Investor Sentiment in Japanese and U.S. Daily Mutual Fund Flows

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Abstract

We find evidence that is consistent with the hypothesis that daily mutual fund flows may be instruments for investor sentiment about the stock market. We use this finding to construct a new index of investor sentiment, and validate this index using data from both the United States and Japan. In both markets exposure to this factor is priced, and in the Japanese case, we document evidence of negative correlations between "Bull" and "Bear" domestic funds. The flows to bear foreign funds in Japan display some evidence of negative correlation to domestic and foreign equity funds, suggesting that there is a foreign vs. domestic sentiment factor in Japan that does not appear in the contemporaneous U.S. data. By contrast, U.S. mutual fund investors appear to regard domestic and foreign equity mutual funds as economic substitutes.

JEL classification: G15

1 Introduction

Ever since the theoretical work of Delong Shleifer, Summers and Waldmann (1990) [DSSW] researchers have sought empirical evidence of a sentiment factor that reflects fluctuations in the opinions of traders regarding the future prospects for the stock market. It is potentially valuable to find an empirical measure of sentiment because of the suggestion that it may be priced. In particular, it could be source of non-diversifiable risk generated by the very existence of an asset market that simultaneously serves as a mechanism for impounding expectations and beliefs about the future, and provides liquidity to savers. Finding an empirical instrument for the sentiment factor would allow a test of the DSSW model and its implications, including the possibility that market prices temporarily deviate from true economic values as a function of investor sentiment.

Shiller, Kon-Ya and Tsutsui (1996) take a direct approach to capturing market sentiment by sending a semi-annual mail survey to institutional investors, asking their opinion about the market in the U.S. and Japan. Lee, Shleifer and Thaler (1991) argue that the closed-end fund discount measures small investor sentiment, although Elton, Gruber and Busse (1998) find that exposure to this variable is not priced. Barber (1999) considers odd-lot trading as a measure of investor sentiment and finds a relation to the small-firm effect. Froot and Dabora (1999) interpret the shifting differential between prices of Royal Dutch and Shell as a potential sentiment factor. Goetzmann, Massa and Rouwenhorst (1999) find evidence of a negative correlation between the daily flows to equity mutual funds, money market funds and precious metals funds. These flows explain part of the covariance structure of mutual fund returns. Froot, O'Connell and Seasholes (1999) find evidence that cross-border flows reflect shifting investor sentiment regarding foreign markets, and that this in turn affects asset prices. Using a Finish dataset, Grinblatt and Keloharju (2000) find, among other things, that foreign investor flows have some impact on share prices. Iihara, Kato and Tokunaga (2001) document the herding behavior in various investor classes on the Tokyo Stock Exchange. The money-flow instruments we study in this paper are particularly valuable in the context of past research, because they allow the separation of the measurement of sentiment from measurement of asset returns. This separation is important because if DSSW -- and more recently Barberis and Shleifer (2001) -- are valid models of investor behavior, then we would expect the sentiment-based flows to affect asset returns. Consequently, a measure distinct from returns is useful.

One drawback to most empirical attempts to capture sentiment thus far is that few papers save Shiller, Kon-Ya and Tsutsui (1996) have access to explicit sentiment measures. They are based instead on the presumption that flows, or purchases of odd-lots, or fund discounts can be logically interpreted as a proxy for investor sentiment. Money flows typically are not labeled as "optimistic" or "pessimistic" as such. They can be alternatively interpreted as reflecting correlated liquidity trades or even groups of traders following dynamic portfolio insurance strategies. It would be nice to actually have a variable explicitly tied to expectations about the market trajectory -- a way for investors to "vote" if you will on whether they foresee a bull or a bear market.

In this paper, we use a daily panel dataset of United States and Japanese mutual fund flows. The Japanese dataset is particularly interesting in this context, as it contains a number of funds explicitly named "Bull" and "Bear," reflecting investor opportunities to effectively bet on the rise or fall of the Japanese stock market. In a sense, we are the beneficiaries of poor market performance in Japan. The last decade has made pessimists out of many Japanese equity investors, and the mutual fund industry has responded to growing demand for speculative instruments that profit on continued market decline. In our analysis, we find that the daily flows to bull and bear funds in Japan are strongly negatively correlated. This pattern is consistent with a strong, common sentiment factor among Japanese mutual fund investors. Our evidence supports that this sentiment factor is priced. These results further suggest that the structure of correlation in daily mutual fund flows both in the U.S. and Japan is a useful measure of attitudes beyond the simple domestic equity markets. For example, Barberis and Shleifer (2001) argue that herding may take place in sub-sectors of the equity universe, not simply with respect to the stock market as a whole. Our Japanese flow data is consistent with the existence of a foreign-domestic sentiment factor as well as a domestic equity factor. We find flows into and out of foreign mutual funds are negatively correlated with flows to domestic equity funds.

The paper is organized as follows. In the next section, we review the Japanese mutual fund industry. Section 3 describes our data. In Section 4, we identify the flow factors and examine their explanatory power in the cross section of fund returns. Section 5 concludes.

2   The Japanese Mutual Fund Industry

While mutual funds have grown to become a dominant vehicle for savings in the United States over the past decade, its Japanese counterpart, the investment trust sector -- a term that includes both closed-end and open-end funds -- has grown more modestly. That said, it is one of the most well-developed investment fund sectors in the world, with hundreds of billions of dollars in savings and several thousand investment products. Japanese open-end investments trusts correspond to open-end mutual funds in the U.S. and are further classified into equity and bond categories. Cai, Chan and Yamada (1997) and Brown, Goetzmann, Hiraki, Otsuki and Shiraishi (2001) [BGHOS] both focus on the equity-type funds in their historical performance studies, although many funds classified in the equities group as such are free to hold fixed-income securities, and thus are effectively bond funds. Until the end of 1994, Japanese mutual funds could not trade derivative products except for hedging purposes. This regulation was relaxed in 1995, when Yamaichi Asset Management created the first derivatives-based fund "Power Active Open."

At the end April 1999, the entire Japanese mutual fund industry was 48.2 trillion yen or 403 billion dollars at the prevailing rate of exchange, with 4,296 funds.[1] In the meantime, equity mutual funds recorded 11.8 trillion yen or 98.5 billion dollars in total net assets. By comparison, U.S. equity mutual funds held approximately $4 trillion in net assets at the end of 1999 -- an order of magnitude difference. The strong contrast in the growth of the U.S. and Japanese mutual fund industries over the last ten years may in part be due to the bursting Japanese stock market bubble in the early 1990's, and the extended bear market that followed. Never-the-less, our dataset from includes a substantial number of funds. It covers the complete set of Japanese equity mutual funds with no survivorship bias. Specifically, we have 2,241 funds with daily trading information over the period January 19, 1998 through January 18, 2000. The total net asset represented is 11.6 trillion yen or 97.0 billon dollars.[2] Thus, our dataset covers about 50% of the whole Japanese mutual fund industry in terms of number of funds and about 25% in terms of total net assets. To this we are able to match U.S. daily fund data from Trimtabs over the period February 2, 1998

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[1] Source for the industry total net assets and number of funds: The Investment Trust Association of Japan, http://www.toushin.or.jp/result/getuji/2000/4/g1-1.htm, with English translation. The yen-dollar exchange rate at the end of April 1999 is 119.59 and is taken from The Bank of Japan, http://www2.boj.or.jp/en/dlong/stat/data/cdab1690.txt, with English translation. U.S. figures are from the Investment Company Institute *Mutual Fund Fact Book 2000*. http://www.ici.org

[2] The sum over all funds of the mean total net assets during the sample period. The dollar number is computed by the exchange rate at the end of April 1999.

through June 28, 1999. The Trimtabs data contains 999 funds with the fund size totaling 839 billion dollars.[3]

Japanese fund classifications differ from their U.S. counterparts. Our dataset, for example, does not include the standard fixed-income category (although it does include funds that invest heavily in bonds), since pure bond funds are classified as bond investment trusts (*ko-sha-sai* funds) in Japan. Table A1 shows the classification of equity funds by the Investment Trust Association of Japan (ITAJ), an industry-level association for fund management firms. They officially classified every open-end equity fund into one of the seven broadly and 31 narrowly defined categories during our sample period.[4] A distinctive category in Table A1 is the "derivatives" category. The number of funds in this category has increased from virtually zero at the beginning of 1995 to 191 at the beginning of 2000. The closest to a fixed income category is the "balanced" category. Funds in this category can hold 100 percent of their total net assets in fixed income securities or can invest up to 70% in domestic or foreign equities. This mingling of bond and equity funds is not a problem *per se*, as long as we can identify the factors driving returns and flows. Nonetheless, we are interested in extracting "pure" bond funds, for Goetzmann, Massa and Rouwenhorst (1999) identify a sentiment factor as polarity between equity and bond funds using the U.S. data. We address this problem in the next section.

2.1 Tax Effects and Fees

Cai, Chan and Yamada (1997) point out that the unique tax treatment of Japanese funds has the potential to affect return calculation. In fact, BGHOS show that the apparent underperformance of Japanese mutual funds in the 1980's and 1990's can be attributed almost entirely to these tax effects, since better performance effectively penalized fund managers by tax-motivated dilution of the NAV. Although the tax law was changed in April 2000 in order to mitigate this effect, our sample period is still subject to the same taxation problem. Thus investors are sometimes better off canceling his or her fund contract after good performance or by churning the funds after poor performance – a tendency we would expect to show up as contrarian investment flows. Investor sentiment, if extant and measured by net flows, could therefore be complicated by tax dilution.

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[3] For more about the Trimtabs data, see Edelen and Warner (2001) and Greene and Hodges (2002).
[4] The ITAJ has recently terminated this practice.

Although we see little evidence of this in the daily flow pattern documented below, it is potentially detectable at different measurement horizons.

The KDS file indicates that mutual fund fees for investors consist of a front-end commission ranged between 0.0% and 3.5% (with a mode of 2.0%) and an annual trust management fee ranging between 0.5% and 2.0% (with a mode of 0.9%) during our sample period. There is no evidence that derivative funds charge more fees than other funds. Churning among sister funds in the same complex does not cost investors much – a one-time reserve fee of between 0.20% and 1.0% with a mode of 0.3%. Each complex after 1995 usually includes *bear, bull and bull-bear* type derivative funds. The derivative funds have primarily attracted retail investors in Japan. The retail markets are said to be two-tiered: one serving more wealthy individuals, and the other geared towards small investors. Many of the derivative funds in our sample are sold in very small lot sizes with one-yen increments – plainly targeting small individual investors. In contrast, other funds require investors to purchase at least 1,000 contracts with 100 contract increments, at 10,000-yen principal per contract. Both contracts are typically purchased or sold at bank branch offices. In fact, the significant increase in mutual funds' NAVs in the bearish year-1998 market is related to deregulation that allows banks to sell mutual funds. It is said that banks' marketing effort has focused on selling bond funds, especially money market mutual funds, rather than equity mutual funds.

3 Data

The U.S. data is obtained from Trimtabs and is identical to that used in Goetzmann, Massa, and Rouwenhorst (1999). This contains the net asset value (NAV), the total net asset (TNA), and investment objective information for 999 U.S. funds. The average fund sizes sum up to 839 billion dollars.

The daily Japanese dataset is compiled and provided by QUICK Corp., containing the NAV, TNA and the ITAJ classification for 2,241 funds during the period January 19, 1998 through January 18, 2000. The average total net asset value represented is 11.6 trillion yen or 101 billon dollars. QUICK Corp. also separately provided information about percentage of TNA invested into eight asset classes for 1,935 funds or 86% of the above funds at the beginning, the mid-point and the end of the sample period. This supplements the above dataset and enables us to construct

Japanese asset class categories just as Goetzmann, Massa and Rouwenhorst (1999) do for the U.S. We use the common trading days for the two countries, resulting in 329 trading days between February 2, 1998 and June 28, 1999.[5] Finally, Kinyu Data Services (KDS) provided another Japanese dataset, which contains fund attributes, investment policies and strategies for most of funds in our sample.[6] This is used in interpreting the GSC categories and confirming the trading strategies of the bull and bear derivative funds in later sections.

We attempt to identify factors driving returns and flows. One way to do this is to classify funds based on asset classes and aggregate returns and flows within class. We categorize the U.S. funds into eight asset classes: domestic equity, foreign equity, industry sector, domestic bonds, foreign bonds, municipal bonds, precious metals, and cash. For the Japanese funds, we cannot completely rely on stated categories because of the omitted *ko-sha-sai* funds. We address this problem by using two alternative classifications, the Generalized Style Classification (GSC) and the augmented Investment Trust Association (ITA) classification, whose description follows in the next two subsections.

3.1 Japanese GSC Classification

The first Japanese classification is the Generalized Style Classification (GSC) used by Brown and Goetzmann (1997). This algorithm classifies funds with similar return characteristics into a given number of groups, by minimizing the sum of squared deviations between individual fund returns and the group mean return. A virtue of this methodology is that it can classify funds based solely on the *ex-post* returns and thus can pick up factors driving returns, if any, without being biased by the *ex-ante* characteristics such as invested assets. Previous research has applied the GSC algorithm to both U.S. mutual funds (Brown and Goetzmann, 1997) and Japanese funds (BGHOS) in the analysis of fund styles. Since the GSC algorithm classifies funds based solely on the return variability and assigns no objective characteristics *a priori*, we shall interpret each GSC category by known characteristics of the component funds. Table 1 tabulates the GSC classification against

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[5] For Japan, we have also obtained the dividend data for all funds in the sample and conducted flow and return computation. The results, however, do not change qualitatively with the use of the dividend data, and therefore are not reported for brevity, although available upon request.

[6] The KDS dataset does not contain fund codes. Therefore, the QUICK and KDS files are matched by both the fund and managing firm names. This resulted in imperfect but satisfactory matching results. For example, of the 188 derivative funds in the first QUICK file, we could find 170 funds in the KDS file.

the original ITAJ classification and summarizes the interpretation of the GSC categories. GSC1 is heavily loaded on the Japanese domestic equity funds and hence is considered the domestic equity category. Both the GSC2 and GSC3 categories include international equity funds. However, GSC2 is tilted toward Asian funds while GSC3 is tilted more toward North American and European funds. This defines them as Asian and Western equity categories, respectively. Although not indicated in the table, it is interesting to note that more funds in the GSC3 category are managed by foreign-brand firms than are those in the GSC2 category. The GSC4 category is loaded on domestic equity funds. We interpret this category as focused equity in the sense that the component funds are dominantly managed by non-big three firms (non-Nomura, Daiwa or Nikko, not shown in the table). These funds follow non-standard strategies as indicated by their fund titles and strategy statements. GSC5 can be regarded as the balanced or cash category, because it is comprised mainly of the ITA balanced funds and the domestic money pools. GSC6 shares a similar composition to GSC5 but a notable difference is that it contains 22 out of the 37 convertible bond funds. This is a balanced-convertibles category. GSC7 and GSC8 clearly represent the index fund and cash categories, respectively.

3.2 Japanese ITA Classification and Bull-Bear Funds

Since we are interested in identifying those balanced funds that are closest to pure bond funds, we also rely on ITAJ categories to assign funds to approximate asset classes, delineating the "balanced" category funds as either Japanese bond, foreign bond or "not applicable" using information about invested assets in the second Quick dataset. This covers 1,935 funds or 86% of the 2,241 funds in the first QUICK dataset. Combining both, we group funds into the following twelve asset classes: Japanese equity, Foreign equity, equity index, Japanese sector, Japanese bond, cash, foreign bond, Japan bull, Japan bear, foreign bull, foreign bear, and other derivatives. The last five categories divide the ITAJ derivative funds and are constructed as follows. We first classify each ITAJ derivative fund into either bull, bear, or other type using fund name. In order to be classified as a bull or bear-equity type, a fund must not have the word "bond," "yen," or "dollar" in their names. No other words that imply non-equity assets were found in the sample fund names. Then we construct the potential set of bull funds by taking those funds whose names contain the

words "bull" and/or "double" and not "bear" or "reverse."[7] The bear funds are those whose names contain the words "bear" or "reverse." In our sample, no fund has the words "bull" and "bear" simultaneously in its name. Then, we further divide the bull and bear funds into domestic and foreign. Specifically, if a fund contains any one of the following words in its name, it is classified as foreign bull/bear type: U.S., Hong Kong, Britain, France, Italy, Germany, Global, World, and their literal derivatives. No other words that imply country or region were found in the sample fund names.

Next, in order to ensure that our bull and bear funds are indeed bets on the rise and fall, respectively, of the stock market, we check the fund characteristics found in the Kinyu Data Services dataset. The specific column in the dataset often describes how a fund operates, like "This fund aims to realize approximately twice the reverse movement of the domestic stock market by shorting the Nikkei index futures by about twice the total net assets" (for a domestic double bear fund). Sometimes it does not explicitly reference the use of futures. In addition, we complement this information by performance reports found on the Internet. Whenever possible, we take reports issued in the sample period or as close as possible to it. After this process, we still have five funds that we cannot confirm to be a bet on the rise or fall of the stock market. For completeness, we discard these five funds and determine the final sets of domestic and foreign bull and bear funds. 54 out of 89 finalists or 61% of them are explicitly stated or known to trade in equity index futures. The cross tabulation between the above defined categories and the original ITAJ categories is shown in Table 2. We call this the "ITA" classification.[8]

Table 3 shows the characteristics of the bull- and bear-type derivative funds. We see that bull funds are relatively large as measured by TNA, while bear funds are relatively small: Japanese bull funds account for 40.9% of the total TNA of all derivative funds, while Japanese bear funds only 3.8%, though the number of funds is almost equal at 27 and 28, respectively. The mean that the TNA of Japanese bull funds is more than ten times that of Japanese bear funds. Similarly, we see that foreign bull funds are in general bigger in size than foreign bull funds.

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[7] The words "bull" and "double" are alternative because when a fund is of double-bull type, the word "bull" is often omitted from its name. In order to reject double-bear funds, we exclude funds whose names contain the words "bear" or "reverse." One fund has the word "triple" implying triple-bull/bear type, but it invests in bond futures with the word "bond" in its name, and therefore is excluded from our analysis by the initial screening.
[8] Specifically, of the 415 ITAJ balanced funds, those funds are extracted that appear in the second Quick file and that invest at least 70% of their total net assets in either the Japanese or foreign bonds. This resulted in 26 Japanese and 75 foreign "pure" bond funds. Other 314 funds are unclassified.

Performance reports are found on the Internet for 10, 9, 6, and 8 funds in the Japanese bull, bear, and foreign bull, bear categories, respectively (not shown in the table). Using them, we estimate the position of index futures in percentage of the TNA as 178.8%, -162.8%, 200.7% and -99.2%, respectively. Figure 1 further confirms the trading activity in the index futures. In Panel (a), the Japanese bull category returns are plotted during the first sample period, along with the ITA index category returns for comparison purposes.[9] The bull fund returns almost always move in exactly the same direction as the index fund returns, and slightly less than twice in magnitude, in line with the estimated futures position of 178.8%. In contrast, in Panel (b), the Japanese bear fund returns move in exactly the opposite way to the index category returns. The return correlation with the index fund returns is extremely positive for Japanese bull funds and extremely negative for Japanese bear funds, with absolute values exceeding 0.90 for both categories, which strongly supports trading in index futures.

Finally, we confirm the bull and bear designations by applying the GSC procedure to all derivative funds. Table 4 reports the results. 19 out of 27 Japanese bull funds are clustered in the GSC I category. This GSC category thus represents funds that bet on the rise of the Japanese stock market. Similarly, the GSC II, III and IV categories represent Japan bear, foreign bull, foreign bear categories, respectively. GSC V might be a non-equity derivatives category, such as bond or currency derivatives.[10] This confirms that the designations of our domestic/foreign Bull and Bear funds correspond to real differences in return generating processes.

4   Factors in Mutual Fund Flows

4.1   Sentiment and Derivatives Funds

Following standard practice in the literature, we compute the flow to fund i on day t by[11]

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[9] The plots for the second half sample period are similar and hence omitted.

[10] The fact that nontrivial number of "other derivatives" category funds fall in the GSC I and III categories implies that our method based on the fund naming is not picking up all of the Japanese and foreign bull funds.

[11] We also computed the fund flows with dividends using the formula $F_{i,t} = TNA_{i,t} - TNA_{i,t-1} \cdot (NAV_{i,t} + DIV_{i,t}) / NAV_{i,t-1}$ for Japan, where $DIV_{i,t}$ is the dividends for fund i on date t. Since the results are qualitatively similar, for consistency with the U.S., we do not use the dividend information.

$$F_{i,t} = TNA_{i,t} - TNA_{i,t-1} \cdot NAV_{i,t} / NAV_{i,t-1},$$

where $TNA_{i,t}$ and $NAV_{i,t}$ are the total net asset and net asset value, respectively, of fund i on day t. Since net purchases and sales are recognized at the end of the day, the issue of the potential timing effects of intra-day flows is not material for this study, although for analysis of longer-horizon fund flows it can be a worry. The total net fund flow for category g, $TNF_{g,t}$, is then the sum of $F_{i,t}$'s over the component funds:

$$TNF_{g,t} = \sum_{i \in g} F_{i,t}.$$

The equally weighted average percentage flow for category g, $EWAPF_{g,t}$, is the equally weighted average of the normalized flows over the component funds, where normalization is by each fund's previous-day TNA:

$$EWAPF_{g,t} = \frac{1}{N_{g,t}} \sum_{i \in g} \frac{F_{i,t}}{TNA_{i,t-1}}.$$

Here, $N_{g,t}$ is the number of funds in category g on day t.[12]

Table 5 shows the flow and return correlations among categories. Panel (a) exhibits correlations between U.S. asset classes, while Panels (b) and (c) show those for the two Japanese classifications, GSC and ITA, respectively. Panel (a) is essentially a replication of Table 2 in Goetzmann, Massa, and Rouwenhorst (1999) over the common trading dates between the U.S. and Japan. In Panel (a1), we can confirm their findings. First, flows into and out of domestic equity funds are strongly positively correlated with flows to foreign equity funds (0.70). This is consistent with the hypothesis that U.S. investors regard domestic and foreign equity funds as economic

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[12] The accounting practice of international funds managed in Japan is worth mentioning. Because of the time lag, the total net assets and the net asset values of international funds are not determined within day t. At 10a.m. on day $t+1$, they are determined by the date-t local closing stock prices in the foreign markets (which are known) and the prevailing exchange rates (i.e., those prevailing at 10a.m. on day $t+1$). These are called the total net assets and the net asset values *on day $t+1$* and are recorded as such in our datasets. Consequently, an order on international fund j submitted on day t is not executed at $NAV_{j,t}$, but at $NAV_{j,t+1}$. We correct for this practice by using the one-day lead TNA and NAV in the calculation of flows and returns.

substitutes. Next, flows to U.S. equity funds are significantly negatively correlated with flows to cash (-0.21) and bond (-0.23) funds.

Similarly, we find negative and significant correlations between the domestic stock and cash fund flows for both Japanese classifications: in Panel (b1), the GSC cash category flows are negatively correlated with Japanese equity (-0.12) and index (-0.56) category flows. In Panel (c1), the ITA cash category flows are negatively correlated with the Japanese equity (-0.17), index (-0.25) and sector (-0.24) category flows. We can observe even stronger patterns in Panels (b2) and (c2), where we use the equally weighted average percentage flows. This confirms that the negative correlation is not caused by a few large-sized funds.

Goetzmann, Massa and Rouwenhorst (1999) consider three possible explanations for the negative correlation between equity and cash/bond fund flows. First, the negative correlation may simply be the result of investors using the cash funds as checking account. Second, investors may be following passive portfolio insurance strategies. Last, the negative correlation may be caused by negative investor sentiment about the future equity market. They find evidence supporting the last explanation in the U.S. data; they find a negative correlation between the equity and precious metal funds (ρ = -0.12 in Panel (a1)). Since precious metals have been traditionally considered a hedge during times of uncertainty, negative correlation is consistent with the negative investor sentiment causing the money to shift from equity funds to precious metal funds during such periods. The negative correlation between stock market flows and metals funds is suggestive of a sentiment factor, but it is certainly not conclusive.

In this paper, the richer Japanese dataset, reflecting a fundamentally different market environment, gives us an opportunity to document more direct evidence of investor sentiment. Notice in Panel (c1) that the TNF to Japanese bull funds are positively correlated with Japanese equity funds at 0.24, strongly with index funds at 0.49, and extremely negatively with cash funds at -0.75. In contrast, the corresponding correlations with respect to the Japanese bear funds have opposite sings: -0.13, -0.32, and 0.41 with Japanese equity, index, and cash funds. Flows to Japanese bull and bear funds are strongly negatively correlated at -0.65. The magnitudes of these correlations are striking. In fact, there is no a priori reason to anticipate that the bull and bear flows should be correlated at all. If Japanese retail investors had diverse opinions about future market trends, some might be optimistic and others pessimistic on the same day. Goetzmann and Massa (2000a&b), for example, find evidence of index fund purchases and sales by investors on the same

day, and further they find that these events correlated well with other measures of the dispersion of opinions among investors. The strong negative correlation in the flows suggests that Japanese investors had fairly homogeneous sentiments about the domestic stock market over the period of our sample. This is direct evidence of investor *sentiment*, because it is unlikely that bear funds are used as either checking account or a device to provide portfolio insurance. These results are consistent with the evidence of Iihara, Kato and Tokunaga (2001), who document herding behavior in various investor classes in the Japanese market.

Evidence of investor sentiment in the Japanese data extends to attitudes about foreign vs. domestic markets as well. We find that the flows to foreign bull and bear fund have positive and negative correlations, respectively, with foreign equity fund flows. While the U.S. flow data suggest that U.S. investors regard domestic and international equity funds as substitutes, the Japanese evidence is different. In Panel (c1), flows to foreign bull funds are significantly negatively correlated with the Japanese equity funds at -0.15 (and also negatively in Panel (c2) though insignificant), despite the fact that their return correlation is strongly positive at 0.44 in Panel (c3). This is consistent with the hypothesis that Japanese investors may regard the domestic and foreign equity funds as economic complements. When we use EWAPF as flow measure in Panel (c2), qualitatively the same, often stronger, contrast obtains between the bull and bear funds. In Panel (c3), Japanese bull fund returns are extremely positively correlated with equity or index funds: the correlation is 0.90 with Japanese equity, 0.96 with index, and 0.93 with Japanese sector categories. In contrast, Japanese bear fund returns are extremely negatively correlated with those categories at -0.90, -0.95, and -0.92, respectively. Without trading in futures contracts, these extreme levels of correlations will not obtain. These findings are consistent with a negative sentiment story that the Japanese investors move money from equity funds to bear derivative funds when they are pessimistic about future stock payoffs, and vice versa. They appear to be acting on negative sentiment about the Japanese market in both absolute and relative terms.

4.2 Principal Component Analysis

Goetzmann, Massa, and Rouwenhorst (1999) document the polarity between the U.S. stock and cash funds in the principal components of flow measures. We are interested in whether a similar polarity obtains for Japanese flows. Table 6 shows the first four principal components for the set of

31 original ITAJ category flows. In Panel (a), the TNF is used as flow measure. The first factor is a polarity between Japanese equity (ITAJ1) and balanced funds (ITAJ10), which invest in bonds nontrivially. The second factor is loaded positively on equity (ITAJ1), index (ITAJ13) and derivative funds (ITAJ21) and negatively on money pools (ITAJ20). This is consistent with the fact that the bull funds are large-sized and represent significant part of the ITAJ derivatives category TNF. The interpretation for the third and fourth factors is less clear. However, the derivative funds seem to be playing an important role in these factors, possibly representing underlying investor sentiment.

Panel (b) presents the results when the EWAPF is used as flow measure. The first factor is a polarity between cash/derivatives and index. In contrast to the second TNF factor, the loadings on the derivatives and cash categories are large and now share the same sign, consistent with the fact that the EWAPF tilts towards the bear funds. The second factor seems to be a diversification factor among domestic and international stocks. Again, the derivative funds are key in the third factor, and its loadings are also large in magnitude in the first two factors. The fourth factor might be considered a bet on steel and shipbuilding industries.

4.3 The Sentiment Factor and the Cross-section of Fund Returns

A necessary condition for flows to capturing a sentiment factor in the Japanese market is that loadings on the flows should spread asset returns. In this subsection, we construct a single flow sentiment factor and examine how well it explains the cross-section of fund returns. For each country, we first use canonical correlation analysis to find the linear combination of category fund flows (EWAPFs) that is maximally correlated to a linear combination of category returns.[13] The optimal linear combination of category returns in turn can be viewed as the flow-factor mimicking portfolio return. We use the eight asset class categories for the U.S. and the twelve ITA categories for Japan. The results are summarized in Table 7. Consistent with the analyses in the previous sections, both U.S. and Japanese flow factors are positively correlated with respective equity categories and negatively with cash categories. Notably, the Japanese flow factor is strongly positively correlated with the domestic bull fund flows (0.658 by EWAPF, 0.647 by TNF) and negatively with bear fund flows (-0.839 by EWAPF, -0.653 by TNF). The correlation between the

sentiment flow factor and the factor mimicking portfolio return is substantial for both countries, 0.429 for the U.S. and 0.460 for Japan. This confirms that the flow factor extracted in the above way is indeed a *sentiment* factor that may affect return variation substantially.

Next, we examine the significance of our sentiment flow factor in explaining the cross-section of fund returns. To this end, we first orthogonalize our flow factor against all the lagged category returns. That is, for a given country, we regress the sentiment flow factor on a constant and one-day lags of all category returns in the same country, and use the residual from this regression in the following analyses. Regressing on the previous-day return is meant to negate any explanatory power due to investor return-chasing behavior. We then estimate the factor loadings by regressing each fund return on a constant, the category returns and the orthogonalized sentiment flow factor using *even* days. In this factor model framework, category returns simply constitute return factors. Then, using *odd* days, we regress the cross-section of fund returns on the factor loadings with the constraint that the coefficients are constant over time. The resulting coefficients are the estimates of factor risk premia. Use of alternate, different days for factor-loadings and factor-risk premia estimation alleviates the sample dependency between the two estimation processes. In effect, we use the same approach as Roll and Ross (1980), who in turn use a version of the Fama-MacBeth (1973) cross-sectional regression suitably modified for factor models.

Jones (2001) shows that failure to correct for temporal changes in residual variance can lead to significant reduction in the power of asset pricing tests. We control for the documented shifts in residual variance that occurred over the time period of our study. Table 8 summarizes the estimation results. The estimated sentiment flow factor risk premium is significantly positive and economically large for both countries: the U.S. value implies that a unit increase in the factor loading rewards the investor by 5.57 basis points, which is more than half the domestic equity risk premium. The Japanese sentiment factor risk premium is 23.96 basis points, more than twice that of the domestic equity risk premium. Return factor risk premia are generally significant and carry the expected signs. In particular, in the Japanese market, the risk premia on Japanese bull (14.98bp), bear (-12.26bp) and foreign bull (19.50bp) and bear (-12.95bp) return factors all have expected signs and magnitudes in line with the futures positions estimated previously. The hypothesis that

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[13] In constructing the U.S. sentiment flow factor, the U.S. cash and foreign bond categories are excluded because none of their component funds existed in the beginning of the sample period.

the sentiment flow factor risk premium is zero is strongly rejected with any reasonable confidence level for both countries.

It is important that our sentiment flow factor be orthogonal to known factors, in particular size, value/growth and momentum in the U.S. market, because other work in the literature has clearly shown that mutual fund styles orient to them. We examined the robustness of our U.S. sentiment factor to inclusion of these factors. Specifically, we did the same exercise as above, replacing the category return factors by the daily factor returns representing the market, size, book-to-market, and momentum.[14] The estimate of the sentiment flow factor premium is significantly positive, and is consistent in magnitude to the above number. For brevity, the results are not reported.

Furthermore, our Japanese results are unlikely to be driven by passive styles -- notably momentum -- since our sentiment flow factor is orthogonalized against one-day lagged category returns so that they are mostly immune to investors' return chasing behavior, at least on a daily basis. Moreover, it is known that the momentum effect does not obtain in Japan (Chui, Titman and Wei [2000]). To shed some light on this, Table 9 shows serial category return correlations for both countries. In Panel (a), all U.S. category fund returns are serially positively correlated significantly, except for the cash category. In contrast, Panel (b) says that the serial correlations of Japanese equity, index and bond fund returns are insignificant in general, except for GSC focused equity category. Returns on Japanese funds that invest in foreign equities and bonds are serially positively correlated. Overall, it is unlikely that we can construct a profitable strategy that invests in Japanese equity funds based on daily return predictability.[15]

Finally, we consider the question of whether there are any cross-border relationships in flow factors. Evidence reported in Froot, O'Connell and Seasholes (2001) suggests we might find

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[14] These factor returns are downloaded from Jeffrey Busse's web site http://www.bus.emory.edu/jbusse/daily.htm. The excess market return factor is the CRSP value weighted daily return less 30-day T-bill return (VWRETD - T30RETDY). The size and book-to-market mimicking portfolio returns are daily versions of Fama-French (1993) SMB and HML factors (SMBDAY and HMLDAY). Momentum factor is UMDDAY.

[15] The difference in serial return correlation between the two countries might be attributed to the difference in investor composition. In the U.S., the equity has been a very popular investment venue for decades, attracting rather unsophisticated investors to the stock market. In contrast, only several percent of household savings heads to the stock market in Japan, even in recent years. Such households may be composed of relatively sophisticated investors, if gathering information about the stock market is costly for unsophisticated investors. If this is the case, investors' underreaction may be limited in Japan, leading to insignificant serial return correlations. Although it is out of the scope of our paper, the above is potentially an interesting hypothesis to consider given the puzzling empirical fact that the momentum effect exists in the U.S. and Europe (Jegadeesh and Titman (1993, 2001), Rouwenhorst (1998)), but not in Japan (Chui, Titman and Wei (2000)).

structural relationships in cross-border equity flows in our data. Table 10 shows the cross-country flow correlations. In Panel (a1), the same calendar-day TNF correlations are shown. Since Japanese Standard Time is 14 hours ahead of U.S. Eastern Standard Time (13 hours ahead in the summer), this panel looks at the possibility of flow spillovers from Japan to the U.S. The opposite direction is checked in Panel (a2), which uses the previous calendar-day flow for the U.S. The corresponding results using EWAPF are shown in Panels (b1) and (b2). Although some correlations are significant, we do not find systematic evidence of flow spillovers in any panel, except possibly in the last two columns of Panel (b2). This is consistent with the results of Lin and Ito (1994), who find no spillover effect in volume or in returns and volatility between the two countries. Not reported in the table, but of some interest, is that we do find volatility spillover from the U.S. to Japan, but not in the other direction, using equity category returns. This is consistent with the finding of Hamao, Masulis, and Ng (1990), rather than Lin and Ito (1994).[16] We conclude that our flow factors represent autonomous country-specific sentiment in the U.S. and Japan.

5 Conclusion

While theory suggests that a pervasive sentiment factor might well be priced, the quest for a concrete measure of that factor has been somewhat illusive. The Japanese mutual fund data we use in this paper allows us to directly observe flows of small, retail investors in the Japanese market into funds that explicitly speculate on the direction of the stock market. Our study reveals a number of results that are of potential interest to both asset pricing and behavioral research. First, the structure of flow correlations across funds representing major asset classes is strong and significant. Investors make correlated rebalancing decisions on a daily basis. In the U.S., where mutual funds are a major factor in the securities markets, these choices appear to be simultaneously correlated to asset class returns. In Japan, the correlation is significantly weaker. The negative

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[16] Following Hamao, Masulis, and Ng (1990), we conducted a two-step test of volatility spillover. In the first step, a GARCH(1,1)-MA(1)-in-mean model is estimated for each country. In the second step, as a measure of information generation, the square of the previous foreign market's residuals from the first step is added in the conditional variance equation of each country's GARCH(1,1)-MA(1)-in-mean model. The coefficient on the squared foreign residuals is significant for Japan, but not for the U.S. Interestingly, for Japan, the coefficient on the lagged domestic squared residual becomes insignificant upon inclusion of the U.S. squared residuals, suggesting the strong influence of U.S. news. The results are available upon request.

correlation of bull and bear fund flows is strongly suggestive of speculative herding by retail investors in the Japanese market. DSSW suggest that exposure to this sentiment factor may be priced.   We apply a Fama-MacBeth (1973) style two-stage procedure to fund returns, using return-based factors and flow factors. We find that in the period of our analysis, flow factors – that is sentiment factors -- add significant incremental explanatory power beyond that of return factors.

A comparison of the sentiment structure in the U.S. and Japan is itself instructive. Attitudes towards different asset classes differ across countries. While U.S. investors regard foreign securities as economic substitutes for domestic equities, Japanese investors appear to treat them as complements. We further ivestigate the relationship between our sentiment factors and the known empirical facts about unconditional and conditional second moments in international market returns. Our evidence on flow factors is generally in accordance with the existence of momentum in the U.S., its non-existence in Japan, and volatility spillover from the U.S. to Japan but not in the other direction.

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Table 1
ITAJ and GSC categories and Interpretations for Japanese Funds

This table shows the cross tabulation of the Investment Trust Association of Japan (ITAJ) categories versus the Generalized Style Classification (GSC) categories for the Japanese funds. We classify all the Japanese funds into eight return-based categories (and "not applicable") by the GSC algorithm as described in Brown and Goetzmann (1997).

ITAJ Broad Category	ITAJ Narrow Category, Fund Objective	GSC1 Dom. Equity	GSC2 Int'l Asian	GSC3 Int'l West.	GSC4 Focus. Equity	GSC5 Bal. / Cash	GSC6 Bal. / CB	GSC7 Index	GSC8 Cash	N/A	Total
1. Japan Equity	Japan Equity, Big Cap	13	0	0	4	0	0	0	0	0	17
	Japan Equity, General	214	47	0	86	2	0	31	0	12	392
	Japan Equity, OTC	32	0	0	4	0	0	0	0	0	36
	Japan Equity, Middle-Small Cap	24	1	0	15	1	0	1	0	1	43
	Million (periodic contribution)	2	10	0	0	0	0	12	1	0	25
	Japan Sectors	54	35	0	24	2	3	7	0	0	125
2. International Equity	International Equity, Asia-Pacific	7	77	8	6	3	7	0	0	1	109
	International Equity, Europe	0	12	48	4	0	6	0	3	0	73
	International Equity, General	6	28	82	13	5	7	0	1	2	144
	International Equity, Latin America	1	2	0	5	0	0	0	0	0	8
	International Equity, North America	0	7	29	6	0	2	0	0	2	46
3. Balanced Funds	Balanced	1	30	128	14	164	61	0	12	5	415
4. Convertible Bonds	Convertible Bonds	0	5	3	4	0	24	0	0	1	37
5. Index Linked	Japan Equity, Nikkei225 linked	0	0	0	0	0	0	45	0	0	45
	Japan Equity, Nikkei300 linked	31	0	0	0	0	0	0	0	0	31
	Japan Equity, Other Indexes linked	5	0	0	0	0	0	1	0	1	7
	Japan Equity, TOPIX linked	26	0	0	0	0	0	0	0	0	26
6. Industry Sector	Japan Sector, Automobile-Machinery	6	10	0	2	0	0	0	0	0	18
	Japan Sector, Chemical-Textile-Pulp	1	19	0	0	0	0	2	0	0	22
	Japan Sector, Commerce	13	1	0	6	0	0	0	0	0	20
	Japan Sector, Construction-Real Estate	4	12	0	0	0	0	5	0	0	21
	Japan Sector, Electric-Precision Machinery	3	0	0	13	0	0	0	0	0	16
	Japan Sector, Financial	14	0	0	0	0	0	0	0	0	14
	Japan Sector, Oil-Nonferrous	0	7	0	0	0	0	6	0	0	13
	Japan Sector, Pharmaceutical-Food	0	19	0	0	0	0	0	0	0	19
	Japan Sector, Steel-Shipbuilding	5	3	0	0	0	0	3	0	0	11
	Japan Sector, Utility	5	4	0	3	0	0	1	0	0	13
7. Derivatives	Derivatives	12	7	15	12	40	30	49	24	0	189
Others	Limited	23	97	0	28	0	28	0	1	0	177
	Savings (Domestic Zaikei)	0	11	0	0	0	4	0	0	0	15
	Domestic Money Pool	0	0	1	0	23	40	0	50	0	114
	Total	502	444	314	249	240	212	163	92	25	2241

Table 2
Original ITAJ and ITA Categories for Japanese Funds

This table shows the cross tabulation of the Investment Trust Association of Japan (ITAJ) categories versus the ITA categories for the Japanese funds. The ITA classification groups the 31 ITAJ narrow categories into the following twelve asset classes: Japanese equity, Foreign equity, equity index, Japanese sector, Japanese bond, cash, foreign bond, Japan bull, Japan bear, foreign bull, foreign bear, and other derivatives. For unambiguous classification, we excluded the following ITAJ categories by classifying as "not applicable": million, convertible bonds, limited, and savings.

ITAJ Broad Category	ITAJ Narrow Category, Fund Objective	JP Equity	For. Equity	Index	JP Sector	JP Bond	Cash	For. Bond	Other Deriv.	JP Bull	JP Bear	For. Bull	For. Bear	N/A	Total
1. Japan Equity	Japan Equity, Big Cap	17	0	0	0	0	0	0	0	0	0	0	0	0	17
	Japan Equity, General	392	0	0	0	0	0	0	0	0	0	0	0	0	392
	Japan Equity, OTC	36	0	0	0	0	0	0	0	0	0	0	0	0	36
	Japan Equity, Middle-Small Cap	43	0	0	0	0	0	0	0	0	0	0	0	0	43
	Million (periodic contribution)	0	0	0	0	0	0	0	0	0	0	0	0	25	25
	Japan Sectors	0	0	0	125	0	0	0	0	0	0	0	0	0	125
2. International Equity	International Equity, Asia-Pacific	0	109	0	0	0	0	0	0	0	0	0	0	0	109
	International Equity, Europe	0	73	0	0	0	0	0	0	0	0	0	0	0	73
	International Equity, General	0	144	0	0	0	0	0	0	0	0	0	0	0	144
	International Equity, Latin America	0	8	0	0	0	0	0	0	0	0	0	0	0	8
	International Equity, North America	0	46	0	0	0	0	0	0	0	0	0	0	0	46
3. Balanced Funds	Balanced	0	0	0	0	26	0	75	0	0	0	0	0	314	415
4. Convertible Bonds	Convertible Bonds	0	0	0	0	0	0	0	0	0	0	0	0	37	37
5. Index Linked	Japan Equity, Nikkei225 linked	0	0	45	0	0	0	0	0	0	0	0	0	0	45
	Japan Equity, Nikkei300 linked	0	0	31	0	0	0	0	0	0	0	0	0	0	31
	Japan Equity, Other Indexes linked	0	0	7	0	0	0	0	0	0	0	0	0	0	7
	Japan Equity, TOPIX linked	0	0	26	0	0	0	0	0	0	0	0	0	0	26
6. Industry Sector	Japan Sector, Automobile-Machinery	0	0	0	18	0	0	0	0	0	0	0	0	0	18
	Japan Sector, Chemical-Textile-Pulp	0	0	0	22	0	0	0	0	0	0	0	0	0	22
	Japan Sector, Commerce	0	0	0	20	0	0	0	0	0	0	0	0	0	20
	Japan Sector, Construction-Real Estate	0	0	0	21	0	0	0	0	0	0	0	0	0	21
	Japan Sector, Electric-Precision Machinery	0	0	0	16	0	0	0	0	0	0	0	0	0	16
	Japan Sector, Financial	0	0	0	14	0	0	0	0	0	0	0	0	0	14
	Japan Sector, Oil-Nonferrous	0	0	0	13	0	0	0	0	0	0	0	0	0	13
	Japan Sector, Pharmaceutical-Food	0	0	0	19	0	0	0	0	0	0	0	0	0	19
	Japan Sector, Steel-Shipbuilding	0	0	0	11	0	0	0	0	0	0	0	0	0	11
	Japan Sector, Utility	0	0	0	13	0	0	0	0	0	0	0	0	0	13
7. Derivatives	Derivatives	0	0	0	0	0	0	0	100	27	28	16	18	0	189
Others	Limited	0	0	0	0	0	0	0	0	0	0	0	0	177	177
	Savings (Domestic Zaikei)	0	0	0	0	0	0	0	0	0	0	0	0	15	15
	Domestic Money Pool	0	0	0	0	0	114	0	0	0	0	0	0	0	114
	Total	488	380	109	292	26	114	75	100	27	28	16	18	568	2241

Table 3
Characteristics of Bull and Bear Funds

This table shows the characteristics of the bull- and bear-type equity derivative funds. First, in order to be classified as a bull or bear-equity type, a fund must not have the word "bond," "yen," or "dollar" in their names. Then we construct the potential set of bull funds by taking those funds whose names contain the words "bull" and/or "double" and not "bear" or "reverse."   The bear funds are those whose names contain the words "bear" or "reverse." Next, if a fund contains any one of the following words in its name, it is classified as foreign bull/bear type: U.S., Hong Kong, Britain, France, Italy, Germany, Global, World, and their literal derivatives. Otherwise, it is classified as a Japanese fund. Finally, we determine the final set of bull and bear funds by checking the fund characteristics as described in the text. The total net assets (TNA) are in hundreds of millions of Yen. The percentage of TNA shorted in the futures contracts is estimated from the performance reports found on the Internet.

	Sum TNA (%)	Mean TNA	# Funds (%)	Estimated %TNA Future Position
JP Bull	4,745.8 (40.9%)	175.8	27 (14.3%)	178.8%
JP Bear	435.8 (3.8%)	15.6	28 (14.8%)	-162.8%
Foreign Bull	590.5 (5.1%)	36.9	16 (8.5%)	200.7%
Foreign Bear	222.7 (1.9%)	12.4	18 (9.5%)	-99.2%
Other Derivatives	5,603.8 (48.3%)	56.6	100 (52.9%)	
Total	11,598.7 (100.0%)	61.7	189 (100.0%)	

Table 4
GSC Clustering Results of Japanese Derivative Funds

This table shows the number of Japanese derivative funds classified into each of five GSC categories. The derivative funds are classified into Japanese/foreign bull and bear funds by their names, as described in the caption to Table 3.

	GSC I	GSC II	GSC III	GSC IV	GSC V	N/A	Total
JP Bull	19	0	0	0	0	8	27
JP Bear	0	19	0	0	1	8	28
For. Bull	5	0	11	0	0	0	16
For. Bear	0	6	0	12	0	0	18
Other Deriv.	23	0	44	3	21	9	100
Total	47	25	55	15	22	25	189

Table 5
Correlations between Category Flows and Returns

This table shows the correlations between category flows and returns. The total net flow (TNF) is the sum of the dollar net flows to the category component funds. The equally weighted average percentage flow (EWAPF) is the equally weighted average of the normalized flows over the category component funds, where normalization is by each fund's previous-day total net assets. Equally weighted category returns (RET) is the equally weighted average of the percentage changes in the net asset values of the component funds.
* Significant at 5% level. ** Significant at 1% level.

(a) US

(a1) Total Net Flows (TNF)

	US Equity	Foreign Equity	Metal	US Sector	US Bond	US Cash	Foreign Bond	Muni Bond
US Equity	1.00	0.70**	-0.12*	0.67**	-0.23**	-0.21**	0.01	-0.06
Foreign Equity		1.00	-0.13*	0.61**	-0.30**	-0.25**	0.09	-0.07
Metal			1.00	-0.05	0.03	0.01	0.11*	-0.09
US Sector				1.00	-0.24**	-0.23**	0.10	-0.03
US Bond					1.00	0.18**	-0.05	0.11
US Cash						1.00	-0.03	-0.03
Foreign Bond							1.00	0.07
Muni Bond								1.00

(a2) Equally Weighted Average Percentage Flows (EWAPF)

	US Equity	Foreign Equity	Metal	US Sector	US Bond	US Cash	Foreign Bond	Muni Bond
US Equity	1.00	0.63**	-0.08	0.55**	-0.09	-0.43**	0.15**	0.03
Foreign Equity		1.00	-0.12*	0.48**	-0.15**	-0.45**	0.11	-0.09
Metal			1.00	0.08	0.04	0.03	0.09	0.00
US Sector				1.00	-0.11	-0.43**	0.14*	-0.05
US Bond					1.00	0.17**	-0.01	0.08
US Cash						1.00	-0.10	0.03
Foreign Bond							1.00	0.12*
Muni Bond								1.00

(a3) Equally Weighted Category Returns (RET)

	US Equity	Foreign Equity	Metal	US Sector	US Bond	US Cash	Foreign Bond	Muni Bond
US Equity	1.00	0.57**	0.16**	0.98**	0.33**	-0.07	0.27**	-0.11
Foreign Equity		1.00	0.32**	0.61**	0.21**	-0.21**	0.47**	-0.27**
Metal			1.00	0.19**	0.07	-0.03	0.27**	-0.09
US Sector				1.00	0.37**	-0.04	0.34**	-0.07
US Bond					1.00	0.72**	0.56**	0.63**
US Cash						1.00	0.30**	0.74**
Foreign Bond							1.00	0.22**
Muni Bond								1.00

(a4) Cross Correlations between TNF and RET
(Flows in rows, returns in columns)

	US Equity	Foreign Equity	Metal	US Sector	US Bond	US Cash	Foreign Bond	Muni Bond
US Equity	0.24**	0.39**	0.08	0.25**	0.13*	-0.07	0.18**	-0.01
For. Equity	0.14*	0.31**	0.03	0.12*	0.08	-0.04	0.10	-0.02
Metal	-0.01	0.02	0.30**	0.00	-0.06	-0.02	0.00	0.01
US Sector	0.16**	0.23**	0.04	0.14*	0.15**	0.08	0.12*	0.11
US Bond	-0.07	-0.07	0.06	-0.07	0.05	-0.04	0.01	0.05
US Cash	-0.09	-0.08	-0.04	-0.09	-0.04	0.01	-0.01	0.02
For. Bond	-0.04	-0.05	-0.03	-0.05	0.07	0.06	-0.07	0.05
Muni Bond	-0.06	-0.12*	0.03	-0.06	-0.01	0.02	0.06	0.12*

Table 5 - Continued

(b) Japan, GSC

(b1) Total Net Flows (TNF)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
JP Equity	1.00	0.03	-0.26**	0.42**	-0.14*	0.11*	0.31**	-0.12*
Asian Equity		1.00	0.23**	0.12*	0.10	0.02	0.28**	-0.21**
Western Equity			1.00	-0.09	0.25**	-0.16**	0.10	-0.11
Focused Equity				1.00	0.01	0.17**	0.22**	-0.08
Balanced/Cash					1.00	0.01	0.04	0.07
Balanced/CB						1.00	-0.14*	0.18**
Index							1.00	-0.56**
Cash								1.00

(b2) Equally Weighted Average Percentage Flows (EWAPF)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
JP Equity	1.00	0.41**	-0.12*	0.43**	-0.08	-0.07	0.44**	-0.27**
Asian Equity		1.00	0.19**	0.43**	-0.09	-0.07	0.29**	-0.15**
Western Equity			1.00	0.15**	0.08	0.08	-0.13*	0.22**
Focused Equity				1.00	-0.05	-0.02	0.30**	-0.13*
Balanced/Cash					1.00	0.28**	-0.48**	0.53**
Balanced/CB						1.00	-0.33**	0.38**
Index							1.00	-0.71**
Cash								1.00

(b3) Equally Weighted Category Returns (RET)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
JP Equity	1.00	0.92**	0.20**	0.95**	-0.48**	0.60**	0.93**	-0.90**
Asian Equity		1.00	0.25**	0.87**	-0.38**	0.59**	0.91**	-0.88**
Western Equity			1.00	0.36**	-0.38**	0.19**	0.17**	-0.13*
Focused Equity				1.00	-0.57**	0.63**	0.84**	-0.82**
Balanced/Cash					1.00	-0.52**	-0.38**	0.40**
Balanced/CB						1.00	0.55**	-0.54**
Index							1.00	-0.96**
Cash								1.00

(b4) Cross Correlations between TNF and RET

(Flows in rows, returns in columns)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
JP Equity	0.08	0.06	-0.03	0.06	-0.10	0.05	0.06	-0.06
Asian Eq.	-0.06	-0.04	-0.02	-0.07	0.04	-0.10	-0.03	0.05
West. Eq.	-0.18**	-0.16**	0.03	-0.17**	0.10	-0.14*	-0.12*	0.13*
Focus. Eq.	-0.04	-0.03	-0.01	-0.04	-0.01	0.01	-0.03	0.05
Bal. / Cash	0.05	0.06	0.05	0.07	-0.02	0.07	0.05	-0.03
Bal. / CB	0.02	0.02	-0.10	0.00	0.04	0.01	0.00	-0.02
Index	-0.07	-0.01	-0.06	-0.10	0.06	-0.04	0.02	0.03
Cash	0.05	-0.01	-0.03	0.05	-0.02	0.05	-0.02	-0.03

Table 5 - Continued

(c) Japan, ITA
(c1) Total Net Flows (TNF)

	JP Equity	Foreign Equity	Index	JP Sector	JP Bond	Cash	Foreign Bond	Other Deriv.	JP Bull	JP Bear	Foreign Bull	Foreign Bear
JP Equity	1.00	-0.26**	0.17**	0.12*	0.05	-0.17**	-0.28**	0.07	0.24**	-0.13*	-0.15**	-0.09
Foreign Equity		1.00	0.05	0.10	0.01	0.03	0.44**	-0.09	0.04	-0.05	0.20**	-0.14*
Index			1.00	0.53**	0.05	-0.25**	0.16**	0.12*	0.49**	-0.32**	0.05	0.02
JP Sector				1.00	0.02	-0.24**	0.17**	0.11*	0.31**	-0.14**	-0.01	0.04
JP Bond					1.00	0.03	0.05	-0.01	-0.02	0.04	0.04	-0.01
Cash						1.00	0.03	-0.11	-0.75**	0.41**	0.04	0.04
Foreign Bond							1.00	0.06	0.06	-0.02	0.16**	-0.06
Other Derivatives								1.00	0.14*	-0.10	0.00	0.15**
JP Bull									1.00	-0.65**	-0.07	-0.01
JP Bear										1.00	0.02	0.03
Foreign Bull											1.00	-0.11
Foreign Bear												1.00

(c2) Equally Weighted Average Percentage Flows (EWAPF)

	JP Equity	Foreign Equity	Index	JP Sector	JP Bond	Cash	Foreign Bond	Other Deriv.	JP Bull	JP Bear	Foreign Bull	Foreign Bear
JP Equity	1.00	0.12*	0.48**	0.43**	0.06	-0.25**	-0.06	-0.01	0.39**	-0.22**	-0.02	-0.05
Foreign Equity		1.00	0.15**	0.08	0.06	0.03	0.09	0.01	-0.06	0.06	0.25**	-0.14*
Index			1.00	0.38**	0.02	-0.31**	0.02	-0.03	0.91**	-0.38**	0.03	-0.09
JP Sector				1.00	-0.08	-0.26**	0.02	0.06	0.25**	-0.15**	-0.06	0.01
JP Bond					1.00	0.04	0.02	0.03	-0.02	0.09	0.09	-0.05
Cash						1.00	-0.01	0.15**	-0.66**	0.49**	-0.08	0.16**
Foreign Bond							1.00	0.03	-0.03	0.02	0.07	0.04
Other Derivatives								1.00	-0.14*	0.16**	0.06	0.14*
JP Bull									1.00	-0.68**	-0.06	-0.07
JP Bear										1.00	0.00	0.09
Foreign Bull											1.00	-0.20**
Foreign Bear												1.00

(c3) Equally Weighted Category Returns (RET)

	JP Equity	Foreign Equity	Index	JP Sector	JP Bond	Cash	Foreign Bond	Other Deriv.	JP Bull	JP Bear	Foreign Bull	Foreign Bear
JP Equity	1.00	0.41**	0.96**	0.98**	-0.03	0.00	-0.03	0.90**	0.90**	-0.90**	0.44**	-0.34**
Foreign Equity		1.00	0.40**	0.40**	-0.01	-0.04	-0.09	0.38**	0.41**	-0.39**	0.25**	-0.28**
Index			1.00	0.98**	-0.01	-0.05	-0.08	0.92**	0.96**	-0.95**	0.26**	-0.26**
JP Sector				1.00	-0.03	-0.06	-0.09	0.91**	0.93**	-0.92**	0.28**	-0.29**
JP Bond					1.00	0.22**	0.27**	-0.30**	0.01	-0.04	-0.03	0.07
Cash						1.00	0.94**	-0.07	0.01	-0.02	0.06	0.08
Foreign Bond							1.00	-0.11*	-0.03	0.01	0.02	0.11*
Other Derivatives								1.00	0.91**	-0.90**	0.30**	-0.31**
JP Bull									1.00	-0.99**	0.22**	-0.21**
JP Bear										1.00	-0.21**	0.21**
Foreign Bull											1.00	-0.98**
Foreign Bear												1.00

(c4) Cross Correlations between TNF and RET
(Flows in rows, returns in columns)

	JP Equity	Foreign Equity	Index	JP Sector	JP Bond	Cash	Foreign Bond	Other Deriv.	JP Bull	JP Bear	Foreign Bull	Foreign Bear
JP Equity	0.08	-0.06	0.06	0.06	-0.14*	0.00	-0.06	0.07	0.05	-0.06	-0.08	0.08
Foreign Equity	-0.14*	-0.08	-0.12*	-0.12*	0.12*	0.02	0.03	-0.15**	-0.12*	0.11*	-0.12*	0.10
Index	-0.06	-0.03	0.00	-0.03	0.02	0.01	0.00	-0.03	0.01	0.00	-0.11	0.10
JP Sector	-0.04	0.02	0.01	-0.02	0.02	0.01	0.01	-0.01	0.00	0.00	0.02	-0.02
JP Bond	-0.02	-0.08	-0.03	-0.02	-0.02	-0.04	-0.04	-0.01	-0.05	0.04	0.04	-0.04
Cash	0.02	-0.01	-0.04	-0.01	0.03	-0.01	0.00	-0.02	-0.04	0.03	0.13*	-0.13*
Foreign Bond	-0.14**	-0.08	-0.08	-0.10	0.05	0.01	0.07	-0.09	-0.06	0.07	-0.07	0.08
Other Derivatives	0.06	-0.01	0.08	0.08	-0.04	-0.02	-0.02	0.09	0.07	-0.07	-0.05	0.04
JP Bull	-0.05	-0.02	0.03	0.00	-0.02	-0.06	-0.10	-0.01	0.01	-0.01	-0.18**	0.17**
JP Bear	0.05	-0.05	-0.02	0.01	0.00	0.03	0.08	0.04	-0.01	0.01	0.20**	-0.20**
Foreign Bull	-0.02	0.01	-0.02	-0.03	-0.01	0.01	0.02	0.00	-0.02	0.03	-0.07	0.08
Foreign Bear	0.05	0.06	0.09	0.07	0.07	-0.06	-0.04	0.07	0.11	-0.11*	-0.05	0.03

Table 6
Principal Components for Japanese ITAJ Categories

This table shows the first four principal components of the set of flows to the 31 ITAJ narrow categories. Flow measures used are (a) the total net flow and (b) the equally weighted average percentage flow.
* Loadings greater than 0.10.

		(a) TNF				(b) EWAPF			
		TNF1	TNF2	TNF3	TNF4	EWAPF1	EWAPF2	EWAPF3	EWAPF4
ITAJ1	Japan Equity, General	0.14*	0.57*	-0.77*	0.01	-0.04	-0.04	-0.01	0.00
ITAJ2	Japan Equity, Big Cap	0.00	0.00	0.00	0.00	-0.02	-0.03	-0.06	0.08
ITAJ3	Japan Equity, Middle-Small Cap	0.02	0.02	-0.07	0.00	0.01	-0.05	-0.03	-0.08
ITAJ4	Japan Equity, OTC	-0.02	0.00	0.02	0.01	0.00	-0.04	0.06	-0.03
ITAJ5	International Equity, Asia-Pacific	-0.09	-0.05	0.21*	-0.05	0.01	-0.04	0.00	-0.03
ITAJ6	International Equity, North America	0.01	0.00	-0.03	-0.03	0.03	-0.16*	-0.04	-0.33*
ITAJ7	International Equity, Asia-Pacific	0.00	0.01	-0.01	-0.01	0.00	-0.02	-0.02	0.02
ITAJ8	International Equity, Europe	-0.06	-0.04	0.09	0.00	-0.01	-0.13*	0.21*	-0.23*
ITAJ9	International Equity, Latin America	0.00	0.00	0.00	0.00	0.02	0.00	-0.15*	-0.03
ITAJ10	Balanced Funds	-0.98*	0.02	-0.19*	0.03	0.03	-0.01	0.00	-0.04
ITAJ11	Limited	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00	0.01
ITAJ12	Convertible Bonds	0.00	0.01	0.00	-0.01	-0.01	-0.06	0.00	-0.01
ITAJ13	Japan Equity, Nikkei225 linked	-0.07	0.40*	0.26*	-0.82*	-0.16*	-0.13*	-0.13*	-0.04
ITAJ14	Japan Equity, TOPIX linked	0.00	0.14*	0.09	-0.23*	-0.08	-0.18*	-0.07	-0.08
ITAJ15	Japan Equity, Nikkei300 linked	0.00	0.02	-0.01	-0.02	-0.02	-0.08	-0.03	-0.04
ITAJ16	Japan Equity, Other Indexes linked	-0.01	0.01	0.00	-0.01	-0.05	-0.11*	-0.05	-0.06
ITAJ17	Million (periodic contribution)	0.00	0.00	0.00	0.00	-0.02	-0.03	-0.03	-0.07
ITAJ18	Japan Zaikei	0.00	0.00	0.00	0.00	-0.01	0.01	0.01	-0.02
ITAJ19	Japan Sectors	-0.01	0.03	0.02	-0.04	-0.02	-0.06	0.00	-0.03
ITAJ20	Cash (Money Pool)	0.01	-0.12*	-0.08	-0.11*	0.88*	-0.14*	-0.39*	0.12*
ITAJ21	Derivatives	-0.07	0.69*	0.49*	0.50*	0.37*	-0.20*	0.85*	0.06
ITAJ22	Japan Sector, Construction-Real Estate	0.00	0.01	0.00	0.00	-0.06	-0.10	0.00	0.06
ITAJ23	Japan Sector, Pharmaceutical-Food	0.00	0.00	0.00	-0.01	-0.03	-0.11*	0.01	0.03
ITAJ24	Japan Sector, Chemical-Textile-Pulp	0.00	0.00	0.00	-0.01	-0.08	-0.40*	-0.01	0.06
ITAJ25	Japan Sector, Oil-Nonferrous	0.00	0.00	0.00	0.00	-0.07	-0.45*	-0.13*	-0.02
ITAJ26	Japan Sector, Steel-Shipbuilding	0.00	0.00	0.00	0.00	-0.13*	0.00	0.02	0.87*
ITAJ27	Japan Sector, Electric-Precision Machinery	0.00	0.02	0.00	-0.02	-0.05	-0.08	-0.02	0.00
ITAJ28	Japan Sector, Automobile-Machinery	0.00	0.01	0.01	-0.02	-0.09	-0.27*	0.02	0.08
ITAJ29	Japan Sector, Commerce	0.00	0.00	0.01	-0.01	-0.07	-0.17*	-0.01	0.02
ITAJ30	Japan Sector, Financial	0.00	0.01	0.00	-0.01	-0.07	-0.52*	-0.06	0.06
ITAJ31	Japan Sector, Utility	0.00	0.00	0.00	0.00	-0.02	-0.22*	-0.02	0.05
	Percentage of variance explained:	58%	17%	10%	5%	28%	10%	8%	7%

Table 7
Correlations between Sentiment Flow Factor and
Category Flows and Returns

This table shows the correlations between the sentiment flow factor and category flows and returns. The sentiment flow factor is the linear combination of category EWAPFs that is maximally correlated with a linear combination of category returns (which defines the flow-factor mimicking portfolio return), and is found by canonical correlation analysis. In constructing the U.S. sentiment flow factor, the U.S. cash and foreign bond categories are excluded because none of their component funds existed in the beginning of the sample period.
* Significant at 5% level   ** Significant at 1% level

(a) US

	Correlation with Category		
	EWAPF	TNF	Returns
US Equity	0.774**	0.758**	0.181**
Foreign Equity	0.899**	0.848**	0.396**
Metal	0.007	0.018	0.089
US Sector	0.657**	0.667**	0.167**
US Bond	-0.086	-0.241**	0.059
US Cash	-0.478**	-0.256**	-0.068
Foreigh Bond	-0.137*	-0.036	0.141*
Foreign Cash	-0.093	-0.155**	-0.031

Correlation between Sentiment Factor Flow and
   Factor Mimicking Portfolio Return   0.429**

(b) Japan

	Correlation with Category		
	EWAPF	TNF	Returns
Japan Equity	0.204**	0.081	-0.018
Foreign Equity	0.039	0.137*	0.041
Index	0.658**	0.490**	0.078
Japan Sector	0.256**	0.290**	0.045
Japan Bond	-0.056	-0.041	-0.005
Japan Cash	-0.349**	-0.434**	-0.081
Foreign Bond	0.186**	0.152**	-0.102
Other Derivatives	-0.200**	0.092	0.024
Japan Bull	0.658**	0.647**	0.078
Japan Bear	-0.839**	-0.653**	-0.067
Foreign Bull	0.114*	0.025	-0.295**
Foreign Bear	0.158**	0.124*	0.263**

Correlation between Sentiment Factor Flow and
   Factor Mimicking Portfolio Return   0.460**

Table 8
Estimated Sentiment Flow Factor Risk Preimum

This table estimates the U.S. and Japanese sentiment factor risk premia. The U.S. categories are the eight asset classes, and the Japanese categories are the twelve ITA categories. Return factors are simply the equally weighted returns on these category funds. The orthogonalized sentiment flow factor is defined as the residual regressing the sentiment flow factor on one-day lags of all the category returns. The sentiment flow factor is the linear combination of category EWAPFs that is maximally correlated with a linear combination of category returns, found by canonical correlation analysis. We then estimate the factor loadings by regressing each fund return on a constant, the category returns and the orthogonalized sentiment flow factor using even days. Then, using odd days, we regress the cross-section of fund returns on a constant and the factor loadings in a two-step generalized least-squares seemingly unrelated regression (GLS-SUR) with the restriction that coefficients are constant over time. In the first step, a vector of fund returns stacked over days is regressed on a constant and the stacked factor loadings estimates. The sample residual variance for each day is then computed, whose reciprocal in turn is fed into the second-stage GLS-SUR as weights. Reported are the estimated coefficients or factor risk premia (multiplied by 1,000) and in brackets below, the corresponding t-values based on the heteroskedastic-consistent standard errors (White [1980]).

(a) US		(b) Japan	
Sentiment Flow Factor	0.5570	**Sentiment Flow Factor**	2.3960
	(3.49)		(4.94)
Return Factors		**Return Factors**	
US Equity	0.9490	Japan Equity	1.0272
	(15.01)		(21.36)
Foreign Equity	0.9533	Foreign Equity	0.9321
	(9.04)		(11.82)
Metal	-0.3128	Index	0.9759
	(-0.77)		(18.01)
US Sector	0.8477	Japan Sector	0.7054
	(9.37)		(14.53)
US Bond	-0.0462	Japan Bond	-0.1676
	(-0.78)		(-4.52)
US Cash	-0.0343	Japan Cash	0.0000
	(-1.05)		(0.00)
Foreigh Bond	-0.4159	Foreign Bond	0.0771
	(-3.94)		(0.73)
Foreign Cash	-0.0827	Other Derivatives	0.2292
	(-1.59)		(4.09)
		Japan Bull	1.4975
Constant	-0.1278		(9.77)
	(-2.47)	Japan Bear	-1.2257
			(-9.26)
Flow Factor = 0	F = 20.934	Foreign Bull	1.9498
	(p value = 0.00)		(4.47)
		Foreign Bear	-1.2948
			(-5.02)
		Constant	0.0030
			(0.08)
		Flow Factor = 0	F = 88.866
			(p value = 0.00)

White, H. 1980 "A Heteroskedasticity-Consistent Covariance Matrix and a Direct Test for Heteroskedasticity,"
     Econometrica, 48, 817-838.

Table 9
Serial Category-Return Correlations

This table shows the serial correlations of the U.S. and Japanese category returns. The Japanese Generalized Style Classification (GSC) and ITA classifications are described in the text.
* Significant at 5% level. ** Significant at 1% level.

(a) U.S.		(b) Japan GSC		ITA	
US Equity	0.12*	JP Equity	0.10	Japan Equity	0.09
Foreign Equity	0.23**	Asian Equity	0.08	Foreign Equity	0.18**
Metal	0.27**	Western Equity	0.39**	Index	-0.03
US Sector	0.12*	Focused Equity	0.17**	Japan Sector	0.03
US Bond	0.32**	Balanced/Cash	0.00	Japan Bond	0.07
US Cash	0.10	Balanced/CB	0.07	Japan Cash	0.21**
Foreign Bond	0.25**	Index	-0.06	Foreign Bond	0.22**
Muni Bond	0.27**	Cash	-0.03	Other Derivatives	-0.02
				Japan Bull	-0.11
				Japan Bear	-0.12*
				Foreign Bull	0.08
				Foreign Bear	0.13*

Table 10
Cross Country Flow Correlations

This table shows the cross-country correlations between U.S. and Japanese category flows. The GSC categories are used for Japan. TNF(t) stands for the sum of the dollar net flows of the category component funds on day t. EWAPF is the equally weighted average of the percentage flows of the category component funds.
* Significant at 5% level. ** Significant at 1% level.

(a1) US TNF(t) vs JP TNF(t)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
US Equity	0.05	-0.11	-0.05	-0.01	0.04	-0.06	0.00	-0.04
Foreign Equity	0.07	0.03	0.00	-0.03	0.04	-0.10	0.07	-0.08
Metal	-0.02	-0.07	-0.05	-0.03	-0.04	0.11*	-0.07	0.07
US Sector	0.02	-0.02	-0.02	-0.07	0.01	-0.05	0.04	0.00
US Bond	-0.02	-0.05	0.08	-0.02	0.20**	0.06	-0.06	0.12*
US Cash	0.02	-0.01	0.05	-0.01	-0.02	0.01	-0.10	-0.02
Foreign Bond	-0.05	-0.04	0.06	-0.06	-0.13*	0.02	0.00	0.00
Muni Bond	-0.02	-0.12*	-0.04	-0.04	0.02	0.02	0.05	0.07

(a2) US TNF(t-1) vs JP TNF(t)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
US Equity	0.02	-0.11	-0.12*	0.00	-0.04	0.03	-0.17**	0.10
Foreign Equity	-0.03	-0.05	0.03	0.02	-0.03	0.03	-0.14*	0.11*
Metal	0.00	0.03	-0.05	0.03	-0.09	0.05	-0.01	-0.04
US Sector	-0.01	0.02	-0.03	-0.02	0.02	0.12*	-0.13*	0.11
US Bond	-0.07	-0.06	0.09	-0.07	0.21**	-0.04	0.00	0.06
US Cash	0.00	0.00	0.05	-0.21**	0.01	-0.03	0.08	-0.06
Foreign Bond	-0.11*	-0.04	0.16**	0.02	0.11	-0.04	-0.12*	0.07
Muni Bond	-0.01	-0.03	0.01	0.03	0.18**	0.05	0.01	0.03

(b1) US EWAPF(t) vs JP EWAPF(t)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
US Equity	0.02	0.01	0.02	0.01	-0.01	0.02	0.04	-0.08
Foreign Equity	0.08	0.06	0.02	-0.05	-0.01	0.02	0.03	-0.08
Metal	-0.14*	-0.12*	-0.03	-0.09	-0.03	0.06	-0.09	0.11*
US Sector	0.00	-0.02	-0.03	-0.04	0.06	0.00	0.01	-0.04
US Bond	-0.06	-0.05	0.06	-0.02	0.02	-0.02	-0.01	0.05
US Cash	0.02	0.00	0.01	0.01	-0.01	0.02	-0.04	0.06
Foreign Bond	-0.11*	-0.06	-0.04	-0.07	0.00	0.04	-0.11*	0.07
Muni Bond	-0.05	0.02	-0.02	0.08	0.01	-0.09	0.02	-0.01

(b2) US EWAPF(t-1) vs JP EWAPF(t)

	JP Equity	Asian Equity	West'n Equity	Foc'd Equity	Bal'd / Cash	Bal'd / CB	Index	Cash
US Equity	-0.03	-0.05	0.01	-0.06	0.10	-0.04	-0.14*	0.11
Foreign Equity	-0.05	-0.07	0.08	-0.03	0.05	0.02	-0.22**	0.22**
Metal	-0.05	0.07	0.08	0.08	-0.01	0.02	0.01	0.06
US Sector	-0.03	-0.04	-0.02	0.00	0.06	0.05	-0.18**	0.15**
US Bond	-0.05	0.04	-0.02	0.01	-0.04	-0.04	0.03	-0.01
US Cash	0.00	-0.07	-0.02	0.03	0.00	0.00	0.17**	-0.15**
Foreign Bond	-0.08	-0.03	-0.05	-0.10	0.05	-0.10	-0.12*	0.03
Muni Bond	0.07	-0.05	-0.07	0.00	0.06	-0.03	0.05	-0.02

Table A1
Definition of ITAJ Categories

This table shows the definition of the categories by the Investment Trust Association of Japan.

| ITAJ Broad Category	ITAJ Narrow Category, Fund Objective	Definition
1. Japan Equity	Japan Equity, Big Cap	Invests more than 70% in domestic stocks, mainly in big cap's (outstanding number of shares listed > 200millon)
	Japan Equity, General	Invests more than 70% in domestic stocks
	Japan Equity, OTC	Invests more than 70% in domestic stocks, mainly in OTC stocks
	Japan Equity, Middle-Small Cap	Invests more than 70% in domestic stocks, mainly in middle-small cap's
	Million (periodic contribution)	Purchased automatically by monthly deduction from investors' payroll
	Japan Sectors	Invests more than 70% in domestic stocks. Investors can switch among several industry sectors.
2. International Equity	International Equity, Asia-Pacific	Invests more than 70% in Asian and Pacific region stocks, excluding Japan.
	International Equity, Europe	Invests more than 70% in European stocks.
	International Equity, General	Invests more than 70% in foreign stocks.
	International Equity, Latin America	Invests more than 70% in Latin American stocks.
	International Equity, North America	Invests more than 70% in North American stocks.
3. Balanced Funds	Balanced	Invests no more than 70% in stocks. Investment is balanced between stocks and bonds, or is focused on bonds. The securities invested can be domestic or foreign.
4. Convertible Bonds	Convertible Bonds	Invests mainly in convertible bonds and no more than 30% in stocks. The securities invested can be domestic or foreign.
5. Index Linked	Japan Equity, Nikkei225 linked	Designed to track Nikkei 225 index without limitation to investment in stocks, as stipulated in prospectus.
	Japan Equity, Nikkei300 linked	Designed to track Nikkei 300 index without limitation to investment in stocks, as stipulated in prospectus.
	Japan Equity, Other Indexes linked	Designed to track indexes other than Nikkei 225, 300, or TOPIX without limitation to investment in stocks, as stipulated in prospectus.
	Japan Equity, TOPIX linked	Designed to track TOPIX index without limitation to investment in stocks, as stipulated in prospectus.
6. Industry Sector	Japan Sector, Automobile-Machinery	Invests more than 70% of the fund in domestic stocks, mainly in automobile and/or machinery industries, as stipulated in prospectus.
	Japan Sector, Chemical-Textile-Pulp	Invests more than 70% of the fund in domestic stocks, mainly in chemical, textile and/or pulp industries, as stipulated in prospectus.
	Japan Sector, Commerce	Invests more than 70% of the fund in domestic stocks, mainly in commerce industry, as stipulated in prospectus.
	Japan Sector, Construction-Real Estate	Invests more than 70% of the fund in domestic stocks, mainly in construction and/or real estate industries, as stipulated in prospectus.
	Japan Sector, Electric-Precision Machinery	Invests more than 70% of the fund in domestic stocks, mainly in electric and/or precision machinery industries, as stipulated in prospectus.
	Japan Sector, Financial	Invests more than 70% of the fund in domestic stocks, mainly in financial industry, as stipulated in prospectus.
	Japan Sector, Oil-Nonferrous	Invests more than 70% of the fund in domestic stocks, mainly in oil and/or nonferrous industries, as stipulated in prospectus.
	Japan Sector, Pharmaceutical-Food	Invests more than 70% of the fund in domestic stocks, mainly in pharmaceutical and/or food industries, as stipulated in prospectus.
	Japan Sector, Steel-Shipbuilding	Invests more than 70% of the fund in domestic stocks, mainly in steel and/or shipbuilding industries, as stipulated in prospectus.
	Japan Sector, Utility	Invests more than 70% of the fund in domestic stocks, mainly in utility industry, as stipulated in prospectus.
7. Derivatives	Derivatives	Aggressively uses derivative securities for purposes other than hedging.
8. Others	Limited	
	Savings (Domestic Zaikei)	
	Domestic Money Pool	
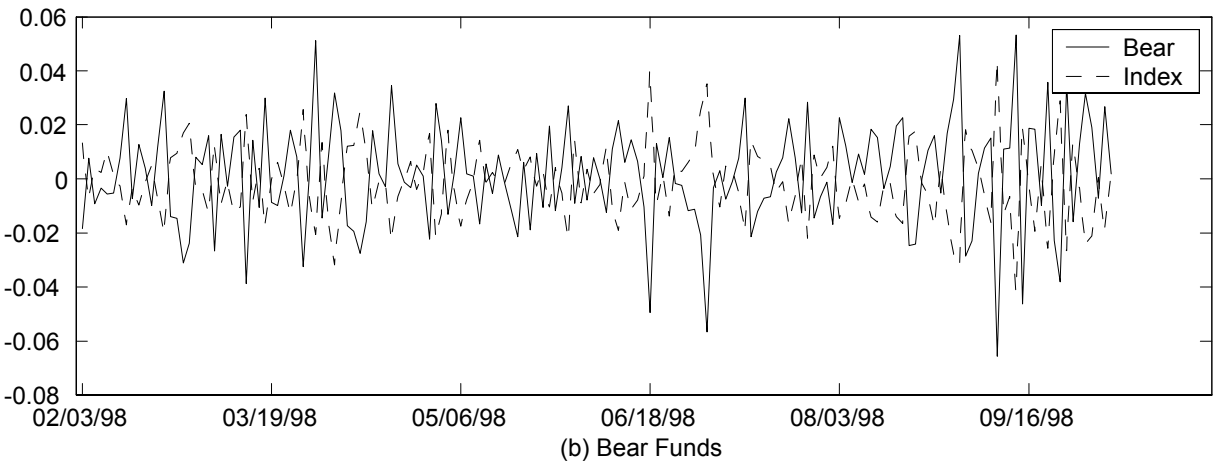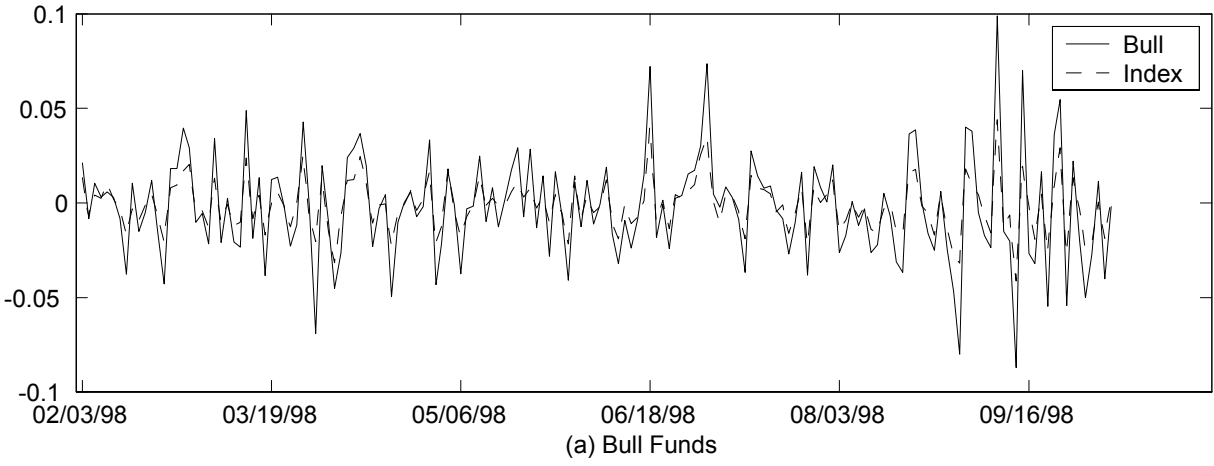
Figure 1: Time-series plots of the Japanese bull and bear daily category returns during the first half sample period, February 3, 1998 through October 6, 1998. The dashed line is the index category fund returns.