Till Death Do Us Part: Marital Events and Hedge Funds*

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Abstract

Using an event study framework, we find that marital events tend to negatively impact hedge fund performance around the event window. Fund manager marriages and divorces significantly lower investment performance, both during the six-month period surrounding the event and for up to two years after the event. Relative to the period before the event, fund alpha falls by an annualized 5.10 percent during a marriage and 7.79 percent during a divorce. Older managers who run liquid, high-tempo investment strategies are more negatively impacted by marriage. Younger managers who engage in illiquid investment strategies with a longer investment horizon are more susceptible to the deleterious effects of divorce. We show that behavioral biases may partially explain the performance deterioration. The difference between the proportion of losses realized and the proportion of gains realized widens both during a marriage and during a divorce, indicating that hedge fund managers are more prone to the disposition effect around marital events. Taken together, our findings suggest that life events can shape the investment performance of professional money managers.

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1. Introduction

"One of my No. 1 rules as an investor is as soon as … I find out that [a] manager is going through divorce, [I] redeem immediately. Because the emotional distraction that comes from divorce is so overwhelming. … You can automatically subtract 10 to 20 percent from any manager if he is going through divorce."

- Paul Tudor Jones II[1]

Presumably, the drop in returns claimed by Jones is a result of emotional distractions at the personal level affecting professional investment decision-making. While intuitive, no formal study has documented the relationship between money managers' divorces and their investment performance.[2] Indeed if the emotional distractions from a divorce drive managers to underperform, may the emotional distractions associated with a marriage lead also to inferior investment performance?[3] We explore these questions by examining the effects of marital events on money managers' performance and risk-taking behavior using publicly available, court-reported marriage and divorce data.

In line with Jones's statement, we find that money managers significantly underperform during a divorce. In the six-month period surrounding a divorce, hedge fund

[1] Jones founded and manages the Tudor Investment Corporation, which has $11.4 BN under management. Jones made the statement at a panel discussion at his alma mater, the University of Virginia. See "Hedge fund legend: if one of my managers is getting divorced, I'll pull my money out," Business Insider, 23 May 2013 and "Tudor said to open first macro hedge fund in decade," Bloomberg, 2 July 2012.

[2] Despite the paucity of academic research examining the effects of marriage and divorce on investment performance, the literature on the effects of marriage on productivity in other fields is quite rich. For example, Bellas and Toutkoushian (1999), Cornaglia and Feldman (2011) and Roussanov and Savor (2013) analyze the impact of marital events on productivity in the academia, baseball, and general management, respectively.

[3] Paul Tudor Jones II, in clarifying remarks after the University of Virginia panel discussion, noted that "life events, such as birth, divorce, death of a loved one and other emotional highs and lows are obstacles to success in this specific field of finance (managing global macro hedge funds)." See "Investor Paul Tudor Jones says mothers can't be top traders" ABC News, 24 May 2013. This suggests that, for hedge fund managers at least. a marriage may not be so helpful for investment performance.

managers underperform by 4.33 percent per annum relative to the pre-divorce period.[4] After adjusting for co-variation with the Fung and Hsieh (2004) seven factors, the underperformance during the divorce increases to 7.79 percent per annum. The deleterious effects of a divorce extend beyond the six-month event window. Hedge funds continue to underperform by a risk-adjusted 2.29 percent per annum up to two years post divorce.

The emotional distraction associated with a marriage has a similar, albeit weaker, effect on hedge fund investment performance. In the six-month period surrounding a marriage, hedge fund managers underperform by an annualized 3.13 percent relative to the 21-month period before the event window. After adjusting for co-variation with the Fung and Hsieh (2004) seven factors, the underperformance during a marriage worsens to an annualized 5.10 percent. The loss in focus as a result of a marriage manifests beyond the six-month event window. For the two-year period post marriage, hedge funds continue to underperform by an annualized 3.16 percent after adjusting for risk.

Our results cannot be explained by the usual factors that explain hedge fund returns. Even after controlling for a myriad of variables that explain fund performance including fund incentives (Agarwal, Daniel, and Naik, 2009), share restrictions (Aragon, 2007), age (Aggarwal and Jorion, 2010), and size (Berk and Green, 2004), we find that both divorce and marriage are associated with significant deteriorations in investment performance. Our findings are also not artifacts of the decline in hedge fund risk-adjusted performance over time (Fung and Hsieh, 2004). We match our sample of marital event funds with other hedge funds based on performance in the pre-event window. We find that relative to this matched fund sample, hedge fund alpha wanes by an annualized 8.50 percent during a marriage and by an annualized 7.39 percent during a divorce.

[4] Inferences do not change when we use a one-year event window instead and reduce the before and after periods to 18 months.

Motivated by Paul Tudor Jones II's comments, we test whether marital events are more impactful for managers who have lower bandwidth and therefore can ill afford the emotional distractions associated with such events. We stratify funds into high and low bandwidth groups based on manager age, fund strategy, fund share restrictions, and fund size, and re-do our matched sample analysis. We argue that older managers who are running liquid, higher tempo strategies such as macro and managed futures that trade frequently have little bandwidth to cope with the emotional demands of a marriage. Conversely, younger managers who are running illiquid, lower tempo strategies such as distressed debt and equity long/short that arbitrage away long-term mispricing in the market, have greater bandwidth to contend with the emotional distractions associated with the marriage event. In line with this intuition, we find that marriages are more detrimental to investment performance for high tempo and liquid hedge funds run by older managers. In the months surrounding a marriage, managers running high tempo strategies suffer an annualized 15.59 percent deterioration in risk-adjusted performance while managers running low tempo strategies only suffer an annualized 7 percent drop in risk-adjusted performance. Along the same lines, in the months surrounding a marriage, funds with short redemption periods experience a statistically significant 15.52 percent reduction in annualized alpha, while funds with long redemption periods experience a modest and statistically unreliable 2.34 percent increase in annualized alpha. Relative to younger and presumably more energetic fund managers, older fund managers find it harder to manage the emotional distractions that come with a marriage. The average annualized alpha for older fund managers drops by 14.29 percent during the marriage event window, while that for younger fund managers actually experiences an uptick of 1.72 percent during the same time.

Do we also observe a similar effect for divorces? One view is that a divorce is more than simply a source of emotional distraction for hedge fund managers. It can be a source of

great emotional stress as well. Older, presumably calmer and less emotional, fund managers may be able to better manage the stress associated with a divorce than are younger, presumably more emotional, fund managers. Hedge managers that engage in illiquid, less transactional, more long-term strategies such as equity long/short, shareholder activism, and distressed debt tend to rely more on information networks and inter-personal relationships in the investment decision process. These managers may place a greater value on being in a stable, long-term relationship, and may therefore be more emotionally scarred by a divorce than are hedge fund managers that engage in liquid, transactional, short-term strategies such as macro and managed futures.

In line with this reasoning, we show that younger fund managers are more susceptible to the deleterious effects of divorce than are older fund managers. Specifically, the annualized alpha of the younger fund managers in our sample wanes by 15.68 percent during a divorce while that of the older fund managers in our sample only drops by 4.10 percent. A divorce precipitates an 8 percent per annum reduction in risk-adjusted performance for the illiquid funds in our sample versus a 1.12 percent per annum improvement in risk-adjusted performance for the liquid funds in our sample. Moreover, a divorce shaves off 7.86 percent in annualized alpha for low tempo funds, which tend to be less transactional by nature, but adds to the annualized alpha for high tempo funds, which are more transactional by nature. The magnitude of the impact of divorce on younger fund managers is consistent with the 10 to 20 percent drop in returns claimed by Jones.

While we cannot totally rule out the possibility that causality goes the other way, i.e., that poor performance leads to divorce, rather than divorce leading to poor performance, we appeal to the fact that the effects of marriage and divorce start relatively close to the event and persist well after the event to argue that our findings are more likely to reflect the effects of marital distractions on performance. That said, another interpretation of our results is that

the personal and professional lives of money managers are inextricably intertwined. In particular, negative returns and marital discord go hand in hand. Still, it is hard to explain the sign of our marriage results with the endogeneity story. According to the endogeneity story, positive returns and marital harmony should go hand in hand. This suggests that, contrary to our findings, fund performance should improve during and post marriage. Therefore, reverse causality cannot fully explain the impact of marital events on hedge fund manager investment performance.

How do marital events and the emotional distractions that come with those events engender deteriorations in investment performance for hedge fund managers? We show that emotional distracted hedge fund managers are less disciplined about cutting losses and more susceptible to the disposition effect. Using stocks holdings data, we find that the difference in the proportion of gains realized (PGR) and the proportion of losses realized (PLR) for hedge fund managers widens both during a marriage and during a divorce. In other words, hedge fund managers exhibit a greater tendency to hold on to their losses and realize their gains around marital events. In particular, the spread between PGR and PLR is 5.9 percent for the 6-month period surrounding a marriage but only -3.1 percent during the period before a marriage. Similarly, the spread between PGR and PLR is 4.5 percent for the 6-month period surrounding a divorce but only 2.3 percent during the period before a divorce. Given the Odean (1998) finding that the disposition effect hurts the performance of stock market investors, these results suggest that behavioral biases may partially explain the performance deterioration around marital events.

Our work sheds light on how the emotional distraction brought about by significant marital events can impact investment performance. By doing so, we contribute to the extant literature on marriage and productivity. In line with the arguments put forth by Becker (1973), this literature largely finds that there are productivity gains from marriage (through

specialization, for example). However, many of these studies focus on salary changes after marriage, rather than on innovations in an objective measure of productivity. For example, Korenman and Neumark (1991) show that married men make more than unmarried men. Two exceptions are Cornaglia and Feldman (2011) and Bellas and Toutkoushian (1999) who find that married baseball players (at least for those in the lower tercile of the ability distribution) and married academics are more productive than their unmarried counterparts. In addition, existing studies rarely address the disruptions brought about by the marital event itself. Our study adds to this incipient body of work by documenting, using a direct measure of productivity, the existence and magnitude of disruptions from marital events in the context of investment management. Our findings suggest that the work-related productivity gains from marriage, proposed by Becker (1973), are highly dependent on the nature of the work.

This study also resonates with work on the effects of marriage on portfolio choice. Love (2010) estimates a model of portfolio choice through marriage and divorce events. He finds that men increase portfolio risk by increasing the equity component of their portfolios following divorce, while women reduce risk.[5] Roussanov and Savor (2013) show that unmarried CEOs take on more risk professionally and interpret this as evidence supporting a model where status concerns arise endogenously due to competition in the marriage market and lead to greater risk-taking for unmarried individuals. We complement this literature by examining cross-sectional differences in risk-taking across single, married, divorced, and remarried fund managers. In line with prior studies, single fund managers take on more risk than their married competitors.

Our work also relates to several papers in finance. Barber and Odean (2001) show that marriage attenuates overconfidence amongst retail investors. They show that men, especially

[5] These studies typically focus on gender differences in portfolio choice. In our sample, the majority (> 90%) of fund managers are male. Thus, we do not separately analyze male and female fund managers.

single men, trade more than women and lose more from their trading activity. While not central to their analysis, they also find that single retail investors tend to trade more and take on more portfolio risk. Our results on risk-taking echo their findings. Given that professional money managers should seek to minimize the impact of personal emotions on their investment performance as part of their fiduciary duty to investors, we believe that marital events like a divorce will have an even greater impact on the investment performance of retail investors. Our findings on the impact of emotional distractions on investment performance also complement extant research on the impact of sentiment on stock returns. Notable examples include work on the impact of sunny weather (Shumway and Hirshleifer, 2003), seasonal affective disorder (Kamstra, Kramer, and Levi, 2003), and sports sentiment (Edmans, García, and Norli, 2007) on stock returns. By showing that hedge fund managers are more prone to the disposition effect (Odean, 1998) around marital events, we provide tantalizing prime facie evidence that behavioral biases such as disposition (Odean, 1998), overconfidence (Barber and Odean, 1999; 2001), and inattentiveness (Barber and Odean, 2008) may lie at the root of performance deteriorations amongst emotionally distracted market participants.

The remainder of this paper is organized as follows: Section 2 provides a description of the data and methodology. Section 3 reports the results from the empirical analysis. Section 4 presents robustness tests while Section 5 concludes.

2. Data and methodology

We evaluate the impact of hedge funds using monthly net–of–fee returns and assets under management data of live and dead hedge funds reported in the TASS, HFR, and

BarclayHedge datasets from January 1990 to December 2012.[6] Because TASS, HFR, and BarclayHedge started distributing their data in 1994, the data sets do not contain information on funds that died before December 1993. This gives rise to survivorship bias. We mitigate this bias by focusing on data from January 1994 onward.

In our fund universe, we have a total of 31,542 hedge funds, of which 18,295 are live funds and 13,247 are dead funds. However, due to concerns that funds with multiple share classes could cloud the analysis, we exclude duplicate share classes from the sample.[7] This leaves a total of 26,811 hedge funds, of which 15,550 are live funds and 11,261 are dead funds. The funds are roughly evenly split between TASS, Morningstar, HFR, and BarclayHedge. While 5,805 funds appear in multiple databases, many funds belong to only one database. Specifically, there are 6,595, 5,317, 4,847 and 4,247 funds peculiar to the TASS, Morningstar, HFR, and BarclayHedge databases, respectively. This highlights the advantage of obtaining data from more than one source. Other than monthly return and size information, our sample also captures data on fund characteristics such as management fee, performance fee, redemption period, lock-up period, investment style, leverage indicator, high-water mark indicator, fund age, and fund location. For funds in multiple databases, we follow a priority rule and only keep the observations from the highest priority database.[8]

We hand collect money managers' marital records from several data sources. The primary data source is Lexis-Nexis court record searches and this is supplemented by Internet searches. For each money manager, we start by performing a name search in Lexis-Nexis using the first name, middle initials and last name. If there are multiple matches with the same middle initials, we use other Internet public sources to identify possible spouses, and then locate the correct marriage/divorce records. The matches are also confirmed by cross

[6] The results are robust to using pre–fee returns.
[7] Inferences do not change when we include multiple share classes of the same fund in the analysis.
[8] We adopt the following priority rule for our fund data: TASS>Morningstar>HFR>BarclayHedge.

checking the marriage location with the city and state of the manager's management firm.

We are able to obtain marriage and divorce records for the following 13 states: Arizona, California, Colorado, Connecticut, Florida, Georgia, Kentucky, Nevada, North Carolina, Ohio, Pennsylvania, Texas, and Virginia, which publicly disclose marital records. The remaining states do not disclose marriage and divorce data publicly.[9] The matching results in 857 marriages and 251 divorces for 786 hedge fund managers. Table 1 presents the distribution of marriages and divorces by state, as well as the divorce rates for each state.

Throughout this paper, we model the risks of hedge funds using the Fung and Hsieh (2004) seven–factor model. The Fung and Hsieh factors are the excess return on the Standard and Poor's (S&P) 500 index (*SNPMRF*); a small minus big factor (*SCMLC*) constructed as the difference between the Wilshire small and large capitalization stock indices; the yield spread of the US ten–year Treasury bond over the three–month Treasury bill, adjusted for duration of the ten–year bond (*BD10RET*); the change in the credit spread of Moody's BAA bond over the ten–year Treasury bond, also appropriately adjusted for duration (*BAAMTSY*); and the excess returns on portfolios of look back straddle options on currencies (*PTFSFX*), commodities (*PTFSCOM*), and bonds (*PTFSBD*), which are constructed to replicate the maximum possible return from trend following strategies (see Fung and Hsieh, 2001) on their respective underlying assets.[10] These seven factors have been shown by Fung and Hsieh (2004) to have considerable explanatory power on hedge fund returns.

[9] For example, New York State restricts access to marriage records to "the spouses [and] other persons who have a: (1) documented judicial or other proper purpose or (2) New York State Court Order." (see http://www.health.ny.gov/vital_records/marriage.htm)

[10] David Hsieh kindly supplied these risk factors. The trend following factors can be downloaded from http://faculty.fuqua.duke.edu/~dah7/DataLibrary/TF-Fac.xls.

3. Empirical results

3.1. Cross-sectional analysis

As a prelude to exploring the impact of marital events on hedge fund performance, we stratify hedge funds into four groups by fund manager marital status at the end of the sample. The four groups include (1) single managers who have never been married, i.e., those with no marriage records (2) married managers who have never been divorced, i.e., those with a single marriage record and no divorce records (3) divorced managers who married once, i.e., those with a single marriage record and a single divorce record (4) managers who have been married multiple times, i.e., those with multiple marriage records. Next, we evaluate differences in fund characteristics, returns, alpha, flows, total risk, and idiosyncratic risk between these groups of managers, where total risk is the standard deviation of monthly fund returns while idiosyncratic risk is the standard deviation of the monthly residuals from the Fung and Hsieh (2004) seven-factor model.

The results reported in Table 2 indicate that single managers who have never been married tend to take on greater total risk and idiosyncratic risk than all other managers. For example relative to managers who have been married multiple times, single managers deliver raw returns that are 31.0 basis points more volatile and abnormal returns that are 12.7 basis points more volatile. These results are broadly consistent with Love (2010) and Roussanov and Savor (2013) who find that single men tend to take on more risk than unmarried men. The view is that single fund managers take on greater risk so as to increase their status in the marriage market. However the differences are either marginally statistically significant (i.e., significant at the ten percent level) in the case of total risk or unreliably different from zero in the case of idiosyncratic risk. Therefore it is hard to make inferences from these cross-sectional results.

[Insert Table 2 here]

While there are no discernable differences in returns and alphas across the four groups of fund managers, the differences in fund characteristics and flows reported in Table 2 yield some interesting insights. We find that single fund managers who have never been married tend to manage funds with shorter lock-ups and greater inflows than fund managers who have had multiple marriages. One view is that single fund managers, in order to accumulate wealth and raise their status in the marriage market, are highly focused on raising capital. So as to attract capital, these managers offer friendlier, less stringent redemption terms to their investors. Another view is managers with multiple marriages tend to be emotionally distracted by their obligations to their ex-wives and children from previous marriages. They are therefore less focused on growing the fund management company and are less likely to be engaged in high tempo investment strategies such as macro and managed futures, which tend to be liquid and warrant fewer share restrictions.

3.2. Event study

In this section, we explore the impact of marriage and divorce on the investment performance of hedge fund managers. At the same time we also examine the effects of such marital events on manager risk-taking and capital raising behavior. In that effort, we define as the event period, the six months surrounding a marriage or a divorce. The "before" period is the period that starts two years before the marital event and ends just before the event window. The "after" period is the period that starts just after the event window and ends two years after the event. Therefore the "before" and "after" windows each spans 21 months.[11]

[11] Our baseline inferences do not change when we specify a longer event period (i.e., 12 months) and a correspondingly shorter "before" and "after" period (i.e., 18 months).

Next, we evaluate differences in returns, alphas, flows, total risk, and idiosyncratic risk between the aforementioned periods in event time. The univariate performance results reported in Table 3 are broadly in line with the view expounded by Paul Tudor Jones II. Relative to the period before a marriage, marriage reduces returns by 3.13 percent per annum and crimps alpha by 5.10 percent per annum. The underperformance is not confined to the event window. Fund managers continue to underperform by 3.16 percent per year after adjusting for co-variation with the Fung and Hsieh (2004) risk factors up to two years after the marriage. The impact of divorce tends to be stronger but more transient. Relative to the period before a divorce, divorce precipitates a 4.33 percent per annum reduction in returns and a 7.79 percent per annum drop in alpha. Risk-adjusted returns recover by 5.50 percent per annum post event. Still two years after the divorce, post-event window alphas continue to lag pre-event window alphas by an annualized 2.29 percent.

[Insert Table 3 here]

The comparison of risk-taking behavior before and after a marriage yields results that echo those from the prior literature and corroborate the findings from Table 2 on risk-taking. We find that in the period after a marriage, total risk decreases by an annualized 1.34 percent and idiosyncratic risk shrinks by an annualized 1.71 percent relative to the period before a marriage. The former spread in volatility is significant at the ten percent level, while the latter spread in volatility is statistically significant at the one percent level. This suggests that fund managers tend to take on less risk after marriage. However, we do not witness an opposite effect post divorce. Contrary to the predictions of the Love (2010) model, risk taking does not increase after a divorce. The point estimates in Table 3 indicate that risk taking by hedge fund managers actually decreases following a divorce, although the effects are not reliably different from zero.

One concern is that our findings may be driven by other factors known to explain hedge fund returns. For example, single managers may be highly motivated to raise capital so as to increase their status in the marriage market. Post marriage, these managers will have to grapple with the increased assets under management and the resultant diseconomies of scale, which may make it difficult for the manager to outperform. To address such concerns, we estimate the following multivariate regressions on fund performance for both marriage and divorce events:

$$ALPHA_{im} = \propto + \beta_1 EVENT_{im} + \beta_2 AFTER_{im} + \beta_3 MGTFEE_i + \beta_4 PERFFEE_i + \beta_5 HWM_i + \beta_6 LOCKUP_i + \beta_7 LEVERAGE_i + \beta_8 AGE_{im-1} + \beta_9 REDEMPTION_i + \beta_{10} \log(FUNDSIZE_{im-1}) + \varepsilon_{im}$$

where $ALPHA_{im}$ is Fung and Hsieh (2004) seven-factor alpha for fund *i* and month *m* with factor loadings estimated over the last 24 months, *BEFORE* is an indicator variable that takes a value of one in the 21-month period starting two years prior to the marital event and ending three months before the marital event, and a value of zero otherwise, *EVENT* is an indicator variable that takes a value of one in the six-month period starting three months prior to the marital event and ending three months after the marital event, and a value of zero otherwise, *AFTER* is an indicator variable that takes a value of one in the 21-month period starting three months after the marital event and ending two years after the event, and a value of zero otherwise, *MGTFEE* is fund management fee, *PERFFEE* is fund performance fee, *HWM* is fund high-water mark indicator, *LOCKUP* is fund lock-up period, *LEVERAGE* is fund leverage indicator, *AGE* is fund age since inception, *REDEMPTION* is fund redemption period, and log(*FUNDSIZE*) is the natural logarithm of fund assets under management. We do not include the *BEFORE* dummy due to multi-collinearity concerns. We also estimate regressions on fund returns and fund total risk.

[Insert Table 4 here]

Table 4 reports the coefficient estimates from the multivariate regressions. The coefficient estimates on *EVENT* and *AFTER* dummies in the marriage regressions indicate that after controlling for other variables that explain fund performance, marriage crimps hedge fund alpha by an annualized 7.30 percent over the event window and by an annualized 3.42 percent up to two years after the event. Similarly, the coefficient estimates on the *EVENT* and *AFTER* dummies in the divorce regressions reveal that divorce precipitates a 5.66 percent drop in annualized hedge fund alpha over the event window and a 3.29 percent drop in annualized hedge fund alpha up to two years after the event. The coefficient estimates on the control variables dovetail broadly with prior research. Consistent with Aggarwal and Jorion (2010), returns and alpha are negatively correlated with fund age. Also, in the spirit of Agarwal, Daniel, and Naik (2009), high performance fee funds outperform low performance fee funds.

While the multivariate regression results reported in Table 4 control for a host of variables that explain fund performance, there may be concerns that we have not adequately accounted for possible time trends in hedge fund performance. For example, Fung and Hsieh (2004) provide evidence that the average hedge fund alpha has diminished over time. The reduction in alpha over time may explain why we find that hedge fund risk-adjusted performance wanes post marriage and post divorce. Moreover, such a time trend in performance may be driven by industry or macroeconomic factors that are tangential to the fund level control variables employed in the Table 4 regressions.

To allay concerns that a time trend in fund performance is driving our results, we employ a “differences-in-differences” methodology and match each fund with a marital event

with another fund based on fund performance in the "before" period. Next, we estimate the following multivariate regression:

$$ALPHA_{im} = \propto + \beta_0 TREATMENT_{im} * BEFORE_{im} + \beta_1 TREATMENT_{im} * EVENT_{im} + \beta_2 TREATMENT_{im} * AFTER_{im} + \beta_3 MGTFEE_i + \beta_4 PERFFEE_i + \beta_5 HWM_i + \beta_6 LOCKUP_i + \beta_7 LEVERAGE_i + \beta_8 AGE_{im-1} + \beta_9 REDEMPTION_i + \beta_{10} \log(FUNDSIZE_{im-1}) + \varepsilon_{im}$$

where *TREATMENT* is an indicator variable that takes a value of one if the fund manager experiences a marital event, i.e., the fund is in the treatment group, and takes a value of zero if the fund is in the control group. The rest of the variables are as previously defined.

The coefficient estimates from the regression on the matched sample are reported in Table 5. They indicate that even after accounting for the performance of the matched funds in our control group, hedge fund alpha for the funds in our treatment group still wanes post marriage and post divorce. Relative to the period before a marriage and relative to the funds in the control group, annualized hedge fund alpha declines by 8.50 percent during the marriage event window and by 3.54 percent in the post event window period. Likewise, compared to the period before a divorce and compared to the funds in the control group, annualized hedge fund alpha wanes by 7.39 percent during the divorce event window and by 5.12 percent in the post event window period. These results provide strong evidence that the emotional distractions associated with marital events are detrimental to professional portfolio management.

[Insert Table 5 here]

3.3. Subsample analysis

To further understand the underlying reasons for why hedge fund performance suffers when fund managers marry or divorce, we stratify our sample based on fund manager bandwidth. We hypothesize that marriage has a greater impact on managers who have lower bandwidth and can therefore ill afford the emotional distractions associated with marriage. We classify older fund managers who manage larger funds and engage in liquid, high tempo strategies such as macro and managed futures as low bandwidth funds. We classify younger fund managers who run smaller funds and engage in illiquid, low tempo strategies such as equity long/short and distressed debt as high bandwidth funds. Next, we stratify fund managers into low and high bandwidth groups based on fund liquidity, fund size, fund strategy, and manager age, and re-do the matched sample regression analysis of Section 3.3. Following Aragon (2007), we use fund share restrictions such as redemption period and lock-up period as proxies for fund liquidity.

[Insert Table 6 here]

We find from the results reported in Table 6 that low bandwidth funds are more affected by marriage than are high bandwidth funds. During a marriage, the alpha of funds with short redemption periods wanes by an annualized 15.52 percent while the alpha of funds with long redemption periods increases by an annualized 2.34 percent. Over the marriage event window, high tempo funds underperform by a risk-adjusted 15.59 percent per year while low tempo funds only underperform by a risk-adjusted 7.00 percent per year. A marriage shaves 14.29 percent per year off the alpha of older fund managers but adds 1.72 percent per year to the alpha of younger fund managers. These results are consistent with the view expounded by Jones that life events are a source of emotional distraction for professional money managers. They indicate that personal distractions such as marriages are

most detrimental to managers who can least afford such distractions in their professional lives.

Should we also observe a similar effect for divorces? A divorce is more than simply a source of emotional distraction for hedge fund managers. It can be a source of great emotional stress as well. We argue that older, presumably calmer and less emotional, fund managers are more insulated from the stress associated with a divorce than are younger, presumably more emotional, fund managers. We also hypothesize that hedge fund managers that engage in more transactional strategies, such as macro and managed futures, are more impervious to the emotional stress from a divorce than are managers that engage in less transactional strategies, such as equity long/short, shareholder activism, and distressed debt, which rely more on human networks and relationships in the investment decision process.

In line with this reasoning, we find that compared to their older competitors, younger fund managers tend to be impacted more by a divorce. A divorce shaves 15.68 percent per year off a younger fund manager's alpha but only 4.10 percent per year off an older fund manager's alpha. Funds that offer little liquidity to their investors tend to be affected more by manager divorce than funds that offer greater liquidity to their investors. A divorce precipitates an 8 percent reduction in annualized alpha for funds with short redemption periods but a 1.12 percent improvement in annualized alpha for funds with long redemption periods. High tempo hedge funds, which are more transactional by nature, are largely spared the deleterious effects of manager divorce and actually experience a performance boost in the event window. Conversely, low tempo hedge funds, which are more dependent on networks and relationships in their investment process, are highly susceptible to the effects of a divorce. Their annualized alpha plummets by 7.86 percent in the event window.

3.4. Alternative explanations

An alternative explanation for our findings is that marriage and to a lesser extent divorce are life choices with an element of timing. Given this, it could be that fund returns are driving these marital decisions, rather than the marital events affecting returns. This could manifest in a number of ways:

First, marriage would likely by preceded by good returns and divorces by bad returns. Even if divorces have no effect on fund returns, performance persistence (Kosowski, Naik, and Teo, 2007; Jagannathan, Malakhov, and Novikov, 2010) could explain why divorces are followed by poor returns. Similarly, even if marriages have no impact on fund performance, mean reversion could explain why marriages tend to lead inferior performance. Still it is difficult to understand why returns persist during a divorce but mean revert during a marriage.

Second, there could be a virtuous or vicious cycle between professional and personal life. For example, a slight marital tension leads to poor investment decisions, which leads to lower returns, which in turn increases marital stress, and so on. We cannot precisely isolate personal and professional lives, and while we couch our results in terms of the "effect" of marriage and divorce on performance, there is likely to be some element of feedback. We do, however, note that marriages and divorces are deeply personal events, and to some extent, are exogenous from the fund performance. More importantly, while this story cannot explain why performance wanes post marriage as well as it can explain why returns decline post divorce.

Third, to the extent that participants in the marriage can forecast future returns and strategically time decisions to optimize over future projected returns, we may observe similar empirical outcomes to those documented, even if divorces have absolutely no effect on

performance. For example, the spouse of a fund manager may foresee a rough patch one to two years ahead and may push for a divorce pre-emptively. This seems far-fetched though. Moreover, while this story may explain our divorce findings, it cannot explain our marriage findings. A similarly strategic and prescient fiancé of a fund manager would certainly be reluctant to tie the knot immediately having been blessed with the foreknowledge that fund returns will hit a rough patch one to two years later.

The first two alternative explanations advanced above are based on the view that fund performance leads marriage and divorce. To investigate the determinants of marriage and divorce, we estimate the following multivariate logistic regressions on the probability of marriage and divorce:

$$MARRIAGE_{im} =$$

$$\propto +\beta_1 ALPHA_{im-1,m-12} + \beta_2 FLOW_{im-1,m-12} + \beta_3 ALPHA_{im-13,m-24}$$
$$+ \beta_4 FLOW_{im-13,m-24} + \beta_5 MGTFEE_i + \beta_6 PERFFEE_i + \beta_7 HWM_i$$
$$+ \beta_8 LOCKUP_i + \beta_9 LEVERAGE_i + \beta_{10} AGE_{im-1} + \beta_{11} REDEMPTION_i$$
$$+ \beta_{12} \log (FUNDSIZE_{im-1}) + \varepsilon_{im}$$

$$DIVORCE_{im} =$$

$$\propto +\beta_1 ALPHA_{im-1,m-12} + \beta_2 FLOW_{im-1,m-12} + \beta_3 ALPHA_{im-13,m-24}$$
$$+ \beta_4 FLOW_{im-13,m-24} + \beta_5 MGTFEE_i + \beta_6 PERFFEE_i + \beta_7 HWM_i$$
$$+ \beta_8 LOCKUP_i + \beta_9 LEVERAGE_i + \beta_{10} AGE_{im-1} + \beta_{11} REDEMPTION_i$$
$$+ \beta_{12} \log (FUNDSIZE_{im-1}) + \varepsilon_{im}$$

where $MARRIAGE_{im}$ is an indicator variable that takes a value of one when fund manager *i* marries in month *m* and takes a value of zero otherwise, $DIVORCE_{im}$ is an indicator variable that takes a value of one when fund manager *i* divorces in month *m* and takes a value of zero otherwise, and the other variables are as per previously defined. We also estimate analogous

multivariate logistic regressions with *RETURN* in place of *ALPHA* to ensure that the risk-adjustment methodology is not driving our results.

[Insert Table 7 here]

The results reported in Table 7 broadly indicate that neither fund returns nor fund alpha have a statistically reliable impact on the probability of marriage and divorce. The sign of the coefficient estimates on the *RETURN* and *ALPHA* variables suggest that in line with our prior intuition, good fund performance leads marriage and poor fund performance leads divorce. However, all the coefficient estimates on *RETURN* and *ALPHA* are statistically indistinguishable at the ten percent level except for that on $ALPHA_{im-13,m-24}$ in the marriage regression, indicating that only fund alpha two years ago exerts a modestly significant impact on the probability of a marriage. Because fund performance closer to the event date has no reliable impact on the probability of marriage and divorce, this provides little support for the view that fund performance determines marriage and divorce and because of performance persistence (in the case of divorce) or mean reversion (in the case of marriage), performance wanes post marriage and divorce.

Interestingly we find that a decrease in fund flows is associated with an increase in divorce rates two years later. One view is that the negative earnings shock as a result of the reduction in capital flow increased the probability of divorce by changing the expected gains from marriage (Charles and Stephens, 2004).[12] Another view is that marital problems leading to a divorce may have distracted fund managers and hampered capital raising efforts as early as two years prior to the event.

[12] Charles and Stephen (2004) show that, strictly speaking, it is not evidence about the economic well being of the couple after the earnings shock that increases the probability of a divorce but rather new information that the earnings shock sends about the partner's fitness as a mate (i.e., discipline and temperament) that impacts the divorce decision.

3.5. Behavioral biases

How do marital events and the emotional distractions that come with those events engender deteriorations in investment performance for hedge fund managers? One view is that when fund managers are distracted they become less disciplined and more susceptible to behavioral biases such as the disposition effect. Odean (1998) shows that the disposition effect, or the propensity to hold on to one's losses and realize one's gains, can hurt investment performance as disposition-inclined investors sell winner stocks (gains) which subsequently appreciate in price and hold on to loser stocks (losses) which subsequently depreciate in price. To test the view that hedge fund managers are more susceptible to the disposition effect around marital events, we obtain stock holdings information from the Thompson Financial 13-F holdings database for the fund managers in our sample. Next, we evaluate the difference between the proportion of losses realized (PLR) and the proportion of gains realized (PGR) for the before, event, and after periods previously defined. Our analysis follows Odean (1998). We define PLR as the number of realized losses divided by the number of realized losses plus the number of paper (unrealized) losses, and PGR as the number of realized gains divided by the number of realized gains plus the number of paper (unrealized) gains. Realized gains, paper gains, realized losses, and paper losses are aggregated over time for each period (i.e., before, event, and after) and over all funds. We compute *t*-statistics that test the null hypothesis that the differences in proportions are equal to zero assuming all realized gains, paper gains, realized losses, and paper losses result from independent decisions. To calculate the t-statistics, the standard error for the difference in proportions PGR and PLR is:

$$\sqrt{\frac{PGR(1-PGR)}{n_{rg}+n_{pg}}+\frac{PLR(1-PLR)}{n_{rl}+n_{pl}}}$$

where n_{rg}, n_{pg}, n_{rl}, and n_{pl} are the number of realized gains, paper gains, realized losses, and paper losses.

[Insert Table 8 here]

The results from the disposition effect tests are reported in Table 8. They indicate that hedge fund managers are more prone to the disposition effect during a marriage and during a divorce. The difference between PLR and PGR is positive and statistically different from zero at the one percent level during the "before" period prior to a marriage suggesting that hedge fund managers are not afflicted by the disposition effect during that time. Yet during the marriage "event" period, we find that the difference between PLR and PGR is negative and statistically different from zero at the one percent level. This indicates that hedge fund managers are susceptible to the disposition effect during the marriage "event" period. In particular, in the six-month period surrounding a marriage, they realize 51.1 percent of their gains but only 45.2 percent of their losses. However, the impact of marriage on the propensity of hedge fund managers to hold on to their losses and realize their gains does not extend beyond the marriage "event" period. We find that the difference between PLR and PGR is negative but statistically indistinguishable from zero during the post-marriage "after" period.

Divorces, unlike marriages, appear to have a more durable impact on the hedge fund manager's susceptibility to the disposition effect. We find that hedge fund managers are prone to the disposition effect before, during, and after a divorce. Moreover, the propensity to hold on to losses and realize gains increases as we move from the period before a divorce to the period after a divorce. During the "before" period prior to a divorce, hedge fund managers realize 33.8 percent of their gains and 31.5 percent of their losses. The spread between PGR and PLR increases as we move to the divorce "event" period, where hedge fund managers

realize 41.5 percent of their gains but only 37.0 percent of their losses. In the "after" period, the gap between PGR and PLR increases marginally from 4.5 percent to 4.6 percent. These results indicate that the propensity to hold on to losses and realize gains increases during a divorce. They also suggest that the effect of a divorce on manager trading behavior is stronger and more durable than that of a marriage. The fact that PLR is less than PGR before a divorce but not before a marriage suggests also that unlike that of a marriage the impact of a divorce may manifest up to two years prior to the event itself. These results are not surprising, given that it may take a few years to finalize a divorce, especially when there are disagreements on child custody and the division of matrimonial assets, and the divorce is contested in court.

4. Robustness tests

4.1. Varying the event window

In our baseline results, we used an "event" period of six months (starting three months before and ending three months after the marital event). We also used a "before" period that starts two years prior to the event and ends three months before the event, as well as an "after" period that starts three months after the event and ends two years after the event. To gauge the sensitivity of our results to these specifications, we vary the length and composition of the overall event window. In the first alternative specification, we consider a longer 12-month "event" period and corresponding shorter 18 month "before" and "after" periods. In the second alternative specification, we keep the "event" period at six months but extend both the "before" and "after" periods to 33 months so that the before period starts three years prior to and ends three months before the event while the after period starts three months after and ends three years after the event. The results from the matched sample regression analysis with these alternative event window specifications are reported in Panels A and B of Table 9.

They indicate that our baseline results are robust to changes in the composition and length of the overall event window.

[Insert Table 9 here]

4.2. Unilateral divorce laws

Unilateral divorce allows marriages to end where one person wants out of the marriage and the other person wants to remain married. Not all states in the US have enacted unilateral divorce laws. In states that adopted unilateral divorce, Stevenson and Wolfers (2006) uncover an 8–16 percent decline in female suicide, a 30 percent decline in domestic violence for both men and women, and a 10 percent decline in females murdered by their partners. Stevenson (2007) finds that the adoption of unilateral divorce laws reduces investment in all types of marriage-specific capital considered except home ownership. Newlywed couples in states that allow for unilateral divorce are less likely to support a spouse through school, more likely to have a wife in the labor force, and less likely to have a child.

How does the adoption of unilateral divorce impact the emotional distraction that is associated with getting married and divorced? On one hand, unilateral divorce may ameliorate the impact of marital events as hedge fund managers who tie the knot in states with unilateral divorce laws invest less in marriage-specific capital and are therefore less emotionally distracted by a marriage. Having invested less in the relationship, they are also less emotionally impacted by a divorce. On the other hand, unilateral divorce may reduce the gains from specialization (Becker, 1973) as the wives are less likely to leave the labor force and take on a more supportive role in the household. As a result, hedge fund managers are more negatively impacted by marriage. At the same time, the adoption of unilateral divorce

laws may heighten the emotional impact of a divorce on a hedge fund manager in situations when the spouse initiates the divorce and the fund manager is an unwilling party.

To investigate, we split our sample into states that have adopted unilateral divorce laws and states that have not, and redo our matched sample analysis. We report the results in Panels C and D of Table 9. They indicate that the impact of marital events on fund manager alpha is stronger for states that adopted unilateral divorce, while the impact on returns is stronger for states that did not adopt unilateral divorce. The empirical evidence therefore neither supports the view that unilateral divorce ameliorates the impact of marriage and divorce on investment performance, nor does it support the view that unilateral divorce heightens the impact of marital events on investment performance.

5. Conclusion

The traditional Becker (1973) view in the marriage literature is that marriage increases productivity via the division of labor. For example, in a married household, the wife can focus on cooking, cleaning, and childcare. Unencumbered by such demands, the husband can focus on work, thereby raising productivity. This paper challenges this view, at least in the context of professional investment management. We show that during and after a marriage (and a divorce), risk-adjusted investment performance deteriorates significantly for the predominantly male hedge fund managers in our sample. Why do hedge fund managers not reap the productivity benefits from marriage? We believe the answer lies in their greater initial wealth. Anecdotal evidence suggests that hedge fund managers tend to be reasonably wealthy even before launching their own funds because of the significant capital requirements associated with fund start-ups. Therefore, hedge fund managers would already be able to easily outsource household and childcare related chores, even before they are

married, thereby reducing the productivity gains from marriage. Indeed, these results are in line with Cornaglia and Feldman (2011) who find that the batting averages of higher-ability, presumably wealthier, baseball players in major league baseball do not change post marriage. We show further that because hedge fund managers, especially those managing liquid, high tempo strategies, like macro and managed futures, are so time and energy constrained, marriage effectively reduces productivity for them. The resultant 14–16 percent decline in annualized risk-adjusted performance for these managers during marriage underscores the deleterious effects of emotional distractions on professional money management. Our work is the first step towards understanding the impact of life events and emotional distractions on investment performance. Our findings on the role that the disposition effect plays in this process provide prima facie evidence that behavioral biases may lie at the root of the performance deteriorations experienced by emotionally distracted participants in the stock market. We believe that further research along similar lines with prove fruitful in the future.

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Table 1
Distribution of marital events for hedge fund managers

This table reports the distribution of marital events, i.e., marriages and divorces, by state. Divorce rate is the ratio of the number of divorces to the number of marriages within each state. The sample period is from January 1994 to December 2012.

State	Marriage		Divorce		Total		Divorce rate
	Number	Percentage	Number	Percentage	Number	Percentage	
Arizona	0	0.00	2	0.80	2	0.18	n/a
California	215	25.09	80	31.87	295	26.62	0.37
Colorado	38	4.43	0	0.00	38	3.43	0.00
Connecticut	216	25.20	41	16.33	257	23.19	0.19
Florida	144	16.80	68	27.09	212	19.13	0.47
Georgia	33	3.85	9	3.59	42	3.79	0.27
Kentucky	3	0.35	0	0.00	3	0.27	0.00
Nevada	10	1.17	2	0.80	12	1.08	0.20
North Carolina	22	2.57	9	3.59	31	2.80	0.41
Ohio	16	1.87	2	0.80	18	1.62	0.13
Pennsylvania	5	0.58	0	0.00	5	0.45	0.00
Texas	139	16.22	30	11.95	169	15.25	0.22
Virginia	16	1.87	8	3.19	24	2.17	0.50
Total	857	100	251	100	1,108	100	0.31

Table 2
Summary statistics

This table reports hedge fund characteristics grouped by the marital status of the fund manager. No marriage funds are those whose managers have no marital records within the 13 states for the sample period. Single marriage funds are those for whom we find only one marriage record for the fund manager. Single divorce funds are those for whom we find one marriage record and one divorce record for the fund manager. Multiple marriages funds are those for whom we find more than one marriage record and one divorce record for the fund manager. Management fee and performance fee are both in percentage. High-water mark is a dummy variable which takes one if the hedge fund uses high-water mark and zero otherwise. Lock-up period is in days, conditional on non-zero records. Redemption period is in months. Leveraged is a dummy variable which takes one if the hedge fund uses leverage and zero otherwise. Alpha is Fung and Hsieh (2004) seven-factor alpha. Total risk is the standard deviation of raw returns, while idiosyncratic risk is the standard deviation of the residuals from the seven-factor alpha regressions. The sample period is from January 1994 to December 2012.

Variable	No marriage (1)	Single marriage (2)	Single divorce (3)	Multiple marriages (4)	(1)-(2)	(1)-(3)	(1)-(4)
	Mean	Mean	Mean	Mean			
Number of funds	4,522	635	279	117			
Percentage of funds	81.43	11.44	5.02	2.11			
Management fee (%)	1.422	1.428	1.384	1.392	-0.006	0.038	0.029
Performance fee (%)	16.670	16.590	17.298	16.263	0.080	-0.628	0.407
High-water mark (dummy)	0.752	0.751	0.792	0.697	0.001	-0.040	0.055
Fraction of funds with lock-ups	0.352	0.443	0.470	0.402	-0.090***	-0.117***	-0.050
Lock-up period (days)	112.2	153.0	87.650	216.700	-40.8***	24.600	-104.5***
Redemption period (months)	2.359	2.552	2.336	2.082	-0.194	0.023	0.277*
Leveraged (dummy)	0.601	0.606	0.667	0.778	-0.005	-0.066*	-0.177***
Assets under management (US$m)	130.855	96.879	121.377	131.884	33.976*	9.478	-1.028
Returns (%)	0.758	0.779	0.702	0.772	-0.021	0.056	-0.013
Alpha (%)	0.504	0.532	0.497	0.548	-0.027	0.007	-0.044
Flow (%)	1.785	2.492	1.620	1.355	-0.707***	0.165	0.430*
Total risk (%)	3.705	3.689	3.454	3.395	0.016	0.251*	0.310*
Idiosyncratic risk (%)	2.486	2.477	2.293	2.359	0.009	0.193*	0.127

Table 3
Univariate analysis of hedge fund manager marital events

This table reports univariate analysis of hedge fund performance and risk around the marriage and divorce event windows. Fund performance metrics analyzed include raw returns and Fung and Hsieh (2004) seven-factor alphas. Total risk is the standard deviation of raw returns while the idiosyncratic risk is the residual from the factor regressions. The event window is the period spanning three months before and three months after the marriage/divorce date. The period "before" is 21 months before the event window and the period "after" is 21 months after the event window. Panels A reports results for marriage, while Panel B reports results for divorce. The sample period is from January 1994 to December 2012. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

	Before	Event	After	After-Before	Event-Before	Event-After
Panel A: Marriage						
Return	0.984	0.723	0.979	-0.005	-0.261*	-0.256
Alpha	1.023	0.598	0.760	-0.263***	-0.425***	-0.162
Flow	2.138	2.628	5.744	3.606**	0.490	-3.116
Risk	3.537	3.198	3.149	-0.388*	-0.339	0.049
Idiosyncratic risk	2.758	2.525	2.264	-0.494***	-0.233	0.261
Panel B: Divorce						
Return	0.878	0.517	0.803	-0.075	-0.361*	-0.286
Alpha	0.750	0.101	0.559	-0.191*	-0.649***	-0.458***
Flow	4.966	5.349	5.474	0.508	0.383	-0.125
Risk	2.990	2.845	2.823	-0.167	-0.145	0.022
Idiosyncratic risk	2.049	1.851	1.847	-0.202	-0.198	0.004

Table 4
Regressons on hedge fund performance and risk

This table reports multivariate regression analysis of fund performance and risk. Dependent variables are raw return, alpha, and total risk. Alpha is Fung and Hsieh (2004) seven-factor alpha for hedge funds. The independent variables include three indicator variables which represent different periods. Event takes a value of one during the period spanning three months before and three months after the marriage/divorce date. Before (omitted) takes a value of one during the 21-month period before the event window. After takes a value of one during the 21-month period after the event window. The other independent variables include fund characteristics such as management fee, performance fee, high water mark indicator, lock-up period, redemption period, leverage indicator, fund age and fund size. The *t*-statistics, derived from standard errors clustered by fund, are in parentheses. The sample period is from January 1994 to December 2012. *Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1% level.

	Dependent variable					
	Marriage			Divorce		
Independent variables	Return	Alpha	Risk	Return	Alpha	Risk
Event	-0.453**	-0.608***	-0.079	-0.072	-0.472**	-0.106
	(-2.111)	(-3.023)	(-0.241)	(-0.369)	(-2.144)	(-0.389)
After	-0.218	-0.285**	-0.356	0.076	-0.274**	-0.411**
	(-1.431)	(-2.139)	(-1.507)	(0.535)	(-2.444)	(-2.113)
Management fee (%)	-0.032	0.178**	1.215***	-0.273**	0.120	0.366**
	(-0.312)	(2.055)	(7.496)	(-2.452)	(1.333)	(2.406)
Performance fee (%)	0.020*	0.003	-0.001	0.002	0.008	0.030***
	(1.771)	(0.302)	(-0.074)	(0.301)	(1.164)	(2.732)
High-water mark	0.222	0.145	-0.578	-0.352**	-0.073	-2.091***
	(0.969)	(0.704)	(-1.600)	(-1.988)	(-0.509)	(-8.546)
Lock-up period (years)	-0.030	-0.034	-0.526	-5.910***	-0.937	16.771***
	(-0.131)	(-0.174)	(-1.521)	(-3.564)	(-0.687)	(7.298)
Leveraged	-0.271*	-0.431***	-0.028	-0.016	-0.058	1.020***
	(-1.730)	(-2.906)	(-0.115)	(-0.103)	(-0.439)	(4.807)
Age (years)	-0.045**	-0.073***		0.001	-0.042***	
	(-2.214)	(-3.512)		(0.040)	(-4.022)	
Redemption period (mon	-0.033	-0.039	-0.065	-0.006	0.010	-0.181***
	(-1.084)	(-1.458)	(-1.373)	(-0.201)	(0.419)	(-4.409)
Log size	0.046	0.131***	-0.371***	0.007	0.000	0.023
	(1.034)	(3.217)	(-5.338)	(0.213)	(0.014)	(0.521)
R-squared	0.009	0.024	0.230	0.008	0.017	0.289
N	3,361	2,286	513	3,011	1,859	495

Table 5
Regressons on fund performance and risk with matched sample

This table reports multivariate regression analysis of fund performance with a matched sample. Dependent variables are raw return and the Fung and Hsieh (2004) seven-factor alpha. The independent variables include interactions of the treatment dummy with three indicator variables which represent different periods. Event takes a value of one during the period spanning three months before and three months after the marriage/divorce date. Before takes a value of one during the 21-month period before the event window. After takes a value of one during the 21-month period after the event window. Treatment takes a value of one if the fund manager gets married or divorced in that month, and takes a value of zero if the fund is in the control group. Each fund in the treatment group is matched with a fund in the control group by minimizing the absolute difference in performance during the "Before" period. The other independent variables include fund characteristics such as management fee, performance fee, high water mark indicator, lock-up period, redemption period, leverage indicator, fund age and fund size. The *t*-statistics, derived from standard errors clustered by fund, are in parentheses. The sample period is from January 1994 to December 2012. * Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1% level.

	Dependent variable			
	Marriage		Divorce	
	Return	Alpha	Return	Alpha
Treatment*Before	-0.452	0.157	-0.013	0.096
	(-1.325)	(1.002)	(-0.064)	(0.651)
Treatment*Event	-1.206***	-0.708***	-0.695***	-0.616***
	(-3.036)	(-2.881)	(-2.765)	(-3.378)
Treatment*After	-1.111***	-0.295**	-0.168	-0.427***
	(-3.519)	(-2.017)	(-1.063)	(-2.790)
Management fee (%)	0.163	0.360***	-0.037	0.156
	(0.917)	(7.542)	(-0.272)	(1.496)
Performance fee (%)	0.031**	0.008	0.006	0.005
	(2.337)	(0.890)	(0.879)	(0.562)
High-water mark	-0.138	0.179	-0.323*	0.008
	(-0.452)	(0.883)	(-1.723)	(0.067)
Lock-up period (years)	0.642	0.136	0.645	-0.192
	(1.596)	(0.596)	(0.726)	(-0.796)
Redemption period (months)	0.029	-0.036	-0.061**	-0.008
	(0.716)	(-1.638)	(-2.516)	(-0.496)
Log size	0.064	0.110***	0.017	-0.022
	(0.599)	(2.748)	(0.314)	(-0.703)
Leveraged	-0.202	-0.267*	0.348**	0.052
	(-1.026)	(-1.894)	(2.301)	(0.390)
Age (years)	-0.020	-0.038**	0.010	0.012
	(-0.711)	(-2.470)	(0.847)	(0.753)
R-squared	0.012	0.023	0.007	0.010
N	5,052	3,600	5,413	3,171

Table 6

Matched sample regression analysis on performance for subsets of hedge funds

This table reports multivariate regression analysis of hedge fund performance with a matched sample for subsets of funds. Dependent variables are raw return and the Fung and Hsieh (2004) seven-factor alpha. The independent variables include interactions of the treatment dummy with three indicator variables which represent different periods. Event takes a value of one during the period spanning three months before and three months after the marriage/divorce date. Before takes a value of one during the 21-month period before the event window. After takes a value of one during the 21-month period after the event window. Treatment takes a value of one if the fund manager gets married or divorced in that month, and takes a value of zero if the fund is in the control group. Each fund in the treatment group is matched with a fund in the control group by minimizing the absolute difference in performance during the "Before" period. The other independent variables include fund characteristics such as management fee, performance fee, high water mark indicator, lock-up period, redemption period, leverage indicator, fund age and fund size. Coefficient estimates on these control variables are omitted for brevity. The t-statistics, derived from standard errors clustered by fund, are in parentheses. Liquid funds are hedge funds with redemption periods <= 30 days. Illiquid funds are hedge funds with redemption periods >30 days. Large funds are funds with AUM equal to or greater than the median AUM. Small funds are funds with below median AUM. Macro and CTA funds are classified as high tempo funds. All other hedge funds are low tempo funds. Old fund managers are managers who are as old as or older than the median fund manager when the marital event happens. Young fund managers are managers who are younger than the median fund manager when the marital event happens. The sample period is from January 1994 to December 2012. * Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1% level.

	Liquid funds	Illiquid funds	No lockup	With lockup	Large funds	Small funds	High tempo	Low tempo	Old managers	Young managers
Panel A: Event = Marriage; Dependent variable = Returns										
Treatment*Before	0.043	-0.914	-0.584	-0.512	-0.351	-0.089	-0.107	-0.435	-0.415	-0.289
	(0.112)	(-1.628)	(-1.684)	(-1.067)	(-0.851)	(-0.177)	(-0.182)	(-1.368)	(-1.102)	(-0.656)
Treatment*Event	-1.396***	-0.217	-1.373***	-1.252**	-1.122**	-0.850	-1.788	-1.047***	-1.357***	-0.807
	(-2.953)	(-0.346)	(-3.201)	(-2.122)	(-2.295)	(-1.388)	(-1.805)	(-2.872)	(-3.492)	(-1.318)
Treatment*After	-0.907**	-0.785	-1.167***	-1.183***	-0.918**	-0.884**	-1.037	-1.057***	-1.094***	-0.921**
	(-2.488)	(-1.442)	(-4.000)	(-3.083)	(-2.202)	(-2.255)	(-1.305)	(-3.624)	(-3.200)	(-2.492)
Panel B: Event = Marriage; Dependent variable = Alpha										
Treatment*Before	0.243	0.230	0.080	0.164	0.181	0.087	-0.111	0.192	0.096	0.268
	(1.449)	(1.088)	(0.367)	(1.087)	(1.126)	(0.448)	(-0.342)	(1.256)	(0.508)	(1.572)
Treatment*Event	-1.293***	0.195	-1.271***	-0.700***	-0.677***	-0.601	-1.299**	-0.583**	-1.191***	0.143
	(-3.906)	(0.922)	(-3.045)	(-2.789)	(-2.791)	(-1.332)	(-2.486)	(-2.369)	(-3.624)	(0.564)
Treatment*After	-0.144	-0.333*	-0.356**	-0.290*	-0.260*	-0.103	-0.158	-0.408***	-0.391**	-0.180
	(-0.865)	(-2.009)	(-2.181)	(-1.899)	(-1.724)	(-0.605)	(-0.738)	(-3.504)	(-2.381)	(-0.987)

Panel C: Event = Divorce; Dependent variable = Returns

Treatment*Before	-0.504	0.104	0.191	-0.173	0.293**	-0.180	0.376	0.084	-0.039	0.006
	(-0.922)	(0.882)	(0.923)	(-0.437)	(2.283)	(-0.519)	(0.979)	(0.325)	(-0.127)	(0.029)
Treatment*Event	-0.676	-0.786***	-0.093	-1.396***	-0.653***	-0.540	-0.641	-0.575**	-0.566**	-0.932**
	(-1.558)	(-2.783)	(-0.430)	(-3.165)	(-2.948)	(-1.285)	(-0.548)	(-2.228)	(-2.165)	(-2.214)
Treatment*After	-0.706**	-0.045	-0.060	-0.226	-0.030	-0.128	-0.353	-0.017	-0.393*	0.045
	(-2.342)	(-0.334)	(-0.363)	(-0.731)	(-0.264)	(-0.516)	(-0.834)	(-0.085)	(-1.797)	(0.276)

Panel D: Event = Divorce; Dependent variable = Alpha

Treatment*Before	0.353	0.181	0.013	0.066	0.192	0.034	0.697	0.157	0.087	-0.256
	(1.012)	(0.994)	(0.055)	(0.336)	(1.254)	(0.109)	(1.349)	(1.186)	(0.433)	(-0.951)
Treatment*Event	0.093	-0.667***	-0.564*	-0.311	-0.243	-0.449	2.622*	-0.655***	-0.342	-1.307***
	(0.176)	(-3.395)	(-1.856)	(-0.807)	(-0.628)	(-1.137)	(2.025)	(-4.326)	(-1.644)	(-4.394)
Treatment*After	0.041	-0.394**	-0.204	-0.465***	-0.438**	-0.304	-0.076	-0.225*	-0.369	-0.815***
	(0.087)	(-2.552)	(-0.733)	(-2.749)	(-2.561)	(-1.161)	(-0.110)	(-1.851)	(-1.573)	(-2.984)

Table 7

Regressions on the probability of marriage and divorce amongst hedge fund managers

This table reports coefficient estimates from logistic regressions that analyze the determinants of marriage and divorce. Dependent variables are dummy variables which take a value of one if the fund manager gets married or divorced in month *t*. Columns (1) and (2) present results for the marriage regressions while columns (3) and (4) present results for the divorce regressions. Explanatory variables include fund level performance and flows, and fund characteristics. $Return_{t-1,t-12}$, $Alpha_{t-1,t-12}$, and $Flow_{t-1,t-12}$ are average monthly performance and flows one year before the marriage/divorce event. $Return_{t-13,t-24}$, $Alpha_{t-13,t-24}$, and $Flow_{t-13,t-24}$ are average monthly performance and flows two years before the marriage/divorce event. Alpha is Fung and Hsieh (2004) seven-factor alpha. The other independent variables include fund characteristics such as management fee, performance fee, high-water mark indicator, lock-up period, redemption period, leverage indicator and fund size. The *t*-statistics, derived from standard errors clustered by fund and month, are in parentheses. Marginal effects, that reveal the impact of a one standard deviation change in the independent variable on the probability of a marriage/divorce are in brackets. The sample period is from January 1994 to December 2012. * Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1%

	Dependent variable			
	Marriage		Divorce	
Independent variables	(1)	(2)	(3)	(4)
$Return_{t-1,t-12}$	0.915		-5.770	
	(0.071)		(-0.728)	
	[0.017]		[-0.091]	
$Alpha_{t-1,t-12}$		13.021		-5.043
		(1.152)		(-0.412)
		[0.182]		[-0.077]
$Flow_{t-1,t-12}$	-0.245	-0.075	-0.131	0.205
	(-0.499)	(-0.113)	(-0.303)	(0.541)
	[-0.076]	[-0.023]	[-0.043]	[0.051]
$Return_{t-13,t-24}$	2.376		-5.668	
	(0.295)		(-0.601)	
	[0.040]		[-0.091]	
$Alpha_{t-13,t-24}$		13.982*		1.926
		(1.706)		(0.155)
		[0.193]		[0.012]
$Flow_{t-13,t-24}$	-0.131	-0.412	-0.908***	-1.251*
	(-0.441)	(-0.728)	(-2.633)	(-1.884)
	[-0.043]	[-0.125]	[-0.255]	[-0.341]
Management fee (%)	0.506***	0.740***	-0.107	-0.083
	(4.951)	(7.173)	(-0.596)	(-0.322)
Performance fee (%)	-0.045	-0.066	0.027	0.034
	(-1.093)	(-1.365)	(0.473)	(0.353)
High-water mark	0.781	1.222	0.069	0.173
	(1.461)	(1.570)	(0.122)	(0.229)
Leveraged	-0.017	-0.295	-0.007	-0.146
	(-0.053)	(-1.221)	(-0.016)	(-0.342)
Lock-up period (years)	0.031	0.322	-2.279	-1.863*
	(0.075)	(0.599)	(-1.534)	(-1.888)
Redemption period (months)	0.009	-0.015	0.069	0.072
	(0.086)	(-0.136)	(1.448)	(1.448)
Log size	-0.032	-0.019	-0.051	-0.023
	(-0.417)	(-0.169)	(-0.784)	(-0.246)
R-squared	0.0155	0.0371	0.0149	0.0154
N	157,820	105,943	157,820	105,943

Table 8
The disposition effect around marital events

This table compares the aggregate Proportion of Gains Realized (PGR) to the aggregate Proportion of Losses Realized (PLR), where PGR is the number of realized gains divided by the number of realized gains plus the number of paper (unrealized) gains, and PLR is the number of realized losses divided by the number of realized losses plus the number of paper (unrealized) losses. Realized gains, paper gains, realized losses, and paper losses are aggregated over time for each period (i.e., before, event, and after) and over all funds. The *t*-statistics test the null hypothesis that the differences in proportions are equal to zero assuming all realized gains, paper gains, realized losses, and paper losses result from independent decisions. The sample period is from January 1994 to December 2012. * Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1% level.

	Before	Event	After
Panel A: Marriage			
PLR	0.474	0.452	0.432
PGR	0.443	0.511	0.437
PLR-PGR	0.031***	-0.059***	-0.005
standard error	0.006	0.008	0.005
t-statistic	5.053	-7.171	-1.051
Panel B: Divorce			
PLR	0.315	0.370	0.379
PGR	0.338	0.415	0.425
PLR-PGR	-0.023***	-0.045***	-0.046***
standard error	0.008	0.011	0.006
t-statistic	-2.900	-4.094	-7.636

Table 9
Robustness tests

This table reports multivariate regression analysis of fund performance with a matched sample. Dependent variables are raw return and the Fung and Hsieh (2004) seven-factor alpha. The independent variables include interactions of the treatment dummy with three indicator variables which represent different periods. Event takes a value of one during the period spanning three months before and three months after the marriage/divorce date. Before takes a value of one during the 21-month period before the event window. After takes a value of one during the 21-month period after the event window. Treatment takes a value of one if the fund manager gets married or divorced in that month, and takes a value of zero if the fund is in the control group. Each fund in the treatment group is matched with a fund in the control group by minimizing the absolute difference in performance during the "Before" period. The other independent variables include fund characteristics such as management fee, performance fee, high water mark indicator, lock-up period, redemption period, leverage indicator, fund age and fund size. The *t*-statistics, derived from standard errors clustered by fund, are in parentheses. The sample period is from January 1994 to December 2012. * Significant at the 10% level;** Significant at the 5% level; *** Significant at the 1% level.

	Dependent variable			
	Marriage		Divorce	
	Return	Alpha	Return	Alpha
Panel A: Event period = 1 year; Before period = 1 year 6 mths; After period = 1 year 6 mths				
Treatment*Event	-1.122***	-0.245	-0.353	-0.399***
	(-3.202)	(-1.516)	(-1.430)	(-2.750)
Treatment*After	-0.835***	-0.325**	-0.138	-0.434**
	(-3.185)	(-2.113)	(-0.888)	(-2.652)
Panel B: Event period = 6 mths; Before period = 2 year 9 mths; After period = 2 year 9 mths				
Treatment*Event	-1.358***	-0.824***	-0.740***	-0.565***
	(-3.611)	(-3.154)	(-2.980)	(-3.251)
Treatment*After	-0.888***	-0.277**	-0.208	-0.399***
	(-3.202)	(-2.026)	(-1.500)	(-2.774)
Panel C: States that allow for unilateral divorce				
Treatment*Event	-0.628	-0.976***	-0.408	-0.730***
	(-1.303)	(-3.151)	(-1.410)	(-3.058)
Treatment*After	-0.683*	-0.131	0.039	-0.413*
	(-1.817)	(-0.753)	(0.212)	(-1.837)
Panel D: States that do not allow for unilateral divorce				
Treatment*Event	-4.968***	0.020	-1.419***	0.921
	(-4.000)	(0.136)	(-2.980)	(1.491)
Treatment*After	-4.629***	-0.610***	-0.658***	0.900
	(-3.611)	(-3.818)	(-3.233)	(1.617)