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Buys, holds, and sells: The distribution of investment banks' stock ratings and the implications for the profitability of analysts' recommendations ☆

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Abstract

This paper analyzes the distribution of stock ratings at investment banks and brokerage firms and examines whether these distributions can predict the profitability of analysts' recommendations. We document that the percentage of buys decreased steadily starting in mid-2000, likely due, at least partly, to the implementation of NASD Rule 2711, requiring the public dissemination of ratings distributions. Additionally, we find that a broker's ratings distribution can predict recommendation profitability. Upgrades to buy (downgrades to hold or sell) issued by brokers with the smallest percentage of buy recommendations significantly outperformed (underperformed) those of brokers with the greatest percentage of buys.

JEL classification: G12; G14; G24; G29

Keywords: Analyst; Recommendation; NASD 2711; Investment bank; Stock rating; Broker

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0. Introduction

This paper analyzes the distribution of stock ratings at investment banks and brokerage firms and examines whether these distributions can be used to predict the profitability of analysts' stock recommendations. Our study comes at a time of increased scrutiny by Congress and securities regulators of potential analyst conflicts of interest. With the percentage of buy recommendations reaching 74 percent of total outstanding recommendations by mid-2000 and the percentage of sell recommendations falling to 2 percent, allegations arose that analysts' recommendations did not reflect their true beliefs. Rather, it was contended that, among other things, the recommendations were intended to attract and retain investment banking business. The steep stock market decline during 2000–2002, whose beginning coincided with peak bullishness on Wall Street, only served to fuel the concerns of regulators and politicians.

As part of its attempt to more closely regulate the provision of research on Wall Street, the National Association of Securities Dealers (NASD) proposed Rule 2711, *Research Analysts and Research Reports*, in early 2002. Around the same time, and with the same goal in mind, the New York Stock Exchange (NYSE) proposed a modification to its Rule 472, *Communications with the Public*. The Securities and Exchange Commission (SEC) approved these proposals on May 8, 2002. Among their provisions, these rules require all analyst research reports to display the percentage of the issuing firm's recommendations that are buys, holds, and sells.[1]

This disclosure requirement was intended to provide investors with information useful in evaluating the quality of brokerage firms' recommendations. Announcing the approval of NASD 2711, the SEC stated in its press release of May 8, 2002, that "These disclosures [regarding brokerage firms' ratings] will assist investors in deciding what value to place on a securities firm's ratings and provide them with better information to assess its research." This objective was echoed in a speech by Mary Schapiro, President, NASD Regulation, to the 2002 SIA Research and Regulation Conference on April 9, 2002, where she remarked that "While there may be good reasons why a firm has assigned a buy or strong buy to 80 percent of the companies it covers, investors have a right to know this information. It suggests a bias in the firm's coverage that investors should take into account in evaluating ratings… Our proposal [NASD 2711] would require firms to disclose this information." In addition to providing investors with useful information, the new disclosure requirement was presumably also meant to implicitly pressure those brokers (and their analysts) who were consistently issuing a relatively high percentage of buy recommendations to adopt a more balanced ratings distribution.

The regulatory and political focus on brokers' stock ratings distributions and the subsequent requirement that these distributions be disclosed invite a number of interesting questions. First, did the 10 large investment banks sanctioned for alleged analyst conflicts of interest by the SEC in the 2003 *Global Research Analyst Settlement* issue the most favorable recommendations? Second, does a greater proclivity towards issuing buy recommendations imply that a brokerage firm's recommendations have less investment value? Alternatively stated, would knowledge of a broker's ratings distribution be useful in

[1]For ease of exposition, the discussion in the remainder of the paper is framed solely in terms of NASD Rule 2711. However, because the modified NYSE Rule 472 has an identical reporting requirement, all conclusions clearly apply to it as well.

predicting the performance of its recommendations? Third, has NASD 2711 affected either the distribution of buys, holds, and sells or the predictive value of brokers' ratings distributions?

To address these and other questions, our analysis employs the *First Call* database, which contains over 438,000 recommendations issued on more than 12,000 firms by 463 investment banks and brokerage firms during the 1996–June 2003 time frame. We begin by documenting changes in the distribution of stock ratings over time. Consistent with Barber et al. (2003), we find that the percentage of buy (including strong buy) recommendations issued by investment banks and brokers increased markedly during the first part of our sample period.[2] Standing at 60 percent of all outstanding recommendations at the end of the first quarter of 1996, buy recommendations peaked at 74 percent of the total at the end of the second quarter of 2000. Over the same period, sell (including strong sell) recommendations declined from 4 to 2 percent, while holds went from 36 to 24 percent. From that point, the number of buys decreased steadily, standing at 42 percent of the total at the end of June 2003. The number of sells increased sharply, to 17 percent, while the number of holds increased to 41 percent.

Among possible explanations for this reversal is the contemporaneous softening in economic conditions and sharp stock market decline, which might have negatively affected analysts' expectations for future firm performance. This could not fully explain the reversal, however, since analysts' ratings continued to deteriorate even as the economy and the stock market began their recoveries. Another potential explanation is the implicit pressure which the implementation of NASD Rule 2711 exerted on brokers. Consistent with this possibility, the reduction in percentage buys is most pronounced in the last half of 2002, which coincided with the implementation of this new rule. During that time buy recommendations decreased from 60 to 45 percent, while sell recommendations rose from 5 to 14 percent and holds went from 35 to 41 percent.

We also partition the recommendations in our sample into those issued by the 10 sanctioned banks and those of the non-sanctioned brokers. In contrast to what might have been expected, the difference between the percentage of buys for these two groups of brokers prior to the implementation of NASD 2711 is economically quite small, averaging only 1.7 percentage points. Apparently, the proclivity to issue buy recommendations during that time was not limited to the sanctioned investment banks. Furthermore, in the period subsequent to NASD 2711's implementation the percentage buys for the sanctioned banks declined much more sharply than that of the non-sanctioned brokers. As of June 2003, buys constituted only 32.3 percent of the sanctioned banks' outstanding recommendations; the corresponding figure for the non-sanctioned brokers was 45.7 percent.

We next consider whether a link exists between a broker's stock ratings distribution and the future profitability of its recommendations. Theoretically, a relation should exist as long as: (i) recommendations, in general, have investment value (a notion that has been empirically supported by Barber et al. (2001, 2003), Jegadeesh et al. (2004), Stickel (1995), and Womack (1996), among others); (ii) the information implicit in analysts'

[2]In the remainder of this paper we use the terms *broker* and *brokerage firm* to refer to any financial institution employing sell-side analysts to provide stock recommendations (including investment banks). The terms *investment bank* or *bank* will be reserved for use in those instances in which we are referring to brokers with investment banking activities.

recommendations and in brokers' ratings distributions is not instantaneously incorporated into market prices; and (iii) the criteria used to classify recommendations into buy, hold, and sell differ across brokers.

Empirical evidence to-date strongly suggests that market prices do react slowly to the information contained in recommendations (see, for example, Barber et al., 2001; Brav and Lehavy, 2003; Stickel, 1995; Womack, 1996). The difficulty and costliness of compiling brokers' ratings distributions over most of our sample period (prior to the implementation of NASD 2711) suggest that this information, too, may not have been immediately incorporated into stock prices. Even for investors with access to these ratings distributions, limits to arbitrage may prevent them from fully and instantaneously capitalizing on their information. Among the factors limiting arbitrage are capital constraints, transactions costs (especially for smaller firms), and idiosyncratic risks associated with taking large, concentrated positions.[3] (See Shleifer and Vishny (1997) and Pontiff (1996) for a general discussion of constraints on arbitrage.)

Ratings criteria may differ across brokers for one of (at least) two reasons. First, some brokers might have a tendency to issue buy recommendations when a hold or sell is deserved (as has been alleged by some), while other brokers would be more forthcoming in their ratings. Second (and more innocuously), the definitions of buy, hold, and sell may differ across brokers. Regardless of the cause, these differences would imply that, all else equal, the buy recommendations of brokers with a smaller percentage of such ratings should outperform those of brokers who issue buys more frequently. It would also imply that the hold and sell recommendations of brokers who issue such recommendations less often would outperform (experience a greater decline than) those of brokers who issue them more frequently.

The link between ratings distributions and recommendation returns is empirically examined by first calculating, for each quarter, the percentage of each broker's end-of-quarter outstanding recommendations that are buys. Brokers are then partitioned into quintiles based on this percentage. On average, the firms in the top quintile (descriptively labeled the "least favorable" brokerage firms) issued only 45 percent buys, while the firms in the bottom quintile (descriptively labeled the "most favorable" brokers) gave 79 percent buys. We then compute the average buy-and-hold abnormal return to each quintile's subsequent recommendation upgrades and downgrades. Consistent with our conjectures, we find that upgrades to buy from the least favorable brokers significantly outperformed those of the most favorable brokers, by an average of 50 basis points per month. Further, the downgrades to hold or sell of the most favorable brokers significantly outperformed (experienced a steeper decline than) those of the least favorable brokers, by an average of 46 basis points per month. These results suggest that there are, indeed, persistent differences across brokers in their tendency to issue buy recommendations and that the distribution of each brokers' stock ratings would have been useful information for investors to possess during this time period.

These differences become statistically insignificant, however, in the quarters after the implementation of NASD 2711. Though drawing strong inferences from such a short time series is difficult, these results suggest that the new rules may have tempered the proclivity

[3]Barber et al. (2001) estimate the transactions costs associated with several trading strategies that are based on analysts' recommendations. They find that these strategies require high portfolio turnover and generate large transactions costs, leading, at best, to net returns that are indistinguishable from zero.

of some brokers toward issuing buy recommendations. From the perspective of regulators, then, NASD 2711 may have had its intended effect.

Our paper makes a contribution to the literature by being the first to examine: (i) the evolution of brokers' stock ratings distributions over time, up through the recent bear market; (ii) the value of these distributions for predicting the profitability of future recommendations; and (iii) the impact of NASD 2711 on the nature of these ratings distributions and their predictive value. Moreover, by documenting the sharp change in these distributions post-NASD 2711, our work alerts researchers to the importance of including this more recent period in any future analysis of analysts' recommendations.

Our paper fits in with a number of recent studies that have examined the interaction between investment banking activities and various facets of analysts' earnings forecasts and stock recommendations. Generally in this literature, banking activity has not been found to be associated with either less accurate or more optimistic earnings forecasts (see, for example, Lin and McNichols, 1998; Jacob et al., 1999; Kolasinski and Kothari, 2004; Agrawal and Chen, 2004; Cowen et al., 2003). However, Lin and McNichols (1998) and Dechow et al. (2000) document that long-term growth forecasts for firms with recent equity offerings are more optimistic when coming from analysts at lead underwriters than when issued by other analysts.[4] Iskoz (2003) and Lin and McNichols (1998) compare the performance of recommendations issued by analysts at lead investment banks to the performance of other analysts' recommendations, for firms with recent share offerings. They find no significant difference in returns for either the buy or the hold and sell recommendations.[5] In contrast, Michaely and Womack (1999) document for initial public offerings during the 1990–1991 period that the average 2-year performance of lead underwriter recommendations is significantly lower than that of other analysts. Barber et al. (2005) compare the performance of the recommendations of analysts at investment banks with those of analysts at independent research firms. They find that the buy recommendations of independent research firms outperform those of investment banks, especially subsequent to equity offerings.

The plan of this paper is as follows. In Section 1 we give an overview of NASD Rule 2711 and in Section 2 provide a description of the data. Section 3 empirically examines a number of aspects of brokers' ratings distributions. This is followed in Section 4 by a theoretical discussion of the link between a broker's stock ratings distribution and the subsequent performance of its recommendations. Section 5 explores this link empirically. Finally, summary and conclusions are presented in Section 6.

1. NASD Rule 2711

On February 7, 2002, the National Association of Securities Dealers (NASD) submitted to the Securities and Exchange Commission its proposed Rule 2711, *Research Analysts and Research Reports*. This proposal followed the mid-2001 Congressional hearings, *Analyzing the Analysts*: *Are Investors Getting Unbiased Research from Wall Street*?, conducted by the Subcommittee on Capital Markets, Insurance and Government-Sponsored Enterprises of

[4]In contrast, Agrawal and Chen (2004) find that analysts employed by investment banking firms are more conservative in their long-term growth forecasts than are analysts at independent research firms.

[5]Iskoz (2003) does find that the strong buy recommendations issued by analysts at lead underwriters significantly underperform those of non-lead analysts.

the Committee on Financial Services of the U.S. House of Representatives. These hearings were held against a backdrop of a sharp and prolonged stock market decline, which began in March 2000 and resulted in severe losses for many individual investors. This decline began at a time of heightened bullishness on the part of analysts at brokerage firms, whose buy recommendations outnumbered their sell recommendations by more than 35-1. Rule 2711 also came in the wake of numerous high-profile corporate scandals (such as those involving Enron, WorldCom, Adelphia, and Tyco), which was an embarrassment to the majority of analysts who maintained buy ratings up until the time that the scandals broke.[6]

Among the provisions of NASD 2711 is a requirement that every brokerage firm disclose in its research reports the distribution of stock ratings across its coverage universe.[7] As stated in paragraph (h)(5) of NASD 2711:

> ***Distribution of Ratings***
> 1. (A) Regardless of the rating system that a member employs, a member must disclose in each research report the percentage of all securities rated by the member to which the member would assign a 'buy,' 'hold/neutral,' or 'sell' rating…
> (C) The information that is disclosed…must be current as of the end of the most recent calendar quarter (or the second most recent calendar quarter if the publication date is less than 15 calendar days after the most recent calendar quarter).

The SEC approved the rule on May 8, 2002, with an effective date for implementing the disclosure provision of no later than September 9, 2002.

An example of the form that this disclosure takes is the following excerpt from a Merrill Lynch research report dated January 12, 2003:

Investment Rating Distribution: Global Group (as of 31 December 2002)

Coverage Universe	Count	Percent
Buy	1110	43.46
Neutral	1236	48.39
Sell	208	8.14

This disclosure reveals not only the ratings distribution, but also that the distribution is calculated with respect to Merrill Lynch's entire coverage universe and is as of the end of the most recent quarter-end (December 31, 2002).

[6]For example, prior to Enron's announcing its $1.2 billion, third quarter 2001 charge against earnings, 13 of the analysts following the company rated the stock a buy, while none rated it a hold or sell. See Budd and Wooden (2002).

[7]A related provision of NASD 2711 is that every brokerage firm must disclose in each of its research reports its definitions for buy, hold, and sell. (These definitions were not commonly disclosed prior to the implementation of NASD 2711.) Other provisions of NASD 2711 include a strict curtailment on the interaction between a broker's research and investment banking departments, a restriction on the extent to which a covered firm can review a research report before publication, a prohibition against direct ties between an analyst's compensation and specific investment banking transactions, a prohibition against a broker offering to provide favorable research on a firm in exchange for other business, and a restriction on an analyst's personal trading in the shares of covered firms. NASD 2711 also requires a number of other disclosures in each research report. See Boni and Womack (2003) for a general discussion of how the provisions of NASD 2711 may affect the nature of sell-side research in the future.

2. Data description

The source for the analyst recommendations used in this study is Thomson Financial's *First Call* database, whose data is obtained directly from brokerage houses. The recommendations take one of two forms, real time or batch. Real-time recommendations, which constitute the majority of recent years' recommendations, come from live feeds. Each is accompanied by the date and time of its release. Batch reports come from a weekly batch file sent by the brokerage firms; as a consequence, the precise announcement date of the individual recommendations is unknown. For the first part of this study, in which the distribution of analyst recommendations is analyzed, knowing the exact publication date is not important; therefore, we use both the real-time and batch recommendations. For the second part of the study, in which recommendation returns are calculated, we use only real-time recommendations, since the exact date at which to begin measuring returns must be known. Any recommendation outstanding in the database for more than 1 year, whether it be real-time or batch, is dropped at the end of the year, under the assumption that such a recommendation has become stale by that time.

Each database record contains the name of the company covered, the brokerage firm issuing the report, and a rating between 1 and 5. A rating of 1 represents a strong buy; 2, a buy; 3, a hold; 4, a sell; and 5, a strong sell. If a broker uses some other scale, *First Call* converts the broker's rating to its five-point scale. The recommendations in this study cover the period from January 1996 to June 2003. In the remainder of this analysis we use the term 'buy' to reflect either a buy or a strong buy recommendation and the term 'sell' to reflect either a sell or strong sell recommendation.[8]

Table 1 provides descriptive statistics for the real-time and batch recommendations in the *First Call* database. During the 1996–June 2003 period, *First Call* recorded over 438,000 recommendations issued by 463 brokerage firms on more than 12,000 different firms. As shown in column 2, the year 2002 has by far the most recommendations of any sample year. This is due, in large part, to the reissuance of recommendations just before September 9, the effective date for implementation of the disclosure requirement of NASD 2711. (See the discussion in the next subsection.) In each of our sample years the number of upgrades to buy (column 3) is less than the number of downgrades to hold or sell (column 4). The difference is particularly pronounced during the bear market years of 2001 and 2002, where the number of downgrades exceeds the number of upgrades by 51 and 67 percent, respectively. Column 5 reveals that, after holding fairly steady for the years 1996–2000, the number of covered firms dropped sharply in 2001 and 2002. Among the possible reasons for this decrease is a fall-off in the number of listed firms (many firms were delisted during this period because they either went bankrupt or otherwise failed to meet listing requirements, while few new firms joined those listed, reflecting a slow-down in the new issues market), a tendency by brokers to discontinue coverage of firms whose future prospects are viewed unfavorably, and a general cut-back in the level of brokerage house research services.[9] As reflected in column 7, the average stock rating increased during the

[8]We combine buys with strong buys and sells with strong sells in our analysis because (i) NASD 2711 requires brokers to categorize recommendations as either buy, hold, or sell and (ii) some brokers are now using just these three ratings, dropping the distinction between buy and strong buy and sell and strong sell.

[9]See McNichols and O'Brien (1997) for evidence that analysts tend to discontinue coverage of stocks with unfavorable prospects rather than issue negative recommendations. The study finds that these stocks have lower industry-adjusted returns on equity, as compared to firms with continuous coverage. The impact of recently

Table 1
Descriptive statistics on analyst stock recommendations from the *First Call* database, January 1996–June 2003

This table presents, by year, the number of recommendations issued, the number of recommendation upgrades to either strong buy, buy, hold, or sell, the number of recommendation downgrades to either buy, hold, sell, or strong sell (the number of upgrades and downgrades excludes initiations, resumptions, and iterations of recommendations), the number of firms with at least one report in the *First Call* database, the number of brokers, and the average rating (where strong buy, buy, hold, sell, and strong sell recommendations correspond to the numerical ratings 1–5, respectively).

Year	Number of recommendations	Number of upgrades	Number of downgrades	Number of firms	Number of brokerage houses	Average rating
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1996	47,528	7,870	8,367	6,750	226	2.14
1997	50,785	7,946	8,963	7,261	235	2.09
1998	57,992	9,311	12,029	7,298	254	2.10
1999	64,767	12,657	12,728	7,106	261	2.07
2000	55,608	8,760	11,277	6,854	263	2.02
2001	55,356	8,535	12,865	5,809	247	2.21
2002	84,074	11,166	18,628	5,560	254	2.38
2003 (January–June)	22,029	4,560	6,745	4,229	236	2.63
Overall	438,139	70,805	91,602	12,026	463	2.18

2001–June 2003 period, following a nearly steady decline from 1996 to 2000. (Unless otherwise specified, all averages in this paper are unweighted.)

3. The distribution of brokers' stock ratings

3.1. Time series

Fig. 1 illustrates the distribution of stock ratings in the *First Call* database and how it has changed over our sample period. From the end of the first quarter of 1996 to the end of the second quarter of 2000 the proportion of buy recommendations increased from 60 to 74 percent of total recommendations outstanding. Simultaneously, hold recommendations fell from 36 to 24 percent, and sell recommendations decreased from 4 to 2 percent.[10] At that point the trend reversed, as buys monotonically decreased to 42 percent at the end of the second quarter of 2003. Sells increased steadily to 17 percent, while holds also increased fairly steadily, to 41 percent of total recommendations outstanding.

There are at least two possible explanations for this reversal. One is the weakening in economic conditions during this time, along with the accompanying steep stock market decline, both of which likely had a negative effect on analysts' views of future firm performance. This is unlikely to fully explain our findings, though, since analysts' ratings

(*footnote continued*)
enacted regulations on the provision of analyst research services is discussed by Landon Thomas, Jr. in "An Analyst's Job Used to be Fun. Not Anymore," *The New York Times,* August 17, 2003.

[10]Presumably aware of the asymmetric nature of brokers' ratings distributions, 84 percent of investment professionals surveyed in 2001 believed that analysts should issue more sell recommendations. See Boni and Womack (2002).

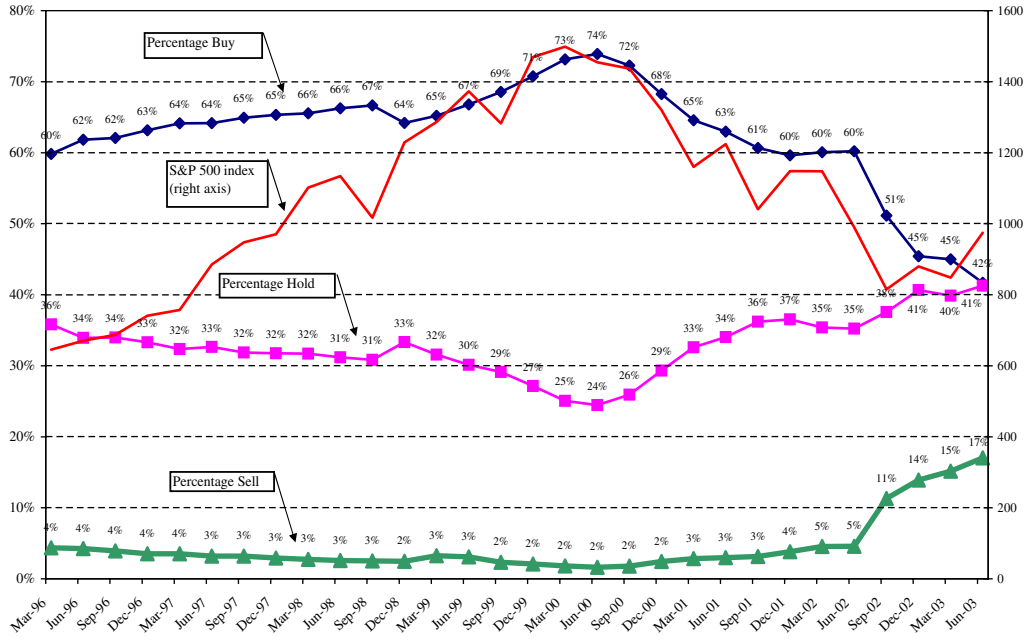

Fig. 1. End-of-quarter distribution of outstanding stock ratings and the level of the S&P 500 Index, March 1996–June 2003.

continued to deteriorate even as the economy, according to the National Bureau of Economic Research, began its recovery at the end of 2001 and even though the stock market, as measured by the *Standard & Poors* 500 Index, began turning up in the fourth quarter of 2002 (see Fig. 1). Another potential explanation is the implicit pressure placed on brokers by the increased scrutiny paid to their ratings by regulators and Congress during this period, as well as by the implementation of NASD Rule 2711.[11]

Taking a closer look at the trends in 2002 makes clear that NASD 2711 likely did play a role in analysts' shift away from buy recommendations. Fig. 2 is a daily plot of the percentages of outstanding recommendations which were buys, holds, and sells during that year. Over the year's span, the percentage of buys decreased from 60 to 45 percent, while the percentage of sells increased from 4 to 14 percent, and the percentage of holds climbed from 34 to 41 percent. Moreover, beginning in the weeks leading up to the September 9 deadline for implementing the ratings distribution disclosure requirement, and continuing for the remainder of the year, the shift away from buy recommendations became quite pronounced.[12]

[11]The heightened scrutiny of analysts during this time and some of the proposed reforms are discussed in Budd and Wooden (2002), "Guidelines Aim to Polish Analysts' Image," by Jeff Opdyke, *The Wall Street Journal*, June 13, 2001, pp. C1–C2, and "Is Wall Street Serious About Reform?," by Shawn Tully, *Fortune*, July 9, 2001, pp. 90–91.

[12]We investigate whether the types of stocks that brokers were more likely to downgrade from buy to hold (rather than from buy to sell) during the third quarter of 2002 were different from the types more likely to receive such downgrades during our sample period as a whole. We do so by computing the quarterly percentage of downgrades to hold (out of the total number of downgrades from buy) for growth and value stocks, big and small firms, and high and low momentum stocks. Growth (value) firms are defined as those with a book-to-market ratio

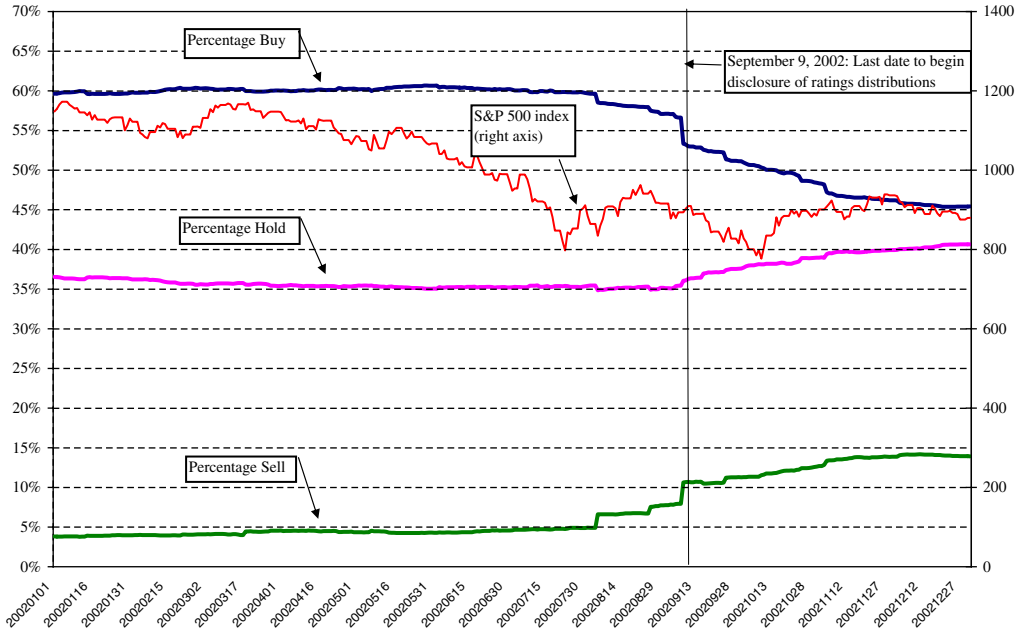

Fig. 2. Daily distribution of outstanding stock ratings, January 1–December 31, 2002.

The single biggest change in the ratings distribution came on Sunday, September 8, when the percentage of buys decreased from 57 to 53 percent and the percentage of sells increased from 8 to 11 percent. Consistent with these changes, untabulated results show that during the week of September 8, there were 1,535 downgrades to hold, sell, or strong sell, compared to an average of only 278 for each of the prior four weeks. These changes are not entirely surprising, given that NASD 2711 requires brokers to partition their recommendations into just *three* categories—buy, hold, and sell—for disclosure purposes, regardless of the actual ratings systems used by them. Apparently, many brokers took advantage of the September 9 implementation date to simplify their own ratings systems and bring them more in line with that required by the new rule. This necessitated a change in many firms' ratings to fit into one of these three categories. (Many research reports issued on September 8, 2002, explicitly give this as the reason for the ratings changes on that date.)

To formally test the hypothesis that the implementation of NASD 2711 played a significant role in the decline in the percentage of buy recommendations (separate from the impact of poor market returns and deteriorating earnings prospects), we estimate a simple vector autoregression (VAR) with three dependent variables: (i) the end-of-quarter percentage buys; (ii) the quarterly (S&P 500) market return; and (iii) the number of annual

(*footnote continued*)
in the bottom (top) 30 percent of that of all firms; big (small) firms are those above (below) the median market capitalization of stocks listed on the NYSE; high (low) momentum stocks are defined as those with 11-month prior buy-and-hold returns in the top (bottom) 30 percent of that of all firms. Untabulated results reveal no significant differences between the third quarter of 2002 and our sample period as a whole with respect to the likelihood that any particular firm type would receive a downgrade to hold rather than to sell.

earnings forecasts revised upward during the quarter, as a percentage of the total number of annual earnings forecast changes.[13] (This last variable serves to capture the effect of changing macroeconomic conditions on analysts' expectations for future firm performance.) In the VAR, we regress each dependent variable on two lags of the quarterly market return, two lags of percentage upward revisions, two lags of percentage buys, and a dummy variable which takes on a value of one for the three quarters after the adoption of NASD 2711. Untabulated results reveal a coefficient estimate on the NASD 2711 dummy variable of −0.054 (with a *t*-statistic of −2.97). This indicates that, after controlling for lagged market returns, lagged percentage upward forecast revisions, and the time-series properties of percentage buys, the buy percentage subsequent to the adoption of NASD 2711 is 5.4 percentage points less than otherwise would have been anticipated.[14] Repeating this analysis for percentage holds and sells yields similar results—the percentage of holds and sells following the implementation of NASD 2711 is 6.6 percentage points higher than would have been expected.[15]

3.2. Sanctioned banks vs. non-sanctioned brokers

Conflicts of interest can potentially affect analysts at all brokerage firms. Ten of the largest ones, though, have come under particular scrutiny by regulators and the media, resulting in an enforcement action, the *Global Research Analyst Settlement*, entered into on April 28, 2003, by the SEC, NASD, NYSE, New York Attorney General Eliot Spitzer, and other regulators on one side and these 10 banks on the other. The focus on these sanctioned banks naturally raises the question of whether their percentage buys systematically differ from that of the non-sanctioned brokers. To address this issue, we separately calculate for each group of brokers the percentage of all end-of-quarter outstanding recommendations that are buys.

These percentages are plotted in Fig. 3 for all quarters of our sample period. Through the quarter prior to the implementation of NASD 2711 (second quarter, 2002), these percentages track each other quite closely. The average end-of-quarter buy rating percentage is 66.4 percent for the sanctioned banks and 64.7 percent for the non-sanctioned brokers. The difference, 1.7 percentage points, is economically very small.

[13]For each quarter, the percentage of annual forecast changes which are upward revisions is computed by first calculating the total number of upwardly revised annual forecasts for the current and next fiscal years, across all firms with outstanding recommendations at quarter-end. The percentage of upwardly revised forecasts is equal to this number divided by the total number of upward and downward revisions.

[14]As a robustness check, we reran the VAR analysis with percentage buys and market return as dependent variables and current and one-quarter lagged percentage upward forecast revisions as independent variables. The results are quantitatively similar to those of our primary analysis.

[15]The sharp drop in the prices of technology and other growth stocks during the 2000–2002 market decline raises the possibility that low book-to-market firms were relatively overvalued in the late-1990s bull market. If so, this suggests that downgrades from buy to either hold or sell, occurring after the implementation of NASD 2711, might be concentrated in growth stocks. We examine this issue by computing the percentage of all growth stocks that were rated buy at the end of the second quarter of 2002 (the quarter preceding the implementation of NASD 2711) and the percentage rated buy at the end of the second quarter of 2003 (the end of our sample period). We perform similar calculations for value stocks. Untabulated results reveal that percentage buys for growth stocks decreased from 68 to 44 percent (a cut of 35.3 percent). For value stocks the drop was from 43.5 to 29.3 percent (a cut of 32.6 percent). These results indicate that growth and value stocks were hit equally hard by analyst downgrades during the post-NASD 2711 period.

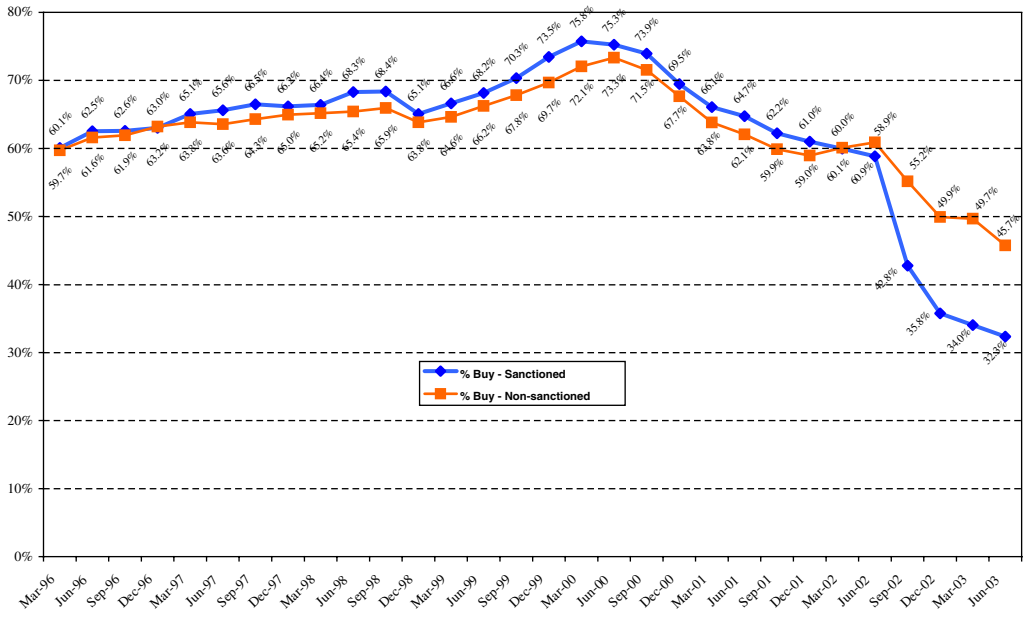

Fig. 3. Percentage of outstanding recommendations that are buys: sanctioned banks and non-sanctioned brokers.

Moreover, there are only two quarters in which the difference exceeds three percentage points. This evidence makes clear that the sanctioned banks did not have a meaningfully greater tendency to issue buy recommendations than did the non-sanctioned brokers during this period. This conclusion, though, should not be taken to necessarily imply that regulators inappropriately singled out these 10 sanctioned banks for enforcement action, as the allegations made against them were primarily based on evidence other than their stock ratings distributions.

After the implementation of the new disclosure rule, the percentage buys of the sanctioned banks drops much more dramatically than does that of the non-sanctioned brokers. By the end of our sample period the difference in percentage buys widens to over 13 percentage points (32.3 percent for the sanctioned banks and 45.7 percent for the non-sanctioned brokers), suggesting that the heightened regulatory scrutiny of the sanctioned banks resulted in their being more wary of issuing buy recommendations than the non-sanctioned brokers.[16]

[16]Untabulated results reveal that the firms covered by the sanctioned banks tend to be larger than those covered by the non-sanctioned brokers. (The mix between growth and value and between winners and losers is about the same for both groups.) This, combined with a greater tendency for the sanctioned banks to issue buys on big firms (the non-sanctioned brokers do not exhibit a similar tendency), likely explains the slightly greater overall percentage of buy recommendations for the sanctioned banks prior to the implementation of NASD 2711. Beginning in the third quarter of 2002, however, the percentage of buy recommendations in each category of covered firm (big, small, growth, value, winner, and loser) is smaller for the sanctioned banks than for the non-sanctioned brokers. Consequently, coverage differences cannot explain the lower percentage of buy recommendations for the sanctioned banks, relative to the non-sanctioned brokers, during the post-NASD 2711 period.

4. The relation between brokers' stock rating distributions and their recommendation returns—intuition and an example

In this section, we present a simple example to illustrate that a relation will exist between a broker's stock rating distribution and the future returns to its recommendations as long as: (i) recommendations, in general, have investment value; (ii) the information implicit in analysts' recommendations and in brokers' ratings distributions is not instantaneously incorporated into market prices; and (iii) the criteria used to rate covered firms differ across brokers. Differences in ratings criteria will arise if some brokers choose to keep covered firms at a buy rating when they truly believe the firms' prospects have dimmed sufficiently to deserve a hold or sell rating (which has been alleged by many regulators and those in the media), while other brokers readily downgrade such firms. (Such differences across brokers are sometimes referred to below as *implicit* differences in ratings criteria.) Differences will also arise in the absence of such deliberate behavior, if brokers simply differ in their definitions of buy, hold, and sell. (These differences are sometimes referred to below as *explicit* differences in ratings criteria.) A quick glance at the ratings definitions of various brokers reveals that explicit differences do exist. For instance, certain brokers classify a firm as a buy if its expected return exceeds a particular *absolute* level, while others classify a buy *relative* to the market. Moreover, these threshold levels differ across brokers.

If brokers differ in the implicit and/or explicit criteria used to rate stocks, then a broker with a greater percentage of buy recommendations is likely to be one that employs looser implicit and/or explicit criteria for classifying a stock as a buy (the opposite is likely to be true for a broker with a greater percentage of hold or sell recommendations).[17] This immediately implies that the future buy recommendations of such a broker would not be expected to generate as great a return as those of brokers with stricter criteria for classifying stocks as buys. Conversely, the stocks that the broker rates as sell would be expected to generate a lower (more negative) return than those of brokers with less-strict criteria for classifying stocks as sells. Note that these conclusions are independent of the reason that brokers differ in their criteria for rating stocks.

The following example makes this intuition more concrete. Consider a stylized risk-neutral setting in which analysts can perfectly predict the 1-year ahead return on each covered firm, and that this return takes one of the values $-10, -5, +5$, or $+10$ percent, with equal probability, ex ante. There exist two types of brokers, denoted by M (for more favorable) and L (for less favorable). The M broker has a policy of requiring its analysts to assign a buy rating to each covered firm whose return will be at least -5 percent, and a sell otherwise. The L broker has a policy of requiring its analysts to assign a buy rating to any covered firm whose return will be $+5$ or $+10$ percent, and a sell otherwise. For purposes of this example, it does not matter whether this reflects an explicit or an implicit difference in classification criterion.

This difference implies that the recommendations of the M brokers will be 75 percent buys, on average, while the L brokers will have an average of 50 percent buys. The mean

[17]Alternatively, a broker might be issuing a greater percentage of buy recommendations because the prospects for its covered firms are genuinely more favorable than those of firms covered by other brokers. If this were the case, though, the stocks recommended by a broker with a higher percentage of buy recommendations should outperform those of a broker with a lower percentage. Additionally, an individual broker's buy recommendation percentage should not be persistent over time. Neither of these two implications is supported by our empirical analysis.

return on an M broker's buy recommendations will be $(-5+5+10)/3 = 3.33$ percent, while the corresponding average return for an L broker will be $(5+10)/2 = 7.5\%$. A sell issued by an M broker will have an expected return of -10 percent, while the expected return for an L broker's sell recommendations will be $(-5-10)/2 = -7.5$ percent. As this example illustrates, the greater a broker's percentage of buy ratings, the smaller the expected return to those recommendations and the more negative the expected return to its sell recommendations.

If investors are rational and know each broker's type with certainty, then they would immediately bid up the price of a stock receiving a buy rating from an M (L) broker by 3.33 (7.5) percent, and would reduce the price of a stock on which an M (L) broker issued a sell recommendation by 10 (7.5) percent. More generally, even if rational investors do not know each broker's type with certainty, they will react less positively to the announcement of a buy recommendation when it comes from a broker with a higher percentage of buy ratings, and will respond more negatively to such a broker's sell recommendations.[18]

5. The relation between brokers' stock rating distributions and their recommendation returns—empirical evidence

5.1. Preliminaries

To examine the relation between brokers' stock rating distributions and their recommendation returns, we begin by ranking brokers each quarter in ascending order according to the percentage of their end-of-quarter recommendations which are buys.[19] Brokers are then assigned to quintiles (sometimes referred to as favorableness quintiles), with the lowest ranked brokers placed in the first quintile, higher ranked brokers placed in higher quintiles, and the highest ranked brokers assigned to the fifth quintile. The buy percentage that serves as the cutoff between adjacent quintiles is set so that the total number of recommendations outstanding at the end of the quarter for all the brokers in each quintile is the same (that is, one-fifth of the total number of recommendations outstanding).[20]

[18]To illustrate this, assume, as an extension of the previous example, that investors cannot distinguish between broker types; rather, they believe there is an equal chance of a broker being of type M or of type L. Consider a broker that currently has one recommendation outstanding, a buy. Using Bayes' rule, it is straightforward to show that the probability such a broker is of type M is $\frac{3}{5}$. If this broker then issues a buy recommendation on another company, investors will revise the probability that the broker is of type M to 9/16. Consequently, the buy recommendation will result in their bidding up the price of the recommended stock by $\frac{9}{16} \times 3.33$ percent $+\frac{7}{16} \times 7.5$ percent $= 5.15$ percent. If the broker's recommendation on this other company is a sell, then investors will revise the probability that the broker is of type M to $\frac{3}{7}$. Consequently, they will reduce the price of the second stock by $\frac{3}{7} \times 10$ percent $+\frac{4}{7} \times 7.5$ percent $= 8.6$ percent. Similar calculations reveal that if the broker originally has one sell recommendation outstanding, the announcement of the second recommendation will drive the stock up by 5.71 percent if it is a buy and will drive it down by 8 percent if it is a sell. As this example shows, the higher the initial percentage of buy recommendations, the less positive will be the return to a new buy recommendation and the more negative the reaction to a new sell recommendation.

[19]We start the ranking with the fourth quarter of 1995, so as to take advantage of our first quarter 1996 recommendation data. However, since the number of recommendations is relatively sparse in January 1996, we ignore those issued that month in calculating recommendation returns.

[20]After assigning brokers to quintiles, we check whether any straddle two quintiles. For any such broker, we reallocate all of its recommendations to the quintile in which the majority of them originally fell.

Table 2
Descriptive statistics by broker favorableness quintile

This table reports the average percentage of all end-of-quarter outstanding recommendations which are buys, the average rating, the average number of brokers, the average number of recommendations, and the average market value of firm covered, by broker favorableness quintile. Quintile *i*'s average end-of-quarter percentage buy recommendations (column 2) is the average of the 30 quarterly ratios of total number of buy recommendations to total number of recommendations outstanding at the end of each quarter. Average rating (column 3) equals the average, over all 30 quarters, of the mean outstanding recommendation in a given quintile at quarter-end. Number of brokers (column 4) is the number of distinct brokers in each quintile at the end of a quarter, averaged over all 30 quarters. Average number of recommendations (column 5) equals the average, over all 30 quarters, of the total number of outstanding recommendations in a given quintile at quarter-end. Average market value of firm covered (column 6) is the mean, over all 30 quarters, of the average quarterly market value of equity of the firms covered by the brokers in a given quintile. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

Favorableness quintile (1)	Average quarterly percentage buy recommendations (2)	Average quarterly rating (3)	Average quarterly number of brokers (4)	Average quarterly number of recommendations (5)	Average market value of firm covered (6)
1 (least favorable)	45	2.4	50	5,137	6,098,450
2	57	2.2	25	5,043	5,848,713
3	62	2.1	23	5,122	5,551,187
4	67	2.0	27	5,130	5,215,182
5 (most favorable)	79	1.8	98	5,082	4,115,469

Table 2 provides descriptive statistics for these quintiles. As shown in column 2, the brokers in the first favorableness quintile (the least favorable brokers) had an average quarterly buy recommendation percentage (each quarter's percentage equals the total number of buys outstanding in the quintile at quarter-end divided by the total number of recommendations outstanding) of 45 percent, while the brokers in the fifth favorableness quintile (the most favorable brokers) had an average quarterly buy recommendation percentage of 79 percent. The average stock rating of the least favorable brokers (the average, over all 30 quarters, of the mean rating at quarter-end) is 2.4 (mid-way between a buy and a hold), while the average rating of the most favorable brokers is 1.8 (between a buy and a strong buy). The number of brokers is greatest in the most favorable quintile. The second-highest number of brokers is in the least favorable quintile.[21] Supplementary analysis reveals that, along with many large brokers, this quintile has a relatively high number of small brokers. It is not surprising that many small brokers would appear in this quintile since, with fewer recommendations, it is more likely that a small broker's buy rating percentage will be at an extreme. As revealed in the last column, the average market

[21]The average quarterly number of brokers across all quintiles is 233. This is approximately equal to the average yearly number of brokers in our entire sample (refer back to Table 1). The discrepancy is due to the fact that some brokers drop out of the database from one quarter to the next and new ones enter.

Table 3
Average percentage buys in quarters $t+1$ through $t+12$ for brokers in each favorableness quintile in quarter t

Over all the brokers in each quintile i at the end of quarter t the percentage of their recommendations which are buys at the end of each of the next 12 quarters (or until the end of the sample period, whichever is shorter) is computed. The numbers presented in the table are the means of these percentages over all quarters t, for each broker favorableness quintile. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

Quarter	Broker favorableness quintile				
	1 (least favorable) (percent)	2 (percent)	3 (percent)	4 (percent)	5 (most favorable) (percent)
t	45	57	62	67	79
$t+1$	48	58	62	66	76
$t+2$	49	60	62	65	74
$t+3$	51	60	62	64	72
$t+4$	52	61	62	64	71
$t+5$	52	61	62	63	70
$t+6$	53	61	62	63	69
$t+7$	53	61	61	63	68
$t+8$	54	60	61	63	68
$t+9$	54	60	60	62	68
$t+10$	53	60	60	62	68
$t+11$	53	60	60	61	68
$t+12$	53	60	60	60	67

value of the covered firms is much smaller for the most favorable brokers than for those in the other quintiles.

Before presenting our return analysis, we test for the presence of persistence in individual broker favorableness over time. If there are truly systematic differences across brokers in their explicit and/or implicit criteria for rating stocks, then we should find evidence of persistence for each broker in its percentage buys over time. Its absence would strongly suggest that any differences in ratings distributions across brokers are due to random (one-time) factors, and would imply that any relation found between the distribution of stock ratings and recommendation returns is spurious.

To test for persistence, we take the brokers in each quintile i and quarter t and compute their buy recommendation percentage at the end of each of the next 12 quarters (or until the end of the sample period, whichever is shorter). We then average these percentages over all quarters t. The results are presented in Table 3. As the table makes clear, there is some limited reversion to the mean. While the buy recommendation percentages range from 45 to 79 percent during the ranking quarter, the range decreases to 53 to 67 percent by the end of 3 years. Most of the reversion is completed by the end of 1 year. The percentage buys for the least favorable brokers of quarter t increases by just 1 percentage point over the next 8 quarters, while the percentage buys for the most favorable brokers decreases by just 4 percentage points. The continuing spread between the percentage buys for the most and least favorable brokers is evidence of underlying, persistent differences in the explicit and/or implicit criteria used to rate stocks.

5.2. Return results

This section begins with an examination of whether recommendation announcement day returns differ across broker quintiles. This analysis will provide evidence as to whether investors' initial reaction to newly announced recommendations reflects knowledge of brokers' stock ratings distributions and what they may imply about brokers' implicit and/or explicit ratings criteria. If it does, then the reaction to both upgrades and initiations/resumptions at buy or strong buy should be more positive the less favorable the broker quintile (that is, the stricter the criteria for issuing a buy recommendation). Similarly, the initial reaction to both downgrades and initiations/resumptions at hold, sell, or strong sell should be less negative the less favorable the broker quintile (that is, the less strict the criteria for issuing such recommendations).

It is important to keep in mind, though, that most of our sample period precedes the implementation of NASD 2711 and the publication of ratings distributions. During this pre-NASD 2711 period, it is likely that most investors were unaware of differences in ratings distributions across brokers. (Only those institutional investors who subscribed to either *First Call* or a similar service and who tabulated brokers' ratings distributions would have known of the differences across brokers.) Consequently, even if investors understood, theoretically, the relation between brokers' ratings distributions and their underlying rating criteria, we might not find announcement day return differences across favorableness quintiles.

Our formal analysis deviates slightly from the precise disclosure requirements of NASD 2711. While the new rule allows brokers to disclose their ratings distributions as of the end of the second most recent quarter for report publication dates within 15 calendar days after quarter-end (presumably to give brokers time to compile their distributions), we use the distributions as of the end of the most recent quarter for *all* of the following quarter's recommendations. We do this because, post-September 9, 2002, several brokers have chosen to disclose the most current end-of-quarter distributions in all of their research reports, and because virtually all, if not all, brokers have the ability to do so.

To begin our analysis we partition our recommendations into four subsamples: (i) upgrades to buy or strong buy; (ii) downgrades to either hold, sell, or strong sell; (iii) initiations or resumptions of coverage with a buy or strong buy; and (iv) initiations or resumptions of coverage with a hold, sell, or strong sell.[22] For the upgrade subsample we run the following regression:

$$ANNR_i = a + b\ \ln(SIZE_i) + c\ \ln(NREC_i) + \sum_{k=1}^{4} d_k\ QUINT_{ki} + e \cdot UPGRADE_i + \varepsilon_i, \quad (1)$$

where $ANNR_i$ is the recommendation announcement day market-adjusted return for upgraded stock i (the stock's gross announcement day return minus the corresponding return on the *CRSP* NYSE/AMEX/Nasdaq value-weighted market index); $\ln(SIZE_i)$ the natural logarithm of the market value of upgraded stock i (as of the close on the day prior

[22]Our focus on changes in analysts' recommendations is consistent with Jegadeesh et al. (2004) who find that changes in recommendations have greater predictive power for returns than do recommendation levels. To the extent that some initiations and resumptions are, in fact, reiterations, return results will be more muted for them.

to the announcement day); $\ln(NREC_i)$ the natural logarithm of the number of end-of-quarter recommendations outstanding for the broker who issued the upgrade on stock i; $QUINT_{ki}$ the dummy variable taking the value 1 if the prior quarter's favorableness quintile of the broker issuing the current-quarter upgrade for stock i is equal to k, $k = 1, \ldots, 4$, and 0 otherwise; $UPGRADE_i$ the dummy variable taking the value 1 if stock i is upgraded to strong buy, and 0 otherwise; and ε_i the regression residual for recommendation i.

For recommendations released after market close (4:00 p.m. Eastern time), the following trading day's market-adjusted return is taken to be the announcement day return. If more than one broker upgrades a particular stock in a given quarter, then that stock will appear multiple times in the regression, once for each upgrade.

In regression (1), the announcement day market-adjusted return of each upgrade is regressed on dummy variables for broker favorableness quintile, as well as on several control variables. The first control variable is the log of firm size, whose introduction is motivated by Barber et al. (2001), Stickel (1995) and Womack (1996) who find that the initial reaction to recommendations is larger for small firms than for large ones. The second control variable is the log of the number of prior quarter-end recommendations outstanding for the issuing broker, a proxy for broker size.[23] The inclusion of this variable is suggested by Barber et al. (2000) who document that the initial reaction to recommendations is greater for larger brokers. We also include a dummy variable for the upgrade, itself. The coefficient on this variable represents the incremental market-adjusted announcement day return to an upgrade to strong buy relative to an upgrade to buy. Given that the price reaction to an upgrade depends not only on the new rating, but also on the covered firm's previous rating, there is no ex ante prediction regarding the sign or relative magnitude of this dummy variable.

Similar regressions are run for the other three recommendation subsamples. In place of the upgrade dummy, the downgrade regression includes dummies for downgrades to hold and sell, the regression for initiations/resumptions at buy or strong buy includes a dummy for a strong buy recommendation, and the regression for initiations/resumptions at hold, sell, or strong sell includes dummies for hold and sell recommendations. In all regressions, only real-time *First Call* recommendations are used; batch recommendations are excluded because their exact disclosure dates are not known.

The results of these four regressions are presented in Table 4. In each regression, the coefficients on the covered firm and broker size control variables are significantly different from zero and have signs consistent with expectations. The sign on the coefficient of $\ln(SIZE_i)$ is opposite to that of the intercept, meaning that the greater the size of the covered firm, the smaller the absolute value of the announcement day price reaction. The sign on the coefficient of $\ln(NREC_i)$ is the same as that of the intercept, implying that the larger the broker, the larger the absolute value of the market-adjusted announcement day return.

The coefficient on the upgrade dummy is positive, indicating that the upgrade to strong buy elicits a stronger response than does an upgrade to buy. The incremental 1-day market-adjusted return, though, is economically small (only 16 basis points). The coefficients on the downgrade dummies indicate that downgrades to hold evoke a $1\frac{1}{4}$ percentage point greater negative response than do downgrades to strong sell. The average

[23]Log transformations are employed because the underlying variables are highly positively skewed.

Table 4
Regressions of announcement day market-adjusted return (percent) to upgrades, downgrades, initiations, and resumptions of coverage

This table reports results of regressions of recommendation announcement day market-adjusted return on size of firm covered (equal to in of firm market value), broker size (equal to in of number of recommendations outstanding by the broker in the prior quarter), and dummy variables for broker favorableness quintile and the nature of the recommendation. The regression results are presented for upgrades to buy, downgrades to hold or sell, initiations or resumptions of coverage with a buy, and initiations or resumptions of coverage with a hold or sell. The coefficient estimates are presented, along with the corresponding *t*-statistics for the null that the coefficients equal zero. Only recommendations coded as "real-time" in the *First Call* database are used. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

	Upgrades to buy		Downgrades to hold or sell		Initiation/ resumption as buy		Initiation/ resumption as hold or sell	
	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
Intercept	5.16	17.8	−10.36	−19.4	1.74	10.7	−3.98	−10.4
ln(firm size)	−0.42	−22.8	0.70	22.9	−0.21	−19.9	0.16	8.3
ln(broker size)	0.59	17.2	−0.77	−13.4	0.23	13.5	−0.23	−7.2
Dummy variable on								
Quintile 1 (least favorable)	−0.70	−6.6	2.02	10.8	0.05	0.7	1.14	9.1
Quintile 2	−0.32	−3.0	1.33	7.0	0.10	1.6	0.75	5.7
Quintile 3	0.11	1.0	0.41	2.2	0.20	3.1	0.57	4.3
Quintile 4	0.16	1.5	1.34	7.4	−0.03	−0.5	0.63	4.8
Dummy variable on								
Upgrades to strong buy	0.16	2.3						
Dummy variable on:								
Downgrades to hold			−1.25	−5.1				
Downgrades to sell			0.29	1.0				
Dummy variable on								
Initiation/resumption at strong buy					1.24	31.3		
Dummy variable on								
Initiation/resumption at hold							0.90	3.8
Initiation/resumption at sell							1.35	4.8
Adjusted R^2	1.9%		2.0%		1.5%		0.5%	
Number of observations	43,893		43,339		93,895		42,956	

reaction to downgrades to sell and strong sell, however, are insignificantly different from each other. Initiations/resumptions at strong buy elicit an approximately $1\frac{1}{4}$ percentage point greater reaction than do initiations/resumptions at buy. Initiations/resumptions at hold and sell evoke a 90 basis point and 1.35 percentage point less negative reaction, respectively, than do initiations/resumptions at strong sell.

The coefficients on the favorableness quintile dummies do not display the predicted pattern in the upgrade regression. Instead of becoming more positive as we move from

quintile 4 to quintile 1, the coefficients decrease in value. The coefficient on the quintile 1 dummy, in fact, actually turns negative, meaning that the average announcement day reaction to upgrades issued by the least favorable brokers is *less* positive than that for the most favorable brokers. This indicates that, in their immediate reaction to upgrades, either investors are not appropriately taking into account the nature of the broker making the recommendation, or the lack of widely disseminated information on brokers' ratings distributions precludes them from doing so during much of our sample period. Similarly, the dummy coefficients for the regression of initiations/resumptions at buy or strong buy are inconsistent with the hypothesized pattern. The coefficients on the quintile dummies are, with one exception, insignificantly different from zero, indicating that the announcement day reaction to these recommendations is generally unrelated to the brokers' ratings distributions.

The coefficients on the favorableness quintile dummies in the downgrade regression yield a pattern more in line with expectations. All coefficients are significantly positive, meaning that the most negative price reaction to downgrades comes from the most favorable quintile of brokers (quintile 5). The coefficient on the quintile 1 dummy is the most positive, indicating that the downgrades of the least favorable brokers elicit the least negative market response (2.02 percentage points less than the downgrades of the most favorable ones). Apparently, investors are reacting most strongly to the downgrades of brokers least inclined to issue hold and sell recommendations. A similar, although more muted, pattern exists for the subsample of hold, sell, or strong sell initiation/resumption recommendations.[24]

To determine whether a broker's ratings distribution is useful in predicting the performance of its recommendations, we turn now to an examination of whether longer-term recommendation returns differ across broker quintiles. We begin our analysis by calculating, for each quintile, returns to each of our four separate recommendation subsamples (20 portfolios in total). To understand how the portfolio returns are calculated, take as an example the upgrade portfolio of the quintile 1 brokers. For each of the brokers in this quintile at the end of quarter t we identify the upgrades they made in quarter $t+1$. An upgraded stock enters the upgrade portfolio at the close of trading on the day the upgrade is announced. (If the upgrade is announced after the market close, it is added to the portfolio at the close of the following trading day.) By waiting until the close of trading, we explicitly exclude the first-day recommendation returns.[25] We do so to reflect

[24]We performed three robustness checks. First, for each broker quintile we calculated average announcement day market-adjusted returns. Untabulated results reveal that the return pattern across quintiles in each of the four recommendation subsamples is quite similar to that documented in the corresponding regression analysis. Second, to control for possible differences in stock coverage across quintiles, we restricted the upgrade (downgrade) portfolios to be comprised of only those stocks that received an upgrade (downgrade) from brokers in every quintile at some point during our sample period. Untabulated results show, similar to the previous findings, an almost monotonic increase in average market-adjusted returns for upgrades as we move from the least favorable to the most favorable analysts. In contrast, the return pattern across quintiles for downgrades is weaker than previously found. These weaker results are likely due, at least in part, to a significant drop in the number of firms in each of the portfolios. Third, we expanded regression (1) by adding the book-to-market ratio and price momentum as independent variables. Untabulated results reveal that the relative magnitudes of the average market-adjusted returns across quintiles are very similar to those previously obtained.

[25]Green (2003) estimates that buying (selling) shares at the start of the trading day subsequent to an upgrade (downgrade), rather than waiting until the end of the day to take a position, would increase returns by approximately $1\frac{1}{2}$ (2) percentage points. Including the announcement day returns in our buy-and-hold return

that some investors, especially small ones, likely become aware of upgrades only with a delay.[26] If more than one broker upgrades a particular stock, then that stock will appear multiple times in the portfolio, once for each upgrade. Assuming an equal dollar investment in each upgrade, the portfolio return on date t is given by

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

where R_{it} is the gross date t return on upgrade i, n_t is the number of upgrades in the portfolio, and x_{it} is the compounded daily return of upgraded stock i from the close of trading on the day of the upgrade through day $t-1$. (The variable x_{it} equals 1 for a stock upgraded on day $t-1$.) The upgrade portfolio is updated daily, so that stocks which are downgraded are dropped from the portfolio at the close of trading on the day of the downgrade. This calculation yields a time-series of daily returns for the upgrade portfolio. The daily returns for the remaining portfolios are determined in an analogous fashion.

Two measures of risk-adjusted performance are calculated for each of our portfolios. The first is the mean daily market-adjusted return, found by subtracting the daily return on the CRSP NYSE/AMEX/Nasdaq value-weighted market index from the daily return of each of our portfolios. The second is the intercept from the four-factor model developed by Carhart (1997), found by estimating the following daily time-series regression for each portfolio j:

$$R_t^j - R_{ft} = \alpha_j + \beta_j(R_{mt} - R_{ft}) + s_j SMB_t + h_j HML_t + w_j WML_t + \varepsilon_{jt}, \quad (2)$$

where R_t^j is the daily return on portfolio j, R_{ft} is the daily risk-free rate, R_{mt} is the daily return on the value-weighted market index, SMB_t is the return on a value-weighted portfolio of small stocks minus the return on a value-weighted portfolio of big stocks, HML_t is the return on a value-weighted portfolio of high book-to-market stocks minus the return on a value-weighted portfolio of low book-to-market stocks, and WML_t is the return on a value-weighted portfolio of stocks with high recent returns minus the return on a value-weighted portfolio of stocks with low recent returns.[27] The regression yields parameter estimates of α_j, β_j, s_j, h_j, and w_j.[28] The error term in the regression is denoted by ε_{jt}. In the discussion below, the intercept α_j is alternatively referred to simply as the abnormal return on portfolio j.

The return results appear in Table 5, panels A–D. While the differences between the raw returns (as well as the market-adjusted returns) of the portfolios of the least favorable and most favorable brokers are of mixed significance, the abnormal return differences are

(*footnote continued*)
calculations does not change our conclusions. Untabulated results reveal that the difference between the abnormal returns of the least favorable and most favorable brokers widens for all our portfolios, except for that of the upgrades (where the difference, while still of the expected sign, becomes marginally insignificant).

[26]Untabulated results show that waiting for up to 20 days before adding a recommendation to its appropriate portfolio causes individual quintile portfolio returns to decrease but has no quantitative effect on the reported differences between the buy-and-hold recommendation returns of the quintile 1 and 5 brokers.

[27]We thank Ken French and James Davis for providing us with daily factor returns. The construction of the size and book-to-market portfolios is identical to that in Fama and French (1993). The WML return is constructed as in Carhart (1997).

[28]To address the possibility that nonsynchronous trading affects our results, we also include one lag of each of the independent variables in the regressions (see Scholes and Williams, 1977).

Table 5
Average daily portfolio buy-and-hold returns (percent)

This table reports the average daily portfolio buy-and-hold raw, market-adjusted, and abnormal returns, for upgrades to buy (panel A), downgrades to hold or sell (panel B), initiations or resumptions of coverage with a buy (panel C), and initiations or resumptions of coverage with a hold or sell (panel D), by broker favorableness quintile. The difference in returns between quintiles 1 and 5 is also presented, along with the corresponding *t*-statistic for the null that the difference is zero. A stock enters a portfolio at the close of trading on the day the recommendation is announced. If more than one broker takes the same action on a particular stock, then that stock will appear multiple times in the corresponding portfolio, once for each broker. A stock is dropped from the upgrade (downgrade) portfolio when a downgrade (upgrade) is announced, or when the stock is dropped from coverage. A stock is dropped from the initiation/resumption of coverage portfolios when a new recommendation is issued. Each portfolio's value-weighted return is calculated each day, with the portfolio rebalanced at the end of the day, if necessary. The daily abnormal return is the intercept from a regression of the daily portfolio excess return on: (1) the excess of the market return over the risk-free rate; (2) the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; (3) the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks; (4) the difference between the daily returns of a value-weighted portfolio of high price momentum stocks and one of low price momentum stocks; and (5) one-trading day lagged values of each of these four variables. Only recommendations coded as "real-time" in the First Call database are used. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

Favorableness quintile	Raw return	Market-adjusted return	Abnormal return
Panel A: upgrade to buy			
1 (least favorable)	0.085	0.049	0.040
2	0.075	0.039	0.030
3	0.068	0.032	0.023
4	0.069	0.034	0.024
5 (most favorable)	0.058	0.023	0.016
Difference (1 minus 5)	0.026	0.026	0.024
t-stat	1.74	1.74	2.71
Panel B: downgrade to hold or sell			
1 (least favorable)	0.022	−0.013	−0.022
2	0.018	−0.018	−0.026
3	0.020	−0.015	−0.023
4	0.010	−0.025	−0.032
5 (most favorable)	−0.007	−0.042	−0.044
Difference (1 minus 5)	0.029	0.029	0.022
t-stat	1.96	1.96	2.19
Panel C: initiation/resumption as buy			
1 (least favorable)	0.056	0.021	0.014
2	0.043	0.007	0.000
3	0.054	0.019	0.010
4	0.039	0.003	−0.003
5 (most favorable)	0.036	0.001	−0.004
Difference (1 minus 5)	0.020	0.020	0.018
t-stat	1.54	1.54	2.12
Panel D: initiation/resumption as hold or sell			
1 (least favorable)	0.044	0.008	0.000
2	0.033	−0.002	−0.011
3	0.028	−0.008	−0.018
4	0.028	−0.007	−0.015
5 (most favorable)	0.004	−0.031	−0.035
Difference (1 minus 5)	0.040	0.040	0.035
t-stat	3.38	3.38	4.18

uniformly significant.[29] In all cases they are of the expected sign and very similar in magnitude across portfolios. The average daily buy-and-hold abnormal return for upgrades by the least favorable brokers is 0.040 and 0.016 percent for the most favorable brokers. The difference is 0.024 percent, or 0.504 percent on a monthly (21-day) basis.[30] Consistent with the existence of underlying differences across brokers in their proclivity to issue buy recommendations, this result implies that upgrades have more information content (or, alternatively stated, are more credible) when issued by brokers who are less prone to giving buy ratings. The average daily buy-and-hold abnormal return for downgrades is −0.022 percent for the least favorable brokers and −0.044 percent for the most favorable brokers. The difference is 0.022 percent, or 0.462 percent on a monthly basis. Again consistent with there being underlying differences across brokers, downgrades apparently have more information content when coming from brokers who are less likely to issue hold or sell ratings.[31]

The initiation/resumption portfolio returns show a similar pattern. Initiating or resuming coverage with a buy or strong buy yields an average daily abnormal buy-and-hold return of 0.014 percent for the least favorable brokers and −0.004 percent for the most favorable ones. The difference is 0.018 percent, or 0.378 percent on a monthly basis. For initiations or resumptions of coverage with a hold, sell, or strong sell, the average daily abnormal buy-and-hold return is zero percent for the least favorable brokers and −0.035 percent for the most favorable ones. This yields the largest difference of all the four portfolios, 0.035 percent, or 0.735 percent on a monthly basis.[32]

Overall, these return differences indicate that knowledge of brokers' stock ratings distributions would have been useful to investors in interpreting analysts' research reports over this time period and provide the NASD and NYSE with some justification for their

[29]Untabulated results reveal that, for each of the four portfolios, the least favorable brokers cover larger stocks than do the most favorable brokers, as well as stocks with higher book-to-market ratios and lower sensitivity to the market. Except for the downgrade portfolio, they also tend to cover stocks that have performed worse in the past.

[30]The *t*-statistic for the difference in abnormal returns (as reported in Table 5) is derived from a regression of the daily abnormal return differences on the four factors. The *t*-statistics for the other abnormal return differences are calculated in the same manner.

[31]A priori, an alternative explanation for observed cross-sectional differences in stock ratings distributions is that more favorable brokers have a greater tendency than less favorable ones to drop coverage of firms they view unfavorably (rather than a greater proclivity to issue buy recommendations). At best this can only be a partial explanation, since it cannot account for the observed return differences for upgrades across quintiles. Untabulated analysis also reveals that the average abnormal return of the stocks covered by the more favorable brokers is *lower* than that of the less favorable ones. This is also inconsistent with more favorable brokers being more likely to drop coverage of firms expected to perform poorly.

[32]As a robustness check, we use an industry factor model as an alternative measure of risk-adjusted portfolio performance. The first step in this analysis is to construct a series of value-weighted daily returns for each of 10 industry segments (as defined by Ken French). Next, each industry segment's excess return (over the risk-free rate) is computed. The industry segments' excess returns then replace the market excess return as independent variables. Untabulated results reveal that the risk-adjusted portfolio performance for each quintile is very similar, both quantitatively and qualitatively, to that reported in Table 5. We alternatively measure the sensitivity of cross-quintile return differences to industry composition by using the industry segments' value-weighted daily returns and the daily percentage that each of these segments makes up of each quintile's total recommendations to calculate the daily return on a portfolio that mimics the quintile's industry composition. Untabulated findings reveal that the daily industry-mimicking portfolio returns are almost identical across quintiles, strongly suggesting that industry composition differences are not a significant determinant of the cross-quintile return differences we document in Table 5.

disclosure requirement. This does not imply, however, that buying the upgraded and downgraded stocks of the least favorable analysts and selling short those of the most favorable analysts is necessarily a profitable strategy. Such a strategy is likely to entail very high portfolio turnover and transactions costs, potentially offsetting any gross trading profits (see Barber et al., 2001).

Prior research (Barber et al., 2001; Stickel, 1995; Womack, 1996) has shown that small firms exhibit a greater absolute response to recommendations than do large firms. This is not surprising, since analysts' research reports likely provide more incremental information to the market for small firms. To ensure that covered firm size differences are not driving the variation in returns across broker quintiles, we partition our recommended stocks into small, medium, and large firms, and replicate our analysis for each subsample. The abnormal return results, which appear in Table 6, are notable in two major respects. First, the signs of the return differences for each portfolio and for each size category are the same as those of the sample as a whole, with but one exception. Second, the magnitude of these differences is generally greatest for the small firms and smallest for the large firms. For the small-firm upgrade portfolio, for example, the difference of 0.060 percent, or 1.26 percent on a monthly basis, is statistically significant and over twice as great as for the sample as a whole. That our return differences are, in general, qualitatively the same for each firm size, and greatest for the small firms, strongly suggests that our findings are not an artifact of differences in the average size of firms covered by the most favorable and least favorable brokers.

If NASD 2711 has had the effect of reducing the (alleged) tendency of some brokers to issue buys when they truly believe that holds or sells are deserved (as Fig. 1 and the ensuing discussion suggest), then differences observed in the ratings distribution across brokers in the post-September 9, 2002, period will more likely reflect the differential impact of transitory factors, instead of underlying, persistent differences in the proclivity to issue buy recommendations. This should manifest itself by a reduction in return differences across broker quintiles during this period. Table 7, panels A and B, documents this reduction. Panel A reports the quintile dummies for the pre- and post-September 9 period, derived from running regression (1) separately for each time frame.[33] For the pre-September 9 period, the quintile 1 dummies (which, for each regression, equals the difference between the recommendation returns of the least and most favorable brokers) are of similar magnitude and statistical significance to those for the entire sample period (as reported in Table 4). In contrast, the post-September 9 quintile 1 dummies are generally lacking in statistical significance. The quintile 1 dummy in the upgrade to buy regression, for instance, is −0.76 percent in the period prior to the effective date of NASD 2711, but only 0.29 percent in the ensuing period. Similarly, the quintile 1 dummy in the downgrade regression decreases from 2.66 to just 0.08 percent.[34]

Turning to the longer-term results (panel B), differences in abnormal buy-and-hold returns between the least favorable and most favorable brokers for the quarters through

[33]September 9 is included in the latter time period.

[34]Untabulated results reveal that the average market-adjusted announcement day return for downgrades to hold and sell during the week of September 9, 2002 is only −1.0 percent. This compares to an average market-adjusted return ranging between −3.7 percent (for quintile 1 recommendations) and −5.8 percent (for quintile 5 recommendations) over our entire sample period. This suggests that many of the downgrades during that week conveyed little new information, instead reflecting the realignment of brokers' ratings from a five-point to a three-point scale. See the discussion in Section 3.1.

Table 6
Daily portfolio buy-and-hold abnormal returns (percent) by size of firm covered

This table reports the average daily portfolio buy-and-hold abnormal returns, for upgrades to buy (panel A), downgrades to hold or sell (panel B), initiations or resumptions of coverage with a buy (panel C), and initiations or resumptions of coverage with a hold or sell (panel D), by broker favorableness quintile and by size of firm covered (small, medium, and large). The difference in returns between quintiles 1 and 5 is also presented, along with the corresponding *t*-statistic for the null that the difference is zero. A stock enters a portfolio at the close of trading on the day the recommendation is announced. If more than one broker takes the same action on a particular stock, then that stock will appear multiple times in the corresponding portfolio, once for each broker. A stock is dropped from the upgrade (downgrade) portfolio when a downgrade (upgrade) is announced, or when the stock is dropped from coverage. A stock is dropped from the initiation/resumption of coverage portfolios when a new recommendation is issued. Each portfolio's return is calculated each day, with the portfolio rebalanced at the end of the day, if necessary. The daily abnormal return is the intercept from a regression of the daily portfolio excess return on: (1) the excess of the market return over the risk-free rate; (2) the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; (3) the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks; (4) the difference between the daily returns of a value-weighted portfolio of high price momentum stocks and one of low price momentum stocks; and (5) one-trading day lagged values of each of these four variables. Only recommendations coded as "real-time" in the First Call database are used. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

Favorableness quintile	Small	Medium	Large
Panel A: upgrade to buy			
1 (least favorable)	0.092	0.032	0.017
2	0.062	0.027	0.021
3	0.053	0.020	0.015
4	0.045	0.015	0.021
5 (most favorable)	0.032	0.017	0.002
Difference (1 minus 5)	0.060	0.015	0.015
t-stat	4.01	1.31	1.09
Panel B: downgrade to hold or sell			
1 (least favorable)	−0.048	−0.015	−0.004
2	−0.060	−0.025	−0.002
3	−0.053	−0.014	−0.007
4	−0.061	−0.025	−0.010
5 (most favorable)	−0.071	−0.035	0.001
Difference (1 minus 5)	0.023	0.019	−0.005
t-stat	1.39	1.37	−0.34
Panel C: initiation/resumption as buy			
1 (least favorable)	0.027	0.010	0.012
2	0.013	0.000	−0.003
3	0.028	0.004	0.007
4	0.009	−0.008	−0.003
5 (most favorable)	0.011	−0.013	0.000
Difference (1 minus 5)	0.017	0.024	0.012
t-stat	1.60	2.38	1.13
Panel D: initiation/resumption as hold or sell			
1 (least favorable)	−0.011	0.012	−0.005
2	−0.031	−0.008	0.002
3	−0.029	−0.015	−0.010
4	−0.039	−0.007	−0.002
5 (most favorable)	−0.054	−0.031	−0.015
Difference (1 minus 5)	0.043	0.042	0.010
t-stat	2.86	3.26	0.89

Table 7
Portfolio returns, by broker favorableness quintile, pre- and post-September 9, 2002 (the effective date of NASD Rule 2711)

This table reports intercepts and quintile dummies from regressions of recommendation announcement day market-adjusted return on size of firm covered (equal to in of firm market value), broker size (equal to in of number of recommendations outstanding by broker in the prior quarter), and dummy variables for broker favorableness quintile and the nature of the recommendation (panel A), and daily portfolio buy-and-hold abnormal returns (panel B), for upgrades to buy, downgrades to hold or sell, initiations/resumptions of coverage with a buy, and initiations/resumptions of coverage with a hold or sell, by broker favorableness quintile for the period prior to and subsequent to September 9, 2002 (with September 9 included in the latter period). In panel A the *t*-statistic on the quintile 1 dummy (which reflects the difference between the 1-day recommendation returns for the least and most favorable brokers) is given. In panel B the difference in returns between the recommendations of quintiles 1 and 5 is also presented, along with the corresponding *t*-statistic for the null that the difference is zero. A stock enters a buy-and-hold portfolio at the close of trading on the day the recommendation is announced. If more than one broker takes the same action on a particular stock, then that stock will appear multiple times in the corresponding portfolio, once for each broker. A stock is dropped from the upgrade (downgrade) portfolio when a downgrade (upgrade) is announced, or when the stock is dropped from coverage. A stock is dropped from the initiation/resumption of coverage portfolios when a new recommendation is issued. Each portfolio's value-weighted return is calculated each day, with the portfolio rebalanced at the end of the day, if necessary. The daily abnormal return is the intercept from a regression of the daily portfolio excess return on: (1) the excess of the market return over the risk-free rate; (2) the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; (3) the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks; (4) the difference between the daily returns of a value-weighted portfolio of high price momentum stocks and one of low price momentum stocks; and (5) one-trading day lagged values of each of these four variables. Only recommendations coded as "real-time" in the First Call database are used. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

	Pre-September 9, 2002				Post-September 9, 2002			
Dummy variable for	Upgrade to buy	Downgrade to hold or sell	Initiate/resume as buy	Initiate/resume as hold or sell	Upgrade to buy	Downgrade to hold or sell	Initiate/resume as buy	Initiate/resume as hold or sell
Panel A: intercept and quintile dummy results for 1-day market-adjusted return regressions								
Quintile 1	−0.76	2.66	0.06	1.34	0.29	0.08	−0.22	0.06
Quintile 2	−0.30	1.96	0.11	0.94	−0.33	−0.05	0.03	0.30
Quintile 3	0.06	1.05	0.21	0.73	0.57	−1.26	−0.09	0.03
Quintile 4	0.19	1.75	−0.03	0.71	−0.06	0.16	−0.07	0.15
t-stat on Q1	−6.8	12.3	0.8	9.6	0.7	0.2	−0.9	0.3

Panel B: daily portfolio buy-and-hold abnormal returns

Favorableness quintile	Pre-September 9, 2002				Post-September 9, 2002			
	Upgrade to buy	Downgrade to hold or sell	Initiate/resume as buy	Initiate/resume as hold or sell	Upgrade to buy	Downgrade to hold or sell	Initiate/resume as buy	Initiate/resume as hold or sell
1 (least favorable)	0.043	−0.026	0.015	−0.004	0.012	−0.018	0.003	−0.008
2	0.030	−0.030	−0.003	−0.014	0.023	−0.032	0.034	−0.004
3	0.022	−0.024	0.009	−0.022	0.024	−0.036	0.021	−0.004
4	0.023	−0.035	−0.005	−0.019	0.019	−0.020	0.020	−0.022
5 (most favorable)	0.016	−0.047	−0.006	−0.042	0.011	−0.034	0.033	−0.019
Difference (1 minus 5)	0.028	0.020	0.022	0.038	0.001	0.016	−0.030	0.011
t-stat	2.8	1.8	2.5	4.2	0.1	0.9	−1.8	0.6

September 2002 are very similar to those for the entire sample period. In contrast, abnormal return differences for the subsequent quarters are indistinguishably different from zero. These results provide additional evidence that this new rule has mitigated differences across brokers in their tendency to issue buy recommendations.[35]

Finally, we consider whether the average daily buy-and-hold abnormal returns differ between the bull and bear markets that comprise our sample period. We limit our analysis to the pre-September 9, 2002, period so as to ensure that our results are not confounded by the effect of the implementation of NASD 2711. The bull market is defined as the period through March 10, 2000, when the NASDAQ market reached its peak, while the bear market is defined as the post-March 10 period. Table 8 presents the results. The individual quintile buy-and-hold abnormal returns for both the downgrades to hold or sell, as well as the initiations and resumptions at hold or sell, are uniformly more negative in the bear market period than during the bull market. In contrast, there is no consistent pattern across the bull and bear markets to the returns to upgrades or initiations and resumptions at buy. The return differences between the most and least favorable brokers for the downgrades to hold or sell and for the initiations and resumptions at buy (hold or sell) are insignificant (significant) in both periods. However, the return difference for the upgrades to buy, while an insignificant 0.2 basis points daily during the bull market, becomes a significant 3.5 basis points daily during the bear market. That the return difference is significant only for the bear market period is consistent with analysis in Barber et al. (2005) which finds that the average abnormal return to buy recommendations of the non-sanctioned brokers, while insignificantly different from that of the sanctioned banks during the bull market, is significantly greater during the ensuing bear market.

6. Summary and conclusions

With the heightened regulatory scrutiny of security analysts as a backdrop, this paper analyzes the distribution of brokers' stock ratings across buys, holds, and sells. Our analysis also sheds light on the effect that NASD Rule 2711 has had on the observed tendency of analysts to issue many more buy than sell recommendations. Consistent with Barber et al. (2003), we find that the percentage of buy recommendations increased substantially from 1996 to 2000, at one point exceeding the number of sell ratings by a ratio of more than 35:1. Notably, the difference between the percentage of buy recommendations of the large investment banks singled out for sanction in the *Global Research Analyst Settlement* and the buy recommendation percentage of the non-sanctioned brokers is economically quite small during the pre-NASD 2711 period.

From the middle of 2000 the percentage of buys in our sample decreased steadily; by the end of June 2003, buys exceeded sells by less than a 3:1 ratio. This decrease probably was due, in part, to a worsening economy and a declining stock market. However, our findings strongly suggest that the implementation of NASD Rule 2711, which made brokers' ratings distributions public, also played an important role. Subsequent to NASD 2711's

[35]An alternative possibility is that, in their announcement day reaction to analysts' recommendations, investors in the post-NASD 2711 period appropriately adjust for differences in broker favorableness (based on the now-disclosed ratings distributions), and that this results in long-term abnormal returns that are similar across quintiles. That we do not find significant differences in announcement day reactions across favorableness quintiles, though, mitigates against this possibility.

Table 8
Average daily portfolio abnormal returns (percent) to recommendation changes, by broker favorableness quintile, through March 10, 2000 (the NASDAQ market peak) and from March 11, 2000 to September 8, 2002

This table reports daily portfolio buy-and-hold abnormal returns, for upgrades to buy, downgrades to hold or sell, initiations/resumptions of coverage with a buy, and initiations/resumptions of coverage with a hold or sell, by broker favorableness quintile for the period up to and including March 10, 2000 (the peak of the NASDAQ market) and the subsequent period (through September 8, 2002, the day prior to the effective date of NASD Rule 2711). The difference in returns between quintiles 1 and 5 is also presented, along with the corresponding *t*-statistic for the null that the difference is zero. A stock enters a buy-and-hold portfolio at the close of trading on the day the recommendation is announced. If more than one broker takes the same action on a particular stock, then that stock will appear multiple times in the corresponding portfolio, once for each broker. A stock is dropped from the upgrade (downgrade) portfolio when a downgrade (upgrade) is announced, or when the stock is dropped from coverage. A stock is dropped from the initiation/resumption of coverage portfolios when a new recommendation is issued. Each portfolio's value-weighted return is calculated each day, with the portfolio rebalanced at the end of the day, if necessary. The daily abnormal return is the intercept from a regression of the daily portfolio excess return on: (1) the excess of the market return over the risk-free rate; (2) the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; (3) the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks; (4) the difference between the daily returns of a value-weighted portfolio of high price momentum stocks and one of low price momentum stocks; and (5) one-trading day lagged values of each of these four variables. Only recommendations coded as "real-time" in the First Call database are used. Broker favorableness quintiles are determined each quarter by ranking brokers in ascending order according to the percentage of their end-of-quarter recommendations which are buys. Brokers are assigned to quintiles so that the total number of end-of-quarter recommendations in each quintile is approximately the same.

	Through March 10, 2000				March 11, 2000–September 8, 2002			
Favorableness quintile	Upgrade to buy	Downgrade to hold or sell	Initiate/ resume as buy	Initiate/ resume as hold or sell	Upgrade to buy	Downgrade to hold or sell	Initiate/ resume as buy	Initiate/ resume as hold or sell
1 (least favorable)	0.019	−0.033	0.000	−0.008	0.062	−0.037	0.017	−0.011
2	0.029	−0.036	0.008	−0.013	0.018	−0.047	−0.021	−0.035
3	0.012	−0.029	0.020	−0.026	0.032	−0.037	−0.017	−0.030
4	0.020	−0.035	−0.002	−0.017	0.011	−0.059	−0.020	−0.042
5 (most favorable)	0.017	−0.041	0.003	−0.041	0.027	−0.067	−0.005	−0.047
Difference (1 minus 5)	0.002	0.008	−0.003	0.033	0.035	0.030	0.022	0.037
t-stat	0.2	0.8	−0.4	3.1	2.0	1.3	1.3	2.2

implementation, the percentage of buy recommendations decreased from 60 to 45 percent, while the percentage of sells rose from 5 to 14 percent.

We also investigate whether the distribution of a broker's stock ratings can predict the profitability of its future recommendations. Theoretically, it should have predictive power as long as: (i) recommendations, in general, have investment value; (ii) market prices do not instantaneously incorporate the information implicit in analysts' recommendations and in brokers' ratings distributions; and (iii) the implicit and/or explicit criteria used to classify recommendations into buys, holds, and sells differ across brokers. The buy recommendations of those brokers who are less inclined to issue buys should outperform those who more readily give them, while their sell recommendations should underperform. Consistent with these conjectures, the upgrades to buy of the brokers issuing the smallest percentage of buy recommendations significantly outperform those of the brokers with the greatest percentage of such recommendations, by an average of 50 basis points per month. Conversely, the downgrades to hold or sell of those issuing the fewest buy recommendations significantly underperform those of the brokers issuing the most such recommendations, by an average of 46 basis points per month. These results suggest that the disclosure of brokers' stock rating distributions, as required by the new rules, would have helped investors in their evaluation of analysts' research reports during this time period. Interestingly, these differences diminish in magnitude and lose their significance in the quarters after the implementation of these regulations. While care must be taken in drawing strong inferences from just a few quarters, this is additional evidence that the new rules have had an effect in disciplining those brokers who tended to issue more buy recommendations than others. This is good news for those who view this as an important goal of these new regulations.

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