Do Fund Managers Use Private Information in their Asset Allocation Decisions? Evidence from Macroeconomic Announcements*

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Abstract

We ask whether fund managers use private information about forthcoming macroeconomic announcements in their asset allocation decisions and whether those that more aggressively use this information outperform those that do not. We present the first evidence that fund managers possess and actively use private information about forthcoming macroeconomic announcements. Specifically, the net asset values (NAVs) of hybrid funds respond strongly to the surprises in macroeconomic announcements and there is a distinct asymmetry in the response to positive and negative surprises. More important, the average fund manager engages in significant reallocation across asset classes in the two days before and (partly) reverses his trades in the two days after a large number of announcements. Further, managers that hold a greater proportion of their funds in stocks and make greater efforts to time the stock market using private information about the macroeconomic announcements earn over 400 basis points higher return per year. The opposite holds for those that hold more cash. Finally, funds that more aggressively attempt to time the market using private information tend to have higher turnover and expense ratios, which are related to a greater marginal product.

Mutual funds have grown considerably in popularity over the past decade. Data from the 2004 Mutual Fund Fact Book indicate that at the end of 1993, 4534 mutual funds managed $2.070 trillion. By end of year 2003, 8126 funds managed a total of $7.414 trillion belonging to over 260 million shareholder accounts held by more than 91 million individuals from over 53 million homes.[1]

The vast majority of mutual funds is actively managed. The premise of active management is that, on average, managers add value because they are able to generate private information that allows them to be superior at stock picking and/or asset allocation. As such, the funds they manage should outperform their benchmarks and passively managed funds. In addition, among actively managed funds, managers with greater abilities should outperform those with less skill. Likewise, the performance of skilled managers should be persistent, allowing investors to use managers' past performance to predict their future performance. Therefore, an important part of determining if active fund managers add value is to ascertain if they possess private information, what the information is about, and how they use and benefit from this private information in their stock-picking or market-timing activities.

In this paper, we study the market-timing ability of fund managers by examining if and how they use private information about forthcoming macroeconomic announcements in their asset allocation decisions and provide evidence on the characteristics of those funds that use and benefit from this information.[2]

To date, several studies have examined whether or not mutual fund managers possess market-timing skills. Although they provide important insights into the added value or lack thereof of active mutual fund management, it is yet to be unambiguously determined if managers do in fact possess market-timing skills. There is also an absence of clear evidence that fund managers have private information, what the information is about, and how they use this information. For instance, Baker et al. (2004) find that fund managers tend to buy (sell) stocks that have higher (lower) returns at their subsequent earnings announcement. However, they cannot unambiguously attribute this to superior

[1]The Fact Book is available at the Investment Company Institute's (ICI) web page at http://www.ici.org/.
[2] We use asset allocation and market-timing decisions interchangeably.

stock-picking skills based on private information about future earnings. This is because they use quarterly fund holdings and are unable to determine if the intra-month trades are motivated by quarterly analysts' earnings forecasts (or revisions thereof), which are public information. Kacperczyk and Seru (2005) conclude that funds that have a low reliance on public information (i.e., analysts' recommendations) have higher abnormal returns and attribute that to the greater use of private information. However, what the private information is about and exactly how it is used are not known and it is possible that fund managers rely on other sources of public information than analysts' recommendations.

To address these issues, we combine daily returns on hybrid mutual funds with macroeconomic announcements and their expectations and use a variant of the Sharpe (1992) methodology to examine if fund managers change their exposure to the various asset classes in anticipation of these announcements and adjust their portfolio holdings in response to surprises in the announcements. An advantage of our data is that we obtain the unanticipated component of the announcement (the surprise) without relying on econometric models. Like Flannery and Protopapadakis (2002), we believe this more adequately reflects current market sentiment than surprises using statistical approaches. Furthermore, the latter surprises are based on revised data that are not available to fund managers at the time of their investment decisions.

We focus on portfolio rebalancing in the two days prior to the announcements. One important benefit of this is that it allows us to determine fund managers' ex ante portfolio allocation decisions. This is important because, as argued by Kim and Verrecchia (1991a, b), McNichols and Trueman (1994), Pasquariello and Vega (2005), and others, if active mutual fund managers possess private information, then they will engage in significant portfolio rebalancing in the period just prior to the release of public information. A second benefit is that it allows us to overcome a weakness of the extant literature, as pointed out by Ferson and Schadt (1996, p. 426), that "…a managed portfolio strategy that can be replicated using readily available public information should not be judged as having superior performance." In other words, because ex ante reallocations are not a reaction to public information, but are based on the managers' private information forecast of the announcement, managers with skill are

better able to exploit the errors between expectation and announcement and, as such, outperform their benchmark and peers. We also provide analysis of ex post reallocations to more sharply identify the presence of market timing. This is motivated by the above theoretical models that argue that investors with private information in the pre-announcement period require the public disclosure and the market's response thereto in order to obtain the short-term benefits of their private information.

We briefly outline a trading strategy consistent with the above. Suppose the market consensus of the expected change in, say, the index of leading indicators (LEAD) is 1.0% and on release it is rapidly impounded into asset prices. A fund manager would choose to maintain his current asset allocation if he believes that this forecast will be met. If, however, using his private information he forecasts LEAD to be 2% he will increase his exposure to equities and, perhaps, fixed-income securities at the expense of cash equivalents prior to the announcement. The decision to increase or decrease the holdings of a particular asset class can be based on the expected response of each asset class to the positive and negative surprises in LEAD. If on announcement LEAD is 2%, then the +1% surprise to the market will be a measure of the private information of the fund manager. Although an announcement at *t* is about economic activities at *t*-1 or earlier, it is price-relevant because it may cause a revision in expectations about future economic activities that affect current asset prices.

A key advantage of our approach is that it exploits a segment of mutual fund returns that not only contains the most concentrated information about future prospects of important sectors of the economy but also the economy as a whole. Therefore, if fund managers have the ability to forecast (sectors of) the economy, then that ability should be reflected in this segment of fund returns. Additionally, our approach overcomes the joint-hypothesis problem commonly found in market-timing tests. This is consistent with the idea by Brown and Warner (1985) that event studies with daily data are robust to this problem.

We focus on hybrid funds for the following reasons. First, hybrid funds present us with a unique opportunity to examine the role of private information about macroeconomic announcements in the asset allocation decision. This is because, in contrast to equity funds that hold most of their funds in equities and typically only temporarily reallocate to cash equivalent securities, hybrid fund managers hold a

combination of equities, fixed-income securities, and cash equivalents in their portfolios and change their asset allocation depending on their forecast of future returns on each of the asset classes.[3]

Second, because of the multiple asset classes of these funds, they provide investors with an investment opportunity that is not offered by equity mutual funds. This makes hybrid funds highly popular with investors and, as pointed out by the ICI, hybrid funds have become increasingly important as an avenue for net cash flows into mutual funds. Over the decade 1993 to 2002, net cash flow into hybrid funds averaged just under $10 billion per year and in 2002 net cash flow into hybrid funds ($8.6 billion) exceeded that into equity funds (-$27.8 billion) and by the end of 2003, there were more than 500 such funds managing about $440 billion. Yet, as Blake et al. (1999, p. 430) point out, "…remarkably little is known empirically about the investment performance of multiple-asset class portfolios," which, arguably, are the best candidates for testing market-timing skills.

Our analysis proceeds in several stages. First, we examine whether or not the three major asset classes (stocks, bonds, and cash equivalents) react to the surprises in macroeconomic announcements using a relatively new dataset containing 32 macroeconomic announcements and survey-based expectations. If the surprises have a differential effect on these asset classes, then this indicates that the surprises should be an important source of information in hybrid fund managers' asset allocation decisions. Second, we determine if the surprises in macroeconomic announcements impact the net asset values (NAVs) of hybrid funds. This provides indirect evidence of whether or not fund managers exploit private information about the pending announcement when it is different from the market's expectation. Third, we present direct evidence on whether or not managers of hybrid mutual funds use private information about macroeconomic announcements in their asset allocation decisions. Fourth, we provide evidence on whether or not managers that more aggressively change their asset allocations in the two days prior to the announcements earn higher average returns than their peers who do not. Finally, we assess

[3] Wermers (2000) reports that the average mutual fund invests about 83% of its funds in stocks. This rises to about 93% for aggressive growth funds. Additionally, funds are becoming more invested in stocks over time and holding less cash, as they find alternative means of providing liquidity to meet redemptions. In contrast, hybrid funds held 55% of funds in stocks, allocating the rest to fixed-income and cash equivalent securities (see our Table 1, Panel B).

the association between fund characteristics, such as expense ratio and turnover, and the extent to which hybrid funds use and benefit from private information about macroeconomic announcements.

We find that, not only do stocks and bonds respond significantly to the surprises in the announcements, but also that cash equivalents are highly responsive. The surprises in macroeconomic announcements significantly affect funds' NAVs and this impact is not simply a result of the effect of the surprises on the constituent asset classes of fund portfolios noted above. We document a clear pattern of portfolio rebalancing whereby fund managers increase (reduce) their holdings of a particular asset class prior to the announcement and then reduce (increase) their holdings of the asset class subsequent to the announcement. What is more, the evidence indicates substantial rebalancing across the various asset classes where, for example, a reduction in cash equivalents is simultaneously associated with an increase in the holdings of stocks and/or bonds. Taken together, these results represent the first direct evidence that mutual fund managers actively utilize private information about forthcoming macroeconomic announcements in their asset allocation decisions.

Finally, we find evidence of successful market timing. Fund managers who more aggressively reallocate their funds to equities and bonds in anticipation of the surprises in the announcements earn 428 and 46 basis points higher annual average return, respectively, than those who do not. In contrast, frequent and significant reallocations to cash result in 120 basis points lower average return. This is consistent with our finding that funds that hold more cash, on average, earn lower rates of return. The evidence also indicates that investors may be able to identify those funds with a greater propensity to exploit private information about macroeconomic announcements because they tend to be high turnover, high expense funds, characteristics that are related to a higher marginal product.

The remainder of the paper is as follows. Section I discusses the literature on market timing and relates our work to the existing literature. Section II describes the data and outlines the methodology. Section III examines the impact of macroeconomic announcements on stocks, bonds and cash equivalents, and on the NAVs of hybrid funds. Empirical results related to the major objective of the paper are contained in section IV. Section V presents evidence on the characteristics of mutual funds that

are more likely to time the market in the manner outlined in the paper. The paper's summary and conclusions are in section VI.

I. Evidence of Market Timing in the Money Management Industry

A large proportion of the mutual fund literature is dedicated to answering the question of whether or not fund managers time the market and earn abnormal returns. The evidence in support of managerial timing ability is decidedly mixed. Treynor and Mazuy (1966), in one of the first papers to address the timing ability of fund managers, find that only one out of a sample of 57 funds displayed significant evidence of market timing. Henriksson (1984) follows the approach of Henriksson and Merton (1981) and reports that only three out of a sample of 116 funds were successful at market timing. More recently, Graham and Harvey (1996) use the recommendations of the allocation between cash and stocks made in investment newsletters to test for the presence of market-timing ability. Consistent with the earlier studies, they find no evidence of market-timing ability.[4]

Bollen and Busse (2001) argue that a possible explanation for the lack of evidence in support of market-timing abilities by managers is that the studies are based on monthly or annual returns. Goetzmann et al. (2000) argue that tests based on monthly or annual returns have weak power in detecting market-timing ability by managers. Busse (1999) use daily data and finds that up to 80% of the fund managers in his sample of 230 funds have the ability to time market volatility. Bollen and Busse use the same data and find that about 34% of the funds display evidence of significant market-timing ability. However, Lee and Rahman (1990), using *monthly* data for a sample of 93 funds, find evidence of market timing for 16 funds. Similarly, using monthly returns for a sample of hybrid mutual funds, Comer (2003) finds some evidence of market-timing ability.

[4] This general finding appears to be robust across geographical borders and to the type of money managers. For example, Blake et al. (1999) find no evidence of market-timing skills for a sample of more than 300 U.K. pension fund managers who invest in multiple asset classes and operate in a less restrictive legal environment than that which exists in the United States.

Thus, the evidence indicates that, although using daily data may lead to more powerful tests, it is highly unlikely that the lack of evidence is due to the periodicity of the data. More importantly, although the Busse and Bollen and Busse studies provide evidence that is consistent with managers' market-timing ability the methodologies used in these papers are unable to tell us what private information fund managers use in their market-timing activities. It must be pointed out that these are not the only papers that suffer from these weaknesses; rather, it is a general characteristic of the extant literature on market timing.

Closely related to our paper, is a growing body of work that conditions fund managers' performance on information sets. Ferson and Schadt (1996) account for the use of public information by fund managers in their test of market-timing skills. They argue that most previous studies of market timing suffer from a bias because they confuse the well-known time variation in risk premiums with abnormal fund performance. That is, if a fund manager uses publicly available information in his asset allocation decisions the performance arising from this should not be judged as superior because investors can readily replicate it. However, traditional tests of market timing would have credited the fund manager with superior performance on the basis of his use of public information. They show that fund managers use public information in their investment decisions and after conditioning manager performance on public information variables they provide some weak evidence of timing ability. In contrast, Becker et al. (1999), using a similar approach, find no evidence of timing ability for a sample of over 400 mutual funds after controlling for public information.

Our study builds on the work of Kacperczyk and Seru (2005) in which they consider fund managers' use of private information in their decisions. More specifically, they estimate the extent of fund managers' reliance on public information, proxied by analysts' recommendation, and use this estimate to infer their use of private information. While they judge skill on the basis of how changes in quarterly portfolio holdings are a function of past public information, we judge a manager's skill on the basis of his ability to make superior forecasts compared to the market; that is, to forecast public information and take a position different from the market consensus. We also judge skill on the basis of

greater ability to process available public information. Whereas in their paper the fund manager has a "clear and unequivocal course of action" following the pronouncement of the buy-side analyst and his skill is determined by the insensitivity of changes in his portfolio holdings to this recommendation, in our framework the fund manager must act prior to the release of the public information given the market's expectation and on the release of the information must interpret any surprise in the announcement and act appropriately. We argue that this is a much better test of skills because the manager, in order to rebalance his portfolio prior to the revelation of the information, must have a contrary view relative to the market and must be ready to put his money where his thoughts are. Finally, as they point out, although they are able to determine if managers have private information about future asset returns, they are unable to say what the information is about. In our paper, we overcome this shortcoming of their paper by being able to provide direct evidence that managers have private information about forthcoming macroeconomic announcements that they use in their asset allocation.

Given that we base our test on fund managers trading both prior and subsequent to the announcement, our results can also be considered as providing empirical support for several theoretical models that point out that investors that have acquired private information have incentives to trade in anticipation of a public announcement (Kim and Verrecchia (1991a), McNichols and Trueman (1994)). They show that the expected impact of the public announcement significantly affects the incentive to gather information and trade in the pre-announcement period. At the time of the announcement, trading takes place as investors with private information revise their expectations. More specifically, because there is a disparity in the precision of the private information between investors in the pre-announcement period (some investors even had no private information) the announcement leads to "differential belief revisions" among investors, whereby the less well informed makes the largest revisions, allowing the more well informed an opportunity for profitable trading (Kim and Verrecchia (1991b)). Similarly, differences in interpreting the information in the announcement could also lead to trading even if there were homogenous expectations in the pre-announcement period.

II. Data and Methodology

A. Data

Hybrid Funds: In this paper, we use daily returns of hybrid mutual funds over the period 1997 to 2002. The selected funds are those classified as asset allocation funds and balanced funds by the Morningstar Principia Pro Mutual Fund CD at end of year 1996. Comer (2003) notes that, unlike popular belief, balanced funds have high turnover rates and also engage in market timing by shifting up to 15% of their assets into the asset class forecasted to do well. Their main restriction is that they have to hold at least 25% of their assets in bonds and/or cash, leaving them with ample scope to vary their asset holdings in an attempt to time the market.

Because our focus is on the use of U.S. macroeconomic announcements in asset allocation decisions, our sample of funds must be primarily invested in U.S. securities, particularly stocks, bonds, and cash equivalents. Hence, funds that have allocated more than 10% of their assets to international investments are excluded. Similarly, funds that invest more than 10% of their assets in asset classes other than equities, bonds, and cash equivalents are excluded.

In addition, we exclude funds that we do not consider to be true hybrid funds because the asset allocation mandate given to their management is too restrictive. These funds include social awareness funds, non-diversified funds, fund of funds, and fixed-horizon/targeted-maturity funds. We also exclude funds that can change their asset allocation through the use of derivatives by eliminating those funds whose prospectus indicates that they use derivatives as a part of their investment strategy. This restriction eliminates hedge funds from our sample.

For each fund, we require daily net asset values and daily dividends and other distributions as of January 1997. These are obtained from Bloomberg. Data on daily net asset value (NAV_t), capital gains distribution g_t, and dividend, interest, or other distributions d_t are used to compute daily returns: $(NAV_t - NAV_{t-1} + g_t + d_t)/NAV_{t-1}$.

We carried out several checks to ensure the validity of our data. First, we control for survivorship bias by including each available hybrid fund in our sample up to the point where the fund is removed

because of mergers or other corporate decisions. Second, we use alternative sources to double check data that appear to be incorrect. After applying the above filters we obtained a total of 149 hybrid funds between 1997 and 2002. This results in a total of 207,920 observations.

Bond returns: We use daily returns on the Lehman Brothers Bond Index. These data are available starting in 1997, thus restricting our sample to the 1997 to 2002 time period.

Cash equivalents: The cash component is the daily return on the 91-day Treasury bill obtained from Datastream.

Stock returns: We use the daily returns on the CRSP value-weighted market portfolio.

Macroeconomic Announcements: Announcement data on 32 regularly scheduled macroeconomic series are obtained from The Money Market Survey (MMS), a subsidiary of Standard &Poors. The MMS data provide both the expectations (median forecast) as well as the actual announcements. The properties of these data are presented in Flannery and Protopapadakis (2002) and Balduzzi et al. (2001), hence, we do not repeat them here beyond what is required for the purposes of this paper. The 32 series in our sample are nearly twice the 17 used by Flannery and Protopapadakis (2002) and six more than the 26 used by Balduzzi et al. (2001). Finally, our sample period does not overlap or intersect with either of the above studies, neither of which extends beyond 1996.

In Table I, we present summary statistics of the returns on the sample of hybrid funds, cash equivalents, bonds, and stocks, macroeconomic announcements and their surprises, and yearly average asset allocation of the hybrid funds. In Panel A, neither the mean daily return on the set of hybrid funds nor on the unmanaged equity or bond index is statistically significantly different from zero.

The yearly average asset allocations shown in Panel B indicate significant flexibility on the part of hybrid funds with respect to their holdings. This is most evident in their cash holdings, which vary from a low of 4% to over 16% of total net assets and in their equity holdings, which vary from 50% to 59%. This time variation in holdings is a necessary, if not sufficient, condition for successful market timing.

Panel C of the table reports summary statistics of the raw announcements and their surprises. The percentage surprise is measured as:

$$\frac{actual - forecast}{forecast} \times 100 . \quad (1)$$

Hence, a positive (negative) surprise indicates that survey (i.e., market) participants underestimated (overestimated) the outcome of the series. The surprises (unanticipated components) of some of these macroeconomic announcements are priced risks in an APT model (Flannery and Protopapadakis (2002)). Additionally, Balduzzi et al. (2001) show that the forecast and, hence, the surprise contain valuable information about the announcement series. Table I indicates that the mean surprise of most of the series is insignificantly different from zero. However, about 25% are statistically significant, implying that there is some bias in the forecast, similar to Balduzzi et al. (2001).

B. Methodology

One of the main objectives of our study is to determine if fund managers possess and use private information about forthcoming macroeconomic announcements in their asset allocation decisions. However, the portfolio holdings of fund managers are publicly available usually only at the quarterly frequency and must be inferred at other (higher) frequencies. We apply Sharpe's (1992) quadratic programming technique to the daily returns on each fund and the returns on the benchmark portfolios of stocks, bonds, and cash equivalents to estimate the average monthly holdings of these assets by each hybrid fund. In effect, we create a synthetic portfolio of assets for each fund manager, with the weights obtained from a quadratic regression. The technique replicates a fund's portfolio as a combination of non-negative proportions of assets within several classes. The proportions sum to one and are fixed within a given period, but may vary over time.

More formally, assume that a *k*-factor model represents the fund's return-generating process and that the factors are the returns on the asset classes in which the mutual fund is invested. Then, for each

fund, we can estimate the average holding of each asset class during a particular month by using daily returns to solve the quadratic program:

$$\begin{aligned} &\min \left[\text{var}\left(R_{it} - \textstyle\sum_{k=1}^{3} b_{ik} R_{kt}\right)\right] \\ &\textit{subject to} \\ &0 \le b_{ik} \le 1 \quad \forall k \\ &\textstyle\sum_{k=1}^{3} b_{ik} = 1. \end{aligned} \tag{2}$$

In equation (2), R_{it} is the daily returns on fund i, R_{kt} is the daily returns on benchmark k (k = 1, 2, 3) representing the stock, bond, and cash equivalent returns, respectively, and b_{ik} represents the monthly average proportion of the k asset classes that are included in the fund's portfolio over the approximately 22 trading days within a month. Thus, using the 22 trading days in each month, we estimate a series of monthly portfolio proportions for each mutual fund. The estimated b_{ik} can be thought of as the portion of funds an investor would allocate to the k^{th} index fund designed to replicate the performance of asset class k. The weighted returns on the asset classes (where b_{ik} is the weight for class k) produce a fund portfolio return in month t for each fund. Thus, Sharpe's quadratic programming technique produces a proxy for the actual fund holdings, where the proxy is derived from the readily observed fund returns and returns on the asset classes.

In the absence of mutual funds' actual asset allocation, this quadratic optimization process produces the best approximation of their asset allocation over a given period. Sharpe (1992) was the first to use this approach to obtain the average exposure of mutual funds to different asset classes over time. Since then, the methodology has been used successfully to estimate portfolio weights that accurately replicate actual fund holdings. For instance, Comer (2003) finds that it accurately replicates the actual holdings of a set of hybrid mutual funds and Blake, Elton, and Gruber (1993) find similar results for bond funds. Similarly, Fung and Hsieh (1997), Brown, Goetzmann, and Park (2000), and Chan, Chen, and Lakonishok (2002), among others, have applied this methodology to the returns on equity and bond mutual funds as well as hedge funds.

III. Effect of Macroeconomic Announcements on Different Asset Classes and Fund NAVs

A. Asset Class Sensitivity to Surprises in Macroeconomic Announcements

To determine if the three broad asset classes respond to macroeconomic announcements, we report univariate regressions of the asset class returns on a constant and the percentage surprises in a single announcement:

$$R_{kt} = \alpha_0 + \alpha_1 * Surprise_{ht} + \varepsilon_{kt}, \quad (3)$$

where R_{kt} is the returns on benchmark k (stocks, bonds, or cash) and $h = (1,...., 32)$ represents the macroeconomic announcements.

We use univariate regressions because attempting to do multivariate regressions with 32 series introduces a significant level of intractability without necessarily adding any real value. This is because we use announcement surprises rather than the announcements themselves. The surprise is the difference between the value of the economic variable announced at time t and the expected (survey) value as at time t-τ, τ generally being five days. Thus, the surprise at t is orthogonal to the information at t-τ.[5] On day t-τ when the expectation of one series is formed, assuming rational expectations, it utilizes all available information including information about all other previously released macroeconomic variables. Because of the orthogonality between the surprises at t and the information at t-τ, it follows that the surprises of one series is uncorrelated with the surprises of other series that have been announced on any previous day. In cases where two or more announcements are made on the same day, given that the expectations of the different series are released at different times during the month the surprises should have relatively low correlation (McQueen and Roley (1993), Balduzzi et al. (2001)). Given the above, univariate regressions should not bias our results.

Table II reports the response of the returns on stocks, bonds, and cash equivalents to the surprises in the individual announcements. Specifically, we report the intercept and the slope, along with their t-

[5] This is clearer if we replaced the surprises with the residuals from an ARMA model fitted to the announcements. In this case, the residuals would be orthogonal to the expected/fitted value of the macroeconomic variable obtained from information available up to t-τ.

statistics. The coefficients are estimated from three different model specifications to deepen our understanding, relative to that based on previous studies such as Flannery and Protopapadakis (2002), Balduzzi et al. (2001), and others, of the effects of macroeconomic surprises on the various asset classes. We first regress the returns of the value-weighted stock index on the positive surprises of macro announcements, and then on the negative surprises. This separation of the data into negative and positive surprises is motivated by the large body of empirical work that documents asymmetric effects in financial markets (see, e.g., McQueen and Roley (1993)), and by the fact that we have no theoretical justification for presuming that the effects are symmetric. Finally, for completion, we also present results in which stock returns are regressed on the overall surprises.

The results in Panel A indicate that stock returns are not simultaneously significantly affected by the positive and negative surprises of any of the series. On average, when the market underestimates the realization of NONFARM, and the announcement is about 1% higher than expected, stock returns experience a significant 1.14% decline. This apparently unexpected result is consistent with the possibility raised by McQueen and Roley (1993) that in a fast-growing economy a positive surprise in real economic activities could result in a larger increase in discount rates than in expected future cash flows, which would result in a decline in asset values. The expectation of a slower increase in future cash flows may be due to near full capacity utilization, which can only be addressed in the medium to long term. Thus, there could be some inflationary pressures due to the unexpected rise in NONFARM. Supporting this, we observe that a 1% unexpected rise in the CPI leads to a similarly significant 1.13% decline in stock returns.

Negative surprises of AVGWORK, GDPPRI, and GDSSERV–where the announcement is less than anticipated by the market also significantly affect stock returns. Finally, we find that the overall surprises of CAPACI, CPI, and NONFARM significantly affect stock returns. Overall, our results are somewhat different from those of Flannery and Protopapadakis (2002) who find that CPI, PPI, monetary aggregate, balance of trade, housing starts (HSTART), and unemployment (UNEMP) had a significant effect on aggregate stock returns. One possible reason for the difference is that the periods reviewed in

their study and ours do not overlap and asset sensitivity to these announcements changes over time depending on the existing economic situation (McQueen and Roley (1993)).

Panel B reports the impact of the surprises on bond returns. The most striking observation is that bonds are significantly affected by a larger number of surprises than are stocks. Whereas only three overall surprises affect stock returns, we find that 12 affect bond returns. This result is consistent with the findings in Balduzzi et al. (2001). One possible explanation for this is that, while macroeconomic surprises could have offsetting effects on the discount rate and expected cash flows of stocks resulting in an insignificant impact on stock prices, these surprises are more likely to affect only the yields of bonds given their fixed cash flows (and assuming no material change in the probability of bankruptcy). Therefore, any effect of the surprises on bond yields is likely to be statistically significant for bond prices.

A second important observation concerning the response of bonds to the surprises is that several of the surprises that affect bonds only have an effect if the surprise is positive or negative. For example, from columns 3 and 4, CONFID, GDPPRI, GDSSERV, HREARN, and RETSLS only affect bonds when the surprise is positive (i.e., the outcome is larger than expected). Similarly, from columns 7 and 8, surprises in AVGWORK, BUSINV, CAPACI, DURGDS, IMPRICE, and UNEMP significantly affect bond returns only when the surprise is negative.

The evidence also indicates that roughly the same proportion of the macroeconomic announcements whose positive (5 of 7) or negative (5 of 8) surprises are significant continue to be significant with the same sign when the overall surprises (columns 11 and 12) are used as the regressors. This implies that the positive and negative surprises, respectively, drive the significance of the overall surprises. Additionally, the results indicate that there are only two macroeconomic announcements (ECI and NAPM) whose positive and negative surprises simultaneously affect bond prices. For these two, they both affect bond returns in the same direction and their overall surprises are also significant. Finally, CHICAGO, HMSLS, INDPRO, NONFARM are significant only in the unconditional regressions, but do not have power when only the negative or positive surprises are considered.

Panel C reports the results for cash equivalents. The returns reveal a striking feature. While only a single overall surprise (TRUCKS) has a significant impact on the returns on cash equivalents (column 12), there are several macroeconomic announcements that affect the returns on cash equivalents only when their surprises are either positive or negative. As expected, most of the coefficients are very small, given that daily returns on cash equivalents are very small.

The evidence is that BUSINV, LEAD, NAPM, RETSLS, and TRUCKS significantly affect cash returns when their surprises are positive. On the other hand, GDPPRI, IMPORT, MFGPAY, and PERSINC, as well as BUSINV and LEAD, significantly affect cash returns when their surprises are negative. Hence, the only announcements for which both positive and negative surprises have an effect on cash returns are BUSINV and LEAD. What is interesting but not surprising, however, is that while both series have an impact through both their positive and negative surprises, neither has a significant effect when their overall surprises are used in the regression. This is because, as displayed in columns 3 and 4 and 7 and 8, the effects of the positive and negative surprises are of opposite signs. Overall, nine surprises affect the returns on cash equivalents, a larger number than expected. A possible reason for this is that some surprises induce asset switching between the asset classes by investors with finite resources. We take a more in-depth look at this below.

So far, we have provided new evidence on the effect of macroeconomic announcements on the different asset classes. To our knowledge, this is the first study that uses a comprehensive set of announcements to show that they significantly impact all the major asset classes. Our results indicate that though there are several macroeconomic announcements that affect returns on the different asset classes, there are others whose impact is likely to be unobserved if the model does not allow for a separate effect from positive and negative surprises. Nonetheless, while it is clear that these announcements affect the performance of the aggregate asset classes, their collective impact is not overwhelming in the sense that several series seem to have no effect.[6]

[6] This is the correct interpretation as the result is not due to a large number of zero surprises on a period-by-period basis.

We highlight three implications from these results. One, given that the signed surprises of a particular economic series have a different effect on the different asset classes it implies that forecasting the value of the economic variable will be useful to fund managers who engage in dynamic asset allocation strategies. Two, if we were to find that the surprises have a more pervasive effect on fund returns, then it would lend support to the notion that fund managers actively rebalance their portfolios using their private information about the announcements. That is, we could discount somewhat the idea that fund returns are affected simply because the constituent asset classes are affected. Three, while the direction (sign) of the response by an asset class to a particular surprise may not always be consistent with what is typically expected, there may be a reasonable explanation for this. A particular shock to a series may induce asset switching by investors. Consider, for example, the consumer confidence index (CONFID). A positive surprise–the market is more confident than expected–has an unexpected significant negative effect on bond returns. We conjecture that this is because the unexpected "good news" causes investors to increase their holdings of stocks at the expense of bonds. The large positive coefficient on CONFID for stock returns supports the conjecture. We present substantially more (direct) evidence of asset switching below.

B. Are Fund NAVs Sensitive to Surprises in Macroeconomic Announcements?

If fund managers act on private information about pending announcements, then announcement surprises should have a significant effect on the NAVs of their funds. However, depending on the strength and pervasiveness of the effects of the surprises (relative to the effects on the asset classes), this is only indirect evidence that fund managers utilize these announcements in their asset allocation decisions. This is because the response of NAVs to the surprises could be merely a reflection of the NAVs picking up the sensitivity of the broad asset classes to the announcements that we have already identified. Nonetheless, we present this indirect evidence ahead of more direct evidence below.

To determine if the NAVs of hybrid funds are affected by the surprises in macroeconomic announcements, we perform fund-specific regressions of the fund's returns R_{it} on the percentage surprises of the individual macroeconomic variables:

$$R_{it} = \delta_0 + \delta_1 * Surprise_{ht} + \eta_{it}, \quad i = 1,...,149 . \tag{4}$$

We then use the Fama-MacBeth approach to determine if the surprises in each announcement significantly affect the returns. That is, for the surprises of each macroeconomic variable we obtain the mean and standard deviation of the coefficient estimates across the sample of funds and compute the Fama-MacBeth *t*-statistic. The regressions, which are performed separately for positive, negative, and the overall surprises, are presented in Table III.

The evidence indicates that macroeconomic surprises have a strong and pervasive effect on fund NAVs, substantially more so than on the returns of the asset classes, with most of the surprises (a minimum of 21 and a maximum of 27, depending on the particular regression) having a significant impact on the NAVs. There are at least two possible explanations for the pervasive effect of the macroeconomic announcements on the NAVs in light of the earlier results for the asset classes. First, within a particular asset class, mutual fund managers have distinct preferences for assets with specific characteristics (Falkenstein (1996) and Coval and Moskowitz (1999)). These are likely to be different from the average characteristics of the overall asset class. As a result, it is expected that the surprises affect fund returns differently from the way they affect the asset classes. A second possible explanation is that these tests exhibit increased statistical power due to the use of the Fama-MacBeth approach, which is not applicable to the asset classes.[7]

A closer inspection of the results provides us with some important insights into the impact of the surprises on the NAVs. We find that when the overall (both positive and negative) surprises are used as

[7] For robustness, we estimated the following regression for each mutual fund and each announcement: fund returns = *f*(announcement surprises, stock returns, bond returns, cash returns). Using the Fama-MacBeth approach, about half of the announcements that were previously individually significant remained so. The fall in the number of significant surprises is not unexpected, given the presence of the return-based regressors which, as we show above, are themselves significantly affected by the surprises. In fact, given that several papers (e.g., Brinson, Singer, and

the independent variable, all have a statistically significant impact on the NAVs except for CONSTR, EXPORT, DURGDS, GDPPRI, and PPI. Separating the surprises into positive and negative, we find that the negative surprises (when the announcement turns out to be less than the market expected) of fewer announcements significantly affect the NAVs compared to the positive surprises. More concretely, we find that 11 (roughly a third) of the announcements do not have a significant effect on the NAVs when only their negative surprises are considered. This is compared to five when only the positive surprises are considered. There is also a stark contrast in the magnitude of the coefficients where, typically, that associated with the positive surprises is greater than that for the negative. For example, a 1% positive shock to unemployment (UNEMP) reduces the returns on the average fund by a statistically and economically large 3.62%. In contrast, when unemployment turns out to be less than expected (a 1% negative surprise) fund returns increase by only 1.33%. The same is observed for series such as CHICAG, EXHOME, ECI, EXPRIC, HREARN, HSTART, INDPRO, among others, even though this is not always the case.

Therefore, there is a strong asymmetry that cannot be captured by the unconditional regression. Instead, the unconditional regression is likely to understate the impact of the announcement on funds' NAVs. There are also several announcements that have a significant effect only when the surprises are positive or negative. The importance of this is that it suggests that the assumption of symmetry should not be maintained when studying fund managers' reaction to surprises in macroeconomic announcements. A possible explanation for the asymmetric response to positive and negative shocks is that, whereas a mutual fund manager can usually exploit expected price run-ups in securities by acquiring the securities before the announcement, shortselling is required to fully exploit the expected price declines. Because of external and/or internal restrictions on the mutual fund, this may not be possible.[8]

Beebower (1991), Comer (2003)) show that over 90% of the variation in fund returns can be explained by the returns on stocks, bonds, and cash it is remarkable that the surprises have such a significant effect.

[8] The following Internet source entitled "Benefits of Hybrid Mutual Funds" indicates that hybrid funds can and do engage in short sales: http://cisdm.som.umass.edu/research/pdffiles/benefitsofhybridmutualfunds.pdf.

A further inspection of the results also reveals a pattern whereby the sign of the impact of the surprises on the NAVs is frequently the same as the impact of the surprises on the aggregate stock market, even in cases where the impact is negative while that on bonds is positive (or vice versa). Typical cases of this include AVGWOR, CAPACI, CONFID, PERSIN, UNEMP, EXPRI, and others. This may be due to the fact that hybrid funds tend to invest a significantly larger proportion of their cash flows in stocks (about 55%) than in bonds (35%) and they actively attempt to time the stock market in a bid to earn the higher expected returns on stocks, relative to the returns on the other asset classes.

On average, over the 32 series, a 10% surprise leads to approximately a 0.25% change in the value of the daily NAVs. Assuming net assets of $1 billion, this implies a change in investor wealth of $2.5 million. Hence, the above results suggest that hybrid fund managers may benefit from using their private information about the announcements for significant gains. We address this issue next.

IV. Evidence of Market-Timing Ability

A. Do Fund Managers Proactively Utilize Private Information about Macroeconomic Announcements?

Ascertaining if fund managers proactively utilize the information in the macroeconomic announcements to rebalance their portfolios is a separate issue from demonstrating that the asset classes are impacted by the surprises. For instance, since rebalancing incurs non-trivial transactions costs, managers must have rather strong views about the precision of their private information relative to the market expectation in order to rebalance their holdings before the announcement. Similarly, even though the fund NAVs are affected by the surprises in a manner that is substantially different from how the broad asset classes are affected, this furnishes only indirect evidence that fund managers proactively utilize private information about macroeconomic announcements.

To provide direct evidence on whether or not fund managers proactively utilize this source of information in their asset allocation decisions we use a variant of the Sharpe (1992) quadratic regression in a panel framework to examine if the fund holdings in stocks, bonds, or cash equivalents change during

the two-day period before each announcement.[9] Specifically, the panel of daily returns for the 149 hybrid funds is regressed on the daily returns of the three asset classes and the coefficients (i.e., asset class weights) are conditioned on a dummy variable defined as 1 for the two days before the announcement of a particular variable and 0 otherwise.[10] Similarly, we define a second dummy variable as 1 for the two days after the particular announcement and 0 otherwise. This set-up allows us to compare the unconditional mean holdings in stocks, bonds, and cash equivalents for the typical fund manager over a given month with the holdings during the two-day periods surrounding the announcement.

The goal is to determine if the weights of the asset classes in the portfolio of the average fund manager change during the two days before and after the macroeconomic announcement. If fund managers possess private information about the true value of the macroeconomic activity that is about to be released and if this is different from the market expectation that was previously released, then fund managers attempting to time the market will change their fund holdings prior to the release of the macroeconomic information. It is also likely that their holdings will change after the release of the macroeconomic information.

To accomplish our objective, we estimate the quadratic model in equation (2), with b_k modified as follows:

$$\begin{aligned} & R_t = \sum_{k=1}^{3} b_k R_{kt} + e_t \\ & \textit{subject to} \\ & b_k = \lambda_0^k + \lambda_1^k I_{pre\,2} + \lambda_2^k I_{post\,2}. \end{aligned} \tag{5}$$

The dummy variables, I_{pre2} and I_{post2}, are as defined above and the remaining notation is defined in equation (2). The regression in equation (5) is estimated for each month using the within-month daily

[9] Throughout the paper, we estimate several models in a panel framework. The panel regressions are estimated without fund unobserved effects, in the spirit of the linear panel models of Wooldridge (2001, chapter 7). The most likely reason for fund unobserved effects is unobserved managerial skill. Since this is exactly what we are attempting to estimate, it would be inappropriate to account for them in the usual manner.

[10] A window of two days ensures that fund managers' rebalancing takes place after the release of the market expectation (the median survey, which is public information) has been embedded into asset prices. The expectation is typically released five days before the announcement. This window makes our test conservative because it does not capture any rebalancing that occurs, say, in the two days just after the market expectation is released.

returns. This provides us with a series of monthly style weight estimates, b_k, conditioned on the dummy variables. Similarly, the components of b_k, the λ_j^k, are available for each month. Further, since the dummy variables I_{pre2} and I_{post2} are defined with respect to a particular macroeconomic announcement the above regression is estimated for each announcement. The $\hat{\lambda}_j^k s$ are interpreted as the components of the proportion of funds invested in the k^{th} asset class. For instant, if $\hat{\lambda}_0^k + \hat{\lambda}_1^k + \hat{\lambda}_2^k = 60\%$ for stocks as an asset class, with $\hat{\lambda}_0^k = 45\%$ and $\hat{\lambda}_1^k = 10\%$, this implies that the unconditional mean asset allocation for stocks is 45%, while there is, on average, a 10 percentage point increase in stock holdings in the two days before the announcement. The coefficients $\hat{\lambda}_j^k$ (when j =1,2, the pre- and post-announcement rebalancing) are constrained so that the rebalancing across the three asset classes sum to 0. Thus, if, for example, the average fund's stock and bond holdings jointly increase by 5%, then its cash holdings must decline by 5%.

If the coefficient estimate $\hat{\lambda}_1^k$ is positive (negative), this means that the average manager increases (reduces) his holdings of the k^{th} asset class before the announcement. If a fund manager is attempting to time the market for a particular asset class based on the belief that he has superior information relative to the market about the announcement that is pending it is most likely that he will increase (or decrease) his holding of that particular asset class after the release of the expectation but prior to the announcement and subsequently take the opposite position. He will increase his equity exposure prior to the announcement of, say, durable goods orders if his private information indicates a larger increase in the demand for durable goods than the market consensus. If he is correct, then on announcement of the orders and the observation of a positive surprise, the rest of the market will bid up the price of stocks. If fund managers believe that the increase is temporary (or they are only interested in the short term) then they will reverse the position taken in the two-day period prior to the announcement, thereby locking in the gains from their private information. Hence, we should observe that λ_1^k and λ_2^k are of different signs.

However, the sufficient condition for timing the market for the asset classes is that λ_1^k be significantly different from zero. That is, even if the fund manager has private information he needs not immediately lock in his gain by reversing his trade after the announcement. In fact, the fund manager could reinforce his position by engaging in more of the same trade after the announcement, especially if the effect of the surprise is expected to be more persistent than he had thought.[11] In such a case the coefficients λ_1^k and λ_2^k would be of the same sign.

Table IV reports the results of this test. They indicate that fund managers engage in nonrandom asset reallocation surrounding the announcements by systematically switching a portion of their holdings in a particular asset class between the various asset classes. Overall, the shift in asset holdings prior to the announcements is statistically significant and in most cases economically large for 25 to 27 of the 32 announcements. Importantly, in the two days after the announcements, there is significant evidence of either partial reversal or entrenchment of the prior position for 24 to 27 of the announcements.

More specifically, the evidence in column 3 indicates that in anticipation of 18 (12 are statistically significant) of the 32 announcements, the average fund manager increases his holdings of cash before the announcement. On average, there is a 5.72 percentage point increase in the amount of assets held in cash in this period. From Table I, Panel B, the average cash holdings over our sample period is 10.7%. Taken together, this indicates that fund managers hold up to 16% of their funds in cash just prior to these announcements. This is equivalent to their highest annual average holding of 16.1% in 2000, when the market suffered a major correction after the *dot.com* boom of the 1990s. Though the received knowledge is that holding cash negatively affects the performance of mutual funds–the so-called "cash drag" effect–an issue we consider in more detail below, it may be the case that the increase in cash holdings that is accompanied by a reduction in stock and bond holdings, reduces the overall portfolio risk at a time when the fund manager foresees the announcement as having increased uncertainty for the stock and bond asset classes.

[11] Evidence in Bernanke and Kuttner (2005) indicates that markets respond much more strongly to unanticipated

In contrast, prior to the announcement of 14 of the series, the manager decreases his cash holdings by an average of 5.6 percentage points and increases his exposure to the stock and bond markets. This implies that he expects an increase in the values of the stock and bond asset classes subsequent to the announcements and wishes to benefit from his private information.

As noted above, the clearest evidence of market timing surrounding the announcements is from the pattern of trades in which the fund manager takes the opposite position subsequent to the announcement as that prior to the announcement. For the series CHICAG, CONSTR, DURGDS, EXPORT, GDPPRI, GDSSER, HMSLS, HSTARTS, IMPORT, LEAD, NAPM, PERSINC, PHILFED, and TRUCKS, in the run-up to the announcement the average fund manager reduces his cash holdings, as reflected by the negative coefficient in column 3, while simultaneously increasing his holdings in bonds (as evidenced by the large positive coefficient associated with all the above series in column 2) and in stocks (as evidenced by the large positive coefficient associated with DURGDS, HMSLS, IMPORT, and PERSINC in column 1). On the other hand, once the announcement is made, column 6 indicates that for 11 of the above 14 series there is a (partial) reversal of the previous trades leading to an increase in cash holdings and a simultaneous reduction in the stock and/or bond positions (columns 4 and 5).

A further examination of the results indicates that for announcements such as AVGWOR, CAPACI, CONFID, CPI, CREDIT, EXPRI, IMPRIC, INDPRO, MFGPAY, NONFAR, PPI, RETSLS, and UNEMP the pattern of trades is opposite to that previously described in that the average fund manager increases his cash holdings at the expense of bonds and/or stocks prior to the announcement. In several cases he (partially) reverses that position in the two days after the announcement.

Finally, for series such as AVGWOR, CPI, CREDIT, DURGDS, EXPRI, GDSSER, IMPORTS, MFGPAY, NONFAR, and UNEMP we observe that fund managers increase or decrease their cash holdings prior to the announcement at the expense of stocks and/or bonds and further increase or decrease their cash holdings subsequent to the announcement.

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monetary policy changes that are expected to have a persistent effect than to those with a temporary effect.

Overall, the evidence indicates that, on average over our sample period, hybrid fund managers engaged in asset reallocation on a proactive and reactive basis using their private information about the announcements. This is not surprising because it is reasonable to expect that these announcements represent a major component of the information set of investors in general and fund managers in particular. It is possible to argue that because some of the pre-announcement reallocation is reversed after the announcement this behavior is that of traders who dishonestly receive information before others (see, e.g., Hirschleifer, Subrahmanyam, and Titman (1994) and Irvine, Lipson, and Puckett (2004)), rather than the result of their own private information search. However, this is hardly likely given the source of the macroeconomic information. Additionally, it is not likely that the rebalancing prior to the announcements is the result of managers rebalancing around the time of the usual performance disclosure dates, the "window dressing" effect of Musto (1997, 1999) and others. This is because our mainly intra-month surprises do not coincide with the usual quarterly reporting periods.

The evidence above indicates that (at least some) hybrid mutual fund managers have superior skills in forecasting macroeconomic variables and are willing to act on that forecast when it is contrary to the median forecast. Additionally, some managers may be better able to process public information and to determine the effects of the information on asset values. This definition of skill–ability to more precisely forecast the series or to better process public information when it becomes available–is consistent with the results of Kacperczyk and Seru (2005). However, unlike these authors we are able to identify the type of private information that these managers use. Although this is an important result, we have yet to address how economically beneficial is the strategy of reallocating funds in anticipation of macroeconomic announcements. In a subsequent sub-section, we test whether or not those fund managers that actively engage in timing in the manner discussed above earn a greater rate of return relative to their peers who take a more passive approach to the macroeconomic announcements.

B. Further Evidence that Fund Managers Use Private Information

The evidence in the previous sub-section indicates that fund managers rebalance their holdings in the different asset classes before and after several of the macroeconomic announcements. Such evidence is new to the literature and is particularly strong. From the patterns in the rebalancing, the evidence points overwhelmingly to fund managers' private information about the announcements as the cause of the portfolio rebalancing. However, it may still be argued that the rebalancing arises for other reasons unrelated to fund managers' use of private information about forthcoming macroeconomic announcements. The most likely other reason is that investors' purchase and sale of mutual fund shares precede the macroeconomic announcements and, therefore, create a liquidity effect that fund managers are simply reacting to. This is highly unlikely given that the announcements are mainly intra-month and therefore do not correspond to the primarily end-of-month investments of retail investors. Notwithstanding, we examine this possibility.

It is well known that liquidity-based trades have only transitory effects, while information-driven trades have a persistent effect. Therefore, if the reallocations are driven by private information, past surprises should be significantly associated with current reallocations. In contrast, if the reallocations are liquidity driven there should be no significant association between future reallocations and past surprises in the announcements. Hence, in this sub-section we examine if the surprises in macroeconomic announcements in period *t*-1 affect the portfolio reallocations in period *t*.

For each month within a given year *t*, on a fund-by-fund basis and for each announcement, we estimate equation (5) with:

$$b_{ik} = \lambda_{i0}^{k} + \lambda_{i1}^{k} I_{pre2} + \lambda_{i2}^{k} I_{post2}, \tag{6}$$

where λ_{ij}^{k} (i = 1…149 funds, j =1, 2 for the pre- and post-announcement periods) are the components of b_{ik} representing the change in the k = 3 asset class holdings of each of the 149 fund managers in the two days prior and the two days subsequent to each of the 32 announcements. As before, if the announcement

occurs on day t, the pre-announcement dummy variable I_{pre2} takes the value of 1 on days t-1 and t-2 and 0 otherwise. The post-announcement dummy variable I_{post2} takes the value 1 during days t+1 and t+2 and 0 on other days of the month. We then take the 12-month average of the estimates of $\hat{\lambda}_{i1}^{k}$, the pre-announcement portfolio rebalancing of each of the 149 funds in a given year t, for each macroeconomic series. Next, we compute the surprise for each of the 32 announcements averaged over the 12 months in year t-1. We use yearly intervals in this test because they allow us to clearly differentiate between a transitory liquidity effect that will dissipate within the year and a persistent information effect. Furthermore, it is consistent with the yearly interval required for additional tests conducted below. Finally, for each surprise, we run a panel regression of the 149 yearly averages of the estimates of $\hat{\lambda}_{1}^{k}$ from year t on the annual average of the surprises in the announcement for year t-1:

$$\hat{\lambda}_{1t}^{k} = c_0 + c_1 * Surprise_{t-1} + \upsilon_{1t}, \quad k = \text{stocks, bonds, and cash equivalents.} \tag{7}$$

In all, for each asset class, we estimate 32 panel regressions, one for each macroeconomic announcement.

Table V reports the results of this test. For each of the three asset classes the results indicate that the past surprises of about 40% (about 13) of the announcements have significant, at least at the 0.10 level, explanatory power for fund managers' portfolio rebalancing in the two days prior to the announcements.[12] For example, a 1% surprise in the series BUSINV in t-1, on average, leads to a reallocation away from stocks (0.20%) and cash equivalents (0.25%) and an increase in the proportion of funds invested in bonds (0.45%) in the two days prior to the announcement in t. The symmetry in reactions is due to the fact that overall reallocations are restricted to sum to zero. A closer inspection of the table reveals that the more important series in this respect are BUSINV, RETSLS, PERSINC, HREARN, NAPM, DURGDS, and GDPPRICE in the sense that their past surprises affect the pre-announcement reallocation decision relating to the three asset classes. However, the past surprises of other series such as EXPRICE, INDPRO, NONFARM, PHILFED, and PPI affect two asset classes, while

the past surprises of UNEMP, MFGPAY, LEAD, EXHOME, and GDSSERV affect at least one asset class. As expected, there is a considerable overlap between these series and those for which we found significant reallocation (in Table IV) around the time of the announcements.

In sum, these results show that there exists a statistically significant relationship between the 2-day pre-announcement portfolio rebalancing of hybrid fund managers and the past surprises in the announcement of over 40% of the macroeconomic series. This indicates that it is private information about the announcements that drives the rebalancing that takes place around the time of the macroeconomic announcements and not liquidity-induced trades.[13]

C. Economic Benefits of Market Timing using Private Information about Macroeconomic Announcements

Thus far, we have shown that mutual fund managers utilize private information about forthcoming macroeconomic announcements in their asset allocation decisions. The evidence indicates that there is an attempt to time the markets for the stock and bond asset classes by moving funds between these asset classes and cash equivalents. The holding of cash reserves in the mutual fund industry has been a perennial concern for investors and, perhaps less so, funds managers.[14] The 2003 Mutual Fund Fact Book indicates that the Liquid Asset Ratio (cash equivalents as a proportion of total net assets) of the average equity fund between 1975 and 2002 is 8%. Given the large difference in average returns between stocks and cash it is not difficult to see why various sources (especially financial journalists) have demonstrated that holding this much cash can have a significant deleterious effect on investors' terminal wealth over the average investment span of 30 years. However, this is not a foregone conclusion because aside from the precautionary motive for holding cash (induced by the fact that mutual funds are liquidity

[12]The use of a generated dependent variable in equation (7) may cause a bias in the significance of the estimated coefficient. However, it typically leads to a more conservative test by increasing the probability of us not finding any support for the hypothesis that past surprises affect the reallocation decisions (see, e.g., Dumont et al. (2005)).
[13]Considering that our results use the joint surprises, despite the evidence above that positive and negative surprises are required to bring out the true importance of the surprises, this is particularly strong evidence.
[14] Over the last 120 years the average return on stocks is 11% compared to 4% for cash, resulting in a large wealth loss for equity funds with high cash reserves (see "Turnover and Cash Reserves," - B. Barker of the Motley Fool.com at http://www.fool.com/school/mutualfunds/costs/turnover.htm and "Why Fund Managers Are Buying Lunch," - R. Lowenstein at http://pages.stern.nyu.edu/~adamodar/New_Home_Page/invmgmt/ch7/fundcash.htm).

providers) the variation in cash holdings across mutual funds and over time is also driven by the speculative motive. That is, fund managers tend to vary their cash holdings with their efforts to time the market. Thus, if some fund managers have the ability to time the stock and bond markets then significant time variation in their cash holdings may be associated with higher average return.

In this sub-section, we examine if the cross-sectional variation in the average cash holdings of mutual funds explains differences in fund returns and if those funds that more aggressively attempt to time the markets for the various asset classes using their private information about macroeconomic announcements outperform their peers that are less aggressive at market timing. As a measure of market timing, we use the absolute value of the coefficient $\hat{\lambda}_{i1}^{k}$ associated with the I_{pre2} dummy variable (see equation 6), where the latter is defined as 1 in the two days before the announcement and 0 otherwise and captures the asset reallocation in anticipation of the announcement. The absolute value of this measure is appropriate given that managers who make more frequent and economically material changes in their asset allocation to these asset classes will have higher realizations of this coefficient than their peers who pursue a more passive strategy.

Specifically, using a panel regression framework, we regress the yearly average fund return on the annual average holdings in stocks, bonds, and cash equivalents, along with the (yearly average of the) absolute value of the percentage changes in holdings in stocks, bonds, and cash equivalents (the $\hat{\lambda}_{1}^{k}$ coefficients from equation 6), in the two days before the announcements:

$$R_t = d_0 + d_1 * \%Stocks_t + d_2 * \%Bonds_t + d_3 * \%Cash_t + d_4 * \hat{\lambda}_{1t}^{stocks} + d_5 * \hat{\lambda}_{1t}^{bonds} + d_6 * \hat{\lambda}_{1t}^{cash} + \omega_t . \quad (8)$$

It may be argued that there are other variables with significant explanatory power for fund returns. However, the specification in equation (8) can be justified on the basis that, according to Brinson et al. (1991), Comer (1993), Blake et al. (1999), and others, the main determinant of fund performance is their average asset allocation decision, which is accounted for by the first three variables in the

regression.[15] In this model, we posit that managerial skill, as measured by $\hat{\lambda}_{1t}^{k}$, play an important role in mutual fund performance.

Table VI contains the results, where the coefficients in the first three columns allow us to present evidence on the effect of average asset allocation on fund returns. The evidence indicates that funds that hold a larger proportion of equity earn higher returns on average. Overall, a 1 percentage point higher equity holding in the asset mix leads to about 2.1% higher return on average. Similarly, another 1 percentage point allocation to bonds increases fund returns by 114 basis points per year. In contrast, increasing the cash reserves by 1 percentage point leads to a statistically significant 39 basis points per year lower average return. This indicates that if the average fund manager in our sample were to increase his cash holdings from the sample average of about 10.7% to the sample maximum of 16.1% (see our Table I), the effect would be to reduce performance by an average of 2 percentage points. The finding that increasing cash reserves reduces mutual fund performance is broadly consistent with the finding by Wermers (2000) that, over the period 1975 to 1994, the underperformance of mutual funds relative to stock indices arose from the fact that mutual funds held other securities than stocks (e.g., bonds and cash equivalents) in their portfolios and these non-equity asset classes performed poorly relative to stocks.

Next, we turn to the issue of whether or not fund managers that utilize private information about macroeconomic announcements to aggressively time the market by changing their allocation to stocks, bonds, and cash equivalents outperform their peers.[16] Column 4 of Table VI indicates that fund managers that attempt timing by increasing the allocation to stocks by 1 percentage point in the two days prior to the announcements are rewarded by an extra 428 basis points on average per year. Interestingly, the announcements that are most influential in this respect are those that the financial press would lead us to

[15] Fung and Hsieh (1997, p. 279) sum up the importance of asset allocation to fund performance when they note, "… *where* they invest, much less *how* they invest, is the key determinant of performance in mutual funds."

[16] We are aware that there is a potential generated-regressor problem due to the use of the estimates of the changes in asset allocation around the announcements ($\hat{\lambda}_1^k$). We do not believe that this poses a problem to our inferences because, even if it causes an overstatement of the significance of the coefficients, given that the magnitude of the *t*-statistics of d_4, d_5, and d_6 on average are 14.10, 2.24, and 6.92, respectively, if we were to adjust for the generated regressor our inferences would remain intact. Furthermore, the magnitudes of the coefficients are economically large, even if they were to turn out to be statistically insignificant after adjusting the standard errors.

believe are most important to investors. These include business inventory (BUSINV), the CPI, durable goods orders (DURGDS), home sales (HMSLS) and home starts (HSTART), and the index of leading indicators (LEAD), among others. Similarly, increasing the allocation to bonds also leads to an increase in the average returns of mutual funds, albeit by a much smaller amount (46 basis points per year).

Consistent with the earlier result that funds that hold higher average cash reserves underperform their peers, we also find that funds that increase their allocation to cash equivalents by 1 percentage point in the two days prior to the announcements underperform by 120 basis points per year.

Taken together, the evidence indicates that a strategy of shifting resources into stocks and bonds and away from cash prior to the announcements, based on forecasting the announcements, has a net positive payoff.

This strong evidence of timing ability is significantly different from the general result in the mutual fund literature, where the majority of papers fail to unearth any evidence of market-timing skills (see, e.g., Treynor and Mazuy (1966), Henriksson (1984), Graham and Harvey (1996), Blake et al. (1999)). There are three likely reasons for this difference. The first is that, as previously discussed, most papers use monthly data, which diminishes the probability of finding evidence of timing. Thus, having used daily mutual fund returns, similar to Bollen and Busse (2001) and Busse (1999), we find strong evidence of timing ability. The second is that we identify a particular segment of mutual fund returns that has highly concentrated information, which makes market timing most likely. The third reason is that, unlike most papers, we focus on hybrid mutual funds. Among mutual funds, they are the most likely to time the market. In fact, market timing is fundamental to their long-term trading strategy.

The above results should be interpreted with some care. Although we have shown that fund managers who time the stock market using private information about macroeconomic announcements earn a higher average rate of return than those who do not, it is not clear if these funds would outperform their peers on a net-of-transaction costs basis. That is, although the extra 428 basis points earned from timing the stock market are greater than the expense ratio of the average actively managed fund the higher turnover required to pursue this strategy also leads to higher trading costs. However, given that many

funds currently have high turnover it would, in all likelihood, be more profitable if the higher turnover were in pursuit of the timing strategy that utilizes information in macroeconomic announcements.[17] Another dimension of the costs to investors of frequent trading is the tax associated with the realization of short-term capital gains. With the reduction in the tax penalties on mutual funds that earn more than 30% of their gains from holdings of less than 91 days (the "short-short" rules) due to the Taxpayer Relief Act (1997), more funds may be inclined to pursue this kind of trading strategy.

It should also be noted that more than one announcement is sometimes made on the same day. Though the market consensus of forthcoming joint announcements is typically released on different days for the different announcements and the fund manager can separately forecast each of the joint announcements, practically implementing a trading strategy based on reallocating funds prior to these announcements poses a tougher challenge. That is, it can easily be imagined that on some occasions the forecast of one of the jointly occurring announcements motivates the fund manager to increase holdings of, say, stocks while the other calls for a decline in stock holdings. One possible way of dealing with such a situation would be to make a net adjustment to fund holdings. That is, having established the dollar rebalancing required for each announcement the fund manager would change portfolio allocation by the net amount.

V. Fund Characteristics and the Propensity to Trade on Private Information

Having found that fund managers use private information about macroeconomic announcements in their asset allocation decisions and that those who attempt to time the market using this information earn a significantly higher return than those who do not, it is of interest to determine if funds that use this information share some common characteristics. If this were the case, then this information could be used

[17] The 2004 Mutual Fund Fact Book indicates that between 1984 and 2003 equity mutual funds had an average yearly *asset-weighted* turnover rate of over 67%, ranging from 55% in 2003, the lowest since 1988, to 81% in 1987. This translates to the average fund holding the average stock for under 18 months. The *unweighted* average turnover in 2003 was about 110%. See, Statement of John C. Bogle (Founder and Former Chief Executive of the Vanguard Group and President of the Bogle Financial Markets Research Center) before the U.S. Senate Committee on Banking, Housing, and Urban Affairs, 02/26/2004, at http://banking.senate.gov/_files/bogle.pdf.

by investors to assist them in identifying funds that are more likely to use and benefit from private information about macroeconomic announcements.

To examine the relationship between fund characteristics and the propensity to use private information in asset allocation decisions, we first identify those funds that "follow" the trading strategy outlined earlier in the paper (or, at least, act in a manner consistent with the proposed strategy). A fund follows the trading strategy if it increases its holdings in an asset class prior to an announcement when the expected reaction of that asset class to the surprise in the announcement is positive (negative) and the fund's private information indicates that the market consensus has under (over) estimated the macroeconomic variable and so the surprise will be positive (negative). That is, the product of these two values forms the basis of the fund manager's trade prior to the announcement.

In order to match fund characteristics, which are available on a yearly basis, with the use of announcement surprises, the tests are based on annual estimates. The expected reaction of an asset class to the surprises in a macroeconomic announcement can be calculated from a linear regression of the asset class' historical returns on the surprises of the given announcement (as in Table II). Likewise, to determine the sign (and magnitude) of the surprise for a given announcement in year t we assume that it is equal to the mean (median) of the surprises over year t-1. This assumption is reasonable given that we have already shown (see equation 7 and Table V) that private information as reflected in the surprises in year t-1 affects the reallocations in year t.

More specifically, at the beginning of year t, if the fund manager notices that in year t-1 stocks were positively (negatively) affected by the surprises in a particular announcement and the average surprise of the announcement was positive (negative), then the fund manager should increase his exposure to stocks. This increased holding of stocks would be simultaneous with a reduction in the fund's holdings of any asset class for which the product of the expected sensitivity and surprise are negative (or for any asset class with a smaller positive product).

Within each year t, we identify those funds where, on average, the fund manager changes his holdings of asset class k in the two days prior to the announcement. That is, we determine if there is an

increase (decrease) in λ_{i1}^{k}, the portion of b_{ik} allocated to asset class k before the announcement. This is determined from the estimates of the within-year, fund-by-fund estimation of the modified quadratic regression on a year-by-year basis, as described in equation (6). If $\hat{\lambda}_{i1}^{k} > (<) 0$ in year t when the product of the average reaction of the asset class to the announcement in year t and the surprise in the announcement in year t-1 is positive (negative), then the fund manager follows the trading strategy and we create a dummy variable with value equal 1, and 0 otherwise.

Finally, we select a few characteristics that, intuitively, should describe funds that are most likely to use the private information contained in macroeconomic announcements. Ippolito (1992), Edelen (1999), and Deli (2002) argue that advisors with higher marginal compensation, which is reflected in higher expenses to investors, have higher marginal products. Similarly, Deli argues that high turnover funds utilize higher-quality information. However, it should be pointed out that this might not in fact be the case because, as argued by Dow and Gorton (1997), fund managers may also engage in high turnover even if the trades are known ex ante to be value-decreasing for investors. This suggests that high turnover of funds may not be a signal that fund managers possess information-generating skills, or that these managers have the ability to better utilize high-quality information. Notwithstanding, it may be the case that funds with higher turnover and expense ratios use more information and provide investors with greater payoffs.

It is also likely that larger funds utilize the information in macroeconomic announcements more than small funds. This may be because large funds/fund families have greater in-house human capital to monitor, forecast, and interpret the announcements than small funds/fund families. However, given the active trading implied by the reallocation of assets in accordance with a trading strategy that utilizes these announcements it is also possible that large funds make relatively less use of the information. This is because the size of their portfolios prevents them from actively trading the same proportion of their portfolio as smaller funds given the greater negative consequences of the price impact. Finally, among hybrid funds, asset allocation funds may utilize more of this information in their trades than balanced

funds because, although both balanced and asset allocation funds attempt to time the market (see, e.g., Comer (2003)), the latter are more aggressive in their attempts and, as such, should utilize more information in their trades.

To determine if funds with the above characteristics are more inclined to follow the trading strategy, we estimate the following regression:[18]

$$Characteristic_{it} = f_0 + f_1 * Follow_{it}^{k} + \pi_{it}. \quad (9)$$

"Characteristic" represents a fund characteristic–expense ratio, turnover, total net assets, or fund objective (1 if asset allocation fund (more aggressive) and 0 if balanced fund (less aggressive)). "$Follow_{it}^{k}$" is a dummy variable defined as 1 if the fund follows the trading strategy outlined above and 0 otherwise, for each of the *k* asset classes. The model is estimated in a panel framework where each characteristic is regressed on the decision variable across all funds on a yearly basis.

The results in Table VII indicate that fund managers that time stocks on the basis of private information about macroeconomic announcements have roughly 8 percentage points higher turnover than funds that do not. One implication of this is that the concern raised earlier that following the trading strategy might lead to higher turnover and, therefore, a negation of the pre-trading expense gains may be unfounded. That is, it is unlikely that this difference in turnover could eliminate the over 400 basis points higher average return of funds that trade more aggressively using private information.

The evidence also indicates that balanced funds are slightly more likely to time the stock market. Comer (2003) finds a similar result and suggests that, in a rising market, balanced funds may be more successful at timing than asset allocation funds because they make fewer and smaller adjustments to their portfolios. Funds that time the bond market tend to have higher turnover (6.2 percentage points) and expense ratios (3 basis points).

[18] Because we are interested in the association between firm characteristics and their propensity to utilize the trading strategy that uses private information about the announcements and are not proposing causality, whether the characteristics become the dependent or independent variable is not that important. The above approach allows easier estimation and interpretation.

The finding that funds that time the markets for bonds and stocks using private information about upcoming macroeconomic announcements tend to have higher expense and turnover ratios is not unexpected because funds with higher marginal compensation and higher turnover also have higher marginal products. This is consistent with the result that funds that more aggressively use private information about macroeconomic announcements outperform those that do not.

VI. Conclusion

Using a high-frequency dataset and focusing on hybrid funds, we show that fund NAVs are significantly affected by the surprises in a broad range of macroeconomic announcements. More important, managers with private information about pending macroeconomic announcements (and, therefore, about what the market regards as a surprise) significantly rebalance their portfolios around the announcements. A variant of style analysis is used to show that managers tend to increase or decrease their holdings of the various asset classes before and after macroeconomic announcements and, on average, the choice of the fund manager is one that tends to create value. Those managers that more aggressively reallocate funds to equities and, less so, to bonds in the two days prior to the announcements earn returns that exceed those that do not. In contrast, funds that allocate more to cash equivalent securities earn significantly less. Likewise, funds that, on average, hold more cash (stocks) earn lower (higher) average returns. We also find that the propensity to use and, therefore, benefit from private information about macroeconomic announcements is higher for funds with higher expense and turnover ratios. This is consistent with the idea that mutual funds are skilled in the use of information and that those that charge higher fees provide greater marginal products.

The approach in this paper is not without some potential shortcomings. Potentially the most important is that we have to infer fund holdings from high-frequency data. However, given evidence in Comer (2003) and others that the imputed and actual holdings are highly similar, we do not think this affects our inferences. Another issue is that, because we wish to consider the effects of a large number of macroeconomic announcements on fund managers' allocation decisions and we have no a priori reason to

include some and exclude others, we estimate only univariate regressions, which could overstate the effect of a particular variable. For the reasons discussed in the paper, we think the use of surprises renders this effect negligible. Finally, our evidence of market timing does not account for the higher transaction costs and taxes implied by the strategy. While, the magnitude of the gains from timing stocks is large and would probably provide a net gain after accounting for higher trading costs, in the absence of specific data on actual holdings and trading costs we cannot be certain of this. We hope that future research using more detailed data can shed further light on these issues.

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Table I

Summary Statistics of Announcements, Hybrid Funds, Stocks, Bonds, and Treasury Bills

Panel A of this table reports summary statistics of the stocks, bonds, and cash equivalent asset classes, represented by the CRSP value-weighted market index, the Lehman Brothers Bond Index, and the 91-day Treasury bill return, respectively, from Datastream. The mutual fund returns are represented by the returns on 149 hybrid (asset allocation and balanced) funds obtained from Bloomberg. Panel B reports annual average asset allocations of the hybrid funds. The first column in Panel C reports the symbol, name, and units of measurement of the macroeconomic announcements. The other columns report summary statistics of the macroeconomic announcements and their (percentage) surprises. Percentage surprises are estimated as: 100×((actual-forecast)/forecast). The announcements and forecasts (median surveys) are from Money Market Surveys (MMS). All returns and macroeconomic data are daily, covering the period January 1997 to December 2002.

Panel A: Daily Average Return on Asset Classes and Mutual Funds

	Mean (%)	Std		Mean (%)	Std
Bonds	0.03	0.91	Stocks	0.03	1.34
Cash Equivalents	0.02	0.01	Hybrid mutual funds	0.02	0.78

Panel B: Hybrid Funds Yearly Average Asset Allocation Across Asset Classes

Year	Stocks (%)	Bonds (%)	Cash Equivalent (%)
1997	56.37	39.61	4.03
1998	55.10	32.15	12.75
1999	53.35	33.24	13.41
2000	49.80	34.10	16.11
2001	52.55	37.74	9.71
2002	58.50	33.16	8.33
1997 - 2002	54.28	35.00	10.72

Panel C: Macroeconomic Announcements

Series name (unit of measurement)	Raw series Mean	Raw series T-stat	Surprises of series (%) Mean	Surprises of series (%) T-stat
AVGWORK (average work week; hours)	34.35	1184.71	-0.06%	-1.31
BUSINV (Business inventories; annual % change)	0.24	8.31	9.75%	1.20
CAPACITY (capacity utilization; %)	81.47	415.09	0.05%	1.75
CHICAGO (Chicago purchasing managers' index; 100)	50.61	49.41	-0.37%	-0.34
CONFIDENCE (consumer confidence index; 100)	103.49	44.03	0.38%	0.75
CONSTRUCT (construction spending; % change)	0.31	3.48	-0.74%	-0.02
CPI (Consumer price index; % change)	0.32	18.86	0.46%	0.13
CREDIT consumer credit; $billion)	5.32	14.75	-24.10%	-0.83
DURGD (durable goods orders; % change)	0.29	1.31	-29.78%	-0.58
ECI (Employment cost index; civilian % change)	0.85	24.77	-2.63%	-0.67
EXHOME (existing home sales; 000,000)	4.92	86.57	1.12%	2.13
EXPORT (U.S. exports; $billions)	0.31	3.48	-0.74%	-0.02
EXPRICE (U.S. export price index; % change)	0.00	-0.12	-36.46%	-0.90
GDPRICE (GDP price index; % change)	1.85	28.85	-1.62%	-0.54
GDSERV (goods and services trade balance; $billions)	-12.11	-24.39	4.61%	2.70
HMSLS (home sales; 000)	736.91	63.68	1.09%	1.92
HREARN (hourly earnings; % change)	0.47	4.44	5.30%	0.67
HSTART (Housing Starts; 000,000)	1.46	91.80	1.15%	2.72
IMPORT (U.S. imports; $billions)	71.84	32.41	0.47%	2.36
IMPRICE (U.S. import price index; % change)	0.03	0.24	71.43%	1.93
INDPRO (industrial production; % change)	0.14	3.33	9.65%	1.24
LEAD (index of leading indicators; % change)	0.17	3.45	6.82%	0.98
MFGPAY (Manufacturing payroll; 000)	-45.74	-6.43	67.74%	1.31
NAPM (Nat Assoc. of Purchasing Mgrs/ISM index; 100)	51.15	128.89	-0.26%	-0.82
NONFARM (non-farm payrolls; 000)	149.22	12.32	2.80%	0.34
PERSINC (Personal Income; % change)	0.53	8.88	7.70%	1.54
PHILFED (Phila Fed index of changes in business growth; 0)	2.59	1.17	-16.49%	-0.55
PPI (Producer price index; % change)	0.20	6.64	-17.91%	-1.66
RETSLS (Retail sales; % change)	0.34	4.80	-13.76%	-1.01
TREAS (Treasury budget; $billions)	-7.05	-2.17	-5.93%	-1.33
TRUCK (annual truck sales; 000,000)	6.63	79.75	1.76%	3.32
UNEMP (civilian unemployment rate; %)	6.27	68.15	-0.70%	-4.21

Table II

Impact of Surprises in Macroeconomic Announcements on Stocks, Bonds, and Treasury Bills

Panels A, B, and C, respectively, report the results from regressing stock, bond, and cash equivalent returns on the positive, negative, and overall surprises of each of the macroeconomic announcements. Positive (negative) surprises are those for which the announcement is greater (less) than was expected, where the expectation is formed from the median survey. That is, a positive (negative) surprise occurs when the market underestimates (overestimates) the level of the announcement. *T*-statistics ≥ 1.645 (equivalent to a *p*-value of 0.10) are in **bold**. All data are daily, covering the period January 1997 to December 2002.

Panel A: Stocks

	Positive Surprises				**Negative Surprises**				**All Surprises**			
	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat
AVGWOR	0.81	2.327	-110.32	-0.618	0.81	2.327	206.60	**1.662**	0.49	2.062	88.71	1.089
BUSINV	-0.15	-0.507	0.16	0.407	-0.15	-0.507	0.17	0.427	-0.15	-0.771	0.17	0.746
CAPACI	0.08	0.252	82.89	0.967	0.08	0.252	103.27	1.055	0.05	0.266	92.19	**2.097**
CHICAG	0.45	1.601	-3.68	-0.820	0.45	1.601	0.96	0.241	0.30	1.905	-1.17	-0.565
CONFID	0.01	0.059	9.06	1.544	0.01	0.059	-0.46	-0.058	0.16	0.974	5.33	1.412
CONSTR	0.28	1.196	0.01	0.325	0.28	1.196	0.01	0.174	0.28	1.538	0.01	0.415
CREDIT	0.28	1.233	0.05	0.221	0.28	1.233	0.46	1.141	0.15	1.010	0.18	1.142
DURGDS	0.39	2.080	-0.08	-1.476	0.39	2.080	0.08	1.368	0.16	1.187	-0.01	-0.163
ECI	0.97	2.025	-3.38	-1.436	0.97	2.025	0.55	0.217	0.63	1.957	-1.52	-1.120
EXHOME	-0.05	-0.193	0.87	0.142	-0.05	-0.193	-1.47	-0.195	-0.01	-0.061	-0.13	-0.034
EXPORT	0.28	1.196	0.01	0.325	0.28	1.196	0.01	0.174	0.28	1.538	0.01	0.415
EXPRIC	-0.12	-0.361	0.16	0.833	-0.12	-0.361	0.01	0.043	0.00	-0.004	0.07	0.729
GDSSER	-0.42	-1.532	2.56	0.725	-0.42	-1.532	-5.48	**-1.876**	-0.10	-0.609	-1.98	-1.188
HMSLS	-0.20	-0.761	5.98	1.303	-0.20	-0.761	-3.41	-0.547	0.00	0.022	2.28	0.802
HREARN	0.51	1.772	-0.31	-0.444	0.51	1.772	0.09	0.152	0.43	2.383	-0.09	-0.261
HSTART	0.30	1.063	-9.22	-1.335	0.30	1.063	1.99	0.230	0.11	0.653	-4.47	-1.131
INDPRO	0.47	1.680	-0.57	-1.352	0.47	1.680	0.21	1.058	0.16	0.860	0.02	0.101
LEAD	0.12	0.496	0.08	0.239	0.12	0.496	0.11	0.382	0.11	0.604	0.10	0.516
MFGPAY	0.18	0.521	0.08	0.549	0.18	0.521	0.00	-0.032	0.26	1.021	0.03	0.380
NONFAR	0.83	3.649	-1.14	**-3.121**	0.83	3.649	0.00	-0.025	0.45	2.512	-0.28	**-1.879**
PERSIN	0.14	0.850	0.25	0.981	0.14	0.850	0.31	0.993	0.12	0.980	0.28	1.602
PHILFE	0.13	0.513	0.13	0.736	0.13	0.513	0.01	0.063	0.20	0.970	0.06	0.604
RETSLS	0.16	0.881	-0.12	-0.852	0.16	0.881	-0.02	-0.263	0.11	0.716	-0.06	-0.788
TREAS	-0.28	-1.579	-0.49	-0.452	-0.28	-1.579	-0.18	-0.675	-0.31	-2.072	-0.20	-0.836
TRUCKS	0.14	0.537	-0.23	-0.054	0.14	0.537	-2.30	-0.314	0.18	1.062	-0.90	-0.314
CPI	0.11	0.411	-1.13	**-2.294**	0.11	0.411	-0.18	-0.348	-0.11	-0.596	-0.67	**-2.327**
GDPPRI	-0.30	-1.661	0.54	1.280	-0.30	-1.661	-1.41	**-1.650**	-0.12	-0.743	0.10	0.271
IMPORT	0.01	0.059	-14.38	-0.888	0.01	0.059	1.59	0.120	-0.10	-0.621	-5.22	-0.634
IMPRIC	-0.35	-1.075	0.13	0.918	-0.35	-1.075	0.01	0.049	-0.25	-1.214	0.08	0.981
NAPM	0.18	0.634	-2.00	-0.250	0.18	0.634	0.57	0.061	0.14	0.829	-0.85	-0.193
PPI	0.32	1.231	-0.08	-0.547	0.32	1.231	0.01	0.038	0.25	1.448	-0.04	-0.470
UNEMP	0.55	1.962	-6.99	-0.513	0.55	1.962	2.05	0.202	0.45	2.526	-1.54	-0.249

Panel B: Bonds

	Positive Surprises				**Negative Surprises**				**All Surprises**			
	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat
AVGWOR	-0.13	-1.894	51.9	1.502	-0.13	-1.894	-68.86	**-2.863**	-0.01	-0.121	-23.94	-1.447
BUSINV	0.11	2.029	-0.11	-1.56	0.11	2.029	0.16	**2.089**	0.02	0.583	0.02	0.436
CAPACI	0.02	0.334	-20.57	-1.284	0.02	0.334	-31.76	**-1.736**	0.04	1.165	-25.68	**-3.123**
CHICAG	0.11	1.608	-1.64	-1.451	0.11	1.608	-0.62	-0.619	0.08	2.034	-1.09	**-2.082**
CONFID	0.03	0.671	-1.92	**-1.937**	0.03	0.671	-1.25	-0.934	0.02	0.613	-1.66	**-2.612**
CONSTR	0.04	0.971	0.00	0.396	0.04	0.971	0.01	0.636	0.03	0.974	0.00	0.775
CPI	0.04	0.852	-0.12	-1.179	0.04	0.852	0.01	0.095	0.02	0.442	-0.06	-0.967
CREDIT	0.01	0.275	-0.02	-0.331	0.01	0.275	0.06	0.711	-0.01	-0.332	0.01	0.24
DURGDS	0.04	0.995	0.00	0.345	0.04	0.995	0.03	**2.397**	0.00	0.075	0.02	**2.271**
ECI	0.07	0.991	-0.76	**-2.079**	0.07	0.991	-0.75	**-1.894**	0.07	1.492	-0.75	**-3.659**
EXHOME	0.00	0.119	-1.2	-1.219	0.00	0.119	0.26	0.214	-0.02	-0.709	-0.58	-0.97
EXPORT	0.04	0.971	0.00	0.396	0.04	0.971	0.01	0.636	0.03	0.974	0.00	0.775
EXPRIC	0.07	1.257	-0.03	-1.054	0.07	1.257	0.01	0.181	0.04	0.98	-0.01	-0.707
GDPPRI	0.07	1.741	-0.17	**-1.903**	0.07	1.741	-0.02	-0.093	0.05	1.61	-0.13	**-1.809**
GDSSER	0.09	2.135	-1.16	**-2.091**	0.09	2.135	0.58	1.264	0.02	0.867	-0.18	-0.67
HMSLS	0.05	1.055	-1.04	-1.201	0.05	1.055	-1.72	-1.456	0.07	2.071	-1.31	**-2.446**
HREARN	0.14	2.35	-0.45	**-3.267**	0.14	2.35	0.13	1.076	0.02	0.447	-0.13	**-1.87**
HSTART	0.05	1.073	0.37	0.307	0.05	1.073	2.08	1.377	0.02	0.808	1.1	1.588
IMPORT	0.07	1.697	-3.41	-1.35	0.07	1.697	2.41	1.167	0.02	0.831	-0.07	-0.054
IMPRIC	0.12	1.826	-0.03	-1.055	0.12	1.826	0.08	**1.971**	0.02	0.586	0.01	0.627
INDPRO	0.05	0.92	-0.12	-1.384	0.05	0.92	-0.04	-0.946	0.02	0.545	-0.06	**-1.931**
LEAD	0.03	0.634	0.04	0.59	0.03	0.634	0.03	0.644	0.03	0.86	0.03	1.017
MFGPAY	-0.05	-0.782	0.02	0.738	-0.05	-0.782	0	0.107	-0.03	-0.635	0.01	0.639
NAPM	0.04	0.723	-5.17	**-3.432**	0.04	0.723	-3.98	**-2.259**	0.02	0.639	-4.64	**-5.563**
NONFAR	0.07	1.35	-0.11	-1.454	0.07	1.35	-0.03	-0.799	0.04	1.034	-0.05	**-1.66**
PERSIN	-0.04	-1.022	-0.03	-0.531	-0.04	-1.022	-0.11	-1.473	-0.02	-0.736	-0.06	-1.574
PHILFE	-0.01	-0.238	0.01	0.273	-0.01	-0.238	0	0.039	-0.01	-0.174	0.00	0.238
PPI	0.03	0.492	0.01	0.184	0.03	0.492	-0.01	-0.136	0.04	0.925	0.00	0.051
RETSLS	0.04	1.064	-0.09	**-2.844**	0.04	1.064	0.02	0.979	-0.01	-0.398	-0.02	-0.956
TREAS	-0.04	-1.048	0.04	0.197	-0.04	-1.048	0.02	0.425	-0.03	-1.2	0.02	0.495
TRUCKS	-0.01	-0.158	0.17	0.181	-0.01	-0.158	-2.37	-1.526	0.04	1.133	-0.65	-1.066
UNEMP	0.07	1.135	1.22	0.424	0.07	1.135	4.26	**1.995**	0.03	0.912	3.05	**2.334**

Panel C: Cash Equivalent

	Positive Surprises				**Negative Surprises**				**All Surprises**			
	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat	const	*t*-stat	coeff	*t*-stat
AVGWOR	0.02	11.672	-0.13	-0.179	0.02	11.672	0.22	0.426	0.02	17.002	0.09	0.267
BUSINV	0.02	20.73	0.00	**-2.633**	0.02	20.73	0.00	**2.964**	0.02	24.844	0.00	0.244
CAPACI	0.02	14.518	-0.25	-0.729	0.02	14.518	-0.07	-0.182	0.02	25.864	-0.17	-0.957
CHICAG	0.02	10.722	-0.02	-0.953	0.02	10.722	0.00	-0.081	0.02	18.087	-0.01	-1.031
CONFID	0.02	19.673	-0.03	-1.372	0.02	19.673	0.04	1.411	0.02	26.574	0.00	-0.133
CONSTR	0.02	19.592	0.00	0.662	0.02	19.592	0.00	0.488	0.02	25.103	0.00	0.931
CPI	0.02	18.095	0.00	-0.124	0.02	18.095	0.00	0.472	0.02	25.951	0.00	0.3
CREDIT	0.02	18.029	0.00	-0.974	0.02	18.029	0.00	0.642	0.02	25.87	0.00	-0.463
DURGDS	0.02	17.607	0.00	0.228	0.02	17.607	0.00	0.688	0.02	24.2	0.00	0.776
ECI	0.02	9.501	0.00	0.288	0.02	9.501	-0.01	-0.628	0.02	15.099	0.00	-0.297
EXHOME	0.02	18.419	-0.04	-1.526	0.02	18.419	0.04	1.217	0.02	25.442	-0.01	-0.388
EXPORT	0.02	19.592	0.00	0.662	0.02	19.592	0.00	0.488	0.02	25.103	0.00	0.931
EXPRIC	0.02	9.949	0.00	-1.216	0.02	9.949	0.00	0.057	0.02	12.919	0.00	-0.95
GDPPRI	0.02	24.318	0.00	-1.047	0.02	24.318	0.01	**2.639**	0.02	25.722	0.00	0.457
GDSSER	0.02	15.655	0.00	-0.051	0.02	15.655	0.00	0.313	0.02	26.061	0.00	0.267
HMSLS	0.02	15.877	0.01	0.327	0.02	15.877	-0.01	-0.385	0.02	24.864	0.00	-0.013
HREARN	0.02	16.205	0.00	0.672	0.02	16.205	0.00	0.654	0.02	26.019	0.00	1.256
HSTART	0.02	16.306	-0.03	-1.17	0.02	16.306	0.00	0.136	0.02	25.86	-0.02	-1.053
IMPORT	0.02	18.919	-0.04	-0.596	0.02	18.919	0.09	**1.703**	0.02	26.164	0.03	1.062
IMPRIC	0.02	10.457	0.00	-1.417	0.02	10.457	0.00	0.192	0.02	15.438	0.00	-1.27
INDPRO	0.02	15.907	0.00	-0.288	0.02	15.907	0.00	-0.198	0.02	23.488	0.00	-0.405
LEAD	0.02	21.709	0.00	**-2.519**	0.02	21.709	0.00	**2.74**	0.02	23.594	0.00	0.352
MFGPAY	0.01	10.759	0.00	1.556	0.01	10.759	0.00	**-2.297**	0.02	14.971	0.00	-0.777
NAPM	0.02	17.958	-0.07	**-2.439**	0.02	17.958	0.04	1.184	0.02	26.424	-0.02	-1.281
NONFAR	0.02	19.866	0.00	0.326	0.02	19.866	0.00	0.151	0.02	26.457	0.00	0.347
PERSIN	0.02	22.162	0.00	-0.488	0.02	22.162	0.00	**2.479**	0.02	25.867	0.00	1.426
PHILFE	0.02	14.008	0.00	0.302	0.02	14.008	0.00	-0.303	0.02	17.548	0.00	-0.028
PPI	0.02	17.187	0.00	-0.931	0.02	17.187	0.00	1.481	0.02	23.155	0.00	0.413
RETSLS	0.02	22.549	0.00	**-2.162**	0.02	22.549	0.00	-0.219	0.02	25.214	0.00	-1.582
TREAS	0.02	21.24	0.00	0.915	0.02	21.24	0.00	-0.368	0.02	25.946	0.00	-0.026
TRUCKS	0.02	18.694	-0.04	**-2.516**	0.02	18.694	0.01	0.354	0.02	26.705	-0.02	**-2.249**
UNEMP	0.02	17.612	-0.05	-1.019	0.02	17.612	0.05	1.369	0.02	25.497	0.01	0.453

Table III

Impact of Surprises in Macroeconomic Announcements on Mutual Fund Returns

The table reports the results of regressing the returns of hybrid mutual funds on the percentage positive, negative, and overall surprises, respectively, of each of the macroeconomic announcements. Fund returns are obtained from daily net asset values and daily dividends and other distributions. The *t*-statistics are computed, using the Fama-MacBeth approach, from the mean and standard deviation of the coefficient estimates of fund-specific regressions. Positive (negative) surprises are those for which the announcement is greater (less) than was expected, where the expectation is formed from the median survey. That is, a positive (negative) surprise occurs when the market underestimates (overestimates) the level of the announcement. *T*-statistics ≥ 1.645 (equivalent to a *p*-value of 0.10) are in **bold**. All data are daily, covering the period January 1997 to December 2002.

Series	Positive Surprises		Negative Surprises		All Surprises	
	coeff	*t*-stat	coeff	*t*-stat	coeff	*t*-stat
AVGWOR	-17.14	**-3.29**	92.01	**17.82**	52.8	**21.43**
BUSINV	-0.03	**-1.85**	0.26	**19.19**	0.11	**11.64**
CAPACI	23.41	**7.53**	44.72	**12.21**	33.16	**20.83**
CHICAG	-3.30	**-18.28**	-0.08	-0.62	-1.54	**-18.11**
CONFID	4.19	**20.46**	-5.34	**-3.37**	1.32	**5.01**
CONSTR	0.00	-0.22	0.00	1.06	0.00	1.27
CPI	-0.73	**-27.04**	-0.06	**-3.21**	-0.39	**-34.91**
CREDIT	0.00	0.07	0.37	**10.49**	0.12	**14.22**
DURGDS	-0.06	**-8.52**	0.06	**19.55**	0.00	-1.04
ECI	-2.44	**-28.52**	-0.03	-0.49	-1.30	**-26.87**
EXHOME	-0.51	**-2.51**	-0.19	-0.63	-0.46	**-3.31**
EXPORT	0.00	-0.22	0.00	1.06	0.00	1.27
EXPRIC	0.16	**14.11**	-0.03	**-2.76**	0.06	**10.49**
GDPPRI	0.38	**8.61**	-1.13	**-21.05**	0.00	0.20
GDSSER	0.78	**7.33**	-2.48	**-19.69**	-1.03	**-25.21**
HMSLS	2.05	**12.56**	-2.49	**-9.76**	0.23	**2.52**
HREARN	-0.31	**-22.23**	0.06	**5.32**	-0.12	**-18.39**
HSTART	-4.59	**-18.73**	3.01	**11.31**	-1.33	**-10.51**
IMPORT	-7.87	**-18.47**	-2.77	-1.27	-3.50	**-11.39**
IMPRIC	0.08	**19.55**	0.02	**3.37**	0.06	**18.2**
INDPRO	-0.37	**-23.36**	0.12	**12.6**	-0.02	**-3.69**
LEAD	0.05	**3.57**	0.07	**9.46**	0.06	**5.54**
MFGPAY	0.07	**20.69**	0.01	1.40	0.03	**11.47**
NAPM	-4.09	**-12.91**	-2.13	**-5.27**	-3.29	**-15.74**
NONFAR	-0.65	**-31.78**	-0.01	-0.74	-0.21	**-19.86**
PERSIN	0.13	**9.48**	0.16	**4.82**	0.14	**17.29**
PHILFE	0.08	**16.63**	0.01	**1.97**	0.04	**10.49**
PPI	0.00	0.22	0.00	0.72	0.00	-1.22
RETSLS	-0.20	**-4.92**	0.00	-0.05	-0.10	**-2.41**
TREAS	-0.11	**-4.66**	-0.03	-0.85	-0.07	**-5.83**
TRUCKS	-0.49	-0.57	-1.24	**-2.97**	-1.07	**-12.51**
UNEMP	-3.62	**-7.37**	1.33	**6.22**	-0.65	**-3.48**

Table IV

Portfolio Rebalancing by Fund Managers around Macroeconomic Announcements

The table reports $\hat{\lambda}_j^k$ (j =1, 2) from the modified Sharpe quadratic regression, estimated in a panel framework, in which the within-month daily returns of the 149 hybrid funds are regressed on the within-month daily returns of the three asset classes. The coefficients b_k (i.e., the monthly asset class weights) are conditioned on dummy variables I_{pre2} and I_{post2} that take the value of 1 for the two days before and two days after the macroeconomic announcement, respectively, and 0 otherwise: $R_t = \sum_{k=1}^{3} b_k R_{kt} + e_t \quad subject \quad to \quad b_k = \lambda_0^k + \lambda_1^k I_{pre\,2} + \lambda_2^k I_{post\,2}$. The $\hat{\lambda}_j^k$, j =1, 2, representing the pre- or post-announcement changes in the asset class weights are constrained to sum to zero across the k asset classes. The aim is to determine if fund holdings change during the two days before and the two days after the macroeconomic announcement. Fund returns are obtained from daily net asset values and daily dividends and other distributions. The data cover the period January 1997 to December 2002. *, **, and *** represent significance at the 10, 5, and 1% levels, respectively.

	Weight changes **before** announcement ($\hat{\lambda}_1^k$)			Weight changes **after** announcement ($\hat{\lambda}_2^k$)		
Series	**Stocks**	**Bonds**	**Cash**	**Stocks**	**Bonds**	**Cash**
AVGWOR	-2.67%**	-2.76%***	5.43%***	-1.25%***	-12.13%***	13.38%***
BUSINV	-2.64%***	0.76%	1.88%	-0.31%	5.88%***	-5.57%***
CAPACI	-1.64%***	-5.14%***	6.78%***	-1.91%***	3.02%***	-1.11%
CHICAG	-0.21%	7.86%***	-7.64%***	-1.76%***	-8.90%***	10.66%***
CONFID	2.76%***	-4.66%***	1.90%	0.97%***	8.43%***	-9.40%***
CONSTR	-0.17%	5.87%***	-5.70%***	-0.89%***	-7.01%***	7.90%***
CPI	0.93%***	-3.58%***	2.65%***	-0.79%***	-4.21%***	5.01%***
CREDIT	-0.49%***	-6.16%***	6.66%***	-1.57%***	-3.06%***	4.63%***
DURGDS	0.84%***	10.78%***	-11.63%***	2.62%***	4.46%***	-7.08%***
ECI	1.71%***	-2.08%	0.36%	3.57%***	-1.74%	-1.83%
EXHOME	0.63%***	-1.77%	1.14%	1.58%***	5.11%***	-6.69%***
EXPORT	-0.17%	5.87%***	-5.70%***	-0.89%***	-7.01%***	7.90%***
EXPRIC	-4.04%***	-16.44%***	20.48%***	-1.10%***	-1.40%	2.50%
GDPPRI	-0.71%***	6.30%***	-5.60%***	-0.54%***	-3.15%***	3.70%***
GDSSER	-2.11%***	4.73%***	-2.62%***	0.49%*	5.13%***	-5.63%***
HMSLS	0.58%***	2.07%*	-2.65%***	-0.28%	-3.61%***	3.89%***
HREARN	-1.27%***	-0.67%	1.94%	-0.25%	-8.55%***	8.80%***
HSTART	-0.10%	5.72%***	-5.62%***	-1.43%***	0.62%	0.81%
IMPORT	-2.11%***	4.73%***	-2.62%***	0.49%*	5.13%***	-5.63%***
IMPRIC	-3.49%***	-10.38%***	13.87%***	-1.81%***	3.43%***	-1.62%
INDPRO	-1.66%***	-6.29%***	7.95%***	-1.91%***	4.47%***	-2.56%*
LEAD	-0.50%***	4.54%***	-4.05%***	-1.99%***	-5.57%***	7.56%***
MFGPAY	-2.10%***	-2.66%***	4.76%***	-0.64%***	-14.86%***	15.50%***
NAPM	-1.30%***	5.96%***	-4.66%***	-2.41%***	-10.19%***	12.59%***
NONFAR	-1.40%***	-0.98%	2.38%*	-0.29%	-8.91%***	9.21%***
PERSIN	0.34%	8.11%***	-8.45%***	-1.23%***	-9.65%***	10.88%***
PHILFE	-2.25%***	8.05%***	-5.80%***	-1.29%***	-0.21%	1.50%
PPI	-3.04%***	-5.82%***	8.86%***	-1.05%***	3.30%***	-2.25%
RETSLS	-2.27%***	-9.43%***	11.70%***	1.21%***	6.40%***	-7.62%***
TREAS	-0.96%***	-0.69%	1.64%	0.59%***	-1.70%	1.12%
TRUCKS	-1.30%***	6.80%***	-5.50%***	-2.40%***	-9.59%***	11.99%***
UNEMP	-1.27%***	-1.22%	2.49%***	-0.38%	-8.79%***	9.17%***

Table V

Regression Results of Portfolio Weights on Past Surprises

The table reports the result of regressing the components of b_{ik} from the Sharpe quadratic regression representing the change in the asset class holdings of 149 fund managers in the two days prior to each of the 32 announcements (λ_{i1}^{k} , i = 1…149 funds) on the past surprises in the macroeconomic announcement: $\lambda_{1t}^{k} = c_0 + c_1 * Surprise_{t-1} + \upsilon_{1t}$. The estimation is done in a panel framework whereby the changes λ_{i1}^{k} for each announcement across the 149 funds for year t are regressed on the average surprise for year t-1. That is, all variables are annual averages and the panel regression is done across all fund/years in the dataset. The aim is to provide direct evidence that the previously observed portfolio rebalancing prior to the macroeconomic announcements is driven by private information about macroeconomic announcements, rather than by a transitory liquidity effect. T-statistics ≥ 1.645 (equivalent to a p-value of 0.10) are in **bold**. The quadratic regressions for ECI and TREAS did not converge; hence, they are not reported. Similarly, we do not report the constants.

	Stocks		Bonds		Cash equivalent	
	coeff	*t*-stat	coeff	*t*-stat	coeff	*t*-stat
AVGWORK	-33.07	-0.45	-40.22	-0.55	73.29	0.78
BUSINV	-0.20	**-4.93**	0.45	**5.16**	-0.25	**-2.65**
CAPACITY	0.76	0.03	-15.32	-0.39	14.57	0.31
CHICAGO	0.34	0.38	2.12	0.93	-2.46	-1.15
CONFIDENCE	0.17	0.49	0.30	0.27	-0.47	-0.39
CONSTRUCT	0.01	1.23	0.00	0.06	-0.01	-0.74
CPI	-0.04	-0.51	-0.05	-0.35	0.09	0.54
CREDIT	-0.05	-0.23	0.27	0.65	-0.22	-0.53
DURGDS	0.01	**1.97**	-0.03	**-3.61**	0.02	**2.76**
EXHOME	-2.31	**-2.01**	2.30	0.87	0.00	0.00
EXPORTS	0.01	1.23	0.00	0.06	-0.01	-0.74
EXPRICE	-0.01	**-1.80**	0.03	**2.40**	-0.02	-1.49
GDPPRICE	0.04	0.97	0.23	**2.05**	-0.27	**-2.21**
GDSSERV	-1.42	**-2.11**	1.10	0.88	0.33	0.34
HMSLS	-0.66	-0.34	1.61	0.39	-0.95	-0.23
HREARN	-0.08	**-2.73**	0.23	**3.28**	-0.15	**-2.16**
HSTARTS	0.17	0.34	-0.31	-0.24	0.14	0.10
IMPORTS	-2.70	-1.23	-0.77	-0.20	3.47	1.17
IMPRICE	0.00	0.08	-0.03	-0.95	0.03	0.72
INDPRO	-0.02	-0.88	-0.11	**-2.21**	0.13	**2.54**
LEAD	-0.14	**-1.72**	0.13	0.89	0.01	0.07
MFGPAY	-0.01	**-1.66**	0.00	0.10	0.01	0.61
NAPM	-0.78	**-2.65**	-4.59	**-6.46**	5.37	**7.05**
NONFARM	0.02	0.92	0.33	**5.17**	-0.35	**-5.46**
PERSINC	0.04	**1.76**	0.26	**4.03**	-0.30	**-4.31**
PHILFED	-0.02	**-1.80**	-0.03	-1.64	0.04	**2.71**
PPI	0.00	0.49	-0.03	**-3.22**	0.03	**2.89**
RETSLS	-0.01	**-3.48**	-0.02	**-1.99**	0.04	**2.88**
TRUCKS	0.58	**3.11**	-0.16	-0.35	-0.41	-0.85
UNEMP	-0.55	-1.00	-2.13	-1.48	2.68	**1.81**

Table VI

Economic Benefits of Cash Holdings and Rewards to Timing Effort

The table reports results of regressions of the annual average fund return on a constant (not reported) and the annual average holdings in stocks (%stock), bonds (%bond), and cash equivalents (%cash), along with three variables that represent the annual average of the absolute value of the change in holdings in stocks ($\hat{\lambda}_{1t}^{stocks}$), bonds ($\hat{\lambda}_{1t}^{bonds}$), and cash equivalents ($\hat{\lambda}_{1t}^{cash}$), respectively, in the two days before each of the announcements: $R_t = d_0 + d_1 * \%Stocks_t + d_2 * \%Bonds_t + d_3 * \%Cash_t + d_4 * \hat{\lambda}_{1t}^{stocks} + d_5 * \hat{\lambda}_{1t}^{bonds} + d_6 * \hat{\lambda}_{1t}^{cash} + \omega_t$. The $\hat{\lambda}_1^k$ coefficient is that associated with the I_{pre2} dummy variable reported in Table IV (for each asset class *k*) and is used as a proxy for timing efforts by fund managers. The aims are to determine, i. the effect of fund cash (and other asset) holdings on their average return, and ii. if those fund managers who frequently time the market using private information about macroeconomic announcements earn higher returns than those who do not. The estimation is done in a panel framework across all fund/years in the dataset. Fund returns are yearly averages from daily net asset values augmented with daily dividends and other distributions. The data cover the period January 1997 to December 2002. *, **, and *** represent significance at the 10, 5, and 1% levels, respectively.

Stocks	Bonds	Cash	Announcement used to time asset class	$\hat{\lambda}_{1t}^{stocks}$	$\hat{\lambda}_{1t}^{bonds}$	$\hat{\lambda}_{1t}^{cash}$
0.0199***	0.0088	0.0009	AVGWOR	0.0179	0.0131	-0.0098
0.0160***	0.0191*	-0.0056	BUSINV	0.0557***	0.0027	-0.0062
0.0234***	0.0090	-0.0037	CAPACI	-0.0078	-0.0066	0.0059
0.0184***	0.0135	0.0036	CHICAG	0.0868***	-0.0004	-0.0220***
0.0248***	0.0044	-0.0097	CONFID	0.0364*	0.0032	-0.0151
0.0242***	0.0050	-0.0074	CONSTR	0.0200	0.0159	-0.0203*
0.0231***	0.0006	-0.0168**	CPI	0.1033***	0.0098	-0.0129
0.0179***	0.0140	-0.0030	CREDIT	0.0418*	0.0138	-0.0077
0.0209***	0.0159	-0.0028	DURGDS	0.0611***	0.0058	-0.0224***
0.0206***	0.0091	-0.0126	ECI	0.0476***	0.0325***	-0.0354***
0.0207***	0.0153***	-0.0022	EXHOME	0.0365***	0.0088	-0.0162*
0.0242***	0.0050	-0.0074	EXPORT	0.0200	0.0159	-0.0203*
0.0146***	0.0284	0.0105	EXPRIC	0.0489***	0.0013	-0.0120
0.0197***	0.0071	-0.0118	GDPPRI	0.1323***	0.0080	-0.0188
0.0173***	0.0154	-0.0102	HMSLS	0.0972***	0.0216	-0.0186
0.0159***	0.0221***	0.0043	HREARN	0.0277	0.0180	-0.0183***
0.0187***	0.0161	0.0010	HSTART	0.0661***	-0.0156*	0.0013
0.0172***	0.0152	0.0038	IMPRIC	0.0354***	-0.0008	-0.0038
0.0263***	0.0066	-0.0042	INDPRO	-0.0241	-0.0368***	0.0265***
0.0262***	-0.0022	-0.0120	LEAD	0.0861***	0.0239*	-0.0396***
0.0142***	0.0153	-0.0018	MFGPAY	0.0576***	-0.0147	0.0119
0.0241***	0.0050	-0.0088	NAPM	0.0412***	0.0039	-0.0163
0.0159***	0.0170	-0.0026	NONFAR	0.0598***	0.0156	-0.0144
0.0193***	0.0153	0.0036	PERSIN	0.0393	0.0209	-0.0267***
0.0229***	0.0073	-0.0019	PHILFE	0.0735***	-0.0141	-0.0198***
0.0250***	0.0080	-0.0020	PPI	0.0228	-0.0274	0.0048
0.0231***	0.0113	0.0010	RETSLS	0.0047	-0.0223	0.0117
0.0172***	0.0160	-0.0058	TREAS	0.0428***	0.0090	-0.0025
0.0277***	-0.0033	-0.0018	TRUCKS	0.0260	-0.0059	-0.0097
0.0189***	0.0131	-0.0035	UNEMP	0.0513***	0.0220***	-0.0248***
0.0208***	0.0114***	-0.0039***	OVERALL	0.0428***	0.0046***	-0.0120***

Table VII

Fund Characteristics and the Propensity to Use Private Information

The table reports the relationship between fund characteristics (the dependent variable)–expense ratio, turnover rate, total net assets (TNA), and fund objective (1= asset allocation funds and 0 = balanced funds)–and the decision to follow the trading strategy outlined previously: $Characteristic_{it} = f_0 + f_1 * Follow_{it}^{k} + \pi_{it}$. "$Follow_{it}^{k}$" is a dummy variable defined as 1 if the fund follows the trading strategy outlined in the text and 0 otherwise, for each of the k asset classes. The model is estimated in a panel framework where each characteristic is regressed on the decision variable across all fund managers on a yearly basis. T-statistics ≥ 1.645 (equivalent to a p-value of 0.10) are in **bold**. The constant is not reported.

	Dependent variables:	EXPENSES	TURNOVER	TNA	OBJECTIVE
Stocks	coeff	-0.01%	7.73%	-46.38	-0.04
	t-stat	-1.01	**3.52**	-0.52	**-2.88**
Bonds	coeff	0.03%	6.17%	-135.86	-0.01
	t-stat	**2.93**	**2.68**	-1.45	-0.87
Cash	coeff	0.00%	-1.81%	131.17	0.01
	t-stat	-0.45	-0.98	**1.75**	1.23