Internet Appendix to "Who Drove and Burst the Tech Bubble?"*

This appendix includes supplemental data facts, analyses, tables, and figures. Sections A to I provide supplemental details on data construction and measures used in the published paper. Section J presents supplemental analyses on the relations between investor imbalances and stock returns at the cross-sectional and market levels. The contents of Figures IA.1 to IA.15 and Tables IA.I to IA.IX are discussed but not reported in detail in the published paper, and the contents of Figures IB.1 and IB.2 and Tables IB.I and IB.II are discussed in the Internet Appendix. Figures IB.3 to IB.13 and Tables IB.III to IB.IX are supplemental results not mentioned in the paper or the Internet Appendix.

More specifically, the organization of the Internet Appendix is as follows:

* Citation format: Griffin, John M., Jeffrey H. Harris, Tao Shu, and Selim Topaloglu, 2011, Internet Appendix to "Who Drove and Burst the Tech Bubble?" *Journal of Finance* 66, 1251-1290, http://www.afajof.org/supplements.asp. Please note: Wiley-Blackwell is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries (other than missing material) should be directed to the authors of the article.

A. Composition of the Technology Sector for Quarterly Analysis

We apply the following sample selection criteria for our quarterly analyses using the full sample of NASDAQ technology firms. 1) We include IPOs issued during quarter *q* in the sample. When we calculate net buying for IPO quarter *q*, we set initial holdings to zero. 2) For a firm delisted during quarter *q*, we set its quarter-end holdings to zero when we calculate net buying for quarter *q*. We further match delistings with M&A data from SDC to identify cases in which non-technology firms take over technology firms in quarter *q*. For those cases, we multiply their passive holdings (calculation described in Section II.B of the published text) of quarter *q* by one minus the percentage of stock payment. This avoids counting the non-tech stock payment as active selling of technology firms. 3) Typically, each quarter fewer than five firms enter and exit the technology sector because of changes in SIC codes, exchange listing, or share codes. However, in September 2000, 91 (40) firms enter (exit) the sector, mostly due to changing SIC codes. For firms entering (exiting) during quarter *q* due to these changes, we include holdings data for both quarter *q*-1 and quarter *q* to avoid spurious net buying changes driven by changes in the composition of the sector. For some tests we only include firms that are in the technology sector at both the quarter-beginning and the quarter-end. This sample therefore excludes IPOs, delistings, and firms moving into and out of the technology sector over a quarter.

B. Thomson Financial 13f Institutional Holdings Data

We correct Thomson Financial 13f institutional holdings data as follows. 1) We identify stock splits for which Thomson Financial incorrectly changes shares outstanding in quarter *q* even though the split occurs in quarter *q*+1 by comparing shares outstanding from Thomson Financial and CRSP. When deviations greater than 15% exist, we examine 13f holdings for consistency. When both Thomson shares outstanding and 13f holdings are inflated, we assume consistency within Thomson and hence that percentage ownership is not affected.[1] When only Thomson shares outstanding are inflated (0.3% of observations), we use CRSP shares outstanding. 2) If an institution reports holdings in quarters *q*-1 and

q+1 but not in quarter *q* (3.3% of observations), we backfill positions in quarter *q* using shares held and change in shares reported in quarter *q*+1. 3) Many institutions are improperly classified into the "others" group in 1998 and beyond. For example, in the first quarter of 1999, the number of independent investment advisors drops from 1,159 to 183, while "others" jumps from 242 to 1,125. We therefore ignore institution type changes in 1998 and beyond if the new institution type is listed as "others." For hedge funds our primary means of identification is a grouping from LionShares with the addition of 306 firms from Griffin and Xu (2009).[2]

C. NASDAQ Trading Data

In the NASDAQ trading data, each side of the trade is classified as to whether the market maker is trading for its own account (as a principal) or handling a trade for a brokerage client (as an agent). The data include both trades reported "to the tape" and unreported NASDAQ clearing records. We check for consistency between the reported and unreported records when assigning whether a market maker acted as a principal or an agent for each leg of the trade. We exclude unclassified trades that are inconsistently reported in any leg of the routing report. Additionally, we use unreported records to trace electronic communication network (ECN) and regional exchange trades back to the originating broker, where possible. For example, if a client at brokerage A buys through an ECN and meets a client from brokerage B, then the trade can be matched as a brokerage A (client buy) to brokerage B (client sell) trade. Unfortunately, we are unable to match parties in some ECN and regional exchange trades, likely because the data do not include complete details related to clearing (based on investigating unmatched ECN trades and consulting with NASDAQ officials). For technology stocks, there are 5.51% client-to-client, 57.62% client-to-market maker, 9.38% market maker-to-market maker, 18.65% unmatched ECN, and 8.84% unclassified trades in terms of value. In our analysis, we focus on client trades and only use client-to-client and client-to-market maker trades.

Excluding unmatched ECN trades will not affect the overall trading imbalance of a group unless that particular group systematically uses ECNs for either buying or selling stocks. It is reasonable to assume that no group routes orders on only one side of the market to ECNs, but we also check for robustness by including unmatched ECN and regional exchange trades in the analysis. This approach barely alters our findings on institutional trading. In addition, for eight of the nine investor groups, imbalances measured with or without unmatched ECN and regional exchange trades are highly correlated (above 0.75) with the exception of day traders, consistent with the propensity of day traders to use ECNs. However, when we exclude unmatched ECN trades, we find that day traders trade with short-term momentum (consistent with Battalio, Hatch, and Jennings (1997) and Harris and Schultz (1998)), suggesting that our data set is reasonably representative of day trader positions as well.

D. Merged Mutual Fund Sample

We obtain Thomson Financial N-30D data on fund number, investment objective, report date, CUSIP, shares held, and change in shares since last report. We include stocks with ordinary common shares (CRSP share codes 10 or 11) listed on NYSE, Amex, or NASDAQ. We delete 8.35% of observations for which the difference between shares held for the current report and shares held for the previous report is not equal to the change in shares since the last report after controlling for stock splits using CRSP split factors. We refer to the remaining observations as the mutual fund holdings data. For 98.24% of the observations in the mutual fund holdings data, the report date is the same as the end of the month. For the remaining 1.76% of the observations, we assume that the report date was at the end of the current month if the mutual fund reported after mid-month and at the end of the previous month otherwise.

We obtain monthly data on returns and total net asset values from the CRSP Mutual Funds database and match to mutual fund holdings using Mutual Fund Links. We require that data on mutual fund returns and assets be available for all classes of the fund for all months between the previous and

current reports. Based on the dollar value of holdings, the intersection of N-30D holdings and CRSP return and asset data is 54.64% of mutual fund holdings data. We then take the subset of funds that report at consecutive quarter-ends so that the timing of our mutual fund data matches quarterly 13f institutional holdings data, leaving our final sample at 22.58% of mutual fund holdings data. We extrapolate the flows for this subset to the aggregate 13f mutual fund sector as we discuss below. Using the whole intersection (54.64%) for robustness yields proportionally lower flow estimates.[3]

To identify index, sector, and technology funds, we use Standard and Poor's detailed objective name, style name, and specialist name; ICDI's fund objective code; the Wiesenberger objective code; and both CRSP Mutual Funds and Thomson Financial N-30D fund names. We identify a mutual fund as an index fund if Standard and Poor's specialist name includes the keyword "index," the fund name from CRSP Mutual Funds includes one of the keywords "index," "indx," "idx," "dow 30," "100," "500," or "russell 2000," or the Thomson Financial N-30D fund name includes one of the keywords "index" or "indx". We identify sector funds and technology funds in a similar manner and describe details in the header of Figure IA.5.

E. Applying Mutual Fund Flows to 13f Mutual Fund Families

We calculate total flow-induced trading for our merged mutual fund sample and project to aggregate 13f mutual fund families for both technology sector-level and cross-sectional analysis.[4] We first calculate the flow ratio of mutual fund *j* in quarter *q* as

$$FlowRatio_{j,q} = \frac{TNA_{j,q}}{TNA_{j,q-1} \times (1 + R_{j,q})}, \qquad \text{(IA.1)}$$

where $TNA_{j,q}$ is end-of-quarter total net asset value and $R_{j,q}$ is the return during the quarter.

For each firm *i*, we calculate quarterly aggregate flow-induced net buying for the merged mutual fund sample using the formula

$$NBFlows_{i,q}^{Merged} = \frac{\sum_j (Shares_{i,j,q-1} \times FlowRatio_{j,q}) - \sum_j Shares_{i,j,q-1}}{Shrout_{i,q}}, \quad \text{(IA.2)}$$

where $Shares_{i,j,q-1}$ is end-of-quarter shares held and $Shrout_{i,q}$ is end-of-quarter total shares outstanding.

We then compute aggregate flow-induced net buying for the technology sector for our merged mutual fund sample in quarter q, $NBFlows_q^{Merged}$, as the value-weighted average of $NBFlows_{i,q}^{Merged}$, where weights are given by the market capitalization at the end of quarter q. We calculate aggregate flow-induced net buying for the technology sector for 13f mutual fund families as follows:

$$NBFlows_q^{13f} = NBFlows_q^{Merged} \times \frac{Holdings_q^{13f}}{Holdings_q^{Merged}}, \quad \text{(IA.3)}$$

where $Holdings_q^{13f}$ and $Holdings_q^{Merged}$ are the end-of-quarter total dollar value of holdings in the technology sector for 13f mutual fund families and the merged mutual fund sample, respectively. For demand analysis in dollar values (Figure 2 of the published text), we further convert $NBFlows_q^{13f}$ into a dollar amount by multiplying by total market capitalization of the technology sector at the end of quarter q.

This approach projects the impact of flows for the merged mutual fund sample to 13f mutual fund families based on the ratio of technology holdings of 13f fund families and the merged fund sample. For example, for any quarter q if aggregate flow-induced net buying of the merged mutual fund sample is 0.2% of the market capitalization of the technology sector, and if the holdings in the technology sector of 13f mutual fund families is five times that of the merged mutual fund sample, then our approach will calculate flow-induced net buying of 13f mutual fund families to be 1%.

For event studies around individual stock peaks (Figure 7 of the published text), we calculate flow-induced net buying for event firms in the same way as above except that: 1) for each event quarter q, we calculate $NBFlows_q^{Merged}$ as the simple average of the flow-induced buying of each event firm i,

$NBFlows_{i,q}^{Merged}$; and 2) in equation (5) we use the ratio of total dollar holdings in event firms rather than total dollar holdings in the technology sector.

For cross-sectional analysis (Table II of the published text) we calculate flow-induced net buying for individual firms in the same way except that we convert flow-induced net buying of the merged mutual fund sample for firm *i*, $NBFlows_{i,q}^{Merged}$, to 13f mutual fund families using the ratio of total dollar holdings in firm *i* at the beginning of quarter *q*. We winsorize flow-induced net buying of individual firms at the 99.9% cutoff point to eliminate a small number of outliers.

F. Flows for 13f Institution Types Other Than Mutual Funds

We estimate flows into 13f institutions other than mutual funds using quarterly holdings and stock returns, first calculating the flow ratio for 13f institution *k* in quarter *q* using the following formula:

$$FlowRatio_{k,q} = \frac{\sum_i Holdings_{i,k,q}}{\sum_i (Holdings_{i,k,q-1} \times (1 + R_{i,q}))}, \quad \text{(IA.4)}$$

where $Holdings_{i,k,q}$ is the end-of-quarter dollar value of holdings in stock *i* for 13f institution *k* and $R_{i,q}$ is the buy-and-hold return on stock *i* during quarter *q*. To control for outliers we winsorize flow ratios at the 5th and 95th percentiles.[5] We then decompose quarterly net buying of 13f institution *k* in stock *i* over quarter *q* into flow-induced net buying $NBFlows_{i,k,q}$ and net active buying $NetActiveBuying_{i,k,q}$:

$$NBFlows_{i,k,q} = \frac{Holdings_{i,k,q-1} \times (1 + R_{i,q}) \times (FlowRatio_{k,q} - 1)}{MV_{i,q}} \quad \text{(IA.5)}$$

$$NetActiveBuying_{i,k,q} = \frac{Holdings_{i,k,q} - (Holdings_{i,k,q-1} \times (1 + R_{i,q}) \times FlowRatio_{k,q})}{MV_{i,q}}, \quad \text{(IA.6)}$$

where $MV_{i,q}$ is the market capitalization of stock *i* at the end of quarter *q*.

We recognize that these flows will be noisy if the manager trades during the quarter or switches money between stock and non-stock sectors. We find that these flows are small (see Figure IB.1). Hence,

unless otherwise stated, we set flow-induced net buying to zero for institution types other than mutual funds.

G. Flow-induced Net Buying for AMG Technology and Aggressive Growth Funds

We obtain aggregate weekly dollar flows and asset values for technology and aggressive growth mutual funds from AMG Data Services. During the 1997 to 2002 period, AMG technology (aggressive growth) funds account for 69% (65%) of total assets of technology (aggressive growth) funds on average. We calculate flow-induced net buying for AMG funds using the following three steps. First, we calculate portfolio weights in technology stocks for technology and aggressive growth funds in the Thomson Financial N-30D database. We identify technology funds as funds with "internet" or "tech" (but not "biotech") in their names and aggressive growth funds as those that are classified by Thomson as aggressive growth funds. We then compute portfolio weights in the technology sector for aggregate technology (aggressive growth) funds in each quarter. Second, we calculate flow-induced net buying of the technology sector for AMG funds assuming that managers distribute flows proportionally to the current portfolio. Specifically, we calculate weekly flow-induced net buying for technology (aggressive growth) funds as the product of total dollar flows of AMG technology (aggressive growth) funds and technology sector portfolio weights for technology (aggressive growth) funds at the beginning of the current quarter. Third, we generalize AMG results to all technology (aggressive growth) funds assuming that non-AMG technology (aggressive growth) funds trade like AMG funds and divide weekly flow-induced net buying of technology (aggressive growth) funds by 0.69 (0.65) to express net buying as a percentage of total market capitalization of the technology sector.

H. News Articles on Technology Stocks

We manually search the Factiva database and obtain all news articles on firms in the technology sector from January 1, 1997 to December 31, 2002. Following Tetlock, Saar-Tsechansky, and Macskassy

(2008), we require that each story contain at least 50 words and mention the firm's name at least once within the first 25 words and at least twice within the full article. We account for name changes, mergers, etc. using the Factiva company name search function. We perform tests using news articles from top 10 newswires, which account for 94% of news with time stamps. The top 10 newswires are Business Wire, PR Newswire, Dow Jones News Service, Reuters News, Federal Filings Newswires, Professional Investor Report, Dow Jones Business News, Select Federal Filings Newswires, Associated Press Newswires, and Dow Jones Online News. We include news articles from all sources for robustness tests.

I. Components of Supply

We calculate quarterly changes in the supply of technology shares as follows. 1) IPOs: For technology IPOs issued during a quarter, the change in supply is calculated as the total market capitalization of IPO firms at the end of the quarter (excluding insider ownership). 2) Delistings: For technology firms delisted during a quarter, we first calculate delisting value as the product of the firm's market capitalization at the beginning of the quarter (excluding insider ownership) and buy-and-hold returns from the beginning of the quarter to the delisting date. We incorporate delisting returns into the delisting value following Shumway (1997) and assign -30% to a missing delisting return if the delisting is performance related. We then calculate the change in supply as the total value of all technology delistings over the quarter. 3) Trading by insiders: For every existing technology firm, we calculate the dollar value of insider trading as the product of change in shares held by insiders over the quarter (adjusted for stock splits) and quarter-end stock price. We then calculate the change in supply as the sum of the dollar value of insider trading for all technology firms. Insider selling is reported as a positive change in supply and insider buying is reported as a negative change in supply. 4) Changes in shares outstanding for existing firms: For every existing technology firm, we first calculate the dollar change as the product of change in shares outstanding over the quarter (adjusted for stock splits) and quarter-end stock price. We then calculate the change in supply as the sum of dollar changes for all technology firms. We further classify

this category into four subgroups using SDC data: i) share repurchases, ii) technology firms using stock payments to acquire interest in other firms, iii) SEOs, and iv) other share changes.

We use the following procedures to match CRSP changes in shares outstanding with the four subgroups:

Step 1: We first obtain SDC data on repurchases and match with negative share changes. For each repurchase, we take all the negative share changes from CRSP in the 90-day window from the repurchase date and calculate for each negative share change the percentage deviation from the repurchase value or shares in SDC. When both SDC repurchase value and shares are available, we calculate deviations from both and count the smaller of the two. We then match the repurchase with the negative share change that has the smallest deviation. If a repurchase is followed by another repurchase of the same firm within 90 days, we use the time window between the repurchase and the next repurchase date. We match 27 repurchases with share changes.

Step 2: We next obtain SDC data on technology SEOs and mergers (or acquiring interests) that involve stock payments from a technology firm. The latter group includes acquiring major interests with disclosed value and minor interests where acquirers are technology firms. We calculate the amount of stock payments using SDC deal values and percentage of stock payments. When an acquirer conducts more than one merger on the same day, we sum the values of the stock payments. We then match 122 SEOs and 606 (603 acquiring major interests and three acquiring minor interests) stock payments with positive share changes in the 90-day post-event window using the same approach as for matching repurchases.

Step 3: We obtain mergers from SDC with undisclosed deal values. Since their deal values and therefore the amount of stock payments are not available, we match them with CRSP share changes that are not matched with events in steps 1 and 2. Specifically, for each event we take all the positive share changes that are unmatched with SEO or stock payments in the 90-day post-event window. If the biggest percentage change in shares is above 5%, we match it to the merger with undisclosed value. We

match 78 undisclosed mergers with share changes, which are relatively smaller deals than those with disclosed values. For robustness, we also repeat the tests by dropping undisclosed mergers; the results are very similar.

The category "other share changes" includes all other changes in shares outstanding that are not matched with SDC events. There are a large number of these changes but the magnitudes are small (the median change is 0.4% of shares outstanding, and the 75th percentile is 1.5%), which is consistent with insiders exercising options over the bubble period. We lump repurchases with "other share changes" for brevity because repurchases are rare over this period.

J. Investor Imbalances and Stock Returns: Cross-sectional and Market-level Evidence

This section presents our analyses on which investor groups move with and follow prices both in the cross-section and at the technology sector level, predominantly at short-term frequencies, during the run-up period.

J.1. Cross-sectional Evidence

In addition to the cross-sectional analyses regarding news articles by sorting and regressions, we also examine investor trading in the cross-section by sorting on contemporaneous and past returns.

The sorting approach allows for asymmetric behavior in response to up and down price moves and an examination of the magnitude of trading. During the run-up period from January 1997 to March 27, 2000 we examine average investor imbalances in technology stocks sorted by contemporaneous and lagged daily stock returns. In Panel A of Table IB.I, we report daily trading imbalances by market capitalization quartile for the nine investor groups for stocks with negative and positive contemporaneous returns in excess of the technology index return.

For small stocks, all individual investor groups trade in the same direction as contemporaneous returns. Likewise, institutions buy contemporaneous winners and sell contemporaneous losers in the smallest size quartile, with this pattern strengthening with an increase in market capitalization. In the

largest size quartile, for stocks with positive returns, for instance, the net buying of four institutional groups totals 2.55 one-hundredths of a percent of shares outstanding or 1.86% of daily trading volume. In contrast, institutional groups in aggregate sell 2.31 one-hundredths of a percent for stocks with negative returns, which accounts for 2.04% of daily trading volume.[6]

Interesting differences emerge among individual investors for large firms, with day traders and the individual general group trading in the same direction as returns while individual discount and full-service brokerage clients trade in the opposite direction. This net selling pattern is consistent with trades motivated by the disposition effect (Grinblatt and Keloharju (2001)), individual investors using passive limit orders that are executed when prices move quickly (Linnainmaa (2010)), and individuals supplying liquidity (Kaniel, Saar, and Titman (2008)). Among institutional groups, hedge funds and derivatives traders also provide liquidity in large winners but the three largest investment banks (where most of the hedge fund order flow is cleared) move strongly with contemporaneous returns.

Panel B of Table IB.I shows that individuals chase past returns in the smallest two size quartiles. For the largest two quartiles individuals become contrarians to past returns, whereas institutions chase past stock price movements. The magnitude of past return chasing is much smaller than the contemporaneous relation.

Panel C presents investor imbalances across contemporaneous excess returns at the weekly level. Institutions move with contemporaneous returns, especially in large stocks. In contrast, individuals move with contemporaneous returns in the smallest size quartile but move against contemporaneous returns in the two largest size quartiles. Panel D further shows that investor responses to lagged returns at the weekly level are consistent with daily patterns. In the top two size quartiles, institutions chase the previous week's returns while individuals are contrarians.[7]

J.2. Technology Sector-level Evidence

Market or sector-level trading patterns could differ significantly from cross-sectional trading patterns. For example, if institutions or individuals shuffle investments across technology stocks while

keeping total technology investments fixed, one would see little relation between cross-sectional and aggregate technology trading patterns. Therefore, we further analyze investor trading at the aggregate technology sector level.

We first use sorts to examine the contemporaneous and lagged relation between technology index movements and aggregate investor trading at the daily and weekly frequencies. We divide all trading days during the run-up period into four groups—those with index returns below -2.5%, above 2.5%, and two intermediate return intervals. Panel A of Figure IB.2 shows daily aggregate imbalances across contemporaneous value-weighted technology returns. Institutions, largest investment banks, hedge funds, day traders, and mixed brokerage clients exhibit strong positive relations with contemporaneous technology returns. However, the magnitudes of these relations vary considerably. Hedge fund imbalances are noticeably smaller than others because of their generally smaller trading volume. The largest investment bank clients sell with the greatest intensity on down days. In contrast, aggregate net buying of discount brokerage clients and to a lesser extent full-service investors is negatively related with technology index returns. Panel A also presents weekly net trading activity sorted on contemporaneous weekly returns. Similar to the daily analysis, institutions and the largest investment bank clients move with contemporaneous index returns while discount brokerage clients move against index returns.

Panel B of Figure IB.2 presents aggregate imbalances sorted on lagged daily and weekly index returns. For all investor groups except general institutions, daily net buying activity conditioned on lagged index returns is less pronounced than that conditioned on contemporaneous returns. Individuals generally buy slightly more in response to lagged negative returns.[8] Institutions, the largest investment bank clients, and, to a much lesser extent, the mixed group respond positively to lagged daily technology index returns. At the weekly level, however, institutions are contrarians with respect to the previous week's returns.

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Footnotes

[1] Thomson reports change in shares held ('CHANGE' variable) for quarter *q* calculated as the difference between holdings for quarters *q* and *q*-1 adjusting for stock splits. By matching quarterly changes with quarterly holdings, we infer (and adjust for) erroneously inflated quarterly holdings due to stock splits that actually occurred in a later quarter.

[2] We thank Christian Tiu for compiling an additional sample of hedge fund firms using predominantly FactSet's LionShares but also a few firms indentified by Stephanie Sikes through ADV forms.

[3] We repeat our test in Figure 2 using all funds with holdings and flow data and find that total flow-induced trading from January 1997 to March 2000 is 80.62% of the flow-induced trading using the sample in Figure 2. To include funds that do not report at consecutive quarter-ends, one must make additional assumptions about how holdings change over time. In this case, we assume that flow-induced net buying and net active buying between two reports are evenly spread over the period. Since we project fund flows to 13f fund families reporting on a quarterly basis, we believe the results using the merged mutual fund sample are more accurate and report those in the paper.

[4] The dollar value of holdings for our merged mutual fund sample is 22.65% of 13f mutual fund families (manager type=3).

[5] Since 13f data include stock holdings only, outliers can occur if an institution moves funds from non-stock investments into stocks or vice versa.

[6] Market makers offset these net imbalances out of their inventory. Client imbalances are slightly positive due to unmatched and inconsistently reported trades as discussed in Internet Appendix C.

[7] We also examine imbalances for contemporaneous or lagged firm returns above 2.5% and below -2.5% (see Table IB.II) and find similar results.

[8] Similarly, Dhar and Goetzmann (2006) find that in 1999 and 2000 individual investors are largely contrarian. Shiller (2000) documents that in 1999, 56% (19%) of U.S. individual investors thought that a one-day decline of 3% would be followed by an increase (decrease) in prices − a big change in opinion from 35% (34%) in 1989.

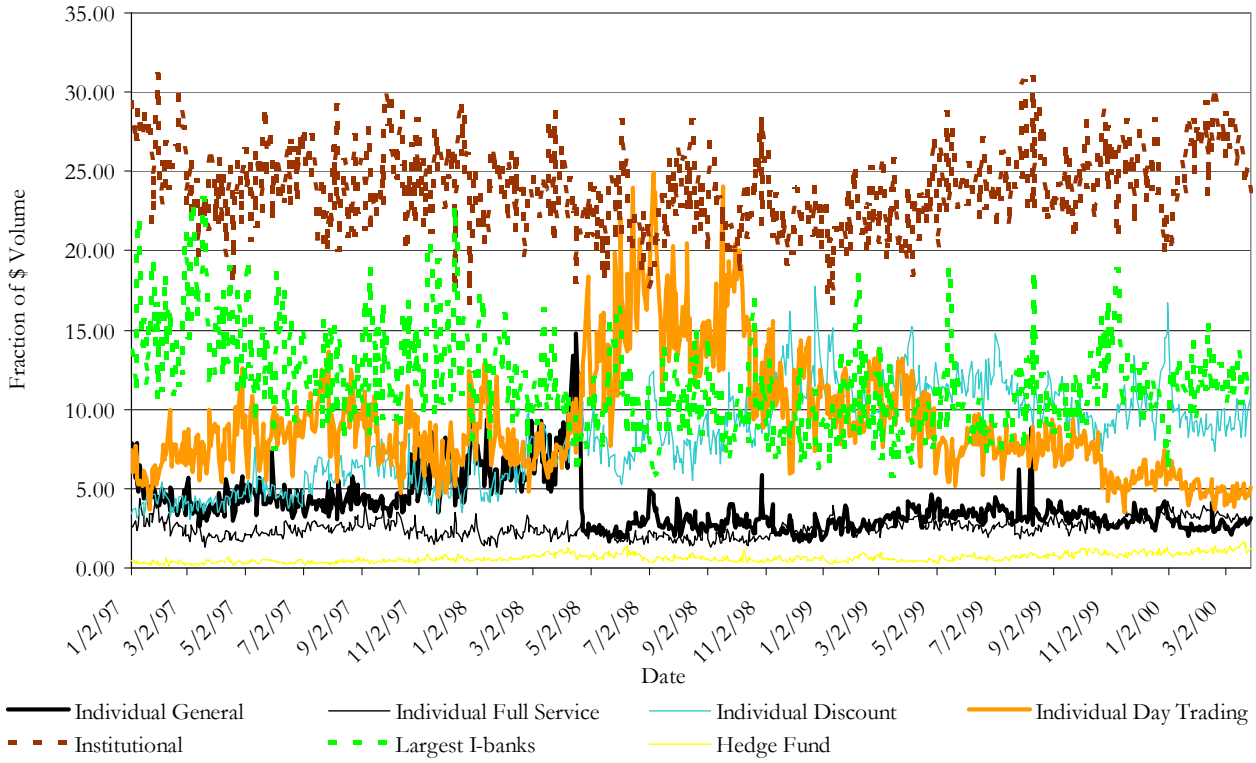


Figure IA.1. Investor trading volume. This figure plots the fraction of the total dollar value of trading ($ volume) for the technology sector that can be attributed to various investor groups for the period from January 2, 1997 to March 27, 2000. The technology sector comprises all NASDAQ stocks with ordinary common shares (CRSP share codes 10 or 11) and three-digit SIC code 737, which stands for computer programming, data processing, and other computer-related services. A detailed description of the method used for classifying the investor groups is in Appendix B of the published text.

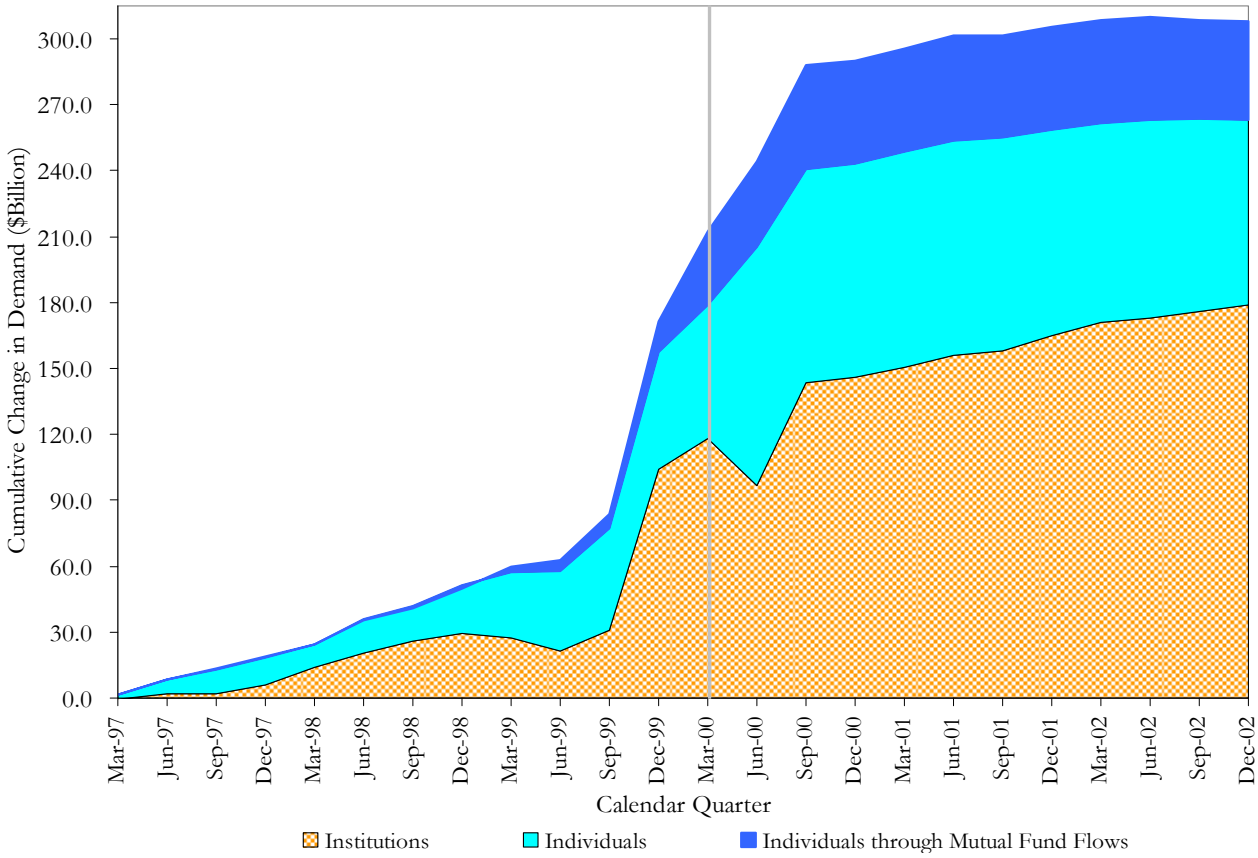


Figure IA.2. Cumulative change in demand for technology stocks: Including IPOs and delistings. We calculate quarterly changes in demand for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. To calculate quarterly change in demand (net active buying) for an investor group, we first take the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. The individual group is net of insiders. We then isolate the change in demand induced by mutual fund flows from the change in demand by institutions. Change in demand induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. We set beginning-of-quarter holdings equal to zero for an IPO issued during the quarter. We set the buy-and-hold value of beginning-of-quarter holdings equal to the product of beginning-of-quarter holdings and the quarterly return until the delisting day (including delisting returns) for a delisting during the quarter. We describe our approach in Internet Appendices A and E.

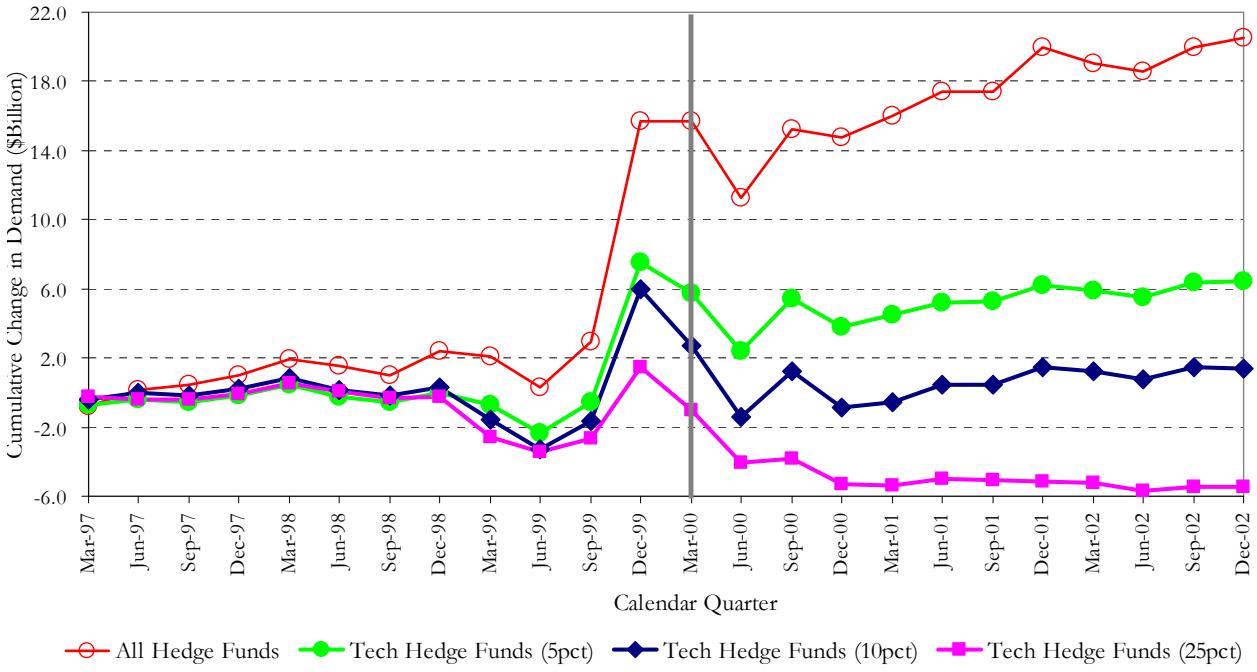


Figure IA.3. Cumulative change in demand for technology stocks: Technology hedge funds. We calculate quarterly changes in demand by technology hedge funds for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. We identify 257 technology hedge funds whose portfolio weights in technology stocks for the first quarter of 1997 (or the first quarter in the 13f sample for a new fund) are higher than the 5th percentile of the corresponding weights for technology mutual funds (Internet Appendix G describes how we identify technology mutual funds). For robustness, we also identify 210 and 94 technology hedge funds using 10th and 25th percentile cutoffs. We also plot cumulative change in demand for the whole hedge fund sample for comparison.

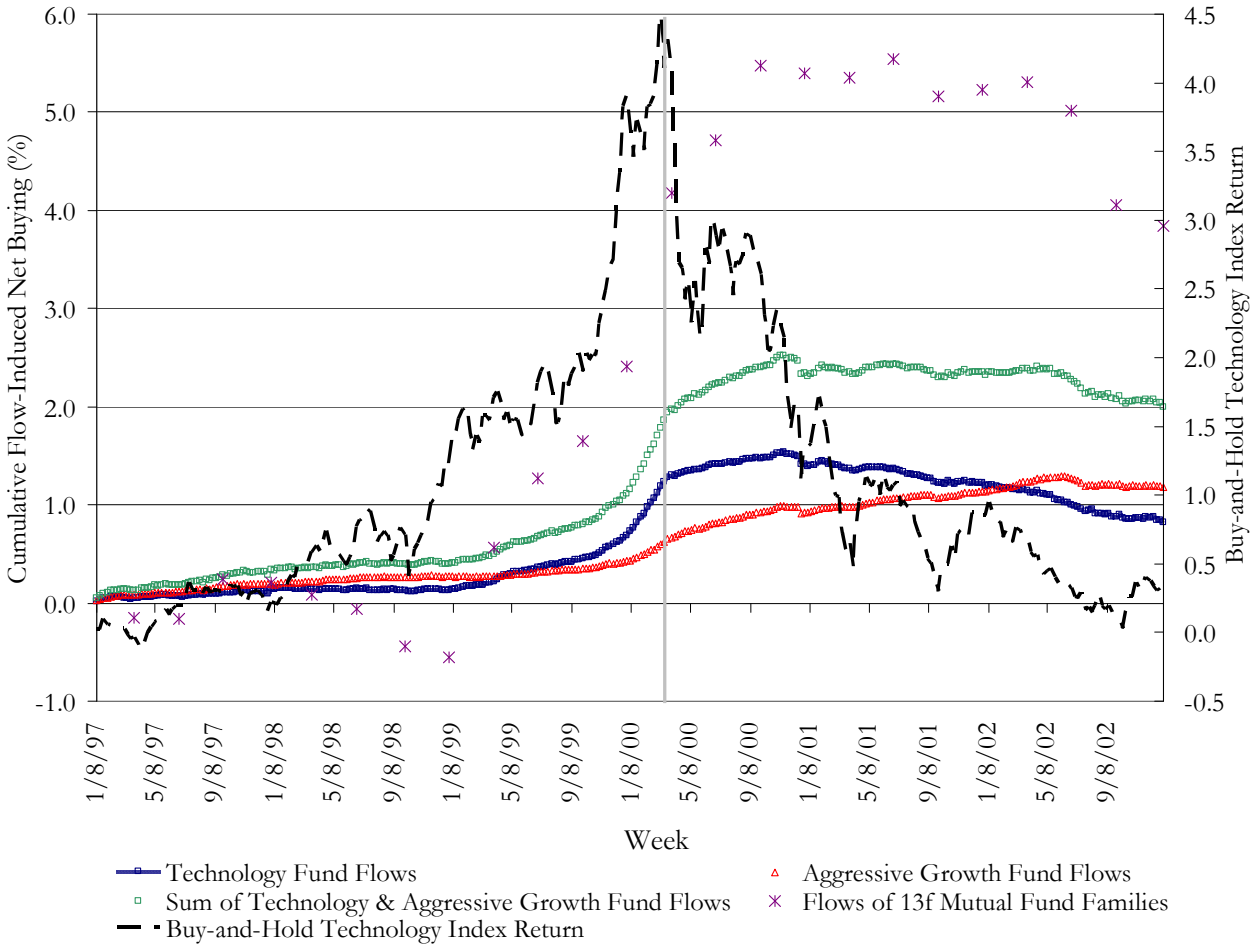


Figure IA.4. Cumulative net buying induced by mutual fund flows. This figure plots cumulative net buying induced by flows of 13f mutual fund families, AMG technology mutual funds (which represent 69% of technology fund assets), and AMG aggressive growth funds (which represent 65% of aggressive growth fund assets) for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. We calculate quarterly net buying induced by flows of 13f mutual fund families, and weekly net buying induced by flows of AMG technology and aggressive growth funds. Quarterly (weekly) flow-induced net buying is expressed as a percentage of total market capitalization of the technology sector at the end of the quarter (week). We then plot cumulative net buying during the 1997 to 2002 period. Details of our calculation of flow-induced net buying are described in Internet Appendices E and G.

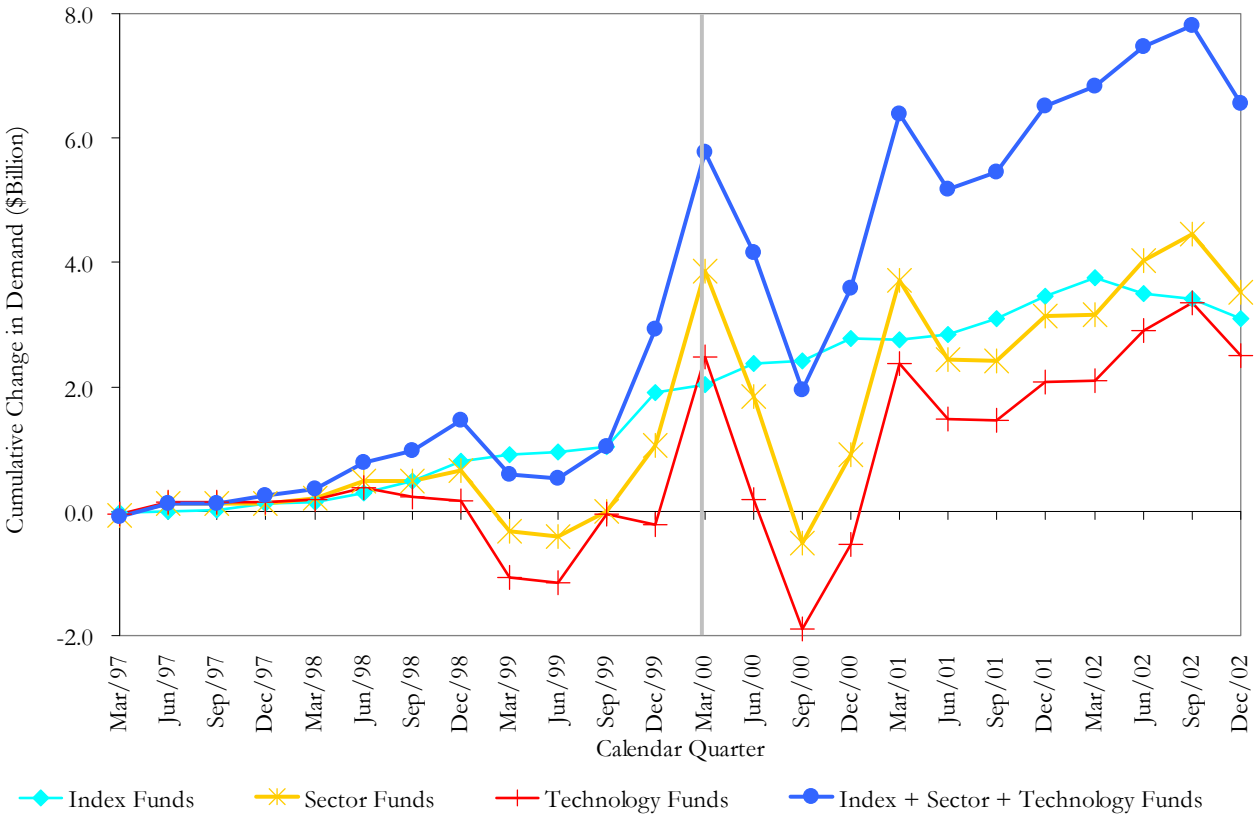


Figure IA.5. Cumulative change in demand for technology stocks: Index mutual funds, sector mutual funds, and technology mutual funds. We calculate quarterly changes in demand for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) for index mutual funds, sector mutual funds, and technology mutual funds during the 1997 to 2002 period. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. We further subtract demand induced by fund flows. Internet Appendix E describes how we calculate flow-induced demand. To identify index, sector, and technology funds, we use Standard and Poor's detailed objective name, style name, and specialist name; ICDI's fund objective code; the Wiesenberger objective code; and fund name variables from the CRSP Mutual Funds database and Thomson Financial N-30D data. We identify a mutual fund as an index fund if Standard and Poor's specialist name variable includes the keyword "index," the fund name from the CRSP Mutual Funds database includes one of the keywords "index," "indx," "idx," "dow 30," "100," "500," or "russell 2000," or the fund name from Thomson Financial N-30D data includes one of the keywords "index" or "indx". We identify a mutual fund as a sector fund if Standard and Poor's detailed objective name variable equals "Equity USA Misc Sectors," Standard and Poor's style name variable equals "Equity Sector," Standard and Poor's specialist name variable equals "Miscellaneous Sector," or ICDI's fund objective code variable equals "SF" (sector funds). We identify a mutual fund as a technology fund if Standard and Poor's detailed objective name variable equals "Equity USA Technology," Standard and Poor's style name variable equals "Equity Information Technology Sector" or "Equity Telecommunications Sector," Standard and Poor's specialist name variable equals "Index ArcaEx Tech 100," "Index GSTI Composite," "Index

MSCI US IM Info Tech," "Index MSCI US IM Telecom Svcs," "Index NYSE Arca Tech 100," "Index PSE Technology 100," "Information Technology," "Internet," "TMT," "TMT (Technology Media & Telecom)," "Technology", or "Telecommunications," the Wiesenberger objective code variable equals "TCH" (technology sector), the fund name from the CRSP Mutual Funds database includes one of the keywords "internet," "technology," or "telecom" but not "biotech," or the fund name from Thomson Financial N-30D data includes the keywords "internet" or "tech" but neither "bio tech" nor "biotech". Since the dollar value of holdings in our merged mutual fund sample is 22.58% of mutual fund holdings in Thomson Financial N-30D data (more details are provided in Internet Appendix D), we further divide demand for each fund type by 22.58% assuming our merged fund sample is representative of the mutual fund universe. We also plot total cumulative change in demand by index, sector, and technology funds.

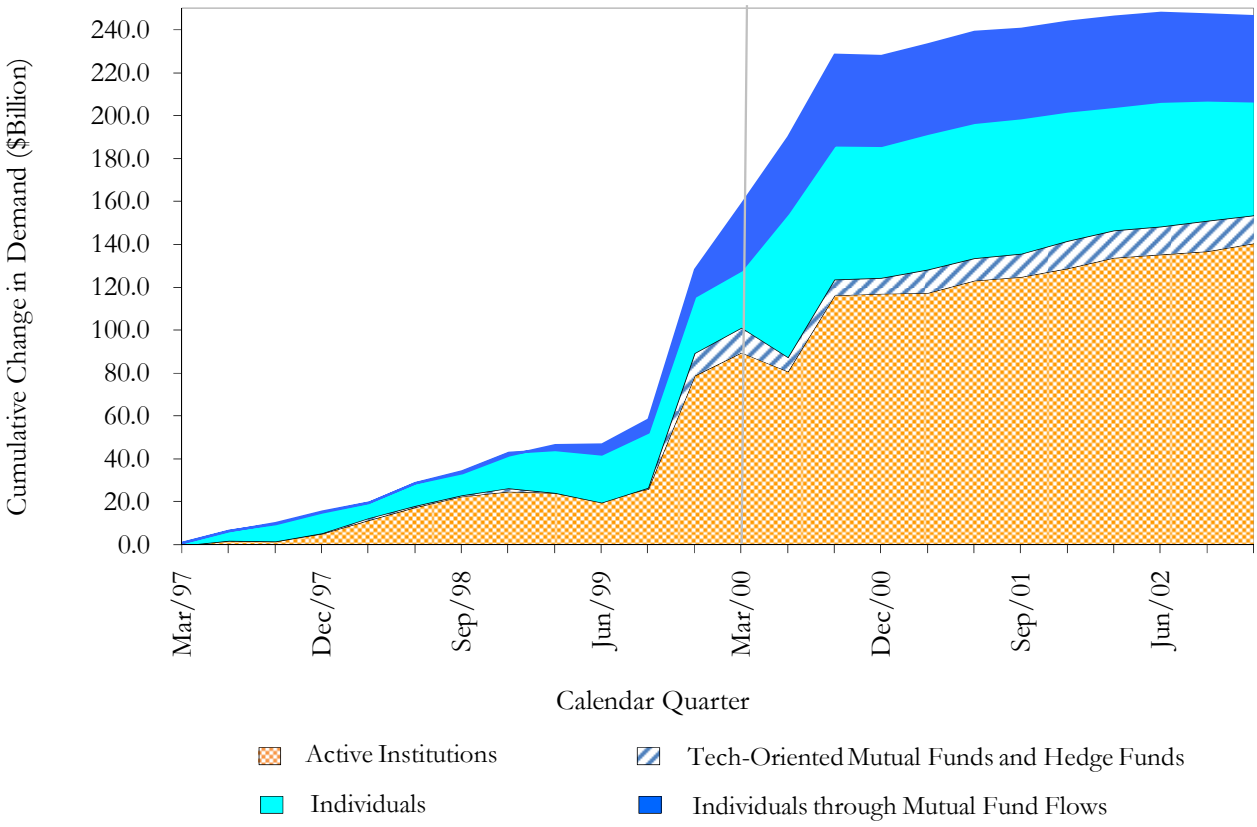


Figure IA.6. Cumulative change in demand for technology stocks: Examining technology-oriented institutions and active institutions separately. We calculate quarterly change in demand for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand for an investor group is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. The individual group is net of insiders. We further isolate the change in demand induced by mutual fund flows from change in demand by technology-oriented mutual funds and hedge funds and change in demand by active institutions. Change in demand induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. We describe the details of our approach in Internet Appendix E. Technology-oriented mutual funds comprise index, sector, and technology funds. To identify such funds, we use Standard and Poor's detailed objective name, style name, specialist name; ICDI's fund objective code; the Wiesenberger objective code; and fund name variables from the CRSP Mutual Funds database and Thomson Financial N-30D data. We identify a mutual fund as an index fund if Standard and Poor's specialist name variable includes the keyword "index," the fund name from the CRSP Mutual Funds database includes one of the keywords "index," "indx," "idx," "dow 30," "100," "500," or "russell 2000," or the fund name from Thomson Financial N-30D data includes one of the keywords "index" or "indx." We identify a mutual fund as a sector fund if Standard and Poor's detailed objective name variable equals "Equity USA Misc Sectors," Standard and Poor's style name variable equals "Equity Sector," Standard and Poor's specialist name variable equals "Miscellaneous Sector," or ICDI's fund

objective code variable equals "SF" (sector funds). We identify a mutual fund as a technology fund if Standard and Poor's detailed objective name variable equals "Equity USA Technology," Standard and Poor's style name variable equals "Equity Information Technology Sector" or "Equity Telecommunications Sector," Standard and Poor's specialist name variable equals "Index ArcaEx Tech 100," "Index GSTI Composite," "Index MSCI US IM Info Tech," "Index MSCI US IM Telecom Svcs," "Index NYSE Arca Tech 100," "Index PSE Technology 100," "Information Technology," "Internet," "TMT," "TMT (Technology Media & Telecom)," "Technology," or "Telecommunications," the Wiesenberger objective code variable equals "TCH" (technology sector), the fund name from the CRSP Mutual Funds database includes one of the keywords "internet," "technology," or "telecom" but not "biotech," or the fund name from Thomson Financial N-30D data includes the keywords "internet" or "tech" but neither "bio tech" nor "biotech". Since the dollar value of holdings in our merged mutual fund sample is 22.58% of mutual fund holdings in Thomson Financial N-30D data (more details are provided in Internet Appendix D), we further divide demand for each fund type by 22.58% assuming our merged fund sample is representative of the mutual fund universe. We identify 257 technology hedge funds whose portfolio weights in technology stocks for the first quarter of 1997 (or the first quarter in the 13f sample for a new fund) are higher than the 5th percentile of the corresponding weights for technology mutual funds. We plot cumulative changes in demand for technology-oriented mutual funds and hedge funds, active institutions, and individuals, and demand induced by mutual fund flows. Active institutions include all institutions other than technology-oriented mutual funds and hedge funds.

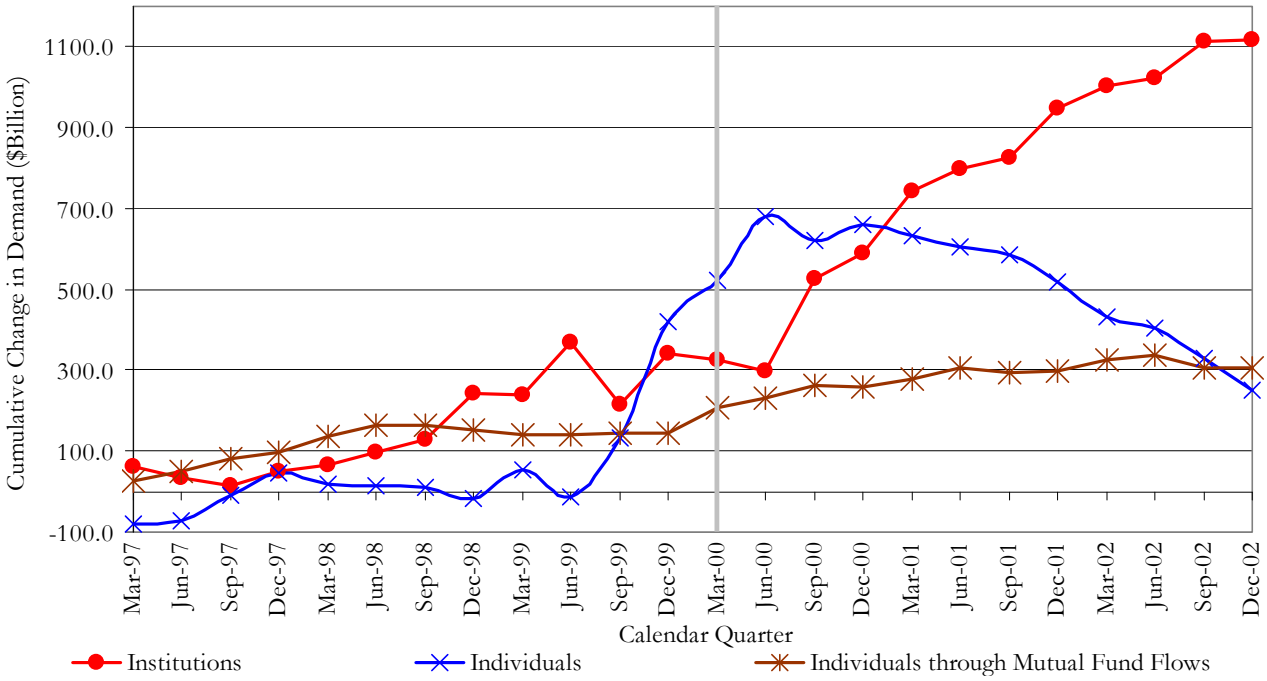
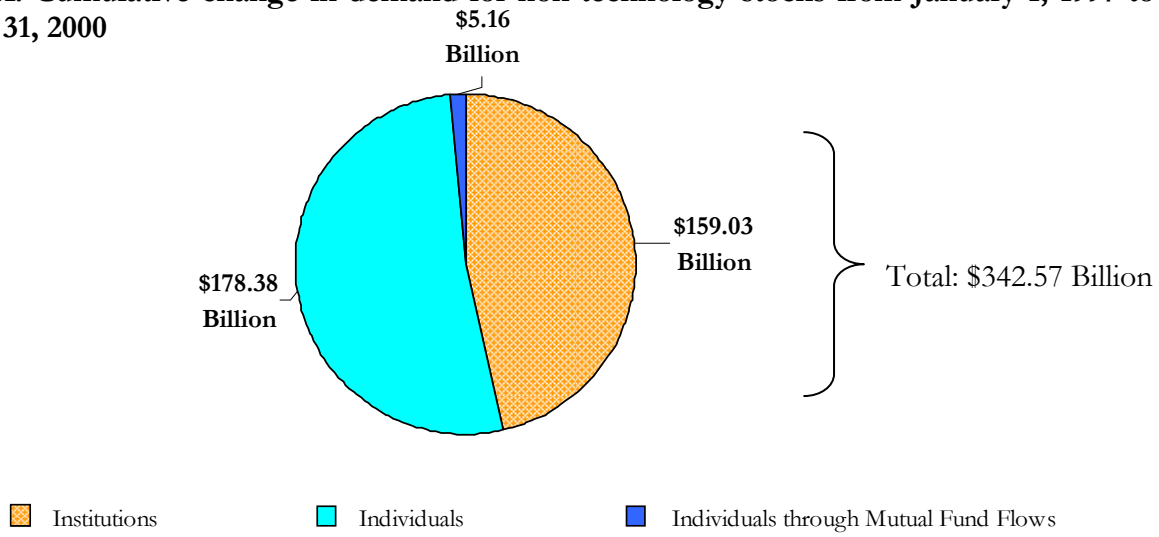


Figure IA.7. Cumulative change in demand for non-technology stocks. We calculate quarterly changes in demand for non-technology stocks (three-digit SIC code≠737 or exchange code≠3) with ordinary common shares during the 1997 to 2002 period. We require a firm to be a non-technology stock at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand for an investor group is the difference between end-of-quarter non-technology holdings and the buy-and-hold value of beginning-of-quarter non-technology holdings. The individual group is net of insiders. We further isolate the change in demand induced by mutual fund flows from change in demand by institutions. Change in demand induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. We describe the details of our approach in Internet Appendix E.

Panel A. Cumulative change in demand for non-technology stocks from January 1, 1997 to March 31, 2000



Panel B. Cumulative change in demand for non-technology stocks from April 1, 2000 to March 31, 2001

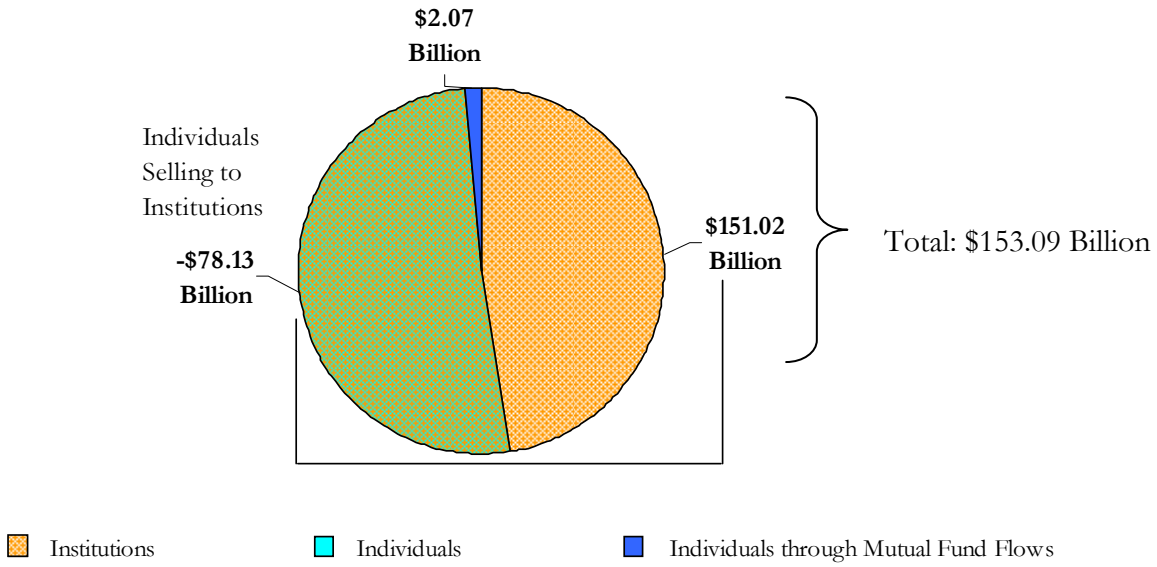


Figure IA.8. Cumulative change in demand for non-technology stocks: Excluding stocks with high P/S ratios. In Panel A, we first calculate quarterly changes in demand from January 1997 to March 2000 for non-technology stocks (three-digit SIC code≠737 or exchange code≠3) with ordinary common shares. We require a firm to be in the non-technology sector at both the beginning and the end of the quarter to be included in the sample. We exclude stocks that are in the top quartile according to the price-to-sales ratio as of March 31, 2000. The price-to-sales ratio as of March 31, 2000 is price per share for March 31, 2000 divided by sales per share for most recent fiscal year-end that is at least six months before March 31, 2000. Quarterly change in demand for non-technology stocks by an investor group is the difference between end-of-quarter non-technology holdings and the buy-and-hold value of beginning-of-quarter non-technology holdings. The individual group is net of insiders. We further isolate the change in demand induced by mutual

fund flows from change in demand by institutions. Change in demand induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. We describe the details of our approach in Internet Appendix E. We then sum the quarterly changes in demand from January 1997 to March 2000. Panel B plots the corresponding changes in demand from April 2000 to March 2001.

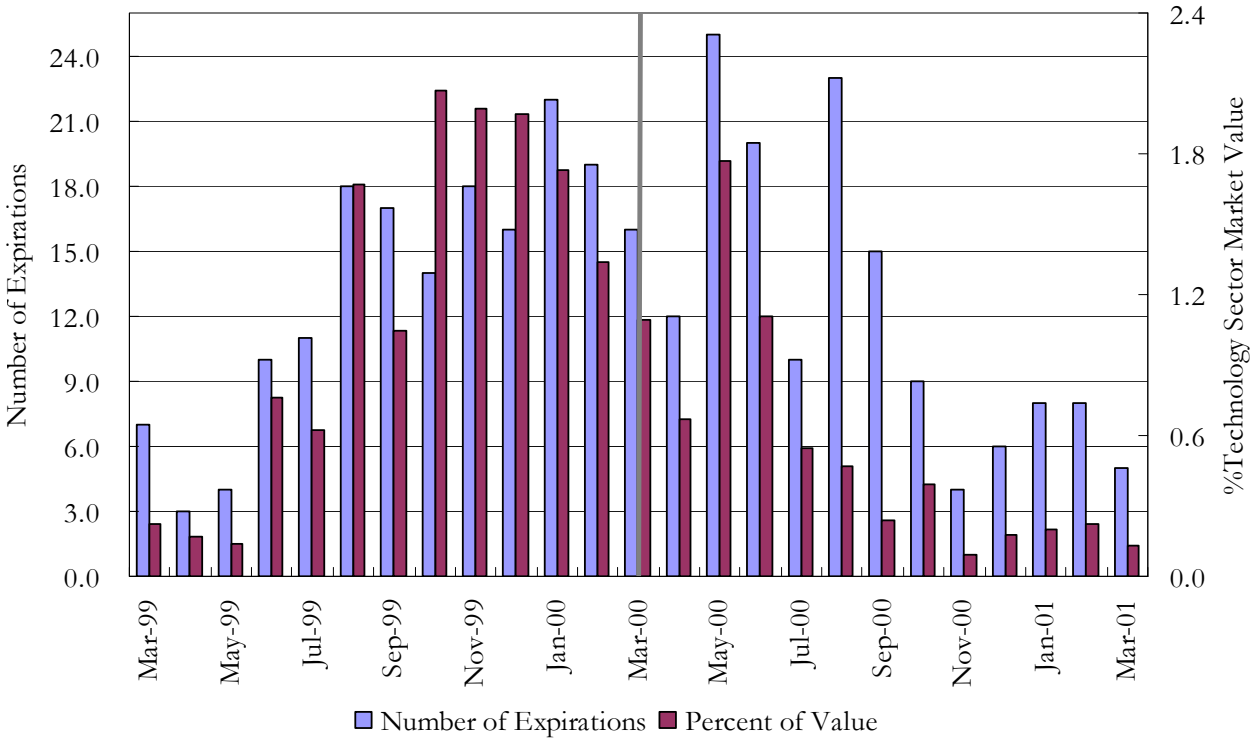
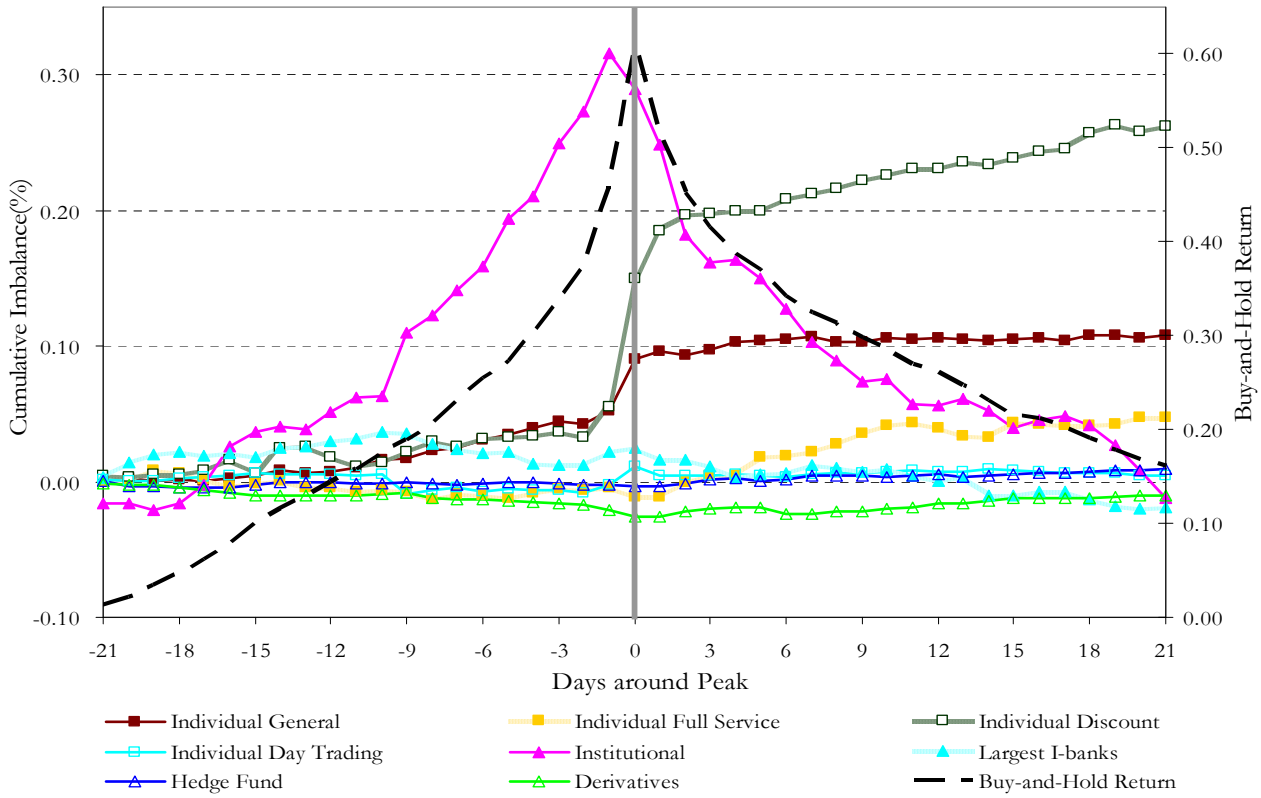
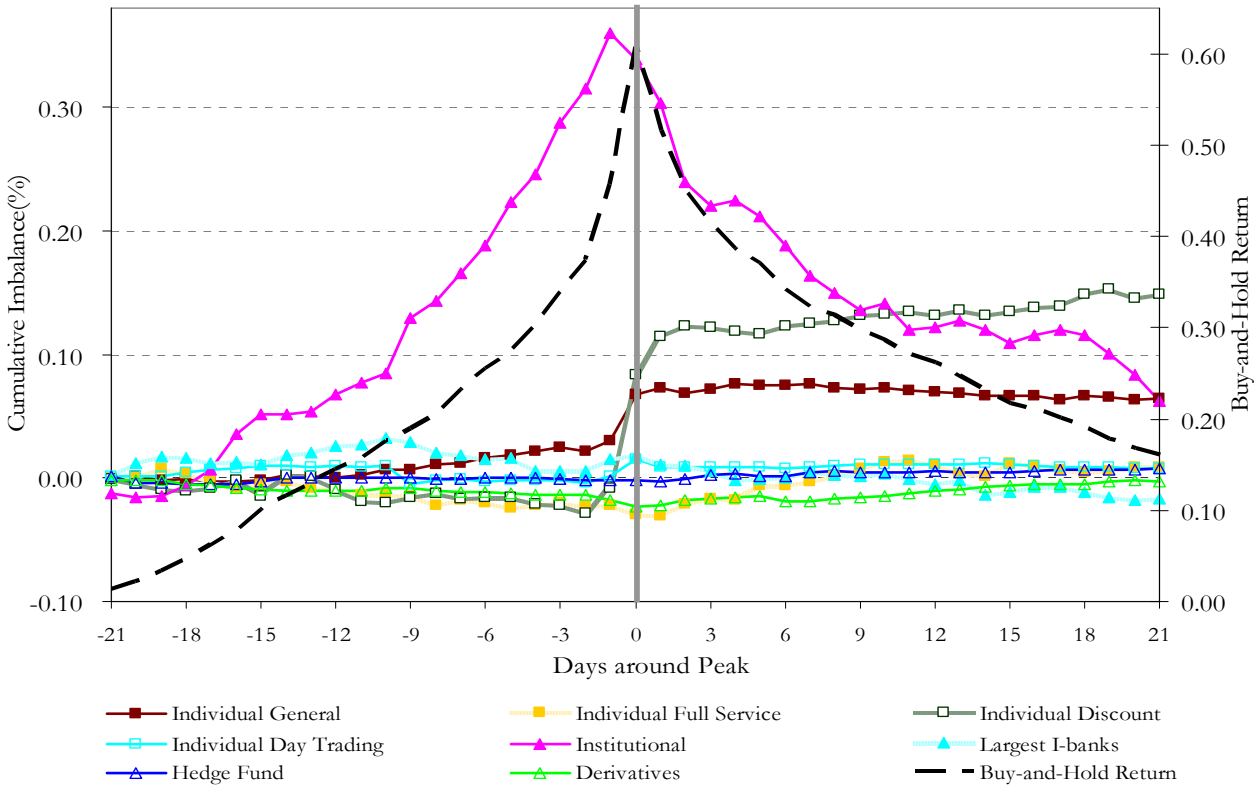


Figure IA.9. Lockup expirations around the market peak. We collect data from SDC on IPO and SEO lockup expirations for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) during the 1997 to 2002 period. We manually search prospectuses through the EDGAR database to confirm the expiration dates and fill in missing data on expiration dates and number of shares subject to lockup. We drop issues with multiple lockup expiration dates or with an offer price less than $5. We plot the total number of IPO and SEO lockup expirations each month during the two-year window around the market peak in March 2000. We also calculate the total daily value of expiring IPO and SEO lockup shares expressed as a percentage of total market capitalization of the technology sector. We then plot the sum of daily values for each month during the two-year window around the market peak.

Panel A. Cumulative size-adjusted imbalances around individual stock peaks: [-21, 21] window



Panel B. Cumulative turnover-adjusted imbalances around individual stock peaks: [-21, 21] window



Panel C. Cumulative imbalances around individual stock peaks: [-60, 60] window

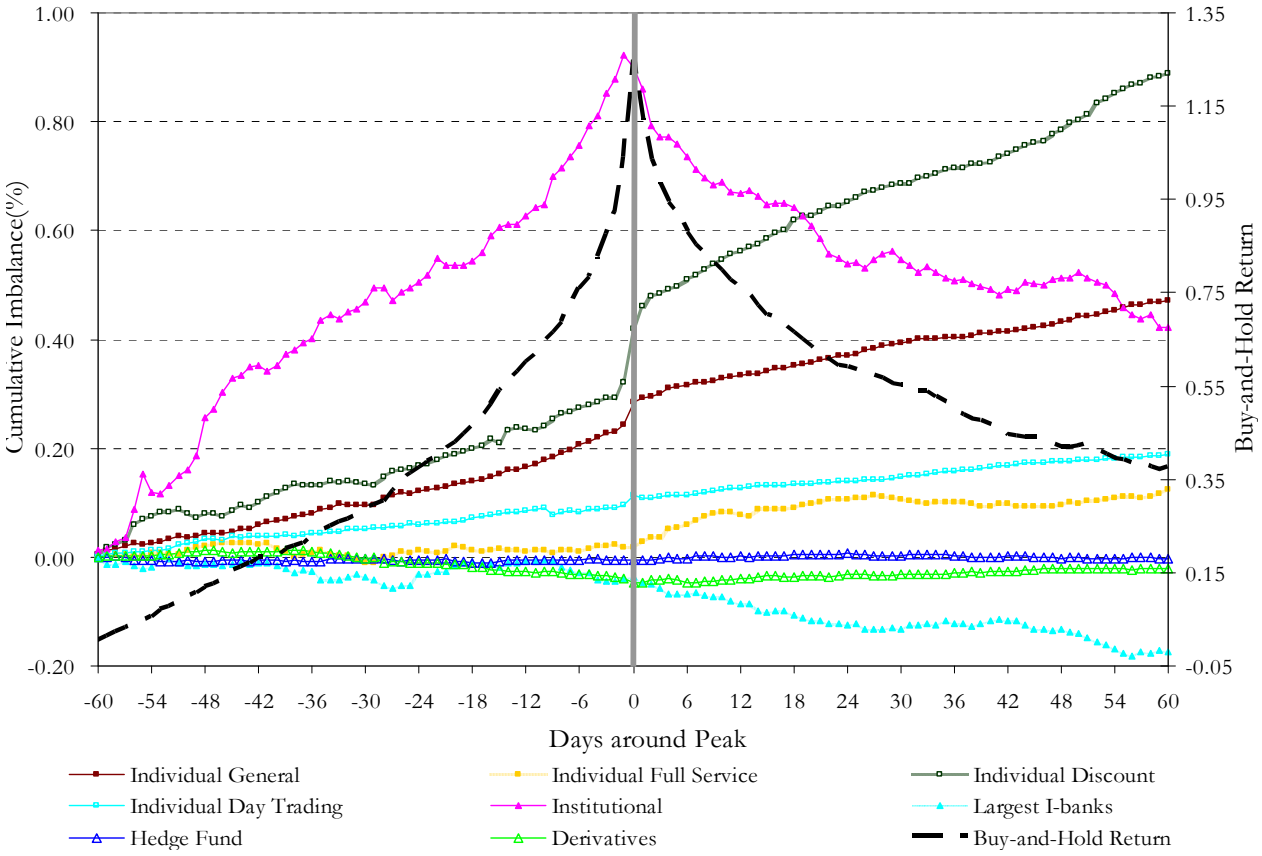


Figure IA.10. Cumulative imbalances around individual stock peaks: Size- and turnover-adjusted imbalances and [-60, 60] window. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. When two stocks peak on the same day, we take the equal-weighted average of the two observations to avoid clustering. This gives us 279 different peak days. We plot the cross-sectional averages of the buy-and-hold return and cumulative imbalances for various investor groups around individual peaks. Panel A plots cumulative size-adjusted imbalances in the [-21, 21] window surrounding individual peaks. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Panel B plots cumulative turnover-adjusted imbalances in the [-21, 21] window surrounding individual peaks. We adjust daily imbalances for turnover by subtracting the average imbalance for the firm's historical turnover quartile in the technology sector. Historical turnover for a stock is sum of the stock's daily turnover in the past 20 trading days. Panel C plots cumulative imbalances in the [-60, 60] window surrounding individual peaks.

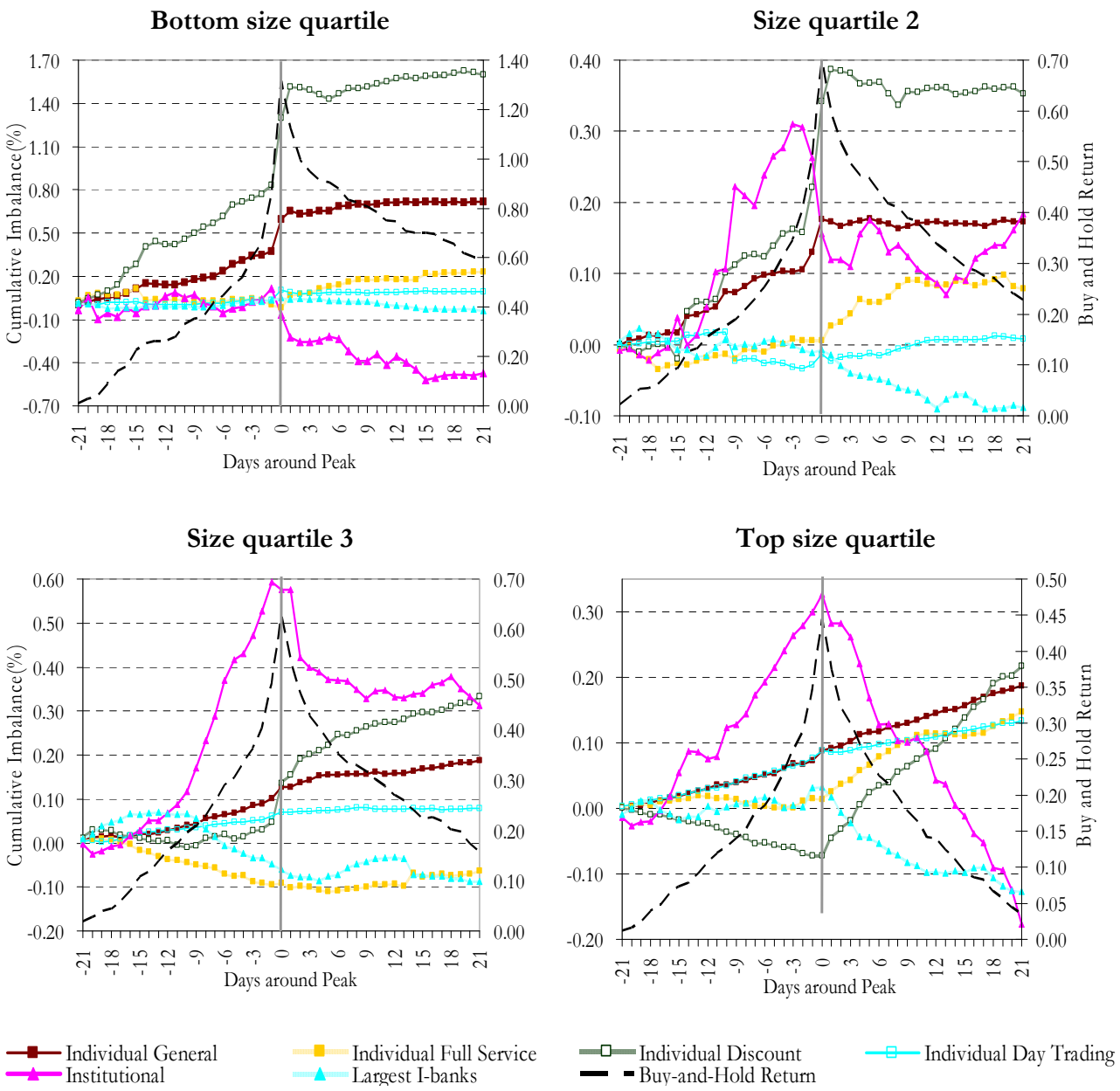


Figure IA.11. Cumulative imbalances around individual stock peaks: Groups of firm size. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. We then assign individual peaks into quartiles based on market capitalization. When two stocks in the same size quartile peak on the same day, we take the equal-weighted average of the two observations to avoid clustering. This figure plots the cross-sectional averages of the buy-and-hold return and cumulative imbalances for various investor groups for 43 trading days surrounding individual peaks for each size quartile. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding.

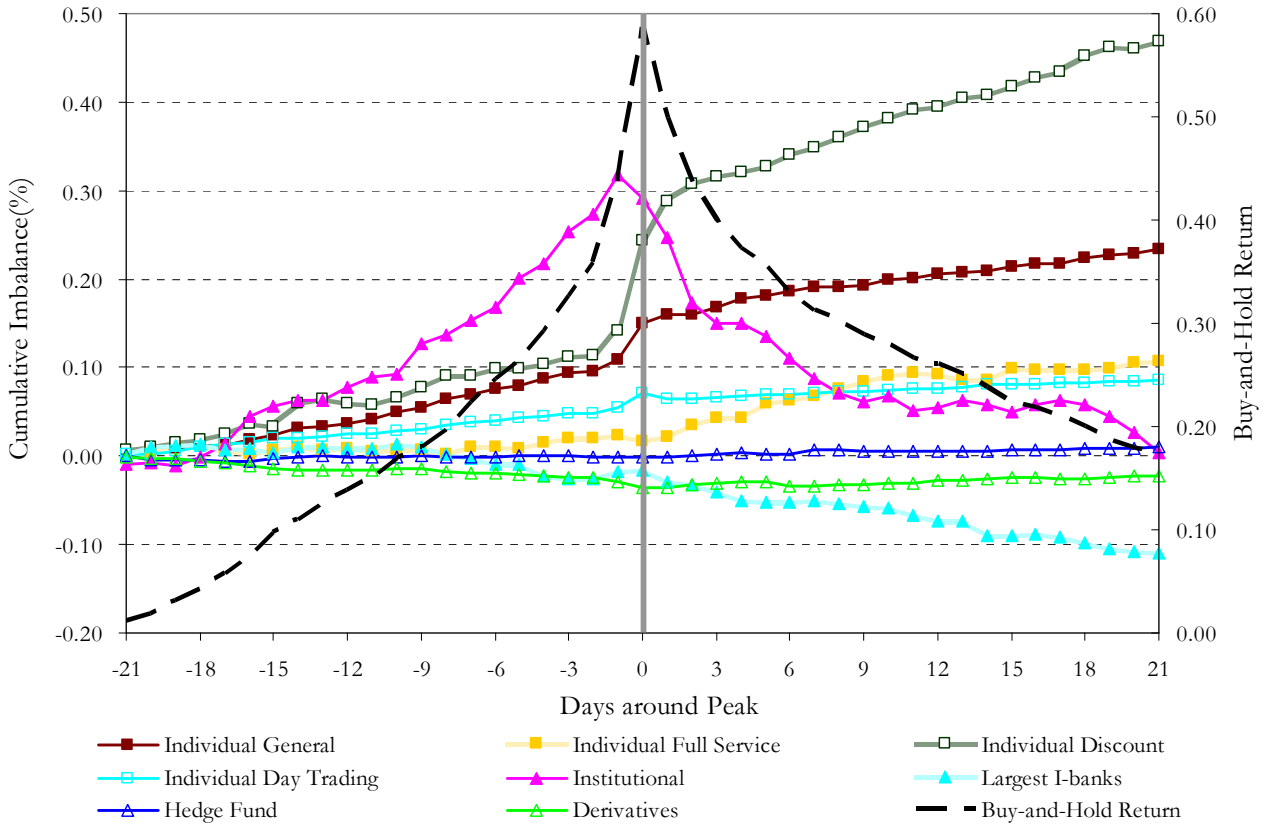
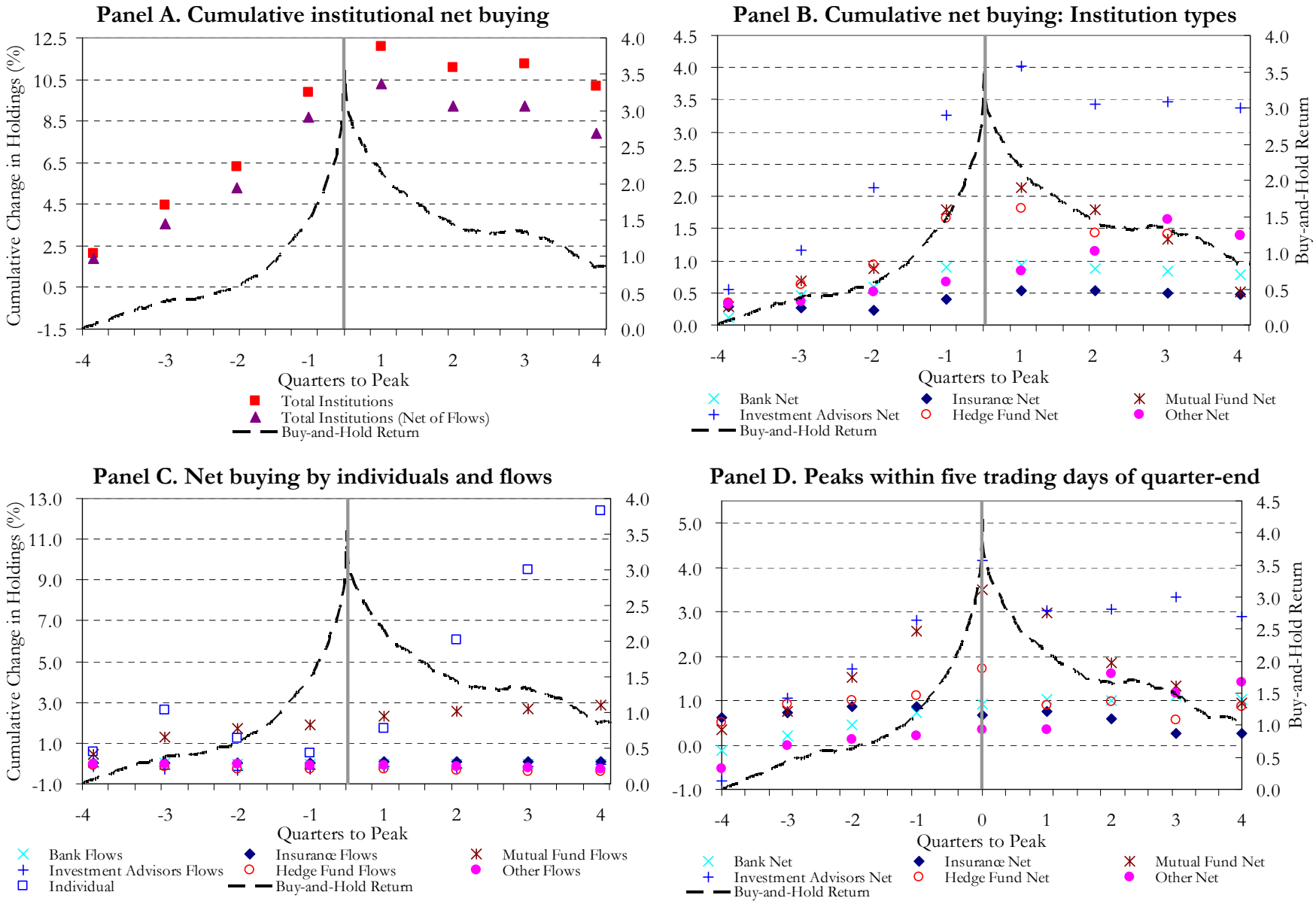


Figure IA.12. Cumulative imbalances around individual stock peaks: [-21, 21] window; excluding peaks in March 2000. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. We also eliminate stocks with peaks in March 2000 to avoid clustering. We are left with 429 stocks. When two stocks peak on the same day, we take the equal-weighted average of the two observations to avoid clustering. This gives us 258 different peak days. This figure plots the cross-sectional averages of the buy-and-hold return and cumulative imbalances for various investor groups for 43 trading days surrounding individual peaks. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding.


Panel A. Cumulative institutional net buying
Cumulative Change in Holdings (%)
Quarters to Peak
Total Institutions
Total Institutions (Net of Flows)
Buy-and-Hold Return
Panel B. Cumulative net buying: Institution types
Buy-and-Hold Return
Quarters to Peak
Bank Net
Investment Advisors Net
Insurance Net
Hedge Fund Net
Mutual Fund Net
Other Net
Buy-and-Hold Return
Panel C. Net buying by individuals and flows
Cumulative Change in Holdings (%)
Quarters to Peak
Bank Flows
Investment Advisors Flows
Individual
Insurance Flows
Hedge Fund Flows
Buy-and-Hold Return
Mutual Fund Flows
Other Flows
Panel D. Peaks within five trading days of quarter-end
Buy-and-Hold Return
Quarters to Peak
Bank Net
Investment Advisors Net
Insurance Net
Hedge Fund Net
Buy-and-Hold Return
Mutual Fund Net
Other Net

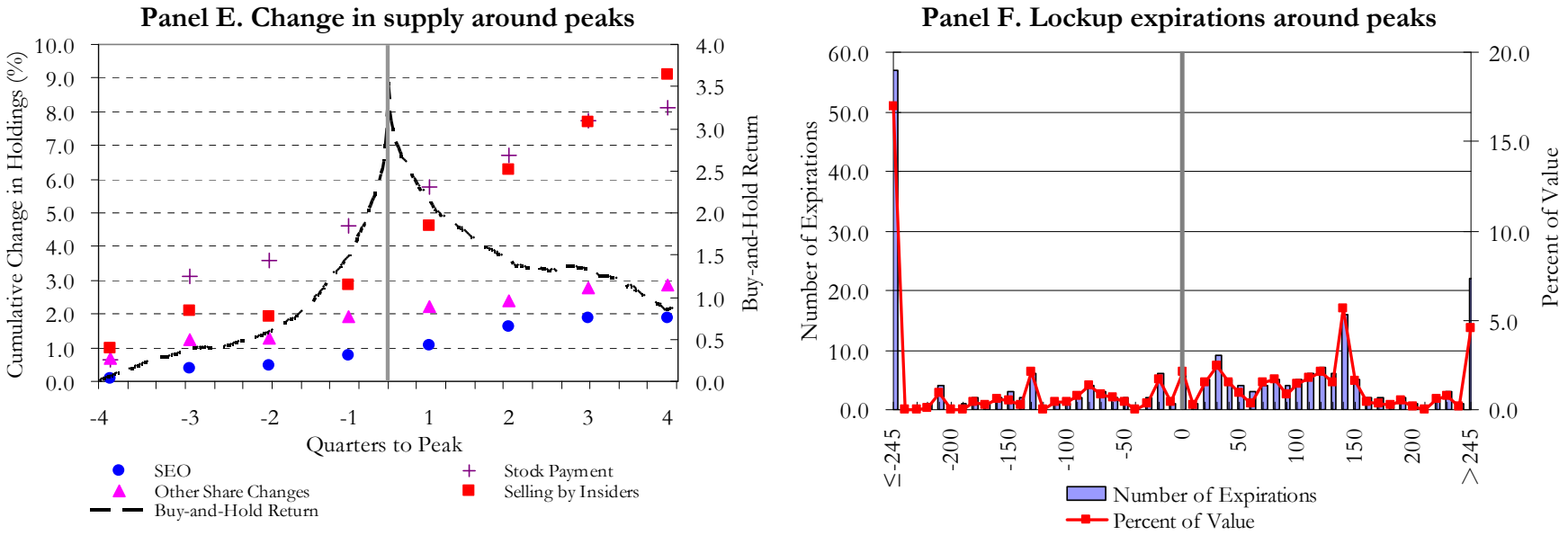
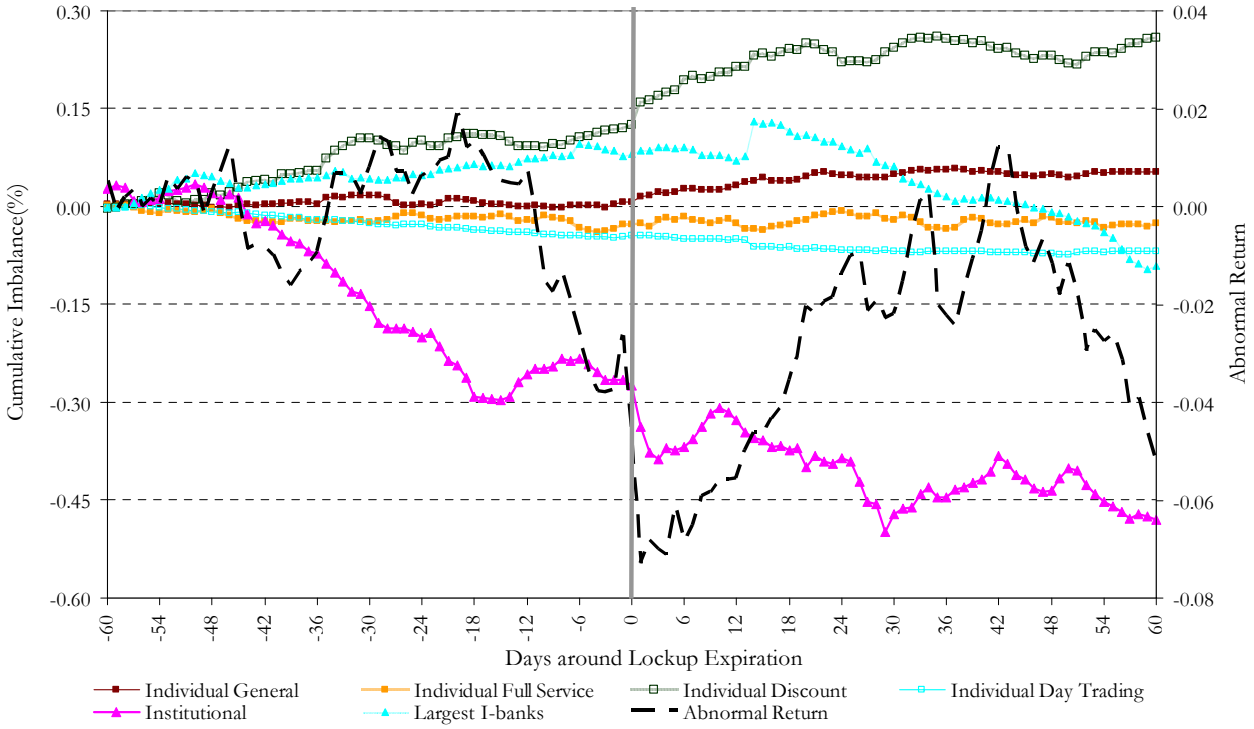


Figure IA.13. Demand and supply around individual stock peaks: Excluding peaks in March 2000. We analyze demand and supply around individual peaks for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the period from January 1997 to December 2000 (excluding March 2000 to avoid clustering). There are 429 technology stock peaks (258 different event days) during this period. When stocks peak in the same quarter, we take the equal-weighted average of the observations. Panel A plots cross-sectional averages of the buy-and-hold return and cumulative net buying for aggregate 13f institutions during the eight quarters surrounding individual peaks. Quarterly institutional net buying for a stock is calculated as the difference between end-of-quarter institutional holdings and the buy-and-hold value of beginning-of-quarter holdings, expressed as a percentage of the stock's market capitalization at the end of quarter. "Total Institutions" is cumulative net buying and "Total Institutions (Net of Flows)" is cumulative net buying minus net buying induced by flows (net active buying). Calculations of flow-induced net buying for mutual funds and other 13f institution types are described in Internet Appendices E and F. Quarter 1 marks the end of the quarter containing the peak, which is on average 33 trading days after the peak for our sample. Quarter -1 marks the end of the quarter prior to the peak. Panel B plots the cumulative net active buying excluding flows for the six 13f institution types. Panel C plots the cumulative net buying induced by flows and by individuals directly. Individual net buying is calculated similar to institutional net buying by using individual ownership (net of insiders). Panel D plots cumulative institutional net active buying around 91 price peaks that occur within five trading days ([-5, 5] window) from the end of a quarter, where quarter 0 refers to the end of the quarter that coincides with the individual price peak. Panel E plots the cumulative change in the supply of shares around individual price peaks due to SEOs, insider selling, stock payments for mergers and acquisitions, and other changes in shares outstanding. Panel F plots the lockup expirations relative to price peaks for the 238 technology firms that have both individual peaks and lockup expirations during the 1997 to 2002 period. Number of lockup expirations at *t* refers to the total number of IPO and SEO lockup expirations during the 10-day window of (*t*-5, *t*+5]. Day 0 refers to the day of the peak. For the amount of lockup expirations at *t*, we first sum for each firm the value of expiring shares during the window (*t*-5, *t*+5] as a percentage of the firm's market capitalization. We then average the amount across event firms.

Panel A. Cumulative imbalances during the [-60, 60] window around IPO lockup expirations



Panel B. Cumulative imbalances during the [-60, 60] window around SEO lockup expirations

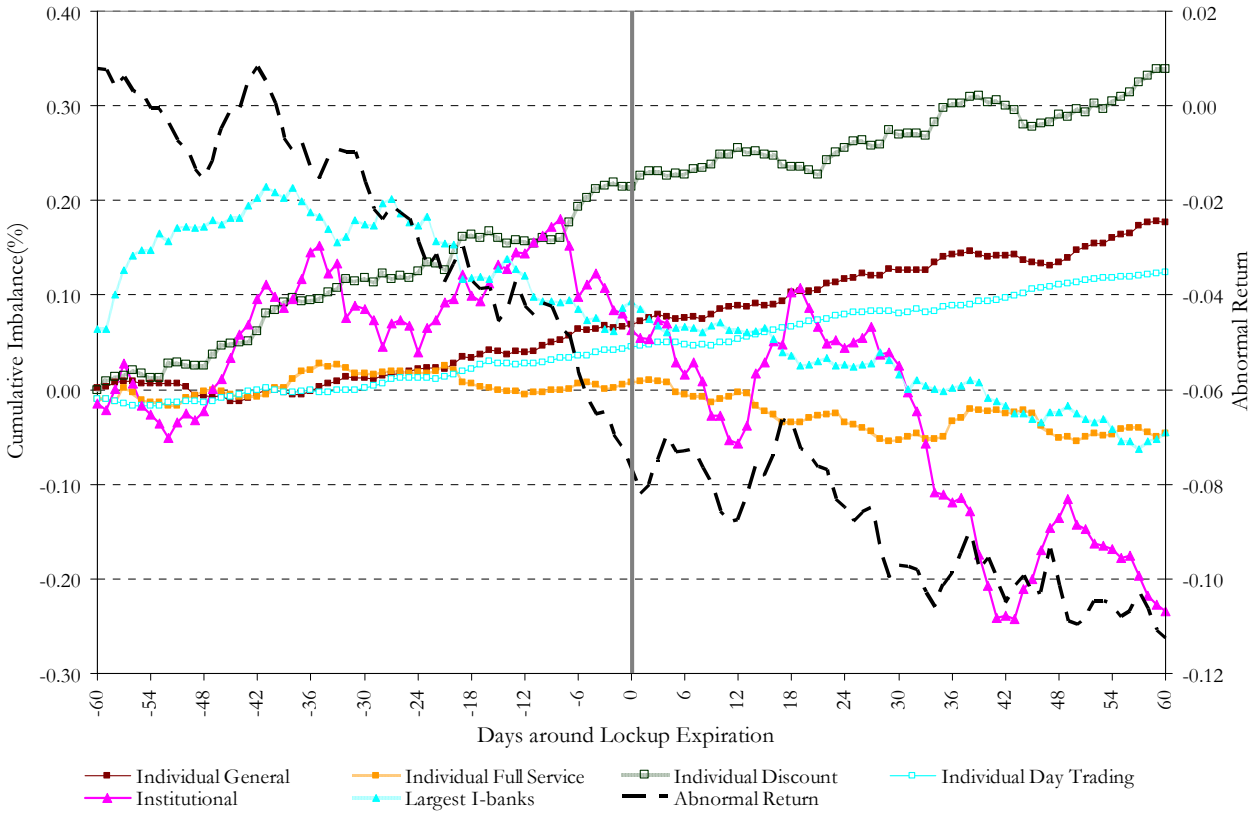
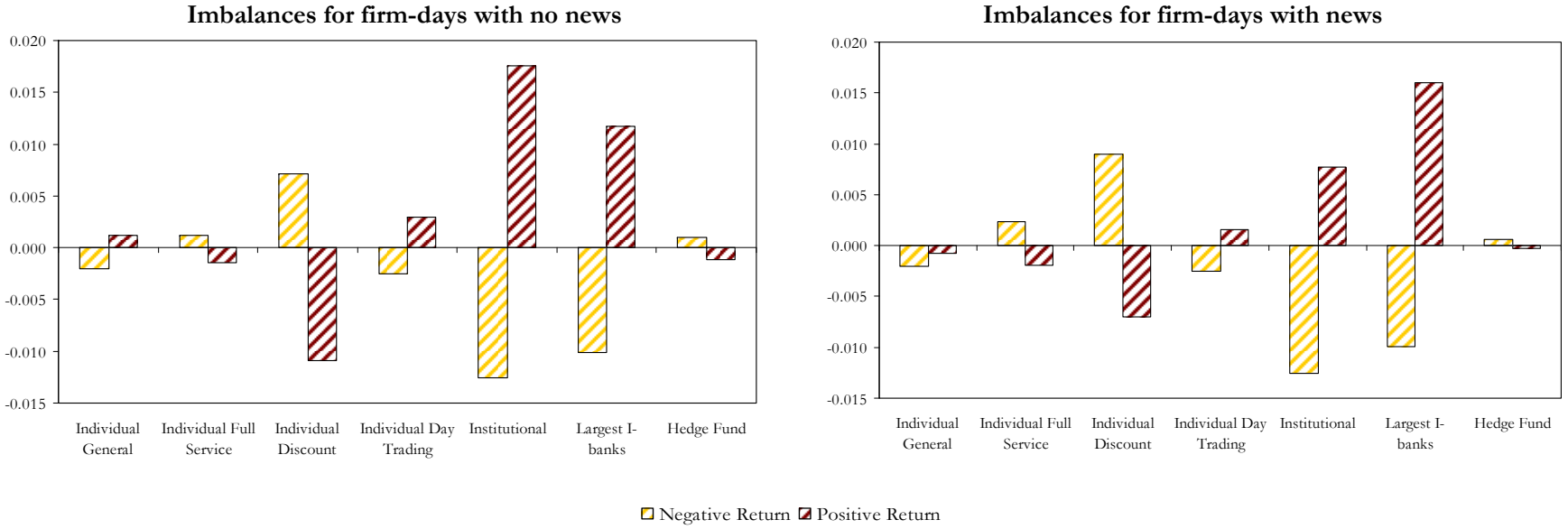


Figure IA.14. Cumulative imbalances around lockup expirations. We collect data from SDC on IPO and SEO lockup expirations for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) during the 1997 to 2002 period. We manually search prospectuses through the EDGAR database to confirm the expiration dates and fill in missing data on expiration dates and number of shares subject to lockup. We drop issues with multiple lockup expiration dates or with an offer price less than $5. Panels A and B plot the cross-sectional averages of the abnormal return and cumulative imbalances for various investor groups for 121 trading days surrounding IPO and SEO lockup expirations, respectively. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Abnormal return is the buy-and-hold return in excess of the value-weighted technology index return.

Panel A. Portfolios based on news articles in the top 10 newswires



Panel B. Portfolios based on news articles in all newswires and non-newswire sources

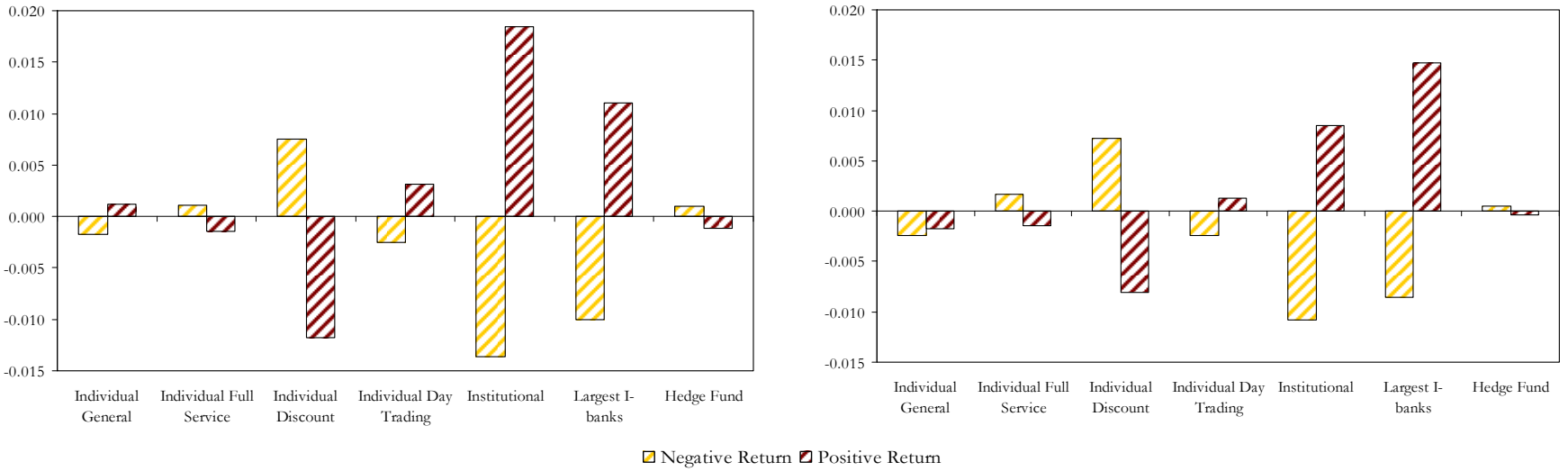


Figure IA.15. Imbalances sorted on firm returns and news. The sample contains NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) from January 2, 1997 to March 27, 2000. In Panel A, on each day *t* we assign stocks to portfolios according to whether their contemporaneous returns in excess of the technology index return are negative or positive and whether there are any news articles about the firm in the top 10 newswires on day *t*. We calculate the value-weighted average daily imbalance for each portfolio and investor group and then plot the time-series means. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Panel B uses news articles from all newswires and non-newswire sources to form portfolios.

Table IA.I
Correlations among Investor Group Imbalances and Market Returns

This table reports the correlations among daily imbalances for nine investor groups and the market return for the technology sector for the period January 2, 1997 to March 27, 2000. The technology sector comprises all NASDAQ stocks with ordinary common shares (CRSP share codes 10 or 11) and three-digit SIC code 737, which stands for computer programming, data processing, and other computer-related services. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. Correlations above the diagonal are computed using equal-weighted averages; correlations below the diagonal are based on value-weighted averages. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

	Ind. General	Ind. Full Service	Ind. Discount	Ind. Day Trading	Inst.	Largest I-banks	Hedge Fund	Deriv.	Mixed	Market Return
Ind. General		0.16*	0.40*	-0.14*	0.00	-0.10*	0.02	-0.10*	0.27*	0.13*
Ind. Full Service	0.30*		0.27*	-0.06	-0.15*	-0.13*	-0.07**	-0.01	0.20*	-0.01
Ind. Discount	0.38*	0.54*		0.07**	-0.34*	-0.18*	-0.17*	0.02	0.15*	-0.07**
Ind. Day Trading	-0.30*	-0.04	-0.25*		-0.09*	-0.11*	0.16*	0.02	-0.09**	0.44*
Institutional	0.07**	-0.19*	-0.27*	-0.06		0.06	0.04	-0.18*	-0.11*	0.16*
Largest I-banks	-0.18*	-0.43*	-0.46*	-0.01	0.08**		-0.02	-0.09*	-0.17*	0.05
Hedge Fund	-0.01	-0.06	-0.28*	0.26*	-0.01	0.08**		-0.07	-0.10*	0.26*
Derivatives	-0.03	0.03	0.04	0.07**	-0.21*	-0.09**	0.06		-0.07**	-0.14*
Mixed	0.19*	0.20*	0.11*	-0.11*	-0.09*	-0.24*	-0.02	-0.13*		0.16*
Market Return	-0.05	-0.15*	-0.49*	0.40*	0.18*	0.21*	0.39*	-0.04	0.15*	

Table IA.II
Firm Characteristics Sorted on the Difference between Institutional and Individual Change in Ownership up to March 2000: Large Firms

The sample includes all CRSP stocks with ordinary common shares (CRSP share codes 10 or 11) and market capitalization above the CRSP median on March 31, 2000. We further divide sample firms into two groups according to their market capitalization as of March 31, 2000. We then assign sample firms in each size group into terciles according to the difference between change in institutional ownership and change in individual ownership. Change in ownership for an investor group is the difference between that group's ownership at the end of March 2000 and March 1999. Ownership for an investor group is defined as shareholdings divided by total shares outstanding. Individual ownership is net of insiders. We report simple averages of price-to-sales ratios and buy-and-hold returns for each portfolio. The price-to-sales ratio as of March 31, 2000 is price per share for March 31, 2000 divided by sales per share for most recent fiscal year-end that is at least six months before March 31, 2000. Returns are buy-and-hold returns. P/S-adjusted return is the individual firm return minus the average return for the firm's P/S quartile on March 31, 2000. We also report the percentage of total market capitalization of the CRSP sample accounted for by each portfolio.

	Characteristics Mar.00		Buy-and-Hold Return			P/S-adj. Returns	
	Fraction CRSP ME	P/S Ratios	Apr.99-Mar.00	Apr.00-Mar.01	Apr.00-Dec.02	Apr.00-Mar.01	Apr.00-Dec.02
Largest 25% Firms							
Institutional Buying	0.121	2.126	2.458	-0.196	-0.271	0.026	-0.068
Medium	0.406	1.375	0.596	0.033	0.020	0.152	0.063
Individual Buying	0.432	1.393	0.485	0.022	-0.003	0.140	0.027
Inst. Buying – Indiv. Buying		0.733	1.974	-0.218	-0.268	-0.113	-0.095
t-statistics		(6.95)	(8.90)	(-5.75)	(-5.51)	(-3.39)	(-2.25)
2nd Largest 25% Firms							
Institutional Buying	0.011	1.714	1.901	-0.148	-0.168	0.020	-0.055
Medium	0.010	1.346	0.826	0.062	0.151	0.153	0.137
Individual Buying	0.010	1.250	0.901	-0.058	0.023	0.038	0.011
Inst. Buying – Indiv. Buying		0.465	1.000	-0.090	-0.191	-0.018	-0.066
t-statistics		(4.55)	(3.75)	(-1.79)	(-2.78)	(-0.40)	(-1.05)

Table IA.III
Firm Characteristics Sorted on the Difference between Institutional and Individual Trading up to March 2000: Second Largest 25% CRSP Firms

The sample includes all CRSP stocks with ordinary common shares (CRSP share codes 10 or 11) and market capitalization in the second highest quartile of CRSP on March 31, 2000. We first assign sample firms into terciles according to the difference between institutional net active buying and individual net active buying. For net active buying, we first take the difference between end-of-quarter holdings and the buy-and-hold value of beginning-of-quarter holdings, divided by end-of-quarter market capitalization. We further subtract net buying induced by mutual fund flows (calculation described in Internet Appendix E) to obtain net active buying. We set flow-induced net buying to zero for individual investors. We then sum quarterly net active buying for the four quarters from April 1, 1999 to March 31, 2000. We report simple averages of firm characteristics and institutional and individual (net of insiders) trading for each portfolio. The price-to-sales ratio as of March 31, 2000 is price per share for March 31, 2000 divided by sales per share for most recent fiscal year-end that is at least six months before March 31, 2000. Returns are buy-and-hold returns. P/S-adjusted returns are individual firm returns minus the average returns of their P/S quartile benchmarks on March 31, 2000. We also report the percentage of total market capitalization of CRSP sample accounted for by each portfolio.

	Characteristics Mar.00		Buy-and-Hold Return			P/S-adj. Returns	
	Fraction CRSP ME	P/S Ratios	Apr.99-Mar.00	Apr.00-Mar.01	Apr.00-Dec.02	Apr.00-Mar.01	Apr.00-Dec.02
Institutional Buying	0.011	1.565	1.772	-0.105	-0.118	0.038	-0.043
Medium	0.010	1.246	0.616	0.084	0.165	0.170	0.140
Individual Buying	0.010	1.489	1.201	-0.113	-0.032	0.006	-0.004
Inst. Buying – Indiv. Buying		0.076	0.571	0.008	-0.086	0.032	-0.039
t-statistics		(0.70)	(2.00)	(0.16)	(-1.25)	(0.69)	(-0.26)

Table IA.IV

Cross-sectional Regressions of Post-peak Returns on Pre-peak Mutual Fund Flows and Trading by Institutions and Individuals

This table presents cross-sectional regressions of post-peak returns on pre-peak mutual fund flows and trading by institutions and individuals for CRSP stocks with ordinary common shares (CRSP share codes 10 or 11). The dependent variables are buy-and-hold returns from April 1, 2000 to March 31, 2001, March 31, 2002, and December 31, 2002. In Panel A, the independent variables are institutional net active buying (excluding flows), individual net buying (including flows), or the difference between institutional and individual trading from April 1, 1999 to March 31, 2000. For institutional net active buying, we first calculate net buying as the difference between end-of-quarter holdings and the buy-and-hold value of beginning-of-quarter holdings, divided by end-of-quarter market capitalization. We then subtract net buying induced by mutual fund flows (calculation described in Internet Appendix E) to compute quarterly institutional net active buying and sum over the four quarters from April 1, 1999 to March 31, 2000. For individual net buying including flows, we sum individual net buying and net buying induced by mutual fund flows. Panel B presents multivariate regressions on net active buying by institutions (excluding flows), mutual fund flows, and net buying by individuals. We also estimate regressions for two subsamples that include firms in the top 50% and 25% of the CRSP sample according to market capitalization. Panel C repeats the regressions in Panel B but with P/S-adjusted returns, which are individual firm returns minus the average returns for the firms' P/S quartiles on March 31, 2000. Panel D repeats the regressions in Panel B but with two-year net buying prior to March 31, 2000. We standardize all variables in the cross-section and estimate with intercepts that are not displayed for brevity. *t*-statistics computed with White robust errors are in parentheses.

Panel A: Univariate Regressions of Post-peak Returns on One-year Pre-peak Net Buying: Full Sample

	Return Regressed on Inst. (Excl. Flows)			Return Regressed on Indiv. (Incl. Flows)			Return Regressed on (Inst.-Indiv.)		
	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)
Net Buying	-0.09	-0.09	-0.10	-0.14	-0.12	-0.13	0.06	0.04	0.04
	(-3.94)	(-4.16)	(-4.49)	(-3.70)	(-3.95)	(-3.93)	(3.62)	(2.83)	(2.88)
Adj.-R^2	0.007	0.008	0.010	0.019	0.014	0.016	0.004	0.002	0.002

Panel B: Multivariate Regressions of Post-peak Returns on One-year Pre-peak Net Active Buying by Institutions (Excluding Flows), Mutual Fund Flows, and Net Buying by Individuals

	Full Sample			Top 50% Market Capitalization			Top 25% Market Capitalization		
	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)
Inst. (Excl. flows)	-0.11	-0.12	-0.13	-0.15	-0.15	-0.15	-0.21	-0.17	-0.16
	(-5.02)	(-6.11)	(-6.61)	(-4.93)	(-5.54)	(-5.85)	(-9.40)	(-9.52)	(-9.51)
Flows	-0.18	-0.16	-0.16	-0.20	-0.18	-0.16	-0.19	-0.18	-0.16
	(-12.41)	(-12.97)	(-12.72)	(-12.83)	(-14.03)	(-13.13)	(-10.76)	(-12.19)	(-11.40)
Indiv.	-0.13	-0.11	-0.12	-0.11	-0.09	-0.09	-0.17	-0.14	-0.14
	(-3.02)	(-3.11)	(-3.11)	(-1.43)	(-1.41)	(-1.45)	(-4.26)	(-4.41)	(-4.44)
Adj.-R^2	0.057	0.053	0.056	0.122	0.138	0.127	0.235	0.263	0.232

Panel C: Multivariate Regressions of Post-peak Returns on One-year Pre-peak Net Active Buying by Institutions (Excluding Flows), Mutual Fund Flows, and Net Buying by Individuals: P/S-adjusted Returns

	Full Sample			Top 50% Market Capitalization			Top 25% Market Capitalization		
	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)	Ret (Apr.00-Mar.01)	Ret (Apr.00-Mar.02)	Ret (Apr.00-Dec.02)
Inst. (Excl. flows)	-0.02	-0.03	-0.04	-0.08	-0.07	-0.07	-0.11	-0.08	-0.08
	(-0.95)	(-1.60)	(-2.29)	(-3.05)	(-3.31)	(-3.52)	(-5.62)	(-4.91)	(-4.62)
Flows	-0.09	-0.07	-0.07	-0.10	-0.08	-0.06	-0.08	-0.07	-0.05
	(-6.30)	(-5.94)	(-5.42)	(-6.91)	(-7.00)	(-5.29)	(-5.06)	(-5.86)	(-3.86)
Indiv.	-0.09	-0.07	-0.08	-0.06	-0.05	-0.04	-0.10	-0.08	-0.07
	(-2.70)	(-2.69)	(-2.67)	(-1.22)	(-1.11)	(-1.14)	(-2.78)	(-2.92)	(-2.77)
Adj.-R^2	0.015	0.011	0.011	0.033	0.032	0.023	0.064	0.059	0.035

Panel D: Multivariate Regressions of Post-peak Returns on Two-year Pre-peak Net Active Buying by Institutions (Excluding Flows), Mutual Fund Flows, and Net Buying by Individuals

Inst. (Excl. flows)	-0.09	-0.09	-0.11	-0.15	-0.13	-0.14	-0.18	-0.15	-0.15
	(-4.73)	(-5.44)	(-6.47)	(-5.53)	(-5.65)	(-6.04)	(-8.26)	(-8.10)	(-7.76)
Flows	-0.13	-0.12	-0.13	-0.16	-0.14	-0.13	-0.17	-0.16	-0.14
	(-8.79)	(-8.84)	(-9.03)	(-8.97)	(-9.99)	(-9.37)	(-7.87)	(-9.39)	(-8.54)
Indiv.	-0.17	-0.14	-0.14	-0.16	-0.14	-0.13	-0.07	-0.06	-0.07
	(-4.25)	(-3.78)	(-3.64)	(-1.95)	(-2.03)	(-2.02)	(-1.47)	(-1.51)	(-1.70)
Adj.-R^2	0.051	0.041	0.046	0.095	0.102	0.096	0.174	0.196	0.167

Table IA.V

Imbalances Sorted on Firm Returns and News: Large Technology Firms; Weekly Analysis

The sample contains firms in the top 50% of NASDAQ technology sector (three-digit SIC code=737 with ordinary common shares) according to market capitalization from January 2, 1997 to March 27, 2000. In Panel A, each week (Thursday open to Wednesday close), we assign stocks to portfolios according to whether their contemporaneous weekly returns in excess of the technology index return are negative or positive and whether there are any news articles about the firm during the week. We use news articles from the top 10 newswires. We calculate the equal-weighted average weekly imbalance for each portfolio and investor group and then report the time-series means. Daily imbalance is the difference between buy and sell volumes expressed as 1/100 of a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly imbalance is the sum of daily imbalances over the week. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. Panel B is similar to Panel A, but assigns stocks to portfolios according to excess returns for the previous week. *t*-statistics are calculated for the differences between positive-return and negative-return portfolios. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

Panel A: Imbalances Sorted on Contemporaneous Firm Returns: Weekly Analysis

	No News			News			News – No News
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Diff.
Total Individual	1.37	-3.51	-4.88**	3.00	-1.44	-4.44**	0.44
Total Institution	-6.94	8.41	15.35**	-7.85	8.94	16.79**	1.44

Panel B: Imbalances Sorted on Lagged Firm Returns: Weekly Analysis

Total Individual	0.99	-3.02	-4.01**	2.42	-0.77	-3.19**	0.83
Total Institution	-2.04	2.65	4.69**	-2.07	1.73	3.80**	-0.89

Table IA.VI
Imbalances Sorted on Firm Returns: News versus No-news Samples, Full Sample

Our sample contains NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) from January 2, 1997 to March 27, 2000. In Panel A, on each day *t* we assign stocks to portfolios according to whether their contemporaneous returns in excess of the technology index return are negative or positive and whether there are any news stories about the firm during the [*t*-3, *t*] window. We use news stories from the top 10 newswires. We calculate the equal-weighted average daily imbalance for each portfolio and investor group and then report the time-series means. Daily imbalance is the difference between buy and sell volumes expressed as 1/100 of a percentage of shares outstanding. We further adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. Panel B is similar to Panel A, but assigns stocks to portfolios according to excess returns for the previous day. In Panel C, each week (Thursday open to Wednesday close) we assign stocks to portfolios based on whether their contemporaneous weekly excess returns are negative or positive and whether there are any news stories during the week and then report weekly imbalances. Weekly imbalance is the sum of daily imbalances over the week. Panel D is similar to Panel C, but assigns stocks to portfolios based on excess returns for the previous week. *t*-statistics are calculated for the difference between positive-return and negative-return portfolios. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

Panel A: Imbalances Sorted on Contemporaneous Firm Returns: Daily Analysis

	No News			News			News – No News
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Diff
Indiv. General	-0.14	0.08	0.21**	-0.08	0.53	0.62**	0.40**
Indiv. Full Service	-0.14	0.09	0.22**	0.12	0.06	-0.06	-0.28**
Indiv. Discount	0.21	-0.65	-0.86**	0.84	0.22	-0.62**	0.24*
Indiv. Day Trading	-0.15	0.18	0.34**	-0.20	0.36	0.56**	0.22**
Institutional	-1.22	1.76	2.98**	-2.01	1.46	3.47**	0.49*
Largest I-banks	-0.28	0.30	0.58**	-0.53	0.56	1.09**	0.52**
Hedge fund	0.02	-0.05	-0.07**	0.07	-0.01	-0.08**	-0.01
Derivatives	0.09	-0.08	-0.16**	0.10	-0.22	-0.31**	-0.15**
Total Individual	-0.22	-0.31	-0.09	0.68	1.18	0.49**	0.58**
Total Institution	-1.39	1.93	3.32**	-2.37	1.79	4.16**	0.84**
Panel B: Imbalances Sorted on Lagged Firm Returns: Daily Analysis							
Total Individual	-0.16	-0.40	-0.24**	0.83	0.93	0.10	0.34*
Total Institution	-0.21	0.63	0.84**	-0.70	-0.13	0.57**	-0.26
Panel C: Imbalances Sorted on Contemporaneous Firm Returns: Weekly Analysis							
Total Individual	-0.83	-1.99	-1.16*	1.91	2.02	0.11	1.27
Total Institution	-3.79	6.45	10.24**	-6.21	5.59	11.80**	1.56
Panel D: Imbalances Sorted on Lagged Firm Returns: Weekly Analysis							
Total Individual	-0.53	-2.54	-2.02**	3.40	0.43	-2.97**	-0.95
Total Institution	-0.41	2.36	2.77**	-2.51	0.64	3.15**	0.38

Table IA.VII
Fama-MacBeth Regressions of Returns on Contemporaneous Imbalances: Alternative Sample Selections

This table presents time-series averages of coefficients, number of observations, and adjusted-R^2s for cross-sectional regressions estimated each day (week, month) from January 2, 1997 to March 27, 2000 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). Panel A presents results for firms that are in the top 25% of the technology sector according to market capitalization. Panel B presents results for all technology firms. Panel C presents results for firms that are in the bottom 50% of the technology sector according to market capitalization. The dependent variables are daily (weekly, monthly) returns and the independent variables are contemporaneous daily (weekly, monthly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly or monthly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close) or month. Weekly (monthly) returns are buy-and-hold returns over the week (month). For the daily cross-sectional regression on day *t*, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the [*t*-3, *t*] window. For weekly (monthly) cross-sectional regressions, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the week (month). We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using Newey-West standard errors with five lags are reported in parentheses.

Panel A: Top 25% Technology Firms according to Market Capitalization

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	0.18	0.08	-0.01	0.16	0.05
	(10.74)	(2.42)	(-0.39)	(9.41)	(1.13)
Indiv. Full Service	0.00	0.01	0.01	0.00	0.00
	(-0.48)	(0.87)	(0.58)	(0.08)	(0.19)
Indiv. Discount	-0.23	-0.19	-0.25	-0.25	-0.22
	(-16.21)	(-7.94)	(-8.11)	(-16.18)	(-6.95)
Indiv. Day Trading		0.19	0.15		0.21
		(5.63)	(3.41)		(5.62)
Institutional	0.21	0.21	0.17	0.20	0.19
	(26.21)	(12.40)	(6.96)	(23.85)	(10.69)
Largest I-banks	0.08	0.08	0.05	0.08	0.09
	(15.90)	(8.54)	(3.85)	(14.73)	(7.68)
Hedge Fund		-0.12	-0.06		-0.13
		(-13.07)	(-3.59)		(-11.24)
Mixed	0.15	0.12	0.09	0.14	0.13
	(21.58)	(8.46)	(4.46)	(20.54)	(7.22)
D_{News} x Indiv. General				0.12	0.04
				(1.14)	(0.80)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Indiv. Full Service				0.29	-0.01
				(0.72)	(-0.24)
D_{News} x Indiv. Discount				0.39	0.01
				(1.07)	(0.33)
D_{News} x Indiv. Day Trading					0.02
					(1.03)
D_{News} x Institutional				0.11	0.05
				(3.41)	(2.00)
D_{News} x Largest I-banks				0.84	0.01
				(1.05)	(0.58)
D_{News} x Hedge Fund					-0.01
					(-0.25)
D_{News} x Mixed				0.27	0.03
				(1.33)	(1.52)
Avg. N	122.1	121.9	128.6	122.1	121.9
Adj.-R^2	0.256	0.307	0.278	0.309	0.339
Panel B: Full Technology Sample					
Indiv. General	0.08	0.08	0.06	0.07	0.06
	(13.33)	(5.91)	(2.41)	(10.15)	(4.29)
Indiv. Full Service	0.06	0.05	0.02	0.08	0.07
	(20.15)	(7.29)	(3.39)	(21.75)	(8.73)
Indiv. Discount	-0.01	0.00	-0.02	-0.01	0.00
	(-0.93)	(0.17)	(-0.68)	(-2.20)	(-0.24)
Indiv. Day Trading	0.16	0.14	0.14	0.16	0.16
	(17.46)	(8.14)	(5.48)	(17.49)	(7.29)
Institutional	0.19	0.21	0.18	0.19	0.21
	(36.28)	(17.24)	(8.58)	(36.82)	(16.55)
Largest I-banks	0.10	0.10	0.08	0.10	-0.04
	(25.00)	(11.87)	(4.08)	(23.46)	(-3.65)
Hedge Fund	0.00	-0.01	0.02	0.00	0.11
	(0.28)	(-1.81)	(1.43)	(-0.81)	(11.14)
Mixed	0.17	0.17	0.13	0.18	0.19
	(36.70)	(18.68)	(7.70)	(40.54)	(19.25)
D_{News} x Indiv. General				0.07	0.04
				(4.51)	(1.86)
D_{News} x Indiv. Full Service				-0.03	-0.03
				(-2.43)	(-1.94)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Indiv. Discount				-0.02	0.00
				(-1.42)	(-0.07)
D_{News} x Indiv. Day Trading				0.05	-0.01
				(5.00)	(-0.29)
D_{News} x Institutional				0.07	0.02
				(5.51)	(1.19)
D_{News} x Largest I-banks				0.02	0.01
				(3.17)	(0.98)
D_{News} x Hedge Fund				-0.02	-0.01
				(-1.80)	(-0.80)
D_{News} x Mixed				0.03	-0.02
				(2.66)	(-1.31)
Avg. N	489	489.9	490.2	489.0	489.9
Adj.-R^2	0.147	0.141	0.127	0.183	0.174
Panel C: Bottom 50% Technology Firms according to Market Capitalization					
Indiv. General	0.07	0.07	0.01	0.05	0.05
	(9.69)	(5.40)	(0.59)	(7.05)	(3.15)
Indiv. Full Service	0.09	0.10	0.05	0.11	0.13
	(17.94)	(10.79)	(4.43)	(20.79)	(12.60)
Indiv. Discount	0.04	0.06	0.01	0.02	0.05
	(5.31)	(3.51)	(0.30)	(3.24)	(1.88)
Indiv. Day Trading		0.15	0.06		0.16
		(7.75)	(1.46)		(7.92)
Institutional	0.19	0.21	0.19	0.20	0.23
	(23.21)	(15.04)	(8.33)	(25.85)	(12.71)
Largest I-banks	0.13	0.13	0.08	0.15	0.15
	(13.12)	(7.52)	(2.61)	(15.24)	(8.33)
Hedge Fund		0.05	0.05		0.07
		(2.90)	(1.44)		(3.03)
Mixed	0.21	0.23	0.17	0.23	0.25
	(27.33)	(16.39)	(7.89)	(30.39)	(17.14)
D_{News} x Indiv. General				1.29	-0.01
				(0.80)	(-0.14)
D_{News} x Indiv. Full Service				0.74	-0.02
				(0.85)	(-0.84)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Indiv. Discount				0.28	0.03
				(1.90)	(0.90)
D_{News} x Indiv. Day Trading					0.01
					(0.21)
D_{News} x Institutional				-0.12	0.09
				(-0.43)	(2.39)
D_{News} x Largest I-banks				1.27	0.00
				(0.91)	(0.08)
D_{News} x Hedge Fund					-0.38
					(-1.23)
D_{News} x Mixed				0.07	0.05
				(0.50)	(1.80)
Avg. N	244.2	243.8	257.1	244.2	243.8
Adj.-R^2	0.125	0.154	0.123	0.176	0.204

Table IA.VIII
Fama-MacBeth Regressions of Returns on Contemporaneous Imbalances: Alternative News Measures

This table presents time-series averages of coefficients, number of observations, and adjusted-R^2s for cross-sectional regressions estimated each day (week) from January 2, 1997 to March 27, 2000 and March 28, 2000 to December 31, 2002 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). The dependent variables are daily (weekly) returns and the independent variables are contemporaneous daily (weekly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of shares outstanding. Weekly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close). We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly returns are buy-and-hold returns over the week. For the daily cross-sectional regression on day *t*, news dummy equals one for a firm if there are any news articles about the firm in any Factiva newswire or non-newswire source on day *t*. For weekly cross-sectional regression, news dummy equals one for a firm if there are any news articles about the firm in any Factiva newswire or non-newswire source during the week. We standardize dependent and independent variables except for news dummies in each cross-section and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using Newey-West standard errors with five lags are reported in parentheses.

	Jan. 2, 1997 – Mar. 27, 2000		Mar. 28, 2000 – Dec. 31, 2002	
	Daily	Weekly	Daily	Weekly
Individual General	0.07	0.07	0.04	0.01
	(10.15)	(4.67)	(6.14)	(0.40)
Individual Full Service	0.08	0.07	0.06	0.06
	(21.75)	(8.50)	(12.49)	(6.89)
Individual Discount	-0.01	-0.01	0.00	-0.01
	(-2.20)	(-0.51)	(0.57)	(-0.89)
Individual Day Trading	0.16	0.14	0.05	0.03
	(17.49)	(7.93)	(9.32)	(2.41)
Institutional	0.19	0.21	0.20	0.24
	(36.82)	(17.41)	(26.88)	(14.28)
Largest I-banks	0.10	0.11	0.10	0.10
	(23.46)	(10.09)	(19.63)	(10.13)
Hedge Fund	0.00	-0.02	0.02	0.01
	(-0.81)	(-2.39)	(6.27)	(1.08)
Mixed	0.18	0.18	0.20	0.21
	(40.54)	(21.08)	(31.82)	(14.98)
D_{News} x Individual General	0.07	0.01	-0.01	-0.01
	(4.51)	(1.72)	(-0.64)	(-1.79)
D_{News} x Individual Full Service	-0.03	-0.02	-0.02	-0.02
	(-2.43)	(-2.24)	(-1.61)	(-3.19)
D_{News} x Individual Discount	-0.02	0.00	-0.02	-0.02
	(-1.42)	(-0.28)	(-1.51)	(-2.24)
D_{News} x Individual Day Trading	0.05	0.01	0.05	0.02
	(5.00)	(1.87)	(4.14)	(3.35)
D_{News} x Institutional	0.07	0.01	0.05	-0.01
	(5.51)	(1.73)	(5.16)	(-1.27)

	Jan. 2, 1997 – Mar. 27, 2000		Mar. 28, 2000 – Dec. 31., 2002	
	Daily	Weekly	Daily	Weekly
D_{News} x Largest I-banks	0.02	0.00	0.02	0.00
	(3.17)	(-0.76)	(3.09)	(-1.07)
D_{News} x Hedge Fund	-0.02	-0.01	0.03	-0.01
	(-1.80)	(-0.78)	(4.54)	(-1.95)
D_{News} x Mixed	0.03	-0.01	0.01	-0.02
	(2.66)	(-0.90)	(1.11)	(-3.44)
N	489	490	551	552
Adj.-R^2	0.183	0.173	0.118	0.118

Table IA.IX
Panel Regressions of Returns on Contemporaneous Imbalances

This table presents coefficients, number of observations, and adjusted-R^2s for panel regressions estimated for the periods from January 2, 1997 to March 27, 2000 and March 28, 2000 to December 31, 2002 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). Panel A reports results for the period from January 2, 1997 to March 27, 2000. Panel B reports results for the period from March 28, 2000 to December 31, 2002. The dependent variables are daily (weekly, monthly) returns and the independent variables are contemporaneous daily (weekly, monthly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of shares outstanding. Weekly or monthly imbalance is sum of daily imbalances over the week (Thursday open to Wednesday close) or month. We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly or monthly returns are buy-and-hold returns over the week or month. For daily regressions, news dummy equals one for a firm on day *t* if there are any news articles about the firm in the top 10 newswires during the [*t*-3, *t*] window. For weekly (monthly) regressions, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the week (month). We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. *t*-statistics computed by clustering standard errors by firm and by month are in parentheses.

Panel A: January 2, 1997 – March 27, 2000

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	0.08	0.09	0.08	0.07	0.08
	(10.59)	(7.04)	(3.72)	(9.01)	(5.34)
Indiv. Full Service	0.04	0.03	0.01	0.06	0.05
	(10.27)	(4.52)	(0.95)	(10.91)	(5.74)
Indiv. Discount	-0.01	-0.01	-0.04	-0.02	-0.02
	(-0.71)	(-0.63)	(-1.24)	(-2.04)	(-1.74)
Indiv. Day Trading	0.16	0.15	0.15	0.15	0.14
	(11.31)	(11.20)	(7.56)	(9.95)	(8.25)
Institutional	0.16	0.18	0.16	0.17	0.18
	(22.46)	(14.26)	(6.39)	(24.13)	(16.76)
Largest I-banks	0.08	0.08	0.06	0.09	0.08
	(18.81)	(9.05)	(4.03)	(17.24)	(6.95)
Hedge Fund	-0.01	-0.02	0.01	-0.01	-0.01
	(-1.14)	(-2.65)	(0.72)	(-2.87)	(-1.15)
Mixed	0.14	0.15	0.12	0.16	0.16
	(19.15)	(11.23)	(6.22)	(25.06)	(13.90)
D_{News} x Indiv. General				0.05	0.02
				(3.36)	(2.38)
D_{News} x Indiv. Full Service				-0.05	-0.02
				(-5.65)	(-3.56)
D_{News} x Indiv. Discount				0.03	0.01
				(1.42)	(0.99)
D_{News} x Indiv. Day Trading				0.02	0.00
				(1.49)	(0.99)
D_{News} x Institutional				-0.02	0.00
				(-0.94)	(-0.33)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Largest I-banks				-0.01	0.00
				(-1.01)	(0.64)
D_{News} x Hedge Fund				0.01	-0.01
				(1.25)	(-2.98)
D_{News} x Mixed				-0.05	-0.01
				(-3.27)	(-1.12)
N	399,016	82,298	19,118	396,965	81,480
Adj.-R^2	0.060	0.058	0.049	0.062	0.060
Panel B: March 28, 2000 – December 31, 2002					
Indiv. General	0.02	-0.01	-0.05	0.02	0.00
	(2.03)	(-0.65)	(-3.33)	(2.56)	(-0.08)
Indiv. Full Service	0.03	0.03	0.02	0.05	0.03
	(7.28)	(4.57)	(1.87)	(9.22)	(3.68)
Indiv. Discount	-0.03	-0.05	-0.10	-0.01	-0.04
	(-3.09)	(-3.35)	(-4.43)	(-1.21)	(-2.37)
Indiv. Day Trading	0.05	0.04	0.02	0.05	0.03
	(6.02)	(4.59)	(1.22)	(5.42)	(2.84)
Institutional	0.17	0.20	0.21	0.17	0.20
	(17.85)	(17.87)	(11.84)	(15.15)	(15.33)
Largest I-banks	0.08	0.09	0.08	0.09	0.09
	(17.50)	(13.33)	(6.80)	(13.56)	(12.44)
Hedge Fund	0.03	0.00	0.03	0.02	0.02
	(6.99)	(0.43)	(2.08)	(5.63)	(2.51)
Mixed	0.15	0.16	0.13	0.17	0.16
	(15.63)	(12.89)	(7.61)	(14.73)	(11.51)
D_{News} x Indiv. General				-0.01	-0.01
				(-1.04)	(-1.62)
D_{News} x Indiv. Full Service				-0.04	0.00
				(-4.93)	(-0.26)
D_{News} x Indiv. Discount				-0.04	-0.01
				(-2.60)	(-1.68)
D_{News} x Indiv. Day Trading				0.01	0.01
				(1.14)	(1.52)
D_{News} x Institutional				-0.01	0.00
				(-0.59)	(-0.90)
D_{News} x Largest I-banks				-0.01	0.00
				(-1.43)	(0.24)
D_{News} x Hedge Fund				0.02	-0.01
				(3.20)	(-5.20)
D_{News} x Mixed				-0.03	0.00
				(-2.82)	(-0.71)
N	381,512	80,074	18,177	381,349	79,877
Adj.-R^2	0.039	0.052	0.071	0.040	0.053

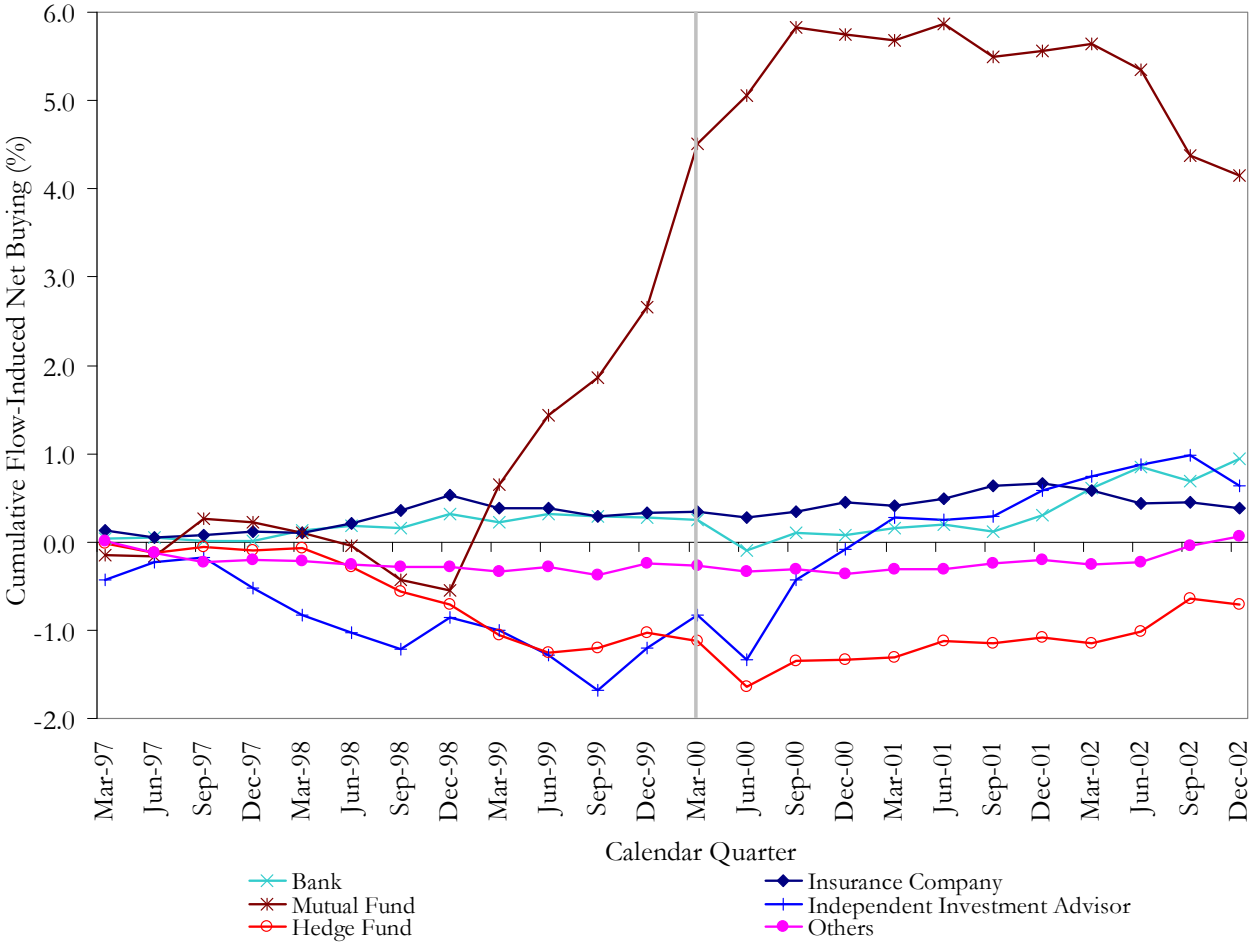
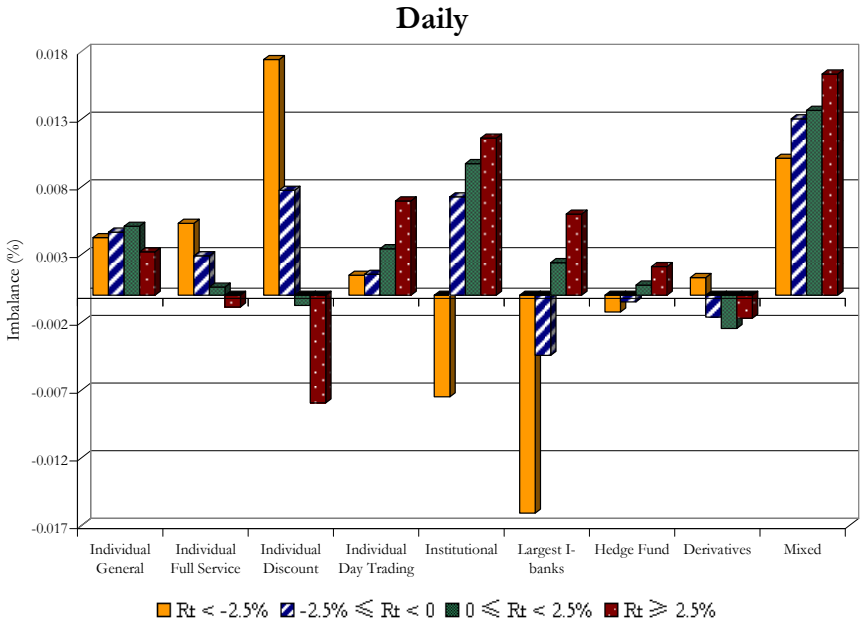
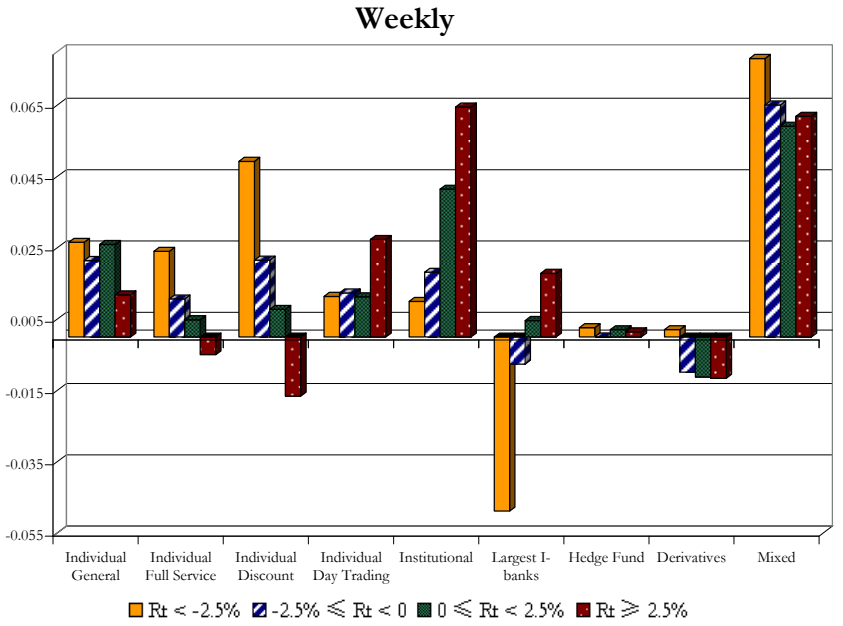


Figure IB.1. Cumulative net buying induced by flows: 13f institution types. This figure plots cumulative net buying induced by flows of 13f institution types for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly net buying is expressed as a percentage of total market capitalization of the technology sector. Net buying induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. Details of the calculation are described in Internet Appendix E. Flows of institution types other than mutual funds are estimated using quarterly holdings and stock returns. We further calculate flow-induced net buying by institution types other than mutual funds by assuming that managers allocate flows proportionally to their current portfolio. Details of the calculation are described in Internet Appendix F. We then plot cumulative net buying during the 1997 to 2002 period.

Panel A. Imbalances sorted on contemporaneous technology index returns





Panel B. Imbalances sorted on lagged technology index returns

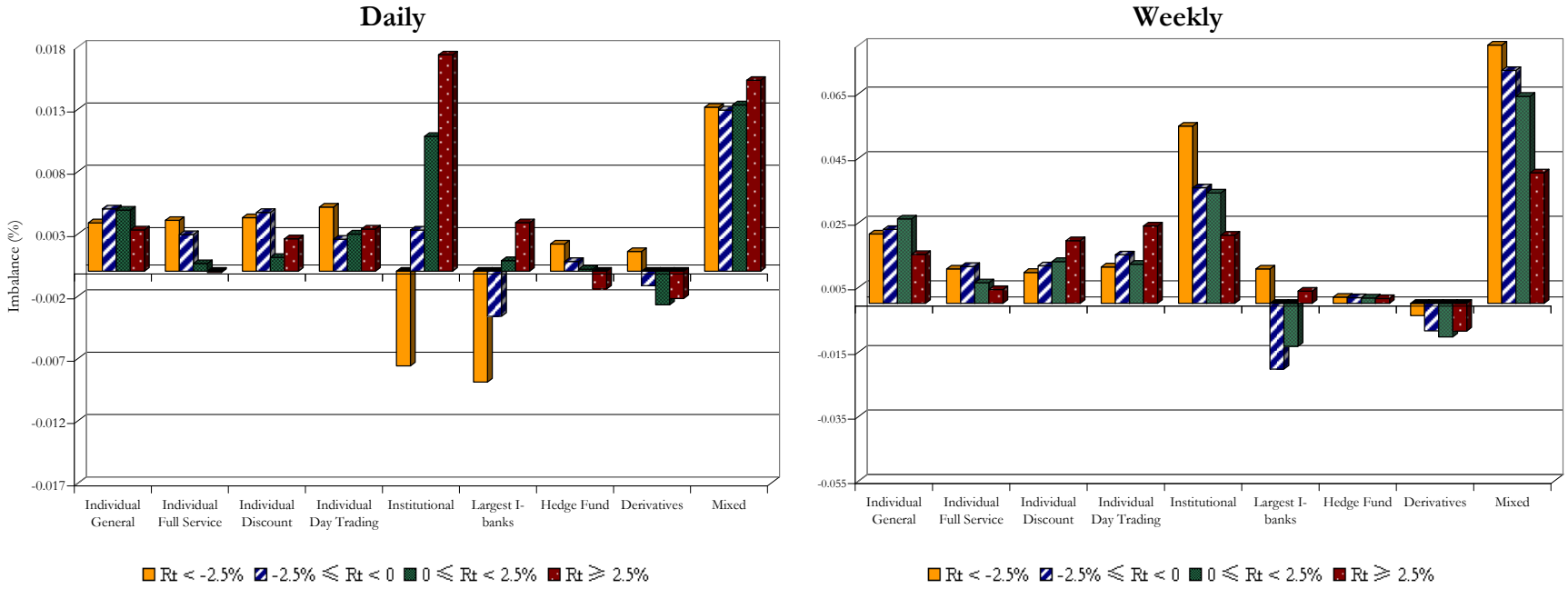


Figure IB.2. Imbalances across market return categories. This figure plots the daily and weekly imbalances for nine investor groups across four index return categories for the value-weighted technology sector from January 2, 1997 to March 27, 2000. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. The technology sector is comprised of all NASDAQ stocks with ordinary common shares and three-digit SIC code 737, excluding Microsoft. In Panel A, the chart on the left plots value-weighted daily imbalances sorted on contemporaneous daily index returns, while the chart on the right plots value-weighted weekly imbalances sorted on contemporaneous weekly index returns. In Panel B, the chart on the left plots value-weighted daily imbalances sorted on lagged daily index returns, while the chart on the right plots value-weighted weekly imbalances sorted on lagged weekly index returns.

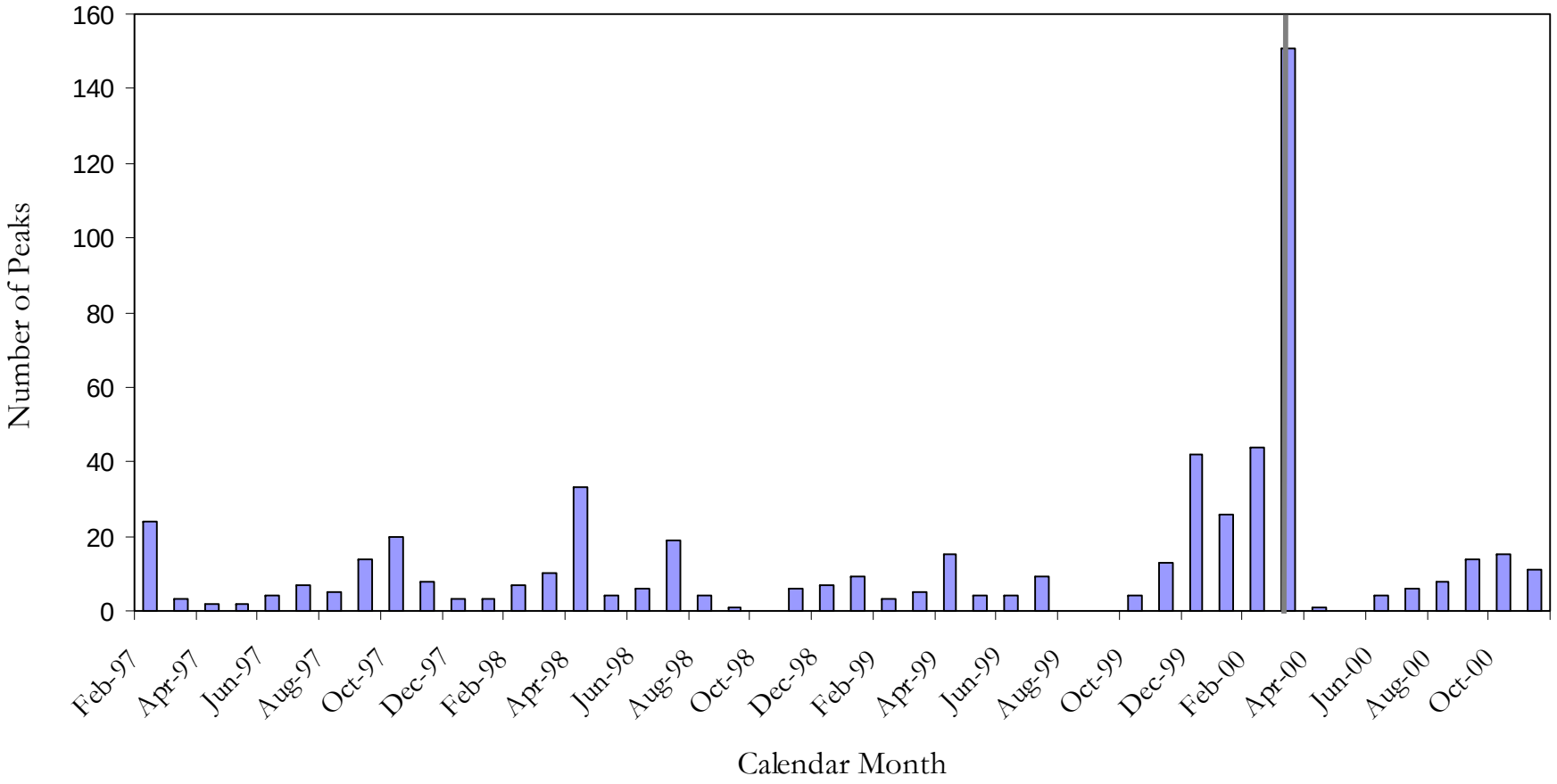
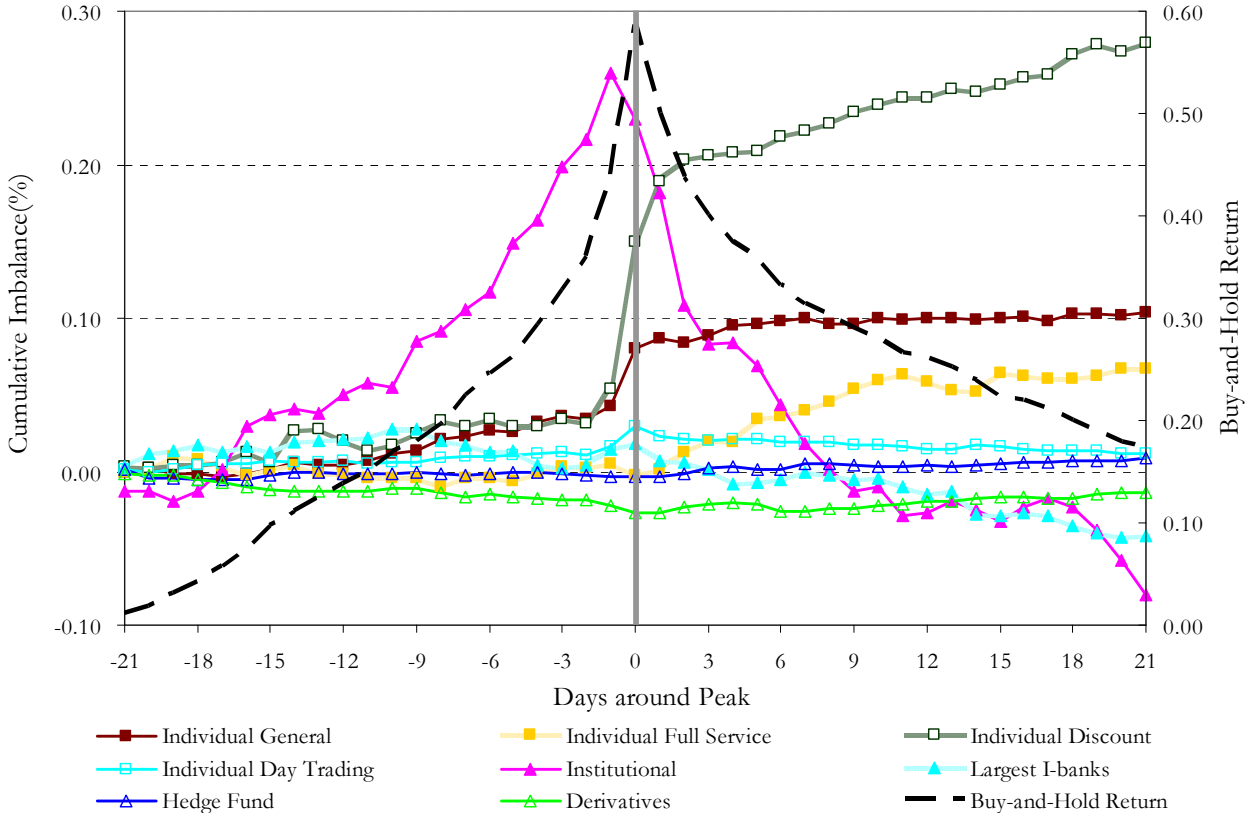
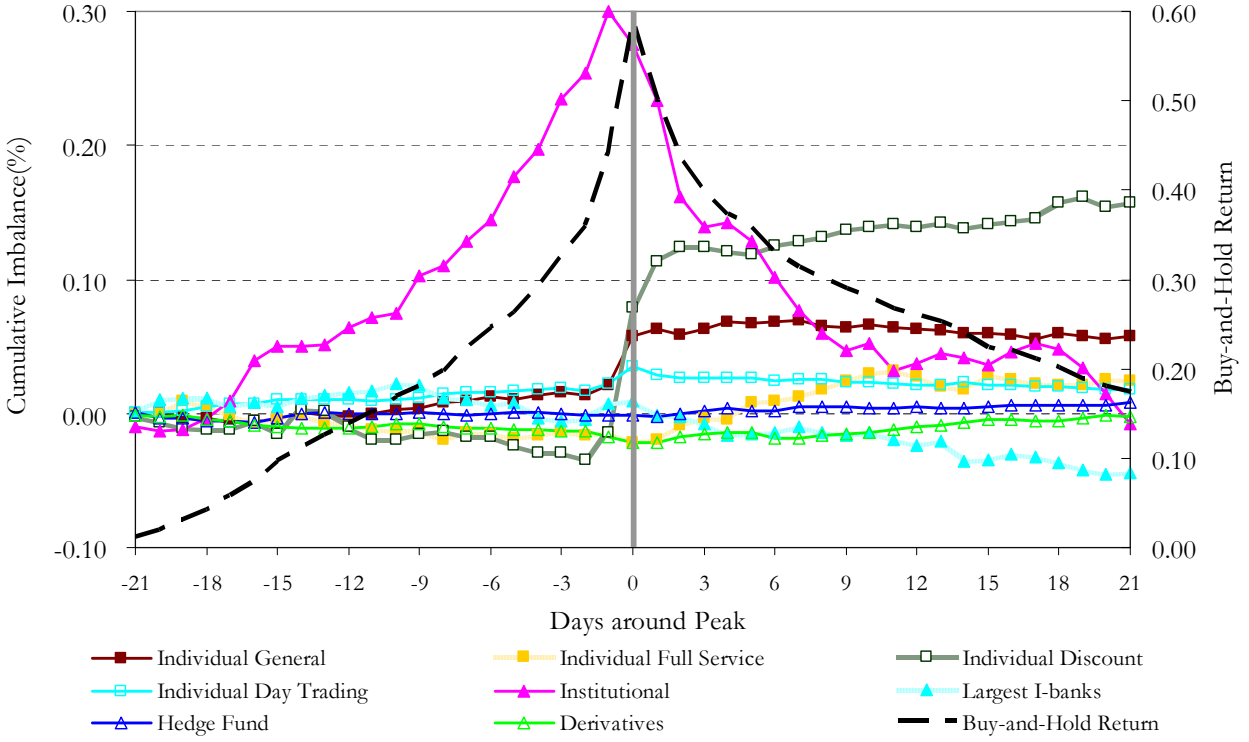


Figure IB.3. Number of individual stock peaks by month. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. We plot the number of individual peaks in each month from January 1997 to December 2000. March 2000 has the highest number of peaks with 151, as compared to a total of 429 peaks in all other months.

Panel A. Cumulative size-adjusted imbalances around individual stock peaks: [-21, 21] window



Panel B. Cumulative turnover-adjusted imbalances around individual stock peaks: [-21, 21] window



Panel C. Cumulative imbalances around individual stock peaks: [-60, 60] window

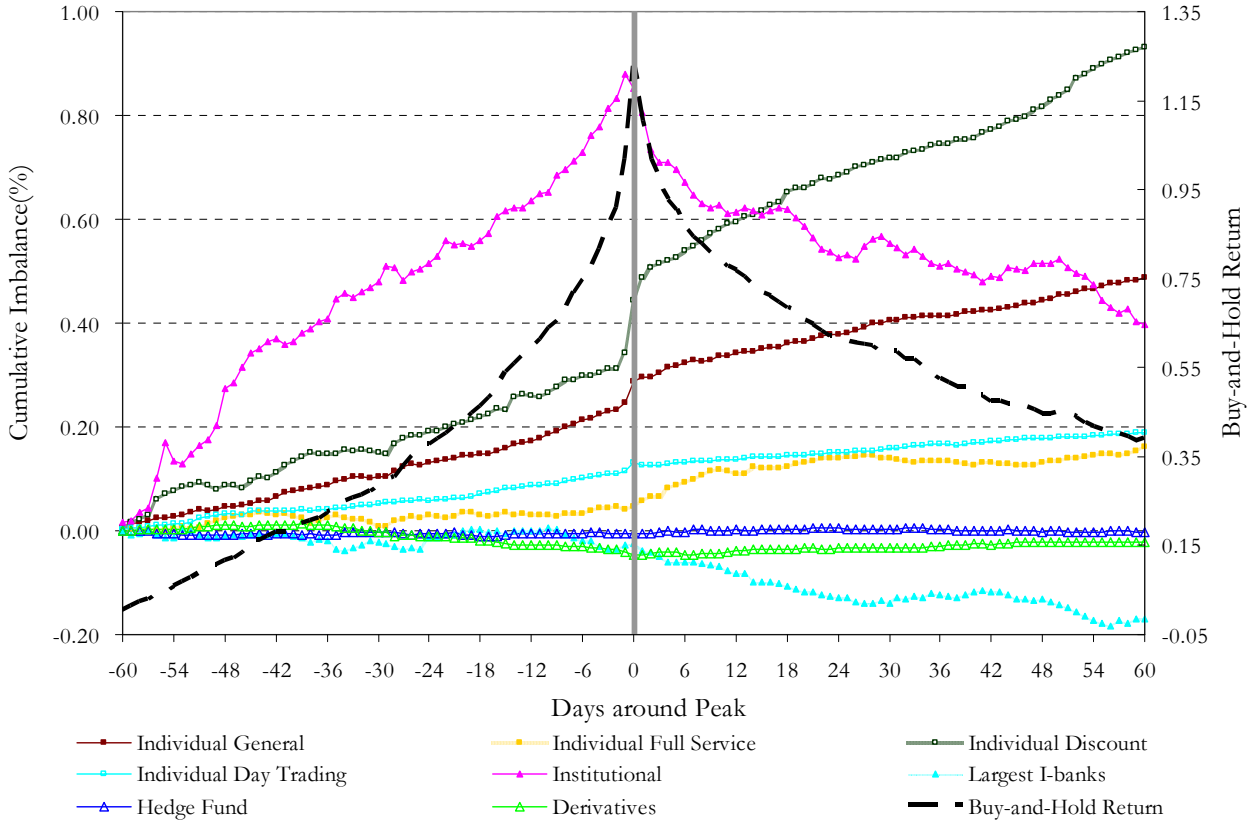


Figure IB.4. Cumulative imbalances around individual stock peaks: Size- and turnover-adjusted imbalances and [-60, 60] window; excluding peaks in March 2000. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. We also eliminate stocks with peaks in March 2000 to avoid clustering. We are left with 429 stocks. When two stocks peak on the same day, we take the equal-weighted average of the two observations to avoid clustering. This gives us 258 different peak days. We plot the cross-sectional averages of the buy-and-hold return and cumulative imbalances for various investor groups around individual peaks. Panel A plots cumulative size-adjusted imbalances in the [-21, 21] window surrounding individual peaks. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Panel B plots cumulative turnover-adjusted imbalances in the [-21, 21] window surrounding individual peaks. We adjust daily imbalances for turnover by subtracting the average imbalance for the firm's historical turnover quartile in the technology sector. Historical turnover for a stock is the sum of daily turnover of the stock in the past 20 trading days. Panel C plots cumulative imbalances in the [-60, 60] window surrounding individual peaks.

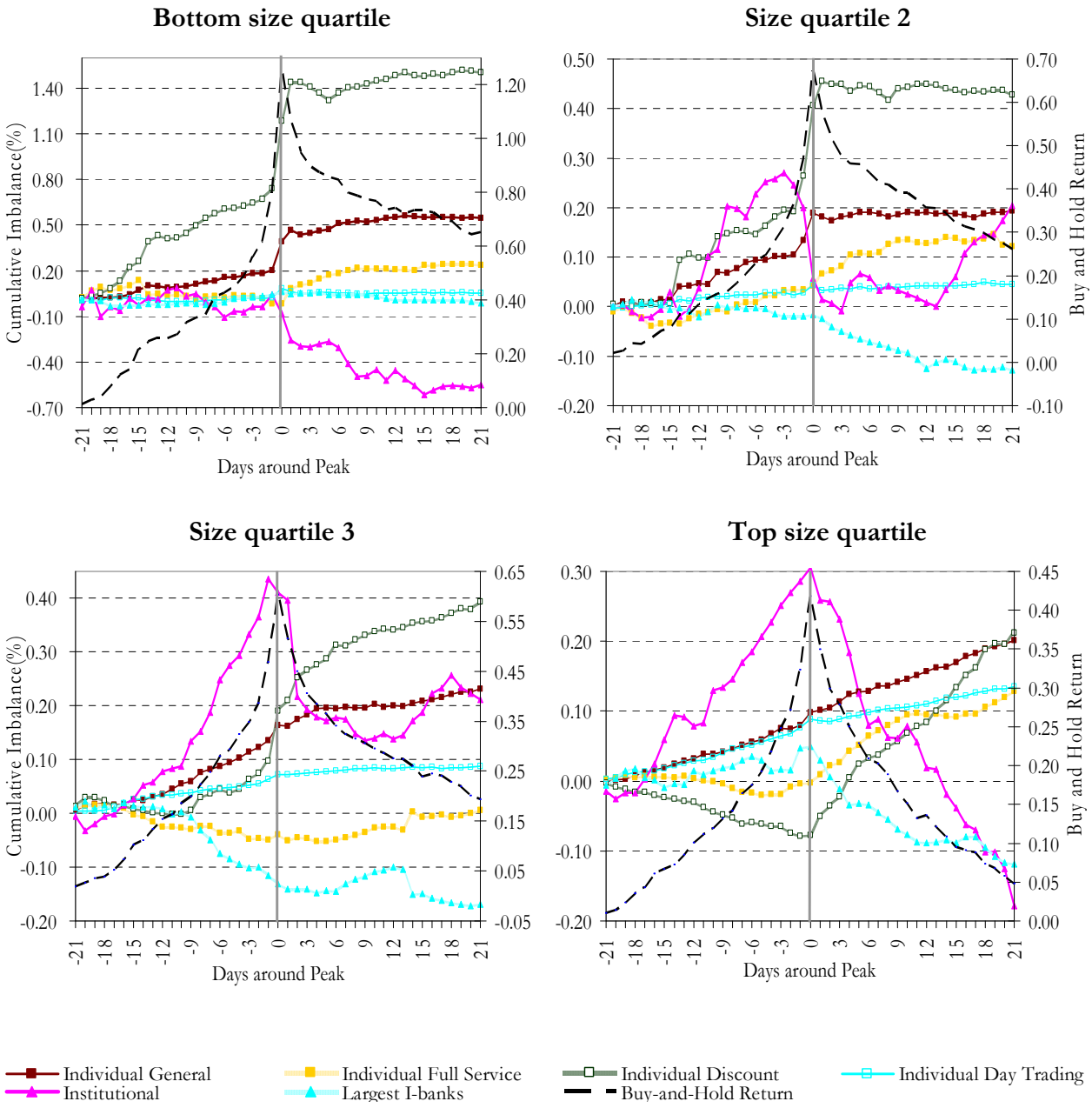


Figure IB.5. Cumulative imbalances around individual stock peaks: Groups of firm size; excluding peaks in March 2000. For all NASDAQ stocks with ordinary common shares and three-digit SIC code 737 at some point from January 1997 to December 2000, we identify the individual peaks during the same period. In the case of a tie, we choose the first peak. We then eliminate stocks for which the peak is within the first or last 21 days of trading or the three-digit SIC code is different from 737 at the time of the peak. We also eliminate stocks with peaks in March 2000 to avoid clustering. We are left with 429 stocks and assign them into quartiles based on market capitalization. When two stocks in the same size quartile peak on the same day, we take the equal-weighted average of the two observations to avoid clustering. This figure plots the cross-sectional averages of the buy-and-hold return and cumulative imbalances for various investor groups for 43 trading days surrounding individual peaks for each size quartile. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding.

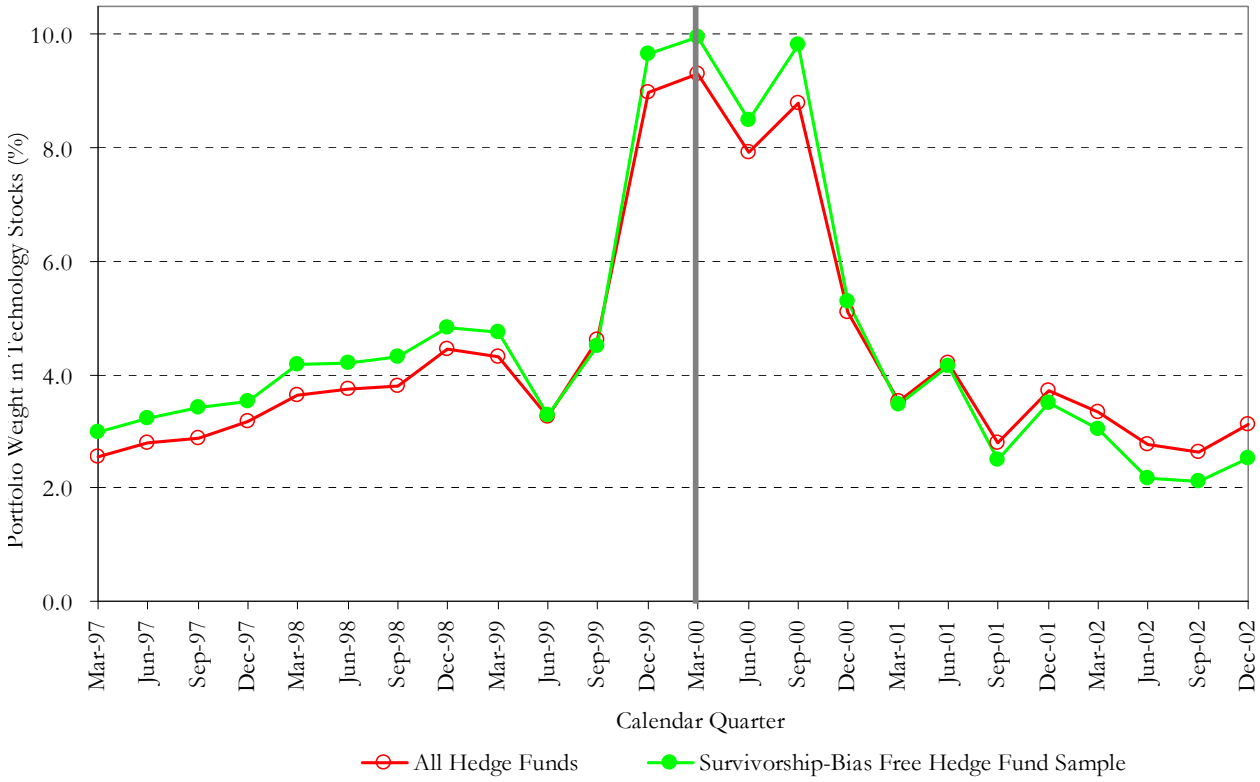


Figure IB.6. Portfolio weights in technology stocks: Hedge funds in the survivorship-bias free subsample. This figure plots portfolio weights in NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) for hedge funds in the survivorship-bias free subsample during the 1997 to 2002 period. Portfolio weight is the percentage of total dollar holdings accounted for by technology stocks. The survivorship-bias free subsample of hedge funds is used in Griffin and Xu (2009), containing fund-years only after a hedge fund first appears in various name lists (without backfill). We also plot portfolio weights for the whole hedge fund sample for comparison.

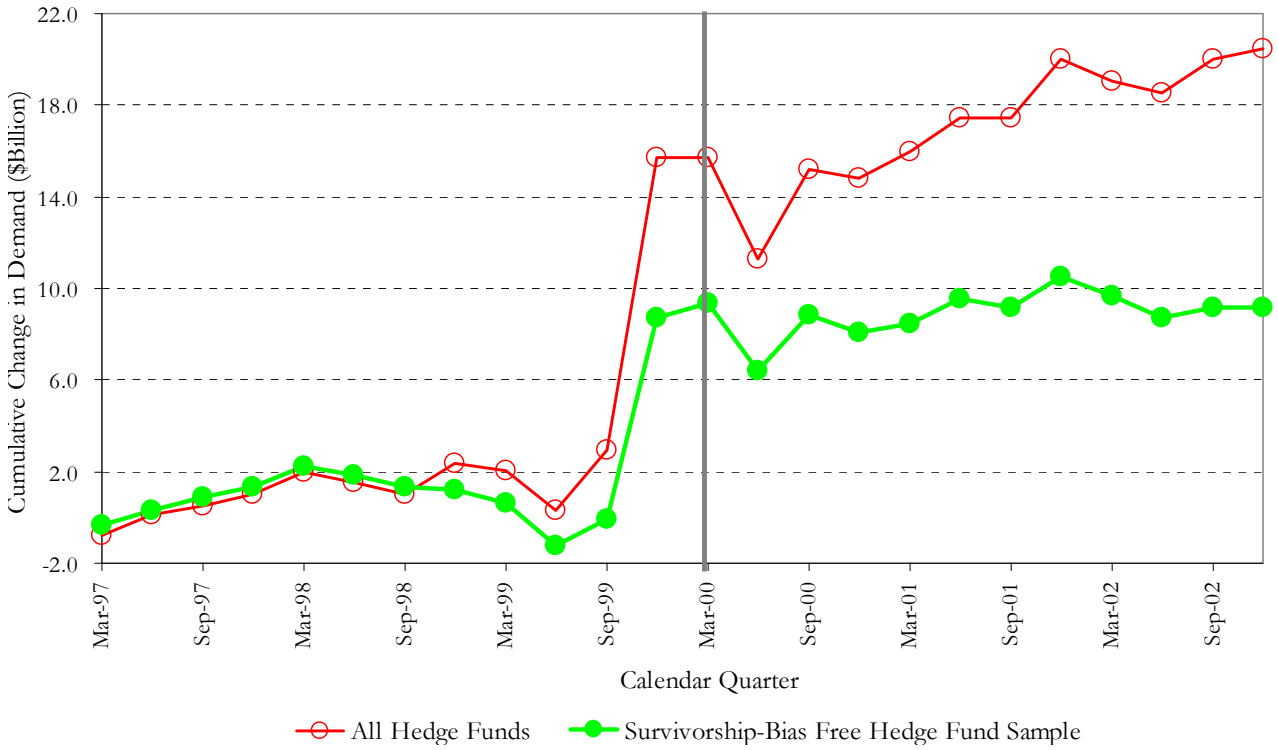
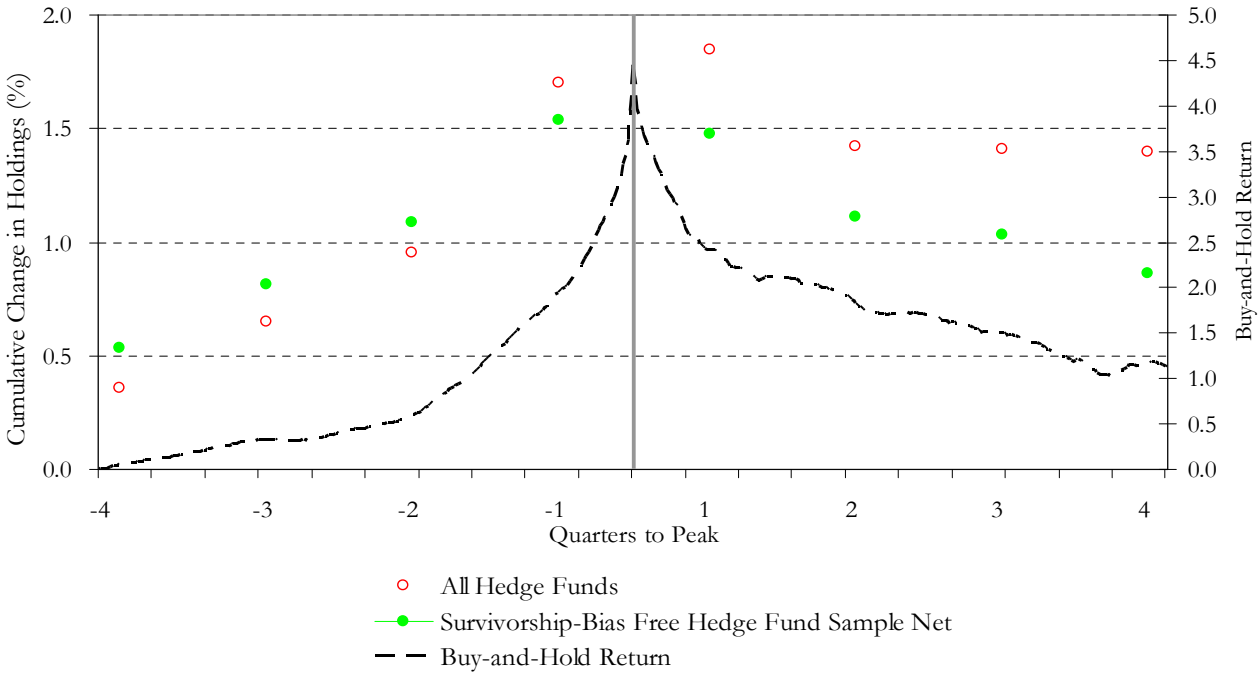


Figure IB.7. Cumulative change in demand for technology stocks: Hedge funds in the survivorship-bias free subsample. We calculate quarterly changes in demand for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) for hedge funds in the survivorship-bias free subsample during the 1997 to 2002 period. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. The survivorship-bias free subsample of hedge funds is used in Griffin and Xu (2009), containing fund-years only after a hedge fund first appears in various name lists (without backfill). We also plot cumulative change in demand for the whole hedge fund sample for comparison.

Panel A. Cumulative net active buying: Hedge funds



Panel B. Peaks within five trading days of quarter-end: Hedge funds

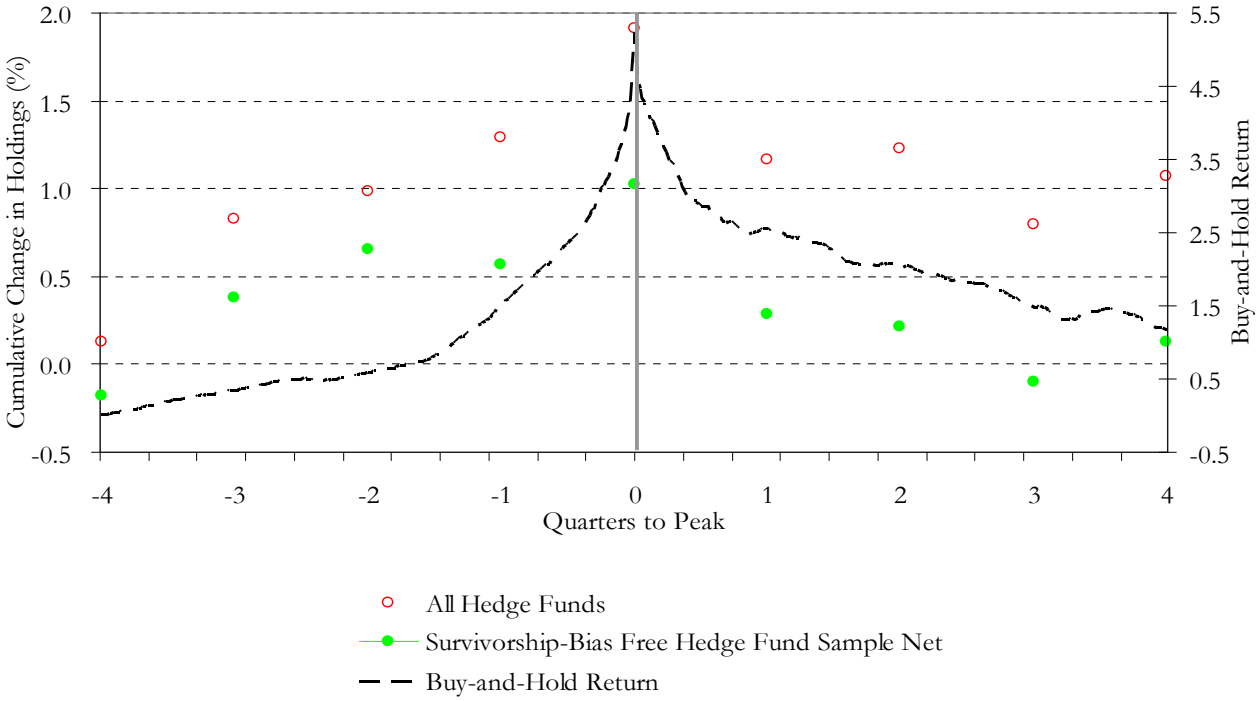


Figure IB.8. Demand around individual stock peaks: Hedge funds in the survivorship-bias free subsample. We analyze demand around individual peaks for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the period from January 1997 to December 2000. There are 580 technology stock peaks (279 different event days) during this period. When stocks peak in the same quarter, we take the equal-weighted average of the observations. Panel A plots cross-sectional averages of the buy-and-hold return and cumulative net active buying for hedge funds in the survivorship-bias free subsample during the eight quarters surrounding individual peaks. Quarterly net buying for a stock is calculated as the difference between end-of-quarter holdings and the buy-and-hold value of beginning-of-quarter holdings, expressed as a percentage of the stock's market capitalization at the end of the quarter. Cumulative net active buying is cumulative net buying minus net buying induced by flows. Calculations of flow-induced net buying are described in Internet Appendix F. Quarter 1 marks the end of the quarter containing the peak, which is on average 33 trading days after the peak for our sample. Quarter -1 marks the end of the quarter prior to the peak. The survivorship-bias free subsample of hedge funds is used in Griffin and Xu (2009), containing fund-years only after a hedge fund first appears in various name lists (without backfill). We also plot cumulative net active buying for the whole hedge fund sample for comparison. Panel B plots cumulative net active buying for hedge funds around 95 price peaks that occur within five trading days ([-5, 5] window) from the end of a quarter, where quarter 0 refers to the end of the quarter that coincides with the individual price peak.

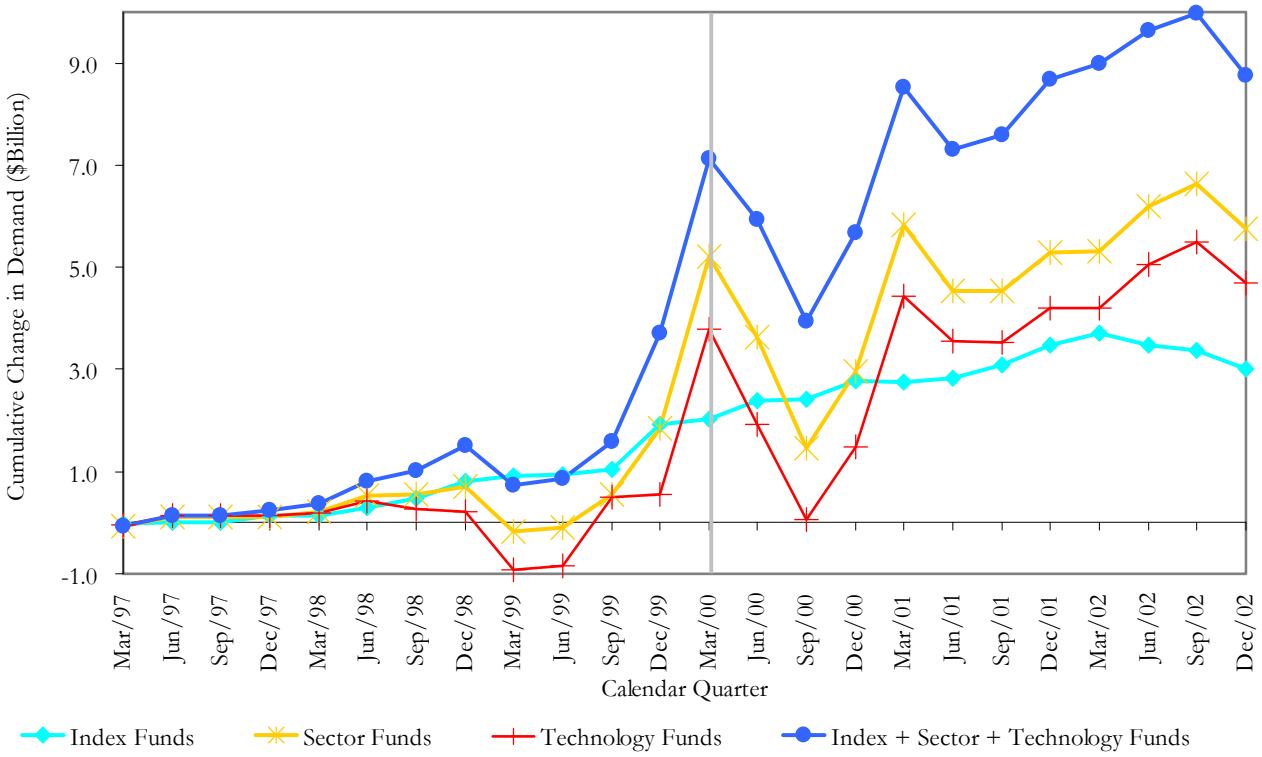
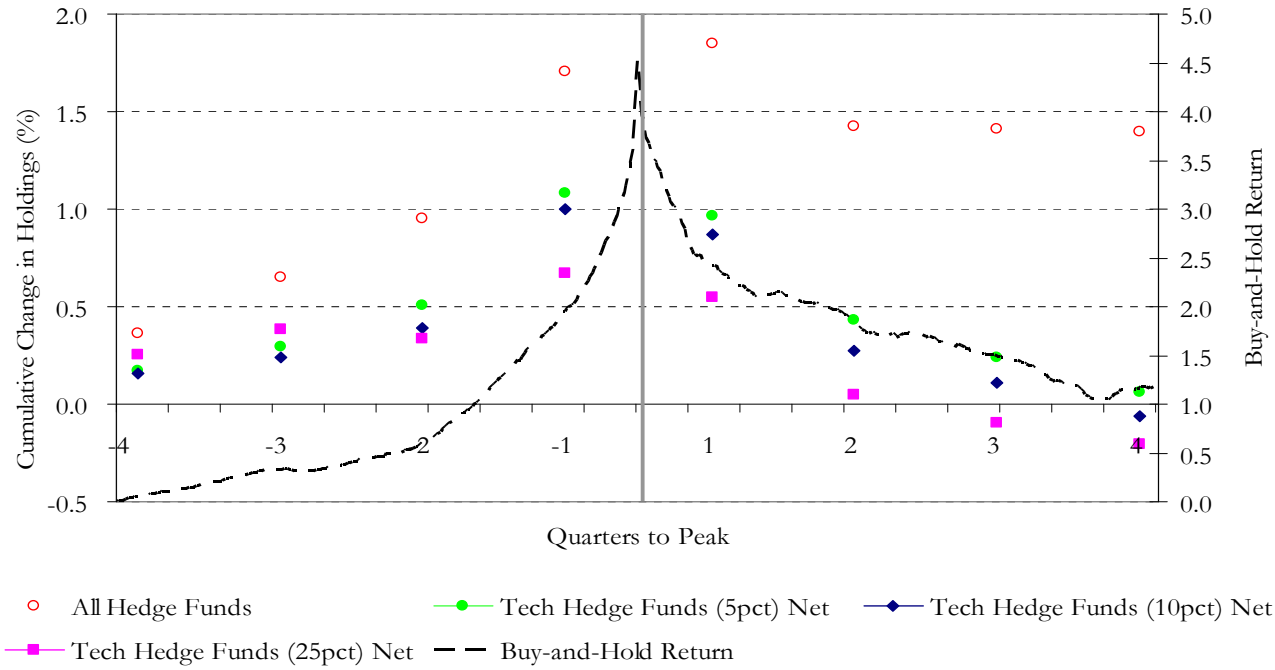


Figure IB.9. Cumulative change in demand for technology stocks: Index mutual funds, sector mutual funds, and technology mutual funds; including IPOs and delistings. We calculate quarterly changes in demand for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) for index mutual funds, sector mutual funds, and technology mutual funds during the 1997 to 2002 period. Quarterly change in demand is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. We further subtract demand induced by fund flows. Internet Appendix E describes how we calculate flow-induced demand. To identify index, sector, and technology funds, we use Standard and Poor's detailed objective name, style name, and specialist name; ICDI's fund objective code; the Wiesenberger objective code; and fund name variables from the CRSP Mutual Funds database and Thomson Financial N-30D data. We identify a mutual fund as an index fund if Standard and Poor's specialist name variable includes the keyword "index," the fund name from the CRSP Mutual Funds database includes one of the keywords "index," "indx," "idx," "dow 30," "100," "500," or "russell 2000," or the fund name from Thomson Financial N-30D data includes one of the keywords "index" or "indx." We identify a mutual fund as a sector fund if Standard and Poor's detailed objective name variable equals "Equity USA Misc Sectors," Standard and Poor's style name variable equals "Equity Sector," Standard and Poor's specialist name variable equals "Miscellaneous Sector," or ICDI's fund objective code variable equals "SF" (sector funds). We identify a mutual fund as a technology fund if Standard and Poor's detailed objective name variable equals "Equity USA Technology," Standard and Poor's style name variable equals "Equity Information Technology Sector" or "Equity Telecommunications Sector," Standard and Poor's specialist name variable equals "Index ArcaEx Tech 100," "Index GSTI Composite," "Index MSCI US IM Info Tech," "Index MSCI US IM Telecom Svcs," "Index NYSE Arca Tech 100," "Index PSE Technology 100," "Information Technology," "Internet," "TMT," "TMT (Technology Media

& Telecom)," "Technology," or "Telecommunications," the Wiesenberger objective code variable equals "TCH" (technology sector), the fund name from the CRSP Mutual Funds database includes one of the keywords "internet," "technology," or "telecom" but not "biotech," or the fund name from Thomson Financial N-30D data includes the keywords "internet" or "tech" but neither "bio tech" nor "biotech." Since the dollar value of holdings in our merged mutual fund sample is 22.58% of mutual fund holdings in Thomson Financial N-30D data (more details are provided in Internet Appendix D), we further divide demand for each fund type by 22.58% assuming our merged fund sample is representative of the mutual fund universe. We also plot total cumulative change in demand by index, sector, and technology funds.

Panel A. Cumulative net active buying: Technology hedge funds



Panel B. Peaks within five trading days of quarter-end: Technology hedge funds

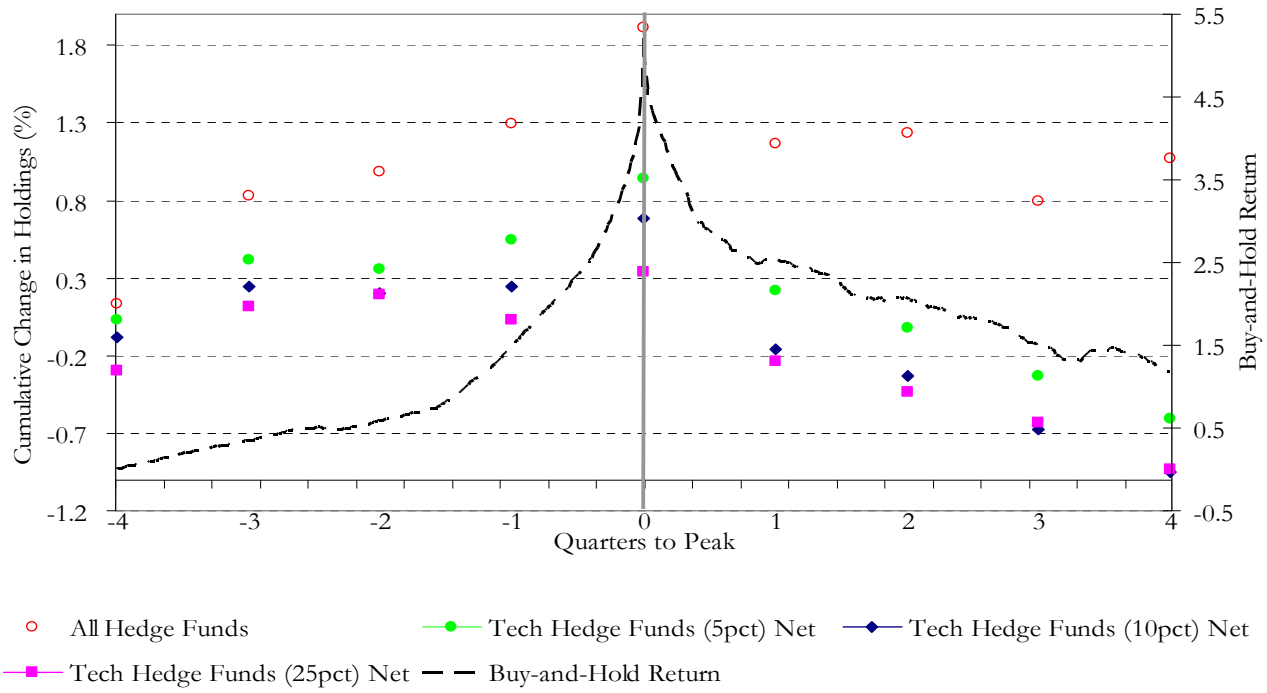
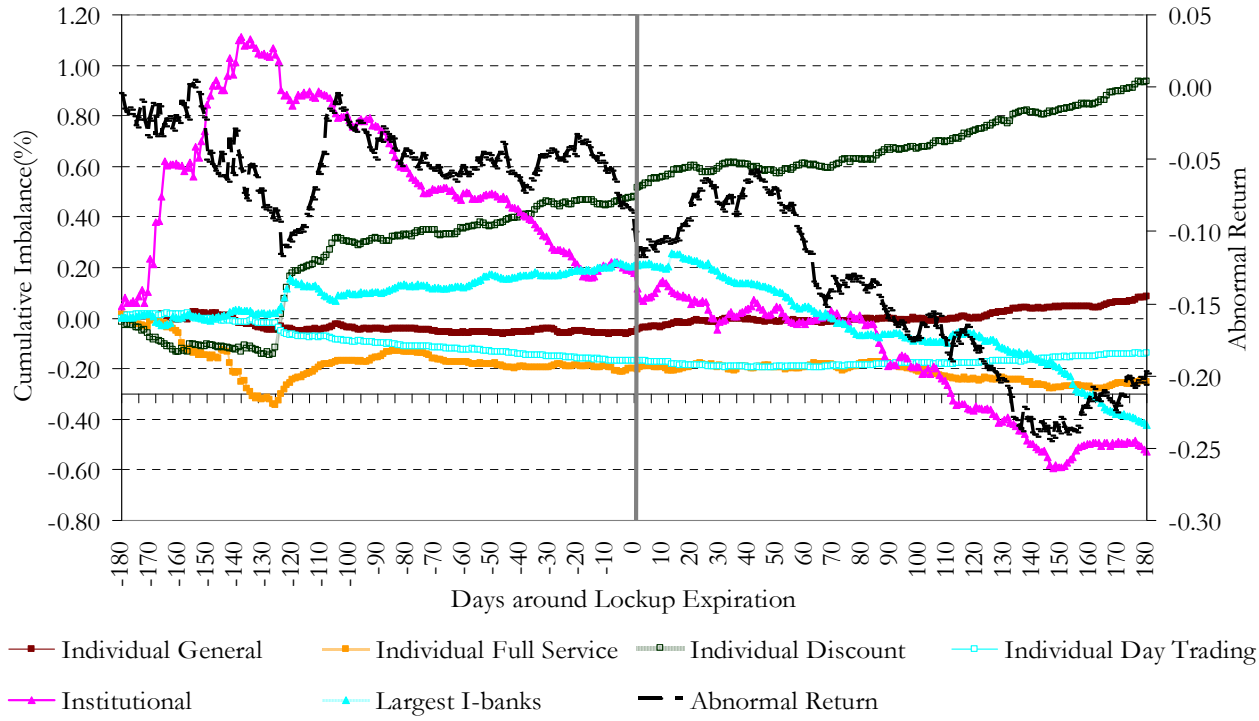


Figure IB.10. Demand around individual stock peaks: Technology hedge funds. We analyze demand around individual peaks for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the period from January 1997 to December 2000 (excluding March 2000 to avoid clustering). There are 580 technology stock peaks (279 different event days) during this period. When stocks peak in the same quarter, we take the equal-weighted average of the observations. Panel A plots cross-sectional averages of the buy-and-hold return and cumulative net active buying for technology hedge funds during the eight quarters surrounding individual peaks. Quarterly net buying for a stock is calculated as the difference between end-of-quarter holdings and the buy-and-hold value of beginning-of-quarter holdings, expressed as a percentage of the stock's market capitalization at the end of the quarter. Cumulative net active buying is cumulative net buying minus net buying induced by flows. Calculations of flow-induced net buying are described in Internet Appendix F. Quarter 1 marks the end of the quarter containing the peak, which is on average 33 trading days after the peak for our sample. Quarter -1 marks the end of the quarter prior to the peak. We identify 257 technology hedge funds whose portfolio weights in technology stocks for the first quarter of 1997 (or the first quarter in the 13f sample for a new fund) are higher than the 5th percentile of the corresponding weights for technology mutual funds (Internet Appendix G describes how we identify technology mutual funds). For robustness, we also identify 210 and 94 technology hedge funds using 10th and 25th percentile cutoffs. We also plot cumulative net active buying for the whole hedge fund sample for comparison. Panel B plots cumulative net active buying for hedge funds around 95 price peaks that occur within five trading days ([-5, 5] window) from the end of a quarter, where quarter 0 refers to the end of the quarter that coincides with the individual price peak.

Panel A. Cumulative imbalances during the [-180, 180] window around IPO lockup expirations



Panel B. Cumulative imbalances during the [-180, 180] window around SEO lockup expirations

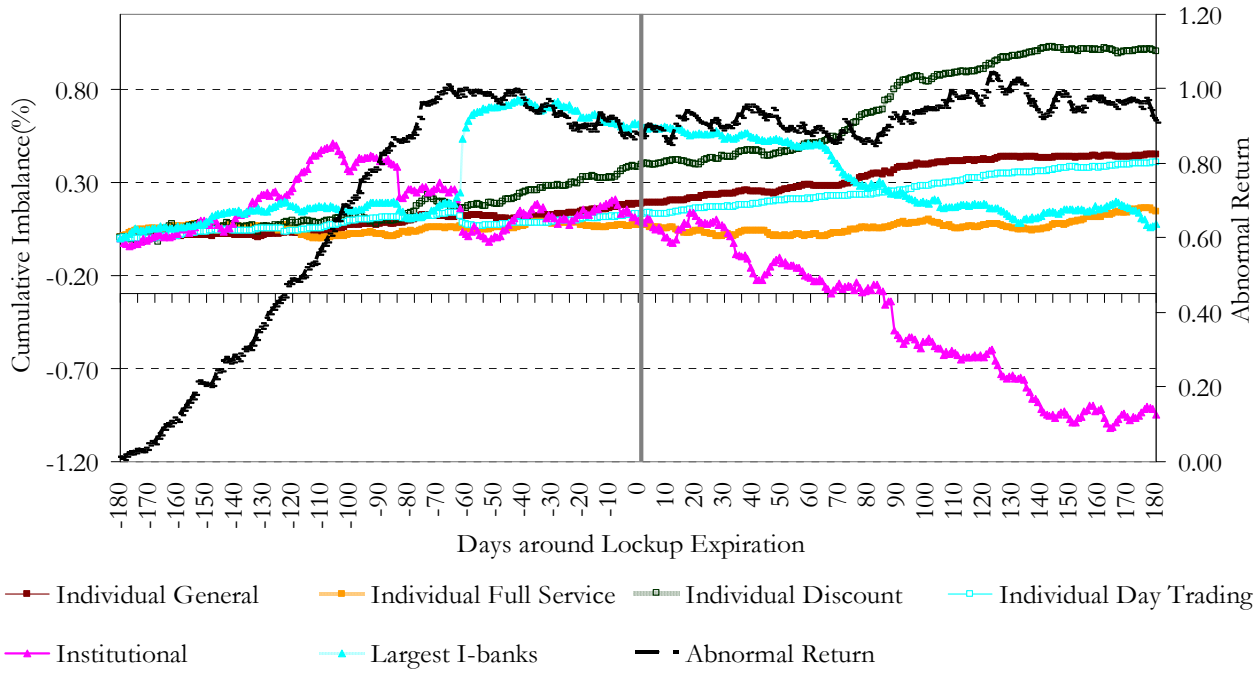


Figure IB.11. Cumulative imbalances around lockup expirations: [-180, 180] window. We collect data from SDC on IPO and SEO lockup expirations for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) during the 1997 to 2002 period. We manually search prospectuses through the EDGAR database to confirm the expiration dates and fill in missing data on expiration dates and number of shares subject to lockup. We drop issues with multiple lockup expiration dates or with an offer price less than $5. Panels A and B plot the cross-sectional averages of the abnormal return and cumulative imbalances for various investor groups for 361 trading days surrounding IPO and SEO lockup expirations, respectively. Daily imbalance is the difference between buy and sell volumes expressed as a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Abnormal return is the buy-and-hold return in excess of the value-weighted technology index return.

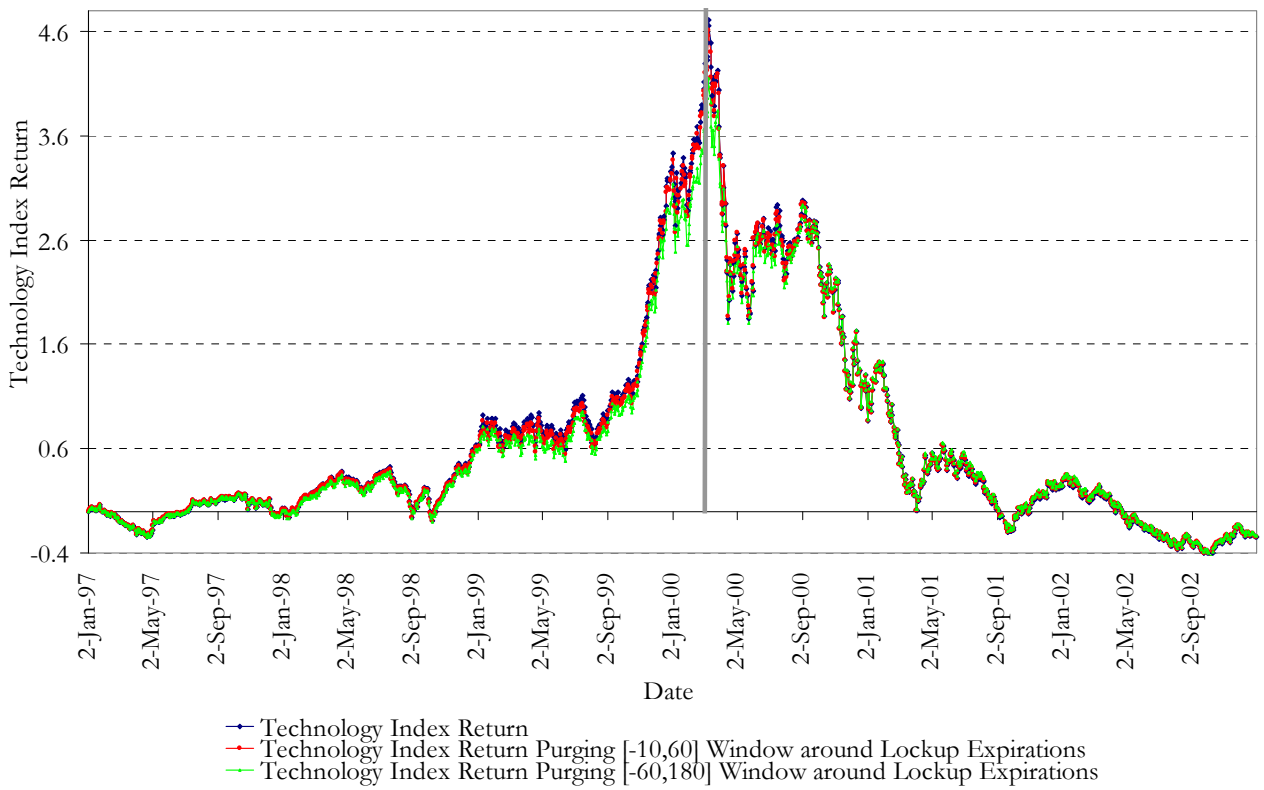


Figure IB.12. Technology index returns excluding lockup expirations. We calculate buy-and-hold index returns for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares, excluding Microsoft) during the 1997 to 2002 period. We plot index returns for the full sample, the subsample that excludes a firm-day if it is in the [-10, 60] window of an IPO or SEO lockup expiration for the firm, and the subsample that excludes a firm-day if it is in the [-60, 180] window of an IPO or SEO lockup expiration for the firm. Day 0 is the expiration day for the lockup shares.

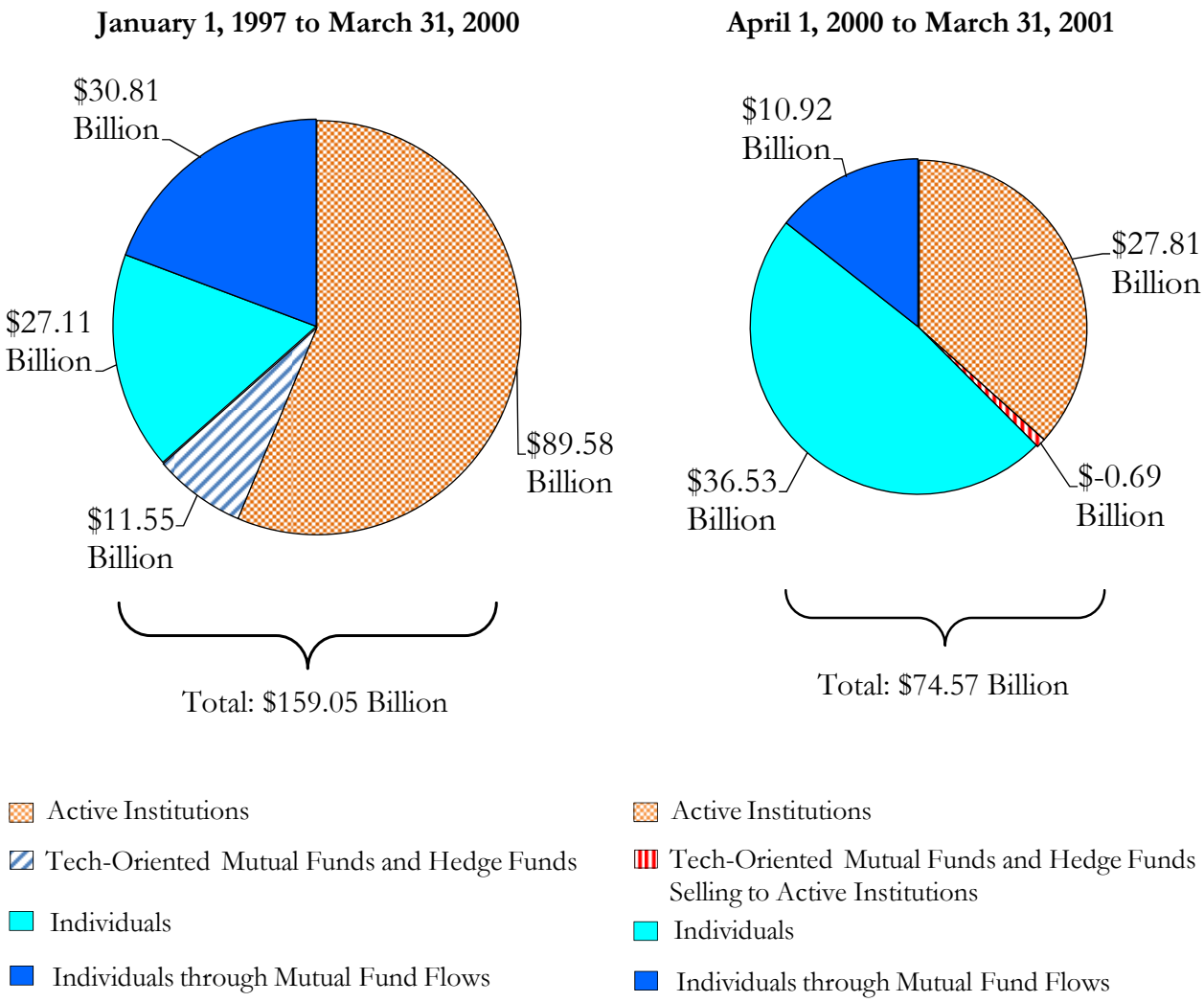


Figure IB.13. Cumulative change in demand for technology stocks: Examining technology-oriented institutions and active institutions separately. We first calculate quarterly changes in demand from January 1997 to March 2000 and from April 2000 to March 2001 for NASDAQ technology stocks (three-digit SIC code=737, excluding Microsoft) with ordinary common shares. We require a firm to be in the technology sector at both the beginning and the end of the quarter to be included in the sample. Quarterly change in demand for an investor group is the difference between end-of-quarter technology holdings and the buy-and-hold value of beginning-of-quarter technology holdings. The individual group is net of insiders. We further isolate the change in demand induced by mutual fund flows from change in demand by technology-oriented mutual funds and hedge funds and change in demand by active institutions. Change in demand induced by mutual fund flows is calculated by applying mutual fund flows for the merged CRSP-Thomson Financial sample to 13f mutual fund families. We describe the details of our approach in Internet Appendix E. We then sum the quarterly changes in demand from January 1997 to March 2000 and from April 2000 to March 2001. Technology-oriented mutual funds comprise index, sector, and technology funds. To identify such funds, we use Standard and Poor's detailed objective name, style name, and specialist name; ICDI's fund objective code; the Wiesenberger objective code; and fund name variables from the CRSP Mutual Funds database and Thomson Financial N-30D data. We identify a

mutual fund as an index fund if Standard and Poor's specialist name variable includes the keyword "index," the fund name from the CRSP Mutual Funds database includes one of the keywords "index," "indx," "idx," "dow 30," "100," "500," or "russell 2000," or the fund name from Thomson Financial N-30D data includes one of the keywords "index" or "indx." We identify a mutual fund as a sector fund if Standard and Poor's detailed objective name variable equals "Equity USA Misc Sectors," Standard and Poor's style name variable equals "Equity Sector," Standard and Poor's specialist name variable equals "Miscellaneous Sector," or ICDI's fund objective code variable equals "SF" (sector funds). We identify a mutual fund as a technology fund if Standard and Poor's detailed objective name variable equals "Equity USA Technology," Standard and Poor's style name variable equals "Equity Information Technology Sector" or "Equity Telecommunications Sector," Standard and Poor's specialist name variable equals "Index ArcaEx Tech 100," "Index GSTI Composite," "Index MSCI US IM Info Tech," "Index MSCI US IM Telecom Svcs," "Index NYSE Arca Tech 100," "Index PSE Technology 100," "Information Technology," "Internet," "TMT," "TMT (Technology Media & Telecom)," "Technology," or "Telecommunications," the Wiesenberger objective code variable equals "TCH" (technology sector), the fund name from the CRSP Mutual Funds database includes one of the keywords "internet," "technology," or "telecom" but not "biotech," or the fund name from Thomson Financial N-30D data includes the keywords "internet" or "tech" but neither "bio tech" nor "biotech." Since the dollar value of holdings in our merged mutual fund sample is 22.58% of mutual fund holdings in Thomson Financial N-30D data (more details are provided in Internet Appendix D), we further divide demand for each fund type by 22.58% assuming our merged fund sample is representative of the mutual fund universe. We identify 257 technology hedge funds whose portfolio weights in technology stocks for the first quarter of 1997 (or the first quarter in the 13f sample for a new fund) are higher than the 5th percentile of the corresponding weights for technology mutual funds. We plot cumulative changes in demand for technology-oriented mutual funds and hedge funds, active institutions, and individuals, and demand induced by mutual fund flows for the January 1997 to March 2000 and April 2000 to March 2001 periods. Active institutions include all institutions other than technology-oriented mutual funds and hedge funds.

Table IB.I
Imbalances Sorted on Contemporaneous and Lagged Firm Returns

This table reports daily and weekly imbalances in NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) by firm size quartile and contemporaneous and lagged firm returns from January 2, 1997 to March 27, 2000. In Panel A, we assign stocks in each size quartile to two portfolios based on whether their contemporaneous daily returns in excess of the technology index return are negative or positive, and then report equal-weighted imbalances for each portfolio and investor group. We first compute daily cross-sectional averages and then report the time-series means. Daily imbalance is the difference between buy and sell volumes expressed as 1/100 of a percentage of shares outstanding. We further adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. Panel B assigns stocks to portfolios according to excess returns for the previous day. Panels C and D assign stocks to portfolios based on contemporaneous and lagged weekly (Thursday open to Wednesday close) excess returns and report average weekly imbalances for each portfolio. Weekly imbalance is the sum of daily imbalances over the week. *t*-statistics are calculated for the difference in net buying between positive-return and negative-return portfolios for each size quartile. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

Panel A: Imbalances Sorted on Contemporaneous Firm Returns: Daily Analysis

	Small			2			3			Large			Large – Small	
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.
Indiv. General	-0.10	0.17	0.27**	-0.11	0.15	0.26**	-0.14	0.19	0.33**	-0.30	0.33	0.62**	-0.20**	0.16**
Indiv. Full Service	-0.32	0.52	0.84**	-0.17	0.25	0.41**	0.04	-0.03	-0.07	0.15	-0.17	-0.32**	0.47**	-0.69**
Indiv. Discount	-0.22	0.34	0.56**	0.13	-0.19	-0.32**	0.48	-0.55	-1.04**	0.86	-0.90	-1.76**	1.08**	-1.24**
Indiv. Day Trading	-0.09	0.12	0.21**	-0.10	0.14	0.25**	-0.18	0.23	0.42**	-0.34	0.35	0.69**	-0.25**	0.23**
Institutional	-0.86	1.53	2.40**	-0.82	1.22	2.04**	-1.67	2.11	3.79**	-1.83	2.03	3.85**	-0.96**	0.48**
Largest I-banks	-0.06	0.09	0.15**	-0.12	0.18	0.30**	-0.17	0.23	0.40**	-0.82	0.90	1.72**	-0.76**	0.81**
Hedge fund	0.00	-0.01	-0.01	-0.01	0.02	0.03	0.02	-0.02	-0.04**	0.10	-0.13	-0.23**	0.10**	-0.12**
Derivatives	0.02	-0.03	-0.05*	0.03	-0.03	-0.06**	0.09	-0.11	-0.20**	0.23	-0.25	-0.49**	0.22**	-0.23**
Mixed	-1.31	2.12	3.43**	-0.95	1.41	2.36**	-0.88	1.16	2.04**	-0.76	0.90	1.66**	0.55**	-1.22**
Total Individual	-0.72	1.16	1.88**	-0.25	0.36	0.60**	0.20	-0.16	-0.36**	0.37	-0.39	-0.76**	1.10**	-1.55**
Total Institution	-0.90	1.59	2.50**	-0.93	1.39	2.32**	-1.74	2.21	3.95**	-2.31	2.55	4.86**	-1.41**	0.94**
Panel B: Imbalances Sorted on Lagged Firm Returns: Daily Analysis														
Total Individual	-0.21	0.30	0.51**	-0.30	0.28	0.58**	0.14	-0.25	-0.39**	0.21	-0.34	-0.55**	0.42**	-0.64**
Total Institution	0.09	-0.09	-0.18	-0.04	0.09	0.13	-0.37	0.48	0.85**	-0.75	0.79	1.53**	-0.83**	0.88**

Panel C: Imbalances Sorted on Contemporaneous Firm Returns: Weekly Analysis

	Small			2			3			Large			Large – Small	
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.
Total Individual	-2.62	4.27	6.89**	-0.46	-0.40	0.06	1.98	-1.95	-3.92**	2.53	-2.87	-5.40**	5.15**	-7.14**
Total Institution	-2.09	2.82	4.91**	-2.87	4.52	7.40**	-7.11	8.23	15.35**	-8.10	8.96	17.07**	-6.01**	6.14**

Panel: D Imbalance Sorted on Lagged Firm Returns: Weekly Analysis

Total Individual	0.69	0.34	-0.34	0.30	-1.21	-1.51*	2.13	-2.59	-4.73**	1.26	-1.12	-2.38**	0.58	-1.46
Total Institution	-0.52	0.15	0.67	-0.67	1.10	1.77	-2.57	2.82	5.39**	-1.74	1.40	3.14**	-1.23	1.25

Table IB.II

Daily Imbalances Sorted on Contemporaneous and Lagged Firm Returns: Extreme Return Groups

This table reports daily imbalances in NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) by firm size quartile and contemporaneous and lagged firm returns from January 2, 1997 to March 27, 2000. In Panel A, we assign stocks in each size quartile to two portfolios based on whether their contemporaneous daily returns are below -2.5% or above 2.5%, and then report equal-weighted imbalances for each portfolio and investor group. We first compute daily cross-sectional averages and then report the time-series means. Daily imbalance is the difference between buy and sell volumes expressed as 1/100 of a percentage of shares outstanding. We adjust daily imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. Panel B assigns stocks to portfolios according to returns for the previous day. *t*-statistics are calculated for the difference in net buying between positive-return and negative-return portfolios for each size quartile. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

Panel A: Imbalances Sorted on Contemporaneous Firm Returns

	Small			2			3			Large			Large – Small	
	<-2.5%	>2.5%	Diff.	<-2.5%	>2.5%	Diff.	<-2.5%	>2.5%	Diff.	<-2.5%	>2.5%	Diff.	<-2.5%	>2.5%
Indiv. General	-0.12	0.30	0.42**	-0.12	0.34	0.46**	-0.15	0.53	0.68**	-0.25	0.97	1.22**	-0.13**	0.67**
Indiv. Full Service	-0.28	0.63	0.90**	-0.13	0.38	0.51**	0.02	0.00	-0.02	0.07	-0.14	-0.22**	0.35**	-0.77**
Indiv. Discount	-0.27	0.59	0.86**	-0.02	0.03	0.05	0.22	-0.51	-0.72**	0.44	-1.21	-1.65**	0.71**	-1.80**
Indiv. Day Trading	-0.08	0.17	0.25**	-0.09	0.26	0.34**	-0.16	0.48	0.63**	-0.27	0.78	1.04**	-0.19**	0.60**
Institutional	-0.68	1.66	2.34**	-0.48	1.41	1.89**	-1.05	3.20	4.25**	-1.16	3.45	4.61**	-0.48**	1.80**
Largest I-banks	-0.04	0.10	0.14**	-0.07	0.22	0.29**	-0.11	0.34	0.46**	-0.43	1.30	1.73**	-0.39**	1.20**
Hedge fund	0.00	-0.01	-0.02	-0.01	0.02	0.03	0.00	-0.01	-0.01	0.07	-0.22	-0.29**	0.06**	-0.21**
Derivatives	0.01	-0.03	-0.05	0.02	-0.07	-0.09**	0.07	-0.20	-0.27**	0.15	-0.46	-0.61**	0.14**	-0.43**
Mixed	-1.13	2.59	3.72**	-0.77	2.27	3.05**	-0.56	1.77	2.33**	-0.50	1.74	2.25**	0.63**	-0.85**
Total Individual	-0.74	1.69	2.43**	-0.36	1.00	1.36**	-0.07	0.50	0.57**	0.00	0.40	0.40**	0.74**	-1.29**
Total Institution	-0.70	1.71	2.40**	-0.53	1.58	2.11**	-1.08	3.35	4.43**	-1.38	4.07	5.45**	-0.67**	2.36**

Panel B: Imbalances Sorted on Lagged Firm Returns

Total Individual	-0.27	0.58	0.85**	-0.36	0.87	1.23**	-0.06	0.16	0.22	-0.07	0.15	0.21	0.21**	-0.44**
Total Institution	0.09	-0.16	-0.24	0.13	-0.33	-0.46**	-0.19	0.47	0.67**	-0.44	1.11	1.55**	-0.53**	1.27**

Table IB.III
Market Maker Imbalances Sorted on Contemporaneous and Lagged Firm Returns

This table reports daily and weekly market maker imbalances in NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares) by firm size quartile and contemporaneous and lagged firm returns from January 2, 1997 to March 27, 2000. In Panel A, we assign stocks in each size quartile to two portfolios based on whether their contemporaneous daily returns in excess of the technology index return are negative or positive, and then report equal-weighted market maker imbalances for each portfolio and investor group. We first compute daily cross-sectional averages and then report the time-series means. Daily market maker imbalance is the difference between market makers' buy and sell volumes expressed as 1/100 of a percentage of shares outstanding. We further adjust daily market maker imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. Panel B assigns stocks to portfolios according to excess returns for the previous day. Panels C and D assign stocks to portfolios based on contemporaneous and lagged weekly (Thursday open to Wednesday close) excess returns and report average weekly market maker imbalances for each portfolio. Weekly market maker imbalance is the sum of daily market maker imbalances over the week. *t*-statistics are calculated for the difference in net buying between positive-return and negative-return portfolios for each size quartile. Significance at the 1% and 5% levels is denoted by ** and *, respectively.

Panel A: Market Maker Imbalances Sorted on Contemporaneous Firm Returns: Daily Analysis

	Small			2			3			Large			Large – Small	
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.
Indiv. General	0.23	-0.37	-0.60**	0.22	-0.32	-0.54**	0.18	-0.24	-0.41**	0.02	-0.04	-0.05	-0.22**	0.33**
Indiv. Full Service	0.15	-0.25	-0.40**	0.07	-0.12	-0.19**	0.05	-0.06	-0.11**	0.00	0.00	0.00	-0.15**	0.25**
Indiv. Discount	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indiv. Day Trading	-0.02	0.02	0.04**	-0.02	0.03	0.05**	-0.01	0.01	0.02**	0.00	0.00	-0.01	0.02**	-0.03**
Institutional	1.41	-2.36	-3.77**	0.79	-1.19	-1.98**	1.05	-1.37	-2.42**	1.04	-1.18	-2.21**	-0.37**	1.20**
Largest I-banks	0.00	0.00	0.00	0.05	-0.07	-0.12**	0.10	-0.14	-0.23**	0.56	-0.59	-1.14**	0.56**	-0.59**
Hedge fund	0.01	-0.01	-0.01	0.00	-0.01	-0.01**	-0.01	0.01	0.01	0.01	-0.02	-0.03**	0.01	-0.01*
Derivatives	0.01	-0.02	-0.03**	0.01	-0.02	-0.04**	0.01	-0.01	-0.03**	0.03	-0.03	-0.05**	0.02**	-0.01
Mixed	1.15	-1.89	-3.05**	1.00	-1.46	-2.46**	1.06	-1.41	-2.47**	1.04	-1.21	-2.26**	-0.11*	0.68**
Total Individual	0.36	-0.59	-0.96**	0.28	-0.40	-0.68**	0.21	-0.29	-0.50**	0.02	-0.04	-0.06	-0.34**	0.55**
Total Institution	1.42	-2.38	-3.80**	0.85	-1.29	-2.14**	1.15	-1.51	-2.66**	1.63	-1.81	-3.44**	0.21**	0.59**

Panel B: Market Maker Imbalances Sorted on Lagged Firm Returns: Daily Analysis

Total Individual	0.04	-0.07	-0.11*	0.10	-0.09	-0.19**	0.06	-0.05	-0.11**	0.08	-0.02	-0.10**	0.04	0.05
Total Institution	0.21	-0.36	-0.57**	0.09	-0.09	-0.18*	0.03	0.01	-0.02	0.44	-0.44	-0.87**	0.23**	-0.09

Panel C: Market Maker Imbalances Sorted on Contemporaneous Firm Returns: Weekly Analysis

	Small			2			3			Large			Large – Small	
	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.	Diff.	Neg. Ret.	Pos. Ret.
Total Individual	1.10	-1.79	-2.89**	0.66	-0.67	-1.33**	0.37	-0.48	-0.85**	4.92	-5.51	-10.43**	-1.34**	2.04**
Total Institution	4.04	-5.46	-9.50**	2.24	-3.07	-5.30**	3.19	-3.90	-7.09**	2.54	-3.05	-5.59**	0.88*	-0.05

Panel: D: Market Maker Imbalances Sorted on Lagged Firm Returns: Weekly Analysis

Total Individual	-0.22	0.02	0.24	-0.01	0.35	0.35	-0.47	0.70	1.16**	-0.23	0.22	0.45*	0.58	-1.46
Total Institution	-0.23	0.26	0.49	-0.52	0.84	1.36**	-0.57	0.70	1.27**	-0.20	0.41	0.61	-1.23*	1.25

Table IB. IV
Cross-sectional Regressions of Post-peak Returns on Pre-peak Investor Trading: Insiders

This table presents cross-sectional univariate regressions of post-peak returns on pre-peak insider trading for CRSP stocks with ordinary common shares (CRSP share codes 10 or 11). The samples include firms in the top 50% and 25% of the CRSP sample according to market capitalization on March 31, 2000. The dependent variables are buy-and-hold returns from April 1, 2000 to March 31, 2001, March 31, 2002, and December 31, 2002. The independent variables are insider trading from April 1, 1999 to March 31, 2000. We calculate net buying for insiders by taking the difference between end-of-quarter holdings and the buy-and-hold value of beginning-of-quarter holdings, divided by end-of-quarter market capitalization. We then sum quarterly net buying for the four quarters from April 1, 1999 to March 31, 2000. We standardize all variables in the cross-section and estimate with intercepts that are not displayed for brevity. *t*-statistics computed with White robust errors are reported in parentheses.

	Top 50% Market Cap.			Top 25% Market Cap.		
	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)
Insider	0.05	0.04	0.04	0.15	0.13	0.12
	(1.63)	(2.11)	(2.07)	(3.92)	(3.98)	(3.61)
Adj.-R^2	0.001	0.002	0.002	0.019	0.019	0.017

Table IB.V
Fama-MacBeth Regressions of Returns on Contemporaneous Imbalances: Imbalances Constructed Using Trading Volume; Large Technology Firms

This table presents time-series averages of coefficients, number of observations, and adjusted-R^2s for cross-sectional regressions estimated each day (week, month) from January 2, 1997 to March 27, 2000 for the top 50% of the NASDAQ technology sector (three-digit SIC code=737 with ordinary common shares) according to market capitalization. The dependent variables are daily (weekly, monthly) returns and the independent variables are contemporaneous daily (weekly, monthly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of the sum of buy and sell volumes. Weekly or monthly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close) or month. We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly or monthly returns are buy-and-hold returns over the week or month. For the daily cross-sectional regression on day *t*, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the [*t*-3, *t*] window. For weekly (monthly) cross-sectional regressions, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the week (month). We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using Newey-West standard errors with five lags are reported in parentheses.

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	0.02	-0.01	-0.04	0.02	0.00
	(3.78)	(-0.35)	(-2.61)	(3.81)	(-0.20)
Indiv. Full Service	-0.02	-0.02	-0.04	-0.01	-0.01
	(-8.95)	(-3.92)	(-5.49)	(-6.20)	(-2.69)
Indiv. Discount	-0.12	-0.13	-0.17	-0.11	-0.13
	(-31.59)	(-17.77)	(-7.82)	(-30.02)	(-18.81)
Indiv. Day Trading		0.06	0.05		0.06
		(8.91)	(5.80)		(8.86)
Institutional	0.09	0.08	0.08	0.08	0.07
	(33.92)	(13.93)	(5.75)	(33.45)	(12.34)
Largest I-banks	0.02	-0.01	-0.02	0.02	-0.01
	(14.45)	(-2.06)	(-2.62)	(13.25)	(-2.29)
Hedge Fund		-0.07	-0.05		-0.08
		(-8.04)	(-4.92)		(-7.71)
Mixed	0.07	0.06	0.04	0.07	0.06
	(31.72)	(13.86)	(3.62)	(30.43)	(12.20)
D_{News} x Indiv. General				0.06	-0.01
				(5.08)	(-0.50)
D_{News} x Indiv. Full Service				-0.05	-0.02
				(-6.08)	(-1.95)
D_{News} x Indiv. Discount				-0.11	-0.02
				(-9.59)	(-1.72)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Indiv. Day Trading					0.01
					(1.42)
D_{News} x Institutional				0.05	0.02
				(5.21)	(1.80)
D_{News} x Largest I-banks				0.02	0.01
				(2.04)	(1.44)
D_{News} x Hedge Fund					0.01
					(1.94)
D_{News} x Mixed				0.02	0.02
				(1.78)	(1.78)
Avg. N	244.8	244.4	257.7	244.8	244.4
Adj.-R^2	0.052	0.101	0.095	0.066	0.104

Table IB.VI
Fama-MacBeth Regressions of Returns on Contemporaneous Imbalances: Imbalances Constructed Using Trading Volume; Alternative Sample Selections

This table presents time-series averages of coefficients, number of observations, and adjusted-R^2s for cross-sectional regressions estimated each day (week, month) from January 2, 1997 to March 27, 2000 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). Panel A reports results for all firms that are in the technology sector according to market capitalization. Panel B reports results for firms that are in the bottom 50% of the technology sector according to market capitalization. The dependent variables are daily (weekly, monthly) returns and the independent variables are contemporaneous daily (weekly, monthly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of the sum of buy and sell volumes. Weekly or monthly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close) or month. We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly or monthly returns are buy-and-hold returns over the week or month. For the daily cross-sectional regression on day *t*, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the [*t*-3, *t*] window. For weekly (monthly) cross-sectional regressions, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the week (month). We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using Newey-West standard errors with five lags are reported in parentheses.

Panel A: Full Sample

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	-0.003	-0.028	-0.052	-0.005	-0.030
	(-0.72)	(-2.54)	(-2.58)	(-1.14)	(-3.03)
Indiv. Full Service	0.017	0.020	0.016	0.021	0.030
	(9.15)	(3.64)	(2.51)	(11.54)	(5.79)
Indiv. Discount	-0.078	-0.109	-0.143	-0.073	-0.101
	(-30.50)	(-18.39)	(-10.74)	(-29.94)	(-16.65)
Indiv. Day Trading	0.073	0.053	0.047	0.067	0.049
	(27.83)	(9.00)	(6.07)	(28.48)	(8.76)
Institutional	0.090	0.082	0.072	0.088	0.079
	(41.46)	(21.91)	(8.18)	(41.16)	(19.34)
Largest I-banks	0.029	0.011	0.002	0.029	0.011
	(17.85)	(1.96)	(0.23)	(18.00)	(1.89)
Hedge Fund	-0.022	-0.060	-0.014	-0.022	-0.064
	(-8.80)	(-6.78)	(-0.94)	(-9.44)	(-6.16)
Mixed	0.092	0.086	0.077	0.090	0.082
	(40.59)	(26.61)	(12.00)	(39.19)	(20.86)
D_{News} x Indiv. General				0.037	0.007
				(3.64)	(0.68)
D_{News} x Indiv. Full Service				-0.045	-0.033
				(-4.65)	(-4.55)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Indiv. Discount				-0.079	-0.031
				(-7.09)	(-3.96)
D_{News} x Indiv. Day Trading				0.066	0.009
				(5.85)	(1.06)
D_{News} x Institutional				0.045	0.014
				(4.12)	(1.58)
D_{News} x Largest I-banks				0.000	0.002
				(-0.03)	(0.32)
D_{News} x Hedge Fund				-0.003	0.012
				(-0.42)	(1.22)
D_{News} x Mixed				0.035	0.024
				(3.42)	(2.62)
Avg. N	489	489.9	490.2	489	489.9
Adj.-R^2	0.034	0.043	0.047	0.044	0.046
Panel B: Small Firms					
Indiv. General	-0.02	-0.05	-0.09	-0.03	-0.05
	(-5.76)	(-5.61)	(-6.05)	(-6.50)	(-6.35)
Indiv. Full Service	0.06	0.07	0.08	0.06	0.08
	(17.56)	(9.56)	(6.63)	(18.18)	(11.14)
Indiv. Discount	-0.05	-0.07	-0.11	-0.05	-0.07
	(-16.61)	(-12.50)	(-7.29)	(-16.72)	(-10.75)
Indiv. Day Trading		0.04	0.00		0.04
		(3.89)	(0.27)		(3.23)
Institutional	0.10	0.08	0.10	0.09	0.08
	(27.46)	(14.06)	(10.77)	(28.26)	(13.50)
Largest I-banks	0.05	0.07	0.06	0.05	0.07
	(11.41)	(6.64)	(4.64)	(12.93)	(6.18)
Hedge Fund		0.11	0.12		0.06
		(4.72)	(3.60)		(2.25)
Mixed	0.11	0.11	0.11	0.11	0.10
	(36.28)	(24.08)	(9.46)	(35.29)	(19.59)
D_{News} x Indiv. General				-0.09	0.00
				(-0.68)	(0.14)
D_{News} x Indiv. Full Service				-0.04	-0.04
				(-0.45)	(-2.09)
D_{News} x Indiv. Discount				-0.09	0.01
				(-0.53)	(0.75)
D_{News} x Indiv. Day Trading					0.07
					(1.21)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Institutional				0.24	0.02
				(1.14)	(1.18)
D_{News} x Largest I-banks				0.25	0.01
				(0.38)	(0.48)
D_{News} x Hedge Fund					0.11
					(0.37)
D_{News} x Mixed				0.06	0.04
				(1.49)	(2.29)
Avg. N	244.2	243.8	257.1	244.2	243.8
Adj.-R^2	0.025	0.038	0.063	0.052	0.064

Table IB.VII
Panel Regressions of Returns on Contemporaneous Imbalances: Imbalances Constructed Using Trading Volume

This table presents coefficients, number of observations, and adjusted-R^2s for panel regressions estimated for the periods from January 2, 1997 to March 27, 2000 and March 28, 2000 to December 31, 2002 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). Panel A reports results for the period from January 2, 1997 to March 27, 2000. Panel B reports results for the period from March 28, 2000 to December 31, 2002. The dependent variables are daily (weekly, monthly) returns and the independent variables are contemporaneous daily (weekly, monthly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of the sum of buy and sell volumes. Weekly or monthly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close) or month. We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly or monthly returns are buy-and-hold returns over the week or month. For daily regressions, news dummy equals one for a firm on day t if there are any news articles about the firm in the top 10 newswires during the [t-3, t] window. For weekly (monthly) regressions, news dummy equals one for a firm if there are any news articles about the firm in the top 10 newswires during the week (month). We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. t-statistics computed by clustering standard errors by firm and by month are reported in parentheses for all regressions.

Panel A: January 2, 1997 – March 27, 2000

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	-0.01	-0.03	-0.05	-0.01	-0.03
	(-1.06)	(-4.30)	(-3.54)	(-1.26)	(-4.32)
Indiv. Full Service	0.02	0.02	0.02	0.02	0.03
	(5.95)	(3.62)	(1.88)	(8.50)	(4.84)
Indiv. Discount	-0.08	-0.11	-0.15	-0.07	-0.11
	(-18.81)	(-17.52)	(-12.53)	(-17.53)	(-16.12)
Indiv. Day Trading	0.07	0.05	0.05	0.07	0.05
	(18.47)	(9.30)	(5.22)	(19.02)	(9.77)
Institutional	0.09	0.08	0.07	0.09	0.08
	(23.04)	(17.54)	(8.46)	(21.66)	(20.39)
Largest I-banks	0.03	0.01	0.00	0.03	0.01
	(12.66)	(2.15)	(0.04)	(12.04)	(1.63)
Hedge Fund	-0.02	-0.06	-0.01	-0.02	-0.06
	(-7.44)	(-9.73)	(-1.13)	(-7.13)	(-7.88)
Mixed	0.09	0.09	0.08	0.09	0.08
	(26.14)	(20.62)	(10.49)	(25.91)	(21.86)
D_{News} x Indiv. General				0.00	0.00
				(0.49)	(0.72)
D_{News} x Indiv. Full Service				-0.03	-0.01
				(-5.65)	(-4.04)
D_{News} x Indiv. Discount				-0.03	-0.01
				(-6.13)	(-2.96)
D_{News} x Indiv. Day Trading				0.01	0.00
				(2.74)	(1.37)

	Daily	Weekly	Monthly	Daily	Weekly
D_{News} x Institutional				0.00	0.00
				(0.66)	(1.40)
D_{News} x Largest I-banks				-0.01	0.00
				(-1.78)	(0.75)
D_{News} x Hedge Fund				0.00	0.00
				(0.41)	(0.01)
D_{News} x Mixed				0.00	0.00
				(0.48)	(1.09)
N	399,018	82,298	19,118	396,965	81,480
Adj.-R^2	0.028	0.032	0.034	0.029	0.033

Panel B: March 28, 2000 – December 31, 2002

	Daily	Weekly	Monthly	Daily	Weekly
Indiv. General	-0.02	-0.06	-0.10	-0.02	-0.05
	(-5.54)	(-8.73)	(-9.43)	(-4.06)	(-6.25)
Indiv. Full Service	0.02	0.01	0.00	0.02	0.02
	(4.30)	(1.26)	(-0.04)	(6.14)	(3.11)
Indiv. Discount	-0.05	-0.08	-0.14	-0.04	-0.07
	(-9.57)	(-9.25)	(-6.91)	(-8.54)	(-7.80)
Indiv. Day Trading	0.01	0.01	0.01	0.01	0.00
	(2.98)	(1.33)	(0.92)	(2.50)	(0.44)
Institutional	0.10	0.10	0.12	0.10	0.10
	(34.12)	(21.77)	(14.85)	(31.17)	(16.66)
Largest I-banks	0.03	0.01	0.02	0.03	0.01
	(10.51)	(1.62)	(1.99)	(9.98)	(1.28)
Hedge Fund	-0.02	-0.08	-0.05	-0.02	-0.07
	(-5.29)	(-16.26)	(-4.73)	(-5.16)	(-12.65)
Mixed	0.11	0.10	0.09	0.11	0.10
	(31.18)	(18.90)	(7.08)	(29.88)	(16.58)
D_{News} x Indiv. General				-0.01	-0.01
				(-2.58)	(-3.07)
D_{News} x Indiv. Full Service				-0.02	-0.01
				(-2.80)	(-3.56)
D_{News} x Indiv. Discount				-0.03	-0.02
				(-4.62)	(-4.90)
D_{News} x Indiv. Day Trading				0.01	0.01
				(2.27)	(1.59)
D_{News} x Institutional				0.03	0.01
				(6.04)	(3.81)
D_{News} x Largest I-banks				0.00	0.00
				(-0.69)	(0.56)
D_{News} x Hedge Fund				0.00	-0.01
				(0.11)	(-5.67)
D_{News} x Mixed				0.02	0.01
				(4.30)	(2.38)

	Daily	Weekly	Monthly	Daily	Weekly
N	381,512	80,074	18,177	381,349	79,877
Adj.-R^2	0.024	0.038	0.059	0.024	0.040

Table IB.VIII
Fama-MacBeth Regressions of Returns on Contemporaneous Imbalances: Alternative News Measures; Imbalances Constructed Using Trading Volume

This table presents time-series averages of coefficients, number of observations, and adjusted-R^2s for cross-sectional regressions estimated each day (week) from January 2, 1997 to March 27, 2000 and March 28, 2000 to December 31, 2002 for NASDAQ technology stocks (three-digit SIC code=737 with ordinary common shares). The dependent variables are daily (weekly) returns and the independent variables are contemporaneous daily (weekly) imbalances and their interactions with news dummies. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of the sum of buy and sell volumes. Weekly imbalance is the sum of daily imbalances over the week (Thursday open to Wednesday close). We adjust imbalances for firm size by subtracting the average imbalance for the firm's size quartile in the technology sector. Weekly returns are buy-and-hold returns over the week. For the daily cross-sectional regression on day *t*, news dummy equals one for a firm if there are any news articles about the firm in any Factiva newswire or non-newswire source on day *t*. For weekly cross-sectional regressions, news dummy equals one for a firm if there are any news articles about the firm in any Factiva newswire or non-newswire source during the week. We standardize dependent and independent variables in each cross-section except for news dummies and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using Newey-West standard errors with five lags are reported in parentheses.

	Jan. 2, 1997 – Mar. 27, 2000		Mar. 28, 2000 – Dec. 31, 2002	
	Daily	Weekly	Daily	Weekly
Individual General	-0.005	-0.029	-0.011	-0.044
	(-1.07)	(-2.80)	(-3.67)	(-7.06)
Individual Full Service	0.022	0.029	0.023	0.023
	(11.81)	(5.47)	(9.69)	(3.98)
Individual Discount	-0.072	-0.100	-0.042	-0.059
	(-29.14)	(-17.51)	(-7.62)	(-4.57)
Individual Day Trading	0.067	0.049	0.009	0.004
	(28.10)	(9.06)	(3.62)	(0.68)
Institutional	0.088	0.077	0.095	0.094
	(41.14)	(19.14)	(37.46)	(11.96)
Largest I-banks	0.030	0.007	0.025	0.010
	(17.57)	(1.27)	(11.99)	(1.67)
Hedge Fund	-0.022	-0.059	-0.016	-0.065
	(-8.72)	(-5.35)	(-7.74)	(-8.87)
Mixed	0.090	0.081	0.110	0.096
	(39.32)	(21.33)	(31.62)	(11.72)
D_{News} x Individual General	0.026	-0.001	-0.020	0.007
	(3.30)	(-0.13)	(-3.39)	(1.96)
D_{News} x Individual Full Service	-0.044	-0.014	-0.024	-0.027
	(-6.35)	(-3.19)	(-3.93)	(-5.60)
D_{News} x Individual Discount	-0.073	-0.016	-0.041	-0.012
	(-8.81)	(-3.91)	(-5.89)	(-3.34)
D_{News} x Individual Day Trading	0.054	0.005	0.012	-0.007
	(8.34)	(1.32)	(2.05)	(-1.58)
D_{News} x Institutional	0.026	0.012	0.049	-0.013
	(3.26)	(2.33)	(7.64)	(-4.50)

	Jan. 2, 1997 – Mar. 27, 2000		Mar. 28, 2000 – Dec. 31, 2002	
	Daily	Weekly	Daily	Weekly
D_{News} x Largest I-banks	-0.003	0.006	0.004	0.000
	(-0.43)	(1.66)	(0.85)	(0.10)
D_{News} x Hedge Fund	-0.002	0.000	0.004	0.014
	(-0.53)	(-0.11)	(0.93)	(2.97)
D_{News} x Mixed	0.027	0.015	0.039	0.012
	(3.56)	(3.11)	(6.38)	(2.69)
Avg. N	489	490	550.5	552
Adj.-R^2	0.040	0.049	0.037	0.055

Table IB.IX
Cross-sectional Regressions of Post-peak Returns on Pre-peak Investor Imbalances

This table presents cross-sectional univariate regressions of post-peak returns on pre-peak investor imbalances for CRSP stocks with ordinary common shares (CRSP share codes 10 or 11). The samples include firms in the top 50% and 25% of the CRSP sample according to market capitalization on March 31, 2000. The dependent variables are buy-and-hold returns from April 1, 2000 to March 31, 2001, March 31, 2002, and December 31, 2002. In Panel A, the independent variables are institutional imbalances from April 1, 1999 to March 31, 2000. Daily imbalance is the difference between buy and sell volumes expressed as a fraction of shares outstanding. We then sum daily imbalances for each investor group from April 1, 1999 to March 31, 2000. "Total Institution" is the sum of institutional, largest investment bank, hedge fund, and derivatives groups. We also control for the price-to-sales ratio as of March 31, 2000, calculated as price per share for March 31, 2000 divided by sales per share for most recent fiscal year-end that is at least six months before March 31, 2000. In Panel B, the independent variables are individual imbalances from April 1, 1999 to March 31, 2000 and the price-to-sales ratio as of March 31, 2000. "Total Individual" is the sum of individual general, individual full-service, individual discount, and individual day trading groups. In Panel C, the independent variables are institutional imbalances in excess of individual imbalances from April 1, 1999 to March 31, 2000 and the price-to-sales ratio as of March 31, 2000. We standardize all variables in the cross-section and estimate with intercepts that are not displayed for brevity. *t*-statistics computed using White robust errors are reported in parentheses.

Panel A: Regressions of Post-peak Returns on One-year Pre-peak Institutional Imbalances

	Top 50% Market Cap.			Top 25% Market Cap.		
	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)
Total Institution	-0.01	-0.01	-0.02	-0.07	-0.04	-0.06
	(-0.76)	(-0.50)	(-1.60)	(-2.27)	(-1.8)	(-2.72)
P/S Ratio	-0.38	-0.32	-0.30	-0.40	-0.33	-0.31
	(-25.05)	(-24.78)	(-24.81)	(-20.92)	(-21.03)	(-20.09)
Adj.-R^2	0.201	0.211	0.187	0.295	0.305	0.271
Institutional	-0.03	-0.02	-0.03	-0.06	-0.03	-0.05
	(-1.44)	(-1.2)	(-2.21)	(-2.16)	(-1.51)	(-2.47)
Largest I-banks	0.01	0.01	0.01	-0.02	-0.02	-0.03
	(0.94)	(1.22)	(0.61)	(-1.78)	(-1.89)	(-2.60)
Hedge Fund	0.01	0.00	0.00	0.18	0.12	0.14
	(0.4)	(0.02)	(-0.12)	(3.18)	(3.12)	(3.49)
Derivatives	0.05	0.033	0.03	0.12	0.09	0.06

	Top 50% Market Cap.			Top 25% Market Cap.		
	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)	Return (Apr.00-Mar.01)	Return (Apr.00-Mar.02)	Return (Apr.00-Dec.02)
	(3.76)	(3.12)	(3.33)	(3.94)	(4.05)	(3.17)
P/S Ratio	-0.37	-0.32	-0.32	-0.38	-0.31	-0.29
	(-23.94)	(-23.91)	(-23.89)	(-19.91)	(-19.93)	(-19.16)
Adj.-R^2	0.204	0.214	0.189	0.308	0.316	0.279
Panel B: Regressions of Post-peak Returns on One-year Pre-peak Individual Imbalances						
Total Individual	-0.09	-0.04	-0.03	-0.01	0.00	0.02
	(-3.86)	(-2.34)	(-1.70)	(-0.39)	(-0.10)	(0.60)
P/S Ratio	-0.36	-0.31	-0.29	-0.40	-0.33	-0.31
	(-22.38)	(-22.48)	(-22.65)	(-19.59)	(-19.78)	(-19.02)
Adj.-R^2	0.206	0.213	0.187	0.292	0.302	0.267
Indiv. General	-0.08	-0.04	-0.03	0.02	0.01	0.03
	(-1.70)	(-1.08)	(-0.77)	(0.29)	(0.31)	(0.78)
Indiv. Full Service	0.00	0.00	0.01	0.04	0.02	0.03
	(-0.24)	(0.23)	(0.68)	(1.43)	(0.85)	(1.20)
Indiv. Discount	-0.03	-0.02	-0.01	-0.02	-0.01	0.00
	(-0.83)	(-0.52)	(-0.33)	(-0.37)	(-0.24)	(0.06)
Indiv. Day Trading	-0.09	-0.06	-0.06	-0.11	-0.05	-0.05
	(-4.40)	(-3.70)	(-4.15)	(-4.15)	(-2.81)	(-3.11)
P/S Ratio	-0.33	-0.29	-0.27	-0.34	-0.30	-0.28
	(-18.51)	(-19.20)	(-19.35)	(-14.96)	(-15.83)	(-15.36)
Adj.-R^2	0.212	0.216	0.191	0.303	0.306	0.271
Panel C: Regressions of Post-peak Returns on One-year Pre-peak "Institutional Imbalance – Individual Imbalance"						
Institution - Individual	0.33	0.16	-0.05	-0.05	-0.03	-0.05
	(1.31)	(0.79)	(-0.27)	(-1.63)	(-1.33)	(-2.36)
P/S Ratio	-0.37	-0.32	-0.30	-0.40	-0.33	-0.31
	(-24.02)	(-23.90)	(-24.02)	(-20.60)	(-20.65)	(-19.88)
Adj.-R^2	0.202	0.211	0.186	0.294	0.303	0.269