Going for Gold: An Analysis of Morningstar Analyst Ratings

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ABSTRACT

We investigate Morningstar's new qualitative, forward-looking analyst ratings, which reflect independent analysts' expectations of a fund's future performance. We find relatively higher abnormal flows to funds receiving higher ratings, particularly in retail funds, suggesting that the average retail investor values the analyst's subjective views when allocating their wealth. Performance tests show that investors would have earned significantly higher returns over horizons of 18 months or more by investing in funds with the highest analyst-convictions. These results suggest that independent research that expands the information set to include qualitative elements may help investors make better investment allocation decisions.

1. Introduction

Household investments in mutual funds represent approximately 89% of the $16 trillion in assets under management at the end of 2014.[1] With approximately 8,000 mutual funds in existence, the question of how investors choose to allocate wealth across this set of mutual funds is a topic of ongoing debate. There is a substantial literature that examines analyst recommendations of individual stocks (see among others, Womack (1996), Clement, (1999), Irvine (2001, 2004), Jegadeesh et. al. (2004), Li (2005), Rebello and Wei (2014)), yet there is limited research available to investors with respect to *expected* performance of mutual funds. While household investors are generally considered to be uninformed with respect to mutual fund investments (Frazzini and Lamont (2008)), there is limited information available to help them make better investment decisions. In this vacuum, academic research largely suggests that mutual fund investors rely heavily on measures of historical fund performance which lead investors to chase returns (Sirri and Tufano, 1998; Del Guercio and Tkac 2008) or recommendations from brokers representing the funds. Unfortunately, measures of past performance are quantitative and backward looking, containing little information regarding how the fund will perform in the future. Broker recommendations also offer little value to investors, especially after taking fees and expenses into account.[2] It is often argued that mutual fund investors need a more comprehensive set of information, including access to unbiased research, in order to make more informed investment decisions.

In September 2011, Morningstar Inc., an independent Chicago-based research firm, launched its new analyst ratings partly to answer the demands for improved research with respect to future mutual fund performance. These recommendations summarize their analysts' outlook for each rated fund using a five-tier scale with three positive (recommended) ratings of Gold, Silver,

[1] Investment Company Institute, 2015.

[2] Bergstresser, Chalmers, and Tufano (2009) find that broker-sold funds underperform funds sold through direct channels. Using individual level data, Hackethal, Haliassos, and Jappelli (2012), and Karabulut (2013) show that advised accounts underperform self-directed accounts. One potential reason for the underperformance of is that research from these third parties is impartial. Inderst and Ottaviani (2009) show that agents can direct clients into buying unsuitable products, when they perform dual tasks of advising and seeking potential clients.

Bronze, a Neutral rating, and a Negative rating. In contrast to its popular star ratings, which rank funds solely on past achievements, the Morningstar analyst rating is a qualitative, forward-looking measure that reflects the analyst's expectation of the fund's future performance relative to its peers over a business cycle (approximately a 5-year horizon). The rating is based on the analyst's evaluation of the fund across five pillars, only one of which reflects past performance. The remaining pillars are price (fees and trading costs), quality of investment team, parent organization, and investment process. Unlike broker advisers, Morningstar analysts do not prospect for potential customers through advising, nor do funds commission their research. Therefore, there is no obvious incentive mechanism for fund analysts that would compromise their ability to be impartial (Inderst and Ottaviani, 2009, 2012).[3] In sum, these ratings are likely to reflect unbiased analyst opinion and incorporate information from multiple dimensions, covering both quantitative and qualitative elements.

Our aim in this paper is twofold. First, we explore how investors respond to analyst ratings and how this response varies with fund characteristics previously shown to affect flows in the cross-section of mutual funds. The qualitative nature of these ratings has the potential to expand the information set of uninformed investors as the ratings summarize both tangible and intangible information pertaining to the rated funds into a relatively easy-to-understand metric. Further, Morningstar's reputation as a well-known, independent source of mutual fund information should facilitate investor adoption of the new analyst ratings.

Second, we assess the value of these ratings as a criterion for identifying which mutual funds are expected to have relatively higher future performance. Backward-looking measures such as star ratings are documented to have limited value in terms of selecting better managed funds.[4]

[3]Analysts ratings are freely available to investors on Mornignstar's website. Rating reports and underlying pillar analyses are accessible with a subscription fee. Morningstar stresses the fact that the analyst's research is independent of the commercial activities, which includes licensing its intellectual property. In this regard, fund managers have no influence over which funds will be rated or the outcome of the analyst's research.

[4]Among others, Blake and Morey (2000) and Morey (2005) find that (prior to the 2002 change) higher star ratings are weak predictors of future superior performance, while funds with low star ratings underperform their peers. Gottesman and Morey (2006) argue that after changes in June 2002, the rating system can better predict future performance. Contradictory to this result, Kraussl and Sandelowsky (2007) find that the predictive power of star ratings does not beat a random walk even after Morningstar changed its rating system in 2002.

Morningstar's stated objective is to identify funds that will outperform their peers over periods representing a full business cycle (or approximately 5 years). If the forward-looking analyst rating contains information with respect to the fund's future performance, investors would benefit by incorporating the analyst rating into their selection criteria.

Our empirical tests start with an examination of the investor response to analyst rating initiations by comparing abnormal flows to rated funds in the months immediately following the release of the initial analyst ratings. Abnormal flows are computed as the difference between the flow to the rated fund and the flow to a "matched" unrated fund (within the same style classification) where matching is performed using propensity score matching (Villaloga 2004; Cooper, Gulen, and Rau, 2005). The use of abnormal flows allows us to isolate the effects of analyst rating initiations on fund flows controlling for flows to unrated funds with similar characteristics. We find that Gold and Silver rated funds receive significantly higher abnormal flows in the six months following analyst ratings initiations than funds that received Not Recommended (Negative and Neutral) ratings. The flow responses are economically economically meaningful with Gold rated funds receiving flows that are approximately 9 to 11 percent of fund net assets higher than flows to Not Recommended funds (4 to 5.5 percent higher flows for Silver rated funds). We do not however observe significant inflows to Bronze rated funds relative to Not Recommended funds, suggesting that investors do not consider Bronze ratings as strong a signal as Gold or Silver ratings.

We conduct three additional sets of tests in an effort to better understand the nature of the flow response. First, we find that abnormal flows to Gold and Silver rated funds are particularly stronger in larger funds suggesting that our results pertain to the average fund-dollar rather than the average fund (Clifford, Jordan, and Riley, 2014). Second, we find that funds with a higher proportion of assets under management in retail classes enjoy a larger flow response. This finding is consistent with retail investors being subject to higher search costs[5] and thus being more dependent on the information disseminated by external sources. Third, we investigate how investors' reaction to analyst ratings differs from the response to star ratings (and star rating changes) and find that

[5]See for example Huang, Wei, and Jan, 2007; Sirri and Tufano, 1998, Jain and Wu, 2000 for the impact of search costs on investor behavior.

flows to Gold rated funds are not related to the fund's star ratings.[6] In contrast, the significant flow reaction to Silver (or Bronze) rated funds prevails only within the set of funds with high star ratings. This suggests that investors jointly consider both sources of information when making investment decisions for Silver and Bronze rated funds, refraining from investing in funds where the two ratings provide conflicting signals, and flocking to funds that receive positive ratings from both rating systems. The Gold rating, representing the highest analyst conviction, appears to be strong enough to overcome the potentially negative impact of a low star rating.

Establishing a robust flow response to funds with high analyst conviction, we next assess if the analyst ratings contain information about the rated funds' future performance. Analysts spend a considerable amount of time researching funds and the fund market, and thus should have more information about funds than an average fund investor. If analyst ratings provide valuable information regarding future performance, investors will benefit by including this information in their fund selection criteria. In an event setting, we find that risk-adjusted returns to Gold, Silver and Bronze rated funds are significantly higher than returns to Not Recommended returns over horizons of 18 months or more. Gold rated funds have risk-adjusted returns (using the Carhart (1997) four factor model) that are approximately 4.5% higher than risk-adjusted returns for Not Recommended funds at a 24-month horizon. In comparison, Silver and Bronze rated funds have risk-adjusted returns over the same horizon of approximately 2% and 1.5%, respectively. These patterns are consistent with Morningstar's objective of identifying funds that are likely to outperform peer funds over a business cycle.

We also examine fund performance using the calendar time portfolio approach which reflects the experience of a hypothetical investor following these recommendations. Specifically, we sort funds into portfolios each month based on their analyst rating at the end of the prior month (monthly rebalancing). We then compute monthly returns for each of the five portfolios (Gold, Silver, Bronze, Not Recommended, and Unrated) over the sample period which extends from

[6]Star-rating is a five tier-rating system that range from 1-star (lowest) to 5-star (highest). In our sample, 30% of Gold rated funds have star ratings 3 or less. The percentage of low star ratings goes up to 42% within Bronze rated funds. Hence, despite the positive association between star and analyst ratings, two ratings frequently disagree on the assessment of a given fund, allowing us to examine the interactions between these two different rating systems.

November 2011 to December 2014. We find that Gold rated funds have significantly higher risk-adjusted returns than funds that did not receive Gold ratings.[7] Overall, our results suggest that Morningstar's analyst ratings contain information about future fund performance for investment horizons of 18 months or more.

Previous research has investigated the stock price reactions to analysts' recommendations to understand if investors value these recommendations.[8] Mutual funds offer a unique way of examining investor decisions via fund flows rather than inferring them from asset prices as in equity markets. Brown, Wei, and Wermers (2013) find that mutual fund managers are prudent to follow analyst recommendations. Jenkinson, Jones, and Martinez (2014) show that consultants for institutional clients have substantial influence on the manager selection decisions of plan sponsors. We extend this literature by demonstrating how analyst-based fund recommendations affect retail fund investor decisions.

Related research examines whether investors could benefit by following analyst-based stock recommendations.[9] Li (2005) provides evidence that high-performing analysts outperform their peers offering value to their clients. Rebello and Wei (2014) provide evidence that buy-side research predicts returns over a one-year horizon, and that investors trades in response to these investment recommendations. However, the profitability of following analysts depends on transaction costs (Barber et. al. 2001), and controlling for the return predictability of other signals such as momentum (Jegadeesh et. al. 2004). For mutual funds, this line of research is concentrated on either recommendations of brokerage firms (Bergstresser et. al. 2009), or on star-ratings for which analysts have no discretion (Blake and Morey, 2000). Our paper differs from these papers because 1) Morningstar analysts are independent so are not likely to be affected by conflicts of interests faced by brokers' analysts and other sell-side analysts, and 2) the analyst

[7] Alphas are estimated using the market model, Fama and French's three factor model, and Carhart's four-factor model.

[8] See, among others, Bjerring, Lakonishok, and Vermaelen (1983), Copeland and Mayers (1982), Barber and Loeffler (1993), Desai and Jain (1995), Womack (1996), Lin and McNichols (1998), Gleason and Lee (2003), Ivkovic̀ and Jegadeesh (2004), Mikhail, Walther and Willis (2007), Altınkılıç and Hansen (2009).

[9] See for example Barber et. al. (2001, 2006), Mikhail and Willis (2004), Jegadeesh et. al. (2004), Li (2005), Rebello and Wei, (2014).

ratings reflect the analysts' expectations of the fund's future performance rather than a score card of past performance. The superior performance of Gold rated funds relative to other funds suggest that analyst ratings have some merit in detecting high quality funds in the cross-section of active managers. Higher flows to the Gold rated funds are consistent with investors recognizing the potential value of these ratings.

Our results are also important for investors seeking to maximize the return on their investments and fund managers trying to maximize assets under management. Given the proliferation of investment advice from various sources, investors should be interested in knowing the reliability and value of analyst recommendations. Understanding the value of the recommendation is especially important since traditional backward-looking measures have little power to predict superior future performance. Further, the impact of analyst ratings on future fund flows may incentivize fund managers to improve in the key areas that affect their fund's analyst ratings. This is important given that more than 90% of fund managers' are compensated with a fixed percentage of assets under management (Deli, 2002; Del Guercio, Genc, Tran, 2015). Therefore, providing a possible link between analyst ratings and subsequent fund flows advances our understanding of determinants of fund flows and the associated managerial incentives.

The paper proceeds as follows: Section 2 provides background on Morningstar's analyst ratings and describes the data. Section 3 examines the investor flow response to rating initiations including the combined effect of analyst ratings and star ratings on investor flows. Section 4 examines out-of-sample performance, and Section 5 concludes.

2. Data

2.1. Background on Morningstar Analyst Ratings

Morningstar began assigning analyst ratings to funds in September 2011. Morningstar's analysts combine qualitative, research-based information with quantitative, numerically-based analysis to generate a composite rating of a fund's prospect to provide superior risk-adjusted

return over the long-term. The rating process starts with the analyst conducting a review of the fund intended to develop an initial view regarding future performance of the fund and determine the key areas of concerns. Prospectuses, shareholder reports, questionnaires from the fund group, news regarding the fund, and performance data may be taken into consideration as a part of this research. This initial stage is followed by a series of interviews with the fund manager, executives of the parent company, risk managers, and traders. After these interviews and consultation with peers, the analyst prepares a report reviewing the fund across five dimensions, which Morningstar believes to be crucial for predicting future performance:[10]

People: The overall quality of a fund's investment team is assessed by considering experience, expertise, talent, stability, manager workload, information flow, and alignment of interest.

Process: The analyst seeks to understand the strength of the fund's investment strategy, the ability of management to execute the fund strategy successfully, whether the process is matched to the manager's skill set and the fund's resources, and the risks entailed in the process.

Parent: The parent company is evaluated based on key areas including stewardship, recruitment and retention of talent, risk and capacity management, regulatory compliance, and organization strategy.

Price: The fund's expenses are analyzed to understand whether the fund offers a good value compared with similar funds sold through similar channels.

Performance: The analyst focuses on whether the manager adds value, the sources of performance, consistency of performance over time, risks taken, and the performance of the same managers in other present or previous accounts.

The analyst assigns a score of Positive, Negative or Neutral to each pillar, which forms the Pillar Scorecard of the fund.[11] For instance, a fund may get a negative score on the people pillar because its manager lacks expertise, the research team is insufficient or unstable, or the manager does not have sufficient track record. The analyst then presents her assessment to a rating committee. If the committee agrees with her judgment in each area, the analyst assigns a final rating on a five-tier

[10]"Morningstar Analyst Ratings for Funds Methodology Document", Fund Research Group (November, 2011)
[11]See "The Pillars of Our New Analyst Ratings" by Russell Kinnel, 2011 for more information.

scale with three medals of Gold, Silver, and Bronze, a Neutral rating, and a Negative rating. The final decision regarding the scores for the individual pillars and the overall analyst rating is made by the analyst in consultation with the ratings committee. The analyst does not simply tally up the pillars as each pillar has overlap with the others, but tries to synthesize the pillars and judge on how they work together.[12] The analyst rating is freely available to all fund customers, while the Pillar Scorecard and the corresponding analyst's report can be accessed with a subscriber fee. Funds with Gold, Silver, and Bronze ratings are medalist funds with Morningstar's positive assessment. The difference between these three ratings is based on the level of analyst conviction. For example, Morningstar describes a Gold rating as follows:

"To earn a Gold rating, a fund must distinguish itself across the five pillars that are the basis for our analysis. That is, a Gold rated fund should have a seasoned, talented, and successful manager or management team; a sound, thoughtful process that has been executed skillfully and consistently; a portfolio that's in harmony with the stated process and that's capable of delivering a reward that compensates investors for the risks it takes; reasonable expenses; and a strong parent organization that is focused on responsible stewardship of investor assets."

A Bronze rated fund may not, on the other hand, have notable advantages across all five pillars, but still have an overall advantage that outweighs its disadvantages when compared to its peers. Morningstar does not have a strong positive or negative opinion about funds with Neutral ratings. An average fund in a category receives this rating as long as its fees gives it a competitive advantage. An unproven, but promising fund may also get a Neutral rating until Morningstar sees enough evidence of potential outperformance. Negative rated funds are the ones that, according to Morningstar, possess at least one flaw that is likely to adversely affect the future performance such as high fees or an unstable management team.

Analyst ratings are fundamentally different from the well-known star ratings even though past performance is part of the analyst's evaluation process. The star rating is a purely quantitative representation of historical, risk-adjusted performance, relative to other funds in the same category.

[12]For example, Morningstar states that analysts put more weight on the price pillar (relative to the other four pillars) for index funds, while the people and process pillars carry more weight for focused-stock funds.

The star rating does not capture, nor was it designed to capture, factors that will contribute to a fund's *future* performance. Morningstar has no discretion with respect to a fund's star rating and is unable to incorporate qualitative information that may affect a fund's future performance.[13] For the analyst rating, the analyst goes far beyond measuring past performance. The analyst rating incorporates the analyst's expectation about a fund's *future* performance over the long term (defined as a full market cycle). This forward-looking view includes inputs and subjective assessments about the fund's people, investment processes, style, strategy, and management firm. The analyst tries to understand why a fund performs a certain way, what the underlying causes of performance are, how the fund performs in different market conditions, its risk profile, and consistency of performance over time. The analyst may also consider the fund manager's current and past records at other funds (or accounts) in order to evaluate the value the manager adds to the fund.[14]

2.2. Description of the Sample

Morningstar Direct reports the analyst rating and rating date given in the latest analyst report for each fund. The analyst report publication date is also the first date that the analyst rating becomes publicly available. For all funds rated through June 2014, we first collect all historical analyst reports back to September 2011 which is the first date the analyst ratings were issued. From these reports, we obtain all analyst ratings and the corresponding report dates for rated funds from September 2011 to June 2014. The median number of reports for a rated fund is three with a mean of 3.17.[15]

Monthly time-series of returns, total net assets, and fund categories for all rated and unrated funds are obtained from Morningstar Direct. We obtain other fund characteristics such as fees and

[13] Many investors appear to rely heavily on star ratings to select funds for their portfolios, incorrectly interpreting the star ratings as Morningstar's buy/sell recommendations. See "Fund Ratings, Recent Results Diverge Following Declines," Wall Street Journal, 2000.

[14] "Introducing our new Analyst Ratings," Morningstar Funds Newsletter, 2011

[15] Approximately 11.4% of analyst rating updates (reports issued subsequent to the initial rating) result in a change to the analyst rating, with most of these changes occurring late in the sample. Because of the small number of rating changes, our empirical tests are based on analyst rating initiations rather than changes in the ratings.

loads from the CRSP Mutual Fund Database because Morningstar either reports them at a yearly frequency (e.g., fees) or only reports the latest value (i.e. loads) whereas CRSP has quarterly data. We limit our sample to funds assigned to one of Morningstar's nine equity fund categories formed by the intersections of three size (Small, Mid-cap, Large) and three valuation (Value, Blend, Growth) categories. To remove index funds, we use the index fund field available in Morningstar Direct. We eliminate multiple share classes of a fund by computing fund-level variables.[16] To account for potential incubation bias (Evans, 2010), we eliminate funds less than two years old and funds that have total net assets below five million dollars at the end of the previous month.

Our sample contains 412 equity funds rated between September 2011 and June 2014. Even though Morningstar covers 21% of the equity funds in our sample, the rated funds manage more than 90% of the total assets as of June 2014. Figure 1 shows the cumulative number of rated funds in each month between September, 2011 and June 2014. Out of 412 rated equity funds, 70% of funds have Gold, Silver, or Bronze ratings while 30% of funds are assigned Neutral or Negative ratings. The number of positive ratings is surprising given that previous research documents underperformance in the majority of funds relative to their passive benchmarks (Malkiel, 1995, 2005; Fama and French, 2010). Morningstar argues that analysts prioritized the rating of funds according to the level of investor interest, which tend to be high quality funds.[17] Thus, the rating distributions might initially be skewed towards positive ratings. Consistent with this argument, most of the Gold rated funds are rated early in our sample period, while Bronze and Neutral ratings are assigned later in the sample period. In fact, since June, 2012, there is not a single fund that gets an initial rating of Gold while 40% of Neutral ratings in our final sample are given in this period.

The non-random selection in Morningtar's decision to roll out their analyst ratings by first covering funds with high-investor interest results in some systematic differences between rated and unrated funds. Table I, Panel A summarizes the differences between rated funds and unrated

[16] For fund level observation, we use the value weighted average of variables that belong to the share classes of the same fund. For fund age, we use the first offer date of the oldest share class.

[17] Several factors may determine when funds are chosen to be rated. For example, the initial set of funds chosen to be rated included large funds (i.e. $250 millions or more) whose families demonstrate good stewardship and whose veteran managers have successfully implemented strategies. The coverage is subject to change and evolves over time. See "Morningstar U.S. Fund Analyst Coverage Overview", Morningstar, 2012.

funds with respect to a set of fund characteristics measured at the time of the analyst rating initiations. Rated funds tend to have more assets under management, belong to large families, and have relatively lower expense ratios and turnover. They are also older, more established funds whose managers have relatively long tenure. Most importantly, rated funds have higher past flows and performance than unrated funds. While there is not a monotonic relation in fund flows, we observe that funds receiving positive ratings (Gold, Silver, and Bronze) on average had positive flows over the prior 12 months, while funds in the Neutral and Negative categories did not.

In addition to differences between rated and unrated funds, there are some notable differences between funds in the various analyst rating categories. Table 1, Panel B summarizes the fund characteristics across the rating categories, sorting the rated funds into the five analyst rating categories from the highest rating of Gold to the lowest rating of Negative. We observe that, on average, Gold and Silver rated funds are larger than Bronze, Neutral, and Negative rated funds, but this relation does not apply to size of the fund families. Somewhat surprisingly, we do not find a strong relation between expense ratios and analyst ratings, even though Gold rated funds have the lowest average expense ratio in our sample. We observe a monotonic decrease across the rating categories in both the past 12-month fund returns and Fama and French three-factor alphas. Gold and Silver rated funds have positive risk-adjusted performance over the previous 36 months, while Neutral and Negative rated funds have negative performance over the same period. Similar monotonicity is apparent in both turnover and manager tenure.

We also examine the distribution of Morningstar's analyst ratings with respect their star ratings. Figure 2, Panel A demonstrates that the forward-looking analyst ratings may substantially differ from the backward-looking star ratings.[18] Funds with a four or five star rating are assigned the largest number of Gold, Silver, and Bronze ratings, while funds with three star ratings have the largest number of Neutral and Negative ratings. On the other hand, 30% of Gold or Silver funds

[18]Morningstar requires at least three years of return history to assign stars. Six funds in our sample have less than three years of return history (but more than our age filter of two years) when the Morningstar analyst evaluated the fund. Therefore, they do not have a star rating at the time of their analyst rating initiations. For example, AQR Large Cap Momentum Fund obtained its Bronze rating in April, 2012, when it was 30 months old. The fund was given its first star rating five months later in July 2012.

have star ratings of 3 or less, while this percentage goes up to 42% for Bronze funds.[19] Similarly, 20% of Neutral or Negative funds achieve star ratings of four or five stars. These statistics suggest that Morningstar is optimistic about the future outlook of some funds despite their low achievements in the past, while a high star rating does not necessarily achieve high-conviction from Morningstars analysts.

Del Guercio and Tkac (2008) find that upgrades or downgrades in star ratings significantly influence fund flows up to six months after the star change, indicating a delayed response to star changes among a substantial group of investors. Figure 2, Panel B shows that 128 out of 412 funds have changes in their star levels within six months prior to analyst rating initiations. Out of these 128 cases, there are 59 upgrades and 69 downgrades, with a relatively higher number of changes in the Bronze and Neutral rating categories. To control for the potential star effect and isolate the influence of analyst rating initiations on fund flows, our regressions include star rating fixed effects and controls for star rating changes using two indicator variables, capturing upgrades or downgrades, respectively.

2.3. Measuring Fund Flows

To measure the fund flows we use the standard definition in the literature:

$$flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1 + R_{i,t})}{TNA_{i,t-1}} \tag{1}$$

where $TNA_{i,t}$ represents the total net assets of fund i at the end of month t and $R_{i,t}$ represents the monthly return of fund i during month t. This definition reflects the growth rate of a fund due to new investments and assumes that all new investments occur at the end of the month. Elton, Gruber, and Blake (2001) show that the dates of fund mergers often differ from actual merger dates and this inaccuracy introduces a large number of errors in fund returns. Even though this bias in

[19] One specific example is Clipper Fund (CFIMIX), which received a two-star rating, but was awarded a Gold rating in November, 2011. Rusell Kinnel, the director of mutual fund research for Morningstar, says "... The fund earned a Gold in Analyst Rating because of the firm's process and other criteria that analysts found admirable...Sometimes, there's just some key information that's not being considered in the star ratings and that's why we feel the Analyst Rating addresses that issue." see "Morningstar explains its new forward-looking rating system – and tosses in some hot fund picks for good measure", 2011.

fund returns does not show a systematic pattern, it may lead to extreme values of flows. To prevent the potential impact of these outliers, we winsorize the top and bottom 1% of the flow distribution.

Previous literature documents that capital flows are highly predictable (e.g. Coval and Stafford, 2007; Lou, 2012). We use this stylized fact to extract residual (unexpected) flows from realized flows estimated in (1). To compute residual flows, we perform Fama and MacBeth (1973) regressions of fund flows on six months of past flows and returns as in Coval and Stafford (2007):

$$flow_{i,t} = a_{i,t} + \sum_{j=1}^{6} b_{i,j,t} flow_{i,t-j} + \sum_{j=1}^{6} c_{i,j,t} return_{i,t-j} + \varepsilon_{i,t} \tag{2}$$

In particular, each month from $t-36$ to t, we estimate a cross-sectional regression as in (2) and obtain the time-series average of estimated coefficients. We then calculate the residual (unexpected) flows in month t as the fund flow minus the expected flow, which is the fitted value using the time-series average of estimated coefficients. This approach purges the effects of past returns and flows from our measure and also nets out the effects of unobserved characteristics to the extent they are correlated with past flows (and returns). To demonstrate robustness, our analysis includes both raw and residual flows in our tests.

3. Flow Response to Rating Initiations

3.1. Empirical Methodology

As discussed in the previous section, Morningstar's implementation of a non-random process for selecting the order in which funds are rated results in systematic differences in fund characteristics between rated and unrated funds. To control for the impact of this selection bias on our fund flow tests, our flow analysis is based on abnormal flows, which measure the *additional* flows to a rated fund due to its rating initiation. To calculate abnormal flows, we employ a propensity score matching algorithm which identifies 412 unrated funds that are most similar, in terms of a set of fund characteristics, to the rated funds in our sample. We next describe

our methodology and provide an analysis of the differences between rated and matched funds to describe the outcome of our matching procedure.

3.1.1. Propensity Score Matching

To analyze the investor response to rating initiations, we compare abnormal flows to rated funds over the 1, 3, and 6 month periods subsequent to initial rating assignment. We estimate the abnormal flow as the difference in flows between each rated fund and the unrated fund most closely matched to the rated fund using a propensity-score matching algorithm. Propensity score matching (Rosenbaum and Rubin, 1983) is based on the assumption that, conditional upon the covariates in the rating model, the decision of Morningstar to have a fund rated is independent of the potential rating. Matching based upon propensity scores avoids the dimensionality problem of having to match upon the full set of covariates, and enable us to construct an appropriate control group while imposing minimal constraints on the matching variables (Villalonga, 2004; Hillio and Vermaelen, 2004; Cooper, Gulen, and Rau, 2005). The abnormal flow captures the *additional* flow that a rated fund receives relative to an unrated fund, which–based on its characteristics–has the same propensity to receive a comparable rating. Thus, adjusting rated fund flows with its closest peer based on propensity scores helps us isolate the investor response to the analyst rating initiations. To the extent that a rated fund's flows are affected by fund characteristics not captured in our regression specification, the peer fund should be affected in a similar manner unless the flow response is due to the rating initiation. Match-adjustment also helps to net out the non-constant time effects (i.e. the impact of aggregate flows and market returns) under the assumption that peer funds are similarly affected by systematic market forces.

To identify unrated funds that are the best match for our rated funds, we employ a multinomial logistic regression model to estimate the probabilities used in the propensity score matching process.[20] Each month we estimate cross-sectional regressions by regressing the initial rating

[20]We chose the multinomial logistic regression model (MLRM) for our propensity score matching process for several reasons. First, Morningstar does not suggest that Gold rated funds will outperform Bronze rated funds, but rather they have a higher conviction that Gold rated funds will outperform peer funds. Second, after estimating the MLRM in a full-panel setting with month fixed effects (instead of monthly cross-sectional regressions used in the

type (5=Gold, 4=Silver, 3=Bronze, 2=Neutral, 1=Negative, and 0=unrated) on a set of lagged fund characteristics that include net assets, firm net assets, age, expense ratio, turnover, 36-month Fama-French 3-factor alpha, average fund flows in the prior 12 months, and the tenure of the management team. For each fund, the regression model produces a probability of being rated in each of the analyst rating categories. Each rated fund is matched with the unrated fund (within the same style group) that has a probability of receiving the assigned rating that is closest to the rated fund's probability. For example, a large value fund assigned a Gold rating in November 2011 would be matched with the unrated large value fund that has the probability of being rated Gold that is closest to the probability assigned to the rated fund. We remove funds that are rated within the subsequent 6 months from the pool of potential matches to ensure that the matched fund's flows are not affected by a subsequent rating event.[21]

Figure 3 graphically demonstrates the quality of the matching process across various fund characteristics. Each panel compares the distribution of the indicated fund characteristic for the rated funds with the distribution of the characteristic for the best matched unrated funds. The distributions of past performance and past flows associated with matched funds almost perfectly line up with the distribution of the same characteristics that belong to rated funds. Table 1, Panel C confirms our judgment. There is no significant difference in the 12 month returns (t-value of difference=0.47) or in Fama and French 3-factor alphas (t-value of difference=-0.38) between rated and matched unrated funds. In contrast, rated funds have statistically higher performance than unrated funds when compared to the entire universe of unrated funds. The matching process also identifies funds with past flows that are similar to those of rated funds. The flow difference between rated and unrated funds of 0.17% before matching decreases to only -0.01% (t-value of difference=-0.01)) when rated funds are compared to the matched sample. The distribution is also

match process), we computed a Hausman test of independence of irrelevant alternatives which suggested that the IIA assumption is not violated (results support the null hypothesis of independence). Third, in untabulated results we replace the MLRM matching process with a matching process based on an ordered probit model and achieved similar results.

[21] We also run the analysis without dropping funds rated over the subsequent 6 months and get quantitatively and qualitatively similar results.

very similar for fund age.[22] Some of the differences in fund characteristics between rated and matched funds are statistically significant, yet in all cases the differences are much lower than the differences between rated and unrated funds. While the difference in expense ratios (and turnover ratios) are statistically significant, their values are substantially closer to those of rated funds. Matched funds also have lower fund and fund family net assets in the right tail of the distribution. The difference in net assets is because Morningstar rolled out the new analyst ratings by starting with the larger funds and fund families. We also examine differences in the distribution of star ratings or star rating changes and find that rated funds have slightly higher star ratings on average, while there is very little difference in the number of funds that received a star rating increase or decrease over the six months prior to the rating initiation.

Overall, these results suggest that our matching process meets our objective of identifying the unrated funds that closely match the rated funds with respect to a broad range of fund characteristics, in particular past flows and performance.

3.1.2. Measuring the Flow Response

We test the flow response to rating initiations by regressing abnormal flows measured over 1, 3, and 6 month windows after the initial rating assignment onto Gold, Silver, and Bronze indicators according to the following specification:

$$\Delta flow_{i,(t-k,t+k)} = \alpha + \beta_{Gold} Gold_{i,t} + \beta_{Silver} Silver_{i,t} + \beta_{Bronze} Bronze_{i,t} + Controls_{i,t} + \varepsilon_{i,t} \qquad (3)$$

where $\Delta flow_{i,(t-k,t+k)}$ represents the abnormal flow summed over 1, 3, and 6 months after the analyst rating is assigned. We compute two types of abnormal flow: (1) abnormal raw flow which is the difference in raw flows (see Equation (1)) between a rated fund and its matched fund, and (2) abnormal residual flow which is the difference in residual flows (see Equation (2)) between a rated fund and its matched fund. Gold, Silver, and Bronze are indicator variables that take the value of

[22] In particular, the mean difference of fund age between two groups is only 11 months (t-value of difference=0.97) while it is 6% (t-value of difference=2.02), which a substantial reduction from 23% when we compare rated funds with the universe of all unrated funds on the date of rating initiation.

1 if the fund is rated in the respective category, 0 otherwise. Since there are very few funds with an initial rating of Negative in our sample (see Figure 1), we group Negative and Neutral rated funds into a Not Recommended category. This is the reference (omitted) group in our regressions. Thus, the coefficient β_{Gold} gives the incremental flow reaction for Gold rated funds relative to Not Recommended funds. Similarly, Silver and Bronze are corresponding indicators for Silver and Bronze rated funds.

3.1.3. Control Variables

As discussed in Section 2.2, ratings are not randomly distributed through time. 45 of the 54 Gold ratings (83%) are assigned to funds in the first three months while 20% of the non-Gold ratings are assigned over the corresponding period. Flow response to different ratings might be subject to a time effect particularly given that there is substantial variation in aggregate flows over our sample period. Moreover, there exists confounding star and star change influences on fund flows documented in the previous literature (Bergstresser and Poterba, 2002; Del Guercio and Tkac, 2008). Therefore, our regression specification includes time, star, and star-changes fixed effects.[23] Even though matching should filter out the impact of fund-specific characteristics on funds flows, there can be residual impact left due to imperfect matching. Hence, we add the *difference* of the following characteristics between a rated fund and the corresponding match fund as further controls: natural log of fund size, natural log of family assets, natural log of fund age, expense ratio, turnover, 12-month past fund returns, 12 month volatility of funds returns, and past 12 month average fund flows. Chevalier and Ellison (1997), Sirri and Tufano (1998), Del Guercio and Tkac (2008), and Barber, Odean, and Zheng (2005), among many others, show the influence of these variables on future fund flows.

[23] We use six star rating indicators capturing five-tier star ratings plus one indicator for funds without a star. For star-changes, we use two dummies, capturing upgrades and downgrades respectively

3.2. The Effects of Analyst Ratings on Investor Flows

Table 2 shows the results of our regressions that test the flow response to analyst rating initiations for the 412 rated funds in our sample. The left portion of each panel examines relative differences in abnormal realized flows, while the right portion of each panel examines differences in abnormal residual flows. As discussed earlier, residual flows for each fund are computed to purge the influence of past returns and past flows on fund flows so that we can isolate the effects of rating initiations. Both abnormal realized and residual flows to Gold and Silver Funds are statistically higher than flows to Not Recommended funds at a six month horizon. At the six month horizon, the Gold indicator variable has a coefficient estimate of 0.110 (t-statistic= 3.21) when realized flows are used and .085 (t-statistic= 3.97) when residual flows are used. This suggests that Gold rated funds have an average six month increase in abnormal fund flows that is between 9 and 11 percent higher than Not Recommended funds. On average, a Gold rated fund with net assets of $8,309 million (sample average of rated funds) receives roughly $706 million ($8,309 million x 0.085) more in flows than Not Recommended funds in the following six months. In contrast, we do not observe a statically significant difference in abnormal flows between Gold and Not Recommended funds in the six months *prior* to ratings release, suggesting our matching procedure performs well in finding matching funds. The coefficient estimate for Gold rated funds is insignificant at one and three month windows suggesting that investor response to a rating initiation operates with a delay. This is consistent with the delayed reaction to star rating changes documented in the literature (e.g., Del Guercio and Tkac, 2008). Coefficient estimates for Silver rated funds are also positive and significant. The flow reaction to Silver rating initiations is 5.47% higher than the flow reaction to Not Recommended ratings when realized flows are used and 3.99% higher than the flow response to Not Recommended funds when residual flows are used. These magnitudes are less than one-half of what we observe for Gold rated funds, indicating a stronger economical influence of Gold ratings on investors' capital allocations. A Wald test shows that the difference in flow response between a Gold and Silver rating initiation is statistically significant with a p-value of 0.078. The results also show that there is relatively a small difference between abnormal flows to Bronze

and Not Recommended funds. Specifically, the flow response to Bronze funds is 2.5% higher for realized, and 1.5% higher for residual flows, but the coefficients are not statistically significant. Morningstar previously grouped funds with positive outlook as recommended in their analyst picks and pans. Following the introduction of the new analyst ratings, some previously recommended funds received a Bronze rating while others received Gold and Silver ratings. Investors might view Bronze funds as inferior relative to Gold and Silver rated funds given their higher level of analyst conviction. As a result, investment decisions based on analyst ratings would lead investors to invest into Gold (or less strongly into Silver) rated funds at the expense of other rated funds.

3.3. The Nature of Flow Response

The previous section shows that investors increase their investment into funds with Gold and to a lesser extent Silver rating initiations. In this section, we analyze how this flow response varies across funds with respect to fund size, investor type (retail versus institutional), fund load, and star ratings. Variation in these fund characteristics may enable us to better understand the nature of the flow response

3.3.1. The Role of Fund Size on the Flow Response

The average fund-dollar is concentrated in a small number of large funds indicating a considerable skewness in the distribution of assets under management. One important implication of this skewness is that any statistically significant effect found in the mutual funds universe can have a small economic importance if confined only to small funds (Clifford and Jordan, 2014). This is less of a concern for our results since rated funds are relatively large funds compared to the overall fund universe as reported in Table 1.[24] Nevertheless, we investigate the role of fund size on the flow response to analyst ratings in order to better understand whether our results are more pertinent to the average investor (or to the average fund-dollar) rather than to the average fund in our sample. Specifically, we sort all rated funds into ascending order based on the fund net assets

[24] Our data filters and size control in our regression specification further mitigate this concern.

at the time of the rating assignments, and assign them into three groups: small, medium, or large. The small fund group contains funds that are in the lowest one-third with respect to net assets. The net assets of the funds in this group range from $79 million to $1,531 million with a mean value of $833 million. The medium fund group includes funds in the middle one-third (mean= $2,508 million), while the large fund group includes funds in the top one-third (mean= $11,128 million). We create dummy indicators for medium and small groups, and add the interactions of these dummies with Gold, Silver, and Bronze into our regressions (2). The coefficients for the Gold, Silver, and Bronze indicators now represent the flow response in largest funds (i.e. in the large fund category). The interaction terms capture the additional response for funds in other size groups, respectively.

Table 3 shows the results. We find that the strong response to Gold rated funds is primarily due to funds in the large fund group. In particular, the abnormal flow to Gold rated funds in the large fund group is 14% higher than flows to Not Recommended funds, while it is around 3% higher for Gold funds in small fund group. In contrast, the significant response to Silver rated funds is primarily due to abnormal flows to funds in the small fund group (p-value=.048), while abnormal flows to Bronze rated funds do not gain significance in any of the three size groups. The results using abnormal residual flows are generally consistent with abnormal flows with the notable exception that flows to Silver rated funds are positive and significant in the large fund group when abnormal residual flows are used. These results suggest that once we focus on fund-dollars rather than funds, our results are economically stronger implying that the reaction to analyst ratings is due to a typical fund investor.

3.3.2. The Role of Investor Type on the Flow Response

According to ICI Factbook (2014), there are almost 9,000 mutual funds in the U.S. at the end of 2013. With such a dizzying number of choices, investors face hefty costs of information gathering and analyzing before investing in a new fund. As a result, mechanisms that reduce search costs such as advertising, marketing, or association with a large fund family may have a material impact

fund investors' choices (Sirri and Tufano, 1998; Jian and Wu, 2000; Gallaher, Kaniel and Starks, 2006).

Retail investors have arguably higher search costs than institutions as they have, on average, fewer resources and less time to allocate to fund research or they lack financial literacy to correctly interpret all available information. Therefore, they may be more dependent on information dissemination from external resources such as financial advisors. We argue that analyst ratings have large marginal value for this group of investors as these ratings package a set of fund information from multiple dimensions into a relatively easy-to-grasp metric. If this is true, we would expect a disproportionately larger flow response to funds that have more assets in retail classes.

To test this premise, we calculate the percentage of assets invested in retail share classes for each rated fund and interact this variable with Gold, Silver, and Bronze indicators in our regressions. On average, 75% of rated fund assets are invested in retail classes. with a standard deviation of 30.6%. Table 4 shows that the flow response to Gold rated funds over the six-month horizon is concentrated in funds with a higher proportion of net assets invested in retail share classes. In particular, a one standard deviation increase in the assets held by retail share classes increases the flow response to Gold rated funds by 5.6% (0.186*0.306=0.056) if realized flows are used, and by 4.0% if residual flows are used. The relation between abnormal fund flows and analyst ratings appears to be isolated in Gold rated funds as the coefficient estimates on the interaction terms suggest that abnormal flows to Silver and Bronze rated funds are not significantly related to the percentage of a fund's assets held in retail share classes. This finding is what one may expect to observe if retail investors use the analyst rating as their sole source of information. Without additional information, it is not clear why an uninformed retail investor would choose a Silver (or Bronze) rated fund over a Gold rated one.

In addition to the percentage of net assets invested in retail share classes, we can also examine the channel through which retail investors are responding to ratings initiations. We do this by examining whether the abnormal flows are to funds with or without load fees. The investor clientèle

of no-load funds is viewed as being sophisticated, relying primarily on fund prospectuses and financial publications to make independent investment decisions. Load funds, on the other hand, cater more to less informed investors, who consider brokers and financial advisors as important sources of information (Nanda, Narayanan, and Warther, 2000; Capon, Fitzsimons, and Prince, 1996; Alexander, Jones, and Nigro, 1998). If the flow response is primarily through no-load funds, it is more likely that the investor is making an independent choice to incorporate the analyst rating in her fund selection criteria. If the fund carries a load fee, it may be that brokers are utilizing high analyst ratings as a sales tool, emphasizing the ratings when they are high and de-emphasizing the ratings when they are lower. To test this relation we compute a load fee variable that is equal to one if the fund carries a load fee, and zero otherwise. We then interact the analyst ratings with the load fee variable to construct a set of interaction variables.

Table 5 shows the results. Abnormal flows to Gold rated funds are positive and significant for both no-load and load funds. In contrast, there appears to be a stronger flow response for Silver and Bronze rated funds in the set of funds with load fees. This finding is consistent with retail investors choosing to invest in Gold rated funds when the rating is the primary source of information used in their selection criteria, while abnormal flows to Silver and Bronze rated funds may result from investors viewing the analyst rating information as incremental new information which may be combined with other information such as that which may be provided by brokers.

Together, these results suggest that the information content of analyst ratings may be of greater value to retail investors in that they may decrease their search costs. Institutional investors, on the other hand, have more resources to obtain the same or correlated underlying information, and hence may not be dependent on analyst rating to the same extent.

3.3.3. The Role of Star Ratings on the Flow Response

Previous literature shows that funds with high star ratings–in particular 4 or 5 star rated funds–attract higher fund flows (see for example, Ivkovic and Weisbenner (2006), and Bergstresser and Poterba (2002)). Del Guercio and Tkac (2008) find that changes in star ratings influence future

fund flows for up to six months. These results suggest that investors' expectations about a funds future performance is at least partially formed by the star ratings assigned to the fund. Given that investors now have two rating systems, an interesting question is how the introduction of the new analyst rating interacts with the previously documented star rating effect. Hence, in this section, we analyze how the impact of analyst ratings changes within high-star and low-star groups.

We create a "high-star" indicator variable that takes the value of one if a fund has 4 or 5 stars, and 0 otherwise. We then replicate our regressions in Section 3.2 including terms which interact the high-star indicator variable with Gold, Silver, and Bronze indicator variables. If investors simply replace backward-looking star ratings with new forward-looking analyst ratings, there should be no incremental effect of star ratings and the flow response to analyst ratings should be similar in both groups. An alternative expectation is that investors use the new analyst ratings in order to complement the star ratings, providing additional information regarding future fund performance. In this case, the analyst ratings should affect fund flows within high star funds, but we expect to observe little or no analyst rating effect if this ratings contradict the star ratings.

Table 6 presents the results. We find a strong, positive relationship between fund flows and Gold rated funds irrespective of the star ratings. The flow response to Gold funds with low stars (i.e. stars with 3 or less) is about 12% for raw flows and 9% for residual flows. While the abnormal flow for funds with high stars (i.e. star with 4 or 5) is 1-2% higher in magnitude, there is no statistical difference from abnormal flows to Gold rated funds with low stars. In contrast, star ratings have important implications for Silver or Bronze funds. Funds benefit from Silver or Bronze ratings only if they are also granted with high stars, implying that investors may invest in Silver and Bronze funds when they incorporate the analyst rating as a subset of the selection criteria used to select funds for their portfolio.

In addition to using the high-star dummy, we conduct a similar analysis using star rating changes by interacting the Gold, Silver, and Bronze indicator variables with "star rating increase" and "star rating decrease" indicator variables. In Table 7, we find that investors do not materially change their decision regarding a Gold rated fund based on the recent star upgrade or downgrade.

This confirms that the main results presented in Table 2 are not driven by flows related to changes in star ratings.

Overall, investors seem to replace star ratings with analyst ratings for Gold funds. Investors may consider the analyst's conviction in assigning the Gold rating as sufficiently strong to ignore the signals provided by star ratings and star rating changes. The results for Silver and Bronze rated funds are consistent with investors viewing the new analyst rating as incremental new information, suggesting that investors jointly process the analyst ratings and star ratings when making investment decisions.

3.4. Robustness

In this section, we conduct two sets of tests to further assess the robustness of our results. First. we use style-adjusted 12-months returns and its square term to control for flow-performance convexity instead of raw returns and volatility used in our previous regressions. We also replace 12 month returns with Fama-French 3-factor alpha and Carhart 4-factor alpha estimated from the previous 36-months to control for long-term performance. Panel A of Table 8 show that none of these modifications materially change our results. Second, we exclude a rated fund from our sample if the fund has a star change in the last 6 months before the analyst rating initiation. Our goal is to mitigate the concern of a plausible confounding star change effect that has been shown in the previous literature (Del Guercio and Tkac, 2008). With this filter, our sample drops to 284 funds. Panel B of Table 8 shows that the abnormal flows to Gold and Silver rated funds are significantly higher than flows to Not Recommended funds similar to our previous results. Finally, we alter our matching procedure by explicitly matching a rated fund to an unrated fund within the same star rating group instead of the same style group. Restricting matches to the set of funds with the same star rating decreases the quality of the matches. For example, the match funds restricted to have the same star rating have an average flow ratio of 0.32% in the previous 12-months compared to average flow ratio for rated funds of 0.18%. This 0.15% difference, when compared with the 0.00% difference reported in Table 1, Panel C, suggests a reduction in the quality of the matching

process. The difference in prior period flows introduces a bias in our tests against finding a flow response. Nevertheless, Panel B of Table 8 shows that after this modification high rated funds still obtain higher abnormal flows, albeit the magnitude are smaller relative our previous results.

4. Analyst Ratings and Out-of-Sample Performance

The purpose of this section is to determine whether there is merit to concluding that the analyst rating system has any bearing on future performance. The positive flow response to Gold rated funds (and to a lesser extent to Silver rated funds) reported in previous analyses may be justified if these ratings are able to identify funds that will outperform peer funds in the period subsequent to the initial rating. To fulfill our goal, we examine whether analyst ratings can predict out-of-sample performance using both event-time and calendar-time analyses.

4.1. Event-time Performance Analysis

We compute out-of-sample performance using cumulative risk-adjusted returns measured over the 6, 12, 18, and 24 months following each fund's initial rating. If Morningstar's analysts are able to predict out-of-sample performance, Gold, Silver, and Bronze rated funds should have higher average risk-adjusted returns than Not Recommended funds.[25] To test this, we regress cumulative, fund-level, risk-adjusted returns on Gold, Silver, and Bronze indicator variables according to the following specification:

$$RET_{i,(1,t+k)} = \alpha + \beta_{Gold} Gold_{i,t} + \beta_{Silver} Silver_{i,t} + \beta_{Bronze} Bronze_{i,t} + Controls_{i,t} + \varepsilon_{i,t} \quad (4)$$

where $RET_{i,(1,t+k)}$ represents the fund's cumulative risk-adjusted return measured over the 6, 12, 18, or 24 months subsequent to the analyst rating initiation. Risk-adjustment is performed using two models, the Fama and French (1993) three factor model and the Carhart (1997) four-factor model. The factor loadings used in risk-adjustment are estimated each month using rolling regressions

[25] Similar to fund flows, we group Negative and Neutral rated funds into a Not Recommended category.

where each fund's excess returns over the prior 36 months are regressed on the indicated risk model.[26] Gold is an indicator variable that takes the value of 1 if the fund is rated Gold, or 0 otherwise. Thus, the coefficient β_{Gold} gives the incremental cumulative risk-adjusted return for Gold rated funds relative to Not Recommended funds. Similarly, the coefficients for Silver and Bronze are corresponding indicators for Silver and Bronze rated funds.

Table 9, Panel A (Panel B) shows the results from regressions of cumulative three-factor (four-factor) risk-adjusted returns on Gold, Silver, and Bronze indicator variables. All regressions include time-fixed effects. The last four specifications of each panel includes controls for star rating fixed effects and changes in star ratings in the regression specification. At the 24-month (18-month) horizon, Gold rated funds outperform Not Recommended funds by 4.9% (3.3%) when three-factor risk-adjusted returns are used (Panel A), and by 4.5% (3.2%) when four-factor risk-adjusted returns are used (Panel B). The magnitude of outperformance does not materially change when we control for star rating fixed effects and changes in the star ratings. The outperformance is most pronounced in, but not limited to, Gold rated funds. We find that Silver and Bronze rated funds have four-factor adjusted returns at the 24-month horizon that are higher than the returns of Not Recommended funds by approximately 2.0% and 1.5% respectively. Results for Silver and Bronze rated funds outperfrom Not Recommended funds when the return horizon is 18 months and/or when the three-factor risk-adjusted returns are used as the dependent variables. Higher rated funds have positive, albeit statistically weak, coefficients for return horizon below 18 months with the exception of Silver rated funds which significantly outperform Not Recommended funds at the 12-month horizon.

In Table 9, Panels C and D, we repeat the analysis in Panels A and B including a set of fund characteristics in the regressions as control variables. The results are qualitatively similar to what we observed in Panel A and B. Gold rated funds have higher risk-adjusted returns than those of Not Recommended funds at horizon of 18 months or more. The performance differences are economically and statistically significant with Gold rated funds outperforming Not Recommended

[26] We require at least 24 months of valid returns to calculate the loadings

funds by more than 3%. Silver and Bronze rated funds also outperform Not Recommended funds, but by a much lesser extent. None of the risk-adjusted measures are significant and some are even negative in magnitude when shorter return horizons are used. Morningstar argues that the ratings are designed to predict performance over relatively longer horizons, in particular, over a full business cycle or approximately 5 years. Consistent with this claim, the results in Table 9 provide some initial evidence of performance predictability of the analyst ratings, in particular Gold ratings, in the post-rating period of 18 or 24 months.

One possibile explanation for the performance results in Table 9 is that abnormal flows to Gold rated funds exert price pressure on the funds existing holdings. Lou (2012) shows that funds with good performance attract inflows which may be invested in the fund's existing holdings. The price pressure on the existing holdings results in continuation of the good performance in the subsequent periods. However, Lou (2012) shows that this flow-induced price pressure reverses in the next 2 years. The large difference between our flow results (significant at 6 months) and performance results (significant at 18 to 24 months) suggest that it is unlikely that our results are driven by flow-induced trading. Rather it is consitent with Morningstar claim that the analyst rating reflects the analyst's conviction in the fund's ability to outperform peer funds over the long term (i.e., a full market cycle of at least five years).

4.2. Calendar-time Performance Analysis

We extend our performance analysis to examine whether investors could earn a significantly higher return by investing their wealth across mutual funds with Gold ratings. We simulate this trading strategy by sorting funds into calendar-time portfolios based on the fund's analyst rating at the beginning of each month. For Gold rated funds, we compute monthly net-of-fee returns and gross portfolio returns (i.e. before expenses) based on an equal-weighted (or value-weighted) investment in each fund that was rated Gold at the beginning of the current month. We repeat the process for each rating category as well as for the sample of unrated funds. The portfolios are rebalanced each month based on the current ratings. The time series of excess returns for each of

the five portfolios (Gold, Silver, Bronze, Not Recommended, and Unrated) are separately regressed on four models including a constant (to compute the mean return), the market model, the Fama and French (1993) three-factor model, and the Carhart (1997) four-factor model. The intercepts, or alphas, from these regressions are compared across portfolios to evaluate the performance an investor would experience if she invested her money across the funds in a given rating category (or in unrated funds). We also compare the relative performance of investing in the rated portfolios relative to an investment in the portfolio of unrated funds.

Table 10 reports the calendar-time portfolio intercepts and factor loadings for each of the four regression specifications. In Table 10, Panel A, the alphas are obtained from regressions where the dependent variables are equal-weighted portfolio returns computed using net of fee returns. The intercepts for each of the portfolios, with the exception of the Gold rated fund portfolio, are negative suggesting funds on average underperform on a risk-adjusted basis (Malkiel, 1995, 2005; Fama and French, 2010). The Gold rated fund portfolio has positive alphas in each of the regression specifications with the exception of the market model alphas that are computed using equally weighted portfolio returns. The Gold rated fund portfolio has risk-adjusted performance that is significantly higher than the performance of unrated funds with monthly alphas of 15 to 18 basis points (t-statistics range from 3.69 to 4.68). In contrast, the performance of Silver and Bronze rated fund portfolios are not significantly higher than the performance of unrated funds. In untabulated results, we confirm that the portfolio of Gold rated funds has significantly higher alphas than a portfolio that contains all funds that are not rated Gold.

These results are robust to alternative specifications of the dependent variables. Table 10, Panel B repeats the analysis using value-weighted, net of fee portfolio returns. Table 10, Panels C and D repeat the analyses using gross (before fees) returns. In each of the cases, the results are consistent with the findings in Panel A. The portfolio of Gold rated funds generally has positive alphas, significantly higher performance than unrated funds, and significantly higher performance than funds not rated Gold.

Together the results in Table 9 and Table 10 show that Gold ratings have predictive power

with respect to risk-adjusted returns measured over relatively longer investment horizons (e.g., greater than 12 months), and that over our sample period investors would have earned significantly higher returns if they picked a portfolio of Gold rated funds relative to a portfolio of unrated funds (or funds with other ratings). Morningstar claims that the analyst rating reflects the analyst's conviction in the fund's ability to outperform peer funds over a full market cycle of at least five years. Consistent with this claim, our findings suggest that analyst ratings appear to sort funds according to future performance, at least during our sample period.

5. Conclusion

In September 2011, Morningstar Inc., the most well-known information intermediary that provides independent research on mutual funds, introduced its new analyst ratings, which express their analyst's forward-looking view regarding the fund's future performance. The analyst rating, ranging from Gold (highest) to Negative (lowest), combines both qualitative and quantitative research, and reflects the subjective assessment of fund's ability to provide superior risk-adjusted returns over the long-term.

Our paper investigates the investors response to these new ratings initiations and the value of these ratings as a plausible addition to investors' investment criteria. We find that investors respond positively to Gold and Silver rated funds relative to other rated funds. Our results hold using realized and residual abnormal flows and are robust to the inclusion of a wide range of fund characteristics. The flow response to positive ratings, specifically to Gold ratings, is stronger among retail investors and in large funds. These results suggest that an average retail investors is more likely to follow these ratings in the allocation of her capital among mutual funds.

We find evidence that the new rating system identifies funds that outperform peer funds at horizons of 18 or 24 months. Moreover, an investor that follows a naive (equal or value weighted) strategy of investing into a portfolio of Gold rated funds would earn significantly higher returns than she would obtain by investing in other rated/or unrated funds. Morningstar's documentation

suggests that the analyst ratings are designed to identify funds that outperform their peers over a full business cycle of at least five years. Our results are in line with this claim. However, given that the analyst rating system has not yet experienced a full cycle, we cannot arrive at a strong conclusion regarding the out-of-sample performance. Even if investors are skeptical about the predictive ability of analyst ratings, they may use such ratings to justify their decisions, allowing them, for example to hide behind experts in case their mutual fund allocations have disappointing performance.

References

Alexander, Gordon J. ,Jonathan D. Jones, and Peter J. Nigro, Mutual fund shareholders: characteristics, investor knowledge, and sources of information, *Financial Services Review* 7, 301-316.

Altınkılıç, Oya, and Robert S. Hansen, 2009, On the information role of stock recommendation revisions, *Journal of Accounting and Economics* 48, 17-36.

Barber, Brad, Terrance Odean and Lu Zheng, 2005, Out of sight, out of mind: The effects of expenses on mutual fund flows, *Journal of Business* 78, 2095-2120.

Bergstresser, D., John M. R. Chalmers, and Peter Tufano. 2009. Assessing the costs and benefits of brokers in the mutual fund industry, *Review of Financial Studies* 22, 4129-4156.

Hackethal, A., M. Haliassos, and T. Jappelli. 2012. Financial Advisors: A Case of Babysitters?, *Journal of Banking & Finance* 36, 509524.

Barber, Brad and Douglas Loeffler, 1993, The "Dartboard" column: Second-hand information and price pressure, *Journal of Financial and Quantitative Analysis* 28, 273-284.

Barber, Brad, Reuven Lehavy, Maureen McNichols, and Brett Trueman, 2001, Can investors profit from the prophets? Security analyst recommendations and stock returns, *Journal of Finance* 56, 531-563.

Barber, Brad , Reuven Lehavy, Maureen McNichols, and Brett Trueman, 2006, Buys, holds, and sells: The distribution of investment banks' stock ratings and the implications for the profitability of analysts' recommendations, *Journal of Accounting and Economics* 41, 87-117.

Bergstresser, Daniel, and James Poterba, 2002, Do after-tax returns affect mutual fund inflows?, *Journal of Financial Economics* 63, 381-414.

Bjerring, James H., Josef Lakonishok, and Theo Vermaelen, 1983, Stock prices and financial analysts' recommendations, *Journal of Finance* 38, 187-204.

Blake, Christopher R., and Matthew R. Morey, 2000, Morningstar ratings and mutual fund performance, *Journal of Financial and Quantitative Analysis* 35, 451-483.

Blume, Marshall E., 1998, An Anatomy of Morningstar ratings, *Financial Analysts Journal* 54, 19-27.

Brown, Nerissa C., Kelsey D. Wie, and Russ Wermers, 2013, Analyst recommendations, mutual fund herding, and overreaction in stock prices, *Management Science* 60, 1-20.

Capon, Noel, Gavan J. Fitzsimons, and Russ Alan Price, 1996, An individual level analysis of mutual fund investment decision, *Journal of Financial Research* 10, 59-82.

Carhart, Mark M., 1997, On the persistence of mutual fund performance, *Journal of Finance* 52, 57-82.

Chevalier, Judith and Glenn Ellison, 1997, Risk taking by mutual funds as a response to incentives, *Journal of Political Economy* 105, 1167-1200.

Clement, M.B., 1999. Analyst forecast accuracy: do ability, resources, and portfolio complexity matter? *Journal of Accounting and Economics* 27, 285303.

Clifford, Christopher P., Bradford D. Jordan, and Timothy B. Riley, 2012, Average funds versus average dollars: Implications for mutual fund research, Working paper, University of Kentucky.

Copeland, Thomas E., and David Mayers, 1982, The Value line enigma (1965-1978): A case study of performance evaluation issues, *Journal of Financial Economics* 10, 289-321.

Coval, Joshua and Erik Stafford, 2007, Asset fire sales (and purchases) in equity markets, *Journal of Financial Economics* 86, 479-512.

Cooper, Michael J., Huseyin Gulen, and Raghavendra Rau P., 2005, Changing names with style: Mutual fund name changes and their effects in fund flows, *Journal of Finance* 60, 2825-2858.

Del Guercio, Diane, and Paula A. Tkac, 2002, The determinants of the flow of funds of managed portfolios, *Journal of Financial and Quantitative Analysis* 37, 523-557.

Del Guercio, Diane, and Paula A. Tkac, 2008, Star power: The effect of Morningstar ratings on mutual fund flow, *Journal of Financial and Quantitative Analysis* 43, 907-936.

Del Guercio, Diane, Egemen Genc, and Hai Tran, 2015, Playing favorites: Conflicts of interest in mutual fund management, Working Paper, Universtiy of Oregon and Erasmus University.

Deli, 2002, Mutual fund advisory contracts: An empirical investigation, *Journal of Finance* 52, 109-133

Desai, Hemang and Prem C. Jain, 1995, An analysis of the recommendations of the "Superstar" money managers at Barron's Annual Roundtable, *Journal of Finance* 50, 1257-1273.

Elton, Edwin J., Martin J. Gruber, and Christopher R. Blake, 2001, A first look at the accuracy of the CRSP mutual fund database and a comparison of the CRSP and Morningstar mutual fund databases, *Journal of Finance* 56, 2415-2430.

Evans, Richard B., 2010, Mutual fund incubation, *Journal of Finance* 65, 1581-1611.

Fama, Eugene F. and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

Fama, Eugene F. and Kenneth R. French, 2010, Luck versus skill in the cross-section of mutual fund returns, *Journal of Finance* 65, 1915-1947.

Fama, Eugene F. and James D. MacBeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607-636.

Frazzini, A. and Owen A. Lamont, 2008, Dumb money: Mutual fund flows and the cross-section of stock returns, *Journal of Financial Economics* 88, 299-322.

Gallaher, Steven, Ron Kaniel, and Laura T. Starks, 2006, Madison Avenue meets Wall Street: Mutual fund families, competition and advertising, Working Paper, University of Texas at Austin and University Rochester.

Gleason, Cristi A., and Charles M.C. Lee, 2003, Analyst forecast revisions and market price discovery. *Accounting Review* 78, 193-225.

Gottesman, Aron, and Matthew R. Morey, 2006, Morningstar mutual fund ratings redux, Working Paper, Pace University.

Hillion, Pierre, and Theo Vermaelen, 2004, Death spiral convertibles, *Journal of Financial Economics* 71, 381415.

Huang, Jennifer, Kelsey D. Wei, and Hong Yan, 2007, Participation costs and the sensitivity of fund flows to past performance, *Journal of Finance* 57, 1273-1310.

Invesment Company Institute, 2012, 2012 Investment Company Fact Book : A review of trends and activity in the U.S. Investment Company Industry.

Jain, Prem C., and Joanna Shuang Wu, 2000, Truth in mutual fund advertising: Evidence on future performance and fund flows, *Journal of Finance* 55, 937-958.

Irvine, P.J.A., 2001, Do analysts generate trade for their firms? Evidence form the Toronto stock exchange, *Journal of Accounting and Economics* 30, 209-226.

Irvine, P., 2004, Analysts' forecasts and brokerage-firm trading, *Accounting Review* 79, 12550.

Ivkovič, Zoran, and Scott Weisbenner, 2009, Individual investor mutual fund flows, *Journal of Financial Economics* 92, 223-237.

Ivkovič, Zoran, Jegadeesh, Narasimhan, 2004. The timing and value of forecast and recommendation revisions. *Journal of Financial Economics* 73, 433463

Jegadeesh, N., Joonghyuk Kim, Susan D. Krissche, and Charles M. C. Lee, 2004, Analyzing the analysts: When do recommendations add value? *Journal of Finance* 59, 1083124.

Jenkinson, Tim, Howard Jones, and Jose Vicente Martinez, 2015, Picking winners? Investment consultants' recommendations of fund managers, *Journal of Finance*, Forthcoming.

Inderst, R. and Marco Ottaviani, 2009, Misselling through Agents, *American Economic Review* 99, 883-908.

Inderst, R. and Marco Ottaviani, 2012, Competition through commissions and kickbacks, *American Economic Review* 102, 780-809

Karabulut, Y., 2013, Financial Advice: An Improvement for Worse?, Working paper, Goethe University Frankfurt.

Kraussl, Roman, and Ralph Sandelowsky, 2007, The predictive performance of Morningstars mutual fund ratings, Working Paper, University of Amsterdam.

Li, Xi, 2005, The persistence of relative performance in stock recommendations of sell-side financial analysts, *Journal of Accounting and Economics* 40, 129-152.

Lin, Hsiou-wei, and Maureen F. McNichols. Underwriting relationships, analysts' earnings forecasts and investment recommendations. *Journal of Accounting and Economics* 25, 101-127.

Lou, Dong, 2012, A flow-based explanation for return predictability, *Review of Financial Studies* 25, 3457-3489.

Malkiel, Burton G., 1995, Returns form investing in equity mutual funds 1971 to 1991, *Journal of Finance* 50, 549-572.

Malkiel, Burton G. 2005, Reflections on the efficient market hypothesis: 30 years later, *Financial Review* 40, 1-9.

Mikhail, Michael B., Beverly R. Walther, and Richard H. Willis. When security analysts talk, who listens?. *Accounting Review*, 1227-1253.

Morey, Matthew R., 2002, Mutual fund age and Morningstar ratings, *Financial Analyst Journal* 58, 56-63.

Morey, Matthew R., 2005, The kiss of death? A 5-star Morningstar rating, *Journal of Investment Management* 3, 41-52.

Morningstar, December 13, 2012, Morningstar rating for funds fact sheet.

Morningstar Fund Research Group, November 15, 2011, Morningstar Analyst Rating for Funds Methodology Document.

Nanda, Vikram, M.P Narayanan, Vincent A. Warther, *Journal of Financial Economics* 57, 417-443

Petersen, Mitchell A., 2009, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies* 22, 435-480.

Robello, M., and Kelsey D. Wei, 2014, A Glimpse behind a closed door: The long-term investment value of buy-side research and its effect on fund trades and performance, *Journal of Accounting Research* 52, 775-815

Rosenbaum, Paul R. and Rubin, Donald B. (1983), The Central Role of the Propensity Score in Observational Studies for Causal Effects, Biometrika, 70, 41-55.

Sirri, Erik R., and Peter Tufano, 1998, Costly search and mutual fund flows, *Journal of Finance* 53, 15891622.

Villalonga, Belén, 2004, Does diversification cause the diversification discount? Financial Management 33, 527.

Wermers, 2004 , Is money really ”smart”? New evidence on the relation between mutual fund flows, manager behavior, and performance persistence, Working Paper, University of Maryland.

Womack, Kent L, 1996, Do analysts' recommendations have investment value?, *Journal of Finance* 51, 137-167.

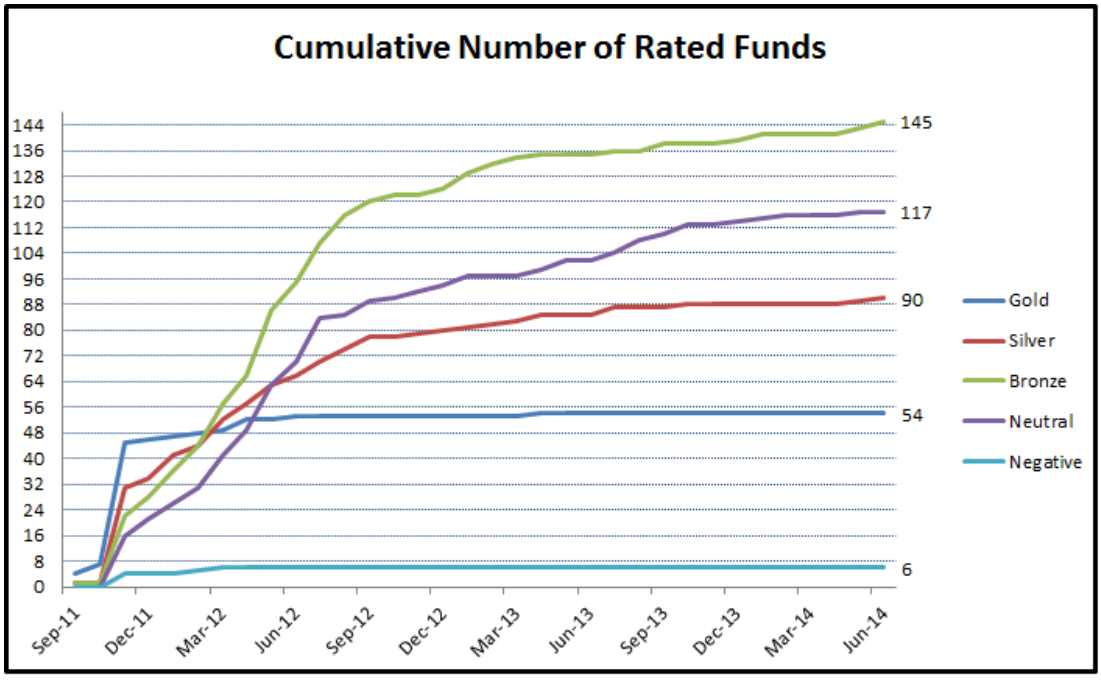
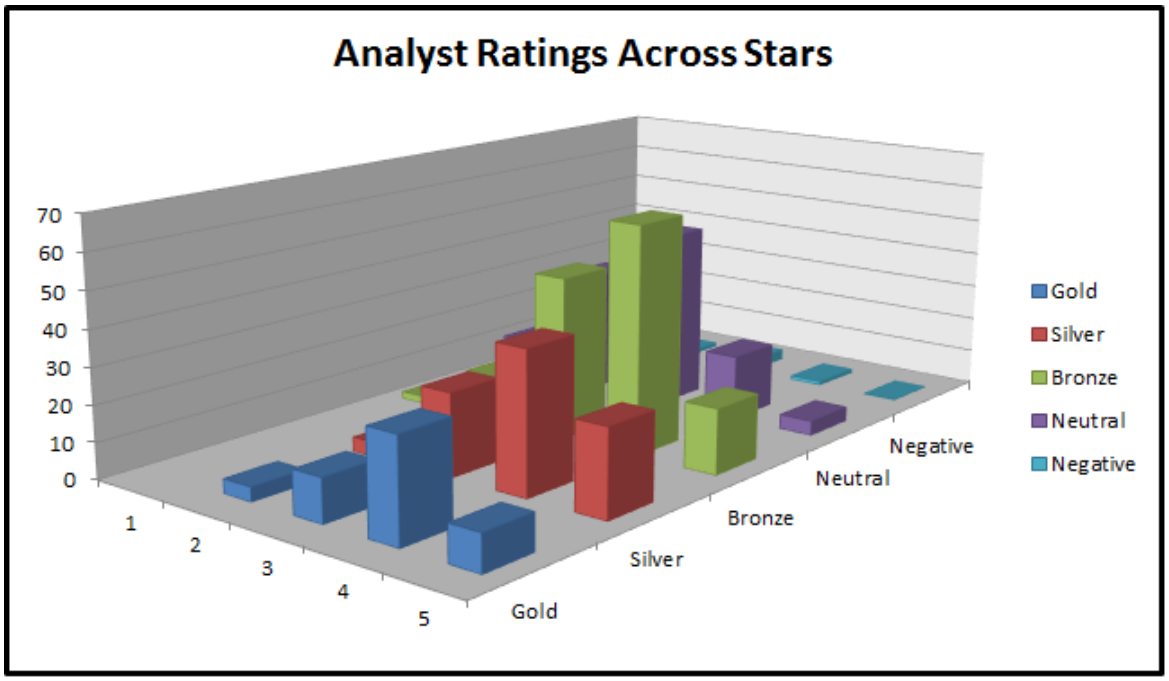


Figure 1. Analyst Ratings Initiations

This figure shows the cumulative number of funds within each analyst rating group over the period September, 2011 to December 2014



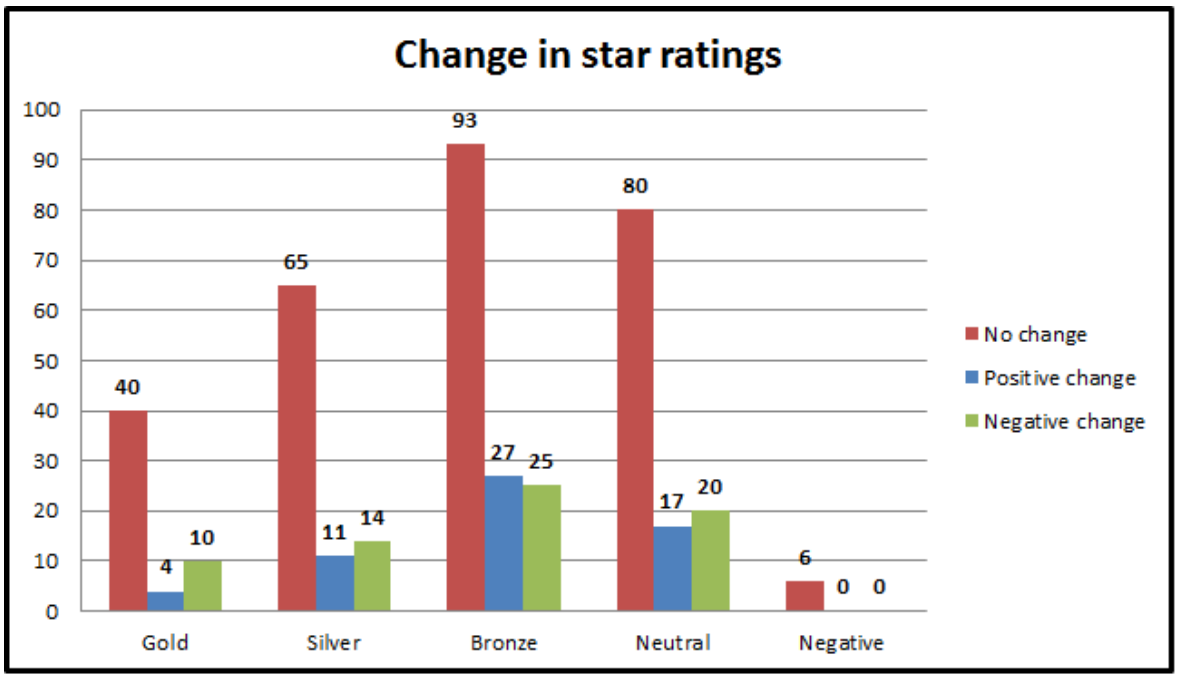


Figure 2. Analyst Ratings Initiations and Star Ratings

This figure shows the distribution of analyst ratings initiations with respect to Morningstar star ratings. Figure 2A (top) shows the distribution of star ratings within each analyst rating category. Figure 2B (bottom) shows the distribution of star ratings changes over the 6-months immediately preceding the analyst rating initiation.

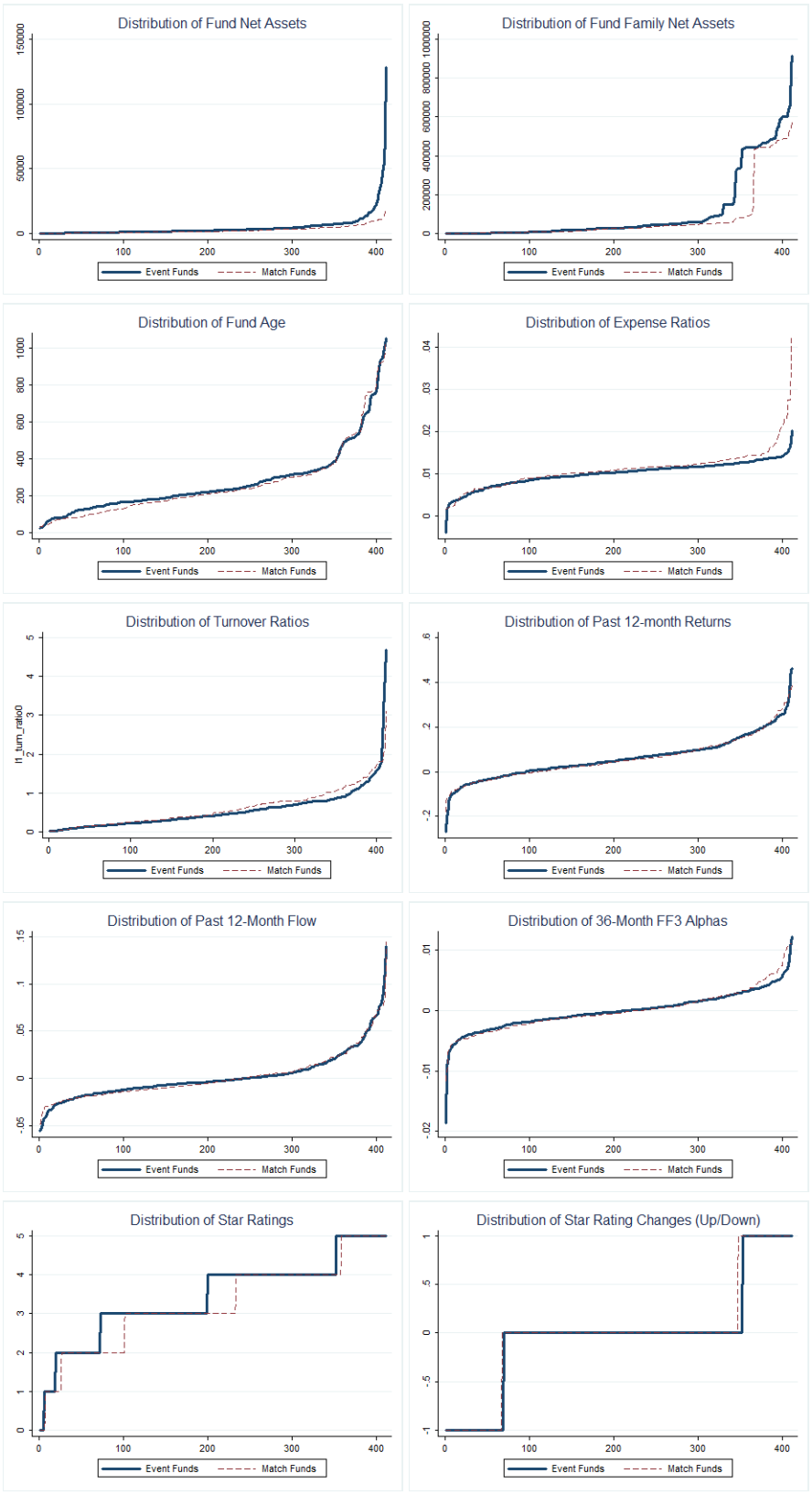


Figure 3. Distribution of Fund Characteristics, Rated Funds versus Matched Funds

This figure compares the distribution of characteristics of the rated funds with the distribution of characteristics of the best matched funds. The matched funds are identified using a multinomial logistic regression detailed in Section 3.1.1. Fund characteristics (identified in the header of each panel) include fund net assets, fund family net assets, fund age, expense ratios, turnover ratios, past 12-month returns, past 12-month flow ratios, past 36-month Fama and French 3-factor alphas, star ratings, and star rating changes over last 6 months.

Table 1: Fund Characteristics and Analyst Rating Initiations

Shown below are summary statistics of lagged fund characteristics at the time of analyst rating initiation (September 2011 to December 2012). Panel A presents average values for rated and and unrated funds for the following fund characteristics: Fund net assets (TNA), fund family net assets (Family TNA), age (measured in months), expense ratio, turnover, cumulative 12 month return, cumulative 12 month flow, Fama and French 3-factor alpha, and maximum manager tenure. Panel B presents the average values of the same characteristics measured within each analyst rating category. Panel C presents the average values of the same characteristics for the matched funds used as a control group. T-statistics are computed using robust standard errors.

Panel A: Fund characteristics of rated and unrated funds

	TNA	Family TNA	Age	Exp. Ratio	Turnover	12M Return	12M Flow	FF3 Alpha	Max Tenure
Rated Funds	4,839	108,050	272.6	1.00%	54.74%	6.05%	0.18%	0.00%	128.8
Unrated Funds	670.7	4297.9	139.9	1.17%	77.49%	5.44%	0.01%	-0.10%	95.1
Rated-Unrated	4,168	103,752	132.8	-0.18%	-22.76%	0.61%	0.17%	0.09%	33.7
t-statistic	8.85	11.75	14.85	-12.55	-9.20	2.36	1.38	6.20	7.69

Panel B: Fund characteristics by analyst rating

	TNA	Family TNA	Age	Exp. Ratio	Turnover	12M Return	12M Flow	FF3 Alpha	Max Tenure
Gold	8,309	109,878	283.0	0.86%	33.75%	7.15%	0.42%	0.19%	189.5
Silver	7,767	108,499	240.1	1.00%	38.86%	6.88%	1.05%	0.12%	147.3
Bronze	2,853	62,651	277.4	1.09%	57.55%	5.93%	0.63%	0.00%	123.8
Neutral	3,627	162,922	285.8	0.93%	70.36%	5.15%	-1.05%	-0.18%	95.3
Negative	1,272	112,009	294.0	1.14%	109.04%	3.98%	-2.06%	-0.22%	79.3

Panel C: Match fund characteristics

	TNA	Family TNA	Age	Exp. Ratio	Turnover	12M Return	12M Flow	FF3 Alpha	Max Tenure
Match Funds	2,715	76,304	261.4	1.10%	60.74%	5.90%	0.18%	0.00%	131.2
Rated-Match	2,124	31,746	11.3	-0.10%	-6.00%	0.15%	0.00%	-0.01%	-2.4
t-statistic	4.59	3.10	0.97	-4.16	-2.02	0.47	0.01	-0.38	-0.39

Table 2: Match-Adjusted Fund Flows and Analyst Ratings Initiations

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds. Flow measures are constructed using monthly realized flows and residual flows; details on the construction of these variables are provided in Section 2.3. The dependent variables are measured over the indicated windows. For example, the [1,6] window indicates that flows are computed by cumulating flows over the 6 months following the rating initiation. Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, lagged fund characteristics, and star change indicator variables. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. *p*-values from a Wald test of the difference between the indicated coefficient estimates are included at the bottom of each of the panels. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	0.1107	0.0230	-0.0031	0.0188	0.0850	0.0172	-0.0046	0.0103
	3.21	1.43	-0.43	0.91	3.97	1.34	-0.70	0.56
Silver	0.0547	0.0069	-0.0038	0.0010	0.0399	0.0056	-0.0037	0.0036
	2.27	0.45	-0.57	0.06	2.69	0.46	-0.60	0.23
Bronze	0.0271	0.0003	-0.0051	0.0090	0.0152	-0.0048	-0.0074	0.0128
	1.35	0.02	-0.91	0.53	1.15	-0.46	-1.44	0.91
ln(Net Assets)	-0.0111	-0.0069	-0.0056	-0.0070	-0.0081	-0.0058	-0.0057	-0.0047
	-1.31	-1.22	-1.73	-1.07	-1.58	-1.31	-1.89	-0.87
ln(Family Net Assets)	0.0036	0.0057	0.0034	0.0049	-0.0006	0.0028	0.0027	0.0046
	0.90	2.32	2.52	1.50	-0.24	1.45	2.13	1.70
ln(Age)	0.0211	0.0058	0.0019	0.0065	0.0126	0.0029	0.0006	0.0053
	1.89	0.98	0.82	0.92	1.77	0.61	0.29	0.88
Expense Ratio	-2.4713	-0.7844	-0.8061	0.7921	-2.2229	-1.0203	-1.0762	1.2844
	-1.21	-0.57	-0.77	0.57	-1.84	-0.96	-1.04	1.12
Turnover	-0.0071	0.0003	-0.0001	-0.0243	-0.0045	-0.0002	0.0004	-0.0185
	-0.34	0.02	-0.02	-1.37	-0.38	-0.01	0.10	-1.24
Return (Past 12 mo.)	1.1622	0.5616	0.1604	0.4685	0.4567	0.2097	0.0427	0.0305
	7.41	5.55	4.14	3.56	5.01	2.61	1.19	0.27
Return Vol. (Past 12 mo.)	1.1819	0.3075	0.1768	-0.4544	0.6505	0.2488	0.1631	0.0028
	1.47	0.67	0.74	-0.68	1.32	0.69	0.72	0.01
Net Flow (Past 12 mo.)	3.0512	1.8286	0.6275	6.1534	0.8730	0.6219	0.2128	2.5022
	8.00	7.93	5.14	21.96	3.92	3.78	1.95	11.24
Star Rating Increase	0.0512	0.0193	0.0057	0.0227	0.0325	0.0138	0.0053	0.0158
	1.79	1.09	0.67	1.19	1.87	0.99	0.67	1.05
Star Rating Decrease	-0.0093	-0.0106	-0.0012	-0.0029	0.0021	-0.0026	0.0017	-0.0018
	-0.39	-0.86	-0.18	-0.20	0.15	-0.28	0.28	-0.15
Intercept	0.0152	-0.0235	0.0018	0.0077	-0.0169	-0.0369	-0.0054	0.0488
	0.33	-0.80	0.13	0.10	-0.45	-1.23	-0.42	0.73
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.402	0.371	0.204	0.759	0.178	0.093	0.050	0.404
p-values from Wald tests of difference between indicated coefficient estimates								
Gold-Silver	0.078	0.247	0.905	0.361	0.017	0.271	0.875	0.692
Gold-Bronze	0.012	0.119	0.769	0.597	0.001	0.051	0.662	0.877
Silver-Bronze	0.204	0.631	0.834	0.613	0.057	0.333	0.510	0.481

Table 3: Match-Adjusted Fund Flows, Analyst Ratings Initiations, and Fund Size

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds (additional details are provided in Table 3). Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, size group interaction variables, lagged fund characteristics, and star change indicator variables. Size groups are formed by sorting rated funds into three portfolios (small, medium, and large) based on lagged fund net assets. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	0.1477	0.0401	0.0018	0.0398	0.1073	0.0293	-0.0008	0.0301
	3.13	1.97	0.19	1.68	3.75	1.83	-0.09	1.47
Silver	0.0408	-0.0128	-0.0093	0.0133	0.0374	-0.0065	-0.0079	0.0147
	1.46	-0.75	-1.26	0.69	2.19	-0.48	-1.20	0.90
Bronze	0.0000	-0.0148	-0.0092	-0.0250	0.0014	-0.0122	-0.0099	-0.0145
	0.00	-0.74	-1.23	-1.01	0.07	-0.72	-1.43	-0.71
Gold-Medium	-0.0731	-0.0559	-0.0214	-0.0587	-0.0291	-0.0317	-0.0147	-0.0563
	-0.95	-2.16	-1.96	-1.61	-0.65	-1.56	-1.33	-1.68
Silver-Medium	-0.0291	-0.0108	-0.0076	-0.0545	-0.0165	-0.0029	-0.0039	-0.0444
	-1.02	-0.60	-0.94	-2.00	-0.98	-0.22	-0.56	-1.87
Bronze-Medium	0.0307	0.0192	0.0019	0.0208	0.0260	0.0155	0.0024	0.0167
	0.88	0.92	0.24	0.78	1.22	0.93	0.33	0.75
Gold-Small	-0.1155	-0.0445	-0.0080	-0.0435	-0.0750	-0.0337	-0.0070	-0.0368
	-2.08	-1.82	-0.78	-1.06	-2.22	-1.64	-0.73	-1.04
Silver-Small	0.0701	0.0720	0.0243	0.0079	0.0250	0.0418	0.0174	0.0034
	1.13	1.97	1.83	0.20	0.75	1.49	1.45	0.11
Bronze-Small	0.0419	0.0219	0.0080	0.0621	0.0156	0.0074	0.0041	0.0501
	1.10	0.91	0.67	2.11	0.69	0.40	0.37	2.15
ln(Net Assets)	-0.0121	-0.0064	-0.0054	-0.0070	-0.0094	-0.0058	-0.0056	-0.0050
	-1.38	-1.04	-1.46	-0.92	-1.76	-1.20	-1.64	-0.81
ln(Family Net Assets)	0.0043	0.0069	0.0040	0.0058	-0.0008	0.0032	0.0031	0.0052
	0.97	2.62	2.73	1.70	-0.32	1.61	2.25	1.86
ln(Age)	0.0208	0.0059	0.0018	0.0054	0.0126	0.0032	0.0006	0.0044
	1.91	1.02	0.80	0.77	1.81	0.66	0.30	0.73
Expense Ratio	-2.6433	-0.7134	-0.7592	0.6608	-2.3525	-0.9916	-1.0444	1.1524
	-1.30	-0.52	-0.71	0.46	-1.94	-0.93	-0.99	0.98
Turnover	-0.0058	0.0005	-0.0004	-0.0254	-0.0032	0.0003	0.0003	-0.0194
	-0.30	0.03	-0.08	-1.41	-0.28	0.03	0.08	-1.29
Return (Past 12 mo.)	1.1635	0.5617	0.1604	0.4691	0.4544	0.2083	0.0424	0.0300
	7.26	5.65	4.17	3.52	4.89	2.61	1.20	0.26
Return Vol. (Past 12 mo.)	1.2043	0.3643	0.2183	-0.3888	0.6177	0.2608	0.1867	0.0552
	1.45	0.78	0.89	-0.57	1.22	0.72	0.80	0.10
Net Flow (Past 12 mo.)	3.0337	1.8342	0.6286	6.1165	0.8775	0.6340	0.2160	2.4742
	7.92	7.95	4.73	21.38	3.92	3.83	1.79	10.94
Star Rating Increase	0.0453	0.0164	0.0043	0.0156	0.0310	0.0131	0.0046	0.0103
	1.60	0.96	0.53	0.85	1.80	0.98	0.62	0.70
Star Rating Decrease	-0.0102	-0.0108	-0.0013	-0.0046	0.0015	-0.0027	0.0017	-0.0032
	-0.43	-0.87	-0.19	-0.31	0.11	-0.29	0.27	-0.26
Intercept	0.0113	-0.0219	0.0016	-0.0084	-0.0165	-0.0337	-0.0049	0.0354
	0.24	-0.74	0.12	-0.11	-0.43	-1.14	-0.40	0.53
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.411	0.389	0.210	0.765	0.184	0.102	0.046	0.419

Table 4: Match-Adjusted Fund Flows, Analyst Ratings Initiations, and Retail Percentage of Net Assets

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds (additional details are provided in Table 3). Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, retail interaction variables, lagged fund characteristics, and star change indicator variables. Retail interaction variables are computed by multiplying each rating indicator by Retail Percent. Retail Percent is computed as the ratio of retail lagged net assets to fund lagged net assets. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	-0.0326	-0.0420	-0.0122	0.0375	-0.0169	-0.0439	-0.0168	0.0288
	-0.58	-0.99	-0.64	0.86	-0.51	-1.31	-0.97	0.73
Silver	0.0918	0.0224	0.0034	0.0836	0.0499	-0.0001	-0.0037	0.0684
	1.39	0.45	0.17	1.49	1.34	0.00	-0.19	1.50
Bronze	-0.0144	-0.0131	-0.0076	0.0409	-0.0328	-0.0307	-0.0147	0.0445
	-0.25	-0.31	-0.45	0.95	-1.00	-0.89	-0.93	1.20
Gold*Retail Percent	0.1841	0.0832	0.0123	-0.0254	0.1310	0.0783	0.0164	-0.0244
	2.30	1.68	0.58	-0.46	2.76	2.02	0.85	-0.49
Silver*Retail Percent	-0.0518	-0.0218	-0.0094	-0.1104	-0.0151	0.0064	0.0001	-0.0862
	-0.62	-0.37	-0.40	-1.54	-0.31	0.14	0.01	-1.50
Bronze*Retail Percent	0.0554	0.0176	0.0037	-0.0404	0.0638	0.0339	0.0099	-0.0404
	0.79	0.35	0.16	-0.73	1.52	0.83	0.47	-0.86
Retail Percent (of TNA)	-0.0432	-0.0216	0.0066	0.0534	-0.0421	-0.0355	0.0006	0.0485
	-0.77	-0.53	0.39	1.20	-1.25	-1.05	0.04	1.28
ln(Net Assets)	-0.0101	-0.0064	-0.0054	-0.0061	-0.0078	-0.0057	-0.0056	-0.0039
	-1.15	-1.09	-1.66	-0.91	-1.50	-1.25	-1.85	-0.69
ln(Family Net Assets)	0.0045	0.0062	0.0033	0.0047	0.0000	0.0034	0.0026	0.0043
	1.11	2.50	2.42	1.48	-0.01	1.67	2.03	1.63
ln(Age)	0.0232	0.0069	0.0017	0.0067	0.0137	0.0039	0.0004	0.0054
	2.08	1.16	0.72	0.92	1.91	0.80	0.20	0.86
Expense Ratio	-2.0010	-0.5667	-0.8068	0.9613	-1.9147	-0.8416	-1.0836	1.3750
	-0.95	-0.40	-0.74	0.69	-1.54	-0.78	-1.02	1.22
Turnover	-0.0071	0.0002	0.0003	-0.0227	-0.0048	-0.0008	0.0007	-0.0171
	-0.34	0.01	0.07	-1.32	-0.39	-0.06	0.16	-1.19
Return (Past 12 mo.)	1.1201	0.5423	0.1573	0.4480	0.4323	0.1975	0.0411	0.0156
	7.36	5.57	4.13	3.40	4.82	2.53	1.16	0.14
Return Vol. (Past 12 mo.)	1.0611	0.2437	0.1783	-0.4675	0.5844	0.1994	0.1658	-0.0048
	1.31	0.52	0.72	-0.70	1.18	0.54	0.70	-0.01
Net Flow (Past 12 mo.)	3.0847	1.8422	0.6332	6.1959	0.8896	0.6242	0.2150	2.5351
	8.20	7.96	5.10	22.66	4.00	3.74	1.93	11.59
Star Rating Increase	0.0509	0.0189	0.0061	0.0242	0.0325	0.0131	0.0056	0.0170
	1.79	1.05	0.70	1.27	1.89	0.94	0.69	1.12
Star Rating Decrease	-0.0141	-0.0131	-0.0011	-0.0034	-0.0005	-0.0046	0.0019	-0.0021
	-0.61	-1.05	-0.16	-0.23	-0.04	-0.49	0.29	-0.17
Intercept	0.0573	-0.0052	-0.0021	-0.0364	0.0271	-0.0049	-0.0039	0.0071
	0.82	-0.10	-0.09	-0.37	0.55	-0.11	-0.17	0.09
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.409	0.372	0.199	0.759	0.193	0.096	0.044	0.404

Table 5: Match-Adjusted Fund Flows, Analyst Ratings Initiations, and Fund Loads

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds (additional details are provided in Table 3). Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, fund load interaction variables, lagged fund characteristics, and star change indicator variables. Fund load interaction variables are computed by multiplying each rating indicator by the fund's load. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	0.1195	0.0254	-0.0035	0.0212	0.0896	0.0190	-0.0049	0.0149
	2.85	1.41	-0.43	0.89	3.63	1.38	-0.68	0.71
Silver	0.0258	-0.0017	-0.0052	-0.0199	0.0273	0.0022	-0.0034	-0.0107
	0.96	-0.09	-0.64	-0.91	1.66	0.16	-0.47	-0.58
Bronze	-0.0010	-0.0094	-0.0120	0.0446	-0.0151	-0.0203	-0.0165	0.0420
	-0.03	-0.43	-1.28	1.93	-0.80	-1.15	-1.84	2.12
Gold*Load	-0.0339	-0.0107	-0.0010	0.0000	-0.0218	-0.0098	-0.0018	-0.0074
	-0.60	-0.40	-0.09	0.00	-0.64	-0.48	-0.18	-0.26
Silver*Load	0.0458	0.0140	0.0027	0.0322	0.0204	0.0059	0.0002	0.0215
	1.34	0.65	0.30	1.16	1.03	0.36	0.02	0.94
Bronze*Load	0.0417	0.0152	0.0107	-0.0494	0.0444	0.0230	0.0138	-0.0416
	1.21	0.63	0.92	-2.18	2.16	1.23	1.25	-2.11
Load	-0.5680	-0.2880	-0.1878	0.3246	-0.5365	-0.3104	-0.2148	0.3660
	-1.12	-0.96	-1.34	0.85	-1.48	-1.30	-1.57	1.15
ln(Net Assets)	-0.0098	-0.0063	-0.0052	-0.0077	-0.0069	-0.0051	-0.0053	-0.0054
	-1.17	-1.10	-1.62	-1.16	-1.37	-1.15	-1.76	-0.97
ln(Family Net Assets)	0.0040	0.0059	0.0035	0.0047	-0.0003	0.0030	0.0028	0.0045
	1.00	2.36	2.58	1.45	-0.10	1.53	2.22	1.66
ln(Age)	0.0218	0.0062	0.0022	0.0055	0.0135	0.0035	0.0011	0.0043
	1.96	1.05	0.99	0.76	1.89	0.72	0.50	0.69
Expense Ratio	-2.1392	-0.5961	-0.6807	0.5597	-1.8873	-0.8134	-0.9286	1.0378
	-1.04	-0.42	-0.65	0.40	-1.55	-0.75	-0.90	0.90
Turnover	-0.0067	0.0004	0.0001	-0.0266	-0.0036	0.0004	0.0008	-0.0204
	-0.33	0.02	0.03	-1.49	-0.30	0.03	0.20	-1.36
Return (Past 12 mo.)	1.1432	0.5515	0.1548	0.4819	0.4381	0.1982	0.0356	0.0410
	7.10	5.29	3.89	3.65	4.70	2.38	0.96	0.36
Return Vol. (Past 12 mo.)	1.0450	0.2608	0.1548	-0.3777	0.5340	0.1922	0.1356	0.0607
	1.29	0.57	0.66	-0.57	1.07	0.54	0.61	0.11
Net Flow (Past 12 mo.)	2.9814	1.8082	0.6237	6.1443	0.8307	0.6053	0.2094	2.4908
	7.81	7.85	5.00	21.36	3.70	3.68	1.86	10.90
Star Rating Increase	0.0513	0.0193	0.0056	0.0243	0.0321	0.0134	0.0051	0.0169
	1.74	1.08	0.66	1.27	1.78	0.95	0.64	1.12
Star Rating Decrease	-0.0121	-0.0123	-0.0025	-0.0005	-0.0010	-0.0047	0.0002	0.0007
	-0.52	-1.01	-0.36	-0.03	-0.07	-0.49	0.04	0.06
Intercept	0.0434	-0.0136	0.0080	-0.0197	0.0110	-0.0228	0.0026	0.0263
	0.85	-0.42	0.46	-0.25	0.29	-0.75	0.16	0.40
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.401	0.366	0.199	0.760	0.184	0.091	0.048	0.408

Table 6: Match-Adjusted Fund Flows, Analyst Ratings Initiations, and Star Ratings

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds (additional details are provided in Table 3). Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, star rating interaction variables, lagged fund characteristics, and star change indicator variables. Star rating interaction variables are computed by multiplying each rating indicator by HighStar. HighStar is a dummy variable that takes the value of 1 if the fund's star rating is 4 or 5, and zero otherwise. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	0.1232	0.0245	-0.0001	0.0309	0.0911	0.0215	0.0002	0.0197
	2.07	1.12	-0.01	0.99	2.52	1.22	0.02	0.69
Silver	0.0197	-0.0141	-0.0079	-0.0083	0.0106	-0.0168	-0.0080	-0.0016
	0.69	-0.83	-1.04	-0.34	0.57	-1.28	-1.14	-0.07
Bronze	-0.0010	-0.0300	-0.0132	0.0076	0.0028	-0.0290	-0.0143	0.0120
	-0.04	-2.08	-1.84	0.36	0.17	-2.65	-2.18	0.69
Gold*HighStar	0.0179	0.0370	0.0046	-0.0183	0.0106	0.0254	0.0000	-0.0152
	0.24	1.25	0.40	-0.43	0.23	1.00	0.00	-0.39
Silver*HighStar	0.0905	0.0720	0.0157	0.0141	0.0642	0.0665	0.0140	0.0069
	2.08	2.71	1.41	0.37	2.30	3.07	1.44	0.21
Bronze*HighStar	0.0888	0.0934	0.0237	0.0037	0.0436	0.0758	0.0198	0.0015
	2.09	3.50	1.97	0.11	1.59	3.39	1.83	0.05
HighStar	-0.0908	-0.0213	0.0017	-0.0211	-0.0358	-0.0027	0.0110	-0.0546
	-1.45	-0.59	0.11	-0.23	-0.78	-0.08	0.80	-0.72
ln(Net Assets)	-0.0089	-0.0047	-0.0051	-0.0069	-0.0069	-0.0039	-0.0053	-0.0048
	-1.03	-0.83	-1.59	-1.07	-1.32	-0.90	-1.77	-0.88
ln(Family Net Assets)	0.0035	0.0056	0.0034	0.0050	-0.0007	0.0027	0.0027	0.0046
	0.86	2.28	2.47	1.50	-0.29	1.41	2.11	1.71
ln(Age)	0.0204	0.0055	0.0018	0.0061	0.0121	0.0026	0.0005	0.0051
	1.84	0.97	0.78	0.86	1.69	0.56	0.23	0.83
Expense Ratio	-2.1031	-0.4798	-0.7256	0.8646	-2.0032	-0.7474	-0.9999	1.3305
	-1.04	-0.35	-0.68	0.62	-1.66	-0.72	-0.96	1.16
Turnover	-0.0096	-0.0018	-0.0006	-0.0248	-0.0061	-0.0021	-0.0001	-0.0188
	-0.47	-0.11	-0.13	-1.38	-0.51	-0.16	-0.02	-1.25
Return (Past 12 mo.)	1.1372	0.5503	0.1585	0.4596	0.4335	0.1955	0.0402	0.0254
	7.32	5.41	4.02	3.46	4.78	2.45	1.11	0.22
Return Vol. (Past 12 mo.)	1.1539	0.2664	0.1613	-0.4567	0.6563	0.2205	0.1489	-0.0013
	1.43	0.59	0.68	-0.67	1.34	0.63	0.66	0.00
Net Flow (Past 12 mo.)	3.0534	1.8360	0.6306	6.1523	0.8682	0.6259	0.2155	2.5021
	8.09	8.06	5.21	21.84	3.95	3.84	1.99	11.18
Star Rating Increase	0.0506	0.0192	0.0056	0.0222	0.0322	0.0136	0.0051	0.0154
	1.77	1.12	0.66	1.16	1.85	1.02	0.65	1.02
Star Rating Decrease	-0.0057	-0.0075	-0.0003	-0.0020	0.0041	0.0000	0.0026	-0.0012
	-0.23	-0.60	-0.05	-0.14	0.29	0.00	0.40	-0.10
Intercept	0.0365	-0.0022	0.0074	0.0096	-0.0063	-0.0193	-0.0006	0.0499
	0.74	-0.08	0.50	0.12	-0.16	-0.69	-0.04	0.74
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.405	0.387	0.205	0.757	0.182	0.121	0.050	0.400

Table 7: Match-Adjusted Fund Flows, Analyst Ratings Initiations, and Star Rating Changes

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds (additional details are provided in Table 3). Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, star rating change interaction variables, lagged fund characteristics, and star change indicator variables. Star rating change interaction variables are computed by multiplying each rating indicator by the Star Rating Increase and Star Rating Decrease indicator variables. Star Rating Increase (Decrease) is an indicator variable that takes the value of 1 if the fund's star rating has increased (decreased) over the prior 6 months, and zero otherwise. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. T-statistics are based on robust standard errors.

	Flow ratio				Residual flow ratio			
	[1,6]	[1,3]	[1,1]	[-6,0]	[1,6]	[1,3]	[1,1]	[-6,0]
Gold	0.0925	0.0277	0.0008	0.0124	0.0736	0.0217	-0.0004	0.0053
	2.71	1.51	0.10	0.53	3.36	1.51	-0.05	0.25
Silver	0.0593	0.0119	-0.0011	-0.0042	0.0408	0.0079	-0.0011	0.0037
	2.12	0.69	-0.14	-0.20	2.37	0.57	-0.15	0.20
Bronze	0.0229	-0.0053	-0.0057	0.0086	0.0119	-0.0109	-0.0085	0.0142
	1.01	-0.38	-0.88	0.41	0.76	-0.97	-1.38	0.82
Gold*Star Rating Increase	0.0997	0.0036	-0.0057	0.0331	0.0642	0.0064	-0.0039	0.0297
	0.68	0.10	-0.41	0.61	0.70	0.22	-0.32	0.65
Silver*Star Rating Increase	0.0247	0.0113	0.0005	0.0650	0.0289	0.0202	-0.0005	0.0213
	0.39	0.27	0.03	1.11	0.74	0.64	-0.04	0.46
Bronze*Star Rating Increase	0.1341	0.0757	0.0350	0.0389	0.0856	0.0651	0.0342	0.0103
	2.15	1.90	1.83	1.00	2.25	2.08	1.91	0.32
Gold*Star Rating Decrease	0.0417	-0.0428	-0.0267	0.0169	0.0241	-0.0425	-0.0303	0.0139
	0.45	-1.22	-1.50	0.37	0.44	-1.53	-1.83	0.36
Silver*Star Rating Decrease	-0.0509	-0.0491	-0.0211	-0.0170	-0.0306	-0.0385	-0.0201	-0.0158
	-0.97	-1.45	-1.11	-0.42	-1.01	-1.48	-1.15	-0.48
Bronze*Star Rating Decrease	-0.0925	-0.0442	-0.0313	-0.0277	-0.0551	-0.0305	-0.0289	-0.0149
	-1.90	-1.39	-1.72	-0.70	-1.91	-1.23	-1.74	-0.45
ln(Net Assets)	-0.0101	-0.0071	-0.0056	-0.0068	-0.0075	-0.0059	-0.0058	-0.0047
	-1.18	-1.26	-1.72	-1.03	-1.44	-1.37	-1.90	-0.84
ln(Family Net Assets)	0.0042	0.0058	0.0035	0.0052	-0.0002	0.0028	0.0027	0.0047
	1.06	2.35	2.58	1.56	-0.10	1.44	2.16	1.73
ln(Age)	0.0217	0.0065	0.0021	0.0068	0.0130	0.0035	0.0008	0.0055
	1.96	1.09	0.91	0.95	1.84	0.73	0.38	0.88
Expense Ratio	-2.1598	-0.8111	-0.8357	1.0334	-2.0059	-1.0463	-1.1231	1.3903
	-1.09	-0.59	-0.79	0.73	-1.71	-1.00	-1.07	1.19
Turnover	-0.0113	-0.0011	-0.0009	-0.0262	-0.0073	-0.0012	-0.0002	-0.0194
	-0.54	-0.06	-0.18	-1.47	-0.59	-0.09	-0.05	-1.29
Return (Past 12 mo.)	1.1870	0.5756	0.1693	0.4722	0.4712	0.2199	0.0512	0.0312
	7.54	5.66	4.49	3.57	5.20	2.73	1.48	0.27
Return Vol. (Past 12 mo.)	1.3200	0.4561	0.2534	-0.3608	0.7465	0.3733	0.2315	0.0135
	1.63	0.97	0.99	-0.52	1.52	1.02	0.94	0.02
Net Flow (Past 12 mo.)	3.0590	1.8311	0.6258	6.1802	0.8827	0.6257	0.2089	2.5079
	8.03	7.96	5.27	22.60	3.96	3.80	1.98	11.25
Star Rating Increase	-0.0205	-0.0150	-0.0087	-0.0094	-0.0157	-0.0178	-0.0087	0.0047
	-0.46	-0.67	-1.16	-0.41	-0.54	-1.03	-1.18	0.23
Star Rating Decrease	0.0295	0.0239	0.0195	0.0074	0.0252	0.0242	0.0219	0.0045
	0.73	0.91	1.15	0.22	1.09	1.22	1.43	0.17
Intercept	0.0177	-0.0197	0.0021	0.0096	-0.0146	-0.0325	-0.0049	0.0485
	0.38	-0.67	0.15	0.12	-0.40	-1.14	-0.37	0.72
Obs	412	412	412	412	412	412	412	412
Adj.-R^2	0.415	0.378	0.219	0.757	0.196	0.106	0.070	0.396

Table 8: Robustness Tests

Shown below are results from robustness tests of event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are match-adjusted, cumulative flows to analyst rated funds measured over the [1,6] window (additional details are provided in Table 3). Panel A reports results using alternative control variable specifications. Panel B reports results using alternative methods of matching rated funds with unrated funds. Results are obtained by regressing match-adjusted fund flows on Gold, Silver, and Bronze indicator variables, lagged fund characteristics, and star change indicator variables. Fund characteristics are computed as the difference between each rated fund's characteristics and the corresponding characteristics of the matched fund. Match-adjustment is detailed in Section 3.1.1. Month and star rating fixed effects are included in each regression. Coefficient estimates on control variables are suppressed to conserve space. T-statistics are based on robust standard errors.

	Flow ratio			Residual flow ratio		
	Gold	Silver	Bronze	Gold	Silver	Bronze
Panel A: Alternative performance measures						
Style-adjusted return and return squared (12 mo.)	0.1116	0.0566	0.0331	0.0846	0.0411	0.0174
	3.28	2.35	1.65	4.01	2.76	1.31
FF3 alpha and FF3 alpha squared (36 mo.)	0.1016	0.0606	0.0332	0.0799	0.0426	0.0174
	2.95	2.29	1.56	3.90	2.72	1.27
FF4 alpha and FF4 alpha squared (36 mo.)	0.1064	0.0633	0.0352	0.0818	0.0437	0.0180
	3.01	2.43	1.65	3.93	2.82	1.32
Panel B: Alternative sample specifications						
Excludes funds with star changes in last 6 months	0.0875	0.0599	0.0235	0.0663	0.0358	0.0090
	2.59	2.19	1.01	3.01	2.12	0.56
Matching within star ratings	0.0599	0.0314	0.0357	0.0429	0.0200	0.0176
	2.03	1.28	1.60	2.19	1.34	1.13

Table 9: Fund Performance and Analyst Ratings Initiations

Shown below are results from event-time regressions estimated using analyst ratings initiations that occurred over the period September 2011 to June 2014. The dependent variables are event time cumulative risk-adjusted returns to analyst rated funds. Risk-adjusted returns are computed using the Fama and French 3-factor model (Panel A) and the Fama and French 3-factor model augmented with the Carhart (1997) momentum factor (Panel B). The dependent variables are measured over the six, twelve, eighteen and twenty-four month periods subsequent to the ratings initiation. The first four columns of results are obtained by regressing risk-adjusted returns on the Gold, Silver, and Bronze indicator variables and a constant. The second four columns of results are obtained by repeating the analysis in the first four columns and including the star change indicators and star rating fixed effects. Panels C and D repeat the analysis in Panels A and B, respectively, with the inclusion of a set of control variables. The control variables are natural log of fund net assets, natural log of family net assets, natural log of fund age, expense ratio, turnover, past 12-month return, past 12-month return volatility, and past 12-month flow. Coefficient estimates on control variables are suppressed to conserve space. Month fixed effects are included in each regression. T-statistics are based on robust standard errors.

Panel A: FF3 Risk-adjusted returns								
	6 mos.	12 mos.	18 mos.	24 mos.	6 mos.	12 mos.	18 mos.	24 mos.
Gold	0.0029	0.0121	0.0325	0.0497	-0.0006	0.0078	0.0285	0.0472
	0.60	1.81	3.29	4.02	-0.11	1.05	2.82	3.62
Silver	0.0082	0.0172	0.0275	0.0244	0.0049	0.0127	0.0227	0.0206
	1.96	3.17	3.62	2.74	1.10	2.12	2.94	2.14
Bronze	0.0004	0.0045	0.0141	0.0176	-0.0025	-0.0008	0.0091	0.0141
	0.12	0.93	2.28	2.33	-0.69	-0.16	1.51	1.82
Star Rating Increase					0.0009	0.0106	0.0106	0.0043
					0.21	1.95	1.50	0.54
Star Rating Decrease					-0.0036	0.0057	0.0003	-0.0013
					-0.83	1.01	0.04	-0.14
Intercept	-0.0094	-0.0142	-0.0253	-0.0321	0.0102	0.0187	0.0206	0.0378
	-3.58	-4.21	-5.16	-5.62	1.43	1.39	0.93	0.96
Obs	412	401	379	354	412	401	379	354
Adj.-R^2	0.145	0.108	0.071	0.059	0.150	0.127	0.088	0.073
Star Rating Fixed Effects	N	N	N	N	Y	Y	Y	Y

Panel B: FF4 Risk-adjusted returns								
	6 mos.	12 mos.	18 mos.	24 mos.	6 mos.	12 mos.	18 mos.	24 mos.
Gold	0.0004	0.0103	0.0316	0.0445	-0.0014	0.0078	0.0296	0.0458
	0.09	1.54	3.13	3.48	-0.27	1.05	2.92	3.50
Silver	0.0079	0.0173	0.0255	0.0199	0.0061	0.0143	0.0226	0.0195
	1.90	3.17	3.31	2.20	1.38	2.40	2.94	2.06
Bronze	-0.0008	0.0038	0.0131	0.0154	-0.0026	-0.0003	0.0097	0.0147
	-0.23	0.81	2.12	2.10	-0.76	-0.05	1.63	2.00
Star Rating Increase					0.0027	0.0121	0.0122	0.0059
					0.67	2.20	1.69	0.75
Star Rating Decrease					-0.0028	0.0051	-0.0013	-0.0014
					-0.66	0.90	-0.19	-0.15
Intercept	-0.0063	-0.0112	-0.0215	-0.0245	0.0065	0.0178	0.0148	0.0263
	-2.40	-3.25	-4.29	-4.20	0.97	1.28	0.68	0.77
Obs	412	401	379	354	412	401	379	354
Adj.-R^2	0.129	0.099	0.066	0.060	0.125	0.113	0.076	0.063
Star Rating Fixed Effects	N	N	N	N	Y	Y	Y	Y

Table 9: Fund Performance and Analyst Ratings Initiations, contd.

Panel C: FF3 Risk-adjusted returns with control variables (suppressed)								
	6 mos.	12 mos.	18 mos.	24 mos.	6 mos.	12 mos.	18 mos.	24 mos.
Gold	-0.0056	0.0027	0.0202	0.0326	-0.0064	0.0013	0.0201	0.0361
	-1.20	0.38	2.18	2.70	-1.26	0.17	2.01	2.86
Silver	0.0035	0.0110	0.0192	0.0147	0.0029	0.0093	0.0184	0.0170
	0.78	1.82	2.52	1.58	0.63	1.49	2.36	1.80
Bronze	-0.0018	0.0026	0.0100	0.0141	-0.0033	-0.0009	0.0076	0.0131
	-0.47	0.53	1.67	1.94	-0.88	-0.17	1.24	1.70
Star Rating Increase					0.0018	0.0102	0.0108	0.0069
					0.40	1.80	1.46	0.85
Star Rating Decrease					-0.0057	0.0009	-0.0056	-0.0070
					-1.35	0.16	-0.74	-0.76
Intercept	0.0488	0.1090	0.1569	0.1553	0.0550	0.1046	0.1634	0.1759
	2.52	3.74	3.74	2.91	2.84	3.39	3.67	2.98
Obs	412	401	379	354	412	401	379	354
Adj.-R^2	0.197	0.162	0.146	0.155	0.196	0.165	0.146	0.155
Star Rating Fixed Effects	N	N	N	N	Y	Y	Y	Y

Panel D: FF4 Risk-adjusted returns with control variables (suppressed)								
	6 mos.	12 mos.	18 mos.	24 mos.	6 mos.	12 mos.	18 mos.	24 mos.
Gold	-0.0052	0.0032	0.0227	0.0345	-0.0058	0.0024	0.0230	0.0378
	-1.15	0.44	2.38	2.74	-1.16	0.30	2.23	2.85
Silver	0.0048	0.0121	0.0190	0.0153	0.0042	0.0108	0.0185	0.0172
	1.09	2.00	2.47	1.63	0.92	1.72	2.34	1.79
Bronze	-0.0020	0.0026	0.0098	0.0147	-0.0033	-0.0004	0.0079	0.0143
	-0.57	0.52	1.63	2.02	-0.89	-0.07	1.29	1.87
Star Rating Increase					0.0034	0.0114	0.0121	0.0079
					0.78	1.99	1.59	0.96
Star Rating Decrease					-0.0051	0.0000	-0.0070	-0.0067
					-1.22	0.01	-0.92	-0.72
Intercept	0.0383	0.1006	0.1348	0.1259	0.0419	0.0949	0.1397	0.1418
	2.06	3.43	3.22	2.47	2.25	3.09	3.12	2.47
Obs	412	401	379	354	412	401	379	354
Adj.-R^2	0.157	0.144	0.117	0.115	0.153	0.146	0.119	0.113
Star Rating Fixed Effects	N	N	N	N	Y	Y	Y	Y

Table 10: Calendar Time Portfolio Returns and Analyst Ratings

Shown below are calendar time portfolio returns to portfolios formed on analyst ratings over the period September 2011 to December 2014. Monthly portfolio returns are computed within each analyst rating group as the average of all funds with ratings of the indicated type. Analyst rating group classifications include Gold, Silver, Bronze, Negative/Neutral (combined), and Unrated. G-U is time-series of the difference between returns to the Gold and Unrated portfolios over the sample period. Panel A results are computed using monthly equal-weighted returns in excess of the risk free rate. Panel B results are computed using monthly value-weighted excess returns. Panel C results are computed using monthly equal-weighted gross excess returns (excess return + one twelfth of the annual expense ratio). Panel D results are computed using monthly value-weighted gross excess returns. In each panel we report the mean return, market model coefficient estimates and alphas ($MMAlpha$), Fama and French 3-factor coefficient estimates and alphas ($FF3Alpha$), and Fama and French 3-factor + Momentum 4-factor coefficient estimates and alphas ($FF4Alphas$). The factors included in the models include the excess market return (RMRF), the value factor (HML), the size factor (SMB), and the momentum factor (UMD). T-statistics reported below coefficient estimates are based on Newey West standard errors .

Panel A: Equal-weighted portfolio excess returns

	Gold	Silver	Bronze	Not Rec.	Unrated	G-U	S-U	B-U	NR-U
Mean Return	0.0149	0.0142	0.0145	0.0153	0.0142	0.0008	0.0000	0.0003	0.0011
	3.89	3.60	3.48	3.57	3.49	1.49	0.01	0.92	2.05
Market Model									
RMRF	1.0049	1.0229	1.0716	1.0917	1.0629	-0.0580	-0.0400	0.0088	0.0289
	29.15	32.31	30.08	25.85	35.74	-4.36	-3.31	0.66	1.09
MM Alpha	-0.0010	-0.0021	-0.0025	-0.0020	-0.0027	0.0017	0.0006	0.0002	0.0007
	-0.72	-1.75	-1.93	-1.78	-2.32	3.81	1.50	0.57	1.59
Fama and French 3-factor Model									
RMRF	0.9428	0.9718	1.0157	1.0525	1.0083	-0.0656	-0.0365	0.0074	0.0442
	36.24	39.12	33.58	28.43	40.68	-4.58	-2.86	0.62	2.03
HML	-0.0160	0.0318	-0.0586	-0.0947	0.0018	-0.0178	0.0300	-0.0604	-0.0964
	-0.33	0.67	-1.31	-1.28	0.05	-0.61	1.36	-4.36	-2.22
SMB	0.2593	0.2165	0.2301	0.1577	0.2289	0.0305	-0.0123	0.0012	-0.0711
	9.54	11.08	7.91	5.43	12.42	1.43	-0.82	0.07	-4.36
FF3 Alpha	0.0000	-0.0013	-0.0015	-0.0012	-0.0018	0.0018	0.0005	0.0003	0.0006
	0.02	-1.61	-1.55	-1.17	-2.17	4.68	1.41	1.13	1.34
Fama and French 3-factor Model + Momentum									
RMRF	0.9392	0.9500	0.9979	1.0180	0.9938	-0.0546	-0.0438	0.0040	0.0242
	37.66	53.72	41.65	42.86	58.77	-4.09	-3.21	0.30	1.30
HML	-0.0197	0.0092	-0.0772	-0.1304	-0.0133	-0.0065	0.0224	-0.0639	-0.1172
	-0.42	0.22	-1.86	-1.86	-0.41	-0.24	0.94	-5.03	-2.59
SMB	0.2599	0.2200	0.2329	0.1633	0.2312	0.0287	-0.0112	0.0018	-0.0679
	9.44	11.07	7.60	5.55	12.37	1.38	-0.73	0.10	-4.10
UMD	-0.0113	-0.0693	-0.0568	-0.1096	-0.0460	0.0347	-0.0233	-0.0108	-0.0636
	-0.46	-2.54	-2.55	-2.48	-3.12	2.48	-1.07	-1.00	-1.68
FF4 Alpha	0.0001	-0.0007	-0.0011	-0.0004	-0.0014	0.0015	0.0007	0.0004	0.0011
	0.11	-1.04	-1.25	-0.40	-2.16	3.69	1.54	1.33	1.75

Table 10: Calendar Time Portfolio Returns and Analyst Ratings, Cont.

Panel B: Value-weighted portfolio excess returns									
	Gold	Silver	Bronze	Not Rec.	Unrated	G-U	S-U	B-U	NR-U
Mean Return	0.0152	0.0147	0.0146	0.0156	0.0146	0.0005	0.0001	-0.0001	0.0009
	4.27	3.92	3.58	3.72	3.71	0.84	0.17	-0.12	1.56
Market Model									
RMRF	0.9516	0.9899	1.0445	1.0698	1.0434	-0.0918	-0.0535	0.0011	0.0264
	40.78	38.01	30.85	27.92	45.44	-4.47	-2.91	0.05	1.00
MM Alpha	0.0000	-0.0010	-0.0020	-0.0014	-0.0019	0.0020	0.0009	-0.0001	0.0005
	0.05	-1.45	-1.54	-1.45	-2.06	4.11	1.91	-0.13	1.15
Fama and French 3-factor Model									
RMRF	0.9383	0.9809	1.0156	1.0461	1.0047	-0.0663	-0.0237	0.0110	0.0414
	35.24	39.94	29.10	29.66	49.42	-3.92	-1.76	0.58	1.84
HML	-0.0064	-0.0838	-0.1356	-0.1315	-0.0289	0.0225	-0.0549	-0.1067	-0.1026
	-0.15	-1.59	-2.21	-1.96	-0.88	1.10	-2.10	-2.81	-2.73
SMB	0.0552	0.0314	0.1111	0.0899	0.1603	-0.1051	-0.1289	-0.0492	-0.0704
	2.22	1.35	2.95	3.02	8.72	-5.36	-7.07	-1.91	-4.10
FF3 Alpha	0.0003	-0.0007	-0.0014	-0.0009	-0.0013	0.0015	0.0005	-0.0001	0.0004
	0.34	-1.01	-1.06	-0.92	-1.67	5.00	1.67	-0.17	1.29
Fama and French 3-factor Model + Momentum									
RMRF	0.9362	0.9683	1.0051	1.0205	0.9936	-0.0575	-0.0253	0.0115	0.0269
	36.00	46.89	30.42	37.35	63.22	-3.10	-2.06	0.54	1.42
HML	-0.0087	-0.0969	-0.1465	-0.1580	-0.0403	0.0317	-0.0566	-0.1062	-0.1177
	-0.21	-1.82	-2.45	-2.46	-1.34	1.67	-1.86	-2.86	-3.05
SMB	0.0556	0.0334	0.1128	0.0940	0.1621	-0.1065	-0.1287	-0.0492	-0.0680
	2.22	1.38	2.91	3.11	8.66	-5.23	-6.75	-1.86	-3.95
UMD	-0.0068	-0.0401	-0.0334	-0.0811	-0.0350	0.0282	-0.0052	0.0016	-0.0462
	-0.29	-1.18	-0.99	-2.26	-2.22	1.97	-0.19	0.07	-1.70
FF4 Alpha	0.0003	-0.0004	-0.0011	-0.0002	-0.0010	0.0013	0.0006	-0.0001	0.0008
	0.43	-0.58	-0.92	-0.25	-1.50	4.14	1.31	-0.19	1.69

Table 10: Calendar Time Portfolio Returns and Analyst Ratings, Cont.

Panel C: Equal-weighted portfolio gross returns									
	Gold	Silver	Bronze	Not Rec.	Unrated	G-U	S-U	B-U	NR-U
Mean Return	0.0156	0.0150	0.0154	0.0161	0.0151	0.0005	-0.0001	0.0002	0.0010
	4.07	3.81	3.68	3.76	3.73	0.96	-0.39	0.63	1.78
Market Model									
RMRF	1.0050	1.0228	1.0718	1.0916	1.0629	-0.0579	-0.0400	0.0089	0.0287
	29.14	32.29	30.03	25.87	35.73	-4.36	-3.31	0.67	1.08
MM Alpha	-0.0003	-0.0013	-0.0017	-0.0012	-0.0017	0.0014	0.0005	0.0001	0.0005
	-0.24	-1.06	-1.27	-1.07	-1.49	3.20	1.14	0.24	1.23
Fama and French 3-factor Model									
RMRF	0.9428	0.9718	1.0159	1.0523	1.0083	-0.0655	-0.0366	0.0076	0.0440
	36.28	39.15	33.56	28.46	40.69	-4.58	-2.86	0.63	2.03
HML	-0.0158	0.0321	-0.0581	-0.0945	0.0020	-0.0178	0.0301	-0.0601	-0.0966
	-0.33	0.68	-1.29	-1.28	0.06	-0.61	1.36	-4.28	-2.23
SMB	0.2594	0.2165	0.2303	0.1577	0.2289	0.0304	-0.0124	0.0014	-0.0712
	9.51	11.06	7.89	5.44	12.42	1.43	-0.82	0.08	-4.37
FF3 Alpha	0.0007	-0.0005	-0.0007	-0.0004	-0.0008	0.0016	0.0004	0.0002	0.0004
	0.75	-0.57	-0.67	-0.40	-1.01	3.99	1.02	0.72	0.98
Fama and French 3-factor Model + Momentum									
RMRF	0.9393	0.9500	0.9980	1.0180	0.9939	-0.0546	-0.0439	0.0041	0.0241
	37.65	53.71	41.60	42.85	58.75	-4.09	-3.21	0.31	1.30
HML	-0.0195	0.0095	-0.0766	-0.1302	-0.0130	-0.0065	0.0225	-0.0637	-0.1172
	-0.42	0.22	-1.83	-1.86	-0.40	-0.24	0.94	-4.92	-2.59
SMB	0.2599	0.2200	0.2332	0.1633	0.2313	0.0287	-0.0112	0.0019	-0.0680
	9.41	11.03	7.57	5.55	12.35	1.38	-0.73	0.11	-4.11
UMD	-0.0112	-0.0692	-0.0568	-0.1093	-0.0460	0.0347	-0.0232	-0.0109	-0.0633
	-0.45	-2.53	-2.55	-2.47	-3.12	2.49	-1.07	-1.00	-1.68
FF4 Alpha	0.0008	0.0001	-0.0002	0.0004	-0.0005	0.0013	0.0006	0.0003	0.0009
	0.85	0.15	-0.24	0.49	-0.71	3.05	1.22	0.95	1.50

Table 10: Calendar Time Portfolio Returns and Analyst Ratings, Cont.

Panel D: Value-weighted portfolio gross returns									
	Gold	Silver	Bronze	Not Rec.	Unrated	G-U	S-U	B-U	NR-U
Mean Return	0.0157	0.0154	0.0153	0.0162	0.0154	0.0003	0.0000	-0.0001	0.0008
	4.44	4.10	3.77	3.89	3.92	0.51	-0.07	-0.15	1.40
Market Model									
RMRF	0.9517	0.9899	1.0446	1.0697	1.0434	-0.0917	-0.0535	0.0011	0.0262
	40.86	38.03	30.88	27.97	45.41	-4.48	-2.92	0.05	1.00
MM Alpha	0.0006	-0.0003	-0.0013	-0.0007	-0.0012	0.0018	0.0008	-0.0001	0.0004
	0.80	-0.49	-0.95	-0.75	-1.22	3.68	1.65	-0.16	0.92
Fama and French 3-factor Model									
RMRF	0.9384	0.9810	1.0157	1.0459	1.0047	-0.0663	-0.0237	0.0110	0.0412
	35.34	39.96	29.17	29.73	49.41	-3.94	-1.76	0.59	1.84
HML	-0.0061	-0.0834	-0.1351	-0.1315	-0.0287	0.0226	-0.0547	-0.1064	-0.1027
	-0.14	-1.58	-2.20	-1.96	-0.87	1.11	-2.08	-2.79	-2.74
SMB	0.0553	0.0315	0.1112	0.0899	0.1604	-0.1050	-0.1288	-0.0491	-0.0705
	2.22	1.36	2.95	3.02	8.72	-5.35	-7.06	-1.91	-4.10
FF3 Alpha	0.0009	-0.0001	-0.0006	-0.0002	-0.0005	0.0013	0.0004	-0.0001	0.0003
	1.10	-0.10	-0.46	-0.18	-0.62	4.30	1.25	-0.19	0.98
Fama and French 3-factor Model + Momentum									
RMRF	0.9363	0.9683	1.0052	1.0205	0.9937	-0.0574	-0.0253	0.0116	0.0268
	36.03	46.90	30.43	37.38	63.21	-3.10	-2.06	0.54	1.42
HML	-0.0083	-0.0965	-0.1459	-0.1579	-0.0402	0.0319	-0.0563	-0.1057	-0.1177
	-0.20	-1.81	-2.43	-2.46	-1.33	1.68	-1.85	-2.84	-3.05
SMB	0.0557	0.0335	0.1129	0.0940	0.1621	-0.1065	-0.1286	-0.0492	-0.0682
	2.22	1.39	2.91	3.11	8.66	-5.23	-6.74	-1.86	-3.94
UMD	-0.0067	-0.0401	-0.0332	-0.0808	-0.0350	0.0283	-0.0050	0.0019	-0.0458
	-0.28	-1.18	-0.99	-2.26	-2.23	1.98	-0.19	0.08	-1.69
FF4 Alpha	0.0009	0.0002	-0.0003	0.0005	-0.0002	0.0011	0.0004	-0.0001	0.0007
	1.22	0.34	-0.26	0.57	-0.29	3.47	1.01	-0.22	1.48