How are Individual Investors' Trading Activity and Performance Affected by Major Lifecycle Events? The Case of Divorce

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November 2016

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Keywords: Decision-making; Divorce; Individual investors; Performance; Trading Behavior.

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Abstract

How are financial market participation and trading impacted by material events during individuals' lifetimes? We shed light on this question by analyzing the trading performance and decisions of individual investors who experience divorce. We utilize transaction-level stock price data from Finland over a 17-year period, allowing us to identify divorced individuals due to a court-ordered transfer of shares. Divorcees earn around 16% p.a. lower returns than a control sample of closely-matched peers. The low returns earned by divorced individuals are most pronounced among investors holding small portfolios, and investors who do not buy and sell actively around the divorce settlement. We interpret the results as driven by a combination of distraction and unexpected liquidity needs.

Trading activity in equities is only part of individual investors' lives and is therefore likely influenced by major life events. Precisely how do such events impact trading? In this paper, we shed light on this question by analyzing the impact of divorce on individual investors' trading decisions. The process of ending a marriage is an undoubtedly difficult time in one's life. Unexpected costs are incurred, and the upheavals caused in an individual's life almost certainly distract them from regular routines. Among the substantial costs incurred are real estate refinancing, legal costs, and financial advice fees. Even for an amicable separation, the total expenses average $20,000, and may rise much higher depending on where the couple lives and specific assets involved.[1] The unexpected funding requirements around divorce may require the sale of assets in order to finance them, and thus cause diminution in trading performance. Further, distraction caused by divorce proceedings might also reduce trading profits. We present evidence on these issues by using a unique sample of transaction-level stock price data from Finland over a 17-year period, where divorced investors are identified through a special transaction code from the court-ordered transfer of shares. Using a difference-in-difference approach, we find that divorcees earn around 16.0% p.a. lower returns than a carefully-matched control sample of non-divorced investors. Based on the average portfolio size of individuals in our sample, this amounts to an approximate €66,000 wealth differential in the two-year period surrounding the divorce.

Costs directly incurred via the divorce process, are a constraint for investors with less wealth, and smaller portfolios. We find that divorced individuals with smaller portfolios experience greater underperformance compared to investors with larger portfolios. This finding supports the view that portfolio liquidation or rebalancing is one cause of the relatively low returns to divorcees.

We also find evidence supporting the notion that investors who do not trade actively in the period surrounding the divorce are likely distracted. Specifically, those divorcees who both buy *and* sell (and not only buy or sell, which are likely to be liquidity-related or portfolio-rebalancing trades) surrounding the divorce perform substantially better than those that avoid buying and selling. Buyers and sellers underperform their peers by 9.14% p.a. compared to 24.24% p.a. for divorcees that refrain from trade surrounding the divorce. These effects are separate from portfolio-size related effects of divorce – individuals with the largest portfolios who trade actively

[1] A report in the Huffington Post (2013), quotes Bruce Cameron of Cameron LLMC "Basically it costs as much to get unmarried as it does to get married." http://www.huffingtonpost.com/galtime/how-much-does-the-average_b_3360433.html

following the divorce settlement only underperform the average non-divorced investor by 2.93%. Therefore, both liquidity and distraction considerations are responsible in explaining the underperformance of divorced investors.

While our paper focuses on the trading behavior of individual investors, contemporaneous research by Lu et al. (2016) and Shu et al. (2015) examines trading activities of hedge fund managers around marriage and divorce, and mutual fund managers around parental death. Suggesting that fund managers are distracted by the marital activities within their personal lives, Lu et al. (2016) find that divorcing fund managers earn negative alphas in the six month period surrounding, and two year period subsequent to divorce. The negative realized returns to divorced individuals in our study are consistent with the findings of Lu et al. (2016). Shu et al. (2015) report that mutual fund managers similarly exhibit negative alphas surrounding parental deaths, with sadness impeding managers' cognitive abilities in stock trading. In particular, the managers in Shu et al.'s (2015) study rely more on heuristics, and trade less actively following the death of a parent. Our results complement the findings of both of these studies in the domain of individual investors. Moreover, the portfolio trading decisions of individuals directly affect their own wealth, allowing us to avoid agency considerations in understanding the role of divorce in trading activity.

From the standpoint of an investor's asset allocation decision, divorce is a shock to lifetime earnings due to an increase in background risk (e.g. Love, 2010). The gains provided by marriage stem from an ability to share consumption, and insurance against negative shocks to earnings, income or health (Schaller, 2013). Married investors, therefore, tend to hold a larger proportion of their portfolios in stocks (Sunden and Surette, 1998; Lupton and Smith, 2003; Bertocchi et al, 2011), although part of this may be in order to finance the expected costs of divorce (e.g. Fernandez and Wong, 2014). Theoretical models hence predict a reduction in an investor's propensity to hold risky assets following divorce, a finding that is broadly corroborated by our results, and consistent with the empirical findings (e.g. Christiansen et al, 2015). The life-cycle model of Love (2010) predicts that women optimally reduce their share of risky assets, whereas men increase their share following separation, because they no longer have to finance the ongoing consumption of a longer-lived, lower earning spouse. The impact is stronger for childless men. In a recent study, Christiansen et al. (2015), using Danish data, show that women increase their share in risky assets

following marriage, and decrease it following divorce. Men show the opposite pattern in their asset allocation decisions, increasing their allocation to shares following divorce.[2]

In this paper, rather than focusing on the asset allocation decision, we examine the way in which the stock trading behavior of investors is affected by divorce. However, given that the final settlement through the court represents the culmination of a lengthy process, identifying the specific date of the couple's separation is problematic. Instead, we compare each individual's trading activity in a two-year period commencing three years prior to the divorce transaction, with a second two-year period occurring one year either side of the divorce settlement date. Thus, in each year in our sample period (from 1995 until 2011), divorced individuals are matched with another individual based on age, gender, total portfolio value, and realized returns and turnover rates in the previous two years. The pool of potential matches for each divorced investor is large, averaging 150,000 valid individuals each year. As the average number of court-ordered divorces is relatively small (mean 110 divorces each year), we are able to generate a control sample that very closely mimics the divorce sample in their attributes. We use this control sample to conduct our difference-in-difference regressions.

Our results contribute to the literature in at least two ways. First, we document the extent of divorce-driven underperformance in individual investor trading. While other papers have examined the impact of divorce on an individual's risky share (e.g. Love, 2010; Christiansen et al., 2015), we are the first to examine individual stock trading decisions of divorced individuals, documenting the hidden costs of the returns that divorcees forego.

Second, we show the importance of liquidity considerations in determining the overall cost of divorce. Previous studies have shown that household portfolio allocations to stocks rise with wealth (e.g. Wachter and Yogo, 2010), and we show the converse of this process; the worst performers among the divorced individuals are those with the smallest portfolios (and thus, likely the least wealth).

We also provide evidence that investors who remain active traders during the divorce window are less distracted. These investors are hence able to successfully manage their investments

[2] Some of the noted side effects of divorce, including a reduction in 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) similarly lead to a decrease in the share of an investor's portfolio held in risky assets.

through a divorce with little effort, as their opportunity costs of divorce are low. These results corroborate the findings by Shu et al. (2015) and Lu et al. (2016) for individual investors.

1. Data and Hypotheses

1.1 Source of Investor Level Transactions and Firm-Level Data

To examine the way in which the stock trading behavior of investors is affected by divorce we require very specific data. Our main data source is obtained from Euroclear Finland Ltd (formerly Finnish Central Securities Depository) and includes all transactions in the depository of stock holdings for all individual investors in all common stocks listed on the Nasdaq OMX Helsinki Exchange, Finland during the period January 1, 1995 through December 31, 2011. These official records of ownership are maintained by the clearing house and are hence reliable.

The database contains demographic statistics such as gender, age, postcode, and language for each investor. We retain all investor accounts for which gender and age are verifiable. This leaves us with a total of 322,578 individual investor accounts holding 22% of total market capitalization of listed companies at the end of the sample period.

Trades made by investors in the Euroclear data set are recorded at the actual transaction price. In order to calculate aggregate holdings we augment the clearinghouse data with information on daily closing prices, and returns adjusted for stock splits, dividends and other capital structure changes, and the change in currency from Finnish Markka to Euros (on 1/1/1999) from COMPUSTAT. We retain all trades in common stocks on the OMX Helsinki Exchange, excluding trades in exchange-listed warrants and bonds, and foreign listed stocks.

1.2 Identification of Divorced Investors

The securities depository data includes reference codes that categorize trades into limit order book trades, negotiated trades, capitalization changes (e.g. rights issues, bonus issues), inheritance, and a number of other transaction categories. Importantly, the reference code is used to identify those investors who have divorced. Transfer of stock holdings at the clearinghouse may occur due to court-ordered division of property in a divorce settlement. In such cases, the reference code 9 is used by Euroclear. Among such transactions, we are further able to identify those who have relinquished shares (‘givers’), and their counterparty who has received shares in the settlement. Those investors receiving shares (‘receivers’) are identified as buyers on the ledger at the clearinghouse, although they do not actually pay the market price for the shares upon settlement.

These transfers of shares are distinct from those involving inheritance transfers of shares, bequests, or change in legal type from living to deceased. The use of the reference code 9 is therefore limited to divorce transfers and not, for example transfers between spouses for other reasons.[3]

In our data, we require divorced investors to engage in at least one trade both before and after the court-ordered transfer of shares, so we do not necessarily retain both sides of the couple in our data set following the separation. This particular restriction excludes mainly non-trading spouses receiving shares in the divorce transfer, who are likely to simply sell the windfall (Andersen and Nielsen, 2011). We also require that divorcees hold a portfolio larger than €1,000 and are no older than 80 nor younger than 20. Our final sample consists of 1,480 divorcees.

1.3. Attributes used to Identify Control Sample of Investors

In order to identify a suitable group of investors with which the divorcees can be compared, we implement a 1:1 matching process based on attributes, such as age, portfolio size, and turnover rate that may be correlated with investor trading performance. We refer to the matched sample as the 'peer group' or 'control group' throughout the paper. As the investor population is large relative to the number of investors required for the control sample, we expect to be able to identify investors that are quite similar to the divorced sample of investors along these attributes. In this section, we discuss the variables used to match investors and the process involved.

While the court-ordered transfer of shares takes place on a particular, identifiable date, we are unable to determine the specific date at which the decision to separate or divorce was made. Since 1988, there is no requirement of a formal separation period before a court may grant divorce in Finland.[4] The transfer of shares through the court, however, is likely to occur following a lengthy process, including mediation. Our method compares a period 'before' the divorce, where divorcees are likely to feel little impact from separation-induced anxiety, and 'during' the divorce, when negative emotions would appear most pronounced. We call these two time periods the 'pre-divorce window' and 'divorce window,' respectively.

The pre-divorce period occurs three years to one year before the year of the divorce transaction. Over this time period, we construct pre-window returns and turnover rates of portfolios that are

[3] We exclude divorcees that have both divorce and inheritance or bequest transaction during the sample period.
[4] Finland has allowed for unilateral divorce since 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).

used for matching purposes, and at the end of the period we calculate portfolio size and investor age for the same reason. For each year in our sample of divorces, we construct these trading-related metrics for the entirety of the Euroclear sample.[5]

The 'divorce window' is the period of 24 months surrounding the divorce itself. In our previous example, a July 2001 divorce would generate a divorce window consisting the period July 2000 to June 2002. The divorce window is placed around a specific month in an effort to isolate the divorce-related effects on trading.

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

The investor attributes that are used for matching purposes are discussed below.

1.3.1. Age

Age may be an important determinant of portfolio returns generally (e.g. Korniotis and Kumar, 2011), and 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 younger investors underperform due to excessive overconfidence, although their sample consists of mainly younger investors than ours.

The Euroclear database contains details of investors' dates of birth. Our Age_i variable is investor i's age in years at the end of the pre-divorce window. We eliminate any investors as potential matches whose Age is greater than 80 or less than 20 at the end of the pre-divorce window.

[5] Lucas (2005), for example, in a longitudinal study, notes that life satisfaction for divorcees tends to be at its lowest point in the year leading up to divorce, gradually rebounding over time.

1.3.2 Gender

We match investors based on Gender, which is based on an indicator variable that takes the value of 1 if the stock holder is a woman, and 0 if the stock holder is a man. Taking a distance metric will therefore place a strong weighting on matching by gender.

Previous studies have indicated that men and women exhibit different trading propensities (Barber and Odean, 2001), and as a result, different realizations of portfolio returns. Christiansen et al (2015) show, using a large panel dataset from Denmark, that men and women act differently following divorce in terms of asset allocation and stock market participation decisions. They find that men allocate more to risky assets, but reduce their overall level of participation in the stock market following divorce. In general, we would expect that trading performance (either due to overconfidence or risk-aversion differences) differs along gender lines, and particularly the response to divorce.

1.3.3. Turnover Rate

The degree of trading activity shown by an investor is likely to be negatively correlated with trading performance (e.g. Barber and Odean, 2001; Barber et al., 2009; Linnainmaa, 2011) for individuals. Excessive trading erodes trading performance due to a lack of ability, or informational disadvantages compared with institutional investors (Stoffman, 2014), and appears to be most prominent in single males (Barber and Odean, 2001; Grinblatt and Keloharju, 2009). Dorn and Sengmuller (2009) find that investors who self-report enjoyment from gambling turnover their portfolio more frequently than those who do not. Thus, we might expect that portfolio turnover rate is not only related to trading performance and marital status, but also innate risk-taking characteristics of investors.

We calculate the average turnover rate over the two year pre-divorce window, similar to Barber and Odean (2001), as follows.

$$TurnoverRate_i = \frac{1}{4}\left(\frac{\sum_{m=1}^{12}(VBuys_{i,m-36} + VSells_{i,m-36})}{(PortfolioSize_{i,m-36})} + \frac{\sum_{m=1}^{12}(VBuys_{i,m-24} + VSells_{i,m-24})}{(PortfolioSize_{i,m-24})}\right) \quad (1)$$

where $VBuys_{i,m}$ is the value of stocks purchased and $VSells_{i,m-36}$ is the value of stocks sold by investor i in month m, and $PortfolioSize_{i,m}$ is the total value of investor i's portfolio at the beginning of month m. The two terms inside the large parentheses in (1) indicates the turnover rate of the investor's portfolio within the first and second years of the pre-divorce window,

respectively. The ¼ term at the front of the expression averages the impact of buys and sells within a given year, and averages across the two years in our window. Thus, the turnover rate is the simple arithmetic average of the turnover rates in each of the two years.

For matching purposes, we calculate the two-year average annual turnover rates over the pre-divorce window, $(m-36, m-13)$ for all eligible investors in the sample. Investors with a turnover rate of zero were excluded from both the divorce and control samples, as we required investors to make actual trades in the pre-divorce window. Investors with a turnover rate of greater than 10 (1,000%) were also excluded as potential matches.

1.3.4. Portfolio Size

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

Divorce is likely to impact both large and small investors, with divorce costs at least partially proportional to wealth. Lower net-worth households are more likely to experience divorce, however (Loughran and Zissimopolous, 2009). Thus, based on the US Health and Retirement Study, Zissimopoulos et al. (2015) find that males with one divorce who do not remarry expect to earn 80% of the lifetime wealth of a continuously married male, while single divorced females earn around 46% of their continuously married counterparts. We therefore have reason to believe that investors with larger portfolios might be less affected by divorce, or at least demonstrate improved trading performance due to lower turnover rates.

$PortfolioSize_i$ is calculated as the Euro value of the investor's equity portfolio at the end of the pre-divorce window (start of month $m-12$). Individuals are not excluded from the pool of potential matches based on their portfolio size.

1.3.5 Return Calculations

In order to adjust for inherent skill differences between traders that may not be captured in the other attributes, we match investors on their pre-period, unadjusted returns. Calculation of the investor returns is an important step in our process and so we describe it in detail.

We compute monthly portfolio returns similarly to Barber and Odean (2001), by including both realized and unrealized profits in 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

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

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. We note that the number of shares held cancel out in (2), but we include the term for the purpose of clarity. This method avoids issues of calculating 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 $m-1$, 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 at over the month ending at time m is weighted by the position weights at time $m-1$

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

Shares that were partially liquidated over the previous month show a lower value of $p_{i,s,m-1}$. This way portfolio returns on held positions are revalued month-by-month and realized returns become the accumulated returns up to the start of the month when the shares are sold. Shares that

have been purchased during the previous month are added to the portfolio at the start of the next month with a value of $p_{i,s,m-1}$ that reflects the proportion of the position in the total portfolio.[6]

In order to calculate the pre-window returns, we aggregate and annualize monthly returns for a period of two years, beginning in the January 36 months prior to the year of divorce and ending 12 months prior to the start of the divorce year. Thus, we obtain the value of $PreWindowReturn_i$ for investor i as:

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

where month $m = 1$ indicates the beginning of the year of divorce, and the ½ is used as an adjustment for annualization . The pre-window returns in (6) are those 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 the m = 0 indicates the divorce month.

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

We control for brokerage costs by subtracting a fee for each trade executed. While we are not able to obtain 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 the variable brokerage cost.[7] These costs reflect the approximate cost of trading over the telephone and are hence overstated for investors that used discount or online brokerage houses, particularly towards the end of the sample period. We note that the size of the transaction cost imposed here does not materially alter the findings of the paper.

[6] In tests we have found that the one month accuracy of return measurement is sufficient and not materially different from if the returns were computed daily following the same procedure. We take particular care in obtaining correct number of shares held in each stock position at the start of the month, taking into account all past purchase and sales, share issues, splits and dividends. In most of our further applications, we aggregate the monthly returns to annual, while we use monthly returns to compute standard deviation in returns. Barber and Odean (2001, p. 271) discuss the issue of return calculations and similarly suggest that results are not materially affected by choice of frequency in the calculations.

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

The return after brokerage costs for investor i in month m, which we denote as $NetReturn_{i,m}$ are estimated as:

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

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 divorce window and annualized in a similar fashion to (6) and (7). These annualized pre-window and window returns are subsequently analyzed in the difference-in-difference regressions.

1.4 Matching Process

We have a large number of investors in the Euroclear data set from which to obtain a relatively small control group for the divorced investors. After the filtering processes described in the previous subsection, we are left with 1,480 divorcees over the 14 years from years 1998 to 2011, averaging 106 per year and numbers ranging between 86 in 1998 to 122 in 2011. For clarity, we will index investors from the divorce sample by $i \in I$.

In each year, there are an average of 130,366 potential matches from the filtered sample of non-divorced investors. This value ranges between 105,896 in the year 2000 to 158,056 in 2002, so in any particular year we have at least 1,000 eligible matches from the filtered data set per divorced investor. We will index the population of eligible matched in a particular year by $k \in K$.

An investor's age is positively correlated with their portfolio value (see Table 3, Panel C, for example), but portfolio value exhibits a larger variance than age. Simple matching procedures, such as a nearest-neighbor approach, will tend towards selecting matching candidates based primarily on portfolio value (e.g. Barber and Odean, 2002). We therefore implement as the matching criterion the Mahalanobis Distance (MD), on a year-by-year basis (e.g. Bloom et al., 2013).

The matching procedure works as follows. For the filtered population of non-divorced investors who are eligible to be matched with divorced investors at the end of a particular pre-divorce window, we construct the vector of matching attributes

$$\tilde{v}_k = (Age_k, PortfolioSize_k, TurnoverRate_k, PreWindowReturn_k, Gender_k)'$$

and a corresponding vector of attributes from the divorced sample as

$$\tilde{x}_i = (Age_i, PortfolioSize_i, TurnoverRate_i, PreWindowReturn_i, Gender_i)'$$

Across all the eligible matching sample, we construct the mean vector, $\bar{v}_k$, and covariance matrix Σ.

$$MD_{i,k} = \sqrt{(\tilde{x}_i - \bar{v}_k)' \Sigma^{-1} (\tilde{x}_i - \bar{v}_k)} \tag{9}$$

Individual k from the control sample with minimum value $MD_{i,k}$ is then selected as the control investor for divorced investor i.

1.5 Analysis of trade around divorce

We now present an analysis of trading patterns around divorce. As the divorce may necessitate the further liquidation of stocks by individuals for non-informational reasons (for example, to purchase new furniture), we anticipate that divorced investors should sell shares with a greater frequency than the control sample following the transfer of shares.

We examine the trades of both the divorce sample and control group around the divorce transaction, in order to further analyze the source of returns. Transactions are broken down into market buys and sells (as opposed to shares relinquished or obtained through the type 9 transaction) by each group in separate periods around the divorce transaction.

For each divorced individual, we examine the number and value of transactions in the periods directly before and after the divorce. Specifically, we analyze four periods relative to the month of the type 9 transaction. Period 1 is $(m-36, m-13)$ months (specifically relative to the divorce transaction, rather than in terms of years prior to the divorce as was the case for the investor matching.) Periods 2, 3, and 4 are in the two-year divorce window, in the months just prior to the divorce $(m-12, m-2)$, around the divorce settlement $(m-1, m+1)$, and post-settlement (+2, +12), respectively. If the divorce transaction induces additional sales of shares, we should expect to find an increase in the number of sales occurring in period 4, relative to period 2 for the sample of divorced individuals. We track the mean and median value of investors' portfolios across these four periods.

Further, we compare the market buy and sell transactions of those giving up shares (type 9 sellers) to those receiving shares (type 9 buyers). A large positive shock (that is, a windfall gain) to an investor's portfolio size may lead to a larger degree of selling than a large negative shock, especially if those relinquishing shares aim to rebalance their portfolios.

1.6 Analysis of Shares Transferred in Divorce Transaction

The two parties and their lawyers typically negotiate the transfer of shares in the divorce transaction. Thus, there is some degree of discretion between the divorcees as to which shares are exactly transferred, as the share portfolio typically forms only part of the total assets of the couple. We investigate the proportion of the portfolio at the end of period 2 (two months prior to settlement) that is transferred in the type 9 transaction, and whether investors with a larger proportional change in the value of their portfolio perform worse than those with a small change in the value of their portfolios.

1.7 Descriptive Statistics

1.7.1 Distribution of the divorce settlement transactions

The column chart in Figure 1 shows the distribution of divorce settlements over the sample period. The number of divorce settlements is evenly distributed over the entire period, and that the frequency of divorces that result in share settlements are around 10 to 15 per month. These statistics contrast to a ratio of 50% divorces to around 2,383 new marriages per month (Statistics Finland). Only a fraction of divorces lead to a redistribution of shares due to that not all married couples hold shares. Overall, the number of new marriages, divorces and divorce settlements remain very stable during the sample period. This is in contrast to the OMX Helsinki capital weighted share index. The line graph in Figure 1 shows that the sample period contains several cycles of bull and bear markets.

To gain more insight into the significance and distribution of shares in divorce settlements, Panel A of Table 1 presents descriptive statistics regarding the shares transferred in the settlement transaction. Due to the filtering process requiring minimum portfolio sizes in the pre-divorce period, we retain almost twice as many givers (954) as receivers (526). An average of 3.47 stocks are transferred out by givers, with a mean (median) transfer value of €18,215 (€2,970). Receivers, when present in the sample, gain an additional 3.62 stocks on average, with a mean (median) value that is slightly larger at €26,649 (€3,600).

Panel A, Table 1, shows that divorced receivers of shares receive an average (median) value transfer of 30.3% (45.7%) of their pre-divorce portfolio. Divorced givers of shares hold larger portfolios before the divorce, and relinquish a mean (median) of 11.7% (24.9%) of their pre-divorce portfolio value in the settlement. While the aggregated wealth of a divorced couple is typically divided in a divorce settlement, other wealth considerations such as the family home and

real estate investments are also included in the settlement. The smaller proportion of shares ceded by one party in the settlements indicates that the receivers of shares may retain other investments not held in shares.

Panel B of Table 1 shows the evolution of the average portfolio size of givers and receivers in the divorce period. Prior to the two-year period surrounding divorce, givers hold average (median) portfolios of €164,930 (€11,514), while receivers hold an average (median) portfolio of €97,133 (€7,569). The average portfolio decreases in value prior to the settlement for both givers and receivers, and shows a marked drop in the settlement period, demonstrating the effect of not only the share transfer, but also portfolio rebalancing at the same time. For givers, average portfolio size falls by 26.3%, from €156,115 to €115,071 over the settlement period, while receivers' portfolios decrease by 7.6%, from €87,834 to €81,180. Post settlement the mean (median) portfolio value is €137,484 (€9,310) for givers compared with €87,623 (€8,450) for receivers. The final column (Diff (4) – (2) %) reports the percentage change in portfolio value from period 2 to period 4. For receivers of shares, there is a slight decrease (increase) in average (median) portfolio value during the divorce window (-0.2% (mean); 7.3% (median)). However, the average receiver's portfolio size at the end of period 4 is €87,623 compared to the pre-divorce window value of €97,133. Givers' portfolios decline by 11.9% (-21.9% median) from pre-settlement values, and 16.6% from pre-divorce window values. Overall, these findings demonstrate the deterioration in wealth for both parties in the divorce in the two-year window surrounding settlement.

1.7.2 Treatment, Control and Accuracy of the Matching Procedure

Figure 2 provides a flow chart of our sample construction. This flowchart represents graphically the way in which we combine observations from the complete Euroclear transaction records into a matched dataset of divorced and control investors, and outlines the selected event windows and periods in our analysis. This flowchart depicts the methodology in the following sections.

Table 2 describes the five key variables used as matching criteria in the selection of the control sample, Age, Portfolio size, Turnover rate, Return and Gender at the start of the Divorce window period one year prior to the day of the divorce settlement. Panel A reports descriptive statistics for the sample of divorced investors, Panel B for the sample of matched control investors and Panel C for the remaining universe of household investors in the market (not including the divorced or matched control sample investors).

Comparing Panels A, B and C of Table 2, we observe that the matching process creates two near-identical samples across matching variables. These samples are distinctly different from the remaining excluded (unmatched) Finnish shareholders. The sample of divorced investors and their controls have larger portfolios, are older, their turnover rate is higher, and their average portfolio returns are lower compared to the mean and median investor in the remaining sample of retail investors.

Table 3 describes the five matching criteria variables by three important categorizations of the sample of divorced investors and their controls. Table 3, Panel A reports descriptive statistics for the sample of divorced investors by givers and receivers. As noted in the previous subsection, due to the imposition of transaction filters, there are a greater number of investors in the 'giver' sample than the 'receiver' sample. Givers are a median of three years older than receivers are, and hold much larger average portfolios, although medians are similar. Table 3, Panel B reports descriptive statistics by investor age; investors are separated into categories of 60 years and younger, or older than 60, at the beginning of the divorce window. The younger group of investors perform slightly better in the pre-divorce window, while holding smaller average portfolios and exhibiting higher portfolio turnover, consistent with Barber and Odean (2001).

Table 3, Panel C reports the descriptive statistics by quintiles of portfolio size at the end of the pre-divorce window, with Q1 being the smallest quintile of investor portfolios, and Q5 being the largest. Pre-window returns increase monotonically with portfolio size, rising from 8% in the smallest quintile to over 35% in the largest quintile. Turnover is negatively related to portfolio size, as expected, while portfolio size quintiles each contain a similar proportion of female investors.

1.8 Hypotheses

We use the divorce sample and its matched counterpart to test the following central hypotheses:

H1: Owing to distraction and unexpected liquidity needs, divorced investors underperform relative to their peers.

H2: Divorced investors that trade more than others around their divorce are less distracted than other divorced investors, and hence exhibit superior trading performance.

H3: Those divorced investors that are heavy sellers are more subject to liquidity needs and therefore underperform more than others.

2. Main Results

2.1 The Impact of Divorce on Trading Performance Measured as Annual Portfolio Return

We examine the portfolio performance of investors who have experienced divorce, relative to a control sample of non-divorced investors. Each individual's trading performance in a 24 month period commencing 36 months prior to the divorce transaction, the pre-divorce window, is compared with their trading during a period of 12 months either side of the divorce settlement date, the divorce window. First, we compare investors' annualized portfolio returns (both before and after our brokerage adjustments) in the pre-divorce window to their own returns in the divorce window. Second, a DID regression model is used to examine divorced investors portfolio performance in the two windows, relative to the control sample.

2.1.1 Difference in Performance between Divorced and Control Sample Investors

Table 4 reports the sample mean, median and standard deviation of gross returns (Panel A), net returns (Panel B), and portfolio volatility (Panel C) of both the divorce and control samples, as well as their difference, in the pre-divorce window (denoted as PW) and the window (W). In Table 4, Panel A, we observe that the divorce and control samples exhibit very similar gross portfolio returns in the pre-window (a mean of 22.1% annualized for the divorced sample, compared with 22.0% for the control sample). Whereas the control sample exhibits an increase of mean (median) returns of 10.0% p.a. (4.6% p.a.) in the divorce window (Table 4, Panel A, Column 2), the divorced sample (Table 4, Panel A, Column 1) experiences lower mean (median) portfolio returns of 6.0% (4.9%) during the divorce window. This difference in means (medians) of 16% p.a. (9.5% p.a.) is reported in Table 4, Panel A, Column 3. Thus, divorced investors not only experience underperformance during the period surrounding the divorce, they also suffer on a relative basis, as the control group of investors experiences increased average portfolio performance over the same two-year window.

Next, in terms of net returns, both divorced investors and control investors exhibit a slightly reduced return in the pre-window, comparing Panels A and B of Table 4. Divorced investors' average returns decrease by 1.94% p.a. in the pre-window (from 22.10% gross to 20.16% net, annualized) after incorporating brokerage fees, while the control group experiences a similar decline in returns of 3.53% (from 22.0% gross, to 18.47% net, annualized). Thus, while they earn similar returns in the pre-window period, and exhibit similar portfolio turnover rates, the control group makes slightly more, smaller-sized trades in this period (incurring higher brokerage fees).

Over the divorce window, even though the divorced group trades less than the control group – their brokerage costs amount to 5.24% p.a. compared to 6.89% p.a. for the control sample – the difference in commissions paid does not substantially reduce the deficit in returns earned by the divorced group relative to the control group. The 16% mean gross return differential is barely attenuated by the difference in brokerage fees paid, to 15.94% p.a. in average net returns. In part, this reflects the higher brokerage fees paid by the divorce sample during the divorce window, compared with the pre-window. However, brokerage fees do not reasonably explain the return differences between the two groups. For the sake of simplicity, from this point onwards, we will report only the net returns.

2.1.2 DID regression of Portfolio Performance

To assess the significance of the underperformance of the divorced investors in comparison to the control sample, we estimate a conditional difference-in-difference (DID) regression model. The model measures the effect of divorce on the performance of the group of divorced investors, compared to the control group of investors. This approach allows for a variance – covariance matrix that differs across the treatment and control samples.[8] We estimate the (DID) regression as

$$y_{i,j,t} = b_0 + b_1 Divorce\ Sample\ Indicator_t + b_2 Divorce\ Window\ Indicator_j + b_3 Sample_j \times Window_t \times + d_i + e_{i,j,t} \quad (10)$$

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 of 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 divorce sample and 0 if the investor is in the control sample. $Window_t \times Sample_j$ interacts the two previous indicator variables to indicate the treatment sample and period of interest. The variable d_i denotes fixed year effects, and the standard errors used to estimate coefficient significance are clustered at the investor level.

The estimated coefficient for the interaction variable of interest $Window_t \times Sample_j$ is -0.159 (p-value < 0.001), as seen in Table 5, Column 1. This value is of similar magnitude to that found from simple differences in mean from Table 3, Panel B, and confirms that divorced investors are

[8] See Bertrand et al. (2004) for a detailed discussion of the reliability of difference-in-difference estimates.

significantly[9] (statistically and economically) impacted by the divorce, to the tune of 15.9% per annum underperformance relative to the control group, which supports Hypothesis H1.

2.2 The Impact of Divorce on Portfolio Volatility Measured as Annual Standard Deviation

To assess a possible divergence in risk preferences between the divorced investors in comparison to the control sample, we next measure the impact of divorce on portfolio volatility. We compare the annualized standard deviation in (gross) portfolio returns during the pre-divorce window to the standard deviation in returns during the divorce window across the two samples.

2.2.1 Difference in Portfolio Volatility Divorced to Control Sample

The main results are presented in Table 4, Panel C. As seen in Column 1, divorced investors' portfolios exhibit slightly lower volatility in the divorce window, compared with the pre-divorce window, with standard deviation dropping by 1.8% p.a. (1.3% p.a.) surrounding the divorce. In contrast, Column 2 shows that the portfolio volatility of the control sample by 0.5% p.a. (0.1% p.a.) in the divorce window compared with the pre-divorce window. The mean (median) difference between the divorced sample portfolio volatility and the control sample portfolio volatility is therefore –2.3% (–1.4%) p.a., the relatively small difference reflecting the stationary nature of the volatility metric in comparison to portfolio returns. It would therefore appear unlikely that a lower level of risk explains the portfolio underperformance of divorced investors relative to the control sample.

2.2.2 DID Regression of Portfolio Volatility

The significance of the impact of divorce on portfolio return volatility is estimated using Equation (8) where $y_{i,j,t}$ is altered to be the annualized standard deviation of returns in monthly portfolio j, and other variables the same as previously discussed in subsection 3.1.2. The estimated coefficient for the interaction variable of interest $Sample_j \times Window_t$ is –0.023 (p-value < 0.001), as seen in Table 5, Panel B, Column 1. This coefficient indicates decreased portfolio volatility (by 2.3% p.a.) in the divorce window for divorced individuals compared to the peer group of investors. This may reflect more conservative investment choices for divorced investors.

[9] The average portfolio value of divorced investors one year before the start of the divorce window is €213,765, and there are 1,480 such portfolios (see Tables 1 and 2). A 15.9% per annum decrease in return on these aggregated portfolios is an economically significant effect in excess of €50 million in forfeited returns.

2.3 Portfolio Return for Subsamples of Investors with Different Characteristics

To assess the impact of differences in demographic characteristics between divorced investors, we compare the pre-window to the divorce window net portfolio returns and portfolio volatility of sub-categories of the divorce sample. The subsamples of the divorce group are described in Table 3. Specifically, we split the divorce sample and their peers based on whether they give up or receive shares in the settlement (denoted as $Giver_j$, which takes the value of 1 if the investor gives up shares in the divorce settlement, and 0 if they receive shares in the settlement), or are aged 60 or over at the beginning of the divorce window (indicator variable $Older_j$). We also divide the divorce sample into quintiles of portfolio size at the beginning of the divorce window (indicator variables Small Portfolios, Small-Medium Portfolios, Medium-Large Portfolios, and Large Portfolios for size quintiles 1, 2, 4, and 5, respectively).

The results, in Table 5, Panel A, Column 2, demonstrate that coefficient of interest, for the interaction variable $Giver_j \times Sample_j \times Window_t$, is 0.0429 (p-value 0.06). Thus, givers earn 4.29% p.a. higher net returns than receivers do during the divorce window, which partially offsets the low returns earned by the divorce sample as a whole. Table 5, Panel B, Column 2 shows that the portfolio volatility declines by 2.65% p.a. more for parties giving up shares than those receiving shares in the divorce settlement, which is in part a liquidation effect, although may arise if riskier shares are relinquished in the transfer.

For portfolio returns the estimated coefficient for the interaction variable $Older_j \times Sample_j \times Window_t$ is –0.036 (p-value < 0.001), from Table 5, Panel A, Column 3. Relative to younger divorcees, older investors hence experience an even greater decline in portfolio value, likely due to the increased liquidation needs combined with a decreased ability to offset these with future earnings from employment. Older investors, similarly, exhibit a reduced level of portfolio volatility, with a DID regression coefficient from Table 5, Panel B, Column 3, of 2.37% p.a.

Portfolio size, as a likely indication of the liquidity constraints of the divorced investor, is a key driver of the divorce window returns from the DID regression. The results for returns and volatility are presented in Table 5, Column 4, Panels A and B, respectively. Relative returns in the divorce window for the divorcees are monotonically increasing in portfolio size; those in the smallest quintile of portfolio size lose an additional –12.9% p.a. (p-value 0.009), as indicated by the coefficient $Small\ Portfolios \times Sample_j \times Window_t$. In contrast, the quintile of investors with the largest portfolios earn 10.2% p.a. (p-value 0.042) higher returns than the reference pool of

divorcees (those in portfolio size quintile 3). Thus, their losses are reduced by 66% (-0.102 divided by the $Sample_j \times Window_t$ coefficient of -0.154) compared to the average divorced investor, although not ameliorated completely relative to the control group. This presents strong evidence that liquidation effects are partially, but not completely responsible for the underperformance of divorced investors. Portfolio volatility, like the returns, demonstrates coefficients increasing in the quintiles of portfolio size, although only the coefficients for the smallest and largest quintiles are significant.

Finally, we include all three types of divorce sub-sample indicator variable in the regression model in Table 5, Panel A and B, Column 5. The previously reported coefficients remain relatively consistent in both sign and magnitude. The volatility results show the greatest differences in volatility between younger and older investors (as opposed to givers vs. receivers). We suggest that this is due to older individuals' greater difficulties of adjustment, and fewer opportunities to re-establish themselves, consistent with the literature on divorce (e.g. Booth and Amato, 1991).

2.4 Explaining the return differentials

One important question remains: what drives the deteriorating performance for divorced investors compared to the control sample? To gain further insights into this problem, we investigate the trading behavior of the divorced and control sample investors, prior to, during, and following the divorce settlement. We thus decompose the divorce window into three separate periods: the pre-settlement period -12 to -2 months before settlement, the immediate settlement period -1 to +1 month surrounding settlement and finally a post settlement period +2 to +12 months after the divorce settlement. The difference from the previous analysis is that we separate out the immediate period of two months around the divorce settlement to isolate the effect of divorce transactions and liquidation.

2.4.1 Determinants of the impact of divorce

Table 6 presents statistics of the trading behavior of divorced investors over the periods surrounding the divorce settlement. Panel A of Table 6 reports the average number, and average value, of buys and sells made by the divorce sample and control sample, both prior to the divorce (Column 1) and over the periods immediately surrounding the settlement date (Columns 2, 3, and 4). Purchases and Sales made in the settlement period do not include the transfer in the divorce settlement itself; we label the transactions 'market' buys and sells as a result.

The control sample investors are more active traders in terms of the number of buys and sells made, and the total value of transactions. For instance, divorced investors make 6.44 fewer buys and 6.37 fewer sells, on average, in the pre-divorce window than do the control group. This pattern is consistent throughout the four periods analyzed in Table 6, Panel A. Tests of the significance of the change in trading activity are presented in the final two columns. Column 5 shows the proportional change in trading activity surrounding the settlement date, from period 2 to 4 (the change in the number and value of buys and sells in the period 12 to 2 months prior to the settlement transaction, and 2 to 12 months afterwards). Column 6 reports the percentage change in the number and value of buys and sells from the pre-divorce window (period 1) to the divorce window (the cumulative number and value of buys and sells in periods 2, 3, and 4).

Examining the behavior of divorcees around the settlement period, it is clear that, unlike the control group, they substantially increase their selling behavior – sells increase by a proportion of 57.88% over the divorce window (periods 2, 3, and 4) compared with the control group, whose sales increase by only 0.79% over the same period. The increased number of sells from the divorced group is partially offset by an increased number of buys, which rises 19.05% over the divorce window. Interestingly, the increased selling activity does not commence immediately following the divorce; there is only a 3.2% increase in the number of sales made by divorced investors from the pre-settlement to post-settlement periods. Divorcees therefore commence their increased selling in anticipation of the settlement transaction – liquidity needs likely arise due to separation prior to the final settlement.

Table 6, Panel B reports the average size of buy and sell transactions of the divorced sample compared to the control sample over the four periods. Divorced investors make larger trades (€3,899 for buys, €4,125 for sells) than the control group in the pre-divorce window. Following the settlement transaction, there is marked decrease in the value of transactions made by divorced investors; their average buy trade drops by 37.88% in value, while their average sell trade declines by 29.50%. While lower transaction sizes are also observed in the control sample, their magnitude is far lower (11.66% for buys and 4.45% for sells, respectively).

Panel C of Table 6 reports ratios of buys to sells, in terms of both number of trades and value of trades. For divorced investors, the ratio of buys to sells decrease significantly during the window, falling from 1.319 buys per sell in the pre-divorce period, to 1.065 buys per sell post-settlement. These figures are even more pronounced when examining the values of buys to sells.

Divorced investors, in the pre-window period, buy €1.049 worth of stocks for every euro worth of stock they sell, but in the post settlement period, this shrinks dramatically to buying €0.777 in stocks per euro value sold. In contrast, the buy-sell ratio for the control group is relatively stable throughout the four period, with a slight increase in the number of buys and value of buys from the pre-divorce period to the post-settlement period.

Overall, divorced investors increase their selling propensity more than they increase their buying propensity in the divorce window. There is an increase in their average value of sales in the divorce window, but a decrease in the value of purchases. Compared to the control sample, they reduce the size of their purchase transactions more than they reduce the size of their sales, particularly after the settlement transaction, while exhibiting a sharp decrease in their buy-sell ratios. Thus, we have clear evidence of portfolio liquidation among the divorce sample that does not arise in the control sample. This result also provides an explanation for the underperformance and lower volatility of portfolios of divorced investors - they distance themselves from making trades due to the impact of the divorce, and forfeit return (and volatility in returns) in their portfolio.

2.4.2 DID Regression Explaining Performance by Trading Activity, Size and Liquidation.

To further examine if the changes in performance are statistically and economically driven by the observed altered trading behavior in the previous section, and to measure the proportion of underperformance caused by liquidation vs. the proportion of underperformance caused by decreased activity, we estimate conditional difference-in-difference models based on trading activity during the divorce window and liquidity demands.

We decompose the divorce sample by trading activity in the divorce window. The idea is as follows. Investors who refrain from trade during the divorce window may be considered to be distracted, for reasons of stress or otherwise. Alternatively, those who resume active trading (rather than simply portfolio rebalancing for liquidity needs) may be considered less distracted by the divorce. We construct the indicator variable $Inactive\ Trader\ Indicator$, which takes the value of 1 if an investor does not buy or sell at all during the divorce window, other than the settlement transfer (n = 410; 27.7% of the divorce sample). The other side of the trading activity is covered by $Buyer - Seller\ Indicator$, which takes the value of 1 if the investor both buys *and* sells in the divorce window (n = 561; 37.9% of the sample). The remaining 34.4 of investors are those

who either buy or sell only during the divorce window, who we consider to be portfolio rebalancers.

A third decomposition of the sample is carried out by examining those investors with strong liquidation demand in the divorce window. We define the indicator variable $Selling\ Proportion\ >\ 0.5\ Indicator$ as taking the value of 1 if an investors net sales value during the divorce window (Value of Sells – Value of Buys) is greater than 50% of their end of pre-window portfolio size (n = 96; 6.5% of the divorce sample). For example an investor with portfolio size of €20,000 at the end of the pre-divorce window (1 year prior to the year of divorce) who makes €3,000 of purchases and €15,000 worth of sales during the divorce window would be classified as a liquidity motivated seller.

We estimate difference-in-difference regression models including portfolio size controls and interaction specifications, for investors that both buy and sell in the divorce window, inactive investors, and investors with liquidity needs. This way we are able to compare the performance of those investors that actively trade post-divorce from those that do not, relative to their peers. We estimate the regression as:

$$\begin{aligned} y_{\,i,j,t} = {} & b_0 + b_1 Div.Sample\ Indicator_j + b_2 Div.Window\ Indicator_t + b_3 Sample_j \times \\ & Window_t + b_4 Inactive\ Trader\ Indicator_j \times Sample_j \times Window_t + b_5 Buyer - \\ & Seller\ Indicator_j \times Sample_j \times Window_t + d_i + e_{i,j,t} \end{aligned} \tag{11}$$

where $y_{\,i,j,t}$ is the annualized net portfolio return for investor j. Additional specifications are employed with controls for portfolio size by quintiles. Here, we use simply $Small\ Portfolio\ Indicator$ and $Large\ Portfolio\ Indicator$, separately, and as interaction terms with $Buyer - Seller\ Indicator$ to illustrate the marginal effects of trading activity for the extreme quintiles. The specification including both controls for trading activity, portfolio size, and liquidity needs is estimated as in (12) below:

$$\begin{aligned} y_{\,i,j,t} = {} & b_0 + b_1 Div.Sample\ Indicator_j + b_2 Div.Window\ Indicator_t + b_3 Sample_j \times Window_t \\ & + b_4 Inactive\ Trader\ Indicator_j \times Sample_j \times Window_t + b_5 Buyer \\ & - Seller\ Indicator_j \times Sample_j \times Window_t + b_6 Small\ Portfolios_j \times Sample_j \\ & \times Window_t + b_7 Large\ Portfolios_j \times Sample_j \times Window_t \\ & + b_8 Selling\ Proportion\ >\ 0.5\ Indicator\ \times\ Sample\ \times\ Window\ d_i + e_{i,j,t} \end{aligned} \tag{12}$$

Table 7, Column 1 reports the estimated coefficients for the difference-in-difference regression (11). The coefficients of main interest are those of $Inactive\ Trader\ Indicator_j \times Sample_j \times Window_t$ and $Buyer - Seller\ Indicator_j \times Sample_j \times Window_t$ which represent the incremental difference of the

post-divorce trading inactivity or activity for buyers and sellers, relative to those who only buy or sell.

The coefficient of $Sample_j \times Window_t$ is –0.1676, which indicates that non-buying and selling, but active, divorcees earn substantially lower returns than their peers (–16.76% p.a.), and below the 16.0% p.a. underperformance from Table 5, Column 1. The coefficient of $Inactive\ Trader\ Indicator_j \times Sample_j \times Window_t$, –0.0748, indicates that inactive divorcees lose a further 7.48% p.a. over this reference group of divorcees, a total underperformance relative to the control group of 16.76+7.48 = 24.24%. In contrast, divorcees who actively buy and sell during the divorce window earn returns 7.62% p.a. higher than the reference group, as seen by the coefficient of $Buyer-Seller\ Indicator_j \times Sample_j \times Window_t$. There is therefore partial attenuation of the divorce-driven underperformance for those that trade actively following the divorce, from 16.76% to (16.76% – 7.62%) = 9.14% p.a. relative to the control sample. This figure is an estimate of the `liquidation' component of divorce driven underperformance, while the additional losses incurred by the inactive group may be considered the 'distraction' component of underperformance.

The results presented in Table 7, Columns 2 and 3 show the relative performance of investors who buy and sell in the divorce window, with size controls and size controls with interactions between size and active trading, respectively. In both cases, the coefficient of $Buyer-Seller\ Indicator_j \times Sample_j \times Window_t$ is positive and significant, with magnitudes of 5.34% and 6.92% for models 2 and 3, respectively, which supports Hypothesis H2. Interestingly, $Inactive\ Trader\ Indicator_j \times Sample_j \times Window_t$ is no longer significant; size effects appear to capture part of the distraction effect (those refraining from trade are likely to hold small portfolios). Examining model 2, small portfolios underperform those in the middle three quintiles by 11.20% (liquidity costs are exacerbated for these investors) while large portfolios outperform the other, non-small, divorcees by 8.11%. Thus, a divorced investor with a large portfolio, who actively trades during the divorce window, is able to attenuate most of the losses suffered by the average divorcee in our sample (in model 2, 16.38% - 8.11% - 5.34% = 2.93%). Interaction effects are between portfolio size indicator variables are not significant, indicating that active trading is somewhat independent of portfolio size. Thus, it appears that it not the liquidation or rebalancing alone that drives the underperformance of divorced investors relative to their peers. Active participation in trading is one way in which divorcees can reduce the 'hidden' divorce costs.

Column 4 of Table 7 augments the trading activity specification in (9) with the $Selling\ Proportion > 0.5\ Indicator$ variable, reflecting liquidity motivated selling (those investors that sell more than half their pre-window portfolio value). In this specification, the coefficient is negative and significant, the value of –14.19% indicates that those who liquidate more than 50% of their portfolios during the divorce window lose nearly twice as much as the average divorcee (in model 4, 15.76%), supporting Hypothesis H3. Liquidity motivated sellers only comprise 6.5% of the sample, however, and such demands do not explain the underperformance of the divorced sample as a whole. In column 5 of Table 7, we report the specification in (12), with trading activity, liquidity, and size controls. In comparison to model 4, the size controls reduce the significance of the $Selling\ Proportion > 0.5\ Indicator$ variable. This is because those investors who are liquidity-motivated sellers by our definition (selling out more than 50% of their pre-window portfolio value) are also likely small portfolio holders. However, both portfolio size and trading activity remain significant as determinants of the differential performance of divorced investors.

Overall, the results of the difference in difference regressions in Table 7 support the dual hypotheses that liquidity needs as well as distraction are responsible for the majority of the underperformance of divorced investors. Investors with large portfolios who trade actively surrounding the divorce (both buying and selling) only underperform the average investor in the control sample by around 3% p.a. during the divorce window. The flipside of this, however, is that the additional liquidity costs exacerbate the losses of investors with smaller portfolios, and inactivity during the divorce window, due to distraction or otherwise, is negatively associated with investor performance.

3. Conclusions

The impact of major life events on individual investors' trading activity and performance is an under-explored issue. We examine the effect of a disruptive and material life event, divorce, on the portfolio performance and decisions of individual investors in Finland. We show that divorced individuals underperform a carefully selected control group of investors with similar attributes; age, gender, portfolio size, turnover rate, and return prior to the commencement of the divorce window. The magnitude of the underperformance of the divorce group is large (16.0% p.a.), and economically significant: divorced investors hold portfolios that are on average €66,000 lower than their peers after 1 year after divorce.

Divorce represents an unexpected shock to an investor's lifetime earnings, as a lack of income diversification and increase in future liabilities reflect an increase in background risk (Love, 2010). Investors who experience divorce need to fund unexpected liabilities, such as legal costs and housing. Supporting this notion, compared to the control sample, divorcees sell significantly more than they buy (both in terms of their number of trades and trade value). Likely due to liquidity constraints, investors with smaller portfolios suffer more from the divorce; those in the lowest portfolio size quintile earn 11.2% lower returns than the median portfolio size divorcee.

We also find that divorced investors who actively buy and sell in the divorce window are able to ameliorate approximately 45% of the losses suffered by their other divorced counterparts. Thus, trading actively during the period surrounding divorce is a significant determinant of portfolio performance. This effect remains after controlling for portfolio size, which suggests that liquidity considerations alone do not drive the underperformance of divorcees. Instead, the evidence supports the idea that active traders around divorce are less distracted by the event, which leads to their superior performance. Thus, both distraction and liquidity needs affect performance of divorced individual investors.

While our results also demonstrate some differences between divorcees among based on whether they give or receive shares (givers earn 4.3% p.a. more than receivers), these results are not as pronounced as those based on portfolio size. These results are qualitatively similar to those of Andersen and Nielsen (2011), who show that individuals who inherit shares do not become active traders and are instead more likely to liquidate their position. Younger divorcees (aged sixty or below) perform better than older investors in our sample, by an average of 3.6% per annum. A possible explanation stems from the ability of younger investors to shift background risk in terms of employment, adjusting their incomes in response to changed family circumstances.

Future research could examine (in finer detail) demographic characteristics of divorced investors. For instance, an examination of the impact of children or investors with alternative employment, such as entrepreneurs, may shed light on the role of background risk on investor trading behavior. Further studies could also assess the impact of increased legal costs, remarriage and holdings of assets in other investment classes (housing, bonds, art and other alternative assets).

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Figure 1 Market Development and Distribution of Divorce Settlement during the Sample Period

The left-hand side y-axis provides the scale for the OMX Helsinki All Share Index Value and the right-hand side y-axis shows the number of divorce settlements per month. The x-axis depicts the observation month in the format YYYYMMDD**.**

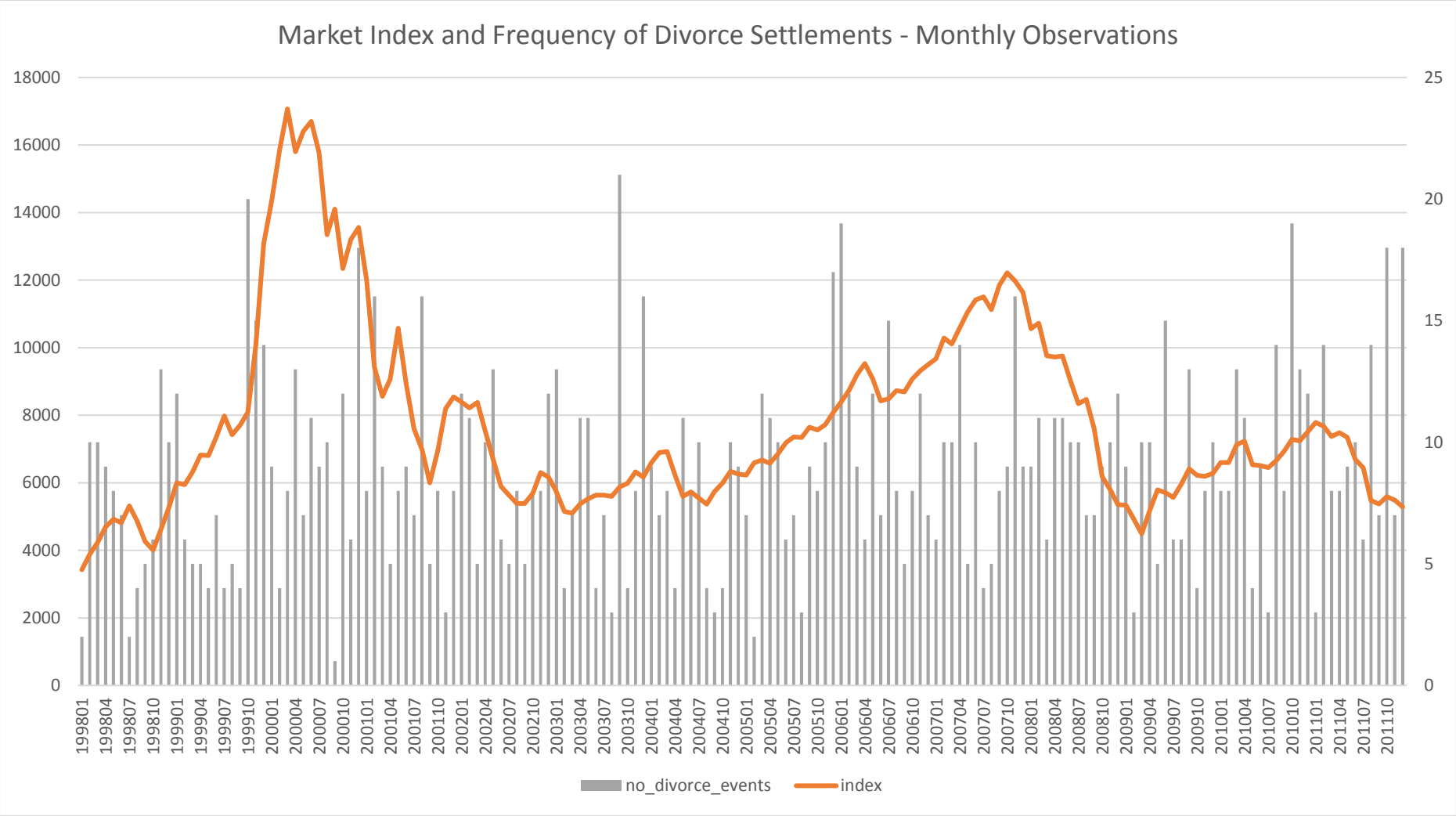

Figure 2 Flow Chart for the Construction of our Data Sample

This flowchart describes how we combine observations from the complete Euroclear transaction records into a matched dataset of divorced and control investors. The chart also describes the selected comparison event windows.

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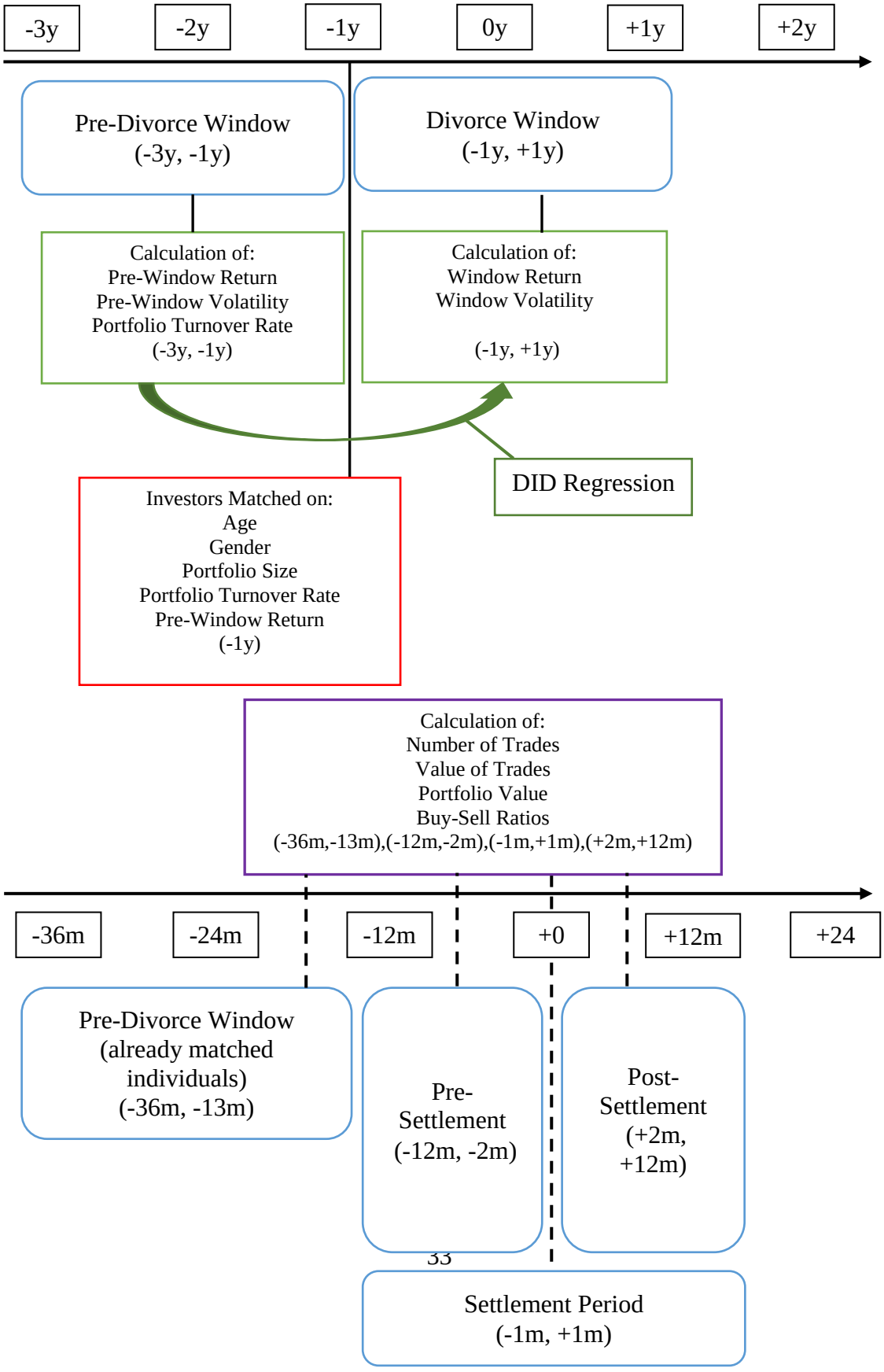

Table 1: Descriptive Statistics for the Settlement Transactions by Givers and Receiver

Panel A shows separately for givers and receivers of shares, the number of investors in each category, the mean and median number of shares transferred in each divorce settlement, the mean and median value of shares transferred. Panel B reports statistics end of period portfolio values for divorced investors categorized into givers and receivers in the divorce settlement at four periods surrounding the divorce. Period 1 is the 'Pre-divorce window' occurring 36 months to 13 months prior to the divorce. Period 2 is the 'Pre-settlement' window, taking place in the period 12 months to two months prior to divorce. Period 3 is the 'Settlement' period, occurring in the period one month prior to divorce until one month following divorce. Period 4 is the 'Post-settlement' period, which takes place two months following the divorce transaction until 12 months following the divorce transaction. The last column reports the difference in portfolio value between the Post-settlement period compared to the Pre-settlement period. The significance of these differences are tested and reported as *, ** and *** for significance at 10%, 5% and 1% level respectively.

Panel A: Descriptive Statistics of Shares Transferred in Settlement

Giver / Receiver Status	Investors	Average Number of Stocks Transferred	Average Value of Shares Transferred (€)	Median Value of Shares Transferred (€)	Average Proportion of Pre-Divorce Portfolio Transferred	Median Proportion of Pre-Divorce Portfolio Transferred
Givers	954	3.47	18,215	2,970	11.70%	24.90%
Receivers	526	3.62	26,649	3,600	30.30%	45.70%

Panel B: Evolution of Divorced Investors' Portfolios Surrounding Divorce Period

		1. Pre-Divorce	2. Pre-Settlement	3. Settlement	4. Post-Settlement	5. Diff (4) - (2) %
		Month Relative to Divorce Settlement Transaction				
		(-36,-13)	(-12,-2)	(-1,+1)	(+2,+12)	
				Mean		
End of Period Portfolio Value	Givers	164,930	156,115	115,071	137,484	-11.9%***
	Receivers	97,133	87,834	81,180	87,623	-0.20%
				Median		
End of Period Portfolio Value	Givers	11,514	11,915	4,556	9,310	-21.9%***
	Receivers	7,569	7,877	5,599	8,450	7.3%*

Table 2 Data Characteristics

This table describes the five key variables used as matching criteria for the selection of the control sample, Age, Portfolio size, Turnover rate, Return and Gender at the start of the Divorce window period one year prior to the day of the divorce settlement. Panel A reports descriptive statistics for the sample of divorced investors, Panel B for the sample of matched control investors and Panel C for the remaining universe of household investors in the market (not including the Divorced and Matched Control sample investors).

Panel A: Divorce Sample

Variable	Mean	25th Pctl	Median	75th Pctl	Std Dev
Age	57.52	48	57	68	13.14
Portfolio Size	213,765	4,633	17,699	86,372	1,472,145
Turnover Rate	62.91%	11.02%	25.95%	63.76%	108.99%
Pre-Window Return	22.08%	3.95%	18.19%	33.98%	28.65%
% Female	35.88%				

Panel B: Matched Control Sample

Variable	Mean	25th Pctl	Median	75th Pctl	Std Dev
Age	57.43	48	57	68	13.06
Portfolio Size	210,267	4,518	16,297	75,003	1,620,442
Turnover Rate	61.76%	10.29%	24.28%	60.49%	109.58%
Pre-Window Return	21.97%	4.94%	18.30%	34.42%	27.88%
% Female	35.88%				

Panel C: Unmatched Investor Population

Variable	Mean	25th Pctl	Median	75th Pctl	Std Dev
Age	51.99	41	53	63	14.57
Portfolio Size	102,811	4,617	14,374	51,346	679,880
Turnover Rate	35.62%	5.81%	14.47%	34.00%	73.81%
Pre-Window Return	29.23%	10.16%	22.75%	39.81%	36.06%
% Female	31.91%				

Table 3 Divorce Sample Characteristics: Subcategories

This table describes the five key variables used as matching criteria for the selection of the control sample, Age, Portfolio size, Turnover rate, Pre-Window Return and Gender (% Female) at the start of the Divorce window period - one year prior to the day of the divorce settlement. Panel A reports descriptive statistics for the sample of divorced investors categorized into categorized into givers and receivers in the divorce settlement. Panel B reports descriptive statistics for the sample of divorced investors categorized into investors below or equal to the age 60 at the time start of the Divorce-window period and investors older than 60. Panel C reports descriptive statistics for investors sorted into quintiles based on portfolio size at the end of the Pre-divorce window (12 months prior to the year of divorce).

	Variable	Mean	25th Pctl	Median	75th Pctl	Std Dev
Panel A: Receivers and Givers of Shares in Divorce Sample						
Receiver	Age	55.10	46	55	66	13.53
n = 526	Portfolio Size	155,506	4,568	18,613	77,408	680,579
	Turnover Rate	65.18%	12.14%	30.86%	73.68%	101.87%
	Pre-Window Return	23.08%	5.09%	18.58%	35.61%	27.95%
	% Female	52.80%				
Giver	Age	58.86	50	58	70	12.74
n = 954	Portfolio Size	245,887	4,645	17,431	89,799	1,762,190
	Turnover Rate	61.66%	10.68%	23.53%	56.80%	112.76%
	Pre-Window Return	21.52%	3.83%	17.91%	33.76%	29.03%
	% Female	26.50%				
Panel B: Younger (Age ≤ 60) and Older (Age>60) Investors in Divorce Sample						
Younger (Age ≤ 60)	Age	48.44	43	50	55	8.29
n = 872	Portfolio Size	200,177	4,488	16,728	76,719	1,696,877
	Turnover Rate	67.76%	12.56%	29.82%	69.14%	114.11%
	Pre-Window Return	23.28%	1.85%	18.19%	38.32%	31.18%
	% Female	34.06%				
Older (Age > 60)	Age	70.55	66	70.5	76	5.83
n = 608	Portfolio Size	233,253	4,796	19,902	97,745	1,071,546
	Turnover Rate	55.95%	10.20%	20.84%	51.89%	100.88%
	Pre-Window Return	20.35%	6.78%	18.23%	31.09%	24.50%
	% Female	38.49%				

Panel C: Descriptive Statistics for Divorced Investors by Quintiles of Portfolio Size at end of Pre-Divorce Window

Q1 Small Portfolios	Age	56.63	47	57	68	13.39
n = 296	Portfolio Size	2,271	1,544	2,232	2,964	807
	Turnover Rate	102.91%	12.27%	43.56%	117.86%	156.35%
	Pre-Window Return	8.06%	-2.13%	6.45%	21.05%	29.25%
	% Female	34.12%				
Q2 Small-Medium Portfolios	Age	56.61	46	57	68	13.96
n = 296	Portfolio Size	6,344	4,633	6,077	7,982	1,860
	Turnover Rate	81.30%	12.39%	34.03%	96.78%	125.75%
	Pre-Window Return	16.87%	0.00%	12.62%	26.75%	27.60%
	% Female	41.89%				
Q3 Medium Portfolios	Age	57.43	50	57	66	12.19
n = 296	Portfolio Size	19,496	13,482	17,699	24,555	6,838
	Turnover Rate	64.97%	12.12%	29.97%	72.52%	100.18%
	Pre-Window Return	22.36%	5.12%	17.12%	34.44%	25.08%
	% Female	37.84%				
Q4 Medium-Large Portfolios	Age	57.45	48	56	69	13.27
n = 296	Portfolio Size	67,637	46,280	61,036	86,372	25,900
	Turnover Rate	36.22%	10.61%	20.73%	41.43%	52.35%
	Pre-Window Return	27.90%	11.94%	22.79%	38.79%	25.55%
	% Female	33.45%				
Q5 Large Portfolios	Age	59.50	51	59	69.5	12.72
n = 296	Portfolio Size	973,076	194,388	358,083	797,707	3,184,160
	Turnover Rate	29.15%	9.52%	16.92%	33.18%	52.11%
	Pre-Window Return	35.19%	17.80%	27.85%	45.18%	28.03%
	% Female	32.09%				

Table 4 Difference in Performance between Divorced and Control Sample Investors: Gross Returns, Net Returns and Volatility in the Pre-Window and Window Periods

This table reports the mean, median annualized gross returns, net returns, and standard deviation of returns for Control and Divorce samples during the Pre-window (-36 to -12 months before divorce settlement), and the Window period (12 months prior to 12 months after the divorce settlement). Panel A reports statistics for gross returns (annualized monthly returns before brokerage). Panel B reports statistics for net returns (annualized monthly returns after brokerage). Panel C reports statistics for the volatility in return (annualized standard deviation in monthly returns). The difference in mean and median return and volatility between the Window (W) and the Pre-window (PW), and between Divorce and Control samples are reported and tested for significance. ** and *** denote significance at the 5 and 1 % levels, respectively.

	1. Divorce Sample			2. Control Sample			3. Difference (Div. - Contr.)		
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	Mean	Median	Std. Dev
Panel A: Gross Returns									
Pre-Window(PW)	22.10%	17.70%	27.40%	22.00%	18.00%	26.60%	0.10%	-0.30%	0.80%
Window(W)	16.10%	12.80%	41.50%	32.00%	22.50%	39.20%	-15.9%***	-9.7%***	2.40%
Difference(W - PW)	-6.00%***	-4.90%***	14.20%	10.10%***	4.60%***	12.60%	-16.00%***	-9.50%***	1.60%
(p-value Difference)	(<0.001)	(<0.001)		(<0.001)	(<0.001)		(<0.001)	(<0.001)	
Panel B: Net Returns									
Pre-Window(PW)	20.16%	17.04%	28.70%	18.47%	16.18%	28.90%	1.69%***	0.86%**	-0.20%
Window(W)	10.86%***	13.40%***	46.70%	25.11%***	19.14%***	54.13%	-14.25%***	-5.75%***	-7.43%
Difference(W - PW)	-9.30%***	-3.64%***	18.00%	6.64%***	2.96%***	25.23%	-15.94%***	-6.61%***	-7.23%
(p-value Difference)	(<0.001)	(<0.001)		(<0.001)	(<0.001)		(<0.001)	(<0.001)	
Panel C: Volatility									
Pre-Window(PW)	16.20%	16.00%	11.60%	23.20%	23.20%	8.80%	-7.0%***	-7.2%***	2.80%
Window(W)	14.40%	14.60%	11.10%	23.60%	23.30%	9.10%	-9.3%***	-8.7%***	2.00%
Difference(W - PW)	-1.8%***	-1.3%***	-0.50%	0.50%	0.10%	0.30%	-2.3%***	-1.4%***	-0.80%
(p-value Difference)	(<0.001)	(<0.001)		(0.324)	(0.615)		(<0.001)	(<0.001)	

Table 5 Difference-in-Difference Regression for Return and Volatility

This table reports the coefficients and p-values for the difference-in-difference regression model of net portfolio returns (annualized monthly portfolio returns net of brokerage fees) in Panel A, and portfolio volatility (annualized standard deviation of portfolio return) in Panel B, against indicator variables. Divorce Sample indicator takes a value of 1 if the investor was in the sample of divorced individuals, and 0 if the individual was from the control sample. Divorce Window indicator takes the value of 1 if the for the period 12 months prior to 12 months after the divorce, and 0 for the pre-divorce window, occurring from three years prior to 1 year prior to the start of the divorce year. Sample × Window is the interaction variable which takes the value of 1 if both Divorce Sample Indicator and Divorce Window Indicator are 1. The interaction between Sample and Window hence estimates the difference of the divorced sample category investor performance and volatility in comparison to the matched control sample of not divorced investors. Using our matched sample approach, there are an equal number of investors in the divorce and control categories. We estimate the basic model including all divorcees (Model 1), adding indicator variables for receivers and givers in the share settlement (Model 2), for investors up to 60 years old vs. for older than 60 (Model 3) and four indicators for different size categories (Model 4), and finally a combination of all these characteristics in Model 5. Year fixed effects and investor-level clustered standard errors are used. *, ** and *** denote significance at 10, 5 and 1% levels respectively, with p-values reported beneath the coefficients in parentheses.

Panel A: Net Returns	1. Base Model	2. Giver Ind.	3. Older Ind.	4. Portfolio Size Ind.	5. All
Intercept	0.216***	0.216***	0.216***	0.209***	0.208***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Divorce Sample Indicator	0.017***	0.017***	0.017***	0.017***	0.0169***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Divorce Window Indicator	0.066***	0.039	0.082***	0.066***	0.054*
	(<0.001)	(0.122)	(<0.001)	(<0.001)	(<0.052)
Sample × Window	-0.159***	-0.159***	-0.159***	-0.154***	-0.156***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Giver × Sample × Window		0.0429*			0.047**
		(0.060)			(0.035)
Older × Sample × Window			-0.036**		-0.043**
			(0.048)		(0.016)
Small Portfolios × Sample × Window				-0.129***	-0.130***
				(<0.001)	(<0.001)
Small-Medium Portfolios × Sample × Window				-0.073*	-0.069*
				(0.056)	(0.070)
Medium-Large Portfolios × Sample × Window				0.074**	0.076**

				(0.032)	(0.025)
Large Portfolios × Sample × Window				0.102***	0.104***
				(0.005)	(0.004)
R^2	0.0456	0.0469	0.0465	0.0565	0.0590
Panel B: Volatility					
Intercept	0.249***	0.249***	0.249***	0.249***	0.249***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Divorce Sample Indicator	-0.0694***	-0.0694***	-0.0694***	-0.0694***	-0.0694***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Divorce Window Indicator	0.00449**	0.00449**	0.00449**	0.00449**	0.0294**
	-0.04	-0.04	-0.04	-0.04	-0.04
Sample × Window	-0.0231***	-0.0231***	-0.0231***	-0.0247***	-0.0249***
	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
Giver ×Sample × Window		-0.0265***			0.0246***
		(< 0.001)			(< 0.001)
Older × Sample × Window			-0.0237***		0.0221***
			(< 0.001)		(< 0.001)
Small Portfolio × Sample × Window				-0.0207**	-0.0203**
				-0.026	-0.024
Small Med Portfolio × Sample × Window				-0.00609	-0.00653
				-0.49	-0.439
Med Large Portfolio × Sample × Window				0.0092	0.0086
				-0.259	-0.274
Large Portfolio × Sample × Window				0.0254***	0.0271***
				-0.001	(< 0.001)
R^2	0.199	0.206	0.205	0.204	0.215

Number of Divorcees	1480	1480	1480	1480	1480
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes	Yes

Table 6 Investor Trading Analysis

This table reports statistics for trades of the divorce and the control group of investors surrounding the divorce. Period 1 is the 'Pre- window' 36 months to 13 months prior to the divorce. Period 2 is the 'Pre-settlement' window, 12 months to two months prior to divorce. Period 3 is the 'Settlement' period, one month prior to divorce until one month following divorce. Period 4 is the 'Post-settlement' period, which takes place two months following the divorce transaction until 12 months following the divorce transaction. Panel A reports the average number and average value of buys and sells made by the divorce and control samples in each of the four periods. Panel B reports the average transaction size made by the divorce and control samples. Panel C reports the ratio of buys to sells both in number of trades and value of trades for the two samples. The last two columns report the differences between the Post-settlement period compared to the Pre-settlement period and between the periods 2, 3 and 4 compared to the Pre window. Significance of differences are tested *, ** and *** for significance at 10%, 5% and 1% level respectively.

	Investor Sample	1. Pre-Window	2. Pre-Settlement	3. Settlement	4. Post-Settlement	5. (4) - (2) %	6. [(2)+(3)+(4)]-(1)%
		Month Relative to divorce transaction					
		(-36,-13)	(-12,-2)	(-1,+1)	(+2,+12)		
Panel A: Number and Value of Trades							
Number of Market Buys	Divorce	6.29	3.10	0.98	3.41	9.90%*	19.05%**
	Control	12.73	6.57	1.21	5.72	-12.90%**	6.01%*
	Difference	-6.44***	-3.47*	-0.23	-2.31*	22.80%***	13.04%**
Number of Market Sells	Divorce	4.77	3.10	1.23	3.20	3.20%*	57.88%***
	Control	11.14	5.64	0.97	4.61	-18.20%**	0.79%
	Difference	-6.37***	-2.54*	0.27	-1.42	21.40%***	57.09%***
Value of Market Buys	Divorce	67,444	32,212	7,151	21,998	-31.70%**	-9.02%**
	Control	92,918	49,744	8,536	38,290	-23.00%**	3.93%*
	Difference	-25,474**	-17,532*	-1,385	-16,292*	-8.70%*	-12.95%**
Value of Market Sells	Divorce	64,271	38,881	10,484	28,296	-27.20%**	20.83%**
	Control	111,405	52,199	8,863	40,786	-21.90%**	-8.58%*
	Difference	-47,134***	-13,318*	1,621	-12,490*	-5.30%*	29.41%***
Panel B: Average Transaction Size							

Average Value Buy Transaction	Divorce	10,712	10,384	7,263	6,453	-37.86%**
	Control	6,813	7,074	6,579	6,249	-11.66%*
	Difference	3,899*	3,310*	684	204	-26.20%***
Average Value Sell Transaction	Divorce	13,466	12,539	8,496	8,840	-29.50%**
	Control	9,341	8,637	8,559	8,253	-4.45%*
	Difference	4,125***	3,902*	-63	587	-25.05%***
Panel C: Buy-Sell Ratios						
Ratio Num. Buys to Num. Sells	Divorce	1.319	1.000	0.798	1.065	6.50%**
	Control	1.143	1.164	1.253	1.240	6.53%**
	Difference	0.176*	-0.164*	-0.455**	-0.175*	-0.03%
Ratio Value Buys to Value Sells	Divorce	1.049	0.828	0.682	0.777	-6.16%**
	Control	0.834	0.953	0.963	0.939	-1.47%
	Difference	0.215**	-0.125*	-0.281**	-0.162*	-4.69%***

Table 7: Difference-in-Difference Regression for Net Return by Investor Trading Activity, Portfolio Size, and Liquidation in Divorce Window

This table reports the coefficients for the difference-in-difference regression model of net portfolio return (annualized monthly portfolio returns adjusted for brokerage fees) against indicator variables measuring investor trading activity, portfolio size, and liquidation demand. Column 1 reports the regression results with trading activity indicator variables only. Columns 2 and 3 report results with trading activity and size variables. Column 4 reports results including an indicator variable for investors liquidating more than 50% of their pre-divorce portfolio. Column 5 reports results for trading activity, size, and liquidation indicator variables. The variable Div. Sample Indicator takes the value of 1 if the individual is in the divorce sample, and 0 if the individual is in the control sample. Div. Window Indicator takes the value of 1 if the portfolio return is observed in the 24 month period surrounding the month of the divorce transaction for the divorced individual. Sample × Window is the interaction variable between the Div. Sample Indicator and Div. Window Indicator. Inactive Trader Indicator takes the value of 1 if the investor does not trade during the divorce window, and zero otherwise. Buyer-Seller Indicator is an indicator variable that takes the value of 1 for an individual that both buys and sells in the divorce window, and zero otherwise (including for those investors that buy only or sell only in the divorce window). Large Portfolio Indicator and Small Portfolio Indicator are indicator variables for divorced investors with the largest quintile of portfolios by size, and smallest quintile of portfolios by size. Selling Proportion > 0.5 Indicator is an indicator variable that takes the value of 1 if the investor sells more than 50% of their end of pre-divorce window portfolio during the divorce window. Year fixed effects and investor-level clustered standard errors are used. *, ** and *** denote significance at 10, 5 and 1% levels respectively, with p-values reported beneath the coefficients in parentheses.

Net Returns

	1. Trading Activity	2. Trading Activity, Size	3. Trading Activity, Size Interaction	4. Trading Activity, Liquidation	5. Trading Activity, Size, Liquidation
Intercept	0.2190***	0.2133***	0.2141***	0.2180***	0.2130***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Div. Sample Indicator	0.01689***	0.01689***	0.01689***	0.01689***	0.01689***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Div. Window Indicator	0.0663***	0.0663***	0.0663***	0.0663***	0.0663***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Sample × Window	-0.1676***	-0.1638***	-0.1696***	-0.1576***	-0.1558***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Inactive Trader Indicator × Sample × Window	-0.0748***	-0.0347	-0.0342	-0.0856***	-0.0458**
	(0.001)	(0.186)	(0.194)	(<0.001)	(0.088)
Buyer-Seller Indicator × Sample × Window	0.0762***	0.0534**	0.0692**	0.0822***	0.0598**
	(0.004)	(0.048)	(0.035)	(0.002)	(0.026)
Small Portfolio (Q1_Size) × Sample × Window		-0.1120***	-0.0861**		-0.1058***

		(0.002)	(0.021)		(0.004)
Large Portfolio (Q5_Size) × Sample × Window		0.0811***	0.0731		0.0720**
		(0.009)	(0.101)		(0.020)
Buyer-Seller Indicator × Small Portfolio (Q1_Size) × Sample × Window			-0.1105		
			(0.232)		
Buyer-Seller Indicator × Large Portfolio (Q5_Size) × Sample × Window			0.0066		
			(0.914)		
Selling Proportion > 0.5 Indicator × Sample × Window				-0.1419**	-0.1051
				(0.047)	(0.150)
R-squared	0.0501	0.0548	0.0553	0.0518	0.0557
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Clustered Standard Errors	Yes	Yes	Yes	Yes	Yes