in the reported returns of side-by-side funds is not attributable to holdings return underperformance, but rather to return gap underperformance and unobserved actions. Again, the evidence leaves open the possibility that firms engaged in acts of favoritism that strategically shifted returns away from side-by-side mutual fund investors.

Continuing to dig deeper, we next examine the cross-section of side-by-side funds based the similarity of mutual fund and affiliated hedge fund investment styles. Under the presumption that greater overlap of investment styles affords greater opportunities to strategically transfer returns, such analysis sheds further light on the favoritism hypothesis. Although hedge funds are not required to report holdings, their management firms are required to file 13F reports that detail aggregate long positions, including the combined holdings of mutual funds and hedge funds. Although the firm may also hold positions in separate accounts or proprietary accounts that it includes in its 13F report, we approximate a firm's hedge fund holdings by removing its reported mutual fund holdings from its reported 13F holdings. We find that mutual funds with investment styles that were most closely aligned to affiliated hedge funds generated reported return alphas that underperformed otherwise similar unaffiliated funds by 11.5 basis points per month, or 138.0 basis points per year. The underperformance is attributable to unobserved actions, as return gaps underperform by a significant 9.8 basis points per month, or 118.2 basis points per year. Return gaps gross of expenses are similar, implying that the drag on performance from unobserved actions is not related to management fees. In sharp contrast, we find no evidence of underperformance for mutual funds with investment styles that were most dissimilar from affiliated hedge funds. Thus, evidence proves consistent with increased opportunity for favoritism being associated with a greater drag on performance from unobserved actions.

The above returns-based evidence does not allow us to rule out the possibility that some firms favored hedge funds at the expense of mutual funds. In the final set of tests, we look for evidence inconsistent with favoritism using information other than fund returns. Specifically, we examine a potential wealth transfer mechanism, the contribution to a fund's return from IPOs. Using the number of shares disclosed at the next report date as an estimate of the number of shares bought at the offer

price, we examine whether the IPO contribution to performance differs for side-by-side mutual funds and unaffiliated mutual funds matched on investment objective, total assets, and portfolio turnover. We find evidence consistent with side-by-side mutual funds getting less of a contribution to performance from IPO underpricing than similar unaffiliated mutual funds. IPO underpricing contributed on average a significant 1.6 basis points per month of added return for unaffiliated mutual funds compared to side-by-side mutual funds. The contribution of IPO underpricing to differential performance is more striking when we condition on hot and cold IPO markets. During hot months with the greatest number of IPOs, the difference grows to 3.7 basis points of added return.

We also compare the IPO contribution to performance of side-by-side mutual funds and affiliated hedge funds. Results should be interpreted with two caveats. First, as noted above, our estimate of hedge fund holdings is only an approximation that may include holdings from separate accounts or proprietary accounts. Second, if indeed firms shifted allocations in hot IPO offerings to hedge funds at the expense of mutual funds, then firms may have masked such favoritism by trading newly acquired IPO shares out of the hedge funds before required disclosure at the next 13f holdings report date. With these caveats in mind, we find that side-by-side mutual funds capture less IPO underpricing than affiliated hedge funds, particularly in hot IPO markets. IPO underpricing contributed on average a significant 1.2 basis points per month of added return for hedge funds compared to affiliated mutual funds. In hot months, the differential contribution grows to 2.6 basis points. Again, results prove consistent with favoritism.

Our research contributes to the academic literature on agency conflicts in delegated portfolio management. In particular, our study adds to the literature that examines conflicts of interest involving performance transfers from one group of investors to another. A number of studies provide evidence consistent with management firms transferring performance across mutual fund investors through stale-price or late-trading schemes.⁵ In the mutual fund scandals that broke in 2003 based largely on this evidence, some firms allegedly extended stale-price and late trading privileges to investors who agreed to make side payments or commit assets to high-fee investment vehicles. The transfer of stale-price and late trading profits came at the expense of long-term investors in the same mutual fund. Evidence consistent with performance transfers within mutual fund families also exists. In particular, Gaspar et al. (2006) find indirect evidence consistent with firms maximizing fee income by favoring high-fee mutual funds or younger-aged and high-performing mutual funds best positioned to take advantage of the convex flow-return relation. The transfer of increased performance of favored mutual funds came at the expense of other members of the mutual fund family. Given the structural differences in fees between mutual funds and hedge funds, one might expect firms' incentives to transfer performance from mutual funds to hedge funds to be at least as great as across investors in the same mutual fund or across members of the same mutual fund family. Our evidence of poor return performance and smaller IPO allocations for side-by-side mutual funds proves consistent with this possibility. Of course, we cannot rule out the possibility that mechanisms other than favoritism explain the pattern of returns and IPO allocations. Further research, perhaps when more or better data become available, is beneficial in that light may be shed on the extent favoritism or other mechanisms affect the performance of side-by-side mutual funds.

The remainder of the paper is organized in four sections. Section 1 describes the data and the construction of the side-by-side mutual fund sample. Section 2 explains the methodology for tests based on reported returns, holdings returns, and return gaps; empirical results are also presented and interpreted. Section 3 discusses the methodology and evidence from tests based on the IPO contribution to performance. In Section 4, we offer concluding remarks.

1. Data and sample construction

We identify management firms that simultaneously ran actively-managed US equity mutual funds and hedge funds using a three-step procedure. First, we identify all firms that ran mutual funds.

⁵ Evidence consistent with stale-price trading is presented by Bhargava et al. (1998), Chalmers et al. (2001), Goetzmann et al. (2001), Green and Hodges (2002), Boudoukh et al. (2002), and Zitzewitz (2003). Evidence consistent with late trading is presented by Zitzewitz (2006).

Second, we identify the subset that also ran hedge funds. Third, we identify the subset that ran at least one actively-managed US equity mutual fund. The three-step procedure, detailed below, identifies a sample of 71 firms that ran 457 actively-managed US equity mutual funds side-by-side hedge funds between 1994 and 2004.

1.1. Identifying mutual fund management firms

We identify mutual fund management firms using an identification variable that is present in both Thomson's 13F and Thomson's CDA/Spectrum mutual fund holdings datasets. The variable is named differently in the two datasets: MGRNO in Thomson's 13F dataset and MGRCOCD in Thomson's CDA/Spectrum mutual fund dataset. MGRCOCD maps a given mutual fund identified by variable FUNDNO in Thomson's CDA/Spectrum mutual fund database to the corresponding firm in the 13F dataset that manages that fund. Since Thomson provides the management firm identification mapping only after 1994, we restrict our sample to the period 1994–2004. The procedure identifies 619 management firms that ran mutual funds between 1994 and 2004.

We make several checks for the accuracy and consistency of the MGRCOCD-FUNDNO link. We first run an algorithm that checks the validity of the map for the entire time series of a mutual fund by calculating an average match rate of the security holdings of each mutual fund with those of the parent 13F management firms and flags the cases with a low match rate.⁶ We then run a consistency check for mutual funds with an established link to a 13F management firm in some quarters, but not in others. We identify quarters with holdings data but with missing links, and fill in the appropriate management firm code whenever the same mutual fund is linked to the management firm in the prior and subsequent quarters.

1.2. Identifying managers who ran mutual funds side-by-side hedge funds

Among the 619 management firms that ran mutual funds between 1994 and 2004, we identify those that simultaneously ran hedge funds. The identification is not as straightforward as for mutual funds given the lack of hedge fund reporting requirements. Unlike mutual funds, management firms are not required to report hedge fund returns or holdings. Management firms are required to file quarterly 13F reports that list all long equity holdings, but 13F reports do not detail whether the positions are held in mutual funds, hedge funds, separate accounts, proprietary accounts, etc. Management firms only report hedge fund returns or holdings to data vendors on a voluntary basis, causing well known biases in hedge fund databases. We do not face the same selection bias in our study, however, as we only require the identity of the management firm that runs the hedge fund.

To mitigate potential selection bias, we use three sources to identify hedge fund management firms. The first is the CISDM hedge fund database, a historical database covering our entire sample period that associates each hedge fund with its corresponding management firm name. This database covers 3939 hedge funds with 1979 corresponding management firms. Running a name matching algorithm on the mutual fund management firm database created in the prior step and the CISDM hedge fund database, we identify 72 US management firms that simultaneously ran mutual funds side-by-side hedge funds between 1994 and 2004. The other two sources we use are the InvestmentSeek Hedge Fund Manager Directory, an online directory of 308 hedge fund management firms, and the HedgeCo Directory, a directory containing the names of over 4853 US hedge funds. The hedge fund directories incrementally add 32 side-by-side management firms, bringing the total to 104.

⁶ The average-match-rate algorithm calculates the average fraction of a mutual fund's reported stock holdings that also appear in the management firm's reported stock holdings. Given that the mutual fund and management firm report dates may not be synchronous, we choose a relatively low match-rate threshold of 10%. The integrity of the MGRNO in Thomson's 13F dataset and MGRCOCD in Thomson's CDA/Spectrum mutual fund dataset appears sound, as less than 1% of mutual funds fail to pass the average-match-rate filter. Funds that do not pass the average-match-rate filter are removed from the sample.

1.3. Identifying actively managed equity mutual funds in side-by-side relationships

We next identify the subset of side-by-side management firms that ran at least one actively-managed US equity mutual fund. We start by matching the Thomson's CDA/Spectrum mutual fund holdings data for all funds managed by the 104 side-by-side management firms identified in the previous step with the CRSP mutual fund database using MFLINKS dataset obtained from WRDS. Mutual funds with multiple share classes are combined to form a single fund. We then exclude all index funds and require funds to have an aggregate position in common stocks between 50% and 105%. To reduce any biases due to the presence of "incubator" funds in our sample, we removed observations with assets in the previous month less than \$5 million. Finally, using the S&P fund investment objective classification code (sp_obj_cd) from the CRSP mutual fund database, we require funds to have an investment objective that falls in one of the following classes: aggressive growth, mid cap, growth and income, growth, equity income and growth, or small cap. After applying the filters detailed above, we end up with a sample of 457 actively-managed US equity mutual funds run by 71 management firms that also ran hedge funds.

In our sample construction methodology, if a firm is identified as a hedge fund manager in any of the three sources, we identify all the mutual funds it manages as being in a side-by-side arrangement. Thus, if a firm chooses to report returns for only some of the hedge funds that it manages, the firm will be in our sample. Even if the firm chooses to not report returns to CISDM for any of its hedge funds, the firm will be included if listed as a hedge fund management firm in either of the directories.

1.4. Sample descriptive statistics

In Table 1 we report summary characteristics of the 457 side-by-side mutual funds and the 1488 actively-managed US equity mutual funds that were not affiliated with hedge funds over 1994–2004. Panel A shows that the percentage of assets held in domestic equities was somewhat higher for side-by-side mutual funds. The focus statistic, calculated following Siggelkow (2003), shows that side-by-side firms ran mutual fund families that were less focused in certain investment categories. Other characteristics do not show statistically significant differences in the means. Panel B shows that our sample of side-by-side funds is made up of a slightly higher proportion of growth and income, equity income and growth, and small cap funds and a slightly lower proportion of aggressive growth, mid cap, and growth funds than unaffiliated funds. Finally, Panel C reports the number and average total assets of side-by-side funds by year.

2. Reported returns, holdings returns, and return gaps

2.1. Methodology for calculating reported returns, holdings returns, and return gaps

Mutual fund reported returns data are from the CRSP Mutual Fund Database. Reported returns reflect capital appreciation and any distributions made by the fund during the month. For each mutual fund, we average the actual returns across all share classes belonging to that same mutual fund, weighted by share class assets at the beginning of the month. To isolate any effects of differential management expenses, we calculate reported returns net and gross of expenses.

To increase the power of our tests designed to detect stock-picking ability and favoritism, we decompose reported returns into holdings returns and return gaps. The security holdings used to estimate holdings returns are from Thomson CDA/Spectrum Mutual Fund Holdings Database. Holdings returns are calculated as a weighted average of the return on the most recently disclosed equity and cash positions. The equity holdings return is computed using the latest equity holdings information available from Thomson CDA/Spectrum Mutual Fund Holdings Database:

$$\text{Equity Holdings Return}_{i,t} = \sum_j \frac{\text{Shares}_{i,t-k}^j \times \text{Price}_{i,t-k}^j}{\sum_j \text{Shares}_{i,t-k}^j \times \text{Price}_{i,t-k}^j} \times \text{Ret}_{i,t}^j$$

Table 1
Sample descriptive statistics.

		Side-by-side funds		Unaffiliated funds		Mean difference	
		Mean	Median	Mean	Median		
Panel A. Mutual fund characteristics							
Total assets (million)		\$956	\$253	\$707	\$104	\$249 (1.60)	
Portfolio turnover rate (%)		98.72	82.40	114.09	73.00	−15.37 (−1.39)	
Domestic equity (%)		92.17	94.40	90.78	93.81	1.39 (2.99)	
Management expense ratio (%)		1.35	1.30	1.37	1.30	−0.02 (−1.06)	
Family size (million)		\$50,624	\$30,194	\$46,803	\$3657	\$3821 (0.57)	
Family focus (%)		32	28	39	30	−7 (−5.80)	
Fraction of load funds (%)		61		52		9	
Number of funds		457		1488		1031	
	Aggressive growth	Mid cap	Growth and income	Growth	Equity income and growth	Small cap	Total
Panel B. Mutual fund investment objectives							
Side-by-side funds							
Number	29	41	95	155	28	109	457
Percent	6.35%	8.97%	20.79%	33.92%	6.13%	23.85%	100%
Unaffiliated funds							
Number	100	154	293	575	62	304	1488
Percent	6.72%	10.35%	19.69%	38.64%	4.17%	20.43%	100%
Year	Side-by-side funds			Unaffiliated funds			
	Number of funds	Number of families	Fund total assets (\$billions)	Number of funds	Number of families	Fund total assets (\$billions)	
Panel C. Statistics on side-by-side funds by year							
1994	249	52	138	537	217	291	
1995	267	53	176	590	225	391	
1996	280	57	237	608	232	531	
1997	339	64	355	719	250	698	
1998	344	63	443	749	256	898	
1999	370	66	504	820	274	1113	
2000	396	69	556	989	337	1290	
2001	362	65	503	977	319	1125	
2002	356	65	429	988	313	1039	
2003	339	63	410	993	310	1092	
2004	325	62	448	968	292	1379	

This table reports summary characteristics of our sample of side-by-side mutual funds and the sample of actively managed US equity mutual funds that were not affiliated with hedge funds over 1994–2004. Panel A reports the number of mutual funds, mean and median total net assets, portfolio turnover rate, and management expense ratio. Panel B reports fund investment objectives. Panel C reports statistics on side-by-side funds and unaffiliated funds by year. Reported statistics are compiled from the CRSP mutual fund database.

where $t - k$ denotes the most recent holdings date for fund i ; $Price_{i,t-k}^j$ and $Shares_{i,t-k}^j$, respectively, denote the price per share and number of shares of security j held by fund i at the end of period $t - k$; and $Ret_{i,t}^j$ denotes the return realized by security j during month t .⁷ As in Kacperczyk et al. (2008), we use fund holdings as far back as six months. If a fund has not reported holdings in the past six months, then the observation is coded as missing. The cash holdings return is computed using the latest cash equivalent holdings, obtained from the CRSP Mutual Fund Database, and the risk-free rate of return.

The return gap is calculated as the difference between the reported return and the holdings return. As for reported returns, to isolate any effects of differential management expenses, we calculate return gaps net and gross of expenses.

⁷ We use the report date (RDATE) from Thomson CDA/Spectrum Database as the effective date of the holdings because this is the date for which the holdings are valid. Share holdings and security prices are adjusted for stock splits using the CRSP share and price adjustment factors.

2.2. Pooled regression methodology

We run pooled regressions that control for a broad set of mutual fund characteristics. Using individual fund level data, we regress measures of fund performance on our key independent variable, *side-by-side dummy*, and two sets of control variables. The first set controls for characteristics that prior research found to be significant in explaining subsidization across members of mutual fund families. The second set controls for other characteristics that prior research has shown significant in explaining mutual fund performance. To provide evidence on the performance of side-by-side mutual funds relative to other mutual funds with the same investment objective in the same month, we include separate fixed effects for each of the six investment objectives each month.

The dependent variable in the first two pooled regressions we run is the reported return alpha gross and net of expenses. We calculate reported return alphas on a rolling basis using the Carhart (1997) model and three years of data. Specifically, the estimate of the reported return alpha of fund i in month t , denoted by $\hat{\alpha}_{i,t}$, is calculated as

$$\hat{\alpha}_{i,t} \equiv (R_{i,t} - r_t^f) - \hat{\beta}_{iMKT}RMRF_t - \hat{\beta}_{iSMB}SMB_t - \hat{\beta}_{iHML}HML_t - \hat{\beta}_{iUMD}UMD_t,$$

where $R_{i,t}$ is the reported return for fund i in month t and r_t^f is the risk-free rate in month t . The common factor variables $RMRF_t$, SMB_t , HML_t , and UMD_t are the month- t return differentials between the market portfolio and risk-free rate, small cap and large cap stocks, high and low book-to-market stocks, and positive and negative return-momentum stocks, respectively.⁸ The factor loadings $\hat{\beta}_{iMKT}$, $\hat{\beta}_{iSMB}$, $\hat{\beta}_{iHML}$, and $\hat{\beta}_{iUMD}$ are estimated using the prior 36 months of returns. Mutual funds with fewer than 15 valid observations in the prior 36 months are treated as missing observations.

Our key independent variable, *side-by-side dummy*, is set equal to one if the mutual fund is managed by a firm that also manages at least one hedge fund, and zero otherwise. If a considerable fraction of firms that manage both mutual funds and hedge funds strategically transfer performance of a significant magnitude, then side-by-side mutual funds on average ought to exhibit returns that underperform those of similar unaffiliated mutual funds.

The next three independent variables control for mutual fund characteristics found by Gaspar et al. (2006) to be significant in explaining subsidization across members of mutual fund families: *young fund dummy*, *relative expense ratio*, and *year-to-date performance*. *Young fund dummy* is set equal to one if the fund is in the youngest quintile of its family and zero if it is not. The age argument is that families boost the performance of younger funds at the expense of older funds to increase inflows. Chevalier and Ellison (1997) show that younger mutual funds exhibit greater inflow sensitivity to good performance. The idea is that young funds' immediate performance is more informative to investors who are trying to learn the ability of the fund's unproven management. *Relative expense ratio* measures the difference between the management expense ratio for the fund and the average for its family. The fee argument is that families maximize overall fees by transferring performance to high-expense funds from low-expense funds. *Year-to-date performance* is the return of the fund since January of the current year, measured in monthly equivalent returns. The performance argument is that families further boost strong year-to-date performers at the expense of other funds in order to attract inflows. Chevalier and Ellison (1997) and Sirri and Tufano (1998), among others, find that investor inflows are more sensitive to top performing funds versus lower performing funds. Moreover, Nanda et al. (2004) present evidence of a spillover effect whereby the presence of a star fund positively affects investor flows to other family members.

The last seven independent variables control for other fund and family characteristics previously found by other studies to affect mutual fund performance: *focus*, *turnover*, *expense ratio*, *load dummy*, *net flows*, *log fund assets*, and *log family assets*. *Focus* is the investment category Herfindahl index for the family to which the fund belongs and measures the concentration of the fund family's assets in certain investment categories. Following Siggelkow (2003), for family k at time t , *Focus* is measured as

⁸ Data on the four common factors were obtained from Kenneth R. French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

$$Focus_{k,t} \equiv \sum_j \left(\frac{\text{assets of fund family } k \text{ in category } j \text{ at time } t}{\text{total assets of family } k \text{ at time } t} \right)^2,$$

where the sum is taken over all j investment categories of family k at time t . *Turnover* is the fund's turnover rate in the previous month. *Expense ratio* is the fund's management expense ratio in the previous month. *Load dummy* takes the value one if the fund charges a load and zero otherwise. *Net flow* is estimated as the change in assets over the previous month that is not attributable to fund asset returns, normalized by the fund assets at the beginning of the previous month. We assume that flows occur at the end of the month. *Log fund assets* is the log of the fund's total net assets as of the beginning of the month. Finally, *log family assets* is the log of the family's total net assets as of the beginning of the month.

2.3. Pooled regression results

Table 2 reports the loading estimates from the pooled regressions. The associated standard errors reported in parentheses are clustered by fund family. The dependent variables in the first two regressions are the reported return alphas gross and net of expenses, respectively. The last three regressions show results when reported returns are decomposed into holdings returns and return gaps. The dependent variables in the remaining three regressions are, respectively, the holdings return alpha, return gap net of expenses, and return gap gross of expenses.

The key results, reported in the first row, are the loadings on the side-by-side dummy. The first column of results shows that the side-by-side funds' reported-return alpha gross of expenses underperformed unaffiliated funds' by 4.4 basis points per month, or 52.9 basis points per year. The second column shows that underperformance is not the result of differences in management fees. Net of expenses, side-by-side funds' reported-return alpha underperformed by 4.0 basis points per month, or 48.1 basis points per year. The underperformances of reported-return alphas gross and net of expenses are significant at the 5% and 10% levels, respectively.

When reported returns are decomposed, the third column shows that holdings returns for side-by-side funds differ insignificantly from unaffiliated funds. Recall that holdings returns provide a measure of investment talent that is unaffected by transaction costs, fees, and other expenses. Thus, we do not find support for the hypothesis that side-by-side funds attract and retain superior stock-picking talent.

The final two columns show that return gaps for side-by-side funds significantly underperform those of unaffiliated funds. Recall that evidence of favoritism such as short-term front running, cherry picking, unbalanced bunched trade allocations, inequitable commission and soft dollar allocations, preferential IPO allocations, market timing, and late trading will show up in return gaps, but not holdings returns. By removing the noise generated by holdings returns, which are not affected by the types of favoritism listed above, we increase the power of tests. Side-by-side return gap underperformance gross of expenses is 3.3 basis points per month, or 39.7 basis points per year. The drag on performance from unobserved actions is not driven by expenses, as return gap underperformance net of expenses is 3.1 basis points per month, or 37.3 basis points per year. The underperformances of return gaps gross and net of expenses are both significant at the 5% level. Thus, the underperformance in the reported returns of side-by-side funds is not attributable to holdings return underperformance, but rather to return gap underperformance and unobserved actions. We cannot reject the hypothesis that firms engaged in acts of favoritism that strategically shifted returns away from side-by-side mutual fund investors.

The next three rows provide evidence on the cross mutual fund subsidization found by Gaspar et al. (2006). The reported-return regressions provide uneven evidence, with only the loading on year-to-date performance coming in positive and significant in both regressions as predicted. The return decomposition shows that the reported-return outperformance of strong year-to-date performers is the result of holdings-return outperformance. The return-gap loadings on the variables for cross mutual fund subsidization are all of the predicted signs: that is, higher return gaps for younger-aged and higher-fee members of mutual fund families and strong year-to-date performers. However, all three return-gap loadings prove to differ insignificantly from zero. Also, unreported regressions show that

Table 2

Return regression results.

Independent variables	Dependent variable				
	Reported return alpha		Holdings return alpha	Return gap	
	Gross of expenses	Net of expenses		Gross of expenses	Net of expenses
<i>Mutual fund to hedge fund subsidization variable</i>					
Side-by-side dummy	−0.044** (0.020)	−0.040* (0.021)	−0.010 (0.026)	−0.033** (0.016)	−0.031** (0.016)
<i>Cross mutual fund family subsidization variables</i>					
Young fund dummy	−0.004 (0.025)	−0.004 (0.025)	−0.014 (0.032)	0.028 (0.019)	0.028 (0.019)
Relative expense ratio	0.026 (0.038)	0.103** (0.052)	0.070 (0.060)	0.050 (0.034)	0.073 (0.045)
Year-to-date performance	0.150*** (0.010)	0.150*** (0.010)	0.129*** (0.010)	0.007 (0.012)	0.007 (0.012)
<i>Control variables</i>					
Focus	0.126*** (0.047)	0.136*** (0.046)	0.139*** (0.047)	−0.074** (0.032)	−0.071** (0.032)
Turnover	−0.052*** (0.020)	−0.047** (0.018)	−0.067*** (0.018)	0.018 (0.011)	0.019* (0.011)
Expense ratio		−1.947*** (0.454)	−1.227** (0.485)		−1.273*** (0.302)
Load dummy	−0.020 (0.019)	0.000 (0.022)	0.013 (0.027)	−0.018 (0.014)	−0.012 (0.016)
Net flows	1.010*** (0.249)	1.010*** (0.249)	0.613** (0.301)	0.595*** (0.171)	0.595*** (0.171)
Log fund assets	−0.031*** (0.007)	−0.033*** (0.007)	−0.025*** (0.008)	−0.018*** (0.006)	−0.019*** (0.006)
Log family assets	0.022*** (0.006)	0.020*** (0.006)	0.014* (0.009)	0.011** (0.005)	0.010** (0.005)
Fixed effect for each month * Investment objective	Yes	Yes	Yes	Yes	Yes
Number of observations	103,628	103,628	92,716	121,446	121,446
R-square	15.54%	15.62%	16.42%	5.99%	6.02%

This table reports loading estimates from pooled regressions of return measures on a set of fund characteristics. Separate regressions are run for five dependent variables: *reported returns alpha gross of expenses*, *reported returns alpha net of expenses*, *holdings returns alpha*, *return gap gross of expenses*, and *return gap net of expenses*. Alphas are calculated on a rolling basis using the Carhart model and three years of data. For example, the estimate of the reported return alpha of fund i in month t , denoted by $\hat{\alpha}_{i,t}$, is calculated as

$$\hat{\alpha}_{i,t} \equiv (R_{i,t} - r_t^f) - \hat{\beta}_{iMKT} RMRF_t - \hat{\beta}_{iSMB} SMB_t - \hat{\beta}_{iHML} HML_t - \hat{\beta}_{iUMD} UMD_t,$$

where $R_{i,t}$ is the reported return for fund i in month t and r_t^f is the risk-free rate in month t . The common factor variables $RMRF_t$, SMB_t , HML_t , and UMD_t are the month- t return differentials between the market portfolio and risk-free rate, small cap and large cap stocks, high and low book-to-market stocks, and positive and negative return-momentum stocks, respectively. The factor loadings $\hat{\beta}_{iMKT}$, $\hat{\beta}_{iSMB}$, $\hat{\beta}_{iHML}$, and $\hat{\beta}_{iUMD}$ are estimated using the prior 36 months of returns. Mutual funds with fewer than 15 valid observations in the prior 36 months are treated as missing observations. The key independent variable, *side-by-side dummy*, takes the value one if the fund is in a side-by-side arrangement and zero if it is not. *Young fund dummy* is set equal to one if the fund is in the youngest quintile of its family and zero if it is not. *Relative expense ratio* measures the difference between the management expense ratio for the fund and the average for its family. *Year-to-date performance* is the return of the fund since January of the current year, measured in monthly equivalent returns. *Focus* is the investment category Herfindahl index for the family to which the fund belongs and measures the concentration of the fund family's assets in certain investment categories. For family k at time t *Focus* is measured as

$$Focus_{k,t} \equiv \sum_j \left(\frac{\text{assets of fund family } k \text{ in category } j \text{ at time } t}{\text{total assets of family } k \text{ at time } t} \right)^2,$$

where the sum is taken over all j investment categories of family k at time t . *Turnover* is the fund's turnover rate in the previous month. *Expense ratio* is the fund's management expense ratio in the previous month. *Load dummy* takes the value one if the fund charges a load and zero if it does not. *Net flow* is estimated as the change in assets over the previous month that is not attributable to fund asset returns, normalized by the fund assets at the beginning of the previous month. We assume that flows occur at the end of the month. *Log fund assets* are the log total net assets of the fund as of the beginning of the month. *Log family assets* are the log total net assets of the family as of the beginning of the month. Regressions are run with investment-style and time fixed effects. Associated standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

interacting the side-by-side dummy with the year-to-date performance, young-age, and higher fee variables yields insignificant results.

The other control variable loadings in the reported-return regressions agree with the findings of previous research. The positive and significant focus loading is consistent with Siggelkow (2003), who finds that mutual fund returns are increasing with the degree of family specialization.⁹ The negative and significant turnover loading is consistent with increased liquidity-related or tax-related forced trades imposing additional costs on the fund or with increased information-related trading being unable to generate trading profits that exceed transactions costs.¹⁰ As expected, the loading on expenses enters net return performance numbers negatively. The load dummy proves insignificant. Also, unreported regressions show that interacting the load dummy with the side-by-side dummy yields insignificant results. Consistent with the “smart money” effect documented by Gruber (1996) and Zheng (1999), the loading on lagged net flows is positive and significant. Consistent with the argument of Perold and Salomon (1991), the total asset loading is negative and significant, suggesting that funds with smaller asset bases can more nimbly exploit securities mispricing opportunities. Finally, consistent with the Chen et al. (2004) finding that members of larger fund families outperform, the loading on the log of family assets is positive and significant, suggesting scale economies associated with trading commissions and trading fees.

2.4. Examining the overlap of mutual fund and affiliated hedge fund portfolios

We next examine the cross-section of side-by-side funds based on the similarity of investment styles with affiliated hedge funds. Based on the presumption that opportunities to strategically transfer returns across mutual funds and hedge funds are greater when there is a higher degree of overlap in investment styles and holdings, the analysis sheds further light on the favoritism hypothesis.

Although hedge funds are not required to report holdings, their management firms are required to file 13F reports that detail aggregate long positions. We approximate a firm's hedge fund holdings by removing its reported mutual fund holdings from its reported 13F holdings. The appendix includes a description of regulations pertaining to holdings reporting and a detailed discussion of our procedure for approximating the holdings of affiliated hedge funds. As described in the appendix, approximated hedge fund holdings may include the holdings of separate accounts or proprietary accounts. Also, mutual fund and hedge fund holdings are not synchronous in some cases.

Our procedure for scoring the similarity of mutual fund and affiliated hedge fund investment styles is based on three stock characteristics typically used for such purposes: size, book-to-market (i.e., value versus growth), and momentum.¹¹ More specifically, we compute the *Compare* score for firm k at time t as follows

$$Compare_{k,t} = \frac{1}{3} \left| SIZE_{k,t}^{MF} - SIZE_{k,t}^{HF} \right| + \frac{1}{3} \left| BTM_{k,t}^{MF} - BTM_{k,t}^{HF} \right| + \frac{1}{3} \left| MOM_{k,t}^{MF} - MOM_{k,t}^{HF} \right|,$$

where $SIZE_{k,t}^{MF}$ and $SIZE_{k,t}^{HF}$ are the value-weighted size quintile scores of all the stocks that at time t are, respectively, in the mutual fund and affiliated hedge fund portfolios of firm k , $BTM_{k,t}$ is the portfolio value-weighted book-to-market quintile score, and $MOM_{k,t}$ is the portfolio value-weighted momentum quintile score. We follow the Daniel et al. (1997) procedure for calculating

⁹ We thank an anonymous referee for pointing out that side-by-side funds could belong to less specialized families, which, based on Siggelkow's (2003) argument, makes them more likely to underperform. By including the *Focus* variable as a regressor, we control for this effect even if it is present.

¹⁰ Chordia (1996), Edelen (1999), Nanda et al. (2000), and Alexander et al. (2006) present evidence that mutual funds rebalance their portfolios in order to control liquidity. Gibson et al. (2000) and Huddart and Narayanan (2002) show that mutual funds trade to minimize taxable distributions heading into the tax year-end. In a rational expectations framework, these liquidity-related and tax-related trades primarily motivated by reasons other than valuation beliefs place mutual funds in the role of noise traders who should experience losses to informed investors.

¹¹ For example, Morningstar uses a three-by-three investment-style box categorization based on the size and value-versus-growth profiles of the underlying stocks in the portfolio.

the quintile scores for size, book-to-market, and momentum. We first rank all stocks into quintiles based on their market capitalization. We then rank stocks within each size quintile into quintiles based on their ratio of book value to market value of equity. Finally we rank stocks within each of the resulting 25 size and book-to-market sorted fractiles into quintiles based on momentum (using the past 12 months of returns). For example, a stock receives a size score of four if it belongs to the fourth size quintile score and a momentum quintile score three if it belongs to the third momentum quintile. The *Compare* score assigns a low value when mutual fund and affiliated hedge fund portfolios are similar in their investment styles and a high value when different.

We then rank all side-by-side firms into quintiles based on their average *Compare* score.¹² Side-by-side advisors in Q1 have the lowest *Compare* scores and thus the most similar investment styles. Those in Q5 have the highest *Compare* scores and thus the most dissimilar investment styles. We construct dummy variables that reflect each firm's membership in a particular quintile. For example, *Q1 Side-by-Side Dummy* (closely aligned investment styles) takes a value of one for mutual funds run by firms belonging to Q1, and a value of zero otherwise.

In Table 3 we extend our regression analysis by replacing the side-by-side dummy with the *Compare*-score dummies. We find that Q1 mutual funds with investment styles that were most closely aligned to affiliated hedge funds generated reported return alphas that underperformed otherwise similar unaffiliated funds by 11.5 basis points per month, or 138 basis points per year. The underperformance is attributable to unobserved actions, as return gaps underperform by a significant 9.8 basis points per month, or 118.2 basis points per year. Return gaps gross of expenses are similar, implying that the drag on performance from unobserved actions is not related to management fees. In sharp contrast, we find no evidence of underperformance for Q5 mutual funds with investment styles that were most dissimilar from affiliated hedge funds. Thus, evidence proves consistent with increased opportunity for favoritism being associated with a greater drag on performance from unobserved actions.

3. IPO contribution to performance

Our final tests provide evidence on a potential mechanism that management firms can use to transfer performance: the contribution to a fund's return from IPO allocations. Previous studies examine mutual funds for evidence of preferential IPO allocations. Reuter (2006) presents evidence consistent with underwriters favoring mutual fund families from whom they received more brokerage business. Gaspar et al. (2006) present evidence suggesting that mutual fund families favored high-value funds at the expense of low-value funds.

Following Reuter (2006) and Gaspar et al. (2006), we use the number of shares disclosed by the mutual fund at the next report date as an estimate of the number of shares bought at the offer price. The specific measure we analyze is the contribution to performance from IPO underpricing that Gaspar et al. (2006) use in their study. Intuitively, the measure estimates the contribution to a fund's return from the first-day underpricing (or overpricing) of all IPOs that it was allocated during the period.

We make two comparisons. First, we examine whether the IPO contribution to performance differs for side-by-side mutual funds and unaffiliated mutual funds matched on investment objective, total assets, and portfolio turnover. Second, we compare the IPO contribution to performance of side-by-side mutual funds and affiliated hedge funds.

3.1. Side-by-side mutual funds versus matched unaffiliated mutual funds

For each of the 457 side-by-side mutual funds each month, we identify a portfolio of matching unaffiliated mutual funds. Our matching procedure begins with all actively managed US equity mutual funds that share an investment objective: aggressive growth, mid cap, growth and income,

¹² Our methodology of categorizing each side-by-side management firm using the average of Compare scores across time rather than each period-specific Compare score is intended to mitigate any potential single-period, synchronicity-related biases.

Table 3

Return regressions and side-by-side quintiles.

Independent variables	Dependent variable				
	Reported return alpha		Holdings return alpha	Return gap	
	Gross of expenses	Net of expenses		gross of expenses	Net of expenses
Mutual fund to hedge fund					
<i>Subsidization variable</i>					
Q1 side-by-side dummy	−0.113*** (0.029)	−0.115*** (0.029)	−0.055 (0.045)	−0.098*** (0.026)	−0.098*** (0.026)
Q2–Q4 side-by-side dummy	−0.041* (0.022)	−0.035 (0.022)	−0.007 (0.029)	−0.037** (0.016)	−0.035** (0.017)
Q5 side-by-side dummy	0.008 (0.035)	0.013 (0.036)	0.021 (0.040)	0.033 (0.023)	0.035 (0.024)
<i>Control variable coefficients not reported</i>					
Number of observations	103,628	103,628	92,716	121,446	121,446
R-square	15.55%	15.63%	16.42%	6.01%	6.04%

This table reports loading estimates from pooled regressions of return measures on a set of fund characteristics. Separate regressions are run for three dependent variables: *reported returns alpha gross of expenses*, *reported returns alpha net of expenses*, *holdings returns alpha*, *return gap gross of expenses*, and *return gap net of expenses*. The holdings return alpha is calculated on a rolling basis using the Carhart model and three years of data. The estimate of the holdings return alpha of fund i in month t , denoted by $\hat{\alpha}_{i,t}$, is calculated as

$$\hat{\alpha}_{i,t} \equiv (R_{i,t} - r_t^f) - \hat{\beta}_{iMKT} RMRF_t - \hat{\beta}_{iSMB} SMB_t - \hat{\beta}_{iHML} HML_t - \hat{\beta}_{iUMD} UMD_t,$$

where $R_{i,t}$ is the reported return for fund i in month t and r_t^f is the risk-free rate in month t . The common factor variables $RMRF_t$, SMB_t , HML_t , and UMD_t are the month- t return differentials between the market portfolio and risk-free rate, small cap and large cap stocks, high and low book-to-market stocks, and positive and negative return-momentum stocks, respectively. The factor loadings $\hat{\beta}_{iMKT}$, $\hat{\beta}_{iSMB}$, $\hat{\beta}_{iHML}$, and $\hat{\beta}_{iUMD}$ are estimated using the prior 36 months of returns. Mutual funds with fewer than 15 valid observations in the prior 36 months are treated as missing observations. The key independent variable, *side-by-side dummy*, takes the value one if the fund is in a side-by-side arrangement and zero if it is not. The Q1 through Q5 side-by-side dummies are constructed by ranking all the advisors in side-by-side arrangements into quintiles based on their average *Compare* score. Side-by-side advisors in Q1 have the lowest and advisors in Q5 have the highest *Compare* score. If, for example, a fund is run by an advisor that belongs to Q1 then Q1 side-by-side dummy for that fund takes a value of one. It takes a value of 0 for all the other funds whose advisors do not belong in Q1. The *Compare* score for advisor k at time t is computed as follows

$$Compare_{k,t} \equiv \frac{1}{3} |SIZE_{k,t}^{MF} - SIZE_{k,t}^{HF}| + \frac{1}{3} |BTM_{k,t}^{MF} - BTM_{k,t}^{HF}| + \frac{1}{3} |MOM_{k,t}^{MF} - MOM_{k,t}^{HF}|,$$

where $SIZE_{k,t}^{MF}$ and $SIZE_{k,t}^{HF}$ are the value-weighted size quintile scores of all the stocks that at time t are, respectively, in the mutual fund and the hedge fund portfolios of advisor k , $BTM_{k,t}$ is the portfolio value-weighted book-to-market quintile score, and $MOM_{k,t}$ is the portfolio value-weighted momentum score. Control variables are described in Table 2 and their coefficients are not reported here. Associated standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

growth, equity income and growth, or small cap. Each month, all actively managed funds that share an investment objective are ranked on total assets and sorted to form size quintiles. Funds are then ranked separately on portfolio turnover and sorted to form turnover quintiles. The procedure produces 25 size and turnover portfolios each month for each investment objective. Finally, we remove side-by-side funds from each of the 25 portfolios and the remaining funds constitute what we refer to as the 25 matching portfolios in each investment objective.

Using data from SDC, we identify all common stock IPOs that took place each month from 1994 to 2004. In order to make meaningful comparisons, we focus on common holdings report dates. That is, we only include instances when the side-by-side fund and at least one matched unaffiliated fund report their holdings on the same date. If two or more matched unaffiliated funds report holdings on the same date as the side-by-side fund, we aggregate all the holdings of the matched unaffiliated funds to construct an aggregate matching portfolio. For each report date, we identify side-by-side and matched unaffiliated fund holdings of all IPOs that took place during the last three months. Then for each of these three months, we calculate the monthly contribution to each fund's return from IPO

underpricing. The IPO contribution to performance is calculated as the dollar value of IPO underpricing allocated to the fund each month divided by fund assets as of the beginning of that month:

$$IPO \text{ Contribution to Performance}_j^t = \frac{\sum_{i=1}^{K_t} (\# \text{ shares}_{ij}^t \times \Delta \text{price}_{ij}^{\text{Day}-1})}{\text{assets}_j^{t-1}},$$

where $\# \text{ shares}_{ij}^t$ represents the number of IPO i shares allocated to fund j in month t , $\Delta \text{price}_{ij}^{\text{Day}-1}$ represents the price change for IPO i shares calculated as the difference between the offer price and the price at the end of the first trading day, and assets_j^{t-1} represents the assets of fund j at the end of month $t - 1$. We calculate the IPO contribution to performance for the aggregate matching portfolio in the same way: Specifically, the total dollar value of IPO underpricing allocated to all funds in the matching portfolio each month is divided by the aggregate total net assets of all funds as of the beginning of the month.

Table 4 presents the IPO contribution to performance for side-by-side funds and matched unaffiliated funds. Panel A shows evidence that is consistent with side-by-side funds being allocated less IPO underpricing than their matched unaffiliated counterparts. IPO underpricing contributes an average of 3.2 basis points to the monthly return of side-by-side funds versus 4.8 basis points to the monthly return of matched unaffiliated funds. The 1.6 basis point differential of added monthly return for matched unaffiliated funds versus side-by-side funds is highly significant.

To understand how the differential IPO contribution to performance varies with hot and cold IPO markets, we rank all months in the sample period by the number of IPOs that occurred. We categorize months in the top quintile as hot IPO months. Panel B shows that the contribution of IPO underpricing to differential performance is more striking when we condition on hot and cold IPO markets. Providing further evidence consistent with favoritism playing a role in the allocation of IPOs by side-by-side management firms, the difference grows to 3.7 basis points of added return for matched unaffiliated funds relative to side-by-side funds during months categorized as hot.

Our evidence is similar to the Gaspar et al. (2006) finding that mutual fund families maximize fee income by allocating more IPO underpricing to high-value funds and less to low-value funds. Our

Table 4

IPO contribution to performance for side-by-side and matched mutual funds.

Portfolio	Side-by-side funds	Matched funds	Difference
<i>Panel A. Contribution to performance of IPO holdings</i>			
Contribution to performance	0.0318*** (0.0011) $N = 21,603$	0.0477*** (0.0009)	−0.0160*** (0.0014)
IPO markets	Side-by-side funds	Matched funds	Difference
<i>Panel B. Contribution to performance of IPO holdings in hot vs. cold IPO markets</i>			
Q [1] hottest	0.0542*** (0.0035) $N = 3702$	0.0909*** (0.0033)	−0.0366*** (0.0047)
Q2–Q4	0.0313*** (0.0014) $N = 14,671$	0.0454*** (0.0010)	−0.0142*** (0.0016)
Q5 coldest	0.0084*** (0.0010) $N = 3230$	0.0087*** (0.0010)	−0.0005 (0.0014)
Q1–Q5	0.0458*** (0.0038)	0.0822*** (0.0037)	−0.0361*** (0.0052)

This table reports the IPO contribution to performance for the side-by-side funds and the matched unaffiliated portfolio of funds. The IPO contribution to performance is calculated as the dollar value of IPO underpricing allocated to the fund each month divided by fund assets as of the beginning of that month. We calculate the IPO contribution to performance for the aggregate matching portfolio in the same way: Specifically, the total dollar value of IPO underpricing allocated to all funds in the matching portfolio each month is divided by the aggregate total net assets of all funds as of the beginning of the month. Panel A reports overall IPO contribution to performance results. Panel B reports IPO contribution to performance results stratified by “hot” and “cold” IPO markets. To identify hot and cold IPO markets, we rank all months in the sample period by the number of IPOs that occurred. We categorize months in the top quintile as hot IPO months. IPO contribution to performance is reported in percentages and associated standard errors are reported in parentheses.***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

evidence proves consistent with another instance of preferential IPO allocations. Specifically, our evidence is consistent with management firms maximizing fee income by allocating more IPO underpricing to hedge funds.

3.2. Side-by-side mutual funds versus affiliated hedge funds

Finally, we compare the IPO contribution to performance of each firm's mutual funds to its hedge funds. To construct an estimate of the IPO allocation for the aggregate portfolio of each firm's mutual funds, we sum all IPO holdings that appear in the nearest holdings report filed after the IPO by each of the mutual funds managed by the firm. Similarly, we estimate the IPO allocation for the firm's hedge funds using the approximated holdings from the nearest 13F report filed after the IPO. Results are reported in Table 5.

Results should be interpreted with several caveats. First, as noted above, our estimate of hedge fund holdings is only an approximation that may include holdings from separate accounts or proprietary accounts. Second, as described in the appendix, mutual fund and hedge fund holdings snapshots may not be perfectly synchronous. Finally, if indeed firms shifted allocations in hot IPO offerings to hedge funds at the expense of mutual funds, then firms may have masked such favoritism by trading newly acquired IPO shares out of the hedge funds before required disclosure at the next 13F holdings report date.

With these caveats in mind, we find that side-by-side mutual funds capture less IPO underpricing than affiliated hedge funds, particularly in hot IPO markets. IPO underpricing contributed on average a significant 1.2 basis points per month of added return for hedge funds compared to affiliated mutual funds. In hot months, the differential contribution grows to 2.6 basis points. Again, evidence proves consistent with firms favoring hedge funds with larger IPO allocations than mutual funds.

Table 5

IPO contribution to performance for side-by-side mutual funds and affiliated hedge funds.

	Side-by-side mutual funds	Hedge funds	Mutual funds–hedge funds
<i>Panel A. Contribution to performance of IPO holdings</i>			
Managers excluding ETFs	0.0322*** (0.0024) N = 3372	0.0438*** (0.0033)	−0.0116*** (0.0030)
IPO markets	Side-by-side mutual funds	Hedge funds	Mutual funds–hedge funds
<i>Panel B. Contribution to performance of IPO holdings in hot vs. cold IPO markets</i>			
Q1 hottest	0.0418*** (0.0051) N = 785	0.0680*** (0.0086)	−0.0262*** (0.0079)
Q2–Q4	0.0320*** (0.0031) N = 2217	0.0407*** (0.0039)	−0.0087** (0.0036)
Q5 coldest	0.0131*** (0.0028) N = 370	0.0111*** (0.0027)	0.0020 (0.0027)
Q1–Q5	0.0286*** (0.0064)	0.0568*** (0.0117)	−0.0282** (0.0110)

This table reports the IPO contribution to performance for the side-by-side mutual fund portfolio and the affiliated hedge fund portfolio. The IPO contribution to performance is calculated as the dollar value of IPO underpricing allocated to the portfolio each month divided by portfolio assets as of the beginning of that month. To identify post-issue IPO holdings, we use quarterly 13F holdings reports filed subsequently to each IPO between 1994 and 2004. Given that 13F reports combine mutual fund and hedge fund IPO holdings, we need to separate IPO holdings. We do this by forming an aggregate mutual fund portfolio each quarter for each side-by-side manager and then subtracting mutual fund IPO holdings from 13F holdings to obtain hedge fund IPO holdings. Panel A reports overall IPO contribution to performance results for all side-by-side managers excluding ETF providers. Panel B reports results stratified by “hot” and “cold” IPO markets. To identify hot and cold IPO markets, we rank all months in the sample period by the number of IPOs that occurred. We categorize months in the top quintile as hot IPO months. IPO contribution to performance is reported in percentages and associated standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

4. Conclusion

We find that the reported returns of side-by-side mutual funds significantly underperformed those of mutual funds that shared similar fund and family characteristics but differed in that they were not affiliated with hedge funds. Digging deeper into performance by decomposing reported returns, we find that holdings returns for side-by-side mutual funds differ insignificantly from unaffiliated mutual funds. We find that the underperformance was confined to return gaps. Interestingly, mutual funds with investment styles that were most closely aligned to affiliated hedge funds generated reported-return alphas and return gaps that underperformed by the greatest amount. Finally, we find that side-by-side mutual funds received less of a contribution to performance from IPO underpricing than similar unaffiliated mutual funds or affiliated hedge funds. Our evidence does not support the hypothesis that affiliations with hedge funds allow side-by-side mutual funds to attract superior stock-picking talent. Rather, our evidence of poor return performance and smaller IPO allocations for side-by-side mutual funds proves consistent with management firms maximizing fee income by strategically transferring performance from mutual funds to hedge funds.

Of course, we cannot rule out the possibility that mechanisms other than favoritism explain the pattern of returns and IPO allocations. Further research, perhaps when more or better data become available, will help shed light on the extent favoritism affects the performance of side-by-side mutual funds. Such additional research is worthwhile given our findings and recent SEC charges of favoritism against side-by-side management firms. In a highly publicized case, Alliance Capital provided timing (i.e., stale-price trading) capacity in its mutual funds to investors who agreed to commit assets for extended periods to its hedge funds and other investment vehicles. Alliance Capital's single largest timer at its height received \$220 million in timing capacity in its mutual funds in exchange for committing assets to its hedge funds. At one point in 2003, Alliance Capital granted over \$600 million in timing capacity in its mutual funds. Clearly Alliance Capital benefited while hedge fund investors profited at mutual fund investors expense. In another case, the side-by-side management firm benefited by transferring wealth across both channels: to a high-fee hedge fund and a high-value mutual fund. Nevis Capital Management, despite having 105 clients, allocated all underpriced IPO shares to Snowdon Limited Partnership, a hedge fund, and Nevis Fund, a start-up mutual fund. Unlike other clients, Snowdon paid a 20% performance-based management fee. Nevis Fund, on the other hand, was young and seeking new investors through strong performance. In Nevis Fund's case, the favoritism was extreme, perhaps triggering the regulatory scrutiny: The SEC reported that disproportionate IPO allocations boosted cumulative returns in the periods ending May 31, September 30, and December 31 of 1999 from –5%, –3.6%, and 41% to 90.1%, 154.6%, and 286.5%, respectively.

Particularly when considered against the backdrop of the Alliance Capital and Nevis Capital Management cases, our research has important normative implications. To protect side-by-side mutual fund investors, management firms should design and adopt strong conflict of interest policies. For example, when multiple mutual funds and hedge funds want to simultaneously buy (or sell) a particular security, sequential trades can be assigned on a randomized basis or trades can be allocated on a pro rata basis, with funds' total net assets serving as the allocation weights. In addition to stronger conflict of interest policies, disclosure should increase. Although recent SEC regulations require more comprehensive mutual fund disclosure about potential conflicts of interest, management firms are still not explicitly required to disclose to mutual fund investors that they also run hedge funds, nor are they required to disclose conflict-of interest policies.¹³ To make fully informed decisions, mutual

¹³ The new disclosure requirements, which became effective October 1, 2004, are described in [US Securities and Exchange Commission \(2004\)](#). Current regulations require that if the *person*, not *firm*, managing the mutual fund also runs other portfolios, such as hedge funds, then these other management positions must be disclosed in the Statement of Additional Information (SAI). The SAI is part of a mutual fund's registration statement and contains additional information not contained in the mutual fund's prospectus. Although mutual fund investors do not receive the SAI report by default, mutual fund firms are required to deliver the SAI to investors upon request. The SAI can also be found on the SEC Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system. Some may question, however, the effectiveness of the new disclosure requirement, given that the typical mutual fund investor is unlikely to explicitly request the SAI or even know that it exists. However, as [Reuter \(2006\)](#) and [Zitzewitz \(2006\)](#) point out, the financial media play an important role in generating and disseminating information to consumers and investors. The financial media can now much more easily access conflict-of-interest information and distill it for the public.

fund investors should know whether a firm also runs hedge funds and should have at least general information about the firm's conflict of interest policies.

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Appendix. Approximating affiliated hedge fund holdings

In order to approximate holdings for affiliated hedge funds, we merge holding reports filed at the investment management company level (13F filings) with similar reports filed by all mutual funds (N-30D, N-30B-2, N-CSR, N-CSRS, and N-Q filings) managed by the same firm. The ownership databases we used were all obtained from Thomson Financial and are free of survivorship bias. We first discuss regulations pertaining to security holding reports that management firms are required to file. We then discuss our procedure for approximating affiliated hedge fund holdings.

A.1. Regulations pertaining to security holdings reports

In 1975, the Congress amended section 13(f) of the Securities Exchange Act in order to increase the public awareness and availability of information on the securities holdings of institutional investors. The new rule required all firms with investment discretion over \$100 million or more in exchange-traded or NASDAQ-quoted equity securities to file form 13F with the SEC within 45 days of the end of each calendar quarter. Firms are required to report all equity positions greater than either 10,000 shares or \$200,000 in market value. CDA/Spectrum, later acquired by Thomson Financial, was hired by the SEC to process these quarterly filings and Thomson's CDA/Spectrum maintains a historical database of all 13F reports filed with the SEC since 1980.

Thomson Financial also compiles holding reports filed at the mutual fund level. Under Section 30 of the Investment Company Act of 1940, firms that manage mutual funds are required to file N-30D reports that detail complete portfolio holdings at the end of each fiscal semiannual period for each individual fund that they manage.

Prior to 1985, firms were required to file fund-holding reports on a quarterly basis. After 1985, although funds were required to report their holdings only semiannually, a majority of firms chose to report mutual fund holdings on a quarterly basis through N-30B-2 filings. Although funds were required to report their holdings only semiannually after 1985, [Wermers \(2000\)](#) points out that the majority of funds choose to report holdings to Thomson's CDA/Spectrum on a quarterly basis. One possible incentive to provide these reports, suggested by [Frank et al. \(2004\)](#), is a clientele effect whereby some investors who value more frequent disclosure are willing to pay higher fees.

After 2003 and following Sarbanes-Oxley Act of 2002, the SEC adopted new rules that require mutual funds and other registered management investment companies to file holding reports on new forms: Form N-CSR and Form N-CSRS, for annual and semiannual reports respectively. Such reports must be filed within 10 days after the transmission of any annual or semi-annual report to shareholders. Firms are no longer required to submit N-30D holding reports. In May 2004, the SEC decided to adopt a new disclosure rule requiring investment companies to report holdings in the first and the third quarters of each fiscal year through N-Q filings, in addition to the annual and semiannual reports. These additional reports shall be filed not later than 60 days after the close of the first and third quarters of each fiscal year. The SEC expects that "by June 30, 2005, all funds will have begun to file reports on Form N-Q" for the first and third quarters in addition to forms N-CSR and N-CSRS for the second and

fourth quarters (semiannual and annual filings). Form N-Q must be filed electronically with EDGAR, but is not required to be delivered to shareholders.

A.2. Procedure for approximating affiliated hedge fund holdings

13F holdings are of quarterly frequency and represent holding snapshots at calendar quarter ends. Mutual fund holding reports represent snapshots as of the end of fiscal quarters. Because fiscal reporting dates for some mutual funds do not necessarily coincide with calendar quarter ends, Thomson aligns mutual fund holdings to calendar quarter ends. In addition, Thomson's CDA/Spectrum makes every attempt to provide quarterly holding information for funds that do not file every quarter. For some of these cases, Thomson's CDA/Spectrum fills in missing quarters by obtaining holding reports directly from the funds, or by carrying forward the holding reports that were filed in the prior quarters.¹⁴ Since the latter practice might create a lack of synchronicity between 13F filings and the holding reports of the corresponding individual mutual funds that the firm manages, we follow a merging procedure intended to mitigate such an effect. More specifically, we match 13F holdings reported by a particular firm at the end of the calendar quarter with holdings of all the funds managed by that same firm that were reported (we use the actual report date in Thomson, RDATE) at any time during that same quarter.

At the end of each calendar quarter we aggregate holdings reported by all mutual funds that were managed by the same firm to construct the aggregated mutual fund portfolio for that particular firm. The hedge fund portfolio is approximated by subtracting the holdings of the aggregated mutual fund portfolio from the total 13F holdings reported by the same firm.

We then take steps to ensure that the holdings of closed-end mutual funds and passively managed open-end mutual funds are excluded from both the mutual fund and hedge fund portfolios. Closed-end fund holdings and passively managed open-end fund holdings are included in Thomson's CDA/Spectrum mutual fund holdings database and were excluded from hedge fund holdings during the prior step of subtracting all mutual fund holdings from the 13F firm holdings. Closed-end fund holdings are excluded from the aggregated mutual fund holdings using identifiers in the CRSP mutual fund database through the WRDS' MFLINKS. Passively managed open-end funds are excluded from the aggregated mutual fund holdings using a search algorithm that excluded funds with names identifying them as passively managed.

To mitigate problems that might arise due to data errors, we apply filters to exclude the following observations: (1) firm quarters where the aggregated value of mutual fund assets (from the N-30D and N-30B-2) exceeded the value of the associated firm's total assets (from the 13F); (2) firm quarters where the change in the total assets of aggregated mutual fund holdings at the firm level was not between –50% and 100%; (3) firm quarters where the change in total assets managed by the firm was not between –50% and 100%; (4) stock holdings that showed total institutional ownership greater than 100% of the total shares outstanding at the end of the quarter; (5) stock holdings that experienced decimal shifts in the number of shares held from one report to another; (6) stock holdings that were present in a given firm's aggregated mutual fund portfolio but not in the firm's 13F report for that quarter.

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¹⁴ See Wermers (2000) for an extended description of Thomson's CDA/Spectrum mutual holdings database.

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