How are Investor Trading Activity and Performance Affected by Major Lifecycle Events? The Case of Divorce[1]

Andrew Grant
Petko S. Kalev
Avanidhar Subrahmanyam
P. Joakim Westerholm

April 2019

Abstract

How are financial market participation and trading impacted by material events during individuals' lifetimes? To uncover the characteristics of those individual investors that are the least and the most impacted by the major lifecycle event divorce, we identify transfers of shares initiated by marriage breakdown over a 20-year period and analyze the trading decisions and share trading performance of the divorced partners. A new finding is that those individuals that are active traders when married are less distracted by divorce. We find that the investments and trades of couples where both spouses are active traders perform better while married, 0.3% better than couples where one spouse is an active trader, and 5% better than couples where neither is an active trader. After divorce couples where one spouse is an active trader perform 0.2% better than couples where both spouses are active traders and 6% better than couples where neither is an active trader. This shows that below par investment activity is an indicator for who will be most distracted by divorce. Focusing on increasingly larger portfolios further increases these differentials in performance by the magnitude of 3% or more, as the impact of liquidation needs affecting smaller portfolios dissipates.

Keywords: Decision Making; Divorce; Individual Investors; Performance; Trading Behavior.

[1] Grant and Westerholm are from the University of Sydney. Kalev is from Latrobe University. Subrahmanyam is from the University of California, Los Angeles. Address correspondence to: Avanidhar Subrahmanyam, University of California at Los Angeles Anderson School of Management, 110 Westwood Plaza, Suite C402, Los Angeles, California 90095-1481, Phone: (310) 825-5355, Email: Subra@anderson.ucla.edu. We thank seminar participants at Macquarie University (MGSM), Massey University and the University of Freiburg. We acknowledge the comments of participants at both the Behavioural Finance and Capital Market Conference and the UniSA Finance Research Colloquium. We also appreciate the valuable comments provided by Stephen Brown, Juhani Linnainmaa, Ben Marshall, Ron Masulis, Vito Mollica, Tom Smith, Michael Stein and Terry Walter.

1. Introduction

Activities such as trading equities represent only parts of an individual investor's life and are therefore likely influenced by major life events. Precisely how such events impact trading by investors is an intriguing issue. Thus, Lu et al. (2016) and Shu et al. (2015) examine the trading activities of hedge fund managers around marriage and divorce and those of mutual fund managers around parental death, respectively. Suggesting that fund managers are distracted by marital events, Lu et al. (2016) find that fund managers earn negative alphas in the six-month period surrounding and the two-year period following divorce. Shu et al. (2015) report that mutual fund managers exhibit similarly negative alphas surrounding parental death, with sadness impeding managers' cognitive abilities in stock trading. In a recent study using Danish data, Christiansen et al. (2015) show that women increase their share of investment in risky assets following marriage and decrease their share following divorce. The opposite pattern of asset allocation decisions is observed among men. These results are broadly consistent with Love (2010) who indicates that men take more risks when they do not have to share consumption with women, who tend to have greater longevity.[2]

Unlike earlier literature, which either focuses on the trading of professional investors or the portfolio allocations of individuals around significant life events, our paper focuses on how divorce alters the day-to-day trading behavior and performance of individual investors. Unlike professional investing, individual investing is often a part time, discretionary activity, which is undertaken sporadically. As such, the impact of divorce-driven distraction might be very different on the infrequent trading activity of individual investors. So the findings on professional investors do not necessarily carry over to individual investors, thus justifying our investigation. Ex ante, there are several hypotheses on the effect of marital separation on individual investors. First, if the upheaval of divorce does indeed impact divorced investors, they may exhibit worse trading performance as a result of distraction. Second, spousal liquidity needs following divorce could lead to "fire sales" of assets, which could also adversely affect performance. Contributing a new hypothesis to the literature, we suggest that marriage can also be a constraining distraction to an actively trading investor. While couples who have shared views on the way the family investments are managed may be better off as a team, other

[2] Some of the noted side effects of divorce, including reduced physical health (Rosen and Wu, 2004; Fan and Zhao, 2009; Love and Smith, 2010; Atella et al., 2012) and mental health (Bogan and Fertig, 2013), lead to similar decreases in the share of an investor's portfolio held in risky assets.

couples may not be able to realize their full potential if their decision making is distracted by the different views of the partner. We expect that these differences will not cause problems when a relationship is intact, but may become a severe distraction when a relationship is in trouble. Hence we expect that some categories of investors will be better off as a result of divorce. We use trading activity as a proxy to distinguish different categories of investment and trading strategies and investigate the performance differential between these investor categories before, during and after divorce.

The market we study has two advantages that makes this study a unique opportunity to increase our understanding the impact of divorce on investment performance. First it is common in Finland that spouses keep their own shareholding account under their personal social security number, while joint family accounts are unusual. We can thus observe married spouses as individuals directly in the data both before and after divorce (add footnote with statistics). Second, the event of division of property due to divorce can be identified in the share transactions data we obtain from the centralized clearing house and share holding depository in Finland, which allows us to exactly determine when a couple has divorced. This information to the best of our knowledge not available in other data on trading decisions (add footnote with references to other datasets used in the literature. The results of our investigation is generalizable for the understanding of the impact of divorce in other markets for the following reasons. There is no reason to believe that Finnish individual investors would be different to individuals in other markets, previous studies such as Grinblatt and Keloharju (2000) have shown statistics that are quite similar to those for the U.S. market in Barber and Odean (2000) for example. In addition the Finnish market is known to be extremely globalized with a large proportion of international institutions and broker-dealers dominating the market share of trading in a range of internationally well-known listed companies. Just as a large number of previous studies in the literature we regard the Finnish market to be a suitable laboratory for studies into investor behavior due to its unusual access to investors level data.

To set up our data we identify divorced investors using a special transaction code for 'division of property' available for each transaction in the data. At the time of settlement, stocks are transferred from one partner to the other. Propensity score matching is used to carefully construct a matched sample of non-divorced individuals from the remainder of the population. We match investors on a range of attributes that may be correlated with trading performance, such as age, portfolio size, and trading frequency, utilizing the full richness of the information about individual investors in the data. We also obtain some further investor

specific information, such as income and education to increase the accuracy of matched investors. (Footnote some statistics here)

In our analysis we identify those investors that are active traders during a period (footnote the different robustness check periods, now it is -3 to -1 year before the division of property event) well before the divorce, assuming that this choice of trading strategy is inherent to the investor and will have an underlying impact on how the investor reacts to divorce. We use the number of trades an individual makes during a specified measurement period, assuming that frequency of trading is a characteristic of an individual's investment preferences (Barber and Odean (2001). A frequent trader that makes a large number of small trades may be trading for entertainment, but if the trades are also significantly large this indicates that the investment activity is a more professional activity, as is larger portfolio size. Hence we also check the robustness of the results using trade size and traded value. A larger number and size of trades can indicate that the investor is or consider themselves better informed than their average peers. Hence it is useful to analyze several trading characteristics of these active investors in our further analysis.

We analyze our sample of divorced investors and their carefully matched peers in two steps. First we examine the performance of the control and treatment samples during the pre-window 3 to 1 year before the division of property event. During this period we expect that the treatment sample will be unaffected by the divorce and that the investment and trading decisions of the sample investors will not be distracted by relationship problems nor liquidity constraints related to the separation. We hence expect the performance of comparable categories of investors to be equal during this period.

Second we implement a difference in difference analysis to examine the trading performance of both the divorced ('treatment') group and control group in a period prior to and immediately surrounding the divorce. Relative to the control group, the group of all divorced investors underperforms their matched peer investors as expected by approximately 6% per annum (p.a.)., but this is offset and improved upon by those investors that are in the upper 75% percentile of active traders and particularly by those who hold larger portfolios. Thus, we find that while divorce represents a substantial negative impact on the portfolio performance of the average individual investors (just as Lu et al. (2016) found for hedge fund managers), those investors who trade activity do in fact outperform their matched not divorced peer investors in the period surrounding divorce.

In a further examination (see the Internet Appendix), we sort divorced investors by their number of buys in the period surrounding the divorce settlement. Divorcees with median portfolio size, in the top quartile of buying activity significantly outperform other divorcees. Investors who actively buy during the period surrounding divorce therefore generate superior performance than even their average non-divorced counterparts.

We supplement this by examining the calendar-time post-trade performance of buys and sells by the divorce and control sample, following Seasholes and Zhu (2010). The main advantage of this analysis is that we can adjust for risk and other stock specific characteristics in the Fama and French (1993) and Carhart (1997) models. During the divorce window, stocks sold by the full sample of divorced investors outperform stocks sold by the control group of investors, while they underperform for the sample of actively trading investors. These findings corroborate our results in the difference in difference analysis described above.

As a conclusion, we argue individual investors who actively manage their portfolios when their marriage was intact, continue to do so effectively after divorce, and those couples where one or both spouses are active traders are in fact better off after divorce.

2. Data.

2.1 Source of Individual Investor Data

To examine how the stock trading behavior of investors is affected by divorce, we require very specific data. Our main data source is Euroclear Finland Ltd. (formerly the Finnish Central Securities Depository), which provides information on all depository transactions related to the stock holdings of individual investors in all common stocks listed on the Finnish stock exchange, the Nasdaq OMX Helsinki, from January 1, 1995, to December 31, 2014. These official records of ownership are maintained by the clearinghouse and are hence reliable.

The database contains demographic statistics such as the gender, age, postal code, and language of each investor. We retain all accounts for which the gender and age of the investor are verifiable. A total of 402,221 individual investor accounts are retained, representing 22% of the total market capitalization of listed companies at the end of the sample period.

In the Euroclear dataset, trades made by investors are recorded using the actual transaction price. To calculate aggregate holdings, we augment the clearinghouse data with information from COMPUSTAT on daily closing prices, and returns adjusted for stock splits, dividends

and other capital structure changes, and the change in the Finnish markka to euro exchange rate (on January 1, 1999). We retain all common stocks traded on the OMX Helsinki, excluding trades in exchange-listed warrants and bonds and foreign listed stocks.

2.2 Identification of Divorced Investors

The securities depository uses reference codes to categorize trades as limit order book trades, negotiated trades, capitalization changes (e.g., rights issues, bonus issues), and bequests, among other transaction categories. Importantly, the reference codes identify investors who have divorced. Transfers of stock holdings through the clearinghouse may occur following a court-ordered division of property in a divorce settlement. Euroclear uses the reference code 9 in such cases. Among such transactions, we are further able to identify the investor who relinquished shares (the 'giver') and the counterparty who received shares (the 'receiver') in the settlement. Receivers are identified as 'buyers' on the clearinghouse ledger, although they do not pay the market price of the shares upon settlement.

These transfers of shares are distinct from those involving transfers of inherited shares, bequests, or changes in legal type from living to deceased. Reference code 9 is limited to divorce transfers and is not used for transfers between spouses for other reasons.[3]

We require that divorced investors included in our dataset engage in at least one trade both before and after the year prior to the settlement year, so we do not necessarily retain both members of the couple following their separation. This restriction excludes mainly non-trading spouses who receive shares in the divorce transfer and are likely to simply sell the windfall (Andersen and Nielsen, 2011). We also require that divorcees hold portfolios valued at over €1,000 and are between the ages of 25 and 75 at the start of the year before the settlement year. Our final sample consists of 1,482 divorcees.

2.3. Attributes used to Identify Control Sample of Investors

To identify a suitable group of investors to which divorcees can be compared, we implement a 1:1 propensity score matching approach, based on several investor attributes that may explain trading performance. We refer to the matched sample of non-divorced individuals as the 'peer group' or 'control group' for the remainder of the paper. As the investor population is large

[3] We exclude divorcees who experience divorce and receive an inheritance or bequest transaction during the sample period.

relative to the number of investors required for the control sample, we expect to be able to identify investors who are quite similar to the divorced sample of investors in terms of these attributes. In this section, we discuss the variables and process used to match the investors.

While the court-ordered transfer of shares occurs on a specific, identifiable date, we are unable to determine the date on which the decision to separate or divorce was made. Since 1988, no formal separation period has been required in Finland before a court may grant a divorce.[4] The transfer of shares ordered by the court, however, is likely to follow a lengthy process, including mediation. Our difference in difference method compares a period before the divorce during which divorcees are likely to feel little impact from separation-induced anxiety to a divorce period during which distraction or negative emotions would appear most pronounced. We call these two periods the 'pre-divorce window' and 'divorce window.'

The pre-divorce window runs from three years to one year before the year of the divorce transaction. This pre-divorce window is used to measure investors' average trade size and number of trades, portfolio returns and portfolio volatility, for both divorced and the population of investors for matching purposes. Other variables used to match investors are measured at end of the pre-divorce window.

The divorce window is the 24-month period surrounding the divorce itself. In our previous example, a divorce granted on July 2001 has a corresponding divorce window of July 2000 to June 2002. The divorce window is centered on a specific month in order to isolate the effects of divorce on trading.

We refer to the January of the divorce year as month $m = 1$, thus the pre-divorce window commences at $m - 36$ and lasts until the end of $m - 13$. For the purposes of matching our sample of divorced investors to the remaining individuals in the dataset, we observe all investor statistics at time $m - 12$. Thus, Age, for example, captures the age of an investor at the end of the pre-divorce window. For statistics that require a time interval (i.e., the pre-return and turnover rates), we take measurements over the entire pre-divorce window.

[4] Finland allowed unilateral divorce before 1950 and is rare among European countries in not requiring a formal separation period. For more on divorce laws in Europe, see Gonzalez and Viitanen (2009). An in-depth discussion of the state of the Finnish divorce law is presented in Savolainen (2002). Finland operates under a 'divorce on demand' system; one or both spouses write to the court seeking a divorce, which will be granted after a reflection period of six months, or immediately if there has been a separation period of two or more years. Savolainen (2002) notes that 90% of divorces are granted following the six month reflection period, rather than following the two year separation period.

The investor attributes that are used for matching purposes are discussed below. All statistics are as referenced in Table 1, where Panel A reports descriptive statistics for attributes for the sample of divorced investors (the divorce sample) Panel B reports descriptives for the population of investors.

1.3.1 Age

Age may be an important determinant of portfolio returns generally (e.g., Korniotis and Kumar, 2011), as it affects whether individuals are subject to background risks from employment or dependent children (e.g., Heaton and Lucas, 2000; Cocco et al., 2005). Grinblatt and Keloharju (2009) find that age is inversely related to trading activity among Finnish investors and that younger investors underperform due to excessive overconfidence, although their sample mainly consists of younger investors than ours.

The Euroclear database provides investors' birthdates. Our Age_i variable captures investor i's age in years at the end of the pre-divorce window. We eliminate any investors who are over 75 or younger than 25 at the end of the pre-divorce window as potential matches. The average age for investors in the general population is 51.41 years, while the average age of the sample of divorced investors skews slightly older at 56.39 years.

1.3.2 Gender

We match investors based on *Gender*, an indicator variable that takes the value 1 if the stockholder is a woman and 0 if the stockholder is a man. Previous studies have indicated that men and women exhibit different trading propensities (e.g. Barber and Odean, 2001) and, as a result, different realized portfolio returns. A slightly larger fraction of divorced investors (36.48%) are female than in the general sample (33.93%).

1.3.3 Language

Most of the population in Finland speaks Finnish, with a minority of around 5% of the sample speaking a foreign tongue (mainly Swedish). Native Finnish speakers prefer to hold and trade stocks of Finnish companies that that publish annual reports in Finnish (Grinblatt and Keloharju, 2001). We construct an indicator variable *Language*, which takes the value of 1 if the investor's native language is Finnish, and 0 otherwise. Among the divorce sample, 95.38% of individuals are Finnish speakers, compared with 92.31% from the investor universe.

1.3.4 Foreign Investors

Investors who are domiciled outside of Finland may underperform Finnish-based individuals because of either information effects or distance effects (see for example, Kang and Stulz, 1997; Hau, 2001; Choe et al., 2005; Dvorak, 2005). We construct an indicator variable,

Foreign, taking the value of 1 if the investor is foreign-based, and 0 otherwise. Only 1.54% of the divorce sample is foreign-based, compared with 9.99% of the wider investor population. This is not a surprise since our divorced investors are by construction identified through the Finnish court system.

1.3.5 Business Owners

In the clearinghouse data, investors are classified by the type of income they receive. Broad categories include salary earners, benefits recipients or self-employed. Self-employed individuals are more likely to be optimistic about future economic states, and likely more willing to take risks (e.g. Puri and Robinson, 2007; Dorn and Sengmueller, 2009). The indicator variable *Business Owner* takes the value of 1 if the individual is classified as self-employed by the clearinghouse, and 0 otherwise. 5.91% of the divorce sample is classified as Business Owners, while 4.83% of individuals in the wider population fall into this category.

1.3.5 Income

We use the individual's postcode to estimate their annual income at the five-digit postcode level, by matching with data from Statistics Finland. Income data is sourced at the closest year available to the beginning of the pre-divorce window. As the data is recorded at the postcode level, there is somewhat less variation between the divorced group, who exhibit an annual average Income of €32,273, compared with the investor population average of €32,306.

1.3.6 Education

Grinblatt et al. (2012) demonstrated that individuals with higher IQs exhibit superior trading performance (mainly driven by purchases), while those with a higher level of education are more likely to be financially sophisticated (Calvet et al., 2009). We categorize individuals as *Educated* based on the five-digit postcode; if the investor resides in an area with above-median number of individuals with a post-school qualification (Bachelor's degree or higher) then *Educated* takes a value of 1. Broadly, the average investor from the divorce sample is as likely to be educated (12% of the sample) as the remainder of the population.

1.3.7 Portfolio Size

Investors with larger portfolios likely have greater net worth and generally exhibit lower portfolio turnover rates than other traders in the sample. Grinblatt and Keloharju (2000) find that Finnish households with larger portfolios tend to be slightly less contrarian than other households, although they do not generate substantially different returns. Barber and Odean (2000) find that individuals with smaller portfolios earned higher returns than those with large portfolios, although the difference was not significant.

Divorce is likely to impact investors with both large and small portfolios, with divorce costs at least partially proportional to wealth. Lower-net-worth households are more likely to experience divorce, however (Loughran and Zissimopolous, 2009). We exclude anyone with a portfolio value of less than €1,000 from the investor population for the purposes of matching. In our sample, investors in the divorce sample have slightly larger portfolios (mean size of €20,584) than those from the eligible matching population (mean size €12,875, likely reflecting their more advanced age and the complexity of the divorce proceedings.

1.3.8 Trade Size

Individuals who trade in larger packages may exhibit a larger level of overconfidence, holding fixed portfolio size (e.g. Grinblatt and Keloharju, 2009). This may erode trading performance, although the net effect after accounting for additional costs from more frequent trading is unclear. We measure investors' average trade sizes (*Ave Trade Size*) during the pre-divorce window for matching purposes. Individuals in the divorce sample exhibit a larger average trade size than the general population (€598 compared with €282).

1.3.9 Number of Trades

The degree of trading activity shown by an individual investor is likely to be negatively correlated with trading performance (e.g., Barber and Odean, 2001; Barber et al., 2009; Dorn and Sengmueller, 2009; Linnainmaa, 2011). However, recent evidence from Dahlquist et al. (2017) shows that active investors from Sweden's Premium Pension System earn higher average returns than inactive investors. We construct a variable *Number of Trades*, measuring the number of trades in the pre-divorce window. The average investor in the divorce sample exhibits a slightly higher number of trades (3.88) than the average investor in the population (3.61).

2.4 Return Calculations

To adjust for the inherent skill of traders that may not be captured by other attributes, we match investors on their pre-window unadjusted returns. The calculation of investor returns is an important step in our process, so we describe it in detail.

We compute monthly portfolio returns similarly to Barber and Odean (2001), including both realized and unrealized profits of each stock held at the start of each month by each investor in the sample. The percentage return on each stock position from the start of the month to the end of the month is computed as follows:

month is computed as follows:

$$Return_{i,s,m} = \frac{N.Sh_{i,s,m-1} \times ClosePrice_{s,m} - N.Sh_{i,s,m-1} \times ClosePrice_{s,m-1}}{N.Sh_{i,s,m-1} \times ClosePrice_{s,m-1}} \quad (2)$$

where $Return_{i,s,m}$ is investor i's return on stock s in month m, $N.Sh_{i,s,m}$ is the number of shares of stock s held by investor i at the end of month m, and $ClosePrice_{s,m}$ is the market value of stock s at the end of month m. This is the return on stocks held in the portfolio at the start of the month. Any stocks that were bought and sold within a month are excluded from these calculations. Note that the terms indicating the number of shares held in (2) cancel out but are included for clarity. This method avoids the calculation of profits relative to some reference price, which is problematic for investors holding stocks over dissimilar time periods.

We then calculate the weight of the position value of stock s to the total value of investor i's portfolio:

$$Weighted\ Return_{i,s,m} = p_{i,s,m-1} \times Return_{i,s,m} \quad (3)$$

where $p_{i,s,m-1}$is the value of the stock position at the end of month $m-1$ over the value of the portfolio at month $m-1$. The value of $p_{i,s,m-1}$ is calculated as follows:

$$p_{i,s,m-1} = \frac{N.Sh_{i,s,m-1} \times ClosePrice_{s,m-1}}{\sum_{s=1}^{S} N.Sh_{i,s,m-1} \times ClosePrice_{s,m-1}} \quad (4)$$

where S is the number of stocks in the investor's portfolio at the end of month $m-1$. The return to investor i's overall portfolio over the month ending at time m is weighted by the position weights at $m-1$:

$$GrossReturn_{i,m} = \sum_{s=1}^{S} p_{i,s,m-1} \times Return_{i,s,m} \quad (5)$$

Shares that were partially liquidated over the previous month show a lower $p_{i,s,m-1}$. Thus, portfolio returns on positions are revalued month-by-month, and realized returns are the accumulated returns at the start of the month when the shares are sold. Shares purchased during the previous month are added to the portfolio at the start of the next month at a value of $p_{i,s,m-1}$ that reflects the proportion of the position in the total portfolio.[5]

[5] In tests, we found that the one-month accuracy of return measurement is sufficient and not materially different from the returns were computed daily following the same procedure. We take care in obtaining the correct number of shares held in each stock position at the start of the month, considering all past purchase and sales, share issues, splits and dividends. In most of our applications, we aggregate the monthly returns to obtain annual returns, while we use monthly returns to compute the standard deviation of returns. Barber and Odean (2001, p. 271) discuss the

To calculate the pre-divorce returns, we aggregate and annualize monthly returns over a period of two years beginning in January 36 months before the year of the divorce and ending 12 months before the year of the divorce. Thus, we obtain the value of the $PreWindowReturn_i$ for investor i:

$$PreWindowReturn_i = \frac{1}{2}\sum_{m=1}^{24} GrossReturn_{i,m-36} \quad (6)$$

where month $m = 1$ indicates the beginning of the year of the divorce, and ½ is used to adjust for annualization. The pre-divorce window returns in (6) are used to match investors, as described in Section 1.4. We calculate the returns in the divorce window, $WindowReturn_i$, in a similar fashion, where m = 0 indicates the divorce month:

$$WindowReturn_i = \frac{1}{2}\sum_{m=1}^{24} GrossReturn_{i,m-12} \quad (7)$$

We control for brokerage costs by subtracting a fee for each trade executed. While we are not able to obtain data on the actual brokerage costs incurred by the investor, we estimate these costs (conservatively) as the minimum of 0.5% of the trade size in euros or €40. Thus, trades of €8,000 or more incur variable brokerage costs.[6] These costs reflect the approximate cost of trading over the telephone and are hence overstated for investors who used discount or online brokerage firms, particularly toward the end of the sample period. We note that the size of the transaction fee imposed here does not materially alter the findings of the paper.

The return net of brokerage costs for investor i in month m is denoted $NetReturn_{i,m}$ and estimated as:

$$NetReturn_{i,m} = GrossReturn_{i,m} - \frac{\sum_{\tau=1}^{T} \min(Tradesize_\tau \times 0.5\%, 40)}{\sum_{s=1}^{S} N.Sh_{i,s,m-1} \times ClosePrice_{s,m-1}} \quad (8)$$

issue of return calculation and similarly suggest that results are not materially affected by the frequency selected for the calculations.

[6] These fees are representative of the transaction costs that were imposed toward the end of the sample period by one of the largest full-service brokerage firms, Nordea. See http://www.nordea.fi/en/personal-customers/savings-and-investments/investments/online-trading.html#tab=Prices for more details.

where $1 \leq \tau \leq T$ is the total number of trades made by investor i in month m. The net returns are summed over both the pre-divorce window and the divorce window and annualized in a similar fashion to (6) and (7). These annualized pre-divorce window and divorce window returns are subsequently analyzed in the DID regressions.

2.5. Propensity Score Matching

We have many investors in the Euroclear dataset from which to obtain a relatively small control group for the 'treatment' group of divorced investors. After the filtering processes described in the previous subsection, we are left with 1,557 divorcees over the 17-year period from 1998 to 2014 (with three years prior to the first year required to produce the pre-divorce window). The average number of divorces leading to a split of share portfolios is 106 per year and ranging from 86 in 1998 to 133 in 2012.

In each year, there are an average of 157,364 potential matches from the filtered sample of non-divorced investors. This value ranges from 105,896 in 2000 to 158,056 in 2002, so in any year, we have at least 1,000 eligible matches from the filtered dataset per divorced investor. We implement propensity score matching on a year-by-year basis including all available demographic variables described in Section 2.3.

The large level of underperformance of divorced investors in the divorce window as documented in Table 1 may be driven by the divorce-induced stress or distraction, or possibly due to other characteristics of divorced investors that explain their trading returns during the divorce window. For example, divorced investors are significantly older and hold larger portfolios than the average individual in the population, and thus may trade different types of firms that happen to underperform in a subsequent two-year period. Thus, their underperformance may be an artifact of characteristics that can explain trading performance.

To gauge how divorced and the non-divorced population of individual investors differ in their observable characteristics, we report the univariate comparisons between these two groups of firms in Columns (1)–(3) of Table 2 Panel A. The divorce sample differs from the remainder of the investor population significantly in each of the attributes other than income (which is measured at the postcode level) and net pre-window return. Specifically, divorced investors are older, more likely to be female, more likely to speak Finnish natively (as opposed to Swedish), less likely to be domiciled in a foreign country, more likely to be self-employed, hold larger portfolios, make larger and more frequent trades, and take slightly less risk than the remainder of the population of traders.

Given that the characteristics of these two groups of individuals are quite different, a regression-based analysis is likely to provide us with an inaccurate estimate of the impact of divorce on trading performance. Thus, we turn to a propensity score matching approach to allow for more accurate inference.

The propensity scores are estimated based on a probit regression at the individual investor level with the dependent variable being a binary variable equal to one for divorced investors and zero for the rest of the populations. We use a set of control variables (attributes) measured at beginning of the year prior to divorce as matching dimensions. We incorporate year fixed effects to absorb any time-specific heterogeneity not captured by firm characteristics. The probit model is estimated across 2,676,758 age- and portfolio-size eligible investors containing non-missing data for all of the matching dimension variables.

We present the estimation results in Column (1) of Table 2, Panel B, labeled "Prematch." We observe the same significant differences between divorced investors and the remainder of the population firm characteristics as with those reported in Column (3) in Panel A. The results also show that the specification captures a reasonable amount of variation in the choice variable, as indicated by a pseudo-R^2 of 3.53%.

We then use the propensity score (i.e., the predicted probability) from the "Prematch" probit regression and perform a nearest-neighbor propensity score matching with replacement. We conduct diagnostic tests to assess the accuracy of the matching procedure.

First, we perform a univariate comparison between divorced and control investors for the matched pairs and report the results in Columns (4) and (5) of Panel A. We observe statistically insignificant differences between the two groups across all characteristics. Next, we rerun the probit model restricted to the matched sample and reported the results in Column (2) of Panel B, labeled "Postmatch." The magnitude of the probit regression coefficients decline dramatically. None of the year dummies is statistically significant in the "Postmatch" column, whereas a majority of them are statistically significant in the "Prematch" column. In addition, the pseudo- R2 drops from 3.53% prior to the matching to 0.23% post matching. Thus, the matching process removes meaningful differences along observable dimensions between these two groups of investors.

3. Performance Differentials and Difference-in-Difference Analysis

To examine whether the performance of divorced investors is statistically and economically driven by alterations in trading behavior and to measure the proportion caused by the investment activity level of the sample investors, we first examine the performance of the control and treatment samples during the pre-window 3 to 1 year before the division of property event. We use the number of trades an individual makes during the pre-period to categorize the investors into couples where both spouses are active, couples where one spouse is active, and couples where neither is an active trader.

We then go on to estimate conditional DID models to estimate the performance differentials between these categories of investors based trading activity in the pre-divorce window. We decompose the divorced sample by trading activity in the pre-divorce window and measure the relative investment and trading performance of divorced couples where both investors are active in the pre-window, couples where one of the spouses is an active trader, and couples where neither are active in the pre-period. The idea is as follows. Investors who are active traders and gain experience how to manage their portfolios before they are affected by relationship frictions, are better equipped to continue to do so during divorce, and may in fact emerge as more profitable investors and traders when the distraction from a difficult relationship is removed through divorce.

To assess the significance of the performance differential observed among divorced investors relative to the control sample, we estimate a conditional DID regression model. The model measures the effect of divorce on the performance of divorced investors compared to that of the control group. This approach allows for a variance-covariance matrix that differs across treatment and control samples.[7] We estimate the (DID) regression as follows:

$$y_{i,j,t} = b_0 + b_1 Divorce\ Sample\ Indicator_t + b_2 Divorce\ Window\ Indicator_j + b_3 Sample_j \times Window_t + Controls_j + d_i + e_{i,j,t} \quad (9)$$

where $y_{i,j,t}$ is the dependent variable, here, the annualized (net) portfolio return for investor j, $Divorce\ Window\ Indicator_t$ is an indicator variable that takes the value 0 during the pre-divorce window and 1 during the divorce window, and $Divorce\ Sample\ Indicator_j$ is an indicator variable that takes the value 1 if investor *j* is the divorced sample and 0 if the investor is in the control sample. The $Window_t \times Sample_j$ interaction term comprising the two previous indicator variables indicates the treatment sample and the period of interest. The variable d_i denotes year fixed effects, and the standard errors used to estimate coefficient

[7] See Bertrand et al. (2004) for a detailed discussion of the reliability of DID estimates.

significance are clustered at the investor level. We incorporate a vector of investor level controls $Controls_j$ to adjust for observable characteristics in the individuals.

3.1 Active vs. Passive Traders in the Pre-Divorce Window.

Table 3 reports the performance of the control and treatment samples during the pre-window 3 to 1 year before the division of property event. The table reports estimates of regression models, including fixed year effects, investor clustered standard errors, and indicator variables identifying divorced couples where one of the spouses is in the top 75 percentile by number of trades in the pre-divorce window denoted 'One Spouse Active Trader' (#795), and in contrast both of the spouses are in the top 75 percentile by number of trades in the pre-divorce window denoted 'Both Spouses Active Traders' (#385). All estimations control for portfolio size quintile by including indicator variables for the two largest and the two smallest portfolio size quintiles (at the end of the pre-window). The estimations start with base case regressions for the control and the divorce samples. The main results are combined in regressions 4 and 5 where the coefficients for one and both sample active traders are presented, 5.39 and 5.39 respectively. Here the sample portfolio for the category of one active trader outperforms the other categories slightly.

3.2 DID results.

Table 4 able reports estimates of DID regression models, including portfolio size controls, fixed year effects, and interaction specifications identifying investors who trade actively in the divorce window and who buy actively. The dependent variable is the annualized Net Return during the 1 year pre-event-period and the 1 year post-event-period centered on the divorce date for the treatment sample (as identified by the date of division of property), and for the three calendar years surrounding the treatment pair's divorce year for the matched control sample. Two trading activity indicator variables are interacted with the sample and the window, first the indicator for when one of the spouses is in the top 75 percentile by number of trades in the pre-divorce window denoted 'One Spouse Active Trader, and second the indicator for when both of the spouses are in the top 75 percentile by number of trades in the pre-divorce window denoted 'Both Spouses Active Traders. Column 4 includes quintile indicators for the two largest and the two smallest portfolio size quintiles (at the end of the pre-window) interacted with the sample and the window.

The main results are combined in regression 4 where the sample x window coefficient is –6.05. the coefficient for one spouse active trader takes the value 6.39 and the coefficient for both spouses active traders takes the value 6.21. Hence investors that are the only active trader in the family perform best and generate a slight positive return over and above the negative return of the average sample investor, improving on the return for the same category in Table 3. When these investors hold above medium size portfolios (in the fourth size quintile) they outperform by 2.49% and when they hold portfolios in the top quintile by size they outperform by 3.48%.

4. Calendar Time Trade Analysis

In order to assess the source of individual trading performance, and to adjust for risk differences between the individual investor portfolios, we examine characteristics of stocks bought and sold by the divorced and control groups of investors. For instance, return differences between the divorced group of individuals may be driven by differences among observable factors in the cross-section of stock returns.

In Table 5, Panel A we analyze stock-level characteristics of purchases and sales made by the divorce and control groups during three periods, the pre-divorce window, the divorce window, and a post-divorce window covering the period from 1 to 3 years post-divorce. The factors examined are beta, size and book-to-market. To allow for comparisons over a long period of time, beta is measured via ranking using the Scholes-Williams (1977) specification (Grinblatt, Keloharju and Linnainmaa, 2012); high beta stocks exhibit a ranking of 100. Similarly, we rank stocks on the basis of market capitalization (measured at the prior trading day), and book-to-market values; high values take a value of 100.

The results of the trade-by-trade analysis show that divorced investors both buy and sell stocks with higher betas than those of the control sample in the pre-divorce window. Stocks purchased and sold by divorced investors are on average 4 percentiles higher in beta than those of control group investors. However, this tendency switches during the divorce window, where the control group trades in higher beta stocks than their divorced counterparts. This change is mainly driven by differences in the behavior of the control group, although suggests that the underperformance of divorcees may be in part due to a reluctance to take systematic risk. The difference between the two groups is attenuated in the post-divorce period; percentile ranks of stocks sold are not significantly different between the groups while the divorce group continues to buy lower beta stocks than the control group.

Turning our analysis to the market capitalization of stocks traded by the two groups, a large difference in the buys of divorced investors compared with control investors is apparent during the divorce window but not prior. Specifically, the average difference in percentile size-rank of stocks purchased by the two groups is 6.10%; divorced investors purchase significantly smaller stocks than their peers during the divorce window. This is not driven purely by the control group. Interestingly, there are no substantial differences between the two groups in the stocks purchased either before or after the divorce window. Stocks sold by divorced investors also skew smaller than those of control investors during the divorce window with an average percentile rank difference of 2.84%. Trading in relatively smaller stocks may explain part of the underperformance of divorced investors; however this explanation would require that small stocks underperform large stocks, as we have equalized transaction costs. The book-to-market percentile rankings of stocks traded by the divorce and control groups do not generate markedly different patterns around the divorce window.

It may be possible that the timing of trades drives the performance differential of the two groups of investors. Odean (1999) utilizes the post-trade sell-buy differential as a measure of investor overconfidence; on average if investors are making good trading decisions, the stocks they purchase should perform at least as well as the stocks they sell. Table 5, Panel B reports the post-buy and post-sell calendar-time returns and alphas at the one year horizon for the two groups of investors. Trades are again separated into the three periods; pre-divorce window, divorce window, and post-divorce window, although the post-trade returns may extend beyond the window itself. Although the one-year horizon is reported, and this may not align with some investors' trading horizons, this metric aims to provide some diagnosis for the trading performance exhibited by the two groups of individuals.

Table 5, Panel B is separated into three sections. In section (1), we report the post-buy 1 year returns of divorced and control investors, and the differences between these in the three periods (the pre-divorce window, the divorce window, and post-divorce window). Section (2) reports the same respective statistics for the sales of the two groups, while section (3) reports the average returns of buys minus sells for the two groups, separately, and then their difference.

In the pre-divorce window, buys of divorced individuals earn a 1-year return of 5.29% p.a., while stocks sold by divorcees earn 3.62% p.a. This differential of 1.67% p.a. between the return on stocks bought and sold is significant and indicative of a level of skill in the trades of divorcees prior to the divorce. In contrast, the control group of investors exhibit negligible skill; buys earn 0.52% p.a. less than their sells during the pre-divorce window. The difference

between these two groups (2.20% p.a.) demonstrates that there is no inherent lack of stock selection ability by the divorcees.

However, during the divorce window, the buys of divorcees significantly underperform their sells. At the one-year horizon, stocks purchased by divorcees generate returns of 1.19% p.a., in comparison to the 2.85% p.a. returns for stocks sold. Liquidation of stocks at inopportune times is a likely consequence faced by divorcing investors, where this evidence suggests that poor timing on sells partially explains their underperformance. The control sample, in contrast, generate a positive (0.74% p.a.) post-trade differential between buys and sells. The net difference in the buy-sell return differential during the divorce window between the treatment group and the control group is -2.40% p.a., compared to 2.20% p.a. difference during the pre-divorce window. The "difference in return differentials" following this calendar time approach is 4.60%, similar in economic magnitude to that found using the Barber and Odean (2000) style return calculations.

In Table 5, Panel C reports the raw returns from Panel, adjusted using a one-factor model (e.g. Seasholes and Zhu, 2010) in Section (1), a Fama-French three-factor model in Section (2) and a Fama-French plus momentum four-factor model in Section (3). During the divorce window, the divorce sample generate a negative (-1.66%, -1.75% and -1.74% p.a.) alpha using a one, three and four-factor model respectively. The control sample, in contrast, generate a positive (0.76%, 0.76% and 0.74% p.a.) alpha across the same risk adjustments. The difference in alpha between treatment and control turns negative during the divorce window and remains negative in the post-divorce window. Hence from the divorce window onwards risk-adjusted buys of divorcees significantly underperform their sells, while this does not occur for the control sample during the same period.

5. Discussion.

In this paper we have analyzed the trading performance of a sample of Finnish household investors who have experienced divorce, during a 20 year period from 1995 until 2014. Relative to a control sample of individuals, matched on a large number of attributes that have been shown to explain individual investor returns in prior studies, we find that divorcees that are active traders when married are less distracted by divorce. We find that couples where both spouses are active traders (more compatible active investment styles) trade better while married approximately 0.32% per year better than couples where one spouse is active, and 5.46% better

than couples where neither is an active trader. After divorce couples where both spouses are active traders perform 0.18 % better than couples where one spouse is an active trader and 6.39% better than couples where neither is an active trader. This differential increases with 3.48% for the largest quintile of portfolios.

The above results should be contrasted to the average non-active investor with an average size portfolio, who underperform by approximately 6.05% p.a. in the two year immediately surrounding the divorce. The underperformance of these less actively trading divorced individuals arises from the liquidation of stocks that subsequently earn positive returns. Using a calendar-time approach, similar to that of Seasholes and Zhu (2010), our results show that, during the divorce window, stocks sold by divorced investors subsequently outperform (by 2.40% at a 1-year horizon) stocks sold by the matched control group. This appears to be the main driver of divorcee underperformance – the liquidation of stocks with unfortunate timing. We find that this negative impact of divorce can be avoided through active portfolio management, for example by consulting professional advisers or reverting to a passive investment strategy during times of difficulty.

References

Andersen, S., and Nielsen, K. M., (2011) "Participation Constraints in the Stock Market: Evidence from Unexpected Inheritance Due to Sudden Death," *Review of Financial Studies*, 24, 1667-1697.

Atella, V., Brunetti, M., and Maestas, N., (2012) "Household Portfolio Choices, Health Status, and Health Care Systems: A Cross-Country Analysis Based on SHARE," *Journal of Banking and Finance*, 36, 1320-1335.

Barber, B. M., and Odean, T., (2000) "Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors," *Journal of Finance*, 55, 773-806.

Barber, B. M., and Odean, T., (2001) "Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment," *Quarterly Journal of Economics*, 116, 261-292.

Barber, B. M., Lee, Y.-T., Liu, Y.-J., and Odean, T., (2009) "Just How Much Do Individual Investors Lose by Trading?" *Review of Financial Studies*, 22, 609-632.

Bertrand, M., Duflo, E. and Mullainathan, S., (2004) "How Much Should We Trust Differences-in-Differences Estimates?" *Quarterly Journal of Economics*, 119, 249-275.

Bogan, V. L., and Fertig, A.R. (2013) "Portfolio Choice and Mental Health," *Review of Finance*, 17, 955-992.

Calvet, L.E., Campbell, J.Y., Sodini, P., 2009. Fight or flight? Portfolio rebalancing by individual investors. Quarterly Journal of Economics 124 (1), 301–348.

Christiansen, C., Joensen, J. S., and Rangvid, J. (2015) "Understanding the Effects of Marriage and Divorce on Financial Investments: The Role of Background Risk Sharing," *Economic Inquiry*, 53, 431-447.

Choe, H., Kho B-C., Stulz, R.M., 2005. Do domestic investors have an edge? The trading experience of foreign investors in Korea. *Review of Financial Studies*, 18, 795–829.

Cocco, J.F., Gomes, F.J., and Maenhout, P.J. (2005) "Consumption and Portfolio Choice over the Life Cycle," *Review of Financial Studies*, 18, 491-533.

Dahlquist, M., Martinez, J. M., and Soderlund, P., (2017) "Individual Investor Activity and Performance," *Review of Financial Studies*, 30, 866-899.

Dhar, R., and Zhu, N., 2006. Up close and personal: Investor sophistication and the disposition effect, *Management Science*, 52, 726–740.

Dorn, D. and Sengmueller, P. (2009) "Trading as Entertainment?" *Management Science*, 55, 591-603.

Dvořák, T., 2005. Do domestic investors have an information advantage? Evidence from Indonesia. *Journal of Finance* 60, 817–839.

Fan, E., and Zhao, R., (2009) "Health Status and Portfolio Choice: Causality or Heterogeneity?" *Journal of Banking and Finance*, 33, 1079-1088.

Gonzalez, L., and Viitanen, T. K. (2009) "The Effect of Divorce Laws on Divorce Rates in Europe," *European Economic Review,* 53, 127-138.

Grinblatt, M., and Keloharju, M. (2000) "The Investment Behavior and Performance of Various Investor Types: A Study of Finland's Unique Data Set," *Journal of Financial Economics*, 55, 43-67.

Grinblatt, M., and Keloharju, M. (2001) "What Makes Investors Trade?" *Journal of Fiannce*, 56, 589-616.

Grinblatt, M. and Keloharju, M. (2009). "Sensation Seeking, Overconfidence, and Trading Activity," *Journal of Finance*, 54, 549-578.

Grinblatt, M., Keloharju, M., and Linniainmaa, J. T. (2012) "IQ, Trading Behavior, and Performance," *Journal of Financial Economics*, 104, 339-362.

Hau, H., (2001) "Location matters: An examination of trading profits," *Journal of Finance*, 56, 1959–1983.

Ivković, Z., Weisbenner, S. (2005) "Local does as local is: Information content of the geography of individual investors' common stock investments," *Journal of Finance,* 60, 267–306.

Heaton, J. and Lucas, D. (2000). "Portfolio Choice and Asset Prices: The Importance of Entrepreneurial Risk," *Journal of Finance*, 55, 1163-1198.

Kang, J.-K., Stulz, R.M., 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. Journal of Financial Economics 46 (1), 3–28.

Korniotis, G. and Kumar, A. (2011). "Do Older Investors Make Better Investment Decisions?" *Review of Economics and Statistics*, 93, 244-265.

Linnainmaa, J. T. (2011) "Why Do (Some) Households Trade Too Much?" *Review of Financial Studies*, 24, 1630-1666.

Loughran, D., and Zissimopoulos, J. (2009). "Why wait? The Effect of Marriage and Childbearing on the Wages of Men and Women." *Journal of Human Resources,* 44, 326–349.

Love, D. A. (2010) "The Effects of Marital Status and Children on Savings and Portfolio Choice," *Review of Financial Studies*, 23, 385-432.

Love, D.A., and Smith, P. A. (2010) "Does Health Affect Portfolio Choice?" *Health Economics*, 19, 1441-1460.

Lu, Y., Ray, S., and Teo, M. (2016) "Limited Attention, Marital Events, and Hedge Funds," *Journal of Financial Economics*, 122, 607-624

Odean, T. (1999) "Do Investors Trade Too Much?" *American Economic Review*, 89, 1279-1298.

Puri, M., and Robinson, D. T. (2007) "Optimism and Economic Choice," *Journal of Financial Economics*, 86, 71-99.

Rosen, H. S., and Wu, S. (2004) "Portfolio Choice and Health Status" *Journal of Financial Economics*, 72, 457-484.

Savolainen, M. (2002) "Grounds for Divorce and Maintenance Between Former Spouses," *Commission on European Family Law Report, http://ceflonline.net/wp-content/uploads/Finland-Divorce.pdf*

Seasholes, M. S. and Zhu, N. (2010) "Individual Investors and Local Bias," *Journal of Finance*, 65, 1987-2010.

Scholes, M. and Williams, J. (1977) "Estimating betas from nonsynchronous data," *Journal of Financial Economics*, 5, 309-327.

Shu, T., Sulaeman, J., and Yeung, P. E. (2015) "Does Sadness Influence Investor Behavior? Evidence from Bereaved Fund Managers," *Working Paper, University of Georgia.*

Table 1 Descriptive Statistics

The table presents demographic and equity portfolio statistics for investors experiencing divorce during the 20 year period 1995-2014, and corresponding statistics for the whole population of investors in our sample (not included in the first group). The variables are selected for the purpose of describing investor characteristics as accurately as possible with available data, and are subsequently used for propensity score matching.

	Mean	Std. Dev	25th Pctl	50th Pctl	75th Pctl
Panel A: Divorced Investors					
Age	56.39	11.61	48.00	57.00	66.00
Gender Dummy (Female = 1)	36.48%	48.15%	0.00%	0.00%	100.00%
Language Dummy (Finnish = 1)	95.38%	21.01%	100.00%	100.00%	100.00%
Foreign Dummy	1.54%	12.32%	0.00%	0.00%	0.00%
Business Owner	5.91%	23.59%	0.00%	0.00%	0.00%
Income	32,273.09	3,046.98	30,205.25	30,461.75	35,812.44
Education	0.12	0.07	0.06	0.14	0.14
ln (Portfolio Size)	9.93	1.89	8.33	9.74	11.13
ln (Trade Size)	6.40	1.69	5.20	6.35	7.51
Number of Trades	3.88	7.04	0.75	1.75	4.00
Net Pre-Window Return	10.93%	27.18%	-5.24%	10.26%	26.32%
Std. Pre-Window Return	7.47%	2.00%	6.01%	7.50%	8.90%
Net Window Return	5.61%	17.94%	-4.93%	6.04%	16.34%
Std. Window Return	7.12%	2.21%	5.52%	7.01%	8.53%
Panel B: Non-Divorced Population					
Age	51.41	14.00	41.00	53.00	63.00
Gender Dummy (Female = 1)	33.93%	47.35%	0.00%	0.00%	100.00%
Language Dummy (Finnish = 1)	92.31%	26.65%	100.00%	100.00%	100.00%
Foreign Dummy	9.99%	29.99%	0.00%	0.00%	0.00%
Business Owner	4.83%	21.45%	0.00%	0.00%	0.00%
Income	32,306.00	3,101.30	30,205.25	31,062.25	35,812.44
Education	0.12	0.07	0.06	0.14	0.14
ln (Portfolio Size)	9.46	1.60	8.19	9.26	10.49
ln (Trade Size)	5.64	1.74	4.59	5.76	6.80
Number of Trades	3.61	6.88	0.40	1.25	3.80
Net Pre-Window Return	11.30%	22.18%	-2.73%	12.95%	27.64%
Std. Pre-Window Return	7.98%	2.26%	6.42%	8.00%	9.45%
Net Window Return	11.88%	17.22%	0.09%	13.66%	26.62%
Std. Window Return	7.89%	1.93%	6.50%	7.85%	9.07%

Table 2 Propensity Score Matching

The table presents the propensity score matching results. Column (1), Panel A, labeled "Prematch" presents the pre-match differences between the treatment sample and the population and Column (2) labeled "Prematch" reports the differences between the treatment and the matched control sample. Panel B reports probit regression results for the prematch and postmatch samples.

	Panel A Comparing Sample Characteristics					Panel B Probit Regressions	
		Prematch		Postmatch		Prematch	Postmatch
	Divorce	Population	Difference	Control	Difference		
	(1)	(2)	(3)	(4)	(5)	(1)	(2)
Age	56.83	51.41	5.42***	56.83	0.00	0.01***	0.00
			(15.27)		(0.00)	(12.28)	(1.04)
Gender Dummy (Female = 1)	0.36	0.34	0.02*	0.37	-0.01	0.05***	-0.05
			(1.69)		(-0.81)	(3.37)	(0.94)
Language Dummy (Finnish = 1)	0.95	0.92	0.03***	0.95	0.00	0.18***	-0.01
			(4.40)		(0.18)	(5.02)	(0.13)
Foreign Dummy	0.02	0.10	-0.08***	0.01	0.00	-0.56***	0.21
			(-11.11)		(1.14)	(-10.42)	(1.04)
Business Owner	0.06	0.05	0.01*	0.06	0.00	0.05	-0.01
			(1.66)		(0.16)	(1.52)	(0.14)
Income	32,266	32,306	-39.95	32,179	86.70	0.00	0.00
			(-0.51)		(0.77)	(0.23)	(0.58)
Educated	0.12	0.12	0.00**	0.12	0.00	0.30***	-0.01
			(2.20)		(0.17)	(2.70)	(0.02)
ln (Portfolio Size)	9.92	9.46	0.46***	9.98	-0.05	-0.02***	-0.02

			(11.34)		(-0.85)	(-3.91)	(1.18)
ln (Trade Size)	6.33	5.64	0.69***	6.32	0.01	0.12***	0.02
			(15.53)		(0.13)	(17.09)	(1.13)
Number of Trades	3.94	3.61	0.33**	4.09	-0.15	-0.01***	0.00
			(1.90)		(-0.61)	(-6.33)	(0.70)
Net Pre-Window Return	0.1086	0.1130	-0.0044	0.1177	-0.0091	-0.04	-0.06
			(-0.79)		(-1.01)	(1.19)	(0.57)
Std. Pre-Window Return	0.0746	0.0798	-0.0051**	0.0758	-0.0012	-3.20***	-1.94*
			(-8.96)		(-1.55)	(-9.57)	(-1.78)
Year fixed effects						Yes	Yes
Num. Observations						2,676,758	2,964
Pseudo R^2						0.0353	0.0023

Table 3 Regression Analysis of Net Return vs. Active Trader investor category indicator variables in the pre-period.

The table reports estimates of regression models, including fixed year effects, investor clustered standard errors, and indicator variables identifying divorced couples where one of the spouses is in the top 75 percentile by number of trades in the pre-divorce window denoted 'One Spouse Active Trader' (#795), and in contrast both of the spouses are in the top 75 percentile by number of trades in the pre-divorce window denoted 'Both Spouses Active Traders' (#385). All estimations control for portfolio size quintile by including indicator variables for the two largest and the two smallest portfolio size quintiles (at the end of the pre-window). *,** and *** denote statistical significance at 10%, 5% and 1% respectively. T-values are reported in parenthesis beneath the coefficients.

	1. Pre-Window Control Sample Size Controls	2. Pre-Window Control Sample One Active Size Controls	3. Pre-Window Divorce Sample Size Controls	4. Pre-Window Divorce Sample One Active Size Controls	5. Pre-Window Divorce Sample Both Indicators Size Controls
Intercept	–0.00404	–0.00580	–0.0569**	–0.0577**	–0.0595**
	(–0.17)	(–0.24)	(–2.34)	(–2.34)	(–2.40)
One Spouse is Active Trader Other Not		0.0276**		0.0546***	
		(2.40)		(3.18)	
Both Spouses are Active Traders					0.0578*
					(1.64)
Small Portfolio (Q1_LnSize_Pre)	–0.0755***	–0.0712***	–0.0536***	–0.0471***	–0.0499***
	(–4.80)	(–4.48)	(–3.78)	(–3.78)	(–3.46)
Medium/Small Portfolio (Q2_LnSize_Pre)	–0.0173	–0.0150	–0.0353**	–0.0313**	–0.0317**
	(–1.25)	(–1.08)	(–2.37)	(–2.10)	(–2.09)
Medium/Large Portfolio (Q4_ LnSize_Pre)	0.0249**	0.0208*	0.0590***	0.0539***	0.0574***
	(1.96)	(1.61)	(3.75)	(3.45)	(3.63)
Large Portfolio (Q4_ LnSize_Pre)	0.0488***	0.0399***	0.116***	0.0991***	0.112***
	(3.71)	(2.86)	(5.15)	(4.37)	(5.03)

R-squared	0.4194	0.4218	0.3997	0.4061	0.4022
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Investor Clustered Standard Errors	Yes	Yes	Yes	Yes	Yes
Observations	3,326	3,326	3,326	3,326	3,326

Table 4 DID Analysis of Net Return Differential between Active Trader Spouses Around Divorce

The table reports estimates of DID regression models, including portfolio size controls, fixed year effects, and interaction specifications identifying investors who trade actively in the divorce window and who buy actively. The dependent variable is the annualized Net Return during the 1 year pre-event-period and the 1 year post-event-period centered on the divorce date for the treatment sample (as identified by the date of division of property), and for the three calendar years surrounding the treatment pair's divorce year for the matched control sample. Two trading activity indicator variables are interacted with the sample and the window, first the indicator for when one of the spouses is in the top 75 percentile by number of trades in the pre-divorce window denoted 'One Spouse Active Trader, and second the indicator for when both of the spouses are in the top 75 percentile by number of trades in the pre-divorce window denoted 'Both Spouses Active Traders. Column 4 includes quintile indicators for the two largest and the two smallest portfolio size quintiles (at the end of the pre-window) interacted with the sample and the window. . *,** and *** denote statistical significance at 10%, 5% and 1% respectively. t-values are reported in parenthesis beneath the coefficients.

	1. Base Case	**2. Base Case One Spouse Active Trader**	**3. Base Case Both Spouses Active Traders**	**4. Combined All Activity Indicators Size Controls**
Intercept	14.9	0.150***	0.149***	0.134***
	(12.8)	(13.0)	(12.8)	(10.7)
Sample	–0.0104	–0.0104	–0.0104	–0.0113
	(–1.22)	(–1.22)	(–1.22)	(–1.40)
Window	0.00654	0.00654	0.00654	0.00654
	(0.87)	(0.87)	(0.89)	(0.87)
Sample × Window	–0.0605***	–0.0702***	–0.0630***	–0.0605***
	(-5.37)	(–6.12)	(–5.54)	(–5.36)
One Spouse is Active Trader Other Not × Sample × Window		0.0409***		0.0639***
		(3.34)		(9.50)
Both Spouses are Active Traders × Sample × Window			0.0416**	0.0621***
			(1.99)	(2.73)

Small Portfolio (Q1_Size) × Sample × Window				–0.0441***
				(-6.23)
Medium/Small Portfolio (Q2_Size) × Sample × Window				–0.0170**
				(2.52)
Medium/Large Portfolio (Q4_Size) × Sample × Window				0.0249***
				(3.70)
Large Portfolio (Q5_Size) × Sample × Window				0.0348***
				(3.73)
R-squared	0.1272	0.1289	0.1277	0.1740
Year Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes
Observations	6,294	6,294	6,294	6,294

Table 5 Calendar-Time Analysis

The table reports stock-level characteristics of purchases and sales made by the divorce and control groups during three periods, the pre-divorce window, the divorce window, and a post-divorce window covering the period from 1 to 3 years post-divorce. The divorce date is identified by the date of the division of property event for the sample of divorced investors, and the control sample is selected for a corresponding time period using one-to-one propensity score matching. Panel A presents stock characteristics, Panel B one year post trade calendar time returns, and Panel C risk adjusted one year post sample returns. Comparing the investor categories *,** and *** denote 10%, 5% and 1% significance levels in differences respectively. T-values are reported in parenthesis beneath the differences.

Panel A: Characteristics of Stocks Traded by Divorced and Control Investors

	Buys			Sells		
Beta (Percentile Ranks)						
	Treatment	Control	Difference	Treatment	Control	Difference
Pre-Divorce Window	0.86	0.83	0.04***	0.83	0.79	0.04***
			(4.91)			(5.62)
Divorce Window	0.87	0.94	-0.06***	0.83	0.89	-0.06***
			(-10.66)			(-9.28)
Post-Divorce Window	0.89	0.92	-0.03***	0.86	0.86	0.00
			(-3.88)			(0.06)
Market Capitalization (Percentile Ranks)						
	Treatment	Control	Difference	Treatment	Control	Difference
Pre-Divorce Window	78.69	78.79	-0.10	77.18	76.25	0.92***
			(-0.26)			(2.41)

Divorce Window	74.13	80.23	-6.10***	74.38	77.22	-2.84***
			(-19.61)			(-8.51)
Post-Divorce Window	77.70	77.69	0.01	76.34	74.87	1.47***
			(0.03)			(3.72)

Book-to-Market (Percentile Ranks)

	Treatment	Control	Difference	Treatment	Control	Difference
Pre-Divorce Window	43.26	43.68	-0.42	46.85	44.76	2.09***
			(-0.96)			(5.09)
Divorce Window	44.46	43.24	1.22***	44.92	44.67	0.26
			(3.57)			(0.72)
Post-Divorce Window	43.07	46.14	-3.07***	44.07	46.44	-2.37***
			(-7.41)			(-5.57)

Panel B: One Year Post-Trade Returns

	(1) Buys			(2) Sells			(3) Buys Minus Sells		
	Treatment	Control	Difference	Treatment	Control	Difference	Treatment	Control	Difference
Pre-Divorce Window	0.0529	0.0416	0.0113***	0.0362	0.0469	-0.0106***	0.0167***	-0.0052	0.0220***
			(2.73)			(-3.04)	(3.88)	(-1.54)	(4.02)
Divorce Window	0.0119	0.0113	0.0005	0.0285	0.0040	0.0245***	-0.0168***	0.0074***	-0.0240***
			(0.17)			(8.34)	(-4.60)	(2.94)	(-5.49)
Post-Divorce Window	0.0189	0.0405	-0.0215***	0.0365	0.0306	0.0059*	-0.0176***	0.0099***	-0.0275***
			(-5.95)			(1.72)	(-4.70)	(2.94)	(-5.46)

Panel C: One Year Post-Trade Returns

	(1) Alpha CAPM			(2) Alpha, CAPM, Size, Book to Market			(3) Alpha, CAPM, Size, Book to Market, Momentum		
	Treatment	Control	Difference	Treatment	Control	Difference	Treatment	Control	Difference
Pre-Divorce Window	0.0110*	-0.0080*	0.0190***	0.0110*	-0.0079*	0.0189***	0.0108*	-0.0079*	0.0189***
	(1.86)	(-1.89)	(3.74)	(1.80)	(-1.83)	(3.66)	(1.76)	(-1.83)	(3.65)
Divorce Window	-0.0166***	0.0076**	-0.0242***	-0.0175***	0.0076**	-0.0245***	-0.0174***	0.0074**	-0.0248***
	(-3.09)	(2.24)	(-5.33)	(-3.17)	(2.25)	(-4.72)	(-3.16)	(2.18)	(-4.71)
Post-Divorce Window	-0.0180***	0.0089**	-0.0269***	-0.0176***	0.0096**	-0.0272***	-0.0179***	0.0091**	-0.0270***
	(-3.43)	(1.97)	(-5.39)	(-3.28)	(2.06)	(-5.34)	(-3.34)	(1.96)	(-5.30)

Appendix Table: The Procedure of Divorce in Finland

Accuracy of the distribution of the property of the spouse transaction type 9 as an indicator of the timing of divorce proceedings.
To evaluate the accuracy of the pre-window and window periods around divorce that we have selected in this study, we consider the impact of both the liquidation effect and the distraction in this Appendix. The majority of cases, except for those less than 6.5% of cases that are disputed (a court elected executor is appointed) the emotional impact on the parties, particularly distraction, would be expected to occur very close within 6 months on either side of the division of property event. The average turnaround time for divorce cases is 8.2 months and a Professor of Family Law states that the time between filing and division of property would in most cases take several (3-5) months. As the division of property procedure can start at the time of the filing for divorce, when the six-month consideration period starts (enforced period during which couples cannot finalize the divorce), it is possible that more distraction impact on the divorcing parties is felt before the division of property event than after, particularly for the filing party. The liquidity effect is also expected to be equally distributed around the division of property event, possibly higher after the event as this is when the division of property and funds is finalized. The property division process can start as soon as the divorce is filed and divorce lawyers recommend to consider an early distribution while the property and asset portfolio is well known to both parties.

Relevance of our current window of one year pre one year post the distribution of property
We argue that the window of one year on either side of the division of property event is sufficiently long to capture both the distraction and the liquidity effects equally and quite symmetrically. There is no need to lengthen or shorten the period in our main study, but a sensitivity analysis when the period is shortened to six months and lengthened to 1 year and six months would be interesting to carry out in future research. In the PSM/DID analysis this is quite tedious to do as our matching procedure is based on the one-year pre/post window and the matching is performed separately for every one of the 20 sample years. In the calendar time analysis a sensitivity analysis is easier to do for many different horizons.

Appendix References

The Marriage Act Finland, Webpage oikeus.fi, accessed April 20, 2018,
Dissolution of Marriage:
https://oikeus.fi/en/index/esitteet/avioliittolaki/avioliitonpurkaminen.html
Distribution of the property of the spouses:
https://oikeus.fi/en/index/esitteet/avioliittolaki/puolisoidenomaisuudenjako.html
Interviews with Professor Urpo Kangas and Professor Tapani Lohi, Civil, Family and Estate Law. University of Helsinki, April 2018.

Appendix Figure: the Divorce Process in Finland.