# Alpha by Affiliation*

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**Abstract**

Using proprietary data to identify employment-connected hedge fund families, we find highly coordinated trades within families predict abnormal returns over the next three months. Results are robust to controlling for other trades within the family, hedge fund industry crowding and herding, and geographic proximity. Effects are pronounced within smaller networks and over short (long) horizons among larger (small) capitalization stocks, suggesting that hedge fund families face arbitrage frictions among the most mispriced stocks. Overall, findings confirm social networks of fund managers remain a distinct channel for information diffusion into stock prices.

JEL Classification: G11, G12, G14, G23, G40

Keywords: Crowdedness, Hedge Funds, Herding, Information Diffusion, Networks, Stock Return Predictability

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# Introduction

Networks of fund managers serve as important channels for incorporating stock-level fundamental information into asset prices. Managers who work in the same city (Hong, Kubik and Stein (2005)), are neighbors (Pool, Stoffman and Yonker (2015)), or previously worked together (Spilker (2022), Gerritzen, Jackwerth and Plazzi (2023)) have more overlapping portfolios and trades, and these coordinated positions subsequently outperform. As networks grow, this may contribute to industry level herding (e.g., Wermers (1999)) and crowded positions (Brown, Howard and Lundblad (2022)), which is associated with stock-level outperformance. These findings seem at odds with evidence that keeping informed trades hidden from other fund managers leads to outperformance (e.g., Aragon, Hertzel and Shi (2013) and Sun, Wang and Zheng (2012)). Moreover, Stein (2008) notes that the recursive nature of sharing investment ideas between fund managers should result in more valuable ideas staying within a small network.

In this study we analyze whether hedge fund industry-level effects subsume smaller network effects entirely, or whether both channels convey information to asset prices. To do so, we investigate whether shared trades by connected hedge funds exhibit stock price predictability after controlling for industry- level hedge fund crowdedness (holdings) and herding (changes in holdings). We focus on hedge fund managers as they are generally regarded as the most sophisticated investors, operating with fewer restrictions than other institutional investors, and coming closest to the ideal of the rational arbitrageur (Brunnermeier and Nagel (2004)). Moreover, the hedge fund industry is economically large, with \$3.25 trillion under management as of 2019.[1]

[1] Hedge Fund Research, *Global Hedge Fund Industry Report*, Second Quarter 2019.

Following Spilker (2022), hedge fund connections are defined by employment histories of hedge fund founders. For example, if hedge funds A and B were founded by managers previously employed at hedge fund X, then both funds belong to the same hedge fund network X. Similarly, if the founders of funds C and D previously worked at hedge fund Y, then they would belong to network Y. Consistent with industry practice and Spilker (2022), we refer to networks X and Y as separate "families," in the sense that funds A (C) and B (D) are "child" funds of parent fund X (Y).[2] We use the same sample of about 1,500 hedge funds used in Brown et al. (2022) covering the period 2004-2017. While this sample does not have the same granularity of relationships between fund managers as Spilker (2022), it is three-times larger and covers the majority of "institutional quality" hedge funds. Last, quarterly holdings from form 13F are merged to each fund in the sample. Hedge fund trades are inferred from changes in quarterly holdings reported. Hedge fund family assignments and holdings data are provided by Novus Partners, a leading portfolio intelligence provider.

In line with the growth of the hedge fund industry, we document a significant increase in the number of hedge fund families in the industry since 2004. The average family size of three funds per family is roughly constant over the sample period. However, several families are significantly larger, consisting of as many as 26 funds. Consistent with Spilker (2022), family level stock holdings reveal levels of portfolio overlap that are 2.5 times those of standalone funds. Moreover, the average family fund is twice as large as the average standalone fund as measured from long-only equity holdings reported in form 13F, increasing the likelihood that coordinated family trades are a channel for stock-level crowdedness.

If indeed the most valuable investment ideas are confined to a small network of managers then we should expect these positions to outperform those more broadly shared in the net-

[2]This should not be confused with the literature on mutual fund families. In our setting, hedge fund families are distinct legal entities connected only through the managers' employment histories.

work or across the industry (Stein (2008)). To identify the most valuable investment ideas, we focus on those coordinated family trades that likely contain the strongest information-based trade signal obtainable from quarterly changes in holdings. Specifically, we focus on unanimous stock-level entries and exits by a family. A unanimous family entry occurs when no fund in the family held stock $i$ in the prior quarter but more than one family fund buys the stock during the current quarter. Similarly, a unanimous exit occurs when each family member holding the stock in the prior quarter exits their position entirely during the current quarter. Unanimous trades also require that no fund in the family takes the *opposite* action of any other fund in the family. We focus on entries and exits as these are consistent with newly established or fully exited "extensive margin" trades (Pool et al. (2015), Spilker (2022)) that probabilistically contain differential fundamental information regarding the underlying firm. This method of identifying the most valuable family level ideas compares to probabilistically lesser informed trades such as adding to or trimming existing positions (the intensive margin), or non-unanimous trades, where funds in the same family are selling while others are buying the same stock.

Finally, each quarter we tabulate the percentage of market capitalization for each stock that was unanimously entered and exited by family funds, and sort them into four portfolios. If the family trade was a unanimous entry into the stock, the largest (smallest) purchases are assigned to portfolio 4 (3). Similarly, if the family was a unanimous exit from the stock, the largest (smallest) sales are assigned to portfolio 1 (2). Hence, the Largest Family Trade (LFT), a stock-level measure defined by family-quarter, allows us to compare those stocks that plausibly contain the most positive information (portfolio 4) to those that contain the most negative information (portfolio 1). We use a long-short portfolio constructed from the return differences between portfolios 4 and 1 as our main variable of interest.[3]

This long-short portfolio of family stock trades generates an alpha of 0.55% (0.44%) on average over the following month using equal (value) weighted returns. This equates to annual alpha of 6.6% (5.3%) for the equal (value) weighted portfolios against an 8-factor model that includes the 5-factors of Fama and French (2015), the momentum factor of Carhart (1997), the traded liquidity factor of Pástor and Stambaugh (2003), and the hedge fund crowdedness factor of Brown et al. (2022). The crowdedness factor is constructed from a long-short portfolio of returns to the largest-minus-smallest percentage of average daily trading volume (Days-ADV) of stocks held by hedge funds. These findings suggest that our long-short LFT portfolio is capturing more information than that captured by the risk premia to crowded trades. Furthermore, we confirm that our results are not driven by particular periods during the sample.

Our results are not driven by agreement *across* hedge fund families. Summary statistics show that LFT trades are rarely accompanied by contemporaneous unanimous entries or exits in the same stocks by the remaining hedge fund families. Further, the largest stock exits (portfolio 1) are not similarly sold or exited by other individual funds in the industry. However, the largest stock entries (portfolio 4) coincide in similar magnitude with other individual funds' increasing weights or entries in the same LFT stock. To rule out the possibility that our main results reflect changes in *total* hedge fund ownership, we run Fama-MacBeth panel regressions controlling for market and firm-level characteristics, as well as variables capturing changes in total hedge fund ownership, the change in the percentage of funds in the sample holding the stock (Chen, Hong and Stein (2001)), and crowdedness. These tests confirm that the LFT long-short return is robust to these controls.

[3]Though rare, for stocks with both a unanimous entry and unanimous exit we define LFT as the difference between the two.

If the LFT long-short portfolio identifies differentially informed trading signals generated within the family, it should outperform a similar long-short portfolio comprised of non-LFT stocks. Here, non-LFTs are other stock entries and exits by funds in families that define the stock-level LFT that quarter, regardless of whether these funds were involved in the LFT. As such, these trades can include informed trades by a single fund in the family or shared trades that are not unanimous, and serve as a family-time fixed effect controlling for family characteristics such as investment skill. We find that the LFT long-short portfolio outperforms the non-LFT long-short portfolio in the subsequent months. Outperformance peaks during the second month following the quarter end holdings filing, with 8-factor monthly alphas of 0.66% and 0.70% for the equal- and value-weight portfolios, respectively. Alphas remain positive in the third month, but statistically so only for the equal-weighted portfolio. This evidence implies that closing the intrinsic value gap occurs more quickly among larger cap stocks in the LFT portfolio (Abreu and Brunnermeier (2002)). Additional tests find that results are pronounced for smaller families and when fewer funds in a family are involved in the LFT trade, thereby supporting the model of Stein (2008), and identifying close social connections as the likely information transmission channel.

Using double-sorts, we then test whether the LFT long-short portfolio is capturing common information shocks across hedge funds that are geographically proximate (Hong et al. (2005) and Pool et al. (2015)) rather than due to family connections (Spilker (2022)). First, we examine whether funds in the same family who are located near one another have systematically stronger LFT returns than those funds in the family who are further away. The long-short returns of close-minus-far LFT family funds are not consistently statistically different from zero, indicating that geographic proximity between family members is not driving our results. Second, we explore whether LFT returns are being driven by the subset of trades that overlap the most with nearby hedge funds outside the family. Specifically, we construct three long-short portfolios based on whether the number of other funds and families (residual funds) within 20 kilometers entering or exiting the same LFT stock is low, medium, or high. We find no convincing evidence that local information shocks are stronger than the family channel. In fact, the coefficient on the high-minus-low numbers of residual funds trading the same LFT stock is negative, with one-month value-weighted results statistically significantly so.

Last, we investigate whether the LFT long-short portfolio represents a viable trading strategy. We find that individual monthly LFT long-short alphas are large and statistically significant in the first two months following the prior quarter, but not distinguishable from zero for months three through six. Hence, buy-and-hold LFT long-short alphas do not reverse, suggesting that LFT is capturing differential information. Consistent with managers' best ideas tilting towards small capitalization stocks (Cohen, Polk and Silli (2010)), cumulative alphas are pronounced for equal-weighted portfolios, suggesting that coordination helps reduce arbitrage risks for capital constrained funds, but cannot close the mispricing entirely. Given 13F filings generally become available 45-days following the end of the prior quarter (Aragon et al. (2013)), most of the excess returns to LFT stocks have been realized prior to holdings disclosure to the public. Hence, market participants are unlikely to trade profitably on this information and capture alphas from the largest family trades. Rather, the growing use of hedge fund holdings as the basis for investment products likely captures industry risk-premia to crowded trades.[4]

In sum, we find that the largest trades of employment connected hedge funds contain differential information and predict stock level alphas beyond that predicted by other family

[4]For example, Goldman Sachs' VIP Index and related ETF (ticker: GVIP) invest in the hedge fund industry's largest holdings each quarter.

trades, hedge fund herding, and geographic proximity. Robustness tests confirm the most stringent definition for LFT is robust to cross-sectional tests that include industry herding and crowding controls. Yet, relaxing restrictions and including intensive margin and non-unanimous trades maintains alphas robust to the 8-factor risk-adjustments, confirming that results in Spilker (2022) and Gerritzen et al. (2023) are robust to larger industry-level effects. This confirms that hedge fund family networks remain a distinctive channel for information diffusion into stock prices.

# 1 Data and Variable of Interest

## 1.1 Data

We use data from Novus Partners, a leading portfolio intelligence provider, to identify hedge fund families. Their proprietary data traces hedge fund formation through the employment histories of key personnel to a terminal hedge fund parent. For example, David Stemerman's Conatus Capital is considered a *child* fund of Steve Mandel's Lone Pine Capital, as Stemerman was a portfolio manager for Mandel prior to launching his own fund. Mandel too is a *child* fund of the most well known hedge fund progenitor in the industry; Julian Robertson's Tiger Management. Hence, Tiger Management is the *parent* and *grandparent* fund in the "Tiger" hedge fund family tree, Lone Pine is the *child* fund, and Conatus Capital is the *grandchild* fund. The dataset contains 1,563 fund management companies overall, of which 418 are assigned to 166 unique hedge fund families. The sample is representative of the "institutional quality" population of hedge fund firms.

We then merge quarterly portfolio holdings of each hedge fund firm from 1Q:2004-4Q:2017. These holdings are hand collected by Novus from form 13F via the SEC's EDGAR site, and include all original and amended filings from each fund management company.[5] These data exclude holdings of hedge funds managed by investment banks and mutual fund companies. We merge holdings information to U.S. companies in the Compustat Quarterly file and draw monthly stock return information from The Center for Research in Security Prices (CRSP). We restrict the data set to stocks listed on the NYSE, NASDAQ, and AMEX exchanges with ordinary share codes (share codes 10 and 11) with a price of $5 or greater at the portfolio formation date. Following Brown et al. (2022), we filter the the smallest securities based on the NYSE 20% breakpoint.[6] Summary statistics for the sample of funds and their holdings of included stocks can be found in Table 1.

Panel A shows the number of families in the data increases steadily from 28 in 2004 to 98 by 2017. Though the average number of funds per family network is fairly constant at around three, the growth in the number of families implies more connected funds, which for some families can be quite large. For example, the largest family in 2010 has 26 members while the smallest has 2. The growth of the hedge fund industry is also reflected in Panel A by an increase in the total market capitalization of CRSP stocks held by hedge funds in the sample; growing from 8.93% in 2004 to 11.92% in 2017. Holdings data are reported at the firm level. For hedge fund companies with many funds, all holdings are rolled up and captured by the hedge fund firm-level holdings data reported on form 13F. Hence, references to the "fund" refer to the fund management company.

We infer quarterly assets under management for each hedge fund firm as the sum of their reported capitalization weighted holdings. Family hedge funds tend to be larger than

[5]This circumvents a number of number errors regarding Thomson Reuter's 13F filing data. For a description of these issues, see https://wrds-www.wharton.upenn.edu/pages/support/research-wrds/research-guides/research-note-regarding-thomson-reuters-ownership-data-issues/#documented-data-issues-as-of-december-2016.

[6]Similar results obtain without this filter.

standalone hedge funds as shown in Panel B ($2.3 billion 13F holdings versus $1.2 billion). They also hold more (fewer) numbers of stocks on average (median). We define an overlapping position as a long position in the portfolio of a hedge fund that is shared by another hedge fund within the same family. For example, if two or more funds within a hedge fund family hold three of the same stocks at the end of a given quarter, the number of overlapping family positions is three. The average value-weighted portfolio overlap between family funds is 31.2%. There is considerable cross-sectional variation as some funds have highly overlapping portfolios while some hedge funds have portfolios that do not overlap with the rest of the family at all. While standalone funds cannot have overlapping portfolios with family members by construction, within hedge fund style classifications, family funds have almost 2.5 times as many overlapping stocks than standalone funds.

[Insert Table 1 here]

## 1.2 Variable of Interest

In order to disentangle industry-level crowding from family-level information production, we focus our study on the largest coordinated trades within the same family. We posit that larger coordinated trades contain more private information than smaller ones, which through more coordination can more quickly close the intrinsic value gap (Abreu and Brunnermeier (2002)). To determine the largest coordinated family trade, we calculate the percentage of market capitalization for each stock $i$ that is purchased or sold by a hedge fund family $j$ during quarter $t$. We then keep only the largest purchases and sales for each stock during the quarter across families to identify the largest family trade (LFT). Taking the difference between the two, LFT is a stock-level variable that takes a positive (negative) value when the largest purchase exceeds (is smaller than) the largest exit.

For example, if three funds in family $j$ collectively purchase 7% of the market capitalization of stock $i$, while two funds in family $k$ purchase 5% of stock $i$, and funds from no other families jointly sell stock $i$, then $LFT_i$ is assigned a value of 7% in that quarter. Similarly, if two funds in family $j$ collectively sell 6% of the market capitalization of stock $I$, while three funds in family $k$ sell 1% of stock $I$, and four funds in family $l$ *buy* 2% of the same stock $I$, then $LFT_I$ is assigned a value of -4% ($= 2\% - [max\{|-6\%, -1\%|\}]$) in that quarter. To the extent that the largest purchases and sales signal informed trading, LFT should measure the strength of this signal; large positive values imply positive future performance and vice-versa.

Other than size, coordinated family trades can take several additional forms. Intensive margin trades are those when several family funds jointly increase and decrease weights to existing holdings during the quarter. Extensive margin trades are those when several family funds establish entirely new positions in the same stock or fully exit existing positions in the same stock during the quarter. Extensive margin trades probabilistically contain more private information (Pool et al. (2015)), with intensive margin trades containing marginally weaker trade signals.[7] To differentiate extensive from intensive margin coordinated trades, we use terms *entries* and *exits* when referring to the extensive margin, and *purchases/buys* and *sales* when referring to the intensive margin.

Finally, trade coordination within the family can also be measured from the level of trade agreement. A unanimous trade agreement occurs when several family funds make the same trade. This occurs when all funds in the network who hold the same stock at the start of the quarter collectively increase (enter) or decrease (exit) the same stock $i$ during the quarter. Conversely, non-unanimous trades can occur when several family funds purchase stock $i$,

[7] Spilker (2022) finds evidence of both an intensive and extensive margin effect.

while at least one other fund in the family does nothing with their holding of stock $i$ or sells it. We posit that unanimous trades occur when the investment signal shared among family funds is the strongest.

Altogether, the coordinated family trades that probabilistically contain the most private information are the largest, extensive margin, unanimous trades. Coordinated family trades containing the weakest trade signal, therefore, are smaller, intensive margin, non-unanimous trades. Other coordinated trades will fall somewhere between this range. We will analyze these probabilistically weaker trade signals in the robustness section. For the main tests in the study, we focus our analysis on the LFT measure of extensive margin unanimous family trades. Hence, reference to LFT refers to this strict definition unless otherwise stated. **(Added this as a short summary. All good?)** That is, LFT only considers the cases where at least two funds in a family enter a stock while no other funds in the family held the stock in the previous quarter, and for exits, where multiple funds in the family held a stock in the previous quarter and all of those funds exit the stock in the current quarter, leaving no funds in the family holding the stock.[8] LFT for stock $i$, family $j$, at the end of quarter $t$ is defined as

$$LFT_{it} = \max_{j} \left( unanimous\ entry_{ijt} \right) - \max_{j} \left( |unanimous\ exit_{ijt}| \right)$$

In Table 2 Panel A, we sort our LFT variable of interest – the largest, extensive margin, unanimous family trades – into quartile portfolios at the end of quarter $t$. The first two portfolios contain negative values and the last two contain positive values, where 1 is the largest negative portfolio (average $LFT$ value of -0.79%) and 4 is the largest positive

[8]The number of stocks with both a unanimous entry and exit in the same quarter represents only 3.6% of the non-zero LFT observations. Removal of these observations does not affect our results.

portfolio (1.03%). Hence, portfolio 1 represents stocks unanimously exited the most by fund families (largest negative change in market capitalization held) and portfolio 4 represents stocks unanimously entered the most by fund families (largest positive change in market capitalization held). There are between 47 and 55 stocks in each of the four portfolios per quarter on average. Of stocks held by hedge funds in a given quarter, roughly 1,500 do not experience a unanimous buy or sell (*Panel B: Excluded stocks (LFT=0)*). This suggests that unanimous family entries or exits are rare, and such trades might reflect strong informational signals.[9]

[Insert Table 2 here]

The variable, $\Delta$ *Residual All*, represents any additional market capitalization changes of the same LFT stocks outside of that captured by LFT. As such, it represents any additional entries/buying and exits/selling of the same LFT stock by other funds outside the family involved in the LFT.[10] For portfolio 4, we see an additional change in market capitalization held by hedge funds of 1.39% in Panel A, and a 0.5% change in the number of funds in the sample holding the stock ($\Delta$ *Breadth (%)*; Chen et al. (2001)), suggesting that many funds enter the position at the same time. Though this may partially reflect common information across hedge funds, it is also consistent with the observed growth of the hedge fund industry over time as evidenced by Table 1, wherein new flows to the industry are allocated to stocks in portfolio 4 that may lead to crowded positions (Brown et al. (2022)). Moreover, for portfolio 1, the residual change in market capitalization held by other hedge funds is -0.15%. This is much smaller in magnitude than the -0.79% captured by LFT for portfolio 1, and is

[9] Given our observations are constrained to the long-side of a hedge fund's portfolio when using 13F holdings data – a common constraint in the holdings-based hedge fund literature (Griffin and Xu (2009) and Aragon and Martin (2012)) – we cannot confirm whether fund families also unanimously short a stock.

[10] $\Delta$ *Residual All* is similar to the $\Delta Hold$ measure of Chen et al. (2001) except theirs is the change in the fraction of shares outstanding held by mutual funds between $t$ and $t-1$.

inconsistent with a solely information-based explanation for the large $\Delta$ *Residual All* average for portfolio 4.

While the change in market capitalization held by all remaining hedge funds ($\Delta$ *Residual All*) in portfolio 4 is similar to our variable of interest, LFT is not capturing agreement *across* hedge fund families. The variable $\Delta$ *Residual Family* accounts for all of the remaining largest unanimous extensive margin family trades in the same LFT stock. For example, imagine a quarter in which two or more funds in three different fund families enter the same stock $i$. Fund family $A$ collectively enters 2% of the market cap of the stock, family $B$ collectively enters 1.5% of the market cap of the stock, and family $C$ collectively enters 1% of the stock. In this example, $LFT_i$ has a value of 2%, which is signaled by family $A$'s entries, while $\Delta$ *Residual Family* is the sum of all other unanimous family entries in that same stock-quarter, or 2.5%. The values of $\Delta$ *Residual Family* in Panel A are close to zero across each portfolio quartile, implying that LFT stocks rarely arise as a contemporaneous unanimous entry or exit for another family. Hence, LFTs are information signals coming from *within*-families and not *across*-families.

Additionally, while the percentage of a stock's market capitalization held by hedge funds (*HF Own. (%)*) is higher for the tail quartile portfolios (P1 and P4), the number of hedge funds holding the stock (*Total Funds*) is smaller than those holding the middle two quartile portfolios (P2 and P3). That is, LFTs are concentrated in fewer hedge funds, which appear to be correlated to the within-family signal. The tail portfolios are more similar in terms of market capitalization, book-to-market, and profitability. This is consistent with the idea that informed trades of hedge fund managers – particularly with respect to portfolio 4 – favor stocks with high information asymmetry; those that have smaller capitalizations, have larger growth opportunities, and where appraising profitability proves challenging.

We also report the percentage of average daily trading volume (Days-ADV) for stocks held by hedge funds used to calculate the crowdedness factor in Brown et al. (2022). The crowdedness factor is constructed from the difference of value-weighted quarterly returns between the quintile of most crowded stocks (high Days-ADV) and the quintile of least crowded stocks (low Days-ADV). In Panel A, Days-ADV is higher for the tail portfolios than for the middle quartile portfolios, but is notably lower than non-LFT stocks in Panel B. This evidence suggests that the crowdedness factor is distinct from the LFT signal.

# 2 Empirical Results

## 2.1 Main Results

For each LFT-sorted quartile portfolio, we analyze returns of a long-short portfolio; going long stocks with large positive values of LFT (portfolio 4) and short stocks with large negative values of LFT (portfolio 1). We then regress these portfolio returns on standard factor returns, culminating in an 8-factor model that includes the three factors of Fama and French (1993) (3-factor), the momentum factor of Carhart (1997) (4-factor), the traded liquidity factor of Pástor and Stambaugh (2003) (5-factor), the profitability and investment factors of Fama and French (2015) (7-factor), and the hedge fund crowding factor of Brown et al. (2022) (8-factor). Excess returns and alphas of equal- and value-weighted buy-and-hold portfolios are reported in Table 3. We assess statistical significance using p-values calculated using Newey-West corrected standard errors with 3 lags.

[Insert Table 3 here]

In Table 3, we report average monthly long-short alpha of 55 (44) basis points per month on the equal (value) weighted portfolio against the 8-factor model. This translates to annual alphas of 6.6% and 5.3% for the equal- and value-weighted portfolios, respectively.[11] To the extent that unanimous family trades contribute to overall hedge fund crowdedness, the inclusion of the eighth factor will dilute the effect of our LFT measure and capture some of this effect. The long-short coefficients in both panels do not change much when moving from the 7-factor to the 8-factor model. Factor coefficients reported in Table 4 confirm no significant differences across any factor loadings for the 4 - 1 long-short portfolio, suggesting our measure is capturing a specific information-driven component of crowdedness. The loadings on the tail portfolios – portfolios 1 and 4 – indicate LFTs concentrate in small-cap contrarian growth stocks with weak profitability.

[Insert Table 4 here]

Averaging across the entire sample does not indicate what time periods are driving the higher returns. Hence, we present a year-by-year look at average raw returns for the long-short portfolio over our sample in Figure 1. Long-short returns are positive in most years with magnitudes that are larger than in negative years. Nor do quartile portfolio sizes noticeably differ across years (see Appendix A.1). As such, our results do not appear to be driven by outliers.

This evidence supports the notion that differentially valuable information is transmitted between family members. However, while we control for crowding in the previous tests, we have not ruled out whether our results merely reflect changes in total hedge fund ownership; either number of funds or total market capitalization held. We control for these characteristics at the stock-level using Fama-MacBeth regressions in Table 5. We regress the returns

[11] In other untabulated tests, results are robust to accounting for delisting returns using the methodology of filling in missing delisting returns (Shumway (1997)) and pro-rating delisting returns occurring more than a month after the last observed return in CRSP (Cohen, Polk and Vuolteenaho (2009)).

of all stocks on LFT in the first model. We add controls for the market in model 2, for style in model 3, and instruments for herding (holding changes) in model 4 ($\Delta$ *Breadth (%)* and $\Delta$ *Residual All*). In the final model, we add the percentage of average daily trading volume (*Days-ADV*) of stocks held by hedge funds as an instrument for hedge fund crowdedness (holdings). These regressions give equal weight to each stock-quarter in our sample and include stocks with LFT equal to zero to improve precision.

[Insert Table 5 here]

Panel A presents results using the continuous measure of LFT that gives rise to the quartile portfolio sorts (1, 2, 3, 4). The coefficient on LFT is positive and significant across all models. In the final model, the coefficient implies that LFTs generate 0.55% of alpha per quarter for every 1% increase in the LFT measure, after controlling for changes in the number of funds (0.31%, $\Delta$ *Breadth*) and residual changes in hedge fund ownership (0.16%, $\Delta$ *Residual All*), and percent of daily trading volume held (0.006%, Days-ADV). Notably, the effect of Days-ADV is largely subsumed by increases in the percentage of hedge funds holding the stock ($\Delta$ Breadth (%)).[12]

Similar results obtain in Panel B, when using dummy variables for positive (LFT = 3 and 4; *+ve*) and negative (LFT = 1 and 2; *-ve*) values of LFT. The difference between the positive and negative dummy variables declines from 1.26 in model 1 to 0.80 in model 5, and the difference remains statistically significant at the 1-percent level (last column). The coefficient for positive LFT stocks is statistically significant by itself and predicts 0.61% quarterly returns on average. This is larger than the combined prediction in stock returns

[12]Given that $\Delta$ Breadth is constructed with a scalar in the denominator (all funds in the sample), it's possible this variable is driven by more hedge funds being able to hold larger cap stocks. In untabulated results, we use an alternative $\Delta$ Breadth measure that is scaled by the average number of firms holding the stock between the the current and last quarter. We find *more* robust results for LFT, with a smaller coefficient on the alternative measure of $\Delta$ Breadth (%).

from other funds: 0.30% + 0.016% + 0.006%. Correlations between the Fama-MacBeth variables reported in Appendix A.2 confirm the distinctiveness of LFT from crowding effects (Days-ADV), but with a modest positive relation to proxies for herding. Double sorts on LFT and $\Delta$ *Residual all* (Appendix A.4) confirm no clear relationship between LFT and herding proxies. In sum, the Fama-MacBeth results confirm that the returns to LFT are incremental to those associated with other proxies for hedge fund crowding and herding.

# 3 Robustness

## 3.1 Alternative Constructions of Variable of Interest

While our main variable of interest – the extensive margin unanimous largest family trade – may present as a logical choice to identify the strongest trade signal, this decision appears extreme relative to Spilker (2022), who finds that even the average shared trade within the family generates alpha. Testing differing levels of intensity (intensive vs. extensive margin) and agreement (unanimous vs. no agreement) may give us a clearer picture of which trade type signals more valuable stock-level information.

In Table 6, we report average quarterly excess returns and alphas in percent for the 4-1 long-short portfolios using less stringent definitions for LFT. As before, Panel A (B) presents equal (value) weighted results. The sorting variable for the top row of each panel is the stock-level largest family trade across all hedge fund families where at least two funds within the family purchased/sold the same stock and all funds holding the stock either increased/decreased their position weight together, or all funds entered/exited together. As such, it is one step less stringent than the main LFT variable of interest by including stocks from increases/decreases in position size (intensive margin trades), and not just entries/exits (extensive margin trades). This sorting variable is labeled *Intensive & Extensive Margin Unanimous LFT*. The sorting variable for the middle row of each panel is similar to the top row, but does not require that trades be unanimous. Hence, it includes stocks where no other family fund makes an opposite trade in the same stock, or if they already hold it, they do not trade it. This sorting variable is labeled *Intensive & Extensive Margin LFT, no opposite trades*. Finally, in the last row of each panel, the sorting variable is similar to the middle row but does not restrict opposing actions of other family funds; i.e., other funds may trade in the opposite direction of the LFT stock. This sorting variable is labeled *Intensive & Extensive Margin LFT, no other restrictions*.

[Insert Table 6 here]

We find that all specifications produce large and statistically significant alphas. Importantly, the specification in the final row of each panel, which is similar to that used in Spilker (2022) remains robust, even after controlling for hedge fund crowding (8-factor), and long-short alphas are similar in magnitude to findings in Spilker (2022). While the coefficients are smaller than those found in our main tests with the more stringent LFT definition, they remain nonetheless.

As with our main tests, we also need to rule out whether these results obtain from changes in total hedge fund ownership (number of funds or total market capitalization held). Hence, we run Fama-MacBeth regressions to control for stock-level variables. For sake of parsimony, we use the least stringent LFT sorting variable, *Intensive & Extensive Margin LFT, no other restrictions*. As before, Panel A of Table 7 presents results using the continuous measure of LFT that gives rise to the quartile sorts (1, 2, 3, 4), and Panel B does so when using dummy variables for positive (LFT = 3 and 4; *+ve*) and negative (LFT = 1 and 2; *-ve*) values of LFT.

[Insert Table 7 here]

As shown in models 3 through 5 in Panel A, the continuous measure of the less stringent LFT variable is not robust to instruments for hedge fund crowding (holdings) and herding (holding changes). This provides strong support for using the more stringent measure of LFT in our main tests that identify stronger trade signals containing differentiated stock-level information. Notably, however, the less stringent LFT measure remains robust in Panel B when we include dummies for positive values of LFT (LFT = 3 and 4; *+ve*), and dummies for negative values of LFT (LFT = 1 and 2; *-ve*) and is statistically significant at the 1-percent level, though smaller economically. The definition of LFT used in Panel B is consistent with that used in Spilker (2022). Hence, these results confirm that findings in Spilker (2022) remain robust to stock-level characteristics that include instruments for changes in total hedge fund herding and crowding (Brown et al. (2022)). Similar statistical results, albeit with slightly smaller coefficients, obtain when using the other two alternative forms of LFT (see Appendices A.7 and A.8). These results confirm that the largest family purchases and entries, as well as the long-short short of purchases/entries minus sales/exits, contain marginally more private information than broader industry trades.

## 3.2 Family Level Characteristics

Perhaps our findings are driven by a family-time fixed effect, such that higher quality families are able to exploit market opportunities than others at various times, or that investment training at shared prior employers – rather than social channels – drive the results. To analyze this question, we examine the return difference between LFTs and non-LFTs within the same family-quarter to see if LFTs contain differential information over other extensive margin trades within the family that quarter. Here, LFTs are the more stringently defined version as used in our main tests. Non-LFTs may include other coordinated extensive margin trades that would qualify as an LFT if another family did not trade more of the same stock in the same quarter, as well as extensive margin trades of a single fund in the family.

To construct the test, we form quartiles of stocks as before, but for all non-LFT entries and exits of families that are involved in an LFT trade that quarter. We then form a long-short portfolio for the non-LFT quartiles of the largest entries minus the largest exits as before (4 - 1) to get the return spread between the largest average entries and exits of these same funds in the same quarter. Finally, we form a long-short portfolio with a long position in the 4 - 1 LFT portfolio minus the 4 - 1 non-LFT portfolio of the same family. If LFT trades signal differential information relative to other trades made by the same family participating in the LFT trade, we should expect a positive coefficient on this long-short portfolio.

Table 8 reports the results across the different factor models for one, two, and three-month holding period returns. These portfolios assume that stocks are bought or sold on the last day of the quarter and then held exactly one, two, and three months, respectively, in order to determine over which horizon excess returns accrue during the quarter.

[Insert Table 8 here]

We find that LFTs indeed contain differential information relative to non-LFTs, with stronger differences observed at the end of the second month. Value-weight coefficients in Panel B are larger than equal-weight results in Panel A. Differences in alphas between the LFT long-short portfolio and non-LFT long-short portfolio recede in month three and are statistically insignificant starting with the 7-factor model for value-weighted portfolios.[13] This suggests that differential information diffusion into markets occurs at slower speeds

[13]However, double sorts on market capitalization and LFT in Appendix A.9 confirm that there is no statistical difference between small-cap and large-cap LFT alphas.

for smaller cap LFTs, consistent with less information production on smaller firms, while closing the intrinsic value gap occurs more quickly among larger cap LFTs (Abreu and Brunnermeier (2002)). Importantly, these results also identify social channels as the likely information transmission channel.

### 3.3 Information Diffusion: Geographic Distance and Family Size

Another potential concern is that the LFT variable is capturing common information between hedge funds that are geographically close (e.g., Hong et al. (2005) and Pool et al. (2015)) rather than due to family connections (Spilker (2022)). Using the geographic center of the zip codes of hedge funds collected from SEC filings, we sort LFTs into terciles based on the average distance between family funds involved in the trades.[14] That is, we calculate three separate 4 - 1 portfolio return series based on whether the distance between family funds involved in an LFT is *low*, *medium*, or *high*, and report them in Table 9.[15]

[Insert Table 9 here]

If low-distance trades systematically outperform high-distance trades, the coefficients on *low* will be larger than that on the *high* coefficient, and the coefficient on the *high* - *low* portfolios will be negative and statistically significant. The results show that LFTs by geographically closer family funds outperform in the first month. However, the difference disappears in the following months as the coefficients for *high* are positive and statistically significant in the second month. Coefficients on *medium* are also positive starting in the second month and statistically significant in the third month.

[14] Approximately 90% of the entirety of the holdings sample has zip code data available. Due to missing zip codes we can study around 90% of the trades in our LFT variable. We calculate the distance when at least two funds involved in the trade have zip code data available.

[15] The distance cutoffs can vary from quarter to quarter, so that one-third of the trades appear in each portfolio.

This evidence suggests no clear advantage from proximity, but monthly comparisons highlight slower information diffusion across distant funds, thereby increasing synchronization timing risk (Abreu and Brunnermeier (2002)) across the network. This is distinct from the time it takes fund managers to coordinate on an investment idea, which is an unobserved exchange that occurs prior to the observed trade that is reflected in quarter end 13F filings. Stein (2008) models that more valuable ideas will remain within smaller networks. To confirm this, we sort LFTs by families size terciles and report excess returns in Table 10. Confirming the theory, we find that LFTs of smaller families results in larger and statistically significant alphas relative to larger families.[16]

[Insert Table 10 here]

To further rule out whether geographic proximity is driving our results, we sort LFT into terciles based on the number of geographically close residual funds trading the same stock. That is, for any unanimous extensive margin family trade captured by LFT, we count the number of residual family funds and standalone funds located within 20 kilometers of any one of the family members involved in the LFT that quarter that also make the same trade. We then sort stocks into terciles based on whether the count of those residual funds nearby is *low*, *medium*, or *high*.[17]

Results in Table 11 do not provide convincing evidence that geographic proximity explains our results. If our results were solely driven by geography, alpha should only arise in the *high* tercile. Instead, the *high* - *low* portfolio returns are consistently negative, significantly so in

[16]Similar results obtain when analyzing the number of funds involved, irrespective of family size. See Appendix

[17]Due to missing zip codes, we only include an LFT trade here if at least one fund involved in the trade has a non-missing zip code and if at least one standalone fund that traded in the same stock has a non-missing zip code

one case. Overall, the geographic tests suggest that our results are not driven by geographic proximity.

[Insert Table 11 here]

### 3.4 LFT as a Trading Strategy

Last, we examine whether LFT can be used as a trading strategy. To test this, we calculate monthly alphas (non-cumulative) for the months following the end of the quarter for the 4 -1 portfolio and report results in Table 12. We find that the long-short portfolio returns are positive and statistically significant in the first two months, and are not distinguishable from zero in months three through six. Hence, cumulative alphas are still non-zero at six months (See Appendix A.5), and is pronounced in equal-weight results. Moreover, in Appendix A.6 we report LFT for the quartile portfolios in the quarters following portfolio formation and note only modest reversals across portfolios. These results suggest longer-term fundamental mispricing information is signaled by LFTs.

[Insert Table 12 here]

Since 13F filings are usually filed at the 45-day mark following the end of the calendar quarter (Aragon et al. (2013)), the information contained in the holdings are largely unobservable during the period when much of the LFT alphas are realized. Hence, investors are likely unable to capture LFT long-short alphas. As such, investment strategies relying on hedge fund holdings are likely capturing the risk-premia to crowded trades. For example, Goldman Sachs constructs the VIP Index from the hedge fund industry's largest holdings each quarter, which serves as the index benchmark for the $140 million net asset value ETF the company offers (ticker: GVIP).[18]

# 4 Conclusion

Using the same sample of around 1,500 hedge funds as used in Brown et al. (2022), along with hedge fund "family" linkages and holdings from Novus Partners, we find a long-short portfolio that takes long unanimous positions in newly entered stocks by multiple family members and short unanimous positions in stocks where all family members holding the stock exit generates annualized equal-weight 8-factor alpha of 6.6%. Newly entered trades and fully exited positions are extensive margin trades, which arguably signal differential private information about the underlying firm relative to when funds size-up or size-down existing holdings (intensive margin). Unanimous trades occur when two or more funds in a family enter or exit the same stock during the same quarter, and no other funds in the family trade that stock differently. The 8-factor model includes the 5-factors of Fama and French (2015), the momentum factor of Carhart (1997), the traded liquidity factor of Pástor and Stambaugh (2003), and the hedge fund crowdedness factor of Brown et al. (2022).

Controlling for changes in total hedge fund ownership, Fama-MacBeth regressions confirm that our long-short portfolio predicts returns to stocks in the following quarter that are incremental to those implied by hedge fund crowding (Brown et al. (2022)) and herding (Chen et al. (2001). Additional monthly leads of predictive regressions also exhibit alphas, which are largest in the second month for value-weighted results, and persist for six months for equal-weighted results, suggesting a mispricing based explanation to information contained

[18]Goldman Sachs' VIP fact sheet notes that *"Because certain information used to construct the Index may be stale at the time of its use...the Index may not be effective in delivering exposure to equity securities whose performance is expected to influence the long portfolios of hedge funds."* Other products and tracking services include Global X GURU Index ETF, Novus Partners, Hedge Follow, and Yahoo!Finance Most Bought By Hedge Funds watchlist.

in fund family trades. Further, the largest unanimous extensive margin family trades predict larger returns that are robust to those predicted by other trades within the family (Spilker (2022)) and common information shocks across the industry (Brown et al. (2022)) and for geographically proximate funds (Hong et al. (2005) and Pool et al. (2015)).

Overall, our results confirm that coordinated within-family trades predict risk-adjusted alphas over the subsequent quarter. These effects are pronounced for smaller capitalization stocks typically associated with higher information asymmetry and greater limits to arbitrage, and within smaller networks (Stein (2008)). Hence, information flows within informal hedge fund families are an important channel for impounding information into prices (Cao, Liang, Lo and Petrasek (2018)).

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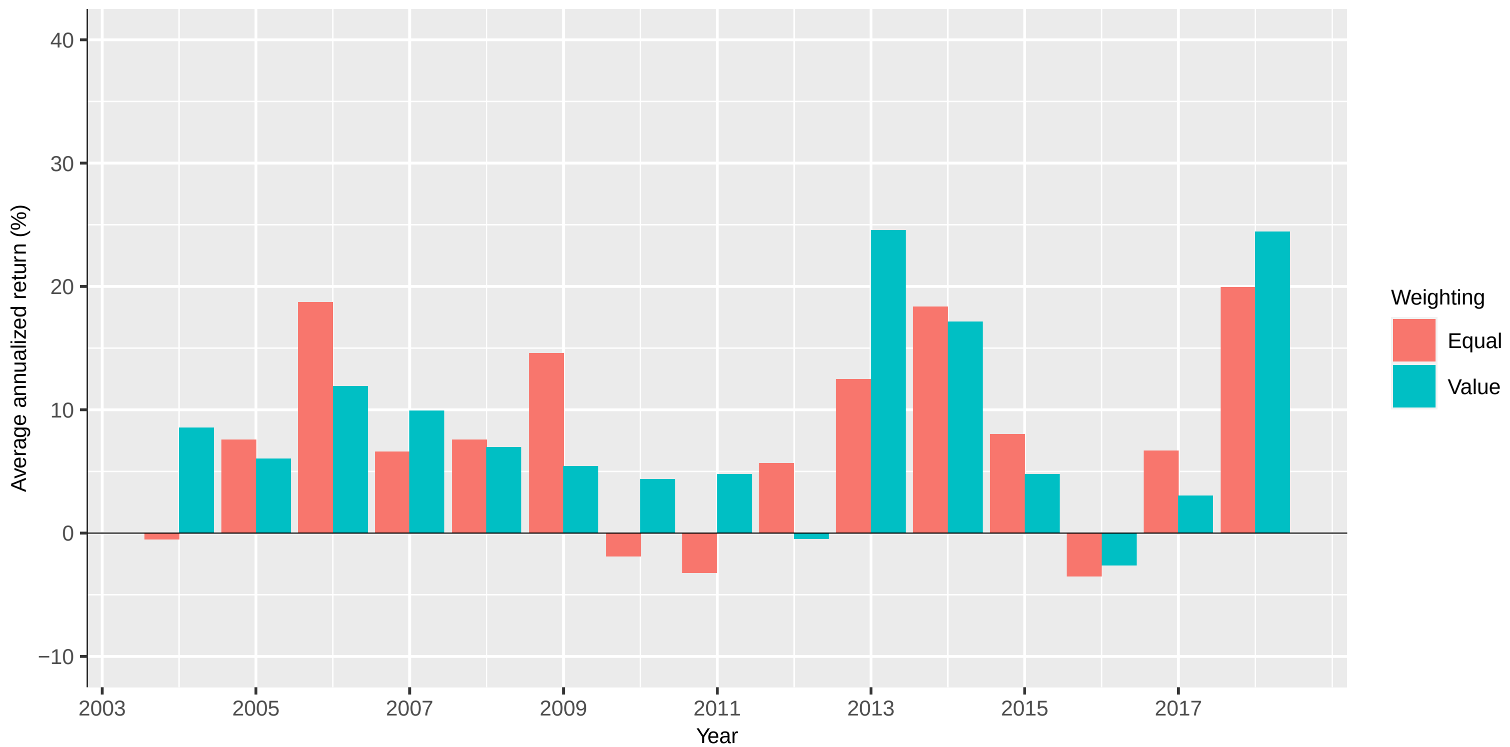
**Figure 1: Average annualized long-short portfolio returns by year: three-month buy-and-hold portfolios**

This figure presents average annualized returns for a long-short portfolio formed on LFT: the largest percentage of market capitalization purchased or sold by a hedge fund family via unanimous entries and exits. The long portfolio (portfolio 4) contains the largest positive values of LFT (unanimous buys) and the short portfolio (portfolio 1) contains the largest negative values of LFT (unanimous sales). The portfolio is held for three months.



## Table 1: Hedge fund summary statistics

Summary statistics for the sample of hedge funds in the study. Panel A presents summary statistics on hedge fund family sizes. *% market cap* is the percentage of the total value of CRSP stocks (trading on NYSE, NASDAQ, and AMEX that are ordinary shares, price greater than $5, and excluding micro-caps based on the 20th percentile breakpoint of NYSE stocks) held by the sample of hedge funds at the end of December of each year. Panel B summarize data on portfolio sizes defined as long-positions on form 13F for standalone and family hedge funds. *# overlapping stocks (same style)* for a family fund is the number of stock positions that a fund has in common with other funds in the family with the same investment style, conditional on having a family member with the same investment style. *# overlapping stocks (same style)* for a standalone fund is the average number of stock positions that fund has in common with another standalone funds within the same investment style.

Panel A: Hedge-fund family size

| | | | Family funds | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | # families | # funds | mean | sd | min | max | # standalone funds | % market cap |
| 2004 | 28 | 77 | 2.85 | 2.30 | 2 | 12 | 474 | 8.93 |
| 2005 | 33 | 94 | 2.75 | 2.22 | 2 | 13 | 545 | 10.50 |
| 2006 | 35 | 104 | 2.88 | 2.66 | 2 | 16 | 640 | 11.92 |
| 2007 | 45 | 136 | 2.92 | 3.13 | 2 | 20 | 696 | 12.83 |
| 2008 | 51 | 160 | 3.02 | 3.19 | 2 | 22 | 723 | 10.10 |
| 2009 | 56 | 174 | 3.17 | 3.71 | 2 | 26 | 729 | 10.61 |
| 2010 | 61 | 186 | 3.08 | 3.72 | 2 | 26 | 717 | 10.57 |
| 2011 | 69 | 199 | 2.91 | 3.25 | 2 | 25 | 704 | 11.27 |
| 2012 | 72 | 217 | 2.84 | 3.00 | 2 | 25 | 712 | 11.79 |
| 2013 | 76 | 240 | 2.96 | 3.13 | 2 | 26 | 719 | 11.75 |
| 2014 | 83 | 268 | 3.18 | 3.12 | 2 | 24 | 747 | 12.96 |
| 2015 | 97 | 306 | 3.21 | 2.91 | 2 | 24 | 749 | 13.11 |
| 2016 | 105 | 325 | 3.04 | 2.78 | 2 | 23 | 733 | 11.65 |
| 2017 | 98 | 325 | 3.16 | 3.10 | 2 | 24 | 718 | 11.92 |

Panel B: Hedge-fund holdings

| | Family funds | | | | | | |
|---|---|---|---|---|---|---|---|
| | mean | sd | min | p25 | median | p75 | max |
| # stocks held | 89.95 | 234.81 | 0 | 12 | 25 | 54.5 | 1,967 |
| # overlapping stocks | 20.52 | 57.95 | 0 | 1 | 4 | 14 | 708 |
| # overlapping stocks (same style) | 15.44 | 42.93 | 0 | 1 | 5 | 14 | 553 |
| portfolio size ($m) | 2,335.80 | 7,923.77 | 0.00 | 172.71 | 568.41 | 1,627.62 | 187,907.60 |
| % portfolio overlapping | 31.18 | 29.68 | 0.00 | 4.21 | 22.53 | 52.34 | 100.00 |
| | Standalone funds | | | | | | |
| | mean | sd | min | p25 | median | p75 | max |
| # stocks held | 82.00 | 165.12 | 0 | 13 | 31 | 74 | 2,100 |
| # overlapping stocks (same style) | 6.32 | 21.40 | 0 | 0 | 1 | 4 | 322 |
| portfolio size ($m) | 1,156.87 | 2,883.23 | 0.00 | 102.62 | 285.93 | 962.72 | 73,695.54 |

## Table 2: Portfolio characteristics

Panel A presents characteristics for portfolios of stocks formed based on quartile sorts of our main variable of interest, LFT. The portfolios are formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and are held for three months. LFT is the largest percentage of market capitalization purchased or sold by a hedge fund family via unanimous entry into (exit from) the stock. Unanimous trades requires that no fund in the family takes the opposite action of any other fund in the family. Further, for entries, unanimous trades requires that no other funds in the family held the stock at the beginning of the quarter. Unanimous exits also require all funds in the family holding the stock to exit the stock in the quarter. Only stocks with non-zero values of LFT are considered. Portfolios 1 and 2 contains stocks with negative values (Portfolio 1=largest negative); i.e., where LFT is an exit. Portfolios 3 and 4 contain stocks with positive values (Portfolio 4=largest positive); i.e., where LFT is an entry. The sample period is 2004 to 2017. *# Firms* is the average number of stocks in the portfolio per quarter. Δ *Residual family* is the change in ownership in a stock by hedge fund families due to unanimous entries and exits, excluding the change in ownership already captured by LFT. Δ *Residual all* is the total change in ownership by hedge funds (including standalone hedge funds), excluding the change in ownership already captured by LFT; i.e., it is the residual change in market capitalization held by hedge funds outside of our variable of interest. *HF own. (%)* is the percentage of a stock's market capitalization held by hedge funds. *Total Funds* is the number of hedge funds holding the stock. Δ *Breadth (%)* is the change in number of hedge funds holding the stock divided by the total number of funds in the sample (following Chen et al. (2001); only funds that exist at $t$ and $t-1$ are used). *B/M* is book-to-market ratio, *ROA* is return on assets, and *Days-ADV* is hedge fund ownership divided by average daily volume. Panel B present similar characteristics for those stocks not included in the LFT quartiles; LFT=0.

| Panel A: Included stocks (LFT $\neq$ 0) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Portfolio | # Firms | LFT (%) | Δ Residual family (%) | Δ Residual all (%) | HF own. (%) | Total funds | Δ Breadth (%) | Market cap. ($m) | B/M (%) | 12 month return (%) | ROA (%) | Days-ADV |
| 1 | 47.70 | -0.79 | -0.02 | -0.15 | 14.87 | 38.16 | -0.24 | 6,941.59 | 48.37 | 21.00 | 0.91 | 12.0 |
| 2 | 47.12 | -0.06 | -0.00 | -0.13 | 9.17 | 56.72 | -0.27 | 30,097.21 | 48.38 | 17.25 | 1.45 | 9.8 |
| 3 | 54.91 | 0.08 | 0.00 | 0.49 | 10.19 | 56.61 | 0.36 | 24,657.68 | 47.96 | 22.52 | 1.42 | 11.2 |
| 4 | 54.29 | 1.03 | 0.07 | 1.39 | 16.98 | 41.80 | 0.50 | 6,668.49 | 47.25 | 30.32 | 0.60 | 13.6 |
| Panel B: Excluded stocks (LFT = 0) | | | | | | | | | | | | |
| Portfolio | # Firms | LFT (%) | Δ Residual family (%) | Δ Residual all (%) | HF own. (%) | Total funds | Δ Breadth (%) | Market cap. ($m) | B/M (%) | 12 month return (%) | ROA (%) | Days-ADV |
| - | 1,523.45 | 0.00 | 0.00 | 0.09 | 11.31 | 32.09 | 0.04 | 8,481.51 | 51.30 | 20.62 | 1.15 | 15.3 |

## Table 3: Long-short portfolio returns and alphas

Average monthly excess returns and alphas in percent for the quartile portfolios. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| 1 | 0.579 | -0.313 | -0.277 | -0.243 | -0.250 | -0.166 | -0.165 |
| | (0.191) | (0.113) | (0.111) | (0.141) | (0.105) | (0.280) | (0.314) |
| 2 | 0.680* | -0.156 | -0.140 | -0.116 | -0.117 | -0.102 | -0.127 |
| | (0.085) | (0.156) | (0.173) | (0.269) | (0.263) | (0.374) | (0.328) |
| 3 | 0.875** | 0.024 | 0.033 | 0.054 | 0.050 | 0.048 | 0.090 |
| | (0.031) | (0.827) | (0.770) | (0.649) | (0.669) | (0.679) | (0.462) |
| 4 | 1.187*** | 0.309* | 0.335** | 0.373*** | 0.370*** | 0.444*** | 0.386*** |
| | (0.006) | (0.065) | (0.028) | (0.009) | (0.009) | (0.001) | (0.007) |
| 4–1 | 0.609*** | 0.621*** | 0.612*** | 0.616*** | 0.620*** | 0.611*** | 0.550*** |
| | (0.001) | (0.001) | (0.001) | (0.000) | (0.000) | (0.000) | (0.003) |

Panel B: Value weighted

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| 1 | 0.504 | -0.264 | -0.249 | -0.209 | -0.215 | -0.078 | -0.022 |
| | (0.208) | (0.249) | (0.264) | (0.329) | (0.295) | (0.711) | (0.913) |
| 2 | 0.647* | -0.060 | -0.054 | -0.058 | -0.049 | 0.014 | 0.095 |
| | (0.062) | (0.701) | (0.710) | (0.694) | (0.715) | (0.920) | (0.494) |
| 3 | 0.654* | -0.121 | -0.133 | -0.139 | -0.145 | -0.137 | -0.101 |
| | (0.079) | (0.363) | (0.308) | (0.292) | (0.262) | (0.289) | (0.439) |
| 4 | 1.149*** | 0.362** | 0.363** | 0.389** | 0.390** | 0.432** | 0.420** |
| | (0.004) | (0.044) | (0.049) | (0.034) | (0.035) | (0.028) | (0.045) |
| 4–1 | 0.645*** | 0.626*** | 0.612*** | 0.599*** | 0.604*** | 0.510** | 0.442** |
| | (0.009) | (0.002) | (0.002) | (0.004) | (0.003) | (0.016) | (0.030) |

## Table 4: Long-short portfolio returns: factor loadings

This table presents factor loadings for regressions of average monthly excess returns on risk-factors. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted 8-Factor loadings

| Portfolio | MKT | HML | SMB | MOM | LIQ | RMW | CMA | CRO |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.063*** | -0.042 | 0.587*** | -0.138*** | 0.106** | -0.200** | -0.031 | 0.042 |
| | (0.000) | (0.597) | (0.000) | (0.002) | (0.029) | (0.024) | (0.820) | (0.670) |
| 2 | 1.117*** | -0.028 | 0.236*** | -0.092*** | 0.022 | -0.032 | -0.019 | 0.009 |
| | (0.000) | (0.691) | (0.000) | (0.001) | (0.638) | (0.662) | (0.883) | (0.911) |
| 3 | 1.096*** | -0.129* | 0.416*** | -0.092** | 0.069* | -0.007 | 0.033 | -0.098 |
| | (0.000) | (0.052) | (0.000) | (0.020) | (0.073) | (0.936) | (0.745) | (0.134) |
| 4 | 1.084*** | -0.146* | 0.582*** | -0.145*** | 0.050 | -0.160** | 0.023 | 0.149 |
| | (0.000) | (0.094) | (0.000) | (0.000) | (0.327) | (0.034) | (0.858) | (0.197) |
| 4–1 | 0.022 | -0.103 | -0.006 | -0.007 | -0.056 | 0.039 | 0.054 | 0.107 |
| | (0.754) | (0.346) | (0.945) | (0.873) | (0.335) | (0.678) | (0.800) | (0.508) |

Panel B: Value weighted 8-Factor loadings

| Portfolio | MKT | HML | SMB | MOM | LIQ | RMW | CMA | CRO |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.911*** | -0.045 | 0.249** | -0.164*** | 0.087 | -0.339*** | -0.094 | -0.112 |
| | (0.000) | (0.655) | (0.024) | (0.004) | (0.217) | (0.005) | (0.507) | (0.438) |
| 2 | 0.998*** | 0.080 | -0.144* | 0.019 | -0.128** | -0.173* | 0.029 | -0.240*** |
| | (0.000) | (0.387) | (0.076) | (0.610) | (0.033) | (0.067) | (0.840) | (0.001) |
| 3 | 1.098*** | 0.066 | -0.058 | 0.013 | 0.073 | -0.024 | -0.311** | -0.032 |
| | (0.000) | (0.415) | (0.419) | (0.716) | (0.221) | (0.766) | (0.015) | (0.702) |
| 4 | 1.058*** | -0.160 | 0.186** | -0.104** | 0.005 | -0.097 | 0.105 | -0.024 |
| | (0.000) | (0.282) | (0.040) | (0.049) | (0.947) | (0.481) | (0.587) | (0.871) |
| 4–1 | 0.147* | -0.115 | -0.063 | 0.060 | -0.082 | 0.242* | 0.199 | 0.088 |
| | (0.094) | (0.556) | (0.636) | (0.336) | (0.376) | (0.100) | (0.420) | (0.698) |

## Table 5: Fama-MacBeth regressions

This table presents results of Fama-MacBeth regressions of quarterly returns on characteristics. Each quarter, returns are regressed on the LFT variable (model 1), market beta (model 2), book-to-market, size, return over months $t-13$ to $t-2$ (model 3), the change in number of hedge funds holding the stock divided by the total number of funds in the sample (Δ Breadth (%), Chen et al. (2001)), the change in percentage of market capitalization held by hedge funds (Δ Residual all (%)) outside that captured by LFT (model 4), and the percentage of average daily trading volume of stocks held by hedge funds (Days-ADV) (model 5). Firms with LFT equal to zero are included to improve precision. Panel A presents results using the continuous LFT measure. Panel B presents similar results where LFT is replaced by two dummy variables, one for positive LFT (+ve) and one for negative LFT (-ve). P-values are given in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fama-MacBeth

| | Constant | LFT (%) | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV |
|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.458** | 0.625*** | | | | | | | |
| | (0.048) | (0.001) | | | | | | | |
| (2) | 1.981* | 0.660*** | 0.478 | | | | | | |
| | (0.053) | (0.000) | (0.564) | | | | | | |
| (3) | 2.654** | 0.685*** | 0.180 | -0.002 | -0.079 | -0.008 | | | |
| | (0.017) | (0.001) | (0.780) | (0.668) | (0.439) | (0.397) | | | |
| (4) | 2.609** | 0.553*** | 0.198 | -0.002 | -0.078 | -0.008 | 0.310*** | 0.157*** | |
| | (0.022) | (0.005) | (0.760) | (0.707) | (0.440) | (0.381) | (0.000) | (0.000) | |
| (5) | 2.414** | 0.551*** | 0.203 | -0.002 | -0.064 | -0.008 | 0.309*** | 0.156*** | 0.006* |
| | (0.033) | (0.005) | (0.756) | (0.683) | (0.531) | (0.374) | (0.000) | (0.000) | (0.080) |

Panel B: Fama-MacBeth with dummies

| | Constant | +ve | −ve | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV | +ve−−ve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.441** | 0.756** | -0.499 | | | | | | | | *** |
| | (0.045) | (0.049) | (0.175) | | | | | | | | |
| (2) | 1.969* | 0.757** | -0.399 | 0.469 | | | | | | | *** |
| | (0.052) | (0.014) | (0.175) | (0.570) | | | | | | | |
| (3) | 2.748** | 0.839*** | -0.314 | 0.165 | -0.002 | -0.093 | -0.008 | | | | *** |
| | (0.015) | (0.009) | (0.285) | (0.795) | (0.660) | (0.367) | (0.397) | | | | |
| (4) | 2.693** | 0.602* | -0.205 | 0.183 | -0.002 | -0.090 | -0.008 | 0.297*** | 0.157*** | | *** |
| | (0.019) | (0.056) | (0.490) | (0.775) | (0.699) | (0.376) | (0.383) | (0.000) | (0.000) | | |
| (5) | 2.504** | 0.611* | -0.193 | 0.187 | -0.002 | -0.077 | -0.008 | 0.296*** | 0.155*** | 0.006* | *** |
| | (0.029) | (0.054) | (0.513) | (0.771) | (0.676) | (0.455) | (0.376) | (0.000) | (0.000) | (0.088) | |

## Table 6: Other LFT Trade Types

This table presents average quarterly excess returns and alphas in percent for the long-short portfolio. The sorting variable for the top row of each panel is the maximum aggregate market capitalization purchased/sold at the stock-level across all hedge fund families where at least two funds within the family purchased/sold the stock (LFT) and all funds (unanimous) holding the stock increased/decreased their position weight (intensive margin), or all funds entered/exited (extensive margin). As such, it is one step less stringent than the main variable of interest by including stocks from increases/decreases in position size and not just entries/exits. The sorting variable for the middle row of each panel is similar to that in the top row but does not require that trades be unanimous. That is, it includes stocks where no other family fund makes an opposite trade in the same stock, or if already holding it, they do not trade it. The sorting variable for the bottom row of each panel is similar to that in the middle row but does not restrict opposing actions of other family funds; i.e., other funds may trade in the opposite direction of the LFT stock. Portfolio 1 (4) contains stocks with the largest negative (positive) values of the sorting variable. Only stocks with non-zero values are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Equal-weight

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| Intensive & Extensive Margin Unanimous LFT | | | | | | | |
| 4–1 | 0.389*** | 0.404*** | 0.399*** | 0.412*** | 0.410*** | 0.404*** | 0.362*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Intensive & Extensive Margin LFT, no opposite trades | | | | | | | |
| 4–1 | 0.394*** | 0.405*** | 0.401*** | 0.414*** | 0.413*** | 0.416*** | 0.379*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Intensive & Extensive Margin LFT, no other restrictions | | | | | | | |
| 4–1 | 0.439*** | 0.436*** | 0.432*** | 0.442*** | 0.441*** | 0.436*** | 0.387*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |

Panel B: Value-weight

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| Intensive & Extensive Margin Unanimous LFT | | | | | | | |
| 4–1 | 0.305** | 0.273** | 0.272** | 0.291*** | 0.289** | 0.271** | 0.218** |
| | (0.016) | (0.012) | (0.011) | (0.010) | (0.010) | (0.011) | (0.031) |
| Intensive & Extensive Margin LFT, no opposite trades | | | | | | | |
| 4–1 | 0.319** | 0.288*** | 0.288*** | 0.307*** | 0.305*** | 0.323*** | 0.273*** |
| | (0.013) | (0.009) | (0.009) | (0.008) | (0.008) | (0.003) | (0.009) |
| Intensive & Extensive Margin LFT, no other restrictions | | | | | | | |
| 4–1 | 0.380*** | 0.343*** | 0.341*** | 0.354*** | 0.352*** | 0.381*** | 0.295** |
| | (0.006) | (0.007) | (0.005) | (0.005) | (0.005) | (0.003) | (0.012) |

## Table 7: Fama-MacBeth regressions: Intensive & Extensive Margin LFT, no other restrictions

This table presents results of Fama-MacBeth regressions of quarterly returns on characteristics. Each quarter, returns are regressed on LFT that includes intensive margin trades with no other family trade restrictions (model 1), market beta (model 2), book-to-market, size, return over months $t-13$ to $t-2$ (model 3), the change in number of hedge funds holding the stock divided by the total number of funds in the sample (Δ Breadth (%), Chen et al. (2001)), and the change in percentage of market capitalization held by hedge funds (Δ Residual all) outside that captured by LFT (model 4), and the percentage of average daily trading volume of stocks held by hedge funds (Days-ADV) (model 5). Firms with LFT equal to zero are included to improve precision. Panel A presents results using the continuous LFT measure. Panel B presents similar results where LFT is replaced by two dummy variables, one for positive LFT (+ve) and one for negative LFT (-ve). P-values are given in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fama-MacBeth

| | Constant | LFT (%) | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV |
|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.455** | 0.409*** | | | | | | | |
| | (0.048) | (0.000) | | | | | | | |
| (2) | 1.985* | 0.396*** | 0.477 | | | | | | |
| | (0.053) | (0.007) | (0.566) | | | | | | |
| (3) | 2.682** | 0.408*** | 0.180 | -0.002 | -0.081 | -0.008 | | | |
| | (0.016) | (0.005) | (0.781) | (0.659) | (0.425) | (0.395) | | | |
| (4) | 2.637** | 0.208 | 0.196 | -0.002 | -0.080 | -0.008 | 0.312*** | 0.154*** | |
| | (0.020) | (0.143) | (0.763) | (0.698) | (0.426) | (0.377) | (0.000) | (0.000) | |
| (5) | 2.440** | 0.205 | 0.200 | -0.002 | -0.066 | -0.008 | 0.311*** | 0.152*** | 0.006* |
| | (0.032) | (0.150) | (0.759) | (0.675) | (0.518) | (0.370) | (0.000) | (0.000) | (0.086) |

Panel B: Fama-MacBeth with dummies

| | Constant | +ve | −ve | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV | +ve−−ve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.383** | 0.771*** | -0.382 | | | | | | | | *** |
| | (0.042) | (0.008) | (0.178) | | | | | | | | |
| (2) | 1.924* | 0.652** | -0.222 | 0.463 | | | | | | | *** |
| | (0.053) | (0.017) | (0.441) | (0.577) | | | | | | | |
| (3) | 2.898*** | 0.758** | -0.116 | 0.151 | -0.002 | -0.121 | -0.008 | | | | *** |
| | (0.009) | (0.012) | (0.680) | (0.811) | (0.656) | (0.228) | (0.399) | | | | |
| (4) | 2.846** | 0.579* | 0.029 | 0.171 | -0.002 | -0.119 | -0.008 | 0.282*** | 0.150*** | | *** |
| | (0.012) | (0.052) | (0.918) | (0.790) | (0.694) | (0.232) | (0.388) | (0.000) | (0.000) | | |
| (5) | 2.637** | 0.570* | 0.025 | 0.176 | -0.002 | -0.104 | -0.008 | 0.281*** | 0.148*** | 0.006* | *** |
| | (0.020) | (0.058) | (0.929) | (0.784) | (0.670) | (0.304) | (0.382) | (0.000) | (0.000) | (0.067) | |

## Table 8: Long-short portfolio returns and alphas, net of other entries and exits by LFT families

This table presents average monthly excess returns and alphas in percent for the difference of two long-short portfolios for varying holding periods. The first portfolio is the LFT long-short (portfolio 4 minus portfolio 1) described earlier. The second portfolio is a similar long-short portfolio constructed using entries into and exits from other stocks by funds in the same family during the quarter the family made the LFT trade. The long position in portfolio 4 (long) consists of stocks where at least one fund from a family that conducted an LFT trade in that quarter made a large (as a percent of market capitalization) entry, and the short position in portfolio 1 (short) consists of stocks where at least one fund from a family that conducted an LFT trade in that quarter made a large exit. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolios are formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| One-month holding period | | | | | | | |
| 4–1 | 0.306 | 0.353 | 0.401 | 0.322 | 0.331 | 0.292 | 0.260 |
| | (0.361) | (0.251) | (0.249) | (0.416) | (0.403) | (0.439) | (0.502) |
| Two-month holding period | | | | | | | |
| 4–1 | 0.685*** | 0.739*** | 0.728*** | 0.713*** | 0.744*** | 0.696*** | 0.663*** |
| | (0.002) | (0.000) | (0.001) | (0.001) | (0.000) | (0.000) | (0.001) |
| Three-month holding period | | | | | | | |
| 4–1 | 0.453** | 0.479** | 0.468** | 0.484*** | 0.489*** | 0.468*** | 0.407** |
| | (0.015) | (0.011) | (0.012) | (0.007) | (0.006) | (0.008) | (0.031) |

Panel B: Value weighted

| Portfolio | Excess | CAPM | 3-Factor | 4-Factor | 5-Factor | 7-Factor | 8-Factor |
|---|---|---|---|---|---|---|---|
| One-month holding period | | | | | | | |
| 4–1 | 0.781 | 0.781* | 0.833** | 0.859* | 0.871* | 0.732 | 0.688 |
| | (0.123) | (0.059) | (0.044) | (0.066) | (0.070) | (0.142) | (0.153) |
| Two-month holding period | | | | | | | |
| 4–1 | 0.875*** | 0.879*** | 0.912*** | 0.919*** | 0.963*** | 0.804*** | 0.704** |
| | (0.009) | (0.002) | (0.001) | (0.001) | (0.000) | (0.004) | (0.018) |
| Three-month holding period | | | | | | | |
| 4–1 | 0.367 | 0.351* | 0.344* | 0.346* | 0.354* | 0.279 | 0.236 |
| | (0.164) | (0.094) | (0.097) | (0.099) | (0.089) | (0.207) | (0.252) |

## Table 9: Double sorts based on average distance between family members

This table reports average monthly excess returns and alphas in percent. We sort stocks into terciles based on the average distance between funds involved in the LFT trades: low, medium, and high. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 0.256 | 0.848 | 1.199* | 0.962 | -0.215 | -0.510 | -0.471 | -1.358* |
| | (0.672) | (0.276) | (0.052) | (0.129) | (0.660) | (0.261) | (0.521) | (0.087) |
| Two-month holding period | | | | | | | | |
| 4–1 | 0.398 | 0.823 | 0.781* | 0.571** | 0.767** | 0.724** | 0.369 | -0.099 |
| | (0.418) | (0.106) | (0.058) | (0.046) | (0.032) | (0.044) | (0.545) | (0.856) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.448 | 0.831** | 0.644** | 0.618** | 0.594** | 0.383 | 0.146 | -0.448 |
| | (0.243) | (0.031) | (0.042) | (0.025) | (0.043) | (0.126) | (0.759) | (0.324) |

Panel B: Value weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 1.184* | 1.793* | 1.180* | 1.102 | 0.262 | -0.062 | -0.922 | -1.855** |
| | (0.094) | (0.058) | (0.061) | (0.186) | (0.707) | (0.900) | (0.303) | (0.028) |
| Two-month holding period | | | | | | | | |
| 4–1 | 0.564 | 0.858 | 0.981** | 0.687 | 1.229*** | 1.074** | 0.665 | 0.216 |
| | (0.270) | (0.165) | (0.048) | (0.158) | (0.008) | (0.016) | (0.339) | (0.739) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.319 | 0.523 | 0.435 | 0.295 | 0.619* | 0.354 | 0.301 | -0.170 |
| | (0.410) | (0.221) | (0.247) | (0.457) | (0.092) | (0.242) | (0.571) | (0.700) |

## Table 10: Constructing LFT within family size terciles

This table reports average monthly excess returns and alphas in percent. We construct LFT within family size (AUM) terciles (small, medium, large). Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | Small | | Medium | | Large | | Large-Small | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 0.699 | 0.398 | 0.421 | 0.469 | 2.127 | 0.818 | 1.244 | 0.202 |
| | (0.439) | (0.629) | (0.305) | (0.199) | (0.175) | (0.440) | (0.519) | (0.881) |
| Two-month holding period | | | | | | | | |
| 4–1 | 1.763*** | 1.760*** | 0.698** | 0.650** | 1.085 | 0.175 | -0.766 | -1.698 |
| | (0.002) | (0.008) | (0.015) | (0.014) | (0.297) | (0.838) | (0.540) | (0.145) |
| Three-month holding period | | | | | | | | |
| 4–1 | 1.338*** | 1.207** | 0.435* | 0.361 | 1.103 | 0.750 | -0.256 | -0.510 |
| | (0.003) | (0.027) | (0.068) | (0.110) | (0.169) | (0.351) | (0.794) | (0.659) |

Panel B: Value weighted

| | Small | | Medium | | Large | | Large-Small | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 1.693** | 1.546** | 1.041* | 0.816 | 2.433 | 1.681 | 0.626 | -0.029 |
| | (0.035) | (0.049) | (0.082) | (0.144) | (0.149) | (0.210) | (0.773) | (0.987) |
| Two-month holding period | | | | | | | | |
| 4–1 | 2.068*** | 2.176*** | 0.798** | 0.559* | 1.808 | 0.972 | -0.159 | -1.202 |
| | (0.000) | (0.000) | (0.032) | (0.072) | (0.117) | (0.382) | (0.909) | (0.291) |
| Three-month holding period | | | | | | | | |
| 4–1 | 1.386*** | 1.427*** | 0.362 | 0.136 | 1.479* | 1.075 | 0.207 | -0.324 |
| | (0.002) | (0.000) | (0.204) | (0.609) | (0.092) | (0.240) | (0.847) | (0.749) |

## Table 11: Double sorts based on number of close trades by residual funds

This table reports average monthly excess returns and alphas in percent. We sort LFT trades into terciles based on the number of geographically-close (within 20km) residual family and standalone funds conducting the same trade (entry or exit) in the same stock in the same quarter: low, medium, or high. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 1.359* | 1.098 | 0.674 | 0.787 | 0.209 | 0.444 | -1.150 | -0.654 |
| | (0.085) | (0.279) | (0.277) | (0.317) | (0.665) | (0.396) | (0.192) | (0.497) |
| Two-month holding period | | | | | | | | |
| 4–1 | 1.297*** | 1.275* | 0.753* | 0.753** | 1.095*** | 1.232*** | -0.202 | -0.043 |
| | (0.007) | (0.051) | (0.055) | (0.020) | (0.003) | (0.000) | (0.739) | (0.949) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.750* | 0.622 | 0.760** | 0.765** | 0.507 | 0.482 | -0.242 | -0.140 |
| | (0.051) | (0.178) | (0.016) | (0.012) | (0.103) | (0.119) | (0.618) | (0.780) |

Panel B: Value weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 1.574* | 1.692** | 1.453** | 1.474* | 0.194 | -0.217 | -1.380 | -1.909** |
| | (0.076) | (0.037) | (0.015) | (0.060) | (0.754) | (0.683) | (0.156) | (0.013) |
| Two-month holding period | | | | | | | | |
| 4–1 | 1.159** | 1.117 | 1.089** | 1.164** | 1.042** | 0.778*** | -0.117 | -0.339 |
| | (0.031) | (0.102) | (0.016) | (0.015) | (0.020) | (0.003) | (0.860) | (0.633) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.517 | 0.402 | 0.421 | 0.370 | 0.539 | 0.284 | 0.022 | -0.118 |
| | (0.224) | (0.463) | (0.259) | (0.382) | (0.114) | (0.297) | (0.965) | (0.849) |

## Table 12: Long-short portfolios: individual month alphas

This table presents average monthly excess returns and alphas in percent for individual months. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). 8-factor alphas are reported for each month following the end of the prior quarter for LFT stocks. The sample period is 2004 to 2017. *8-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003), the RMW and CMA factors of Fama and French (2015), and the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal-weighted

| | | Month | | | | | |
|---|---|---|---|---|---|---|---|
| | Portfolio | 1 | 2 | 3 | 4 | 5 | 6 |
| Excess | 1 | 0.277 | 0.365 | 1.094* | 0.846 | 0.552 | 1.104 |
| | | (0.765) | (0.603) | (0.100) | (0.365) | (0.488) | (0.118) |
| | 4 | 0.910 | 1.511** | 1.141 | 0.917 | 1.077 | 1.136 |
| | | (0.307) | (0.021) | (0.111) | (0.310) | (0.108) | (0.132) |
| | 4–1 | 0.632* | 1.146*** | 0.047 | 0.071 | 0.525 | 0.032 |
| | | (0.064) | (0.000) | (0.882) | (0.821) | (0.182) | (0.904) |
| 8-Factor | 1 | -0.337 | -0.090 | -0.077 | 0.214 | -0.139 | -0.096 |
| | | (0.150) | (0.743) | (0.735) | (0.207) | (0.765) | (0.650) |
| | 4 | 0.313 | 1.087*** | -0.194 | 0.227 | 0.527* | -0.182 |
| | | (0.222) | (0.000) | (0.484) | (0.301) | (0.094) | (0.391) |
| | 4–1 | 0.649* | 1.177*** | -0.117 | 0.014 | 0.666 | -0.086 |
| | | (0.087) | (0.000) | (0.718) | (0.968) | (0.184) | (0.760) |

Panel B: Value-weighted

| | | Month | | | | | |
|---|---|---|---|---|---|---|---|
| | Portfolio | 1 | 2 | 3 | 4 | 5 | 6 |
| Excess | 1 | 0.231 | 0.389 | 0.892 | 0.748 | 0.493 | 0.717 |
| | | (0.781) | (0.551) | (0.131) | (0.349) | (0.454) | (0.246) |
| | 4 | 1.313 | 1.502** | 0.632 | 0.736 | 1.068* | 0.609 |
| | | (0.103) | (0.017) | (0.317) | (0.374) | (0.091) | (0.287) |
| | 4–1 | 1.081** | 1.113*** | -0.259 | -0.012 | 0.575 | -0.108 |
| | | (0.041) | (0.003) | (0.475) | (0.977) | (0.125) | (0.719) |
| 8-Factor | 1 | -0.309 | 0.091 | -0.009 | 0.177 | -0.037 | -0.342 |
| | | (0.475) | (0.718) | (0.978) | (0.708) | (0.888) | (0.153) |
| | 4 | 0.541* | 1.058** | -0.342 | -0.150 | 0.589* | -0.386 |
| | | (0.099) | (0.012) | (0.238) | (0.635) | (0.065) | (0.215) |
| | 4–1 | 0.850* | 0.966** | -0.332 | -0.327 | 0.626 | -0.045 |
| | | (0.059) | (0.030) | (0.351) | (0.290) | (0.243) | (0.908) |

# A Appendix

## Table A.1: Average quarterly firms by year for each portfolio

This table gives the average number of firms per portfolio per year. Portfolios 1 and 2 contains stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 1 (4) contains stocks with the largest negative (positive) LFT values. Only stocks with non-zero values for LFT are included.

| | P1 | P2 | P3 | P4 |
|---|---|---|---|---|
| 2004 | 32.33 | 31.33 | 41.67 | 41.67 |
| 2005 | 28.00 | 27.50 | 27.75 | 26.75 |
| 2006 | 30.25 | 29.75 | 43.25 | 42.50 |
| 2007 | 39.50 | 39.00 | 42.50 | 42.00 |
| 2008 | 45.75 | 45.00 | 51.75 | 51.00 |
| 2009 | 41.50 | 41.50 | 57.25 | 56.50 |
| 2010 | 51.75 | 51.25 | 68.75 | 68.25 |
| 2011 | 62.50 | 62.00 | 60.00 | 59.50 |
| 2012 | 56.50 | 55.50 | 68.00 | 67.50 |
| 2013 | 50.25 | 49.75 | 58.00 | 57.25 |
| 2014 | 53.75 | 53.00 | 62.50 | 62.00 |
| 2015 | 48.00 | 47.50 | 45.00 | 44.50 |
| 2016 | 48.50 | 47.75 | 59.25 | 58.50 |
| 2017 | 64.25 | 63.75 | 80.25 | 79.50 |

## Table A.2: Fama-MacBeth variable correlations

This table presents correlations between variables included in Fama-MacBeth regressions. Variables include LFT, the market (beta), book-to-market, size (log(Market equity)), return over months $t-13$ to $t-2$ (12-month return), the change in number of hedge funds holding the stock divided by the total number of funds in the sample ($\Delta$ Breadth (%), Chen et al. (2001)), the change in percentage of market capitalization held by hedge funds ($\Delta$ Residual all (%)) outside that captured by LFT, and the percentage of average daily trading volume of stocks held by hedge funds (Days-ADV).

Panel A: Fama-MacBeth

| | LFT (%) | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | $\Delta$ Breadth (%) | $\Delta$Residual all (%) | Days-ADV |
|---|---|---|---|---|---|---|---|---|
| LFT | | 0.005 | 0 | -0.003 | 0.013 | 0.067 | 0.049 | 0.001 |
| Beta | | | 0.011 | -0.153 | 0.129 | 0.004 | 0.015 | -0.028 |
| Book-to-Market | | | | -0.139 | -0.208 | -0.05 | -0.006 | 0.022 |
| log(Market equity) | | | | | 0.004 | 0.017 | -0.009 | -0.043 |
| 12-month return (%) | | | | | | 0.118 | 0.001 | 0.001 |
| $\Delta$ Breadth (%) | | | | | | | 0.243 | 0.005 |
| $\Delta$ Residual all (%) | | | | | | | | 0.024 |
| Days-ADV | | | | | | | | |

## Table A.3: LFT returns according to funds involved in LFT trades

This table reports average monthly excess returns and alphas in percent. LFT trades are sorted according to the number of funds involved in the trade (2 vs. 3 or more). Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | 2 | | 3 or more | | High-Low | |
|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| | | | One-month holding period | | | |
| 4–1 | 0.762** | 0.805** | -1.033 | -2.694** | -1.565 | -3.097** |
| | (0.041) | (0.039) | (0.421) | (0.033) | (0.258) | (0.024) |
| | | | Two-month holding period | | | |
| 4–1 | 0.979*** | 0.999*** | -0.244 | -0.705 | -1.123 | -1.621 |
| | (0.000) | (0.000) | (0.789) | (0.527) | (0.230) | (0.205) |
| | | | Three-month holding period | | | |
| 4–1 | 0.654*** | 0.601*** | 0.708 | 0.321 | 0.175 | -0.178 |
| | (0.001) | (0.003) | (0.381) | (0.739) | (0.831) | (0.867) |

Panel B: Value weighted

| | 2 | | 3 or more | | High-Low | |
|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| | | | One-month holding period | | | |
| 4–1 | 0.857 | 0.700 | -0.686 | -2.480 | -1.359 | -2.931 |
| | (0.134) | (0.138) | (0.631) | (0.231) | (0.368) | (0.135) |
| | | | Two-month holding period | | | |
| 4–1 | 0.963*** | 0.738*** | 0.044 | -0.506 | -0.723 | -1.084 |
| | (0.005) | (0.007) | (0.964) | (0.693) | (0.461) | (0.402) |
| | | | Three-month holding period | | | |
| 4–1 | 0.543** | 0.299 | 0.749 | 0.408 | 0.388 | 0.269 |
| | (0.037) | (0.172) | (0.362) | (0.681) | (0.636) | (0.792) |

## Table A.4: Unconditional double sorts based on residual all

This table reports average monthly excess returns and alphas in percent. Stocks are sorted into terciles (low, medium, and high) based on $\Delta$*Residual all*. Stocks are also sorted into quartiles based on LFT. Each sort is not dependent on the other. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| | | | One-month holding period | | | | | |
| 4–1 | 0.873 | 1.063* | 0.617 | -0.060 | 0.190 | 0.325 | -0.683 | -0.737 |
| | (0.119) | (0.054) | (0.368) | (0.937) | (0.701) | (0.516) | (0.333) | (0.236) |
| | | | Two-month holding period | | | | | |
| 4–1 | 0.974** | 0.971** | 1.114** | 0.792 | 0.549 | 0.757** | -0.424 | -0.214 |
| | (0.016) | (0.033) | (0.018) | (0.128) | (0.138) | (0.044) | (0.452) | (0.678) |
| | | | Three-month holding period | | | | | |
| 4–1 | 0.555* | 0.459 | 0.683* | 0.448 | 0.470 | 0.620* | -0.085 | 0.161 |
| | (0.075) | (0.171) | (0.070) | (0.280) | (0.119) | (0.059) | (0.847) | (0.700) |

Panel B: Value weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| | | | One-month holding period | | | | | |
| 4–1 | 0.757 | 0.273 | 0.944 | -0.037 | 0.371 | 0.938 | -0.385 | 0.664 |
| | (0.289) | (0.703) | (0.251) | (0.965) | (0.586) | (0.210) | (0.710) | (0.612) |
| | | | Two-month holding period | | | | | |
| 4–1 | 1.159** | 0.715** | 0.521 | 0.014 | 0.627 | 0.911* | -0.532 | 0.196 |
| | (0.022) | (0.049) | (0.355) | (0.980) | (0.209) | (0.077) | (0.482) | (0.772) |
| | | | Three-month holding period | | | | | |
| 4–1 | 0.741** | 0.303 | 0.037 | -0.335 | 0.634 | 0.831* | -0.107 | 0.528 |
| | (0.049) | (0.381) | (0.934) | (0.433) | (0.122) | (0.060) | (0.856) | (0.355) |

## Table A.5: Long-short portfolios: varying holding period

This table presents average monthly excess returns and alphas in percent. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and we consider different holdings periods: one month to six months. The sample period is 2004 to 2017. *8-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003), the RMW and CMA factors of Fama and French (2015), and the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal-weighted

| | | Months held | | | | | |
|---|---|---|---|---|---|---|---|
| | Portfolio | 1 | 2 | 3 | 4 | 5 | 6 |
| Excess | 1 | 0.277 | 0.321 | 0.579 | 0.681 | 0.721 | 0.727* |
| | | (0.765) | (0.578) | (0.191) | (0.120) | (0.101) | (0.098) |
| | 4 | 0.910 | 1.210** | 1.187*** | 1.170*** | 1.106*** | 1.128*** |
| | | (0.307) | (0.028) | (0.006) | (0.007) | (0.010) | (0.008) |
| | 4–1 | 0.632* | 0.889*** | 0.609*** | 0.489*** | 0.384** | 0.401*** |
| | | (0.064) | (0.000) | (0.001) | (0.002) | (0.010) | (0.002) |
| 8-Factor | 1 | -0.337 | -0.208 | -0.165 | -0.068 | -0.069 | -0.091 |
| | | (0.150) | (0.279) | (0.314) | (0.599) | (0.555) | (0.461) |
| | 4 | 0.313 | 0.688*** | 0.386*** | 0.377*** | 0.288** | 0.301** |
| | | (0.222) | (0.000) | (0.007) | (0.004) | (0.024) | (0.032) |
| | 4–1 | 0.649* | 0.896*** | 0.550*** | 0.445*** | 0.357** | 0.392*** |
| | | (0.087) | (0.000) | (0.003) | (0.003) | (0.025) | (0.008) |

Panel B: Value-weighted

| | | Months held | | | | | |
|---|---|---|---|---|---|---|---|
| | Portfolio | 1 | 2 | 3 | 4 | 5 | 6 |
| Excess | 1 | 0.231 | 0.310 | 0.504 | 0.571 | 0.596 | 0.569 |
| | | (0.781) | (0.554) | (0.208) | (0.139) | (0.114) | (0.128) |
| | 4 | 1.313 | 1.407*** | 1.149*** | 1.056*** | 0.983*** | 0.973*** |
| | | (0.103) | (0.006) | (0.004) | (0.006) | (0.010) | (0.008) |
| | 4–1 | 1.081** | 1.097*** | 0.645*** | 0.485** | 0.388** | 0.405** |
| | | (0.041) | (0.001) | (0.009) | (0.022) | (0.044) | (0.019) |
| 8-Factor | 1 | -0.309 | -0.088 | -0.022 | 0.050 | 0.020 | -0.029 |
| | | (0.475) | (0.719) | (0.913) | (0.745) | (0.872) | (0.813) |
| | 4 | 0.541* | 0.779*** | 0.420** | 0.338* | 0.240 | 0.241* |
| | | (0.099) | (0.004) | (0.045) | (0.060) | (0.132) | (0.099) |
| | 4–1 | 0.850* | 0.867*** | 0.442** | 0.288* | 0.220 | 0.270* |
| | | (0.059) | (0.003) | (0.030) | (0.072) | (0.137) | (0.052) |

## Table A.6: LFT Quarterly Leads

Leads of LFT for each portfolio. Portfolios 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Only stocks with non-zero values for LFT are included.

| | LFT (%) | | | | |
|---|---|---|---|---|---|
| | Quarters ahead | | | | |
| Portfolio | 0 | 1 | 2 | 3 | 10 |
| 1 | -0.793 | 0.049 | 0.007 | -0.006 | -0.002 |
| 2 | -0.063 | 0.019 | 0.008 | 0.009 | 0.007 |
| 3 | 0.075 | -0.006 | 0.004 | 0.007 | 0.003 |
| 4 | 1.032 | -0.101 | -0.026 | -0.003 | 0.011 |

## Table A.7: Fama-MacBeth regressions: Intensive & Extensive Margin LFT, no opposite trades

This table presents results of Fama-MacBeth regressions of quarterly returns on characteristics. Each quarter, returns are regressed on LFT (model 1), market beta (model 2), book-to-market, size, return over months $t-13$ to $t-2$ (model 3), the change in number of hedge funds holding the stock divided by the total number of funds in the sample (Δ Breadth (%), Chen et al. (2001)), and the change in percentage of market capitalization held by hedge funds (Δ Residual all (%)) outside that captured by LFT (model 4), and the percentage of average daily trading volume of stocks held by hedge funds (Days-ADV) (model 5). Firms with LFT equal to zero are included to improve precision. Panel A presents results using the continuous LFT measure. Panel B presents similar results where LFT is replaced by two dummy variables, one for positive LFT (+ve) and one for negative LFT (-ve). P-values are given in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fama-MacBeth

| | Constant | sorting variable (%) | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV |
|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.456** | 0.355*** | | | | | | | |
| | (0.048) | (0.009) | | | | | | | |
| (2) | 1.987* | 0.320** | 0.477 | | | | | | |
| | (0.053) | (0.024) | (0.566) | | | | | | |
| (3) | 2.689** | 0.333** | 0.180 | -0.002 | -0.082 | -0.008 | | | |
| | (0.016) | (0.016) | (0.781) | (0.658) | (0.421) | (0.396) | | | |
| (4) | 2.647** | 0.125 | 0.195 | -0.002 | -0.081 | -0.008 | 0.316*** | 0.158*** | |
| | (0.020) | (0.367) | (0.765) | (0.697) | (0.422) | (0.378) | (0.000) | (0.000) | |
| (5) | 2.450** | 0.123 | 0.199 | -0.002 | -0.067 | -0.008 | 0.315*** | 0.157*** | 0.006* |
| | (0.031) | (0.379) | (0.761) | (0.673) | (0.513) | (0.372) | (0.000) | (0.000) | (0.084) |

Panel B: Fama-MacBeth with dummies

| | Constant | +ve | −ve | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV | +ve−−ve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.365** | 0.774*** | -0.279 | | | | | | | | *** |
| | (0.044) | (0.005) | (0.311) | | | | | | | | |
| (2) | 1.912* | 0.658*** | -0.153 | 0.464 | | | | | | | *** |
| | (0.054) | (0.009) | (0.575) | (0.575) | | | | | | | |
| (3) | 2.909*** | 0.760*** | -0.055 | 0.151 | -0.002 | -0.122 | -0.008 | | | | *** |
| | (0.009) | (0.005) | (0.833) | (0.811) | (0.659) | (0.215) | (0.400) | | | | |
| (4) | 2.859** | 0.565** | 0.095 | 0.170 | -0.002 | -0.120 | -0.008 | 0.286*** | 0.153*** | | *** |
| | (0.012) | (0.035) | (0.714) | (0.791) | (0.698) | (0.219) | (0.390) | (0.000) | (0.000) | | |
| (5) | 2.656** | 0.557** | 0.091 | 0.175 | -0.002 | -0.106 | -0.008 | 0.285*** | 0.151*** | 0.006* | *** |
| | (0.019) | (0.038) | (0.725) | (0.785) | (0.674) | (0.288) | (0.383) | (0.000) | (0.000) | (0.072) | |

## Table A.8: Fama-MacBeth regressions: Intensive & Extensive Margin Unanimous LFT

This table presents results of Fama-MacBeth regressions of quarterly returns on characteristics. Each quarter, returns are regressed on LFT (model 1), market beta (model 2), book-to-market, size, return over months $t-13$ to $t-2$ (model 3), the change in number of hedge funds holding the stock divided by the total number of funds in the sample (Δ Breadth (%), Chen et al. (2001)), and the change in percentage of market capitalization held by hedge funds (Δ Residual all (%)) outside that captured by LFT (model 4), and the percentage of average daily trading volume of stocks held by hedge funds (Days-ADV) (model 5). Firms with LFT equal to zero are included to improve precision. Panel A presents results using the continuous LFT measure. Panel B presents similar results where LFT is replaced by two dummy variables, one for positive LFT (+ve) and one for negative LFT (-ve). P-values are given in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fama-MacBeth

| | Constant | sorting variable (%) | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV |
|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.456** | 0.327** | | | | | | | |
| | (0.048) | (0.015) | | | | | | | |
| (2) | 1.987* | 0.317** | 0.477 | | | | | | |
| | (0.053) | (0.022) | (0.566) | | | | | | |
| (3) | 2.683** | 0.329** | 0.180 | -0.002 | -0.081 | -0.008 | | | |
| | (0.016) | (0.018) | (0.781) | (0.659) | (0.425) | (0.398) | | | |
| (4) | 2.642** | 0.118 | 0.194 | -0.002 | -0.080 | -0.008 | 0.316*** | 0.159*** | |
| | (0.020) | (0.387) | (0.766) | (0.698) | (0.425) | (0.380) | (0.000) | (0.000) | |
| (5) | 2.445** | 0.115 | 0.198 | -0.002 | -0.067 | -0.008 | 0.315*** | 0.158*** | 0.006* |
| | (0.031) | (0.402) | (0.761) | (0.674) | (0.516) | (0.373) | (0.000) | (0.000) | (0.084) |

Panel B: Fama-MacBeth with dummies

| | Constant | +ve | −ve | Beta | Book-to-Market (%) | log(Market equity) | 12-month return (%) | Δ Breadth (%) | ΔResidual all (%) | Days-ADV | +ve−−ve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | 2.366** | 0.747*** | -0.263 | | | | | | | | *** |
| | (0.044) | (0.006) | (0.339) | | | | | | | | |
| (2) | 1.914* | 0.637** | -0.139 | 0.465 | | | | | | | *** |
| | (0.054) | (0.010) | (0.615) | (0.575) | | | | | | | |
| (3) | 2.908*** | 0.737*** | -0.040 | 0.152 | -0.002 | -0.122 | -0.008 | | | | *** |
| | (0.009) | (0.006) | (0.878) | (0.811) | (0.655) | (0.216) | (0.400) | | | | |
| (4) | 2.860** | 0.543** | 0.109 | 0.170 | -0.002 | -0.119 | -0.008 | 0.288*** | 0.153*** | | ** |
| | (0.012) | (0.041) | (0.673) | (0.791) | (0.694) | (0.220) | (0.389) | (0.000) | (0.000) | | |
| (5) | 2.657** | 0.535** | 0.106 | 0.175 | -0.002 | -0.105 | -0.008 | 0.287*** | 0.152*** | 0.006* | ** |
| | (0.019) | (0.044) | (0.683) | (0.785) | (0.669) | (0.288) | (0.383) | (0.000) | (0.000) | (0.073) | |

## Table A.9: Unconditional double sorts based on market capitalization

This table reports average monthly excess returns and alphas in percent. Stocks are sorted into terciles (low, medium, and high) based on market capitalization. Stocks are also sorted into quartiles based on LFT. Each sort is not dependent on the other. Portfolio 1 and 2 contain stocks with negative values of LFT, which is the largest percentage of market capitalization purchased (positive values) or sold (negative values) by a hedge fund family via unanimous entry into (exit from) the stock. Portfolios 3 and 4 contain stocks with positive values of LFT. Portfolio 4-1 is the long-short portfolio; long portfolio 4 (largest positive LFT values) and short portfolio 1 (largest negative LFT values). Only stocks with non-zero values for LFT are included. Portfolio returns are calculated using equal (value) weights in Panel A (B). The portfolio is formed on a quarterly basis at the end of March, June, September, and December based on 13F filings and is held for three months. The sample period is 2004 to 2017. *3-Factor* is the Fama and French (1993) model. *4-Factor* is the Carhart (1997) model. *5-Factor* is the Carhart (1997) model plus the liquidity factor of Pástor and Stambaugh (2003). *7-Factor* is the *5-Factor* model plus the RMW and CMA factors of Fama and French (2015). *8-Factor* is the *7-Factor* model plus the crowdedness factor of Brown et al. (2022). P-values calculated with Newey-West (three lags) corrected standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equal weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 0.336 | 0.300 | 0.622 | 0.721 | 0.942* | 0.769 | 0.606 | 0.470 |
| | (0.527) | (0.612) | (0.194) | (0.219) | (0.097) | (0.209) | (0.455) | (0.428) |
| Two-month holding period | | | | | | | | |
| 4–1 | 0.900** | 1.003*** | 0.853*** | 0.752** | 0.930** | 0.759* | 0.030 | -0.244 |
| | (0.017) | (0.001) | (0.008) | (0.030) | (0.017) | (0.089) | (0.957) | (0.630) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.707** | 0.755*** | 0.551** | 0.413 | 0.459 | 0.250 | -0.248 | -0.505 |
| | (0.015) | (0.010) | (0.040) | (0.155) | (0.151) | (0.397) | (0.569) | (0.200) |

Panel B: Value weighted

| | Low | | Medium | | High | | High-Low | |
|---|---|---|---|---|---|---|---|---|
| Portfolio | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor | Excess | 8-Factor |
| One-month holding period | | | | | | | | |
| 4–1 | 0.264 | 0.242 | 0.424 | 0.476 | 1.218 | 0.979 | 0.954 | 0.737 |
| | (0.637) | (0.621) | (0.393) | (0.456) | (0.104) | (0.115) | (0.338) | (0.228) |
| Two-month holding period | | | | | | | | |
| 4–1 | 0.686* | 0.723** | 0.734** | 0.668** | 1.290*** | 0.974** | 0.604 | 0.250 |
| | (0.067) | (0.022) | (0.022) | (0.027) | (0.008) | (0.045) | (0.328) | (0.683) |
| Three-month holding period | | | | | | | | |
| 4–1 | 0.486 | 0.425 | 0.526** | 0.417 | 0.720* | 0.464 | 0.234 | 0.039 |
| | (0.102) | (0.178) | (0.045) | (0.115) | (0.056) | (0.146) | (0.631) | (0.934) |