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Jan Klobucnik (University of Cologne)
Daniel Kreutzmann (University of Cologne)
Soenke Sievers (University of Cologne)
Stefan Kanne (University of Cologne)

Cologne Graduate School
in Management, Economics
and Social Sciences
Albertus-Magnus-Platz
50923 Köln
www.cgs.uni-koeln.de

University of Cologne

To buy or not to buy? The value of contradictory analyst signals

Jan Klobucnik[#], Daniel Kreutzmann, Soenke Sievers[†], Stefan Kanne

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Abstract We study the predictive ability of individual analyst target price changes for post-event abnormal stock returns within *each* recommendation category. Although prior studies generally demonstrate the investment value of target prices, we find that target price changes do not cause abnormal returns within each recommendation level. Instead, contradictory analyst signals (e.g., strong buy reiterations with large target price decreases) neutralize each other, whereas confirmatory signals reinforce each other. Further, our analysis reveals that large target price downgrades can be explained by preceding stock price decreases. However, upgrades are not preceded by stock price increases. Our results suggest that investors should treat recommendations with caution when they are issued with large contradictory target price changes. Thus, instead of blindly following a recommendation, investors might put more weight on the change in the corresponding target price.

JEL Classifications: G12; G17; G24
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[#]Cologne Graduate School, Richard Strauss Strasse 2, 50923 Cologne, Germany, e-mail: klobucnik@wiso.uni-koeln.de, phone: +49 (221) 470-1223.

[†](Corresponding author) Accounting Area, c/o Seminar für ABWL und Controlling, Albertus Magnus Platz, University of Cologne, 50923 Cologne, Germany, e-mail: sievers@wiso.uni-koeln.de, phone: +49 (221) 470-2352.

1. Introduction

It is well established in the academic literature that analysts' stock recommendations can predict post-event abnormal returns.[1] In contrast, the performance of analysts' target prices has only recently received attention.[2] In an influential study, Brav and Lehavy (2003) show that target price changes have considerable information value. These authors investigate the performance of target price changes conditional on the direction of the recommendation change (upgrades, reiterations, downgrades) issued by the same broker. Sorting stocks according to their target price change within each category, they show, for both the upgrade and reiteration categories, that the extreme portfolios have abnormal returns that are remarkably different from those of the collective portfolios within their respective categories. Following this approach, Gleason et al. (2011), Huang et al. (2009) and Da and Schaumberg (2011) expand this line of research. Because most target prices are associated with a specific time horizon, they represent an implicit return estimate. Gleason et al. (2011) sort stocks by the implicit return estimates of target prices. This sorting conveys information about future abnormal returns if the analyst also issued relatively accurate earnings estimates. Huang et al. (2009) reveal that target price changes combined with recommendation revisions yield higher abnormal returns than each signal alone. Elaborating on trading returns, Da and Schaumberg (2011) find even higher abnormal returns when taking industry affiliation into account. All three studies are based on datasets from First Call over the period of 1997 to 2004 and use consensus analyst signals.

Although these studies focus on the change in recommendations, they do not consider the level. This has two main implications. First, it is unclear whether target price changes contain valuable information for each recommendation level. For example, large target price increases (reductions) for reiterated strong buy (sell) may not provide valuable information to the market because the recommendation already provides a trading signal. In particular, the positive performance of the portfolios with the most favorable target price revisions reported in Brav and Lehavy (2003) might be driven by buy and strong buy recommendations, and the negative performance of the portfolio with the least favorable target price revisions might be driven by hold, sell and strong

[1] See, among others, Womack (1996), Barber et al. (2001), Jegadeesh et al. (2004), Green (2006) and Barber et al. (2009).

[2] See Brav and Lehavy (2003), Gleason et al. (2011), Huang et al. (2009) and Da and Schaumberg (2011). For an exhaustive literature review, we refer to Ramnath et al. (2008) and Bradshaw (2011).

sell recommendations. In contrast, because recommendations are bounded from above (strong buy) and below (strong sell), analysts must resort to target price increases (decreases) to signal private information about an increase in the undervaluation (overvaluation) if the stock has already been given a strong buy (sell) recommendation.

Second, analyzing the performance of target price changes conditional on the recommendation level enables the researcher to examine whether observed abnormal returns are consistent with the recommendations. For example, assuming that, on average, analysts interpret and process information correctly, large target price reductions in combination with reiterated strong buy recommendations should not be followed by average negative abnormal returns. Although it might initially seem unreasonable, such contradictory analyst announcements are fairly common. For example, JPMorgan Chase lowered the target price for Bank of America from $18 to $13 in September 2011 but retained an "overweight" rating.[3] For both researchers and practitioners, the question arises how to interpret the conflicting signals. Our approach builds upon the research design of prior studies, such as Brav and Lehavy (2003) or Huang et al. (2009). However, our approach focuses on individual analyst announcements. By sorting target price changes within reiteration categories, we calculate abnormal returns using the calendar time portfolio approach.

By expanding prior literature in this way, we identify the following results. First, we confirm previous findings, such as those by Brav and Lehavy (2003), that the information value in target price changes is incremental to that contained in stock recommendation levels in a larger and more recent sample (2001-2007) using individual analyst signals. Second, there is evidence that the information in target price changes is even more important than the information in recommendation levels for predicting future abnormal returns. However, following our above argumentation, we do not find abnormal returns for target price changes in each recommendation level. Hence, the investment value depends on the combination of the two signals, the recommendation level and the target price change. Specifically, we provide evidence that contradictory analyst signals neutralize each other, particularly in the month after the announcement. Therefore, third, abnormal returns follow the direction of the target price change when it is in line with the recommendation level and do not clearly follow the direction of the target price change when it contradicts the other signal (for example, buy combined with a large

[3] The stock price of Bank of America was approximately $7 in September 2011. Source of the analyst announcement: The Street (2011).

target price reduction). Finally, our findings indicate that large target price downgrades can mainly be explained by preceding stock price decreases, whereas upgrades contain information other than historical stock price changes. Consequently, analysts are unaware of the contradictory character of certain signals as they adjust target prices to stock price decreases while maintaining a buy recommendation, for example.

Our findings have implications for researchers and investors. Future research on the investment value of target price changes may consider recommendation levels because our study reveals asymmetric reactions among different recommendation levels. At the same time, investors should be highly cautious about recommendations when they are issued with large contradictory target price changes. Rather than blindly following an analyst's recommendation, investors may put more weight on the change of the corresponding target price.

The paper proceeds as follows. In the next section, we introduce the data, provide descriptive statistics and illustrate the methodology. In section three, we present and interpret the empirical findings, provide further analyses and give potential explanations for our findings. Finally, we conclude by summarizing the results.

2. Data, Variables and Descriptive Statistics

Target prices and recommendations come from the Institutional Brokers Estimates System (I/B/E/S), which was integrated with the widely used First Call Database in 2000. Analyst reports contain different outputs, such as recommendations, target prices and earnings forecasts, which are stored in different tables. I/B/E/S claims to offer access to more than 6.5 million research documents from more than 850 brokerage firms.[4] Among other information, the database contains the name of the company covered, the name of the analyst, a target price and a recommendation between 1 and 5. A recommendation of 1 represents a strong buy; 2, a buy; 3, a hold; 4, a sell; and 5, a strong sell. If a broker uses another scale, I/B/E/S converts the broker's recommendation to its five-point scale. Returns are obtained from the CRSP database.

The sample comprising the target prices covers the period from January 2001 to December 2007. There are two main reasons for this choice. First, we want to avoid the influence of heavy market

[4] See Thomson Reuters (2011).

turbulences during the high tech bubble and the financial crisis on our results. Second, there were several regulatory changes around 2000, including Regulation FD, NYSE 472 and NASD rule 2711, which caused a decrease in overall analyst optimism, as presented in Bradshaw (2011). Beginning our analysis in 2001 prevents these changes from affecting our analysis. We restrict the sample to 12-month target prices and to companies listed in the US by using the indicator variables *HORIZON* and *USFIRM* from I/B/E/S. We require the name of the analyst and a previous target price from the same analyst for the firm not to be older than one year. Target prices for which no recommendation is available from the same analyst on the date of the announcement or whose stock price was below one dollar at the time of the announcement are dropped from the sample. Taking these conditions into account, we are left with 253,756 target price change observations.

----------Please insert Table 1 approximately here----------

Because our study builds on the line of research by Brav and Lehavy (2003), Gleason et al. (2011), Huang et al. (2009) and Da and Schaumburg (2011), a few words are in order when comparing the samples. The first main difference is that our sample spans the years 2001-2007, whereas the previous studies are based on target price changes from around 1997 to 2004. The sample of Brav and Lehavy (2003) covers only the bull years of 1997-1999. Due to the significant differences in the overall market returns in these two periods[5] and the fact that the value of stock recommendations is known to depend on the overall market condition (see Barber et al. 2003), it is not clear ex-ante whether target price changes in our sample are also correlated with future abnormal returns. The change in the regulatory environment around 2000 led to more private information being disclosed to the public and, therefore, possibly less informative target prices. Consequently, we expect smaller abnormal returns, as documented in Da and Schaumburg (2011). Furthermore, Huang et al. (2009) and Da and Schaumburg (2011) use consensus recommendations and target prices at fixed dates, whereas our study is conducted on the individual analyst level on an ongoing basis. We treat all analysts the same because Bradshaw

[5] The average yearly return of the S&P 500 was 2.73% from 2001-2007, 5.76% from 1997-2004 and 25.73% from 1997-1999.

and Brown (2006) and Bonini et al. (2010) do not find systematic differences in the target price forecasting abilities of analysts. Finally, our sample covers more than 5,200 companies, whereas the analyses by Huang et al. (2009) and Da and Schaumburg (2011) include approximately 3,000 entities.

For our trading strategies, we sort stocks according to their scaled target price changes ($\Delta TP / P$). $\Delta TP / P$ is the difference between the current (t) and prior target price (TP) issued by the same analyst, deflated by the closing stock price (P) outstanding at the current date.

$$\Delta TP / P = \frac{TP_t - TP_{t-1}}{P_t}$$

Given our research question, we focus on changes in target prices, in contrast to Da and Schaumburg (2011), who consider the levels of the implicit target price return. Studies by Womack (1996) and Jegadeesh et al. (2004) provide evidence that changes are more informative than levels. Table 1 Panel A shows the number of target price changes, analysts and equities per year for our sample. Although target price change observations are relatively low in 2001, with 18,560 observations, target price coverage in I/B/E/S has been increasing steadily, to 47,095 in 2007.

The distribution across the recommendation changing categories in Table 1 Panel B shows that 85% of the target price changes are not accompanied by a recommendation change, and most of these recommendation reiterations are strong buy, buy or hold recommendations. This bias toward positive recommendations is well documented in the literature. Explanations can be found, for example, in Bradshaw (2011).

The sample contains remarkably more hold, sell and strong sell recommendations issued with target prices (104,939) than the sample (20,881) used by Brav and Lehavy (2003), presumably due to the observed time period. As mentioned above, the major part of the target prices in our sample were announced in the time period after the regulatory changes became effective, which led to a generally greater share of negative recommendations.[6]

[6] See Barber et al. (2006).

Table 2 shows the mean scaled target price change $(\Delta TP/P)$, the mean scaled price change $(\Delta P/P = (P_t - P_{t-1})/P_t)$, the mean implicit return change $(\Delta(TP/P) = TP_t/P_t - TP_{t-1}/P_{t-1})$ and the implicit return estimate itself $(TP/P = TP_t/P_t - 1)$ within the extreme target price change groups. We winsorize the values at the 1% and 99% levels, as in Brav and Lehavy (2003) and Huang et al. (2009), to prevent outliers from driving our results. For every month, target price change quintile breakpoints are calculated using all data up to the preceding month for every recommendation changing category.[7] This growing window approach allows us to use all available information up to the actual month, which is also possible for an investor. Target price changes are classified as most favorable (least favorable) if they exceed (fall below) the highest (lowest) quintile breakpoint. This research design is in line with prior literature, such as Brav and Lehavy (2003). In general, large price changes tend to precede large target price changes in Table 2 (for example, -46.69% and -64.19% for the least favorable target price changes in the strong buy reiteration), keeping the change of the implicit return estimate fairly small (1.36%). One could argue that the change of the implicit return estimate might be a superior investment signal because it better represents the shift in the analysts' opinion. However, to be in line with Brav and Lehavy (2003), we use target price changes as the primary investment signal. When we consider the change in the implicit return estimate as an investment signal, the abnormal returns in the next section are smaller, but the results remain qualitatively the same. In general, Table 2 demonstrates that the target price investment signals from the most and least favorable portfolios contradict, in their respective categories, the signals from the corresponding recommendations. In the case of the two positive buy recommendation signals, for example, the least favorable quintile portfolios display large negative target price cut-backs of more than 50%.

----------Please insert Table 2 approximately here----------

It is interesting that the actual implicit return estimates in the fourth rows of Table 2 for the portfolios with the least favorable target price changes are, in several cases, larger than the estimates for the portfolios with the most favorable target price changes. This finding particularly

[7] In addition to this growing window approach, we calculate the results on a rolling window basis for the preceding year. The results are qualitatively the same but are slightly weaker.

holds for the buy and strong buy categories, indicating that analysts continue to believe in the stock's performance even if they decrease the target price. Because these observations constitute a large fraction of the overall sample (55%), it is not surprising that Gleason et al. (2011), who sort stocks by the target price's implicit return estimates, do not find a strong relation between the information in target prices and future abnormal returns.

----------Please insert Table 3 approximately here----------

Finally, it is worthwhile to take a closer look at the distribution of recommendation levels within the extreme portfolios. Although the results in Brav and Lehavy (2003) show that abnormal returns are correlated with past target price changes, the results do not directly imply that target price changes convey valuable information incremental to that contained in recommendations. A study by Barber et al. (2009) shows that abnormal returns to analysts' stock recommendations stem from both the recommendation levels assigned and the changes in those recommendations. Because abnormal returns vary across recommendation levels and target price changes are correlated with recommendation levels, the investment value for target prices found by Brav and Lehavy (2003) might be due to the missing control for the recommendation level. That is, the portfolios with the most favorable target price revisions are biased toward more favorable recommendation levels, whereas the portfolios with the least favorable target price revisions include less favorable recommendations. Table 3 presents the overall distribution and the most and least favorable target price changes for each recommendation changing category. The results provide descriptive evidence of a correlation between the target price change and the recommendation level. Interestingly, even within the reiterations in Table 3 Panel B, there is an asymmetry in the distribution of the recommendation levels. The portfolio with the most favorable target price revisions contains more buy (35.72%) and strong buy recommendations (25.32%) than the portfolio with the least favorable target price revisions (30.88% and 22.41%, respectively). The opposite applies to the hold and sell categories. Because more favorable recommendations within the recommendation reiteration category have higher abnormal returns (see Barber et al. 2009), this asymmetry might drive some of the results in Brav and Lehavy (2003). However, given the size of the average abnormal returns reported by Barber et al. (2009),

this asymmetry seems not to be strong enough to explain the predictive value of the most favorable target price revisions. Nevertheless, this relation should be taken into account when drawing conclusions about the information value of target price changes.

2.1. Methodology

To study the investment value of target prices more closely, we analyze the predictive value of extreme target price changes conditional on the following recommendation levels: strong buy, buy, hold, sell/strong sell. The sell and strong sell recommendations are combined because the number of observations in these categories is very low (4.5% of all reiterations). If not otherwise noted, the sample is confined to recommendation reiterations, which constitute the bulk of observations (see Table 1 Panel B).

Disaggregating the class of recommendation reiterations into the respective recommendation levels allows us to investigate our research questions: first, whether target price changes, not only on average but also for each recommendation level, provide valuable information; second, whether target price changes provide more valuable information than the recommendation level. Further, we can examine whether the observed abnormal returns are consistent with the advice given by the recommendations. Assuming that analysts interpret the information conveyed by their target price changes correctly, on average, large reductions of target prices in combination with reiterated strong buy recommendations, for example, should not be followed by average negative abnormal returns.

Analyzing the predictive value of target price changes is especially interesting for the extreme recommendation levels. On the one hand, large target price increases (reductions) for strong buy (sell) may not provide valuable information to the market because the recommendation already provides a trading signal. On the other hand, because recommendations are bounded from above (strong buy) and below (strong sell), analysts must resort to target price increases (decreases) to signal private information about an increase in the undervaluation (overvaluation) if the stock is already given a strong buy (sell) recommendation.

We use calendar time regressions and calculate post-event abnormal returns to test for abnormal performance, as in Brav and Lehavy (2003). In the calendar time regression approach, for each recommendation category, quintile breakpoints on scaled target price changes $\Delta TP/P$ are

calculated, including all data up to the preceding month. A target price change ΔTP/P is defined as most favorable (least favorable) if it exceeds (falls below) the highest (lowest) quintile breakpoint. These stocks enter the respective portfolio at the close of trading on the first trading day following the date of an individual analyst's announcement to change her target price and remain in that portfolio for a predefined time span. Waiting one trading day ensures that the portfolios are based on available information. Although most target prices are typically issued before the close of trading, we prefer to avoid a potential bias caused by the possible inclusion of event returns, which Brav and Lehavy (2003) have shown to be large for high target price changes. It is plausible to assume a similar time structure for the abnormal returns after target price changes and after recommendation changes. Given the evidence from Green (2006), waiting one trading day should lead to a high reduction of abnormal returns, which, in principle, can be achieved by an investor because subscribers can access analyst reports in real time. Hence, the abnormal returns we find are a conservative estimate.

We assume a one-dollar investment in every stock entering the portfolio. The return for a portfolio is

$$\frac{\sum_{i=1}^{n_{jt}} x_{it} \cdot R_{it}}{\sum_{i=1}^{n_{jt}} x_{it}} = R_{jt},$$

where R_{it} is the return for stock i on day t, n_{jt} is the number of stocks in portfolio j on day t and x_{it} is the value of the investment in stock i on day t-1. Computing portfolio returns in such a buy-and-hold manner avoids the upward bias in equal weighting documented by Canina et al. (1998). Note that a stock can enter a portfolio even if it is already contained in the portfolio because different analysts can cover the same stock. Because the calendar time approach eliminates the problems of cross-sectional dependencies, this will not result in misleading conclusions.[8]

[8] The heteroscedasticity problem, which might arise from the changing composition of the portfolios, as described in Mitchell and Stafford (2000), does not affect our conclusions for two reasons. For the portfolios from which we draw the main conclusions, it seems implausible because the number of stocks in these portfolios is always high in terms of diversification (for the one-month holding period, for example, the average number of stocks per portfolio is approximately 170). Furthermore, we use heteroscedastic robust estimates.

We test the abnormal performance of each extreme quintile portfolio using the three-factor model developed by Fama and French (1993) with an additional momentum factor following Carhart (1997): [9]

$$R_{j,t} - R_{f,t} = \alpha_j + \beta_j \cdot \left(R_{m,t} - R_{f,t}\right) + s_j \cdot SMB_t + h_j \cdot HML_t + u_j \cdot UMD_t + \varepsilon_{j,t}.$$

In this model, α_j represents the average abnormal return of portfolio j.

Note that our approach ensures that the abnormal returns presented in this paper are properly adjusted for momentum effects, which clearly play an important role because extreme target price changes are preceded by large price changes (see Table 2).

Finally, we examine whether the reported abnormal returns imply significant trading profits. To estimate total round-trip transaction costs for buying and selling, we use the results of Keim and Madhavan (1998), who provide an estimation procedure of the costs incurred by institutions in trading exchange-listed and NASDAQ stocks depending on their market capitalization. Similar to Liu and Strong (2008), we impose an upper bound for the half-way transaction costs at 2% to eliminate unreasonable estimates. Liu and Strong (2008) argue that transaction costs decline over time; in particular, decimalization in 2001 increased liquidity such that it lowered costs for buying and selling, as in Da and Schaumburg (2011). Therefore, the transaction costs used in this paper can be interpreted as an upper bound for the actual transaction costs and ensure that the abnormal returns after transaction costs present a lower bound of the profit, which could have been realized by an institutional investor. This conservative perspective ensures that by identifying abnormal returns after costs, it would be profitable for investors to follow the trading strategies. These returns cannot be attributed to market imperfections.

[9] $R_{j,t}$ is the return of portfolio j on day t, R_m is the return on a value-weighted market portfolio, R_f is the one-month Treasury bill rate, SMB is the return on a zero-investment portfolio calculated by the return on a portfolio consisting of small market capitalization stocks minus a portfolio of stocks with high market capitalization, HML is calculated by subtracting the return of a portfolio of low book-to-market stocks from a portfolio of high book-to-market stocks and UMD is the return on a portfolio of stocks with high returns in the preceding year minus the return on a portfolio of stocks with low returns in the preceding year on day t. The factor-portfolio data are obtained from Kenneth French's website.

3. Empirical Results

3.1. Calendar Time Portfolios

Table 4 presents the results for the calendar time regressions. Given a holding period of one month, Panel A of Table 4 shows that the portfolios with the most favorable target price changes produce significant abnormal monthly returns of approximately 1% for the strong buy and buy recommendations and approximately 0.6% for the hold recommendation, which is higher than the 0.4% in Huang et al. (2009). For the least favorable portfolios of the reiteration categories, only the abnormal returns in the sell recommendation are significantly different from zero, at -0.82%. This finding demonstrates that the investment value of target price changes depends on the recommendation level for reiterations. Further, this detailed look at the results reveals an interesting pattern. Recalling the contradictory character of buy (sell) recommendations in combination with the least (most) favorable target price changes, it appears that confirmatory analyst signals reinforce each other, whereas contradictory signals weaken each other. The abnormal returns are more pronounced when the signals go in the same direction, as with (strong) buy and most favorable, which leads to monthly abnormal returns that are significantly different from zero. In contrast, the reaction for the sell recommendation is insignificantly different from zero. For the least favorable portfolios, there is only a significant return for the sell category, in which the two analyst signals are confirmatory. From the overall perspective of the last column, the risk-adjusted returns of 0.70% (-0.21%) for the most (least) favorable target price changes are consistent in magnitude and direction with Huang et al. (2009) and Da and Schaumburg (2011), acknowledging that they form their portfolios on consensus signals.

----------Please insert Table 4 approximately here----------

Below, we present the t-statistics for the difference in abnormal returns between the portfolios with the most and least favorable target price revisions. The spreads are clearly significant within each recommendation category. Hence, target prices provide additional information to the markets.

The last two rows of Table 4 Panel A display the abnormal returns and t-statistics of the collective portfolios, including all target price changes issued within the respective recommendation level. For strong buy and buy recommendations, these values are significantly positive, whereas they are insignificant and around zero for the hold and sell portfolios. This should not be taken as a contradiction of the significant investment value for the sell category demonstrated by Barber et al. (2009). The portfolios in Table 4 only represent a specific part of the recommendation reiterations, namely those issued with target price changes. Moreover, comparing the most and least favorable portfolio returns to the collective portfolios shows that the abnormal returns, which can be attributed to target price changes, have higher absolute values compared to the returns from the collective portfolio. This finding demonstrates that target price changes contain more valuable information than reiterated recommendation levels.

The results show that target prices contain investment value, especially for cases in which they are in line with the recommendation signal. For contradictory trading advice, the abnormal returns are not significantly different from zero. Therefore, these analyst signals initially seem not to provide investment value. However, in these cases, they can prevent an investor from experiencing insignificant or negative abnormal returns following buy recommendations with large contradictory target price changes. Put differently, in these cases, the two contradictory analyst signals neutralize each other such that no abnormal returns are observed. This can have two implications. On the one hand, one can argue that analysts themselves are not fully aware of the investment value of their own target price changes. Consider, for example, an analyst who significantly decreases her target price as a reaction to a preceding stock price change but adheres to a buy recommendation. Because previous research shows that the market reacts only marginally to recommendation reiterations but strongly in the direction of the target price change (see Brav and Lehavy 2003 and Asquith et al. 2005), the stock price after the market's reaction is, on average, lower than before the analyst issued her report. In this case, it is highly likely that the analyst would continue to adhere to the buy recommendation because the stock now seems even more profitable than at the time she issued her report. On the other hand, the apparent inconsistency in analysts' forecasts may be due to a reluctance to change the recommendation because of outside pressure. Analysts then use the possibility of changing the target price to signal their private information to the market. In this case, signaling private information by

means of target price changes would not be restricted to the strong buy (sell) category where the recommendation is bounded from above (below). We address this issue in the final section.

Panels B and C of Table 4 extend the holding period for the stocks entering a portfolio to three and six months. The daily average abnormal returns and the significance decrease for the most favorable target price changes. This evidence is consistent with that reported by Green (2006), Barber et al. (2001) and Jegadeesh and Kim (2006), who find the highest average abnormal returns occurring on the first days after recommendation announcements. However, for the least favorable portfolios, the abnormal returns remain at the same level or increase in the case of buy and strong buy recommendations. This observation of the least favorable target price changes is in line with the results of longer-lasting abnormal returns for negative recommendations reported by Womack (1996) and Barber et al. (2001). Additionally, the difference between the portfolios with the most and least favorable target price changes is now significant for all recommendation categories, whereas the overall portfolios' returns are insignificant. Hence, the predictive ability of negative target price changes is more pronounced for longer holding periods.

Finally, in Table 4 Panel D, we employ the trading strategy that is expected to yield the largest abnormal returns before transaction costs to demonstrate that investors can exploit the information in target price changes and recommendations on an individual analyst level. Based on the results in Barber et al. (2009) and Brav and Lehavy (2003), we analyze recommendation upgrades to buy or strong buy and recommendation downgrades to hold, sell or strong sell. The results for the three holding periods are presented in Table 4 Panel D. We can see that calendar time portfolios with the most (least) favorable target price changes within the upgrade (downgrade) category produce large significant abnormal returns. Consistent with the combination strategy in Huang et al. (2009), we find a monthly return of 1.46% (-0.82%) for the upgrade (downgrade) category for the most (least) favorable target price change. Again, in the case of contradictory analyst signals, the abnormal returns are insignificant. Moreover, the abnormal returns observed with reiterated recommendations in Table 4 Panels A to C are smaller in magnitude and significance, in general, than recommendations in conjunction with a "supporting" change.[10] Several studies, such as Brav and Lehavy (2003) and Barber et al. (2009),

[10] The literature identifies the highest post-event abnormal returns for recommendation changes representing strong new consistent information, such as upgrades to strong buy recommendations. See, for example, Womack (1996), Green (2006) and Barber et al. (2009).

suggest that high abnormal returns can be earned by buying stocks with recommendation upgrades to buy or strong buy and selling those with downgrades to hold, sell and strong sell. However, our results in Table 4 show that investors should refrain from trading on these recommendation revisions if they are accompanied by large target price changes in the opposite direction because, at best, they earn insignificant positive abnormal returns before transaction costs.

In unreported results, we verify the robustness of our results. First, because we use fixed holding periods, one might argue that accounting for the changes of the analysts' opinions in defining the holding period might eliminate the inconsistency. To account for the possibility that, on average, analysts recognize their target price changes' prediction value sufficiently early, we recalculate the results such that the full holding period is reached only if the analyst does not change the recommendation for the company in this time span. If the analyst changes his recommendation, the stock is dropped at the closing price of the first trading day after the announcement. The abnormal returns for these portfolios are very similar in magnitude and significance. None of the conclusions drawn above are altered. Second, we recalculate the abnormal returns in Table 4 for the implicit return change instead of the target price change as a signal. Although the overall significance decreases, the pattern of more pronounced returns for confirmatory signals and inconclusive returns for contradictory analyst announcements remains. Third, because the calendar time portfolio approach has drawbacks, such as the low power to detect abnormal performance in periods of changing event activity (Loughran and Ritter 2000), we also calculate cumulative abnormal returns and buy-and-hold abnormal returns (in the following CARs and BHARs) for each firm following target price changes. Every stock is assigned to one of 125 portfolios, sorted by market capitalization, book-to-market and momentum.[11] The daily abnormal returns are then calculated by subtracting the return of the matching market capitalization/book-to-market/momentum portfolio. We use the event-firms' CARs and BHARs to test for significance of the average CARs and BHARs of each extreme quintile portfolio.[12] To avoid inflated test statistics caused by cross-sectional dependencies, we construct a non-overlapping

[11] The stock assignments are obtained from Russ Wermers' website. We also use these assignments to calculate the daily value-weighted return for each of the 125 benchmark portfolios. Delisting returns are taken into account as described on Russ Wermers' website. See Daniel et al. (1997) and Wermers (2004).

[12] We choose to calculate both CARs and BHARs because both are subject to methodological concerns. See Barber and Lyon (1997) and Fama (1998).

sample that excludes target price changes with overlapping return accumulation periods with any previous target price for the same stock in the same recommendation and target price category. Overall, the unreported results are in line with the findings in Table 4, whereas the abnormal returns are generally more significant. Again, the sell recommendation is neutralized for the most favorable target price changes, and the target prices are the dominant signal in the least favorable portfolios. The CARs are generally higher than the BHARs due to the generally more volatile returns of single stocks compared to their benchmarks.[13] Overall, the results support the notion that target price changes possess predictive value for future abnormal returns incremental to the information contained in recommendation levels.

Taken together, these results show that the market reacts to target price changes, but the magnitude depends on the corresponding recommendation level. Moreover, analysts seem to be unaware of the information contained in their own target price forecasts in case of contradictory signals. Our results are somewhat in contrast with the line of argument in Bradshaw and Brown (2006), who show that analysts' compensation and job tenure increases with recommendation performance. However, there is no evidence that analysts' compensation is tied to their target price forecast accuracy. Bradshaw and Brown (2006) argue that because target prices are not subjected to media scrutiny, they provide a potential means of making optimistic forecasts to curry favor with managers or to generate trading revenues for their firm. We agree with Bradshaw and Brown (2006) that the market does not pay much attention to target prices. However, we argue that target prices provide valuable information that is not fully processed by the market. Especially in cases where target price changes contradict their recommendations, target prices can serve as important information for investment decisions.

3.2. Factor Loadings, Market Capitalization and Transaction Costs

To reveal the characteristics of the stocks included in the extreme quintile portfolios, Table 5 Panel A shows the factor loadings of the calendar time portfolios for a holding period of three months over all recommendation levels.

[13] See Barber and Lyon (1997) for an empirical examination of this phenomenon.

----------Please insert Table 5 approximately here----------

The SMB coefficients are positive and highly significant for both portfolios, implying that the stocks in these portfolios are, on average, of small market capitalization or, at least, correlated with such stocks' returns. The stocks in the most favorable categories seem to be larger because there is a higher factor loading of SMB for the least favorable category. The high significance of the UMD coefficient with a sign equal to the target price changing direction can be explained by the average preceding price change in the direction of the target price change, shown in Table 2. The high significance of the UMD coefficient highlights the importance of correct adjustment for momentum effects in a performance analysis of target price changes. Finally, the exposure to the book-to-market factor (HML) is positive and significant for both portfolios. Compared to the other factors, however, this factor plays a rather minor role. Overall, the factor loadings are similar to Huang et al. (2009) and Da and Schaumburg (2011). However, we find less exposure to the book-to-market factor (HML), indicating a smaller fraction of value stocks, which may be due to our larger sample.

If abnormal returns before transaction costs stem primarily from small stocks, they might not be realizable in a trading strategy because transaction costs are higher for smaller stocks, as reported in Keim and Madhavan (1998). For small stocks to be the driving force behind the abnormal returns, they must both represent a significant fraction and earn higher abnormal returns than large stocks. With respect to the first criterion, the factor loadings on the SMB factor in Table 5 Panel A indicate that the extreme quintile portfolios largely consist of small stocks. With respect to the second criterion, we examine the relation between market capitalization and abnormal returns before transaction costs. Table 5 Panel B differentiates between small and large stocks. A stock is defined as small (large) when its market capitalization falls into the lowest (highest) two NYSE market capitalization quintiles. The results show a correlation between the size and the magnitude of the abnormal returns, especially for the most favorable target price changes in the one-month holding period. The observation that abnormal returns before transaction costs are more pronounced for small stocks is consistent with the findings of Stickel (1995), Womack (1996), Barber et al. (2001) and Mikhail et al. (2004), who find higher post-recommendation abnormal returns for small stocks. Moreover, as Fama (1998) points out, available asset pricing models generally have problems explaining the returns of small stocks, and many anomalies

disappear for large stocks. An explanation of this phenomenon is that the ability of arbitrage to immediately adjust prices to their fair value is limited among small stocks.[14] Hence, our results indicate that the abnormal returns before transaction costs found in this study are partly driven by differences in the market capitalization.

Taking transaction costs into account, Table 5 Panel C shows the remaining abnormal returns for recommendation reiterations, upgrades and downgrades for the different holding periods. The abnormal returns are still positive, but are significant in only in a few cases. The exception is the abnormal return for the least favorable target price change for the one-month portfolios, which is clearly negative. Although the short holding periods show the best performance before transaction costs, the higher costs diminish the abnormal returns.[15] In contrast, the longer horizon reduces the costs of trading such that the strategies remain slightly profitable for the 3- and 6-month periods. Recalling our conservative approach, the results in Table 5 Panel C imply that the information in target prices may be useful for investment purposes even after transaction costs.

3.3. Potential Explanations

The question arises of how to explain the result that identifies contradictory analyst signals that neutralize each other. In this section, we provide further insight into the target price change signal, especially for contradictory signals. Table 6 provides a closer look at firm characteristics and target price specifics for each recommendation category for reiterations. We concentrate on reiterations because the number of observations in the off-diagonals is very small (compare Table 1 Panel B). The selection of firm characteristics is motivated by Jegadeesh et al. (2004). Because Bonini et al. (2010) demonstrate that there are no systematic differences among individual analysts and our sample includes more than 5,200 analysts, we focus on firms to look for explanations for our findings. Panel A of Table 6 reveals that the most favorable target price changes in our sample tend to occur for firms with higher sales growth, higher price earnings and higher price-book ratios. These characteristics can normally be observed for growth firms. At the

[14] Transaction costs are higher for small stocks, and the influence on the price by buying or selling large quantities of a stock is larger for small stocks. Assuming equal misvaluations in the absence of arbitrageurs, Loughran and Ritter (2000) argue that misvaluations in the presence of arbitrageurs, in equilibrium, must be larger for small stocks. Otherwise, arbitrageurs could make more money, net of costs, by finding misvaluations among large stocks. See also Grossman and Stiglitz (1980), Pontiff (1996) and Shleifer and Vishny (1997).

[15] The least favorable portfolios assume a short position; thus, a trading profit is represented by positive values.

same time, these firms have higher market capitalizations, as shown in Table 6 Panel A. These findings indicate that the most favorable target price increases occur primarily for companies with characteristics similar to growth firms. This finding is in line with Jegadeesh et al. (2004), who highlight that such "glamour" firms preferably receive buy recommendations from analysts. Finally, Table 6 Panel B provides the results from a regression of the scaled target price changes on the scaled price changes. We can clearly see that the least favorable target price cut-backs can largely be attributed to preceding decreases in stock prices, with adjusted R^2s of approximately 50%. This finding is in line with the results from the cointegration analysis in Brav and Lehavy (2003), indicating a process of fairly automatic target price adjustments to follow the current price. However, this does not apply to target price increases; generally, large target price increases are not driven by preceding stock price increases. Hence, analysts seem to use target price increases to signal information that is different from historic stock price movements. Such asymmetric analyst behavior between favored and unfavored stocks for recommendations is well documented in the literature. Bradshaw (2011), for example, describes this behavior with the saying, 'If you don't have anything good to say, don't say anything at all.' In particular, our finding is consistent with Easterwood and Nutt (1999), who show that analysts underreact to negative information, and Womack (1996), who finds that the impact of downgrades is longer lasting. Therefore, stock prices adjust after the target price downgrade, yielding negative abnormal returns. In contrast, upgrades have investment value because they are not easily explained by preceding stock price increases. Conrad et al. (2006) demonstrate that although analysts are more likely to downgrade after large stock price declines, they are not more likely to upgrade after price increases. Hence, analysts seem to put more effort into favored stocks to signal a change in their opinion.

----------Please insert Table 6 approximately here----------

Additional insights are provided by examining the contradictory categories in more detail, namely the buy (sell) recommendations combined with the least (most) favorable target price changes. Table 6 Panel B offers evidence that contradictory target price downgrades and upgrades tend to follow preceding price decreases. However, the contradictory target price

increases in the sell category, although significant, only explain 4% of the variation in the scaled target price changes. Because, in some situations, analysts may either be unaware of the information in their own target price forecasts or use target price changes to signal private information to the market if changes in the recommendation are restricted, our finding suggests the unawareness explanation. Analysts seem to be unaware of the contradictory character of some of their signals; they predominantly adjust their target prices to stock price decreases, although their recommendations may point in a different direction.

4. Conclusion

Recommendation and target price changes both reflect analysts' expectations about the performance of a stock. We have confirmed that target price changes convey information about post-event abnormal returns that is incremental to the information contained in recommendations in a larger and more recent dataset. In addition, the results show that target price changes produce more important trading signals than reiterated recommendations. However, we find a systematic inconsistency between the suggested trading action implied in reiterated recommendations and abnormal returns depending on the target price change. Overall, analysts' recommendations go wrong when they are issued with large contradictory target price changes and are high and significant when they agree. This finding is even stronger for the recommendation categories that are found to be the most profitable in the academic literature, namely upgrades to buy, strong buy and downgrades to hold, sell and strong sell. Although large significant abnormal returns can be observed when the target price change agrees with the recommendation change, these recommendation categories have no predictive value when accompanied by high target price changes in the opposite direction of the recommendation change. Hence, contradictory analyst signals neutralize each other. This finding implies that analysts are either unaware of the information in their own target price forecasts, or they use target price changes to signal private information to the market if outside pressure prevents them from changing the recommendation. We demonstrate that large target price downgrades can generally be explained by preceding stock price decreases. This also holds true for contradictory downgrades and upgrades. Therefore, our findings indicate that analysts are unaware of their target price's signal when it contradicts their recommendation.

Potential profits after transaction costs generally remain slightly positive. Therefore, the trading strategies on individual analyst signals presented in this paper are profitable, especially when considering our conservative estimation of transaction costs. In addition, as Barber et al. (2001) point out, one group of investors can take direct advantage of the results in this paper: those intending to buy or sell stocks, who will incur transaction costs in any case, can obtain economic profits by considering the information contained in target price changes. However, not every analyst recommendation provides good advice for investment purposes. Investors should be highly cautious about stocks with strong buy and buy recommendations if their target prices are strongly reduced. These stocks do not earn positive abnormal returns. In fact, reiterated buy and strong buy recommendations actually tend to earn significant negative abnormal returns for longer holding periods when they are combined with contradictory target price decreases.

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Table 1: Descriptive Statistics for the Target Price Changes

Target price changes and recommendations for US firms are obtained from the I/B/E/S database. The sample consists of all target price changes available between January 2001 and December 2007 for which a recommendation reiteration or change is available from the same analyst at the time of the target price change announcement. Further, only target prices for firms are considered which have an available return in the CRSP database for at least one month after the target price announcement. Observations for stocks with a stock price below 1$ at the announcement date of the target price are excluded.

Panel A: Number of Target Price Changes, Analysts and Equities

Year	TP Changes	Analysts	Equities
2001	18,560	1,914	2,644
2002	27,331	2,094	2,823
2003	35,147	2,156	3,150
2004	41,624	2,395	3,447
2005	41,232	2,451	3,681
2006	42,767	2,484	3,795
2007	47,095	2,576	3,887
Total (unique):	253,756	(5,233)	(5,693)

Panel B: Number of Target Price Changes within Recommendation Changing Categories

		To Recommendation of:				
		Strong Buy	Buy	Hold	Sell	Strong Sell
From Recommendation of:	Strong Buy	54,698	4,072	5,130	92	191
		21.56%	1.60%	2.02%	0.04%	0.08%
	Buy	3,386	76,041	8,075	458	84
		1.33%	29.97%	3.18%	0.18%	0.03%
	Hold	4,071	6,011	74,927	2,287	900
		1.60%	2.37%	29.53%	0.90%	0.35%
	Sell	49	270	1,920	7,015	114
		0.02%	0.11%	0.76%	2.76%	0.04%
	Strong Sell	174	45	968	57	2,721
		0.07%	0.02%	0.38%	0.02%	1.07%

Reiterations:	215,402	85%
Upgrades:	16,951	7%
Downgrades:	21,403	8%
Total:	253,756	

Table 2: Average Change of Target Prices, Prices and Implicit Return Estimates within Recommendation Changing Categories

For recommendation changing categories quintile breakpoints are calculated from the beginning of the sample up to the previous month using the scaled target price changes $\Delta TP/P$ $((TP_t-TP_{t-1})/P_t)$. A target price change $\Delta TP/P$ is defined as most favorable (least favorable) if it exceeds (falls below) the highest (lowest) quintile breakpoint of the previous month. For these extreme target price changes this table shows the average scaled target price change $\Delta TP/P$, the average scaled price change $\Delta P/P$ $((P_t-P_{t-1})/P_t)$, the average change of the implicit return estimate $\Delta(TP/P)$ $(TP_t/P_t-TP_{t-1}/P_{t-1})$ and the actual implicit return estimate itself TP/P (TP_t/P_t-1). The values are winsorized at the 1st and 99th percentiles to mitigate the possible effect of extreme observations.

			To Recommendation of:									
			Strong Buy		Buy		Hold		Sell		Strong Sell	
			most fav.	least fav.	most fav.	least fav.	most fav.	least fav.	most fav.	least fav.	most fav.	least fav.
From Recommendation of:	Strong Buy	ΔTP/P	*26.55%*	*-64.19%*	*20.00%*	*-144.49%*	*14.35%*	*-126.00%*	*1.86%*	*-164.69%*	*-11.08%*	*-179.72%*
		ΔP/P	*16.83%*	*-46.69%*	*17.72%*	*-90.90%*	*19.94%*	*-73.54%*	*17.39%*	*-90.29%*	*8.45%*	*-95.26%*
		Δ(TP/P)	*3.65%*	*1.36%*	*-5.38%*	*-0.10%*	*-10.81%*	*-24.57%*	*-23.19%*	*-50.43%*	*-21.97%*	*-58.30%*
		TP/P	*32.59%*	*46.52%*	*24.98%*	*64.97%*	*8.04%*	*20.69%*	*1.17%*	*-9.00%*	*-4.26%*	*-14.75%*
	Buy	ΔTP/P	*39.63%*	*-73.44%*	*25.26%*	*-62.40%*	*14.79%*	*-125.63%*	*8.82%*	*-167.56%*	*10.67%*	*-178.48%*
		ΔP/P	*22.19%*	*-58.67%*	*17.41%*	*-46.39%*	*19.48%*	*-73.28%*	*18.40%*	*-101.38%*	*30.75%*	*-110.04%*
		Δ(TP/P)	*9.56%*	*6.61%*	*2.56%*	*1.19%*	*-9.91%*	*-22.85%*	*-13.38%*	*-39.10%*	*-33.73%*	*-54.21%*
		TP/P	*41.79%*	*48.22%*	*26.66%*	*42.17%*	*8.60%*	*22.63%*	*2.20%*	*0.28%*	*-15.23%*	*-20.42%*
	Hold	ΔTP/P	*45.63%*	*-22.69%*	*42.86%*	*-26.92%*	*21.22%*	*-42.17%*	*12.87%*	*-92.52%*	*11.27%*	*-99.43%*
		ΔP/P	*18.37%*	*-29.92%*	*20.64%*	*-31.33%*	*16.42%*	*-34.74%*	*19.80%*	*-56.10%*	*19.85%*	*-62.20%*
		Δ(TP/P)	*27.22%*	*11.45%*	*20.96%*	*9.59%*	*3.40%*	*-2.48%*	*-8.15%*	*-25.94%*	*-10.28%*	*-31.10%*
		TP/P	*33.71%*	*26.19%*	*28.67%*	*25.68%*	*6.80%*	*12.52%*	*-7.08%*	*-6.60%*	*-11.47%*	*-15.65%*
	Sell	ΔTP/P	*52.90%*	*-10.04%*	*52.70%*	*-9.59%*	*41.16%*	*-22.80%*	*21.40%*	*-39.03%*	*16.47%*	*-45.85%*
		ΔP/P	*19.24%*	*-37.88%*	*23.02%*	*-24.72%*	*21.56%*	*-32.14%*	*16.85%*	*-35.63%*	*23.73%*	*-26.24%*
		Δ(TP/P)	*55.24%*	*24.55%*	*50.77%*	*15.12%*	*22.67%*	*7.93%*	*5.94%*	*-5.37%*	*-5.90%*	*-15.19%*
		TP/P	*40.59%*	*20.97%*	*40.70%*	*20.65%*	*8.44%*	*6.42%*	*-6.58%*	*-6.68%*	*-17.45%*	*-13.57%*
	Strong Sell	ΔTP/P	*53.02%*	*3.86%*	*53.02%*	*-27.57%*	*41.34%*	*-18.59%*	*35.51%*	*-16.23%*	*19.44%*	*-36.03%*
		ΔP/P	*18.30%*	*-22.25%*	*-9.88%*	*-27.60%*	*19.84%*	*-35.78%*	*27.67%*	*-19.52%*	*13.56%*	*-34.97%*
		Δ(TP/P)	*59.69%*	*23.57%*	*51.36%*	*1.50%*	*26.67%*	*13.16%*	*14.41%*	*0.20%*	*8.32%*	*-6.21%*
		TP/P	*40.98%*	*16.23%*	*33.32%*	*9.12%*	*4.41%*	*3.30%*	*-16.45%*	*-13.32%*	*-13.74%*	*-15.75%*

Table 3: Distributions of Recommendation Changing Categories

For recommendation changing categories quintile breakpoints are calculated from the beginning of the sample up to the previous month using the scaled target price changes ΔTP/P. A target price change ΔTP/P is defined as most favorable (least favorable) if it exceeds (falls below) the highest (lowest) quintile breakpoint of the previous month. This table shows the percentage of changing categories for the highest (most fav.) and the lowest (least fav.) target price changes in comparison to the overall distribution of the recommendation changes within the upgrades (Panel A), reiterations (Panel B) and downgrades (Panel C). The recommendations are encoded as follows: 1 = strong buy, 2 = buy, 3 = hold, 4 = sell, 5 = strong sell.

Panel A: Downgrades

			Quintile	
		total	*least fav.*	*most fav.*
From:	To:			
1	**2**	19.05%	12.23%	20.24%
1	**3**	24.02%	23.70%	24.51%
2	**3**	37.67%	39.77%	35.61%
1	**4**	0.43%	0.34%	0.49%
2	**4**	2.12%	3.28%	2.06%
3	**4**	10.68%	13.13%	10.12%
1	**5**	0.92%	0.81%	1.35%
2	**5**	0.38%	0.47%	0.24%
3	**5**	4.20%	5.46%	4.50%
4	**5**	0.53%	0.81%	0.88%

Panel B: Reiterations

			Quintile	
		total	*least fav.*	*most fav.*
From:	To:			
1	**1**	25.40%	22.41%	25.32%
2	**2**	35.30%	30.88%	35.72%
3	**3**	34.78%	40.63%	34.42%
4	**4**	3.26%	4.17%	3.30%
5	**5**	1.27%	1.90%	1.25%

Panel C: Upgrades

			Quintile	
		total	*least fav.*	*most fav.*
From:	To:			
2	**1**	20.05%	13.58%	19.03%
3	**1**	23.99%	25.17%	22.25%
4	**1**	0.28%	0.29%	0.26%
5	**1**	1.01%	1.85%	1.24%
3	**2**	35.52%	35.86%	36.81%
4	**2**	1.58%	1.77%	1.65%
5	**2**	0.27%	0.18%	0.37%
4	**3**	11.27%	13.07%	11.78%
5	**3**	5.69%	7.64%	6.29%
5	**4**	0.34%	0.58%	0.33%

Table 4: Calendar Time Portfolios, Recommendation Reiteration

For recommendation reiteration categories (Panel A-C) and for upgrades to buy / strong buy and downgrades to hold / sell / strong sell (Panel D), quintile breakpoints are calculated from the beginning of the sample until the preceding month using the scaled target price changes ΔTP/P. A target price change ΔTP/P is defined as most favorable (least favorable) if it exceeds (falls below) the highest (lowest) quintile breakpoint of the previous month. The "most fav." and "least fav." portfolios assume a 1$ investment in these target price changes. The "collective portfolio" assumes a 1$ investment in every target price change of a recommendation reiteration category. The positions remain in the portfolios for a predefined time span. For the portfolios this table shows the monthly abnormal returns from a regression of the daily portfolio excess return on the four factors of Carhart (1997) for each recommendation and overall. The abnormal returns are estimated by using the approximate number of trading days (21). Thus, this value equals (1+α)^21-1. Further, the table shows the t-statistics of these intercepts and the t-statistic of the difference of the portfolio returns estimated with heteroscedasticity-robust standard errors. The regressions are based on 1,508 working days from 2002 to 2007. Portfolio returns are winsorized at the 1st and 99th percentiles to mitigate the possible effect of extreme observations. One/ two/ three asterisks represent significance at the 10%/ 5% / 1% level.

Panel A: 1 Month Holding Period

		Strong Buy	Buy	Hold	Sell	Overall
most fav.	monthly abn. ret	0.95%	1.06%	0.58%	0.51%	0.70%
	t-statistic	*(3.55)***	*(4.04)***	*(2.31)***	*(1.46)*	*(4.77)***
least fav.	monthly abn. ret	0.17%	-0.40%	-0.27%	-0.82%	-0.21%
	t-statistic	*(0.51)*	*(-1.18)*	*(-0.78)*	*(-1.72)**	*(-1.05)*
	t-statistic of difference	*(2.59)****	*(4.83)****	*(2.81)****	*(3.18)****	*(5.23)****
	collective portfolio	0.29%	0.30%	0.06%	0.00%	0.18%
	t-statistic	*(4.62)****	*(4.85)****	*(1.02)*	*(-0.02)*	*(4.68)****

Panel B: 3 Month Holding Period

		Strong Buy	Buy	Hold	Sell	Overall
most fav.	monthly abn. ret	0.38%	0.47%	0.23%	0.11%	0.30%
	t-statistic	*(1.72)**	*(2.14)***	*(1.10)*	*(0.46)*	*(2.60)****
least fav.	monthly abn. ret	-0.48%	-0.62%	-0.43%	-0.64%	-0.53%
	t-statistic	*(-1.84)**	*(-2.21)***	*(-1.53)*	*(-1.65)**	*(-3.07)****
	t-statistic of difference	*(3.56)****	*(4.33)****	*(2.66)****	*(2.32)***	*(5.73)****
	collective portfolio	0.06%	0.07%	-0.02%	0.00%	0.03%
	t-statistic	*(1.15)*	*(1.35)*	*(-0.28)*	*(0.00)*	*(1.03)*

Table 4 continued)

		Strong Buy	Buy	Hold	Sell	Overall
Panel C: 6 Month Holding Period						
most fav.	monthly abn. ret	0.08%	0.23%	0.11%	0.08%	0.14%
	t-statistic	*(0.41)*	*(1.17)*	*(0.58)*	*(0.35)*	*(1.35)*
least fav.	monthly abn. ret	-0.52%	-0.56%	-0.34%	-0.63%	-0.46%
	t-statistic	*(-2.23)***	*(-2.15)***	*(-1.27)*	*(-1.74)**	*(-2.83)****
	t-statistic of difference	*(2.79)****	*(3.42)****	*(1.94)***	*(2.37)***	*(4.48)****
	collective portfolio	0.02%	0.04%	0.02%	-0.02%	0.02%
	t-statistic	*(0.28)*	*(0.75)*	*(0.29)*	*(-0.21)*	*(0.52)*

		+1 month	+3 months	+6 months
Panel D: Calendar Time Portfolios by Recommendation Change Direction				
Upgrades to buy / strong buy	most fav. ΔTP/P	1.46%	0.81%	0.45%
		*(3.82)****	*(3.26)****	*(2.23)***
	least fav. ΔTP/P	0.41%	0.21%	0.20%
		(0.96)	*(0.76)*	*(0.85)*
Downgrades to hold / sell / strong sell	most fav. ΔTP/P	0.07%	0.07%	0.05%
		(0.30)	*(0.42)*	*(0.37)*
	least fav. ΔTP/P	-0.82%	-1.14%	-1.00%
		(-0.94)	*(-2.67)****	*(-2.72)****

Table 5: Factor Loadings, Market Capitalization and Transaction Costs

The quintile breakpoints are calculated as described in Table 4. For these portfolios Panel A shows the intercept and monthly abnormal return, the factor loadings and the adjusted R-square from a regression of the daily portfolio excess return on the four factors of Carhart (1997). Further, it shows the t-statistics of these intercepts and coefficients (in italics). Portfolio returns are winsorized at the 1st and 99th percentiles to mitigate the possible effect of extreme observations. Panel B shows the abnormal returns for "high" and "low" market capitalization, whereas "high" ("low") is defined to be in the upper (lower) two size quintiles. The quintile breakpoints are calculated monthly using all available market capitalization data for NYSE stocks. Stocks are assigned to these quintiles at the beginning of every month. Within recommendation changing and market capitalization categories, terciles are calculated every month using the scaled target price changes ΔTP/P. Panel C displays the abnormal returns after transaction costs by using the results of Keim and Madhaven (1998). We use heteroscedasticity-robust standard errors. The regressions are based on 1,508 working days. The "least fav." portfolios assume short positions, thus trading profits are represented by positive alphas. One/ two/ three asterisks represent significance at the 10%/ 5% / 1% level.

Panel A: Factor Loadings for the Calendar Time Regressions (three month holding period)

		Intercept	RMRF	SMB	HML	UMD	Adj. R^2
Reiterations	most fav. ΔTP/P	0.30%					
		0.014	1.174	0.596	0.149	0.112	89.1%
		*(2.60)***	*(145.50)***	*(39.75)***	*(6.77)***	*(7.44)***	
	least fav. ΔTP/P	-0.53%					
		-0.025	1.131	0.859	0.173	-0.486	83.6%
		*(-3.07)***	*(109.56)***	*(45.96)***	*(4.87)***	*(-28.26)***	

Panel B: Calendar Time Portfolio Performance Depending on Market Capitalization

		1 Month Holding Period		6 Month Holding Period	
		Market Cap		Market Cap	
		low	high	low	high
TP Change	most fav.	1.22%	0.31%	0.17%	0.04%
		*(5.66)****	*(1.97)***	*(1.29)*	*(0.34)*
	least fav.	-0.28%	-0.15%	-0.71%	-0.31%
		(-1.00)	*(-0.76)*	*(-3.82)****	*(-2.21)***

Panel C: Transaction Costs

		+1 month	+3 months	+6 months
Reiterations	most fav. ΔTP/P	0.07%	0.07%	0.01%
		(0.46)	*(0.63)*	*(0.08)*
	least fav. ΔTP/P	-0.98%	0.10%	0.29%
		*(-5.19)****	*(0.64)*	*(2.02)***
Upgrades to buy / strong buy	most fav. ΔTP/P	0.44%	0.41%	0.19%
		(1.28)	*(1.76)**	*(0.99)*
Downgrades to hold/ sell/ strong sell	least fav. ΔTP/P	-0.50%	0.26%	0.39%
		(-1.02)	*(0.76)*	*(1.37)*

Table 6: Characteristics per Reiteration Category

For reiterations quintile breakpoints are calculated from the beginning of the sample up to the previous month using the scaled target price changes ΔTP/P. A target price change ΔTP/P is defined as most favorable (least favorable) if it exceeds (falls below) the highest (lowest) quintile breakpoint of the previous month. In Panel A, this table shows the various characteristics of these extreme target price changing categories for the recommendation reiterations. Sales growth represents the growth in sales over the preceding year; price-earnings is the price-to-earnings ratio; price-book is the price-to-book ratio. These values are winsorized at the 1st and 99th percentiles to mitigate the possible effect of extreme observations. Market cap represents the market capitalization in billion dollars. Panel B provides the results for regressions of the scaled target price changes on the scaled price changes, $\Delta TP/P_i = \alpha + \beta \cdot \Delta P/P_i + \varepsilon_i$, per reiteration category. One/ two/ three asterisks represent significance at the 10%/ 5% / 1% level.

Panel A: Firm characteristics

		Strong Buy	Buy	Hold	Sell	Strong Sell
most fav.	sales growth	0.33	0.35	0.22	0.17	0.23
	price-earnings	21.55	23.38	18.65	20.04	13.78
	price-book	4.46	4.41	3.70	3.20	3.72
	market cap	6.08	7.52	7.26	6.43	9.09
least fav.	sales growth	0.23	0.23	0.15	0.08	0.18
	price-earnings	16.35	15.39	13.80	6.68	12.33
	price-book	3.35	3.51	2.72	2.34	2.29
	market cap	5.33	5.92	5.05	3.53	4.13

Panel B: Regression on scaled price change

		Strong Buy	Buy	Hold	Sell	Strong Sell
most fav.	coefficient	-0.10	0.04	-0.16	0.17***	0.00
	adj. R^2	0.00	0.00	0.00	0.04	0.00
least fav.	coefficient	1.00***	0.94***	0.84***	0.56***	0.64***
	adj. R^2	0.41	0.53	0.35	0.37	0.65