ANALYSTS' RECOMMENDATION CHANGES OR DISAGREEMENTS WITH MARKET CONSENSUS: FROM WHICH SIGNAL DOES THE MARKET TAKE ITS LEAD?

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Abstract

Although there is little doubt that the stock market takes note of the investment recommendations made by analysts, it is not always clear which signal matters more: the difference between an analyst's recommendation and his or her previous recommendation, or the difference between an analyst's recommendation and the consensus recommendation? We show that the change in an analyst's recommendation is the clearer of these signals. We also show that the market's reaction is strongly influenced by the reputation of the analyst, the divergence of opinion among analysts and the number of analysts who follow the stock. Existing studies are hampered by the low proportion of negative recommendations. We overcome this deficiency by studying the Australian market, in which institutional differences lead to analysts releasing many more negative recommendations than in the US.

1. INTRODUCTION

Many broking firms employ analysts to produce earnings forecasts and to issue investment recommendations. Whereas an analyst's earnings forecast is subject to interpretation, an analyst's recommendation may be regarded as a clear signal of the analyst's assessment of the attractiveness of the stock as an investment. For example, an analyst may forecast a large increase in earnings yet not regard the stock as a good investment because the current stock price may be even higher than that warranted by the earnings forecast. Nonetheless, analysts' recommendations leave room for interpretation by investors.

Suppose that an analyst changes his or her recommendation from a "strong buy" to a "buy"; is this a positive signal or a negative signal? Of itself, the signal is positive, but it is also clear that the analyst now thinks less highly of the stock than previously. Therefore, investors who had regarded the stock as a marginal "buy", might change their opinion to a "sell". Similarly, if the market consensus is that a particular stock is, say, a "sell", and an analyst releases an "underperform" recommendation on that stock, is this signal positive or negative? Alternatively, suppose that an analyst releases a "buy" recommendation that merely reiterates his or her previous recommendation. Is this new recommendation of any value to investors? On the one hand, it may appear that nothing new has been revealed about the analyst's assessment and hence the recommendation has no value. On the other hand, the new recommendation may be positively regarded since a "buy" recommendation, of itself, is a positive signal. Our main objective in this paper is to answer questions of this type. In particular, we undertake an empirical investigation of the short-term response of stock prices to analysts' recommendations to determine the relative importance of two signal metrics *viz* (i) an analyst's recommendation relative to that analyst's previous recommendation on that stock and (ii) an analyst's recommendation relative to the market consensus recommendation on that stock. Both of these metrics are also assessed conditional on the stock market response to the type (or, 'level') of recommendation. Our main finding is that, when the effect of confounding factors is taken into account, the first of these signals is the most informative.

As far as we are aware, Dhiensiri et al. (2005) is the only other study to investigate both metrics simultaneously. Although our study therefore has many features in common with Dhiensiri et al., there are also important differences. First, Dhiensiri et al. study recommendations at the level of the broking firm, whereas we study recommendations at the level of the individual analyst. As the analyst's employer, the broking firm may influence the recommendations released by the analyst but in the end any recommendation is made by the individual whose name appears as the author of the report. While analysts have an incentive to pay attention to their employer's views, they also have an incentive to protect and develop their individual reputations. Moreover, investors may follow an analyst from one employer to another; indeed, achieving this outcome is a major reason why broking firms hire high-reputation analysts from other firms. The second difference between the studies is related to the first. Empirical evidence has shown that the reputation of the individual analyst affects the extent of the stock market's response. To incorporate the effect of reputation, Dhiensiri et al. use the reputation of the broking firm that employs the analyst, rather than the reputation of the individual analyst. We use the reputation of the individual analyst. We argue that the individual analyst's reputation is a more precise measure because an analyst whose reputation is high (low) may be employed by a broking firm whose reputation is low (high) although it is likely that the reputation of the broking firm and the analyst is positively correlated. Third, in common with other US studies, the dataset used by Dhiensiri et al. is very heavily biased towards “buy” and “strong buy” recommendations. Their explanation is that analysts rely heavily on firm managements for access to information and hence analysts are unwilling to risk offending firm managements by releasing “underperform” and “sell” recommendations. Therefore, to signal a negative view, analysts will downgrade a stock from, say, a “strong buy” to a “buy”, rather than reveal their true opinion which may be that the stock is an “underperform” or a “sell”. We significantly reduce this bias by studying recommendations on Australian stocks. For institutional reasons, it is much more common in Australia than in the US for analysts to issue negative recommendations. This choice also enables us to test whether factors other than heavy dependence of the analysts on firm managements cause investors to respond to recommendation changes, rather than levels. Fourth, only a minute proportion of the sample studied by Dhiensiri et al. consists of reiterations. Hence, they are unable to reach any conclusion on the importance or otherwise of a reiteration. Our sample includes numerous reiterations. Fifth, we conduct several additional tests that shed further light on the issues raised by this area of study.

The remainder of the paper is organized as follows. In section 2, we review the relevant literature and in section 3 we outline our data and methodology. Our results are presented in section 4 and some concluding comments are offered in section 5.

2. LITERATURE REVIEW

There is little doubt that the stock market takes note of at least some of the investment recommendations made by analysts. Ryan and Taffler (2004) report that about 17 per cent of major market-adjusted price changes in the London Stock Exchange are associated with analyst activities such as the release of earnings forecasts and investment recommendations. In the event-study literature, the short-term response of stock prices to the release of analysts' recommendations has been extensively researched. Early international studies such as Bjerring et al. (1983) and Beneish (1991) and, in Australia, Aitken et al. (2000), focused on the *level* of the recommendation: that is, a "buy" ("sell") recommendation was regarded as a positive (negative) signal. Later studies, however, recognized that the *change* in an analyst's recommendation may be important. For example, Stickel (1995), Womack (1996), Francis and Soffer (1997) and Ho and Harris (2000) investigate this hypothesis. In similar vein, researchers have studied "initiations of coverage", which are defined as those recommendations where the analyst concerned has not previously recommended that particular stock. Such an approach implicitly recognizes that an analyst's previous view (or, in this case, lack thereof) may be important. Examples of this research in the US include Peterson (1987), McNichols and O'Brien (1997), Sayrak and Dhiensiri (2002) and Irvine (2003), and, in Australia, Chan et al. (2006).

Other studies have suggested that it is important to evaluate an analyst's recommendation relative to the market consensus recommendation at the time that the analyst's assessment is released. On this view, if the market consensus reflects the market's beliefs about the firm's prospects, then a new recommendation that merely repeats the consensus view is unlikely to elicit a significant stock market response. However, if an analyst contradicts the market consensus, then the market may alter its view, leading to a change in the stock price. Barber et al. (2001, 2003) and Jegadeesh et al. (2004) find that stock price responses depend in part on whether, relative to the consensus, a recommendation is an upgrade, a downgrade or a reiteration. Thus, on this evidence, it is important to take the market consensus into account.

The study that is most directly relevant to ours is Dhiensiri et al. (2005). Their sample consists of 52600 recommendations made on US stocks over the period 1992-2001. Their primary data source is the First Call Recommendations database. Each recommendation is expressed on a five-point scale of 1 ("strong buy"), 2 ("buy"), 3 ("hold"), 4 ("underperform") and 5 ("sell"). The dependent variable is the stock market impact as measured by the cumulative abnormal return over the 3-day period from one trading day before the recommendation release to one trading day after the release. The abnormal return is defined as the return on the firm, minus the return on the CRSP value-weighted market index. Two independent variables are of particular interest to Dhiensiri et al. The first is the absolute value of the difference between a new recommendation and the previous recommendation released by that broking firm on that stock. The second is the difference between a new recommendation and the consensus recommendation. Dhiensiri et al. emphasize that analysts depend on the goodwill of firm managements to provide them with privileged access to information and hence analysts are generally unwilling to issue negative recommendations such as "underperform" and "sell". Thus a downgrade – for example, from "strong buy" to "buy" – is used by analysts to signal a negative view, whilst avoiding the risky course of issuing an "underperform" or a "sell" recommendation. The results of their univariate analysis suggest that both independent variables are relevant to market prices, and that both have a stronger influence in the case of downgrades. The results of their multivariate analysis, using all independent variables and their entire dataset, which they refer to as "Model 7", are consistent with this conclusion. The absolute value of the difference between a recommendation and that broking firm's previous recommendation on the same stock is not significant for upgrades but is marginally significant ($t = 2.00$) for downgrades. The difference between a recommendation and the consensus recommendation is significant for both upgrades and downgrades.

In addition, Dhiensiri et al. hypothesize that the magnitude of the price response should also be related to the magnitude of the change in recommendation. For example, all other things being equal, the magnitude of the price response when an analyst upgrades a recommendation from "hold" (3) to "strong buy" (1), should exceed the magnitude of the price response when an analyst upgrades a recommendation from "hold" (3) to "buy" (2). Their evidence on this hypothesis is mixed. While their evidence suggests that the magnitude of the reaction to a recommendation change of two levels exceeds the magnitude of the reaction to a recommendation change of only one level, the evidence for changes of greater magnitude is typically not as hypothesized.

The other independent variables used by Dhiensiri et al. measure the reputation of the broking firm, the divergence of opinion among analysts, the number of analysts following the firm and a dummy variable to represent whether the firm is listed on NASDAQ. Stickel (1990, 1992) finds that analysts named in the Institutional Investor "All-American Research Team" are able to forecast earnings more accurately than other analysts and have a greater impact on stock prices. In a subsequent study, Stickel (1995) finds that analyst performance increases with All-American status and size of the broking firm but decreases with the size of the firms that they cover.[1] In contrast, Li (2002) finds that All-American status is not a better predictor of analyst performance. Dhiensiri et al. find that a recommendation released by a more reputable broking firm adds about 0.5% to the absolute value of the mean price reaction, compared to one released by a less reputable broking firm.

Greater divergence of opinion among analysts and a higher number of analysts following the firm are expected to reduce the stock price impact of a recommendation. Dhiensiri et al. argue that divergence of opinion may indicate that information about the firm is imprecise, and hence recommendations on that stock are less valuable to investors. Therefore, all other things being equal, the absolute value of the change in the stock price should be smaller, the greater is the divergence of analyst opinion on the stock prior to the release of the recommendation.

When a firm is followed by more analysts, a greater quantum of information is expected to have been impounded in the price. The impact of a new recommendation is expected to be lower because the new information is a smaller fraction of the total information set. Therefore, all other things being equal, the greater is the number of analysts following the firm, the smaller should be the absolute value of the change in the stock price.

Finally, if a firm is listed on NASDAQ, the impact of a recommendation is expected to be greater because, on average, less information is available on NASDAQ-

[1] There is a simultaneity problem since it is the superior performance of the analyst that propels him or her to All-American status.

listed firms than on firms listed on the NYSE or AMEX. Hence, recommendations on NASDAQ-listed firms are expected to be of more value to investors. Most of the empirical results reported by Dhiensiri et al. are consistent with these expectations.

3. DATA AND METHODOLOGY

Analysts' recommendations on listed Australian stocks are obtained from the Institutional Broker Estimates System (I/B/E/S) recommendation file. Each recommendation is expressed on a five-point scale of 1 ("strong buy"), 2 ("buy"), 3 ("hold"), 4 ("underperform") and 5 ("sell"). The file provides unique identifier fields for the individual analyst making a recommendation and the broking firm with which the analyst is associated. Full names are available for each of these fields, and in the first step of organizing the data, the unique identifier fields were linked to the full names. The first recommendation available in the database was issued on 20 November 1993. We treat the first three years of data as an "exclusion period" which we use to establish an initial set of individual analyst's recommendations and consensus recommendations. An exclusion period is needed because, otherwise, firms that are more frequently recommended will be over-represented in the sample, especially in the early years.[2] Our sample of "new" recommendations begins on 20 November 1996 and terminates on 30 June 2003. During this period there were 24797 recommendations. The market consensus recommendation is the median of the available recommendations and is also obtained from I/B/E/S.

[2] To clarify this point, suppose that data collection for the sample began on the first date (20 November 1993) in the database. By definition, on that date no consensus recommendation could be constructed, although in reality consensus recommendations would have existed in the market. As time passes, consensus recommendations could be constructed first for firms on which analysts frequently make recommendations and only later for firms on which less frequent recommendations are made.

Our main dependent variable is the cumulative abnormal return in the event window (-1, +1) – that is, from one trading day before the recommendation date to one trading day after the recommendation date. Daily share prices are sourced from the Securities Industry Research Centre of Asia-Pacific (SIRCA) daily price file. The market index used is the Standard and Poor's Australian Stock Exchange All Ordinaries Accumulation Index and is sourced from Integrated Real Time Equity System (IRESS).

Following Dhiensiri et al., we control for the possible confounding effects of contemporaneous recommendations by deleting all recommendations which occur within two days of each other. In addition, we also delete all recommendations which occurred within two days of the release of a voluntary management earnings forecast or within two days of the announcement of actual earnings.[3] We hand collected the dates of management earnings forecasts released through "Signal G" of the Australian Stock Exchange (ASX). For the period 1 January 1996 to 30 June 2001, Signal G announcements, which include annual and semi-annual earnings announcements, are obtained from IRESS. After 1 July, 2001 the PDF signal on IRESS is used. Announcements were read for any reference to earnings outlook, forecasts or upgrades and such cases were recorded in the database.

Two independent variables are of particular interest to us. The first, which we call the "analyst-specific metric", is denoted by *MRPR* and is the change in an analyst's recommendation on the stock concerned. The second, which we call the "consensus-based metric" is denoted by *RCR* and is the analyst's recommendation minus the

[3] Under the Australian continuous disclosure regime, firms' announcements are released through the stock exchange and are disseminated electronically to market participants and others via "Signal G".

consensus recommendation.[4] For the purpose of this investigation, we hypothesize that the stock price reaction will be related to the direction and magnitude of both these variables; that is, the greater the size of an upgrade (downgrade) the more positive (negative) should be the stock price reaction. However, our reasons for including these variables are not the same as those advanced by Dhiensiri et al. As noted earlier, Dhiensiri et al. emphasize the importance of analysts' need to maintain good relations with firm managements. Hence, they have an incentive to signal bad news by downgrading a recommendation, while still issuing a recommendation that ostensibly is positive. This argument has much less force in Australia. Under Australia's "continuous disclosure" regime, it is illegal for an employee or officer of a listed firm to reveal information about that firm to only selected analysts. If information is to be revealed, it must be revealed to all analysts simultaneously via a message sent to the Australian Stock Exchange. Although compliance with this legal requirement is no doubt less than complete, it is nevertheless reasonable to hypothesize that Australian analysts are less beholden to firms' managements than their US counterparts and that, as a result, they are much more likely to issue negative recommendations.

The continuous disclosure regime does not imply that Australian investors will ignore the change in analysts' recommendations, nor does it imply that Australian investors will not assess a recommendation relative to the consensus recommendation. We argue that in all markets, including the Australian market, there is another (and perhaps more fundamental) reason for investors to focus on the change in a recommendation rather than its level. This reason is simply that it is the change in a

[4] Note that, in our terminology, Dhiensiri et al. study *RCR* and the absolute value of *MRPR*. The issue of signed *versus* absolute values is discussed further below.

variable, rather than its level, that represents new information. Consistent with this view, we hypothesize that if a new signal merely reiterates the previous signal, then there is no new information and hence there should be no price reaction.

Our other independent variables are essentially controls for several factors that may also affect the price reaction. The first control is the reputation of an analyst who makes a recommendation. All other things being equal, a larger price response is expected if the analyst has a high reputation. Analyst rankings were obtained from the East Coles Equities Market Report. Each year, East Coles surveys institutions that trade in the Australian equities market and asks them for performance ratings, on a scale of 1 to 10, on individual analysts in each industry sector. The ratings are then weighted by the domestic equity funds that are managed by the broking firm with whom the nominated analyst is associated. In each industry sector, the individual analysts are then rated according to their weighted performance score. In our empirical tests, we use the dummy variable *TOP5*, which takes the value 1 if an analyst is one of the top 5 analysts in the East Coles ranking for the industry sector to which the recommended firm belongs. The second control variable is *DIVERGENCE*, which is the standard deviation of the recommendations available on a given stock at a given time. The greater the divergence of opinion, the smaller is the expected impact on the stock price. The third control variable is *NOA*, which is the number of analysts covering the stock in the calendar year in which the recommendation is made. The greater the analyst following, the smaller is the expected impact on the stock price.

The final control variable concerns investment banking relationships. Dhiensiri et al. observe that an investment banking relationship between a listed firm and the broking firm with whom the analyst is associated, may affect the recommendations that the analyst is willing to make on that firm. This observation is consistent with the empirical studies of Dugar and Nathan (1995), Carleton et al. (1998), Michaely and Womack (1999), O'Brien et al. (2005) and Agrawal and Chen (2006). To enable us to investigate this issue, we use the SDC Platinum database to identify all initial public offerings (IPOs) and then match these firms with the I/B/E/S recommendation file. The IPO dates are used as a reference point relative to the I/B/E/S recommendation dates so that we can determine the time period of the IPO. A similar approach is used to tag all firms that made seasoned equity offerings. These investment banking relationships are matched to broker recommendations and tagged.

While our main hypothesis is that the sign and magnitude of *CAR* is positively related to the sign and magnitude of *MRPR* and *RCR*, our control variables are hypothesized to relate to the absolute value of *CAR*. Therefore, when we use control variables in our regression analysis, we use the absolute values of our main variables, which we denote as *ABSCAR*, *ABSMRPR* and *ABSRCR*. To enable us to make valid comparisons, we also estimate and report regressions using absolute values when we do not use control variables.

After deleting initiating recommendations and overlapping recommendations, and allowing for data availability in the AGSM files, our final sample consists of 10048 recommendations. The sample covers 543 unique firms, with a minimum of 123 firms in 1996 and a maximum of 314 firms in 2000. On average, there are 252 firms per year in the final sample. The final sample covers all the 24 industries as classified by the Australian Stock Exchange.

4. RESULTS

Descriptive statistics are provided in Table 1. Panel A describes the distribution of recommendation levels, Panel B describes the distributions of the control variables and Panel C provides the correlation matrix.

[TABLE 1 ABOUT HERE]

The most striking feature of Panel A is the high number of negative recommendations. The proportions for each type of recommendation (with corresponding proportions for the US study by Dhiensiri et al. shown in brackets) are: "strong buy" 17.8% (29.3%); "buy" 23.7% (36.7%); "hold" 43.6% (31.2%); "underperform" 6.8% (2.1%) and "sell" 8.1% (0.7%). Thus, in the Australian sample, 14.9% of recommendations are "underperform" or "sell", as against only 2.8% in the US sample. For the reasons set out in section 3, we attribute this finding to Australia's continuous disclosure regime. Panel B shows that the maximum number of analysts covering any particular firm is 18 while the median number of analysts is eight. Of the 10048 recommendations, 405 (4.0%) are made by a "top 5" analyst. Panel C shows that, with one exception, the correlations between variables are low. The exception is the positive correlation of approximately 0.6 between the analyst-specific metric, *MRPR*, and the consensus-based metric, *RCR*. However, the correlation is not so high as to preclude a meaningful estimation of the separate influences represented by the two metrics.

Table 2 provides a matrix showing the mean return observed when an analyst's recommendation is compared with the previous recommendation made by that analyst on that stock.

[TABLE 2 ABOUT HERE]

The data again show a striking difference between our study and that of Dhiensiri et al. Based on the data in Table 2, there are 1936 reiterations (observations on the main diagonal), which represent 19.3% of the sample. Dhiensiri et al. observed only 27 reiterations, which represented only 0.05% of their sample. [5] Consistent with previous studies, the level of recommendation gives rise to significant stock price returns. For example, 'strong buy' recommendations on average result in significantly positive returns (0.40%) while 'underperform' recommendations on average result in significant negative returns (-0.59%).

We next examine the stock price returns of an analyst's recommendations *vis-à-vis* her previous recommendation. The ten cells below (above) the diagonal are upgrades (downgrades). Nine of the ten upgrades are associated with a positive mean return, of which three are significant.[6] Eight of the ten downgrades are associated with a negative mean return, of which four are significant. Two of the five reiterations elicit a positive mean return, of which one is significant, while the other three elicit a negative mean return which is not significantly different from zero. Contrary to our hypothesis, there does not appear to be a strong tendency for mean returns to decrease across individual rows or to increase down individual columns. Our conclusion from this table is qualitatively similar to that of Dhiensiri et al.: while the direction of the change in an analyst's recommendation is important, the influence of its magnitude is less clear. The

[5] The data in Table 2 also permit a comparison between the distributions of recommendation levels using "previous" rather than "current" recommendations. As would be expected given the substantial overlap, the results are very similar to those shown in Table 1. The proportions are: "strong buy" 19.6% in our study (31.7% in Dhiensiri et al.); "buy" 25.0% (40.0%); "hold" 40.9% (26.0%); "underperform" 6.6% (1.8%) and "sell" 7.9% (0.6%).
[6] All references to significance will be based on the 5% level of statistical significance.

results in Table 2 clearly show that analysts' recommendation should not be analyzed from the perspective of levels alone.

Table 3 is constructed in the same way as Table 2, except that the variable of interest now is the change from the market consensus rather than the change from the analyst's previous recommendation.

[TABLE 3 ABOUT HERE]

Six of the ten upgrades (cells below the diagonal) are associated with a positive mean return, of which two are significant. Eight of the ten downgrades (cells above the diagonal) are associated with a negative mean return, and while three of these negative reactions are statistically significant, so also are the two positive reactions. Three of the reiterations elicit a positive mean return, while two elicit a negative mean return, of which one is significant. Similar to Table 2, there is no strong tendency for mean returns to decrease across individual rows or to increase down individual columns. However, the direction of the change appears to be important and not just the level alone.[7]

In Table 4 we provide a formal test of the hypothesis that the magnitude, as well as the sign, of the change in analysts' recommendations has an impact on the stock price.

[TABLE 4 ABOUT HERE]

Because recommendations are made on a five-point scale, there are nine possible changes in recommendations, ranging from upgrades of four levels, through reiterations (no change) to downgrades of four levels. For each change category Panel A of Table 4 provides the mean abnormal return (*AR*) for each of days –1, 0 and +1, together with the mean three-day cumulative abnormal return (*CAR*). Our discussion focuses on the

[7] We also undertake robustness checks using raw returns (rather than abnormal returns), a (–4, +1) event window and by including dates affected by contemporaneous recommendations, management earnings forecasts and earnings announcements. The results are generally qualitatively similar.

cumulative abnormal returns, with the component daily abnormal returns providing a robustness check. Following Dhiensiri et al., in Panel B we group the categories into single-level changes and multi-level changes.

The *CAR*s shown in Panel A of Table 4 confirm that on average price responses to upgrades are positive, while price responses to downgrades are negative. Except for the four-level change, the responses to downgrades show a tendency to be greater, the higher is the number of level changes. There is no similar tendency apparent in the results for upgrades. These findings are very similar to those of Dhiensiri et al. On average, reiterations have little, if any, impact on prices. This result is consistent with the proposition that the market responds primarily to the change in an analyst's recommendation, rather than the level of a recommendation. The daily abnormal returns are remarkably consistent: daily returns are significantly different from zero only when the three-day cumulative return is also significantly different from zero. Importantly, significant daily returns are not confined to day –1, suggesting that abnormal returns may be achievable by investors who respond rapidly to recommendation changes. Panel B confirms these conclusions.

Table 5 is the counterpart to Table 4; whereas Table 4 reports on tests using the analyst-specific metric *MRPR*, Table 5 reports on tests using the consensus-based metric *RCR*.

[TABLE 5 ABOUT HERE]

The results in Table 5 are clearer than those in Table 4. In Panel A, the *CAR*s for both upgrades and downgrades relative to consensus show a clear tendency to become larger in absolute size, the greater is the magnitude of the change. The only exception is that the mean response to upgrades of four levels is slightly less than the mean response to upgrades of three levels. Four of the nine changes in Panel A, and three of the five in Panel B, are statistically significant. The mean response to reiterations is not significantly different from zero. The results for abnormal returns on individual days are consistent with those for the three-day cumulative abnormal return. As in Table 4, significant abnormal returns are not confined to day 0.

Taken together, the results provided in Tables 4 and 5 suggest that, with the exception of upgrades relative to previous recommendations, the magnitude of the change in recommendation is important. In particular, the greater the change relative to the analyst's previous recommendation, and the greater the change relative to the consensus recommendation, the greater is the magnitude of the stock market impact.

Given the high level of consistency between the conclusions supported by the three-day *CAR*s and the conclusions supported by the daily *AR*s, our remaining results are presented only for the three-day cumulative abnormal returns. Table 6 provides the results of a multivariate test of the hypotheses tested in Tables 4 and 5.

[TABLE 6 ABOUT HERE]

In this test, we run a GMM regression where the dependent variable is the absolute value of the cumulative abnormal return (*ABSCAR*) and the independent variables of interest are dummy variables for the non-zero changes in recommendation level. In Panel A, the changes are measured against the analyst's previous recommendation, while in Panel B the changes are measured relative to the consensus recommendation. Panels C and D report results where the multi-level changes are combined, and the benchmarks are again the analyst's previous recommendation and the consensus recommendation, respectively.

We also include control variables for analyst reputation (*TOP5*), divergence of analyst opinion (*DIVERGENCE*) and the number of analysts covering the stock (*NOA*). The results for the control variables are consistent across panels: the variables for reputation, divergence of opinion and number of analysts are all highly significant in every panel and affect returns in the expected directions. The results in Panel A suggest that the market responds as expected to upgrades of one or two levels and to downgrades of two or more levels. Panel B suggests that upgrades and downgrades of two levels relative to consensus elicit the expected price response but in most other cases the responses are not significant. The Wald tests reported in Panels C and D imply that there is a significant difference between the responses to single- and multi-level changes in the case of downgrades relative to the analyst's previous recommendation and upgrades relative to the consensus recommendation.

In unreported tests, we also included a dummy variable in an attempt to capture the effect of there being a conflict of interest stemming from the existence of an investment banking relationship between the broking firm and the recommended firm. It was not significant in any of the regressions. This result is consistent with the finding of Agrawal and Chen (2006) that although the stock price responds to the level of a recommendation made by a broking firm that has a conflict of interest, in such cases the price response to analysts' upgrades is negatively related to measures of the magnitude of the conflict of interest. Agrawal and Chen infer that the market rationally discounts such recommendations.

Our main set of tests consists of 12 regression equations estimated using GMM. The results are shown in Table 7.

[TABLE 7 ABOUT HERE]

There are four basic models (numbered 1, 2, 3 and 4), each of which is estimated in three different ways (labelled A, B and C). In Model 1 our focus is on the analyst-specific metric *MRPR*, while in Model 2 our focus is on the consensus-based metric *RCR*. In Model 3, we include both metrics, while in Model 4 we include both metrics and a set of dummy variables that represent the level of the recommendation. For each of these four models we run four regressions. In the first (labelled "A") the variables are measured using signed, as distinct from absolute, values. In regression B, we use absolute values to enable a comparison with regression C, in which we introduce the control variables.

The estimates for Model 1A show that, as hypothesized, the relation between returns and *MRPR* is positive and highly significant. As would be expected, this finding holds up if absolute values are used (Model 1B). This result also holds when the control variables are included (Model 1C) and for the subsample of recommendations (Model 1D). All control variables are significant and have the sign expected. Indeed, this result is found in all four regressions where control variables are included, confirming very strongly that the reputation of analysts, the divergence of opinion among analysts and the number of analysts following a stock all have a significant impact on the market's reaction to a recommendation. Taken together, the results for Model 1 appear to confirm that the change in an analyst's recommendation has a strong effect on the market's reaction to the recommendation.

The results for Model 2 are very similar to those for Model 1. In Model 2A, the coefficient on the consensus-based metric *RCR* is positive and highly significant; it is also very close in magnitude to the coefficient on *MRPR* in Model 1A. Moreover, as in

Model 1, this result holds up when control variables are included. Therefore, these results appear to confirm that the market assesses analysts' recommendations relative to the consensus recommendation at the time, and responds accordingly.

In Model 3 we include both metrics in the estimations. The results for Models 3A and 3B show that both metrics retain their significance, and have the expected signs, when no control variables are included. This significance is retained when control variables are included. Thus Model 3 also suggests that both metrics are important.

In Model 4 we address directly the issue of whether investors respond primarily to the "change" variables *MRPR* and/or *RCR*, or to the level of analysts' recommendations. Some of the results in Model 4 are readily interpreted. The analyst-specific metric retains its significance in all three regressions, while the consensus-based metric is not significant in any of these regressions. The results for the recommendation levels are inconsistent. For example, in Model 4A, the prob value for the coefficient on the "buy" dummy is 0.0001, but in Model 4B, the prob value is 0.7844. The "sell" dummy is highly significant in Models 4B and 4C but not in Model 4A.

We draw four main inferences from the results presented in Table 7. First, the market clearly responds to the change in analysts' recommendations. Second, the importance of the difference between an analyst's recommendation and the consensus recommendation is not established as convincingly. While the results are strong when this effect is considered in isolation, it is slightly weaker when appropriate control variables are included and disappears when level dummies are included. Third, analyst reputation, the divergence of opinion among analysts and the number of analysts following a stock all have a significant influence on the market's reaction to a recommendation. Fourth, the level of recommendation induces a market reaction that is at best unreliable, once account is taken of the change in the analyst's recommendation.

We undertook further analysis to test whether the results were sensitive to the industrial classification of the firms being recommended. For this purpose we broke the sample into three major industry classifications: resources (ASX codes 1 to 4), light and heavy industry (ASX codes 5 to 15, 18) and financial firms (ASX codes 16, 17, 19 and 20).[8] Except for the resources industry, the results are qualitatively similar. The results for the resource industry may be explained by the small sample size.

5. CONCLUSION

We study more than 10000 recommendations made on Australian stocks over the period 1996 to 2003. By studying Australian stocks we are able to focus on a market in which (unlike the US market) it is common for analysts to issue negative recommendations. We find strong evidence that the change in the analyst's recommendation is the driving force. Significantly, this effect is found in a market where analysts should be less dependent on the goodwill of firm managements. Taken in isolation, the effect of the difference between an analyst's recommendation and the consensus recommendation appears to be of about equal importance to the change in the analyst's recommendation but the significance of the consensus-based metric vanishes when recommendation levels are taken into account. Despite this finding, tests of the influence of the level of a recommendation, rather than its change, suggest that this effect is weak and/or fragile. Consistent with this view, when an analyst's recommendation merely reiterates his or her

[8] This description applies to the industry classifications used up to September 2002, when the ASX switched to GICS categories. After September 2002 we used the equivalent GICS codes.

previous recommendation, the stock market impact is typically small or non-existent. We also show that the absolute value of the stock return is positively related to the reputation of the analyst who makes the recommendation and negatively related to both the divergence of opinion among analysts and the number of analysts who follow the stock.

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Table 1 : Descriptive Statistics

The distribution of recommendation levels is based on those categorized as 'current' recommendations. *TOP5* has a value of 1 if the analyst is one of the top 5 analysts for the year for the industry sector in which the recommended firm belongs. *DIVERGENCE* is the standard deviation of the recommendations available and has a minimum value of zero if there is only one analyst or if all recommendations for the firm share the same level. *NOA* is the number of analysts covering the stock in the calendar year in which the recommendation is made. *MRPR* is the analyst-specific metric and is the change in the analyst's recommendation on that stock. *RCR* is the consensus-based metric and is the difference between a new recommendation and the consensus recommendation. The sample period is from 20 November 1996 to 30 June 2003.

Panel A : Distribution of Recommendation Levels

Recommendation Level	**Number**	**%**
Strong Buy	1795	17.8
Buy	2383	23.7
Hold	4380	43.6
Underperform	679	6.8
Sell	811	8.1
TOTAL	10048	100.0

Panel B : Distributions of Control Variables

	N	**Median**	**Mean**	**Min**	**Max**	**Standard Deviation**
TOP5	405	0	0.0403	0	1	0.1967
DIVERGENCE	NA	0.96	0.8896	0	2.83	0.4416
NOA	NA	8	8.3900	1	18	3.5160

Panel C : Pearson Correlation Matrix

	MRPR	***RCR***	***TOP5***	***DIVER-GENCE***
RCR	0.6044***	1.0000		
TOP5	-0.0601***	-0.0489***	1.0000	
DIVERGENCE	0.0434***	0.0106	-0.0075	1.0000
NOA	0.0414***	-0.0047	0.0043	0.1549***

*** denotes 1% level of significance.

Table 2 : Descriptive Statistics of Current Recommendations *vis-à-vis* Previous Recommendations by the Same Analyst

CAR is the cumulative abnormal return over the event window (-1, +1). The abnormal return is computed as the difference between the cumulative return on the stock less the cumulative market return over the same event window. The market return is proxied by the value-weighted market return for the Australian Stock Exchange provided by AGSM. Recommendations released within two days of each other are eliminated to remove all overlapping event windows. Prob values using a two-tailed *t*-test are in brackets. *N* is the number of observations. The sample period is from 20 November 1996 to 30 June 2003.

Previous Rec \ Current Rec		1 = Strong Buy	2 = Buy	3 = Hold	4 = Under-perform	5 = Sell	TOTAL (%)
1 = Strong Buy	***CAR***	0.0026	0.0007	-0.0073***	-0.0063	0.0089	1965
	(Prob)	(0.3552)	(0.7131)	(0.0000)	(0.3889)	(0.1274)	(19.6%)
	N	347	362	1149	41	66	
2 = Buy	***CAR***	0.0055**	0.0033**	-0.0039***	-0.0212**	-0.0157**	2517
	(Prob)	(0.0162)	(0.0484)	(0.0010)	(0.0111)	(0.0224)	(25.0%)
	N	370	555	1444	80	68	
3 = Hold	***CAR***	0.0041***	0.0059***	-0.0012	-0.0044*	-0.0043	4114
	(Prob)	(0.0034)	(0.0000)	(0.3449)	(0.0892)	(0.1421)	(40.9%)
	N	992	1331	829	399	563	
4 = Under-perform	***CAR***	0.0050	0.0013	0.0024	-0.0018	-0.0013	661
	(Prob)	(0.3197)	(0.7064)	(0.2875)	(0.6290)	(0.8473)	(6.6%)
	N	36	80	384	126	35	
5 = Sell	***CAR***	0.0007	0.0038	0.0008	-0.0029	-0.0023	
	(Prob)	(0.9046)	(0.6701)	(0.6641)	(0.7437)	(0.6497)	791
	N	50	55	574	33	79	(7.9%)
TOTAL	***CAR***	0.0040***	0.0043***	-0.0031***	-0.0059***	-0.0038*	
	(Prob)	(0.0002)	(0.0000)	(0.0000)	(0.0034)	(0.0848)	10048
	N	1795	2383	4380	679	811	(100.0%)
	(%)	(17.8%)	(23.7%)	(43.6%)	(6.8%)	(8.1%)	

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Table 3 : Descriptive Statistics of Current Recommendations *vis-à-vis* Consensus Recommendations

For the definition of *CAR* see Table 2. The consensus recommendation is the median of the available analyst recommendations as provided by I/B/E/S. Prob values using a two-tailed *t*-test are in brackets. N is the number of observations. The sample period is from 20 November 1996 to 30 June 2003.

Consensus Rec \ Current Rec		1 = Strong Buy	2 = Buy	3 = Hold	4 = Under-perform	5 = Sell	TOTAL
1 = Strong Buy	***CAR***	0.0027	0.0051***	-0.0049***	-0.0088**	-0.0092*	2168
	(Prob)	(0.1780)	(0.0037)	(0.0018)	(0.0226)	(0.0913)	(21.6%)
	N	459	541	972	93	103	
2 = Buy	***CAR***	0.0028	0.0018	-0.0024*	-0.0078	-0.0073*	2723
	(Prob)	(0.1278)	(0.2327)	(0.0763)	(0.1674)	(0.0591)	(27.1%)
	N	582	673	1190	127	151	
3 = Hold	***CAR***	0.0058***	0.0051***	-0.0031***	-0.0053**	-0.0037	4749
	(Prob)	(0.0010)	(0.0000)	(0.0017)	(0.0333)	(0.2252)	(47.3%)
	N	715	1113	2014	409	498	
4 = Underperform	***CAR***	-0.0027	-0.0011	-0.0056	0.0054	0.0257**	208
	(Prob)	(0.7956)	(0.9103)	(0.2985)	(0.6353)	(0.0411)	(2.1%)
	N	14	29	101	30	34	
5 = Sell	***CAR***	0.0093	0.0231	0.0058	-0.0106	-0.0027	200
	(Prob)	(0.4017)	(0.1476)	(0.3654)	(0.5387)	(0.8101)	(2.0%)
	N	25	27	103	20	25	
TOTAL	***CAR***	0.0040***	0.0043***	-0.0031***	-0.0059***	-0.0038*	
	(Prob)	(0.0002)	(0.0000)	(0.0000)	(0.0034)	(0.0848)	10048
	N	1795	2383	4380	679	811	(100.0%)
	(%)	(17.9%)	(23.7%)	(43.6%)	(6.8%)	(8.1%)	

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Table 4 : The Distribution of Recommendation Changes by Magnitude using the Previous Recommendation as Benchmark

For the definition of *CAR* see Table 2. *AR* (*t*) is the abnormal return on event day *t*. *A_UPGRADE* (*X*) is a recommendation that is *X* levels higher than that analyst's previous recommendation on the stock. *A_DOWNGRADE* (*X*) is a recommendation that is *X* levels lower than that analyst's previous recommendation on the stock. *A_REITERATION* is where the current recommendation is the same as that analyst's previous recommendation on the stock. N is the number of observations. Prob values using a two-tailed *t*-test are in brackets. The sample period is from 20 November 1996 to 30 June 2003.

Panel A : Nine Categories of Recommendation Change

Changes	**N**	**%**	***AR*(*-1*)**	***AR*(*0*)**	***AR*(*+1*)**	***CAR*(*-1, +1*)**
***A_UPGRADE* (*4*)**	50	0.5%	0.0005	0.0009	-0.0001	0.0007
			(0.8893)	(0.8482)	(0.9677)	(0.9046)
***A_UPGRADE* (*3*)**	91	0.9%	0.0017	0.0023	0.0014	0.0043
			(0.6762)	(0.3309)	(0.5771)	(0.4547)
***A_UPGRADE* (*2*)**	1646	16.4%	0.0009	0.002***	-0.0001	0.0028***
			(0.1424)	(0.0014)	(0.8544)	(0.0084)
***A_UPGRADE* (*1*)**	2118	21.1%	0.0014**	0.0019***	0.0023***	0.0051***
			(0.0148)	(0.0002)	(0.0000)	(0.0000)
A_REITERATION	1936	19.3%	0.0001	0.0002	0.0007	0.0007
			(0.8868)	(0.6910)	(0.2278)	(0.4799)
***A_DOWNGRADE* (*1*)**	2240	22.3%	-0.0003	-0.0009*	-0.0015***	-0.0032***
			(0.6303)	(0.0913)	(0.0030)	(0.0008)
***A_DOWNGRADE* (*2*)**	1792	17.8%	-0.0022**	-0.0041***	-0.0007	-0.007***
			(0.0116)	(0.0000)	(0.3235)	(0.0000)
***A_DOWNGRADE* (*3*)**	109	1.1%	-0.0025	-0.0021	-0.0068***	-0.0122**
			(0.3350)	(0.4734)	(0.0045)	(0.0165)
***A_DOWNGRADE* (*4*)**	66	0.7%	0.0051	-0.0007	0.0032	0.0089
			(0.2035)	(0.8306)	(0.4181)	(0.1274)
N	10048	100.0%				

Panel B : Five Categories of Recommendation Change

CHANGES	**N**	***%***	***AR*(-*1*)**	***AR*(*0*)**	***AR*(+*1*)**	***CAR*(-*1*, +*1*)**
***A_UPGRADE* (*2 to 4*)**	1787	17.8%	0.0009	0.0020***	0.0000	0.0028***
			(0.1281)	(0.0010)	(0.9478)	(0.0063)
***A_UPGRADE* (*1 ONLY*)**	2118	21.1%	0.0014**	0.0019***	0.0023***	0.0051***
			(0.0148)	(0.0002)	(0.0000)	(0.0000)
A_REITERATION	1936	19.3%	0.0001	0.0002	0.0007	0.0007
			(0.8868)	(0.6910)	(0.2278)	(0.4799)
***A_DOWNGRADE* (*1 ONLY*)**	2240	22.2%	-0.0003	-0.0009*	-0.0015***	-0.0032***
			(0.6303)	(0.0913)	(0.0030)	(0.0008)
***A_DOWNGRADE* (*2 to 4*)**	1967	19.6%	-0.0019**	-0.0039***	-0.0009	-0.0067***
			(0.0163)	(0.0000)	(0.1755)	(0.0000)
N	10048	100.0%				

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Table 5 : The Distribution of Recommendation Changes by Magnitude using the Consensus Recommendation as Benchmark

For the definition of *CAR* see Table 2. *AR* (*t*) is the abnormal return on event day *t*. *C_UPGRADE* (*X*) is a recommendation that is *X* levels higher than the consensus recommendation on the stock. *C_DOWNGRADE* (*X*) is a recommendation that is *X* levels lower than the consensus recommendation on the stock. *C_REITERATION* is where the current recommendation is the same as the consensus recommendation on the stock. N is the number of observations. Prob values using a two-tailed *t*-test are in brackets. The sample period is from 20 November 1996 to 30 June 2003.

Panel A : Nine Categories of Recommendation Change

Changes	N	%	*AR*(*-1*)	*AR*(*0*)	*AR*(*+1*)	*CAR*(*-1, +1*)
***C_UPGRADE* (*4*)**	25	0.2%	0.0007	0.0085**	-0.0017	0.0093
			(0.9010)	(0.0330)	(0.7935)	(0.4017)
***C_UPGRADE* (*3*)**	41	0.4%	-0.0024	0.0053	0.0097	0.0143
			(0.6064)	(0.1738)	(0.1054)	(0.1952)
***C_UPGRADE* (*2*)**	847	8.4%	0.0017*	0.0027***	0.0015	0.0056***
			(0.0966)	(0.0072)	(0.1292)	(0.0011)
***C_UPGRADE* (*1*)**	1816	18.1%	0.0018***	0.0013**	0.0006	0.0036***
			(0.0027)	(0.0255)	(0.2310)	(0.0003)
C_REITERATION	3201	31.9%	-0.0004	-0.0001	-0.0002	-0.0011
			(0.4321)	(0.7985)	(0.5613)	(0.1406)
***C_DOWNGRADE* (*1*)**	2174	21.6%	-0.0002	-0.0003	0.0002	-0.0006
			(0.7151)	(0.6369)	(0.6511)	(0.5266)
***C_DOWNGRADE* (*2*)**	1597	15.9%	-0.0011	-0.0028***	-0.0006	-0.0047***
			(0.1935)	(0.0006)	(0.4104)	(0.0008)
***C_DOWNGRADE* (*3*)**	244	2.4%	-0.0037***	-0.0021	-0.0026*	-0.0079***
			(0.0084)	(0.1936)	(0.0970)	(0.0050)
***C_DOWNGRADE* (*4*)**	103	1.0%	-0.0022	-0.0064**	0.0007	-0.0092*
			(0.4247)	(0.0331)	(0.7359)	(0.0913)
N	10048	100.0%				

Panel B : Five Categories of Recommendation Change

CHANGES	**N**	***%***	***AR*(-*1*)**	***AR*(*0*)**	***AR*(+*1*)**	***CAR*(-*1*, +*1*)**
***C_UPGRADE* (*2 to 4*)**	913	9.1%	0.0015 (0.1286)	0.003*** (0.0018)	0.0017* (0.0657)	0.0061*** (0.0003)
***C_UPGRADE* (*1 ONLY*)**	1816	18.1%	0.0018*** (0.0027)	0.0013** (0.0255)	0.0006 (0.2310)	0.0036*** (0.0003)
C_REITERATION	3201	31.9%	-0.0004 (0.4321)	-0.0001 (0.7985)	-0.0002 (0.5613)	-0.0011 (0.1406)
***C_DOWNGRADE* (*1 ONLY*)**	2174	21.6%	-0.0002 (0.7151)	-0.0003 (0.6369)	0.0002 (0.6511)	-0.0006 (0.5266)
***C_DOWNGRADE* (*2 to 4*)**	1944	19.3%	-0.0015** (0.0411)	-0.0029*** (0.0000)	-0.0008 (0.2243)	-0.0054*** (0.0000)
N	10048	100.0%				

***, **, * denote 1%, 5% ,10% levels of significance respectively.

Table 6 : GMM Regression Test of the Magnitude of Recommendation Changes

ABSCAR is the absolute value of *CAR*. For the definition of *CAR* see Table 2. *A_UPGRADE* (*X*) has a value of 1 if a recommendation is *X* levels higher than that analyst's previous recommendation on the stock. *A_DOWNGRADE* (*X*) has a value of 1 if a recommendation is *X* levels lower than that analyst's previous recommendation on the stock. *C_UPGRADE* (*X*) has a value of 1 if a recommendation is *X* levels higher than the consensus recommendation on the stock. *C_DOWNGRADE* (*X*) has the value of 1 if a recommendation is *X* levels lower than the consensus recommendation on the stock. *TOP5* has a value of 1 if the analyst is one of the top 5 analysts for the year for the industry sector in which the firm belongs. *DIVERGENCE* is the standard deviation of the recommendations available and has a minimum value of zero if there is only one analyst or if all recommendations for the firm share the same level. *NOA* is the number of analysts covering the stock in the calendar year in which the recommendation is made. *DAYS_LAST_REC* is the number of days between the previous and current recommendation issued by the same analyst. N is the number of observations. Prob values using a two-tailed *t*-test are in brackets. The sample period is from 20 November 1996 to 30 June 2003.

Panel A : Benchmark is Analyst's Previous Recommendation

	ABSCAR		
Variable	**Coefficient**	***t*-statistic**	**Prob**
Intercept	0.0373***	25.5692	(0.0000)
***A_UPGRADE* (*4*)**	-0.0016	-0.3866	(0.6991)
***A_UPGRADE* (*3*)**	0.0060	1.2753	(0.2022)
***A_UPGRADE* (*2*)**	0.0030***	2.7716	(0.0056)
***A_UPGRADE* (*1*)**	0.0022**	2.2519	(0.0243)
***A_DOWNGRADE* (*1*)**	0.0008	0.7510	(0.4527)
***A_DOWNGRADE* (*2*)**	0.0071***	5.2647	(0.0000)
***A_DOWNGRADE* (*3*)**	0.0068*	1.7683	(0.0770)
***A_DOWNGRADE* (*4*)**	0.0072*	1.8370	(0.0662)
TOP5	0.0317***	9.2193	(0.0000)
DIVERGENCE	-0.0032***	-3.3224	(0.0009)
NOA	-0.0011***	-9.7517	(0.0000)
N	10048		
Adjusted R^2	0.0461		

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Panel B : Benchmark is Consensus Recommendation

Variable	***ABSCAR*** Coefficient	***t*-statistic**	**Prob**
Intercept	0.0380***	25.6291	(0.0000)
***C_UPGRADE* (*4*)**	0.0133*	1.8150	(0.0696)
***C_UPGRADE* (*3*)**	0.0118	1.3121	(0.1895)
***C_UPGRADE* (*2*)**	0.0046***	3.2216	(0.0013)
***C_UPGRADE* (*1*)**	0.0015*	1.6504	(0.0989)
***C_DOWNGRADE* (*1*)**	0.0010	1.0595	(0.2894)
***C_DOWNGRADE* (*2*)**	0.0032**	2.5131	(0.0120)
***C_DOWNGRADE* (*3*)**	0.0002	0.0718	(0.9428)
***C_DOWNGRADE* (*4*)**	0.0032	0.7395	(0.4596)
TOP5	0.0323***	9.3448	(0.0000)
DIVERGENCE	-0.0031***	-3.2990	(0.0010)
NOA	-0.0011***	-9.4561	(0.0000)
N	10048		
Adjusted R^2	0.0437		

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Panel C : Benchmark is Analyst's Previous Recommendation

	ABSCAR		
Variable	**Coefficient**	***t*-statistic**	**Prob**
Intercept	0.0373***	25.5844	(0.0000)
***A_UPGRADE* (*2 to 4*)** (β_2)	0.003***	2.8266	(0.0047)
***A_UPGRADE* (*1 ONLY*)** (β_3)	0.0022**	2.2505	(0.0244)
***A_DOWNGRADE* (*1 ONLY*)** (β_4)	0.0008	0.7496	(0.4535)
***A_DOWNGRADE* (*2 to 4*)** (β_5)	0.0071***	5.5008	(0.0000)
TOP5	0.0318***	9.2237	(0.0000)
DIVERGENCE	-0.0032***	-3.3227	(0.0009)
NOA	-0.0011***	-9.7426	(0.0000)
N	10048		
Adjusted R^2	0.0464		
H_o: $\beta_2 = \beta_3$	H_o: $\beta_4 = \beta_5$		
Wald test: F-stat 0.5240 (0.4692)	**Wald test:** F-stat 23.8792*** (0.0000)		

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Panel D : Benchmark is Consensus Recommendation

Variable	*ABSCAR* Coefficient	*t*-statistic	Prob
Intercept	0.0380***	25.6091	(0.0000)
***C_UPGRADE* (*2 to 4*)** (β_2)	0.0052***	3.6435	(0.0003)
***C_UPGRADE* (*1 ONLY*)** (β_3)	0.0016*	1.6516	(0.0986)
***C_DOWNGRADE* (*1 ONLY*)** (β_4)	0.0010	1.0603	(0.2890)
***C_DOWNGRADE* (*2 to 4*)** (β_5)	0.0028**	2.4497	(0.0143)
TOP5	0.0323***	9.3464	(0.0000)
DIVERGENCE	-0.0031***	-3.1825	(0.0015)
NOA	-0.0011***	-9.4861	(0.0000)
N	10048		
Adjusted R^2	0.0436		
H_o: $\beta_2 = \beta_3$	H_o: $\beta_4 = \beta_5$		
Wald test: *F*-stat 5.8917** (0.0152)	**Wald test:** *F*-stat 1.9838 (0.1590)		

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Table 7 : Results of GMM Regression Analysis: Returns and Recommendation Changes

For the definition of *CAR* see Table 2. *ABSCAR* is the absolute value of *CAR*. *MRPR* is the analyst-specific metric and is the change in the analyst's recommendation on that stock. *ABSMRPR* is the absolute value of *MRPR*. *RCR* is the consensus-based metric and is the difference between a new recommendation and the consensus recommendation. *ABSRCR* is the absolute value of *RCR*. *TOP5* has a value of 1 if the analyst is one of the top 5 analysts for the year for the industry sector in which the recommended firm belongs. *DIVERGENCE* is the standard deviation of the recommendations available and has a minimum value of zero if there is only one analyst or if all recommendations for the firm share the same level. *NOA* is the number of analysts covering the stock in the calendar year in which the recommendation is made. *DUM_SB*, *DUM_BUY*, *DUM_UND* and *DUM_SELL* have a value of 1 if the recommendation is a "strong buy", "buy", "underperform" or "sell", respectively. N is the number of observations. The sample period is from 20 November 1996 to 30 June 2003.

	CAR	***ABSCAR***		***CAR***	***ABSCAR***	
	Model 1A	**Model 1B**	**Model 1C**	**Model 2A**	**Model 2B**	**Model 2C**
Intercept	-0.0002 (0.6741)	0.0261*** (0.0000)	0.0372*** (0.0000)	0.0004 (0.4460)	0.0270*** (0.0000)	0.0381*** (0.0000)
MRPR	0.0025*** (0.0000)					
ABSMRPR		0.0023*** (0.0000)	0.0023*** (0.0000)			
RCR				0.0025*** (0.0000)		
ABSRCR					0.0019*** (0.0001)	0.0015*** (0.0005)
TOP5			0.0321*** (0.0000)			0.0322*** (0.0000)
DIVERGENCE			-0.0033*** (0.0007)			-0.0031*** (0.0014)
NOA			-0.0011*** (0.0000)			-0.0011*** (0.0000)
N **Adjusted R^2**	10048 0.0061	10048 0.0023	10048 0.0449	10048 0.0048	10048 0.0018	10048 0.0435

***, **, * denote 1%, 5%, 10% levels of significance respectively.

Table 7 (contd.)

	CAR	*ABSCAR*		*CAR*	*ABSCAR*	
	Model 3A	**Model 3B**	**Model 3C**	**Model 4A**	**Model 4B**	**Model 4C**
Intercept	0.0001 (0.8145)	0.0252*** (0.0000)	0.0365*** (0.0000)	-0.0017*** (0.0322)	0.0258*** (0.0000)	0.0365*** (0.0000)
MRPR	0.0019*** (0.0000)			0.0016*** (0.0002)		
ABSMRPR		0.0019*** (0.0000)	0.0021*** (0.0000)		0.0014*** (0.0033)	0.0017*** (0.0004)
RCR	0.0012*** (0.0051)			0.0010* (0.0867)		
ABSRCR		0.0014*** (0.0018)	0.0010** (0.0256)		0.0003 (0.5049)	-0.0001 (0.8020)
TOP5			0.0320*** (0.0000)			0.0319*** (0.0000)
DIVERGENCE			-0.0033*** (0.0007)			-0.0031*** (0.0013)
NOA			-0.0011*** (0.0000)			-0.0011*** (0.0000)
DUM_SB				0.0022 (0.2200)	0.0016 (0.1139)	0.0021** (0.0425)
DUM_BUY				0.0049*** (0.0001)	-0.0002 (0.7844)	0.0002 (0.7763)
DUM_UND				-0.0014 (0.5357)	0.0037** (0.0364)	0.0033* (0.0544)
DUM_SELL				0.0034 (0.1947)	0.0071*** (0.0009)	0.0056*** (0.0077)
N **Adjusted R^2**	10048 0.0068	10048 0.0033	10048 0.0453	10048 0.0083	10048 0.0051	10048 0.0464

***, **, * denote 1%, 5%, 10% levels of significance respectively.