Do portfolio managers moonlighting between mutual funds and hedge funds create conflicts of interest?[1]

Li-Wen Chen
Department of Banking and Finance
National Chi-Nan University

Fan Chen[2]
E.J. Ourso College of Business
Louisiana State University

First draft: August, 2005
This version: November, 2006

[1] The authors would like to thank Myron Slovin, Laura Starks, Gary Sanger, Don Chance, Bill Lane, and Ji-Chai Lin for their valuable comments as well as seminar participants at Louisiana State University, the 2006 Financial Management Association conference, the 2006 Eastern Finance Association conference and the 2006 Southwest Finance Association meeting. The authors also thank University of Massachusetts Amherst for providing CISDM hedge fund database. The authors acknowledge the research award at 2005 SFM meeting. All remaining errors are ours.
[2] Corresponding author: Department of Finance, E. J. Ourso College of Business, Louisiana State University, Baton Rouge, LA 70803.Tel: (225) 578-6239, fax:(225) 578-6366. E-mail: fchen4@lsu.edu.

Do portfolio managers moonlighting between mutual fund and hedge fund create conflicts of interest?

Abstract

This paper examines the performance, asset flows, and risk incentives of moonlighting fund managers to provide evidence on whether moonlighting across mutual funds and hedge funds strengthens incentives or creates conflicts of interest. We report three major findings. First, prior to moonlighting, hedge fund managers experience worse performance, while mutual fund managers achieve better performance, relative to their full-time peers. Second, hedge fund managers that choose to moonlight are disproportionately those with less experience and poorer performance. Although recognition increases with moonlighting, the asymmetry of performance, asset flows, and risk incentives between portfolios suggest potential conflicts of interest. Third, reputational capital, marking to market, and option-like incentive contracts induce mutual fund managers that choose to moonlight to take on additional risk, resulting in outperformance relative to their full-time peers.

JEF classification: G1, G2

Keywords: Mutual fund, Hedge fund, Reputational capital, Management incentives, Conflicts of interest

1. Background information

Unlike mutual funds, hedge funds are speculative investment vehicles targeted to mainly high net-worth individuals and institutional investors. Hedge fund managers can hold a wide spectrum of financial instruments and have the flexibility to pursue whatever investment or trading strategies they choose. This lack of constraints gives hedge fund portfolio managers an advantage in down markets relative to mutual fund managers, who can only trade and hold publicly traded securities. Another major difference is the structure of management compensation. Most hedge fund companies charge a flat management fee of 1% to 2% based on the total assets under management plus 20% to 25% incentive fees[3]. Mutual fund companies charge fees of from 1% to 2% on the amount of assets under management, irrespective of performance. Boyson (2005) notes that a hedge fund manager with $115 million of assets in 2001 earned about $4 million that year, while a comparable mutual fund manager earned about $400,000. Goetzmann, Ingersoll and Ross (2003) report that incentive fees for money managers are frequently accompanied by high-water mark provisions that condition the payment of the performance fee on their ability to exceed the previously achieved maximum share value.

There are important regulatory differences between mutual funds and hedge funds. Mutual funds are subject to extensive disclosure under the 1940 Investment Company Act. Prior to 2004, hedge funds were exempt from sections 3(C) 1 and 3(C) 7 of the 1940 Investment Company Act if they had either fewer than 100 investors (or partners) or all of their investors met the eligibility requirements for exemption under section 3 (C) (7). Hedge funds are also exempt from regulations under the Securities Act of 1933 because their securities are offered privately. Information asymmetry and the lack of distribution and marketing channels make it more difficult for hedge fund managers to establish the recognition needed to attract capital flows. In contrast, requirements of marking to market and public disclosure make mutual funds more transparent, reducing information asymmetry. Thus, portfolio managers and their managing companies can accumulate considerable reputational capital if they consistently outperform their peers, suggestive of

[3] Incentive fees being paid in hedge fund industry range from beating benchmark index (a hurdle rate) or simply from generating positive returns.

a tournament process.

Given this regulatory framework, moonlighting between mutual funds and hedge funds can provide a valuable vehicle for portfolio managers to target different sets of audiences and yet achieve economies of scale. Mutual fund managers who have established a strong reputation due to past performance can target a broader field so as to be better compensated for their talents while permitting them to remain with their existing fund companies since moonlighting affords them an opportunity to achieve economies of scales with minimum additional cost. Hedge fund managers can also benefit from moonlighting by establishing more effective marketing through their mutual fund operations. The disclosure and marking to market required of a mutual fund can help hedge fund managers to establish better public recognition and generate improved future asset flows if their mutual fund operations can outperform their peers.

However, moonlighting is associated with costs. For example, in running both a hedge fund and a mutual fund, managers may have to weight the benefits to the parent firm from each activity. Moreover, managers receive greater compensation for hedge fund products than mutual fund products. As a result, fund managers are likely to have an incentive to work more assiduously for their hedge fund clients, creating a potential conflict of interest as to where portfolio managers send the trades. Barclay and Warner (1993) propose a stealth trading hypothesis to explain how informed traders use their private information to structure trades and to move share prices. Large trades are broken up into smaller trades so that the first few trades earn a greater profit than succeeding trades. As a result, moonlighting managers can place hedge fund orders prior to those of a mutual fund[4] to capture higher potential gains from informed trading for hedge fund clients at the expense of mutual fund clients.

There is considerable evidence that reputational capital can serve as a device to discipline managers to induce them to work in the best interests of their clients thus mitigating agency problems and potential conflicts of interest. Although Hayward and

[4] This is also known as front-running.

Boeker (1998) find that analysts rate their clients' securities more favorably than other analysts rating the same securities, they also report that this bias is moderated by the reputation of analysts and their firm. Stickel (1992) documents that there is a positive relation between analyst reputation and performance and concludes that analysts on the All-Americans Research Team generate more accurate earnings forecasts than other analysts. Reputation can also serve to counter information asymmetry problems. Carter and Manaster (1990) find that low risk firms attempt to reveal their favorable characteristics to the market by selecting underwriters with greater prestige. For bond underwriting by investment banks, Fang (2005) shows that economic rents are earned on reputation, providing an incentive for underwriters to maintain reputation.

Although the market may induce portfolio managers and their managing companies to undertake efforts at self-monitoring to counter potential conflicts of interest, the SEC has continued to attempt to increase its oversight of the hedge fund industry. It has proposed either an outright ban on management firms handling both hedge funds and mutual funds or adherence to a strict code of conduct for moonlighting, with both internal and external oversight of the investing process. In May 2005, the SEC adopted new rules, 203 (b) (3)-2, amended related rules, and form ADV under the Investment Advisers Act of 1940, to require certain hedge fund with more than $25 million of assets to register. Hedge funds with $30 million or more and 15 or more U.S. clients during the preceding 12 months were to be required to register with the SEC under the Advisers Act by February 1st, 2006. The SEC argued that these actions were consistent with its efforts at strengthening internal monitoring and governance mechanisms as well as improving the alignment of management and shareholders' interests. However, on June 23rd, 2006, a federal appeals court overruled the SEC's proposed rules for the third time in less than a year. Specifically, the court invalidated rules requiring mutual fund board chairmen to be independent of management and that hedge funds register with the SEC and open their books for regulatory inspection. The three judge panel criticized securities regulators for interpreting legal definitions too broadly as a means of bringing hedge funds under their scrutiny and ruled that the SEC had misinterpreted the Investment Advisors Act of 1940[5].

[5] The Washington Post, "Hedge fund rule tossed" on June 24th, 2006.

There have been hearings before committees in Congress, with industry representatives and regulators testifying as to whether tighter regulations with detailed disclosures are needed, but no legislation has been passed.

This paper provides empirical evidence to the controversy as to whether moonlighting across different types of portfolios strengthens incentives to further client interests or creates conflicts of interest. This research is also relevant for SEC proposals that attempt to address potential conflicts of interest in the industry that could be harmful to investors. Our empirical results indicate three major findings that contribute to the literature. First, prior to the onset of moonlighting, hedge fund managers experience worse performance and sustain indifferent asset flows relative to their full-time peers. In contrast, prior to moonlighting, mutual fund managers achieve better performance than their full-time peers but sustain poorer asset flows. Second, hedge fund managers that adopt moonlighting suffer performance deteriorating of their hedge fund portfolios. The threat of unemployment that these managers face should reduce their risk taking behavior, consistent with the career threat hypothesis of Chevalier and Ellison (1999). On the other hand, option-like incentive compensation contracts provide incentives for moonlighting mutual fund managers to take on additional risk to outperform their full-time peers relative to a year prior to moonlighting. However, moonlighting managers still manage to reduce their overall risk to secure their winner status relative to their full-time peers, a result that is consistent with the tournament hypothesis of Brown, Harlow and Starks (1996). Third, allowing mutual fund managers to manage hedge fund portfolios provides incentives to strengthen retention of top performing mutual fund managers[6], with reputation-in-place and marking to market reinforcing the incentives for those managers to work for the best interests for their shareholders. Managing publicly disclosed mutual funds increases the public recognition of hedge fund managers. However, those asymmetries between performance, asset flows and risk incentives cast doubt on the importance of potential conflicts of interest.

[6] Compared to the matching portfolio managers, none of the moonlighting sample fund experiences manager turnover during the event windows.

Jensen and Meckling (1976) argue that if both principal and agent are utility maximizing, it can be expected that the agent will not always act in the best interests of the principal. However, principals can limit divergences from their interests by establishing appropriate incentives for the agent and by incurring monitoring costs designed to limit the agent's aberrant activities. The Wall Street Journal reports that 3% of mutual funds have incentive fees, a percentage that has been stable over the past five years[7]. However, these mutual fund incentive fees are modest compared with the 20% to 25% incentive fees offered by hedge funds. Industry practitioners believe that these incentive-based compensation schemes attract talented portfolio managers to run hedge funds and explain the past success of hedge funds[8]. However, Brown, Goetzmann and Ibbotson (1999) find that neither raw returns nor style-adjusted bench-marks returns provide any evidence of differential managerial skill for hedge fund managers. Blake, Elton and Gruber (2003) conclude that mutual funds with incentive fees have not, on average, been able to consistently outperform their benchmarks to earn positive incentive fees.

Although the mutual fund and hedge fund literature has yet to find evidence that incentive fees successfully motivate managers and mitigate agency problems, Grinblatt and Titman (1987, 1989a), Kritzman (1987) and Starks (1987) contend that fund managers who perform poorly have an incentive to increase their relative risk. Moreover, Brown, Harlow and Starks (1996) argue that even without incentive fee-based contracts, the competitive nature of the mutual fund industry induces managers who are losing at mid-year to increase their subsequent risk taking relative to winning managers, increasing conflicts of interest between fund managers and their shareholders. However, the competitive nature of the funds industry can reduce such agency problems. Fama (1980) claims that firms are disciplined by competition, forcing the evolution of devices for efficiently monitoring the performance of the entire management team and its individual members. Khorana and Servaes (2004) argue that mutual fund investors generally want high risk-adjusted performance at low cost while fund families generally want to maximize their assets under management (i.e., their market share) and the resulting

[7] April 14th, 2005, "Pay-For-Performance Bedevils Mutual Funds" by Jesse Eisinger.
[8] March 31st, 2003. " Managers Offering Mutual and Hedge Funds Probed" by Svea Herbst-Bayliss.

management fees. They find fund families that perform better initiate more funds relative to the competition (a measure of innovation) and have greater market share. Consequently, they conclude that the competitiveness of the mutual fund industry reduces conflicts of interests between managers and shareholders.

Fama and Jensen (1983) argue that agency problems arise because contracts cannot be costlessly written and enforced. In this regard, it is difficult for investors to determine the marginal costs and benefits of controlling agency problems within fund complexes. Many financial advisors argue that large personal holdings in a fund give managers an extra incentive to perform well. In 2004, the SEC ordered mandatory disclosure of managers' ownership and the Wall Street Journal[9] has used samples of mutual fund managers who have invested more than $1 million of their own money in the funds to test whether such large holdings align managers' interests with shareholders. Their initial results do not suggest any evidence of a positive relationship between ownership and performance, but some fund managers appear to have felt pressure to maintain sizable investments which are reported. Moreover, hedge funds managers often invest a considerable portion of their wealth in the funds they manage[10]. Incentive structures imposed on boards of directors have recently attracted research attention. Cremers, Driessen, Maenhout and Weinbaum (2005) document that directors' incentive-based compensation structure has a positive impact on fund performance and conclude that larger director ownership reduces agency problems between fund managers and shareholders. Chen, Goldstein and Jiang (2006) find that director ownership is concentrated when the benefit from monitoring is expected to be high and when there is a lack of other control mechanisms, a finding that is consistent with the optimal-contracting hypothesis.

Moonlighting can not only provide a reputational outlet for inducing mutual fund managers to act in the best interests of shareholders, it can allow hedge fund managers to increase their public recognition through their mutual fund operations, possibly at the

[9] Karen Damato reported on July 15th, 2005 with the title "A look at which managers back their funds".
[10] Franklin R. Edwards, 1999, Hedge Funds and Collapse of Long Term Capital Management, Journal of Economic Perspectives 13, 189-210.

expense of existing shareholders. Because of the difficulties that pervade all hedge fund data, such findings must necessarily be treated with caution. Nevertheless the results provide direct measures of moonlighting on portfolio performance, asset flows, and managers' risk incentives for both their existing and newly-managed portfolios. Thus these results shed valuable light on the $9 trillion asset management industry[11].

Our paper is closely related to two contemporaneous working papers by Cici et al. (2006) and Nohel et al. (2006) discussing the concerns of potential conflicts of interest for moonlighting managers who have to balance between their mutual fund and hedge fund portfolios. Cici et al. (2006) measure the return gaps and the IPO allocation between mutual funds and hedge funds where investment advisors (firms) are managing both sets of asset classes. Admitting portfolio construction is mostly coming from the decisions of fund managers rather than their managing companies, Nohel et al. (2006) use four-factor model and Sharpe ratios to estimate abnormal returns for mutual funds and hedge funds of side-by-side managers. Interestingly enough, those two papers come to different conclusions. Cici et al. (2006) document that side-by-side mutual fund managers significantly under-perform those peers without a side-by-side relationship. Nohel (006) et al. conclude that side-by-side mutual fund managers significantly outperform their peers but side-by-side hedge fund managers under-perform their style category peers. Neither paper, however, distinguishes the first employment history of those managers. Our paper is distinguished from those two preceding papers in terms of sample construction and methodologies. We construct our sample funds by differentiating moonlighting managers into (1) those who were initially mutual fund managers (1M2H) and (2) those who were initially hedge fund managers (1H2M) based on the date when managers first appeared as portfolio managers in mutual fund and hedge fund database. There are several advantages in differentiating moonlighting managers from the initial type of asset class under management. One advantage is this design allows us to study mutual fund and hedge fund managers on what might induce managers to moonlight and the subsequent wealth impact to shareholders from both managers'

[11] Hedge Fund Research Corp releases on Aug 1st, 2005 indicates that total assets under management reached $1 trillion. The Investment Company Fact book documents that assets under management at mutual funds exceeded $8 trillion in April 2005.

existing and newly-managed portfolios. Avoiding aggregating mutual fund portfolios from 1M2H and 1H2M or aggregating hedge fund portfolios from 1H2M and 1M2H allows us to mitigate endogeneity problems of the causality of performance and moonlighting. More importantly, treating those managers in the side-by-side setting by separating their pre-existing category makes it possible to investigate the different incentives and motivations which induce managers' moonlighting decisions. Using event study methodology with analyzing from multiple dimensions of fund returns, fund flows and risk preference from both managers' existing and newly-managed portfolios enables us to address the concerns of regulators as to whether a reputational outlet for mutual fund managers (1M2H) or a marketing channel for hedge fund managers (1H2M) reinforces incentives or creates conflicts of interest between managers and both sets of their shareholders.

The remainder of the paper is organized as follows. Section 2 describes the data and the sample. Section 3 documents the methodology and develops hypotheses. Section 4 reports empirical results and section 5 concludes the paper.

2. Data and sample description

2.1 Survival bias issue

HedgeFund.net, our primary source for hedge fund data, suffers some degree of survivor bias, a problem that pervades all hedge fund data. The database contains only live funds, a characteristic that is likely to produce an upward bias to hedge fund performance. Fung and Hsieh (2000) report that hedge fund performance is subject to survivorship bias, and calculate the differences between live funds only versus live and dead funds. On this basis, they estimate that the survivorship bias is equivalent to an annual return of 3.6% per year. We use this estimate of bias to correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.

2.2 Data and sample description

We use two primary data sources to identify moonlighting managers. HedgeFund net is used to identify hedge fund managers and Morningstar Principia is used to identify

mutual fund managers. In addition, we use the CRSP mutual fund database and the CISDM hedge fund database to test for robustness. Subject to availability[12], our initial sample is drawn from the period from 1990 to May 2005, covering 4,661 hedge funds and 17,686 mutual funds[13]. We manually merge the two databases by identifying portfolio managers with identical names[14] to document moonlighting. We denote events with existing mutual fund managers that moonlight with newly-managed hedge fund portfolios as 1M2H. Existing hedge fund managers that moonlight with newly-managed mutual fund portfolios are denoted as 1H2M. We delete events with unidentified or team-managed portfolio managers as well as events without 24 consecutive reported monthly returns or funds that have total asset less than $5 million. We also delete events with identical starting dates (1H1M or 1M1H) because of the need to target the impact on existing and newly-managed portfolios to assess whether moonlighting aligns managerial and shareholder interests or generates conflicts of interest.

Based on a managers' starting date, we are able to identify whether a manager initiates moonlighting on a hedge fund portfolio (1M2H) or initiates moonlighting on mutual fund portfolio (1H2M). For the period from 1990 to May 2005, the initial sample contains 109 mutual funds and 80 hedge funds with 63 classified as 1M2H and 42 classified as 1H2M events, a total of 73 portfolio managers. The numbers of funds and managers are not identical because one manager is able to manage several portfolios and we treat the same mutual (hedge) fund manager moonlighting on multiple hedge (mutual) funds as different events. Among the 63 1M2H events, there are 8 international funds, 10 special funds, 9 bond funds and 36 domestic equity funds. We retain equity funds but delete bond funds and international funds, funds without a CUSIP number, funds with total assets less than $5 million, and funds without 24 consecutive reported monthly returns. Among the 42 1H2M events, there are 22 long/short equity funds, 2 market neutral equity funds, 12 long only funds, 1 fixed income arbitrage fund, 3 value funds, and 2 fund of funds (multi-strategy funds). For the remaining samples, we drop funds

[12] HedgeFund net has collected self reported hedge fund data since 1980. However, prior to 1990 the data suffers significant missing variables.
[13] Through data mergers, we delete multiple share classes for both mutual funds and hedge funds.
[14] We match managers' full names and check managers' profiles from Morningstar to identify moonlighting managers.

with unidentified fund managers. We cross check managers' inception dates and event dates by direct telephone contact. The final 1M2H sample contains 30 mutual funds and 25 hedge funds with 23 moonlighting managers, while the 1H2M sample has 36 hedge funds and 30 mutual funds with 21 moonlighting managers. To compare moonlighting against non-moonlighting (full-time) portfolio managers, we create matched samples based on total net assets for mutual funds and the Sharpe ratio for hedge funds. The funds are divided into 5 groups after controlling for investment objective. We also develop one-on-one matched samples by matching on the basis of investment objective as well as total net assets and past returns. We find that the results for the one-on-one matched samples are similar to the portfolio matched samples. Table I reports descriptive statistics for the sample and the matched sample prior to the onset of moonlighting.

3. Methodology

To test whether conflicts of interests arise from the moonlighting of managers, we structure the research design to test fund characteristics, performance, asset flows, and managers' risk preferences surrounding the moonlighting event date[15]. If the portfolios of moonlighting managers sustain similar performance, asset flows and risk preferences, we conclude that interests are aligned. Otherwise, we presume that these are conflicts of interest.

3.1 Measures of performance under 1M2H and 1H2M

3.1.1 Raw returns

We use monthly raw returns obtained from the CRSP mutual fund database and Hedgefund.net to calculate performance before and after moonlighting for the existing portfolio as well as for the newly-managed portfolio. All hedge fund returns have been adjusted downward by a 3.6% annual rate to compensate for survivorship bias.

3.1.2 Risk-adjusted returns

To determine whether a fund performs better than the market, we adopt Sharpe's (1964) one-factor Capital Asset Pricing Model to estimate risk-adjusted returns (i.e.,

[15] We look at 12 months prior to 24 months post on both hedge fund and mutual fund moonlighting managers.

alphas). We also employ Fama and French (1993) three-factor model as well as Carhart (1997) four-factor model for robustness test for estimating the alphas. We adopt S&P 500 index as the overall market index to calculate monthly market-adjusted returns for mutual funds. To measure hedge fund performance, Boyson (2005) proposes the use of excess-of-risk-free-rate returns by taking the 30-day Treasure bill as the risk-free rate to measure hedge fund returns in excess-of-risk-free-rate. Fung and Hsieh (2000, 2002) propose the simple alternative of using funds-of-hedge funds to estimate the performance of the hedge fund market. Since funds-of-hedge funds invest in an array of hedge funds, their track records are likely to be free of the biases contained in databases of individual funds. We adopt the CSFB/Tremont Hedge Fund Index as the benchmark index of returns for hedge funds[16].

3.1.3 Objective-Adjusted Performance

Morck, Shleifer, and Vishny (1989) and Khorana (2001) use the objective-adjusted return (OAR) to measure annual holding period returns in excess of benchmark portfolios composed of other funds that match the investment objective for the relevant mutual fund. Based on this approach, we use the benchmark index that Morningstar defines[17] for each individual mutual fund to measure whether the sample fund performance is significantly different from the benchmark index prior to and after the onset of a manager's dual responsibilities.

3.2 Measures of asset flows

Gruber (1996), Chevalier and Ellison (1999), Sirri and Tufano (1998) document that new inflows to a fund are highly correlated with a fund's outperforming an index. Goetzmann and Peles (1997) and Sirri and Tufano (1992, 1998) examine fund flows and also find that funds that outperform receive greater inflows from investors. The asymmetric flow-performance relation creates incentives for a fund manager to alter the risk of the portfolio. Sirri and Tufano (1992) find that investors chase funds that rank

[16] The CSFB/Tremont Hedge Fund Index is defined as only the funds with a minimum of US $50 million assets under management, a minimum one-year track record, and current audited financial statements. Funds are separated into ten primary subcategories based on their investment style. The Index in all cases represents at least 85% of the asset under management in each respective category of the Index Universe. Please refer to http://www.hedgeindex.com/ for details.

[17] For example, Russell 2000 growth or Dow Jones Health index.

highest in relative return during the previous period, which may be a consequence of widespread reporting of rankings by the media[18]. They also report evidence that there is an asymmetric relationship between performance and flows given that worse performance does not induce significant outflows. We adopt Sirri and Tufano's (1998) measurement for monthly asset flows, which is $[TNA_{i,t} - TNA_{i,t-1} \times (1+R_{i,t})] \div TNA_{i,t-1}$, where $TNA_{i,t}$ is the total net asset for fund i at time t and $R_{i,t}$ is the raw return at time t.

3.3 Relative risk-taking

In addition to performance measurement, we also assess the risk incentives for moonlighting managers in order to understand whether their risk preferences change significantly due to the different asset classes they manage and whether risk preference has a relationship with returns. Our goal is to assess the evidence for conflicts of interests.

Based on the risk adjustment ratio (RAR) by Brown, Harlow and Starks (1996), we use calendar year to access the risk adjustment ratio (RAR) for moonlighting manager for their existing as well as newly-managed portfolios. To capture the risk shifting surrounding the months of moonlighting, we also modify the risk adjustment ratio (RAR)[19] to accommodate the measurement of RAR surrounding the event date for robustness[20]. We measure RAR by usilg the post risk ratio (standard deviation of raw returns) divided by the prior risk ratio (standard deviation of raw returns). Under the tournament hypothesis, Brown et al.(1996), Koski and Pontiff (1999) and Goriaev, Palomino, and Prat (2002) argue that managers trailing the market in the first half of the year may be tempted to increase the volatility of their portfolios to catch up with the market's performance. In contrast, fund managers who are ahead of the market have an incentive to reduce the volatility of a portfolio to lock in their winner status.

---

[18] Wall Street Journal, Business Week, Money, Barron's, etc. Ranking are varied from monthly basis, quarterly basis, semi-annual basis to annual basis.

[19] $RAR = \sqrt{\left(\frac{(\sum_{t=t_1}^{t_2} (r_t - \overline{r_t})^2}{(t_2 - t_1 + 1) - 1} \right)} \div \sqrt{\left(\frac{(\sum_{t=-12}^{-1} (r_t - \overline{r_t})^2}{12 - 1} \right)}$, t_1=0, t_2 =12 or 24

[20] We do aware managers are compensated based on the calendar year thus the RAR (BHS, 1996) is the better measure to capture the tournament within managers.

Blake, Elton, and Gruber (2003) find that funds with incentive fees have greater risk than funds without incentive fees. They report that incentive fees induce such risk taking regardless of whether risk taking is measured in terms of tracking error or total risk. Carpenter (2000) argues that managers engage in strategies that cause returns to have a greater variance around the benchmark. They argue that this strategy is optimal because underperforming a benchmark has less of an impact on dollar fees than does over-performance. Carpenter (2000), and Grinblatt and Titman (1989) claim that managers with poor past performance are found on the flat part of the compensation schedule and thus have an incentive to take on higher risk. Chevalier and Ellison (1999) document how career concerns affect managerial behavior by examining responses to the implicit incentives created by career concerns. They find that young fund managers and managers of the worst performing funds have the lowest risk-taking incentive because of concerns about losing their positions. Khorana (1996, 2001), Goetzmann and Peles (1997), and Fung and Hsieh (2000) similarly argue that managers facing career risks have an incentive to reduce their risk exposure to lessen the risk of unemployment.

3.4 Matched Sample

To eliminate concerns that mean reversion, survivorship bias, and persistence of performance can cause the observed changes in moonlighting, we create matched portfolios to compare moonlighting versus non-moonlighting (full-time) portfolio managers with respect to initial motivation, fund characteristics, performance, asset flows and managers' risk preferences. The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into 5 groups after controlling for investment objective. The matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds. We also test one-on-one matched samples that are matched on the basis of investment objective, total net assets (at 13 months prior to the moonlighting), and past returns (from 24 months to 13 months prior to the moonlighting) and find similar results[21].

[21] To save space, we do not report the one on one matched sample results.

4. Empirical Results

4.1 Analysis of performance and asset flows

Table I reports results for cumulative fee-adjusted holding period return for both sample funds, matched sample funds and their differences. Moonlighting managers outperform their full-time mutual fund peers by 5.83% while moonlighting managers under-perform their full-time hedge fund peers by 6.87% a year prior to the moonlighting. Moonlighting managers under 1M2H suffer significant asset outflows of -0.67 compared to their full-time mutual fund peers while moonlighting managers under 1H2M do not experience significant asset outflows even though they under-perform their full-time hedge fund peers. Table II (Figure II) reports results for cumulative raw, market-adjusted and benchmark-adjusted returns for mutual fund and hedge fund portfolios from the 12 months prior to the 24 months after the event date, (-12, +24)[22], for 1M2H. Our results support Blake, Elton and Gruber's (2003) conclusion that funds with incentive fees have better performance than funds without incentive fees. After they initiate moonlighting in a hedge fund, mutual fund managers continue to demonstrate improved performance both on their existing mutual fund portfolio and on their newly-managed hedge fund portfolio. Table IV (figure II) shows that both the mutual funds and hedge funds have positive and significant inflows. These results findings are consistent with Gruber (1996), Chevalier and Ellison (1999), Sirri and Tufano (1998) who find that new fund inflows are highly correlated with a fund's outperforming an index.

Table III (figure I) reports results for cumulative raw, excess-of-risk-free-rate returns, market-adjusted, and benchmark-adjusted returns for mutual fund and hedge fund portfolios from 12 months prior to 24 months after the event date (-12, +24)[23] for 1H2M. Hedge fund returns deteriorate significantly after moonlighting begins for each of the three performance measurements but the mutual fund portfolios perform well after hedge fund managers take over. Table IV (figure I) reports asset flows for both mutual fund and hedge fund portfolios under 1H2M. Mutual fund asset flows increase by 1.226 while

[22] To save space, we only report the performance measure from event date to 24 months post (0, +24) for all the tables while we summarize the prior 12 months (-12, 0) in table I.

[23] To save space, we only report the performance measure from event date to 24 months post (0, +24) for all the tables while we summarize the prior 12 months (-12, 0) in table I.

hedge fund asset flows increase by 2.59. Although hedge fund portfolio performance deteriorates, asset flows increase significantly after moonlighting events (increase by 0.3081). Our findings are consistent with Sirri and Tufano's (1992, 1998) finding that poor performance does not lead to significant outflows because there is an asymmetric relationship between performance and flows as a result of search costs. Our findings support Merton's (1987) investor recognition hypothesis since the results suggest that managers of 1H2M take advantage of the increased recognition that comes from the performance of their publicly-disclosed mutual funds to attract asset flows into both their hedge fund and mutual fund portfolios.

4.2 Analysis of managers' risk incentives

Khorana and Servaes (2004) conclude that conflicts of interest between mutual fund investors and fund families arise because investors demand greater risk-adjusted performance at low cost while fund families attempt to maximize assets under management (i.e., their market share) and the resulting fees. However, competition among fund families induces lower fees. Moreover, economies of scale can mitigate the potential conflict of interests since fund families that perform better can initiate more new funds relative to the competition and obtain higher market shares. Goetzmann and Peles (1997) and Sirri and Tufano (1992, 1998) conclude that the asymmetric flow-performance relation creates incentives for fund managers to alter the risk of their portfolios, while Blake, Elton and Gruber (2003) find that funds with incentive fees have greater risk than funds without incentive fees.

Chevalier and Ellison (1999) find that young fund managers and managers of the worst performing funds have the lowest incentive to take on risk because of concerns about losing their jobs. In table V, we find results that are consistent with the career threat hypothesis since there is evidence that hedge fund managers that choose to moonlight reduce their risk taking for both their mutual fund (a mean of 0.6916 in RAR in the calendar year approach and a mean of 0.8308 in RAR measurement in the event date approach) and hedge fund portfolios (a mean of 0.8295 in RAR in the calendar year approach and a mean of 9766 in RAR measurement in the event date approach). These findings for mutual fund managers that choose to moonlight also support the tournament

hypothesis of Brown, Harlow and Starks (1996) Koski and Pontiff (1999) and Goriaev, Palomino and Prat (2002) who find that fund managers that are outperforming the market have an incentive to reduce the volatility (a mean of 0.8698 in the calendar year measurement of RAR and a mean of 0.8992 on the event date approach measurement of RAR) of their portfolios to lock in their winner status.

4.3 Robustness check on performance, asset flows and risk incentives

To eliminate concerns that mean reversion, survivorship bias, backfilled bias[24], and persistence of performance could cause changes of moonlighting, we generate matched portfolios to compare moonlighting managers versus non-moonlighting (full-time) portfolio managers with respect to their initial motivations, fund characteristics, performance, asset flows, and managers' risk preferences. Table VI (Figure III) provides performance measures for sample funds relative to matched benchmark funds. Mutual fund portfolios demonstrate the robustness of their positive and significant returns under 1M2H while hedge fund portfolios demonstrate the deteriorating performance under 1H2M. Mutual fund moonlighting managers outperform their full-time peers by 13.14% while hedge fund moonlighting managers under-perform their full-time peers by 12.91% during a 36 months. Table IX uses the one-factor Sharpe (1964) method as well as Fama and French (1993) three-factor model and Carhart (1997) four-actor model to estimate the alphas. Similarly, the results indicate that mutual fund portfolios in 1M2H consistently outperform and earn positive alphas while hedge fund portfolios consistently have negative alphas under 1H2M. The empirical result suggests moonlighting managers under 1M2H outperform their full-time mutual fund peers by 0.1678% per month (2.0136% per year) in a three-factor model while by 0.1521% per month (1.8252% per year) in a four-factor model. On the other hand, moonlighting managers under 1H2M under-perform their full-time hedge fund peers by 0.2446% per month (2.9352% per year) in a three-factor model and 0.2085% per month (2.502% per year) in a four-factor model for the 24 months from the event of moonlighting. Through a OLS regression reported in table X, we further document moonlighting managers under 1M2H outperform their full-time mutual fund peers by 0.6393% per month (7.6716% per year) of fee-adjusted holding period return prior to their moonlighting and a 0.3186% per

[24] Capocci, Corhay and Hübner (2004) observe a backfilled bias of 1.32% per annum.

month (3.8232% per year) return after the moonlighting. The regression result also suggest moonlighting managers under 1H2M under-perform their full-time hedge fund peers by 0.9381% per month prior to their onset of moonlighting (11.2572% per year) and 0.3550% per month (4.26% per year) after the moonlighting.

Table VII (figure III) reports asset flows of sample funds relative to matched funds. Both mutual fund portfolios under 1M2H and hedge fund portfolios under 1H2M experience asset outflows. The flows for 1M2H could arise from the same investors withdrawing capital from the mutual fund portfolios and investing in the hedge fund portfolios of moonlighting managers, supporting the argument of costly search proposed by Sirri and Tufano (1992, 1998). Another possibility might be that investors are aware of the potential conflicts of interest and cash out. This second argument is left for future research when additional data become available. The outflows from hedge fund portfolios under 1H2M support Gruber (1996), Chevalier and Ellison (1999) findings that fund inflows are correlated with performance.

Table VIII reports robustness tests for the risk incentives of moonlighting managers for sample funds relative to benchmark matched funds. Consistent with the earlier findings we find that as a result of career threats hedge fund managers that choose to moonlight reduce risk taking for both their mutual fund and hedge fund portfolios although result is not significant in the calendar year approach (a mean of -0.0752 of the difference of RAR between sample subtract matched sample funds). However, option-like incentive compensation contracts provide an incentive for mutual fund managers that choose to moonlight to take on additional risk (a mean of 0.1272 for the difference of RAR of sample subtract matched sample funds in the calendar year approach and a mean of 0.1532 in RAR in the event date approach) to outperform their full-time peers, consistent with the tournament hypothesis.

5. Conclusions

This paper makes the first attempt in the literature to analyze whether moonlighting across mutual funds and hedge funds creates conflicts of interests or strengthens the

alignment of interests between portfolio managers and shareholders. This issue is of interest to regulators, portfolio managers, board of directors, financial advisors, and investors. This work strengthens our understanding as to whether moonlighting between portfolios strengthens managers' human capital and provides appropriate incentives to mitigate agency problems, or creates conflicts of interest in the asset management industry. Our paper also provides evidence that can be used by regulators to formulate policies directed toward improved governance of the industry.

Overall, our results are consistent with Merton's (1987) investor recognition hypothesis. We find that managing publicly disclosed mutual funds increases public recognition for hedge fund managers. However, the asymmetric relationships for the performance, asset flows, and risk incentives of moonlighting hedge fund managers' existing and newly-managed portfolios suggest that there is a potential for conflicts of interest. Nevertheless, option-like incentive compensation contracts provide sufficiently strong incentives for mutual fund managers that choose to moonlight to take on the appropriate risk and to outperform their full-time peers, consistent with Grinblatt and Titman (1987, 1989a), Kritzman (1987) and Starks (1987) tournament hypothesis. The results are also consistent with Carter and Manaster (1990), and Chemmanur and Paeglis (2005) who argue that reputations reduce information asymmetries. Moreover, the results support Hayward and Boeker's (1998) evidence that even though agency problems exist, reputational capital can discipline agents, helping to solve potential conflicts of interest.

Although attempts have been made to take account of the problems of survivorship bias, these results must be viewed with caution until a hedge fund database that is free of survivorship becomes available.

Reference

Barclay, M., and J. Warner, 1993, Steath Trading and Volatility - Which Trades Move Prices, *Journal of Financial Economics* 34, 281-305.

Black, C., E. Elton, and M. Gruber, 2003, Incentives Fees and Mutual Funds, *Journal of Finance* 58, 779-804.

Boyson, N., 2005, Another Look at Career Concerns: a Study of hedge fund managers, Working paper, Northeastern University.

Brown, K., W. Harlow, and L. Starks, 1996, of Tournaments and Temptations: An analysis of Managerial Incentives in the Mutual Fund Industry, *Journal of Finance* 51, 85-110.

Brown, S., W. Goetzmann and R. Ibbotson, 1999, Offshore Hedge Funds: Survival and Performance from 1985-1995, *Journal of Business* 72, 91-117.

Capocci, D., A. Corhay and G. Hübner, 2004, Hedge Fund Performance and Persistence in Bull and Bear Markets, working paper, University of Liège.

Carhart, M., 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52, 57-82.

Carpenter, J., 2000, Does Option Compensation Increase Managerial Risk Appetite? *Journal of Finance* 55, 2311-2331.

Carter, R., and S. Manaster, 1990, Initial Public Offerings and Underwriter Reputation, *Journal of Finance* 45, 1045-1067.

Chemmanur, T., and I. Paeglis, 2005, Management Quality, Certification, and Initial Public Offerings 76, *Journal of Financial Economics 76*, 331-368.

Chen, Q., I. Goldstein and W. Jiang, 2006, Directors' Ownership in the U.S. Mutual Fund Industry, Working paper, Duke University.

Chevalier, J., and G. Ellison, 1999, Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389-432.

Cici, G., S. Gibson, and R. Moussawi, 2006, For Better or Worse? Mutual Funds in Side-by-Side Management Relationships with Hedge Funds, Working paper.

Cremers, M., J. Driessen, P. Maenhout, and D. Weinbaum, 2005, Does Skin in the Game Matter? Director Incentives and Governance in the Mutual Fund Industry. Working paper, Yale University.

Fama, E., 1980, Agency Problems and the Theory of the Firm, *Journal of Political Economy* 88, 288-307.

Fama, E. and K. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics* 33, 3-56.

Fama, E., and M. Jensen, 1983, Agency Problems and Residual Claims, *Journal of Law and Economics* 26, 327-349.

Fang, L., 2005, Investment Bank Reputation and the Price and Quality of Underwriting Services, *Journal of Finance* 60, 2729-2761.

Edwards, F. R., 1999, Hedge Funds and Collapse of Long Term Capital Management, *Journal of Economic Perspectives* 13, 189-210.

Fung, W. and D. Hsieh, 2000, Performance Characteristic of Hedge Funds and Commodity Funds: Natural vs. Spurious Biased, *Journal of Financial and Quantitative Analysis* 35, 291-307.

Fung, W. and D. Hsieh, 2002, Hedge-fund Benchmarks: Information Content and Biases, *Financial Analysis Journal* 58, 22-34.

Goetzmann, W. and N. Peles, 1997, Cognitive Dissonance and Mutual Fund Investing, *Journal of Financial Research* 20, 145-158.

Goetzmann, W., J. Ingersoll and S. Ross, 2003, High Water Marks and Hedge Fund Management Contracts, *Journal of Finance* 58, 1685-1718.

Goriaev, A., F. Palomino, and A. Prat, 2003, Risk Taking and Optimal Contracts for Money Managers, *RAND Journal of Economics* 34, 113-137.

Grinblatt, M., and S. Titman, 1987, How Clients Can Win the Gaming Game, *Journal of Portfolio Management* 13, 14-20.

Grinblatt, M. and S. Titman, 1989, Adverse Risk Incentives and the Design of Performance-Based Contracts, *Management Science* 35, 907-822.

Gruber, M., 1996, Another Puzzle: The Growth in Actively Managed Mutual Funds. *Journal of Finance* 51, 783-810.

Hayward, M., and W. Boeker, 1998, Power and conflicts of interest in professional firms: Evidence from investment bankilg, *Administratite Science Quarterly* 43, 1-22.

Jensen, M., and W. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3, 305-360.

Khorana, A., 1996, Top Management Turnover: An Empirical Investigation of Mutual Fund Managers, *Journal of Financial Economics* 40, 403-427.

Khorana, A., 2001, Performance Changes Following Top Management Turnover: Evidence fpom Open-end Mutual Funds, *Journal of Financial and Quantitative Analysis* 36, 371-393.

Khorana, A., and H. Servaes, 2004, Conflicts of Interest and Competition in the Mutual Fund Industry, Working paper, Georgia Institute of Technology.

Kritzman, M., 1987, Incentive Fees: Some Problems and Some Solutions, *Financial Analysts Journal* 43, 21-26.

Koski, J. and J. Pontiff, 1999, How are Derivatives Used? Evidence from the Mutual Fund Industry, *Journal of Finance* 54, 791-816.

Merton, R., 1987, A Simple Model of Capital Market Equilibrium with Incomplete Information, *Journal of Finance* 42, 483-510.

Morck, R., A. Shleifer and R. Vishny, 1989, Alternative Mechanisms for Corporate Control, *American Economic Review* 89, 842-852.

Nohel, T., Z. Wang and L. Zheng, 2006, Side-by-Side Management of hedge Funds and Mutual Funds, Working paper.

Sharpe, W., 1964, Capital Asset Prices: A theory of Market Equilibrium under Conditions of Risk, *Journal of Finance* 19, 425-442.

Sirri, E. and P. Tufano, 1992, The Demand For Mutual Fund Services by Individual Investors, Harvard Business School, Working paper.

Sirri, E. and P. Tufano, 1998, Costly Search and Mutual Fund Flow, *Journal of Finance* 53, 1589-1622.

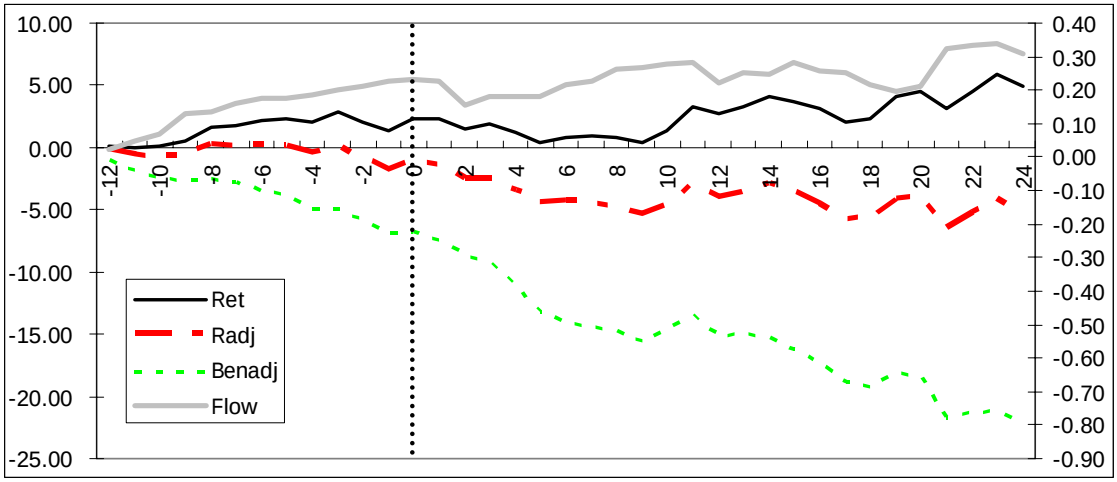
Starks, L., 1987, Performance Incentive Fees: An Agency Theoretic Approach, *Journal of Financial and Quantitative Analysis* 22, 17-32.

Stickel, S., 1992, Reputation and Performance among Security Analysts, *Journal of Finance* 47, 1811-1836.

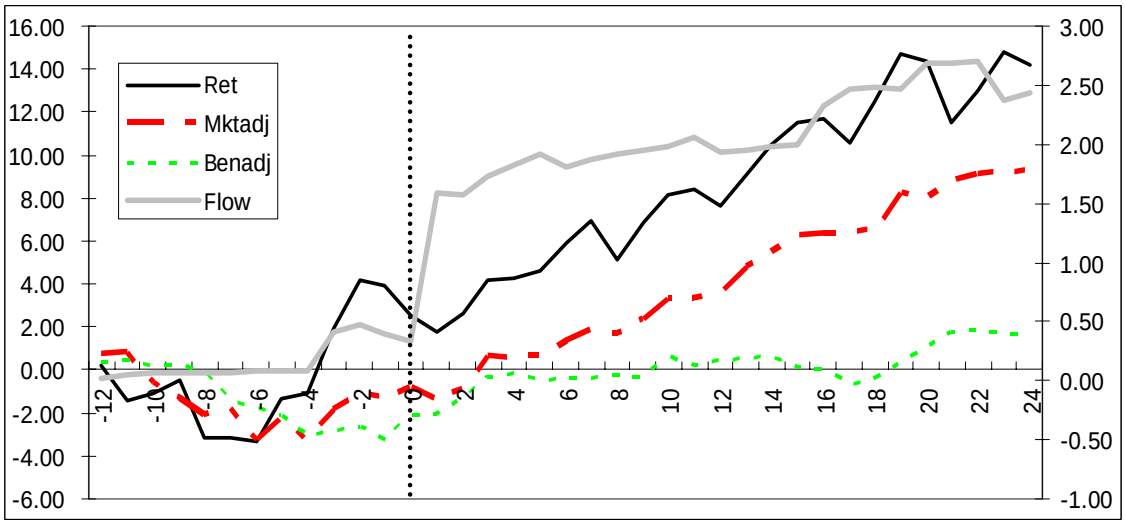
Figure I
Performance and Asset Flows under 1H2M

Figure I plots cumulative returns[25] (Ret: Raw returns; Radj: excess-risk-free-rate returns; Benadj: benchmark-adjusted returns; Mktadj: Market adjusted returns) and cumulative asset flows for hedge fund and mutual fund portfolio between 12 months prior and 24 months after (-12, +24) the events of hedge fund managers moonlighting in mutual fund portfolios (1H2M). Returns are reported in % on the left hand side of Y-axis, and cumulative asset flows[26]are reported on the right hand side of Y-axis. The dot line drawn cross 0 represents the event date. Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.

A. Hedge Fund Performance and Asset Flows



B. Mutual Fund Performance and Asset Flows

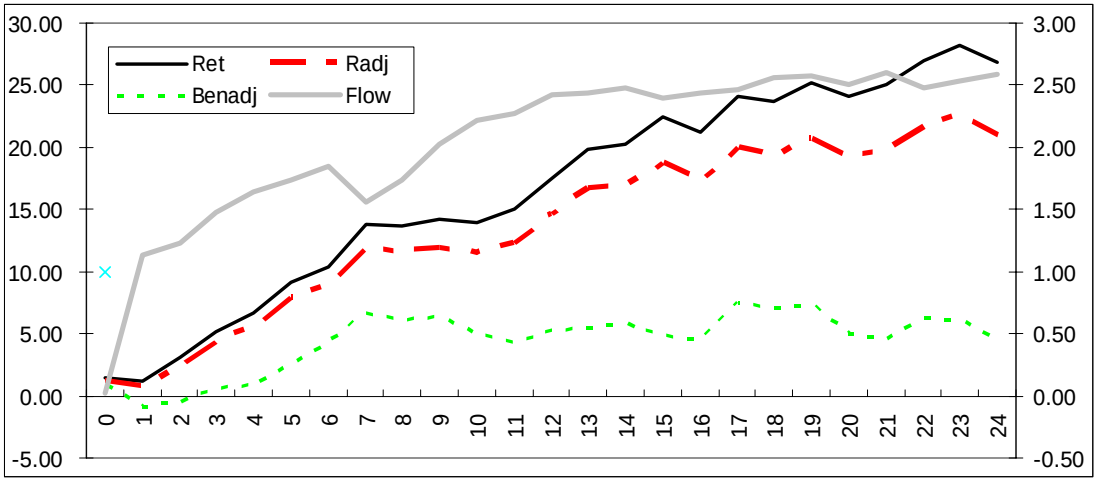


[25] The source of risk-free rate is from Ibbotson and Associates, Inc. Sample fund's benchmark is from Morningstar's defined benchmark category. S&P 500 index is adopted as market returns.
[26] We adopt Sirri and Tufano's (1998) measurement for monthly asset flows, [TNAi, t - TNAi, t-1 × (1+Ri, t)] ÷ TNAi, t-1, where TNAi, t is the total net asset for fund i at time t and Ri,t is the raw return at time t.

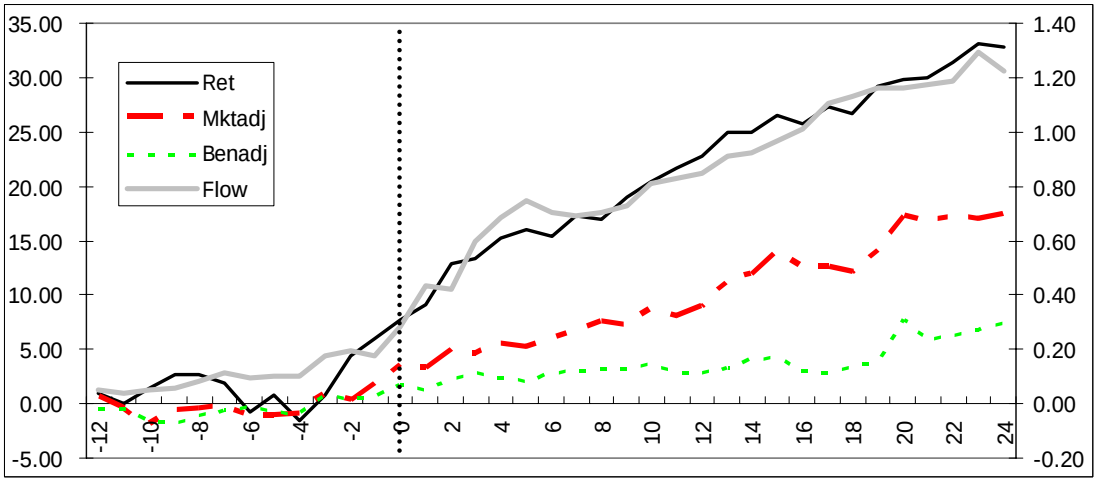
Figure II
Performance and Asset Flows under 1M2H

Figure II plots cumulative returns[27] (Ret: Raw returns; Radj: excess-risk-free-rate returns; Benadj: benchmark-adjusted returns; Mktadj: Market adjusted returns) and cumulative asset flows for hedge fund between 0 to 24 months after (0, +24) the events and mutual fund portfolio between 12 months prior and 24 months after (-12, +24) the events of mutual fund managers moonlighting in hedge fund portfolios (1M2H). Returns are reported in % on the left hand side of Y-axis, and cumulative asset flows[28]are reported on the right hand side of Y-axis. The dot line drawn cross 0 represents the event date. Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.

A. Hedge Fund Performance and Asset Flows



B. Mutual Fund Performance and Asset Flows

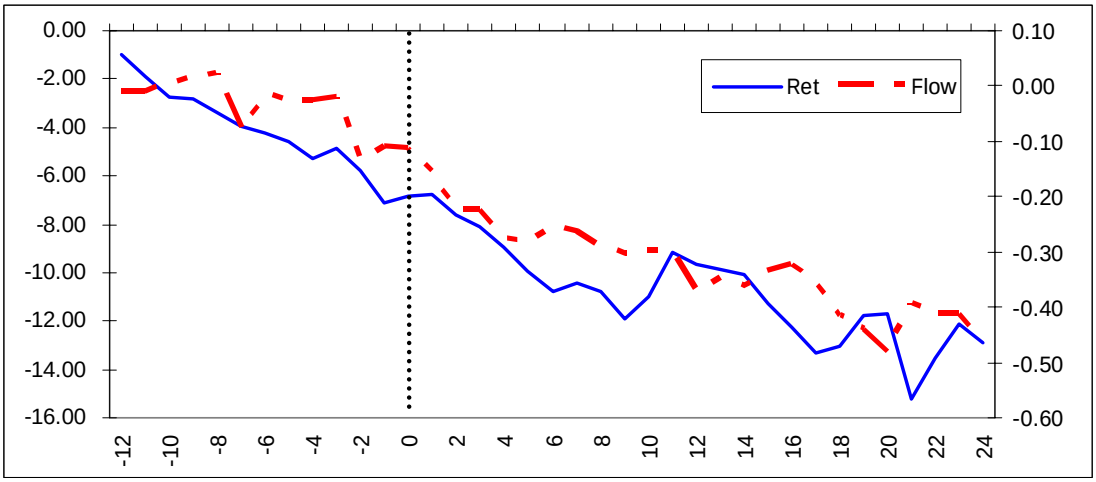


[27] The source of risk-free rate is from Ibbotson and Associates, Inc. Sample fund's benchmark is from Morningstar's defined benchmark category. S&P 500 index is adopted as market returns.
[28] We adopt Sirri and Tufano's (1998) measurement for monthly asset flows, [TNAi, t - TNAi, t-1 × (1+Ri, t)] ÷ TNAi, t-1, where TNAi, t is the total net asset for fund i at time t and Ri,t is the raw return at time t.

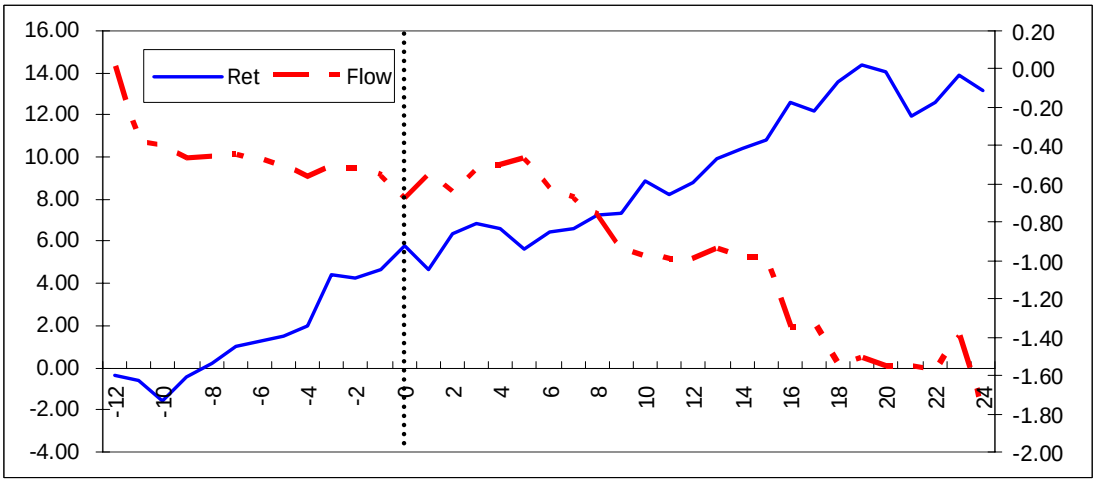
Figure III
Robustness Test for Hedge Fund under 1H2M and Mutual Fund under 1M2H
－ Sample Subtracts Matched Sample

Figure III plots both cumulative raw returns (reported in % on the left hand side of Y-axis) and cumulative asset flows[29] (reported on the right hand side of Y-axis) for sample subtracts matched sample (in portfolio) between 12 months prior and 24 months after (-12, +24) the events of hedge fund managers moonlighting in mutual fund portfolios (1H2M) as well as mutual fund managers moonlighting in hedge fund portfolios (1M2H). The dot line drawn cross 0 represents the event date.
The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds.

A. Hedge fund: Sample Subtracts Matched Sample (1H2M)



B. Mutual fund: Sample Subtracts Matched Sample (1M2H)



[29] We use Sirri and Tufano's (1998) measurement for monthly asset flows, [TNAi, t - TNAi, t-1 ×(1+Ri, t)] ÷ TNAi, t-1, where TNAi, t is the total net asset for fund i at time t and Ri, t is the raw return at time t.

Table I
Sample and Matched Sample Descriptive Statistics

Table I reports cumulative fee-adjusted raw returns, cumulative asset flows, managers' existing portfolio tenure, managers' industry tenure, expense ratios and portfolio turnover for both sample and matched sample funds over mutual fund portfolios in the events of mutual fund managers moonlighting in hedge fund portfolios (1M2H hereafter) and hedge fund portfolios in the events of hedge fund managers moonlighting in mutual fund portfolio (1H2M hereafter).

Cumulative fee-adjusted holding period returns (in %)[30] are computed from 12 months prior to the event date to 1 month prior to the event date (-12, -1). Cumulative asset flows are measured from 12 months prior to the event date to1 month prior to the event date (-12, -1). Manager tenure (in years) is measured from the manager taking over the portfolio to the event date. Industry tenure measures portfolio managers' experience in the industry as portfolio managers. Expense ratio (in %), and portfolio turnover (in %) are measured at the year prior to the event date.[31]

The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds[32].

Category	Returns (-12,-1)	Flows (-12,-1)	Manager tenure	Industry tenure	Expense ratios	Portfolio turnover
Panel A：Mutual Fund (1M2H)						
Sample (N=30)	7.75**	0.28***	4.25	6.20	1.65	102.88
Matched	2.35	0.86***	4.93	5.62	1.26	103.25
Difference (Sample - Matched)	5.83**	-0.67**	-0.68	0.41	0.39***	-0.37
Panel B：Hedge Fund (1H2M)						
Sample (N=36)	2.31	0.23**	5.35	N/A	N/A	N/A
Matched	11.97***	0.26***	5.82	N/A	N/A	N/A
Difference (Sample - Matched)	-6.87***	-0.11	-0.47	N/A	N/A	N/A

[30] The excess-of-risk-free-rate returns, benchmark-adjusted returns and market-adjusted returns generate similar results thus not report here. Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.
[31] The Industry tenure, expense ratio and portfolio turnover are not available for hedge fund database.
[32] We also test one-on-one matched samples that are matched on the basis of investment objective, total net assets (at 13 months prior to the moonlighting), and past returns (from 24 months to 13 months prior to the moonlighting) for both 1M2H and 1H2M portfolios and find similar results.

Table II
Mutual Fund and Hedge Fund Performance under 1M2H

Table II reports test results for cumulative fee-adjusted holding period return (Ret), market-adjusted (Mktadj) and benchmark-adjusted (Benadj), excess of risk-free rate (Radj) returns for mutual fund and hedge fund portfolio from the event date to 24 months after (0, +24) the event of mutual fund managers moonlighting in hedge fund (1M2H). All returns are reported in % while hedge fund returns have downward adjusted[33] to mitigate survivorship bias. ***, **, and * indicate that the mean coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test[34].

Time	Mutual Fund			Hedge Fund		
	Ret	Mktadj	Benadj	Ret	Radj	Benadj
0	7.7522 **	3.5560 *	1.7345	1.4075 *	1.1987 *	0.9641
1	9.1494 **	3.3308	1.3463	1.1913	0.7663	-0.9133
2	12.8076***	5.1116 *	2.2932	3.0605 **	2.4155 *	-0.5025
3	13.3452***	4.5114	2.8579	5.1759 ***	4.3113 **	0.5821
4	15.3016***	5.5184 *	2.4184	6.6321 ***	5.5471 ***	0.8900
5	15.9837***	5.1689 *	1.9888	9.1963 ***	7.8880 ***	2.6005
6	15.3881***	5.9680 *	2.7689	10.3634***	8.8371 ***	4.3625 **
7	17.2944***	6.7389 *	3.0208	13.7485***	11.9260***	6.6735 **
8	16.8826***	7.5948 *	3.2070	13.6945***	11.6420***	6.0615 *
9	19.0448***	7.2696 *	3.1924	14.1916***	11.9221***	6.3256 *
10	20.3779***	8.7368 **	3.6701	13.9276***	11.4426***	5.0786
11	21.5979***	8.0505 *	2.8086	15.0590***	12.3590 **	4.3035
12	22.7287***	9.0369 *	2.8655	17.4681***	14.5601 **	5.2401
13	25.0210***	11.5158*	3.3719	19.8556***	16.7421 **	5.3781
14	24.9506***	11.9139*	4.0255	20.2640***	16.9340 **	5.7753
15	26.5717***	14.1981**	4.3294	22.5022***	18.8006***	4.9094
16	25.7614***	12.3931*	3.0184	21.1839***	17.2683 **	4.5089
17	27.3317***	12.6455*	2.8343	24.1361***	20.0189 **	7.5117
18	26.6790***	12.1577*	3.4931	23.6644***	19.3456***	7.0206
19	29.1381***	14.0623**	3.8587	25.1372***	20.6283***	7.4006
20	29.7948***	17.2092**	7.7511*	24.0318***	19.1894 **	4.9759
21	29.9325***	16.7589**	5.8876	25.0831***	19.8806 **	4.6400
22	31.4254***	17.2148**	6.3163	26.9881***	21.5819***	6.2106
23	33.0800***	16.9302**	6.7349	28.1894***	22.5650***	6.1756
24	32.8373***	17.4878**	7.3380	26.8300***	20.9969***	4.4138

[33] Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.
[34] Wilcoxon sign rank test for median generates similar results thus not report in the table.

Table III
Hedge Fund and Mutual Fund Performance under 1H2M

Table III reports test results for cumulative fee-adjusted holding period return (Ret), excess of risk-free rate (Radj), benchmark-adjusted (Benadj) and market-adjusted (Mktadj) returns for mutual fund and hedge fund portfolio from the event date to 24 months after (0, +24) the events for hedge fund managers moonlighting in mutual fund portfolios (1H2M). All returns are reported in % while hedge fund returns have downward adjusted[35] to mitigate survivorship bias. ***, **, and * indicate that the mean coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test[36].

Time	Hedge Fund			Mutual Fund		
	Ret	Radj	Benadj	Ret	Mktadj	Benadj
0	2.3061	-1.1333	-6.8033***	3.4410	-0.8136	-2.1493*
1	2.2678	-1.4147	-7.3682**	2.5470	-1.4128	-2.0955**
2	1.5244	-2.5059	-8.6523***	3.1685	-0.9204	-1.3580
3	1.8400	-2.4982	-9.2410***	4.6810*	0.6572	-0.2997
4	1.1788	-3.3936	-11.1953***	4.8354	0.5764	-0.1439
5	0.3515	-4.4491	-13.2033***	5.2956	0.6012	-0.5115
6	0.7424	-4.2818	-14.0770***	6.5769*	1.3064	-0.4054
7	0.8918	-4.3476	-14.5000***	7.6703**	1.8871	-0.4749
8	0.7868	-4.8629	-14.7366***	6.1792	1.7122	-0.2728
9	0.4110	-5.4348	-15.5734***	8.0921**	2.3537	-0.3562
10	1.3113	-4.7374	-14.6897***	9.3800**	3.3485	0.5586
11	3.2994	-2.9461	-13.4428***	9.7655**	3.3478	0.1817
12	2.7562	-3.9362	-15.0622***	9.0118**	3.6890	0.4567
13	3.3155	-3.5631	-15.0237***	10.4232**	4.7845*	0.4938
14	4.1145	-2.9531	-15.2407***	11.7916**	5.5120*	0.6168
15	3.7300	-3.5317	-16.1559***	12.7519**	6.2391*	0.1141
16	3.1014	-4.5057	-17.3038***	12.6085**	6.3739*	0.0554
17	2.0457	-5.7539	-18.8377***	11.6407**	6.3871*	-0.6407
18	2.3536	-5.6336	-19.2365***	13.5077**	6.5184*	-0.4438
19	4.0875	-4.1000	-18.1458***	15.8483***	8.1988**	0.3366
20	4.5243	-3.8564	-18.3808***	15.7935**	7.9666*	1.0310
21	3.1291	-6.4830	-21.6986***	14.0961**	8.2035*	1.4784
22	4.5074	-5.2948	-21.3352***	15.4027**	8.5627*	1.5861
23	5.9135	-4.0743	-21.2048***	17.2290***	8.6189*	1.4321
24	4.8678	-5.3070	-22.1586***	16.5111***	8.7117*	1.4179

[35] Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.
[36] Wilcoxon sign rank test for median generates similar results thus not report in the table.

Table IV
Mutual Fund and Hedge Fund Asset Flows under 1M2H and 1H2M

Table IV reports test results for cumulative monthly asset flows for mutual fund and hedge fund portfolio from the event date to 24 months after (0, +24) the events of mutual fund managers moonlighting in hedge fund (1M2H) as well as hedge fund managers moonlighting in mutual fund (1H2M). We adopt Sirri and Tufano's (1998) measurement for monthly asset flows, $(TNA_{i,t} - TNA_{i,t-1}) \times (1+R_{i,t-1}) \div TNA_{i,t-1}$, where $TNA_{i,t}$ is the total net asset for fund i at time t and $R_{i,t-1}$ is the raw return at time t-1. ***, **, and * indicate that the mean coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test[37].

Time	1M2H		1H2M	
	Mutual Fund	Hedge Fund	Hedge Fund	Mutual Fund
0	0.2835***	0.0260	0.2309**	0.3272
1	0.4307***	1.1290**	0.2244**	1.5928**
2	0.4214***	1.2226**	0.1545*	1.5725**
3	0.5980***	1.4814**	0.1806*	1.7225**
4	0.6874***	1.6465***	0.1795*	1.8281**
5	0.7499***	1.7431***	0.1813*	1.9138**
6	0.7004***	1.8539***	0.2152**	1.8001**
7	0.6935***	1.5565***	0.2278**	1.8746**
8	0.7008***	1.7323***	0.2619**	1.9172**
9	0.7272***	2.0244***	0.2685**	1.9563**
10	0.8110***	2.2142***	0.2776**	1.9860**
11	0.8312***	2.2772***	0.2844**	2.0514**
12	0.8462***	2.4179***	0.2237*	1.9312**
13	0.9103***	2.4362***	0.2526*	1.9441**
14	0.9208***	2.4828***	0.2484*	1.9806**
15	0.9652***	2.3942***	0.2813**	2.0004**
16	1.0123***	2.4340***	0.2549*	2.3238**
17	1.1042***	2.4657***	0.2518*	2.4681**
18	1.1288***	2.5603***	0.2180	2.4874**
19	1.1617***	2.5785***	0.1985	2.4646**
20	1.1601***	2.5003***	0.2097	2.6839**
21	1.1735***	2.6067***	0.3223*	2.6885**
22	1.1837***	2.4725***	0.3331*	2.6955**
23	1.2927***	2.5340***	0.3408*	2.3707**
24	1.2260**	2.5903***	0.3081*	2.4278**

[37] Wilcoxon sign rank test for median generates similar results thus not report in the table.

Table V
Mutual Fund and Hedge Fund RAR under 1M2H and 1H2M

This table reports the risk adjustment ration (RAR) for mutual fund portfolios in the event of their managers moonlight hedge fund portfolios (1M2H) as well as mutual fund and hedge fund portfolios in the events that hedge fund managers start moonlighting mutual fund portfolios (1H2M). The RAR for hedge fund under 1M2H sample is not applicable because all moonlighting managers sample in 1M2H start to manage new hedge fund portfolios. In Panel A, we measure the RAR based on the calendar year. We use the standard deviation of fee-adjusted holding period return from a year earlier as base to measure the changes of moonlighting managers' risk incentives a year after the moonlighting year, noted as (-1, +1). In panel B, we measure the RAR based on the months surrounding the event date by using the standard deviation of fund returns from the previous 12 months of moonlighting as base to measure the RAR for 12 months after (0, +12) and 24 months after (0, +24). We also report the proportion of RAR exceeds one in both events. ***, **, and * indicate that the mean and median coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test and Wilcoxon sign rank test. The median values are reported in the parentheses.

Category	1M2H	1H2M	
	Mutual Fund	Hedge Fund	Mutual Fund
Panel A : RAR based on the calendar year			
(-1, +1)	0.8698*	0.8298**	0.6916***
	(0.7575)**	(0.7160)***	(0.6021)***
Proportion of RAR based on calendar year that exceeds one			
(-1, +1)	0.2069	0.1875	0.0833
Panel B : RAR based on the event date			
(0, +12)	0.8992**	0.9766	0.8308**
	(0.8636)**	(0.8115)	(0.7932)**
(0, +24)	0.9793	0.9809	0.8467**
	(0.8673)	(0.8183)	(0.8096)**
Proportion of RAR based on event date that exceeds one			
(0, +12)	0.3333	0.3889	0.1333
(0, +24)	0.3667	0.3889	0.1333

Table VI
Robustness Test for Performance under 1M2H and 1H2M
－ Sample Subtracts Matched Sample

Table VI reports test results for the differences between sample subtract matched sample funds on the cumulative fee-adjusted holding period return[38] for mutual fund and hedge fund portfolio from the event date to 24 months after (0, +24) the events of mutual fund managers moonlighting in hedge fund portfolios (1M2H) as well as hedge fund managers moonlighting in mutual fund portfolios (1H2M). The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds.
Returns are reported in % while hedge fund returns have downward adjusted[39] to mitigate survivorship bias. ***, **, and * indicate that the mean and median coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test and Wilcoxon sign rank test.

Time	Mutual Fund (1M2H)		Hedge Fund (1H2M)	
	Mean	Median	Mean	Median
0	5.8252**	9.4548***	-6.8712***	-5.6958***
1	4.6848*	6.2670**	-6.7670**	-5.3574**
2	6.3473**	8.3715***	-7.6028**	-6.8940***
3	6.8867**	8.3176***	-8.1184***	-6.0231***
4	6.5732*	11.2456**	-8.9590**	-7.2612**
5	5.6624*	9.5079**	-9.9386**	-7.8247**
6	6.4267*	10.7341**	-10.7536***	-9.4475***
7	6.5928**	10.0776**	-10.4202***	-6.2200***
8	7.2733**	9.0033***	-10.8077**	-8.0925**
9	7.3145**	10.3535***	-11.9195***	-10.6121***
10	8.9126**	11.5439***	-11.0121**	-8.9867**
11	8.2181**	9.9036***	-9.1757**	-7.6082**
12	8.7544**	7.7428***	-9.6662**	-8.5350**
13	9.8991**	8.4140***	-9.8676**	-8.3641**
14	10.4311**	8.5336***	-10.1038**	-5.0976**
15	10.7898**	9.6244***	-11.2767**	-8.9965**
16	12.5929***	7.4700***	-12.2360**	-8.4642**
17	12.1856***	9.5923***	-13.3454**	-10.7315**
18	13.5397***	11.6908***	-13.0352**	-10.8825**
19	14.3662***	12.7761***	-11.7660**	-10.9477**
20	14.0568***	10.0682***	-11.6846**	-9.0536**
21	11.9869**	9.1330**	-15.1978***	-12.5489***
22	12.5897***	8.4506**	-13.5077**	-12.1277***
23	13.9215***	11.4563**	-12.1096**	-11.4868**
24	13.1415**	14.9791**	-12.9128**	-14.9468**

[38] The excess-of-risk-free-rate returns, benchmark-adjusted returns and market-adjusted returns generate similar results thus not report here.
[39] Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.

Table VII
Robustness Test for Asset Flows under 1M2H and 1H2M
－ Sample Subtracts Matched Sample

Table VII reports test for differences between sample subtract matched sample funds on the cumulative monthly asset flows for mutual fund and hedge fund portfolios from the event date to 24 months after (0, +24) the events of hedge fund managers moonlighting in mutual fund portfolios (1H2M) as well as mutual fund managers moonlighting in hedge fund portfolios (1M2H). The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds.

We adopt Sirri and Tufano's (1998) measurement for monthly asset flows, (TNAi, t - TNAi, t-1) × (1+Ri, t-1) ÷ TNAi, t-1, where TNAi, t is the total net asset for fund i at time t and Ri, t-1 is the raw return at time t-1. ***, **, and * indicate that the mean and median coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test and Wilcoxon sign rank test.

Time	Mutual Fund (1M2H)		Hedge Fund (1H2M)	
	Mean	Median	Mean	Median
0	-0.6725**	-0.0997**	-0.1129	-0.0568
1	-0.5517*	-0.1129	-0.1539*	-0.1309
2	-0.6344**	-0.1532*	-0.2238**	-0.1598*
3	-0.5172*	-0.1716*	-0.2225**	-0.1272*
4	-0.5057	-0.1792*	-0.2717**	-0.1086*
5	-0.4649	-0.1852*	-0.2853**	-0.1011*
6	-0.6196*	-0.1691*	-0.2519**	-0.0898*
7	-0.6700*	-0.2005*	-0.2651**	-0.0935**
8	-0.7658*	-0.2091*	-0.2888**	-0.1083**
9	-0.9506**	-0.2920**	-0.3038**	-0.1551**
10	-0.9721**	-0.2802**	-0.2979**	-0.1645**
11	-0.9941**	-0.3435**	-0.3007**	-0.2184**
12	-0.9961**	-0.2930**	-0.3723***	-0.3567**
13	-0.9428*	-0.3187*	-0.3471**	-0.3663***
14	-0.9809**	-0.3441*	-0.3639**	-0.3924**
15	-0.9878**	-0.4094*	-0.3344**	-0.4103**
16	-1.3479**	-0.7455**	-0.3216**	-0.2465**
17	-1.3290**	-0.7796*	-0.3547**	-0.2344**
18	-1.5332**	-0.8693**	-0.4157**	-0.4142**
19	-1.5117**	-0.9227**	-0.4383**	-0.5102**
20	-1.5505**	-0.9476**	-0.4786**	-0.4605**
21	-1.5523**	-0.9691**	-0.3932**	-0.2878*
22	-1.5705**	-0.9992**	-0.4131**	-0.3572*
23	-1.3931**	-0.9928**	-0.4127**	-0.3689*
24	-1.7945**	-1.0526**	-0.4615**	-0.4003**

Table VIII
Robustness Test for RAR under 1M2H and 1H2M
－ Sample Subtracts Matched Sample

We conduct robustness test of the risk adjustment ration (RAR) for moonlighting managers' existing portfolios based on the findings of Brown, Harlow and Starks (1996). In this table, we report RAR for sample, matched sample and the difference between sample subtracts matched sample in two different assessments. The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds. In Panel A, we measure the RAR based on the calendar year. We use the standard deviation of fee-adjusted holding period return from both the year of moonlighting as well as the year earlier as base to measure the changes of moonlighting managers' risk incentives a year after the moonlighting year, noted as (0, +1) and (-1, +1). In panel B, we measure the RAR based on the months surrounding the event date by using the standard deviation of fund returns from the previous 12 months of moonlighting as base to measure the RAR for 12 months after (0, +12) and 24 months after (0, +24). ***, **, and * indicate that the mean and median coefficient is statistically significant at 1%, 5% and 10% levels, based on a 2-tail t-test and Wilcoxon sign rank test. The median values are reported in the parentheses.

Category	Mutual Fund (1M2H)			Hedge Fund (1H2M)		
	Sample	Matched	Difference	Sample	Matched	Difference
Panel A : RAR based on the calendar year						
(0, +1)	1.0312	0.8785*	0.1272**	0.9634	1.1170	-0.0752
	(0.9687)	(0.6991)*	(0.0540)**	(0.9549)	(1.1028)	(-0.1546)
(-1, +1)	0.8698*	0.8126**	0.0583	0.8298**	1.0757	-0.2470
	(0.7575)**	(0.5980)**	(0.1274)	(0.7160)***	(0.8176)	(-0.1497)**
Panel B : RAR based on the event date						
(0, +12)	0.8992**	0.7465***	0.1532**	0.9766	0.9661	0.0105
	(0.8636)**	(0.6931)***	(0.0630)**	(0.8515)	(0.9442)	(-0.0921)
(0, +24)	0.9793	0.7965***	0.1901***	0.9808	0.9346	0.0461
	(0.8673)	(0.7326)***	(0.1256)***	(0.8183)	(0.8778)	(-0.1685)

Table IX
Robustness Test for Performance under 1M2H and 1H2M

This table reports robustness test for performance for sample, portfolio matched sample and the difference of sample subtracts matched sample. The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds. Panel A reports performance test for Jensen's Alpha (Sharpe (1964) one-factor capital Asset Pricing Model). Panel B reports performance test for Fama and French (1993) three-factor alpha. Panel C reports performance test for Carhart (1997) four-factor alpha. We test 3 different time frames from 12 months prior to 12 months after the moonlighting events (-12, +12), 12 months prior to 24 months after (-12, +24), and from the moonlighting event to 24 months after (0, +24) for both mutual fund and hedge fund portfolio in the events of mutual fund managers moonlighting in hedge fund portfolios (1M2H) as well as hedge fund managers moonlighting in mutual fund portfolios (1H2M). Returns for hedge funds have downward adjusted[40] to mitigate survivorship and backfilled bias. Monthly returns are reported in percentages. ***, **, and * indicate that the mean coefficient is statistically significant at 1%, 5% and 10% levels, based on the 2-tail t-test[41].

Category	Mutual Fund (1M2H)			Hedge Fund (1H2M)		
	Sample	Matched	Difference	Sample	Matched	Difference
Panel A : Jensen's Alpha						
(-12,+12)	0.4932***	0.0093	0.5131***	0.0304	0.3590***	-0.3285**
(-12,+24)	0.3090**	-0.0128	0.3569***	-0.0077	0.3332***	-0.3409***
(0,+24)	0.2914*	0.0125*	0.3227*	-0.0403	0.2170***	-0.2573***
Panel B : Fama and French's Three-Factor Alpha						
(-12,+12)	0.2613*	-0.1155**	0.3959***	-0.0623	0.2538**	-0.3161**
(-12,+24)	0.1652	-0.0708	0.2672***	-0.1230	0.2185***	-0.3415***
(0,+24)	0.1383	-0.0275	0.1678*	-0.1490**	0.0949	-0.2446***
Panel C: Carhart's Four-Factor Alpha						
(-12,+12)	0.2512*	-0.1046**	0.3726***	-0.0892	0.2138*	-0.3031**
(-12,+24)	0.1416	-0.0701	0.2420***	-0.1177	0.2008**	-0.3185***
(0,+24)	0.1029	-0.0450	0.1521*	-0.1341*	0.0743	-0.2085**

[40] Based on the findings of Fung and Hsieh (2000), we correct hedge fund returns by modifying the annual return for each hedge fund in the sample by an annual rate of 3.6% to rectify the upward bias.
[41] Wilcoxon sign rank test has also been performed and found similar results.

Table X
Robustness Test for Performance under 1M2H and 1H2M through Regression

This table uses OLS regression to examine the differences of monthly return on both mutual funds and hedge funds in the events of moonlighting from twelve months prior to twenty-four months after the moonlighting events (-12, +24). The dependent variable is the differences of monthly fee-adjusted holding period return from sample subtract matched sample funds. The independent variables contain: a pre-moonlighting dummy which equals one from twelve months prior to one month prior to the event date (-12, -1) if a fund is managed by a moonlighting manager at the event date; a post-moonlighting dummy which equals one from one month post to twenty-four months post to the event date (+1, +24) if a fund is managed by a moonlighting manager at the event date; fund asset flow from the lag of one month for sample subtract matched sample funds (based on Sirri and Tufano (1998)); a logarithm total net asset from previous month for sample subtract matched sample funds; an annual portfolio turnover ratio from previous twelve months for sample subtract matched sample funds; an annual expense ratio from previous twelve months for sample subtract matched sample funds . The standard errors are heteroskedasticity-robust. The matched sample is created by forming portfolios based on total net assets of a mutual fund and the Sharpe ratio for a hedge fund without moonlighting engagement. We classify them into five groups after controlling for investment objective and the matched portfolios are identified as those with total net assets (Sharpe ratio) similar to sample funds from one of the five groups for mutual (hedge) funds. The p-values are reported in the parentheses. ***, **, and * indicate that the mean coefficient is statistically significant at 1%, 5% and 10% levels, based on the 2-tail t-test[42].

	Mutual Fund (1M2H)		Hedge Fund (1H2M)	
	(-12, +24)	(-12, +24)	(-12, +24)	(-12, +24)
	Model 1	Model 2	Model 1	Model 2
Pre-Moonlighting dummy	0.6439***	0.6393***	-0.9253***	-0.9381***
	(0.0038)	(0.0043)	(0.0014)	(0.0014)
Post-Moonlighting dummy	0.3264**	0.3186*	-0.3484*	-0.3530*
	(0.0476)	(0.0528)	(0.0879)	(0.0872)
Flow $_{(-1)}$		-0.1364		-1.2467
		(0.3223)		(0.1971)
Log TNA $_{(-1)}$	0.0453	0.0446	-0.0021	-0.0020
	(0.3846)	(0.3870)	(0.4915)	(0.4922)
Turnover $_{(-12)}$	0.1402**	0.1423**		
	(0.0333)	(0.0320)		
Expense $_{(-12)}$	-0.2259	-0.2215		
	(0.1675)	(0.1744)		
Observations	2,088	2,088	2,376	2,376

[42] Wilcoxon sign rank test has also been performed and found similar results.