Analysts' Industry Expertise*

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Abstract

Industry expertise is an important aspect of sell-side research. We explore this aspect using a novel dataset of industry recommendations, which are often issued by strategy analysts. We study sell-side analysts' ability to rank industries relative to each other (across-industry expertise), and how it relates to analysts' ability to rank firms in a particular industry (within-industry expertise). We find that analysts express more optimism towards industries with high levels of investments, past profitability, and past returns. Analysts exhibit across-industry expertise, as portfolios based on industry recommendations generate abnormal returns over both short and long horizons, beyond what would be explained by industry momentum. Additionally, industry recommendations contain information which is orthogonal to the information revealed in firm recommendations, and more so for brokers who benchmark their firm recommendations to industry peers. Consequently, the investment value of sell-side analysts' recommendations is enhanced when both dimensions of industry expertise are utilized by considering industry and firm recommendations in combination.

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1 Introduction

Industry knowledge in sell-side research is highly valued by investors. For example, *Institutional Investor Magazine* has been surveying institutional investors on the importance of various attributes in sell-side research analysts. For each year in the period 1998-2010 industry knowledge was deemed the most important research attribute of equity analysts.[1] Indeed, industry analysis is an important component of the sell-side research business. First, strategy analysts in brokerage houses (strategists for short) often issue industry-level forecasts and recommendations in their periodic reports. These analysts typically follow a top-down approach, trying to exploit sector-rotation strategies mostly driven by the cyclicality of different industries and their sensitivities to macroeconomic shocks. Second, firm-level analysts, who constitute the vast majority of the sell-side research personnel, specialize by industry. They typically work in groups covering a set of firms that are similar to each other in their industry characteristics. At the firm level, they analyze specific firms in their assigned industry, providing earnings estimates, recommendations, price targets, etc. At the industry level, they write periodic industry reports, mostly from a bottom-up perspective, and often incorporate into their reports the industry recommendation advice from the strategists. The extant literature has explored analysts' firm recommendations extensively.[2] Despite the importance of industry expertise in sell-side research, this topic has not yet been fully investigated, probably due to the lack of large scale data on industry recommendations.

Industry expertise can take two forms. The first is *within-industry* expertise, which reflects the analyst's knowledge of economic factors affecting the performance of firms in the industry, and the analyst's ability to value and rank firms in the industry. The second form is *across-industry* expertise, which reflects the ability to compare the prospects of the industry to the market and to other industries. Explicit industry recommendations should reflect across-industry expertise. By contrast, firm recommendations can reflect both within- and across-industry expertise. Boni and Womack (2006) focus mostly on analysts' within-industry expertise as reflected in firm recommendations. In this paper we study whether sell-side analysts possess

[1] See http://www.institutionalinvestor.com/Research/961/What-Investors-Really-Want.html for the most recent edition (2010) of the ranking of the research attributes valued by investors.
[2] For a recent review of the literature see Ramnath, Rock, and Shane (2008).

across-industry expertise as reflected in their industry recommendations, and how the within- and across-industry expertise interact.[3]

To motivate the analysis, consider the following example. During the second half of 2007, the median firm recommendation issued for both GM and Chevron was a 'hold.' However, at that time, analysts issued bearish recommendations for the Automobiles industry as a whole, while they typically issued bullish recommendations for the Oil industry. This scenario raises several interesting questions.

First, what are the industry attributes that determine industry coverage and the level of industry recommendations? In the example above, one might ask whether analysts favored the energy industry because it had shown high past returns, high profitability, or perhaps high equity issuance volume. It may also be that macroeconomic conditions such as the slowdown in the economy during that time period led analysts to favor the Oil industry sector while being pessimistic over the prospects of the Automobiles industry. Second, do analysts have across-industry expertise as reflected in their industry recommendations? In particular, do recommendations for industries carry any value to investors?

Third, to the extent that analysts do provide some across-industry insights in their industry recommendations, is this information incremental to that already included in firm recommendations? Indeed, firm recommendations can include information about the ranking of firms within an industry, and about the performance of firms (or the industry to which they belong) relative to the market as a whole. Thus, it is possible that industry recommendations are subsumed by firm recommendations or their aggregations. Finally, a closely related question is whether analysts benchmark their firm recommendations to the market or to industry peers. In the example above, it is interesting to understand whether the 'hold' recommendations assigned to GM and Chevron have the same meaning or whether they should take into account the different industry recommendations. In this sense we ought to understand whether the "hold" recommendation issued to GM was relative to the entire market or, instead, relative to peers such as Ford, Chrysler, and Toyota.

To answer these questions we use the IBES database to collect industry recommendations. When an analyst produces a report with a recommendation on a firm's stock,

[3] Throughout the paper, the terms "sell-side analysts," or simply "analysts," refer to both firm-level and strategy analysts. Occasionally, when the distinction is important we refer to each type of analyst specifically.

she often includes in the report the brokerage house's current outlook on that firm's industry. In September 2002, IBES started recording the textual information on the industry outlook for those brokers reporting the industry recommendation in their firm reports.

We identify 33 financial institutions for which textual information on industry outlooks is available. Our sample includes a total of 41,315 industry recommendations in the period from September 2002 through December 2009. Overall, 32% of the industry recommendations are optimistic, 54% are neutral, and 14% are pessimistic. We study the factors associated with the level of optimism in industry recommendations. We find that past profitability, past returns, and the extent of R&D and Capex activity are positively associated with the probability of issuing an optimistic industry recommendation. We also find that analysts indeed exploit sector rotation strategies as they are less optimistic toward cyclical industries during recessions.

We next turn to examine the across-industry expertise of analysts as reflected in industry recommendations. These industry recommendations are for the most part determined by strategists using a macroeconomic point of view. Strategists also rely on the input and knowledge of firm-level analysts, who can aggregate information from their analysis of individual firms. It is thus possible that industry recommendations can identify "hot" and "cold" industries, reflecting the joint knowledge of strategists and firm-level analysts. On the other hand, several reasons conspire to make it difficult for investors to exploit analysts' across-industry expertise. One of the reasons relates to analysts' role in collecting and using information. The literature has covered extensively how firm-level analysts' special access and relationships with the firm affect the way they perform.[4] These attributes are likely to augment analysts' within-industry expertise. However, it is not clear whether analogous attributes can be developed with respect to the analysis of macroeconomic data which is key in generating industry recommendations. Another issue that may limit our ability to find evidence of across-industry expertise is that industry recommendations are likely to be quite stale when they become available on IBES. The industry recommendations that we observe are recorded only when a new firm recommendation is issued, so we cannot identify the exact date in which the industry recommendation was originally issued.

[4] For example, the presence of an underwriting relationship enables a broker to issue better earnings forecasts [Malloy (2005)] or to be a better market maker [Ellis, Michaely and O'Hara (2000); Madureira and Underwood (2008)], while the presence of a lending relationship affects the ability of a broker to secure future underwriting business [Drucker and Puri (2005); Ljungqvist, Marston, and Wilhelm (2006)], get better terms for new security offerings [Puri (1996)], or provide better earnings forecasts [Ergungor, Madureira, Nayar, and Sing (2008)].

Our approach to testing for the presence of industry expertise is to examine whether investors can obtain abnormal return by following these recommendations. This approach is similar to prior studies focusing on the investment value of firm recommendations (e.g., Barber et al, 2001, 2006; Boni and Womack, 2006). Specifically, we compute abnormal returns of industry portfolios formed based on changes (upgrades/downgrades) in monthly average industry recommendations.[5] We find that a portfolio of industries about which analysts are most optimistic carries a significant abnormal return of 0.6% per month, while a pessimistic portfolio carries a significantly negative abnormal return of 0.9% per month. These results suggest the presence of across-industry expertise reflected in both optimistic and pessimistic industry recommendations. The abnormal returns are strongest for short horizons of one month. Their magnitudes and statistical significance diminish over longer horizons of up to 12 months, but we do not observe a complete reversal.

Next we turn to studying the interaction between across- and within-industry expertise of analysts. In particular, we attempt to find whether the across-industry expertise of analysts is already reflected in firm recommendations, or in their aggregations. To this end, it is important to identify whether firm recommendations contain information regarding industry outlooks, or whether firm recommendations just rank firms within industries. Our first step is to examine brokers' disclosures about how their firm recommendations should be interpreted. By examining these disclosures for the 20 largest brokers, we find that 10 of these brokers, including six in our industry recommendation sample, benchmark their firm recommendations to industry peers, while the other 10 rely on a market benchmark.

Different benchmarks imply different ways by which firm recommendations reflect industry information. If brokers use an industry benchmark, then their firm recommendations will contain no industry-wide information. Essentially such brokers limit their firm recommendations to ranking firms within industries, and only their within-industry expertise gets reflected in the recommendations. By contrast, if brokers use a market benchmark, then their firm recommendations are expected to incorporate industry outlooks and to reflect both within-industry and across-industry expertise. To help us distinguish between these alternatives we construct "pseudo industry recommendations" – similar to those used in Boni and Womack (2006) – by value weighting all firm recommendations that belong to a specific GICS industry.

[5] Our measures of abnormal returns are in-sample and out-of-sample versions of the Fama-French four factor alpha.

Interestingly, we find that the correlation between the pseudo industry recommendations and the true industry recommendations is low (around 0.10-0.15), suggesting that the two are based on different information. We then repeat the abnormal return analysis using the pseudo industry recommendations. As expected, we find some evidence of abnormal returns for brokers who benchmark their firm recommendation to the market. By contrast, pseudo industry recommendations by brokers who benchmark their firm recommendations to industry peers generate no abnormal returns. Hence, at least for analysts who benchmark firm recommendations to industry peers, it appears that true industry recommendations contain information regarding industry outlooks which is not already reflected in firm recommendations or in aggregations thereof.

Prior research demonstrates that firm recommendations carry investment value.[6] If indeed firm recommendations are often aimed at ranking firms within industries, then adding the across-industry information by conditioning firm recommendations on the prospects of the relevant industry should increase their investment value. Our next set of tests pursues this line of thought by combining both analysts' across- and within-industry expertise in forming investment portfolios. At the industry level, we classify industries into three portfolios based on true industry recommendations as before. At the firm level, we follow Boni and Womack (2006) and classify firms into net upgraded and net downgraded firms. A firm can be allocated to one of six portfolios depending on its own recommendation (upgraded/downgraded) and on whether its industry carries an optimistic, neutral or pessimistic prospect.

The results support the idea that across- and within-industry expertise complement each other. Indeed, combining industry and firm recommendations adds investment value over investment horizons of up to 12 months. For example, when considering a short investment horizon of one month, net upgraded stocks have abnormal returns only if they are part of industries with an optimistic or neutral outlook, but not when they are part of industries with pessimistic outlooks. In a similar fashion, net downgraded stocks have significantly negative alphas only when they belong to industries downgraded to a pessimistic outlook. In fact, when a downgraded firm belongs to an upgraded industry, it generates a *positive* abnormal return.

[6] See for example Stickel (1995); Womack (1996); Barber, Lehavy, McNichols, and Trueman (2001, 2006); Jegadeesh, Kim, Krische and Lee (2004); and Barber, Lehavy, and Trueman (2010).

Finally, we find that portfolios that are based on the combined signal of both industry and firm recommendations outperform portfolios based on just one of the two signals.

The results so far are consistent with analysts possessing across-industry expertise. However, two other explanations also seem plausible. First, it is possible that analysts do not possess any across-industry expertise. Instead, analysts chase industry momentum, and the abnormal returns we document are a reflection of this well-documented phenomenon [Moskowitz and Grinblatt (1999)]. We conduct multiple tests to explore this possibility. For instance, we consider portfolios based on industry recommendations after excluding industries that also exhibit momentum, essentially clearing the momentum effect from industry recommendations. The results show that industry recommendations have investment value regardless of past returns, supporting the idea that they reflect across-industry expertise.

Second, it may be that analysts do not possess insights regarding the long-term fundamentals of the industry. Rather, industry recommendations generate a "hype" or sentiment for some industries that leads to temporary price pressure and to the abnormal returns we observe. If that is the case, then the returns following industry recommendations should be short lived, as prices revert to fundamentals in the long-run. Consequently, a way to distinguish between this alternative explanation and the "industry expertise" hypothesis is to test whether the short-term abnormal returns obtained from following industry recommendations are reversed within one year. While the medium- to long-term returns (over horizons of up to 12 months) to following industry recommendations are lower than the corresponding one-month returns, they are often still significant. Moreover, a direct test does not show evidence of reversals. We conclude that to the extent that a reversal in returns exists, it is only partial. This is again consistent with analysts possessing across-industry expertise.

Our paper contributes to the literature in several ways. To our knowledge, this is the first paper to analyze the outputs of strategy analysts in the form of industry recommendations. These recommendations typically reflect a top-down approach and are thus very different from the firm-level recommendations studied in the existing literature. We also highlight the two dimensions of industry expertise (across-industry and within-industry) that could potentially be reflected in sell-side analysts' recommendations. Boni and Womack (2006) were the first to analyze the within-industry dimension. They show that the value of *firm* recommendations comes mostly from ranking firms within industries. Boni and Womack (2006) did not have access to industry recommendations, and instead analyzed aggregations of firm recommendations to assess across-industry expertise. They conclude that such aggregations cannot be used as signals for industry prospects. We extend the literature by directly testing for analysts' across-industry expertise using industry recommendation data. Our results suggest that analysts do possess across-industry expertise, and show the relevance of industry recommendations from an investment perspective. It is worth emphasizing that our study and Boni and Womack (2006) are not directly comparable since the sample periods are different. While Boni and Womack (2006) use data from 1996-2002, our data starts in September 2002.

Second, the paper also sheds new light on the information contained in firm recommendations. Different brokers define their firm recommendations based on different benchmarks – either the market or the peers in the industry. We establish that industry recommendations contain information that is reflecting analysts' across-industry expertise and that is orthogonal to the information included in firm recommendations, which mostly reflects within-industry expertise. In fact, firm recommendations are best interpreted in conjunction with industry recommendations, jointly exploiting both dimensions of expertise.

Third, we revisit the unsettled issue of whether aggregations of firm recommendations at the industry level can serve as proxies for industry outlook. While Boni and Womack (2006) conclude that such aggregations are not good proxies for the industry prospects, Howe, Unlu, and Yan (2009) find modest evidence that they can forecast industry returns. We point out that industry aggregations of firm recommendations should reflect across-industry expertise conditional on the recommendation benchmark adopted by the broker. Accordingly, we show that aggregations of firm recommendations contain some information about the industry's prospects when issued by analysts using a market benchmark, but not when issued by analysts using the industry peers as a benchmark.

Finally, the paper highlights the role of analysts as producers of, or at least conduits for information at the industry level. Piotroski and Roulstone's (2004) results using stock non-synchronicity measures imply that analyst activity – proxied by the number of analysts issuing forecasts for a firm – helps in incorporating industry information into market prices. Our study provides direct evidence on the types of analysts' industry expertise, in particular its previously unexplored across-industry dimension, and how they get reflected in firm and industry recommendations as well as in market prices.[7]

The rest of the paper proceeds as follows. In section 2 we describe the data and in Section 3 we explore the determinants of industry recommendations. In Section 4 we study the across-industry expertise in sell-side research. Section 5 discusses the relation between across-industry and within-industry expertise. Section 6 explores two alternative explanations for the results. Section 7 concludes.

2 Data

2.1 Firm Analysts vs. Strategists[8]

The bulk of the data employed in sell-side research studies concerns firm-level analysts. These analysts specialize by industry and produce earnings forecasts, price targets and firm recommendations. The production and dissemination of industry recommendations often involve the participation of a different type of sell-side analyst: the one working in the equity strategy group (strategist) of the brokerage house. Contrary to the traditional (firm-level) analysts, strategists are not linked to specific firms or industries, but rather focus on the equity market as a whole.

When strategists issue industry recommendations, they mostly rely on a top-down approach in which they analyze macroeconomic conditions. A common method for these strategists is to exploit "sector rotation" in which they follow business cycles and base industry recommendations on their estimates of the exposure of each industry to macroeconomic shocks. Strategists also often use as input information from firm-level analysts, who rely on a bottom-up approach. Thus, industry recommendations are determined for the most part by strategists with the level of involvement of firm-level analysts varying from broker to broker. In some situations,

[7]Our paper also relates to the literature exploring the relative importance of industry selection in the investment process. Froot and Teo (2008) show that institutional investors reallocate their holdings according to an industry-driven approach. Busse and Tong (2008) report that the industry selection component of a typical actively managed mutual fund accounts for about half of that fund's risk-adjusted return. Kacperczyk, Sialm and Zheng (2005) show that funds that concentrate holdings in fewer industries – the ones in which they have some informational advantages – tend to outperform the more diversified funds. Avramov and Wermers (2006) show that optimally-chosen portfolios based on predictable variation in mutual funds' characteristics outperform their benchmarks, and one important source of this outperformance is the portfolios' strategic allocation to specific industries over the business cycle. Our results add to this literature by directly showing that industry specialists are capable of providing useful industry outlooks.

[8] We thank an anonymous reviewer for drawing our attention to the role of strategy analysts in the issuance of industry recommendations.

e.g., when advice from strategists is not available, firm-level analysts can issue industry recommendations. Several brokers include their industry recommendations in periodic economic outlook reports published by the strategy department of the brokerage house. These recommendations are also often incorporated into firm and industry reports that are produced by firm-level analysts. In particular, the data we use consists of industry recommendations that are attached to firm reports.[9]

The importance of the activities of strategy analysts is highlighted by the All-America Research Team (the "all-star") rankings from Institutional Investor (II) Magazine. Besides the traditional prizes for best analysts in each industry, II Magazine also grants awards for analysts under coarser categories such as Portfolio Strategy and Quantitative Research. These awards are sometimes given based on industry recommendations.[10]

2.2 Brokers and Industry Recommendations

Starting in September of 2002 IBES began to record industry recommendations alongside firm recommendations.[11] This information is recorded in the 'btext' (more lately 'etext') field in the IBES recommendation file. This field always contains the text of the firm recommendation (e.g. 'buy', 'hold', 'underperform'). For investment banks that include an industry recommendation in their firm reports, the field also records the industry recommendations. See Appendix I for details.

In the period starting in September 2002 through December 2009, 33 brokers have provided at least one industry recommendation.[12] Panel A of Table 1 lists those brokers along

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[9] The information in this paragraph is based on interviews we conducted with current and former analysts (including strategists) from various brokerage houses including Goldman Sachs, JP Morgan, Morgan Stanley, Merrill Lynch, Robert Baird, Barclays (formerly Lehman Brothers), CSFB, UBS, Bear Stearns, and Sanford Bernstein.

[10] The qualitative descriptions of the analysts earning the all-star designations, both for the best analyst in each sector and for the best strategist, often draw attention to their correct calls on industry outlooks. For example, the II Magazine once emphasized how a first-prize industry analyst "had been urging clients to underweight their holdings in his sector" (2010 edition, page 47), while for the first-prize in the Portfolio Strategy category the II Magazine cherished the strategist call to "dump defensive stocks such as telecommunications and health care companies and load up on consumer discretionary stocks" (2009 edition, page 98) or how the strategist "reiterated his overweight stance" in a specific sector (2008 edition, page 98) that later outperformed the market.

[11] The IBES files we used were downloaded in 2008 and 2009. These are free from the data problems identified in Ljungqvist, Malloy, and Marston (2009). These problems are related to IBES files from 2002-2004. Note that IBES files starting from 2009 do not include recommendations from Lehman Bros (before they were converted to Barclays). We obtain these recommendations from the 2008 files.

[12] In line with Kadan, Madureira, Wang, and Zach (2009) we omit from the sample recommendations re-issued during the change in rating systems during 2002. Similarly, we omit recommendations originally issued by Lehman Bros, and then re-issued by Barclays when taking over Lehman's research department during 2008. That is, we only account for these recommendations once, when they were initially issued.

with some information regarding their coverage. As listed, the six largest brokers in our sample in terms of the number of industry recommendations made available on IBES are Goldman Sachs, Credit Suisse, Morgan Stanley, Bear Stearns, Lehman Bros. (replaced by Barclays in 2008) and CIBC. For these brokers, we find that industry recommendations are attached to firm recommendations over 95% of the time. It is important to note that other large investment banks also issue industry recommendations. However, these banks do not include their industry recommendations in firm reports, and hence their industry recommendations are not recorded by IBES. In general, 16.6% of all firm recommendations in IBES during our sample period carry with them an industry recommendation.

<Insert Table 1 here>

2.3 Industry Classification

IBES reports the industry recommendation issued by a broker for the industry to which a firm belongs. However, IBES does not explicitly report the industry to which the firm belongs, as defined by the broker. We infer this industry from the identity of the firm and its industry classification as defined by the General Industry Classification Standard (GICS) obtained from Compustat. This classification is maintained by Standard & Poor's and MSCI Barra, and is widely adopted by investment banks as an industry classification system (as opposed to the SIC classification that is popular among academics). The GICS system has four classification levels: 10 sectors, 24 industry groups, 68 industries, and 154 sub-industries.[13] These classifications are highly intuitive, and have been shown to better explain stock comovements compared to other popular industry classifications [Bhojraj, Lee, and Oler (2003)]. In the context of this research, Boni and Womack (2006) show that the GICS classification is a good proxy for how sell-side analysts specialize by industry.[14]

Similar to Boni and Womack (2006) and Bhojraj, Lee, and Oler (2003), we focus on the industry level (6 digits). Appendix II presents the complete list of industries using the GICS classification, as well as some basic statistics of industry coverage by the brokers in our

[13] Standard and Poors and MSCI Barra change their GICS industry definitions from time to time. The numbers listed here are as of August 2008, and have not changed until the end of the sample period.
[14] We extend the analysis offered in Boni and Womack (2006), by comparing the analyst coverage choice in our sample relative to different industry classifications: besides GICS, we also look at SIC (2 digits), IBES internal classification and the Fama-French 48 industries. The comparison (available upon request) shows that the GICS partition most closely resembles how brokers define their industries.

sample.[15] By casually examining industry classifications in the relevant investment banks, we find our classification to be broadly as fine as or finer than the one used by them. This ensures that our industry classification captures variations in industry recommendations within each broker.

According to Boni and Womack (2006), the percentage of all companies an analyst covers that are in one GICS industry averages 81% for analysts at the 20 largest brokerages. For our sample of brokers with industry recommendations, the statistics for the period 2002-2009 is 78%. This suggests that by relying on the GICS classification we are misclassifying industries relative to the true classification used by the broker about 22% of the time.[16] Note that such misclassification work against finding any evidence of return predictability based on industry recommendations. In section 4.1 we construct industry consensus recommendations in a way that mitigates some of the errors due to these inevitable misclassifications.

2.4 Industry Recommendations

Similar to firm recommendations, brokerage houses use a variety of terms to express optimism, neutrality, or pessimism toward industries. In the case of firm recommendations, IBES transforms the textual recommendation into a five-point rating system (recorded in the IRECCD item). By contrast, the text of industry recommendation is not recorded numerically. Hence, we convert the text using a key presented in Appendix I. We code recommendations with an optimistic tone as '1', recommendations with a neutral tone as '2', and recommendations with a pessimistic tone as '3'. Thus, for each IBES entry that also includes the textual description of the industry outlook, we have both the recommendation for the firm itself (optimistic, neutral, or pessimistic) and the recommendation for the industry to which the firm belongs (again, optimistic, neutral, or pessimistic).

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[15] Notice that two of the GICS industries have been discontinued. This is the reason why Panel A of Table 1 shows 70 industries with industry recommendations for Brokers 1020 and 1595, while the number of GICS industries as of August 2008 is only 68.

[16] In fact, these numbers serve as an upper bound on the error, since in many cases analysts still use the GICS classification method, but occasionally focus on the industry-group or sector level, rather than the industry level. For example, an analyst can cover all firms in the 'Utilities' industry, while the GICS industry level distinguishes between 'Gas' and 'Electric Utilities'. Our method of constructing portfolios (see Section 4.1) is robust to such cases. Real errors can occur only when broker uses a classification system that is different from GICS.

3 Basic Characteristics of Industry Recommendations

Panels B through D of Table 1 present summary statistics to describe coverage and distributional properties of industry recommendations for the largest six brokers in our sample.[17] Panel B shows that coverage is quite comprehensive across the universe of industries for five out of the six brokers during 2002-2009.[18] This suggests that in contrast to firm recommendations, selection bias [McNichols and O'Brien (1997)] is not a major issue with industry recommendations for large brokers. Selection bias may, however, still be an issue for small brokers that focus on select industries.

Panel C presents the distribution of industry recommendations by year for all brokers in our sample. The table shows that the frequency of optimistic recommendations hovers around 30%, with little variation over the years. There is, however, a modest increase in the frequency of neutral recommendations accompanied by a decrease in the proportion of pessimistic recommendations. Panel D presents the average industry recommendations by broker for the six largest brokers during our sample period. The results show that there is little difference between the different brokers, as average recommendations hover somewhat below '2' (neutral to slightly optimistic) for all of them. These results suggest that brokers issue a pretty balanced distribution of industry recommendations, with just a small inclination toward optimism. In Section 5 we compare this distribution to that of the associated firm recommendations.

To better understand the determinants of industry recommendations we examine the probability of issuing an optimistic/pessimistic recommendation as a function of several factors. The main explanatory variables we investigate are industry size (aggregate market-value of all firms in the industry in the month before the recommendation), lagged industry and market returns, and industry value-weighted averages of market-to-book ratio, profitability (return on assets), R&D (as a fraction of assets), and capital expenditures (as a fraction of assets). All accounting variables are measured during the year prior to the issuance of the recommendation.

Given that industry recommendations are often issued by strategists allegedly rotating among industries in reaction to macroeconomic shocks, we include in the model a dummy for the

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[17] The table actually includes seven brokers. Broker 2108 (Lehman Bros.) was replaced during 2008 by Broker 10902 (Barclays). Also, IBES does not have any industry recommendation from brokers 251 (Bear Stearns) and 846 (Credit Suisse) in 2009.

[18] During the year 2002 coverage is lower because our sample period only starts in September of that year. In 2008 we see a decline in industry coverage of CIBC and Credit Suisse (broker codes 1750 and 846).

NBER recessions. During our sample period there were two expansions and one recession (from December 2007 to June 2009). We also include another dummy classifying an industry as either cyclical or non-cyclical depending on its sensitivity to the business cycle. Our classification follows Barra (2009), and identifies as cyclical the industries belonging to the Materials, Industrials, and Information Technology sectors (GICS sectors 15, 20, and 45). We then consider the interaction between these two variables to test for sector rotation in the issuance of industry recommendations.

Finally, it may be that analysts are more optimistic about industries that have a high IPO/SEO activity in an attempt to win underwriting business. To examine whether such conflicts of interest have an effect on industry recommendations we include three variables related to equity underwriting activity. The first two are the total and average IPO/SEO proceeds in the industry during the year preceding the recommendation. These variables capture the volume of equity issuance in the industry. The last variable is the percentage of IPO/SEO proceeds in an industry underwritten by the issuing broker during the two years preceding the recommendation, out of all IPO/SEO proceeds underwritten by this broker during that time period. This variable is close in spirit to the "affiliation" variable used in prior research to proxy for conflicts of interest at the firm level [Lin and McNichols (1998); Michaely and Womack (1999)]. We control for broker fixed effects to account for any broker-specific time invariant characteristics. We cluster the standard errors at the broker-industry level.

Table 2 presents the results of logit models based on the explanatory variables above.[19] We use two specifications. In the first (second) specification the dependent variable is a dummy equal to one when the industry recommendation is optimistic (pessimistic) and zero otherwise.[20] Consider the first specification. The probability of issuing an optimistic recommendation is increasing in the average profitability, R&D, and Capex intensity in the industry, and decreasing in the market-to-book ratio. For example, for the median industry, a one standard deviation increase in R&D intensity increases the probability of issuing an optimistic recommendation by

[19] We drop reiterations, i.e., observations with the same industry recommendations from a particular broker in each month. Thus, we only keep one observation per industry-month from any given broker except in cases in which the recommendation changed during the month.

[20] Note that the two specifications are not mutually independent. They reflect the same set of results viewed from two different angles. It would have been desirable to pool the two separate logistic models into a single ordered-logit model. However, this is not possible, since the Wald test rejects the parallel regression assumption, implying that an ordered-logit (and similarly an ordered-probit) is not valid in this castte. See Long and Freese (2006: p. 197-200) for details.

4.1 percentage points.[21] We also observe a momentum effect as the probability of issuing an optimistic recommendation is increasing in the industry returns during the two quarters preceding the recommendation.

Analysts tend to favor cyclical industries during booms as reflected in the positive coefficient on the cyclical dummy. However, cyclical industries fall out of favor during recessions as reflected in the interaction term between the cyclical and recession dummies, in line with a sector rotation approach. Finally, we observe some mixed evidence on the tendency of brokers to issue an optimistic recommendation to industries in which there is more underwriting activity as the coefficient on the total volume of IPOs/SEOs in the industry is positive, while the coefficient on the average offering size is negative.

<Insert Table 2 here>

Similar to the optimistic model, the pessimistic model shows that high R&D and Capex activities are less likely to be associated with a pessimistic industry recommendation. Like the optimistic model, we observe a strong momentum effect. There are also hints of the sector rotation strategy playing a role here: analysts are less likely to issue a pessimistic recommendation to cyclical industries during booms (that is, when the cyclical dummy is 1 and the recession dummy is 0) and to non-cyclical industries during recessions (when the cyclical dummy is 0 and the recession dummy is 1). Finally, underwriting activity does not seem to affect the probability of issuing a pessimistic recommendation.

We also conducted but did not tabulate alternative specifications for Table 2. First, we use the average industry recommendation per broker or across brokers within a given month as dependent variables. Each dependent variable is left censored at 1 and right censored at 3. To account for that, we estimate a Tobit model. Second, we use an upgrade/downgrade approach to define our dependent variables based on changes in industry recommendations. The conclusions from these alternative models are similar.

4 Analysts' Across-Industry Expertise

There is an extensive literature showing that firm-level analysts add value with their firm recommendations [see for example Stickel (1995); Womack (1996); Barber, Lehavy, McNichols,

[21] For the median firm, the marginal effect of R&D (from Table 2) is 0.96, and the standard deviation of R&D is 0.0433 (not tabulated).

and Trueman (2001, 2006); Jegadeesh, Kim, Krische and Lee (2004); and Barber, Lehavy, and Trueman (2010)]. There is also evidence that analysts possess within-industry expertise reflected in their ability to rank firms within industries [Boni and Womack (2006)]. A natural question that arises is whether analysts (firm-level or strategists) have across-industry expertise that allows them to make informative predictions regarding the prospects of industries.

Industry analysis in sell-side research is implemented by a combination of the work of analysts in the strategy group and the traditional firm-level analysts. The way firm-level analysts are organized can foster within-industry rather than across-industry expertise. The coverage universe of each such analyst is typically concentrated in one industry, naturally facilitating the task of ranking firms relative to their industry peers. But organizing firm-analysts by industry can rather imperil their ability to assess the prospects of their industry relative to others. Recall, though, that the main source of across-industry analysis in sell-side research resides with the strategists. For them the task of differentiating among industries is part of the job profile. The two types of analysts thus complement each other. Jointly, they have access to a synthesis of top-down macroeconomic data and bottom-up aggregated firm-specific knowledge. Thus, sell-side analysts may be able to be the first to identify "hot" and "cold" industries.

On the other hand, some prominent features of industry recommendations make their investment value less obvious. Generating such recommendations requires skill and experience, but they are largely based on widely available macroeconomic data, diminishing any informational advantage. Moreover, unlike with firm recommendations, our data does not allow us to identify the exact date at which the industry recommendation is issued. Rather, we can only identify whether a brokerage-house changed its industry recommendation within a month. This diminishes our ability to identify across-industry expertise, even if it exists.

The analysis in this section explores whether analysts have across-industry expertise by analyzing the returns of portfolios constructed based on industry recommendations. That is, we ask whether an investor would have obtained abnormal returns, had she followed up on the recommendations by investing in these portfolios. This is the common approach used to test for information in firm recommendations [e.g., Barber, Lehavy, McNichols, and Trueman (2001, 2006), Boni and Womack (2006), and Barber, Lehavy, and Trueman (2010)].[22]

[22] Another common approach involves looking at investors' short-term reactions to newly issued recommendations. Since this approach depends on knowing the exact recommendation issuance day, it cannot be applied here.

4.1 Recommendation Portfolios

We first aggregate the industry recommendations to create monthly consensus industry recommendations. To avoid neglected industries, facilitate aggregation of information across brokers, and to mitigate some of the errors associated with GICS misclassification (see Section 2.3) we compute the average industry recommendation of industries for which we have at least three recommendations during a month. In Appendix III we provide a formal discussion of how this approach diminishes the mismeasurement associated with the industry classification error. We compute the monthly consensus by averaging all the industry recommendations issued during that month by all the brokers in our sample.[23] To illustrate, assume that brokers issued 10 recommendations for firms in the Media industry in month *t*, then the consensus recommendation for the Media industry would be the average of the industry recommendations recorded from the 'btext' field in those 10 recommendations. This approach allows us to capture changes in industry recommendations during a month. For example, if a broker changed her recommendation for the Media industry from '1' to '2' during the month, then the consensus for month *t* will be affected by this change.

By aggregating industry recommendations from different brokers we reduce the idiosyncratic component associated with the signal obtained by each broker. Note that finding across-industry expertise associated with a consensus measure is indicative of such expertise at the individual analyst level. Indeed, if individual analysts' signals were pure noise, then their aggregations would have no value to investors.[24]

Next, in each month *t* we refer to the consensus recommendation for an industry as "optimistic" if this consensus is less than or equal to 1.5. We refer to the consensus recommendation as "pessimistic" if it is greater than or equal to 2.5. In all other cases, we refer to the consensus as "neutral." We then construct three industry portfolios for each month *t*. Portfolio 1 in month *t* consists of all industries that were upgraded to "optimistic" during month *t*-1, Portfolio 3 consists of all industries that were downgraded to "pessimistic" during month *t*-1, and Portfolio 2 consists of all industries that were either upgraded or downgraded into the

[23] Notice that the term consensus here is a short for the average of recently issued (that is, issued in the current month) recommendations. This contrasts with the meaning of consensus adopted by many papers in the literature, in which it refers to the average of *all* recommendations that are outstanding in a specific moment.

[24] Our approach to aggregating recommendations is similar in spirit to what has been done in the firm-level analysts' literature. For example, Barber et al. (2006) construct portfolios to which they add firm recommendations, and whose returns are effectively returns to aggregate recommendation portfolios and Boni and Womack (2006) build an aggregate variable based on recommendations of different analysts.

“neutral” consensus during month t-1.[25] This approach of building investment portfolios based on changes (revisions) in recommendations is consistent with literature on firm recommendations [e.g. Jegadeesh, Kim, Krische and Lee (2004); Barber, Lehavy, McNichols and Trueman (2006); Barber, Lehavy and Trueman (2010)].

<Insert Table 3 here>

Panel A of Table 3 presents summary statistics related to the three portfolios and the portfolio formation procedure. First, note that Portfolios 1 and 2 are well defined in all 87 months of our sample period. By contrast, Portfolio 3 (the downgrade to pessimistic portfolio) is only defined in 65 months. Thus, there are 22 months in which there aren’t any industries whose consensus was downgraded to “pessimistic.” The average number of industries belonging to Portfolios 1 through 3 in a given month is 5.5, 10.4, and 2.8, respectively.

Note that an alternative approach would be to assign industries to portfolios based on a certain percentile (such as deciles) of the consensus’ distribution. This approach is common in the momentum and over-reaction literature. However, the literature on analysts has typically avoided this type of arbitrary sorting, which ignores the literal meaning of the recommendations.[26] For example, Panel A of Table 3 shows that if we were to always allocate the lowest decile of changes in consensus recommendations into a pessimistic portfolio we would occasionally treat industries as having a negative outlook despite the fact that analysts assign these industries a neutral outlook.

Panel A of Table 3 reveals that the different industries are quite evenly distributed among the three portfolios. Over our sample period 65 out of the 68 industries belonged to Portfolio 1 at some point. Portfolio 3 is the least represented, but still around two thirds of the industries belonged to this portfolio at some point. This suggests that the classification to the three portfolios is not degenerate, and can potentially contain information.

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[25] In unreported results, we also examine breaking down Portfolio 2, depending on whether an industry was upgraded or downgraded towards “neutral.” None of the conclusions presented in the paper changes under this different breakdown.

[26] Some papers do look at recommendations partitioned into percentiles (e.g., Jegadeesh et al, 2004). This made more sense when using recommendation data pre-Global Settlement, when “sells” were rarely used and “holds” were effectively “sells.” For this study, we use data after the Global Settlement, when “sells” are much more common and the distribution of recommendations is more balanced [Barber, Lehavy, McNichols, and Trueman (2006); Kadan, Madureira, Wang, and Zach (2009)].

4.2 Raw Returns

Using CRSP data we calculate a monthly return for each one of the three portfolios in two steps. First, we calculate a month *t* industry return for each one of the GICS industries. This is the value-weighted return across all CRSP firms in the relevant industry, where the weights are based on market values at the end of month *t*-1.[27,28] Second, we calculate the monthly return for portfolios 1-3 as the equal weighted return of all industries in the relevant portfolio.

Panel B of Table 3 reports raw monthly returns related to different time periods for each of the three portfolios. To interpret the results, recall that portfolios in month *t* are formed based on consensus industry recommendations in month *t*-1. Consider first the average returns in month *t*-1. They are monotonically decreasing as we move from Portfolio 1 (1.3%) to Portfolio 3 (-0.2%, insignificant). A similar trend is observed in month *t*-2. Consistent with the logit results, these trends suggest that analysts chase industry momentum. Consider now the returns in month *t*. These reflect the returns to portfolios constructed based on the industry recommendations issued in the previous month. The monthly return on Portfolio 1 is 1.3% which is significantly different from Portfolio 3's return of 0.1%. Moreover, a hedged portfolio long in Portfolio 1 and short in Portfolio 3, during the 65 months in which Portfolio 3 exists, yields a significant 1.4% per month. When examining the returns of the different portfolios starting from month *t*+1, we do not find a significant difference between the three portfolios, except in the case of 12 months returns. Note, however, that these are buy-and-hold returns that do not take into account changes in recommendations during the holding period. In the next section we examine long-term abnormal returns using a more reasonable approach that takes into account subsequent changes in consensus industry recommendations.

4.3 Risk-Adjusted Returns

We next turn to evaluating whether portfolios based on industry recommendations can generate *abnormal* returns. We estimate both in-sample and out-of-sample alphas of the three industry portfolios relative to the Fama-French four factors (excess market return, HML, SMB,

[27] The most obvious and least costly way to "buy" or "sell" an industry is to buy or sell the appropriate industry ETF. By calculating the industry return as a weighted average of all CRSP firms in this industry we essentially replicate the return on the corresponding industry ETF.

[28] If a firm is delisted at time *t*, its monthly return plus its delisting return from CRSP are used in the computation of its industry return. If a firm has a missing return at time *t*, we exclude it from the computation of the industry return. In a robustness test we replace missing returns of a firm in month *t* with the market return during that month; results are not sensitive to this change.

and UMD). For our in-sample analysis we regress the excess returns of the different portfolios on the four Fama-French factors over a period of 60 months similar to Barber, Lehavy, McNichols, and Truman (2001, 2006). The intercept from this regression is an estimate of the in-sample alpha. Our out-of-sample approach is similar to Brennan, Chordia, and Subrahmanyam (1998) and Chordia, Subrahmanyam, and Anshuman (2001). For each month in our sample period, we regress the monthly excess returns of the three industry portfolios on the returns of the Fama-French four factors during the preceding 60 months. Thus, for each month we obtain an estimate of the factor loadings. Next, for each month we calculate the out-of-sample alpha as the realized excess return of the portfolio less the expected excess return calculated from the realized returns on the factors and the estimated factor loadings. For each of the three portfolios we thus obtain a time series of out-of-sample alpha estimates. We can then use a t-test to estimate whether the average alpha is significant.

In both analyses we include the abnormal returns obtained from a short-term investment of one month, and longer term investments of 3, 6, and 12 months. In the long-term analyses we assume that investors keep track of recommendations and change their portfolio accordingly. Thus, we keep an industry in the portfolio as long as its average industry recommendation does not negate the original signal or until the end of the horizon. For example, if an industry is upgraded to optimistic in a given month and enters into portfolio 1, we keep it in the portfolio as long as its monthly average recommendation remains within the optimistic threshold (or no new industry recommendation is available) or until the end of the investment horizon.

Consider first the returns using the one-month horizon presented in Table 4. Both the in-sample (Panel A) and the out-of-sample (Panel B) analyses show a positive and significant alpha for the optimistic portfolio and a negative and significant alpha for the pessimistic portfolio. For example, the average out-of-sample alpha of portfolio 1 is 0.59% per month, significant at the 1% level. By contrast, portfolio 3 generates a negative out-of-sample alpha of 0.9% per month. A hedged portfolio long in portfolio 1 and short in portfolio 3 yields a significant abnormal return of about 1.4% per month both in- and out-of-sample sample.[29]

<Insert Table 4 here>

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[29] Note that the hedged portfolio can only be held about 9 months in each year because portfolio 3 only exists about 75% of the time. Hence an estimate of the annualized abnormal return of the hedged portfolio is 1.4%*9=12.6% (assuming that whenever portfolio 3 does not exist, the investment strategy has zero alpha).

Now, consider the abnormal returns associated with longer investment horizons. Here the results are somewhat different in the two analyses. In the in-sample analysis presented in Panel A we still find abnormal returns for investment horizons of up to 12 months. For example, the long-short portfolio in Panel A shows significant abnormal returns for 3, 6, and 12 month horizons. By contrast, in the out-of-sample analysis the results do not suggest any long-term predictability. We interpret these results as saying that, to the extent that there is a long-term value in the recommendation portfolios, it is weaker than in the short term.

For robustness we performed the same analysis relaxing the requirement of at least three recommendations for an industry to calculate the monthly average. The results are similar to those in Table 4, although they are somewhat smaller in magnitude. This is consistent with our expectation that removing the requirement is likely to increase the frequency of industry misclassifications, and thereby weaken the informativeness of the industry consensus.

One might also wonder whether the results are attributed exclusively to a “bull” or a “bear” market. Note that our time period covers both, and in particular it includes the recent global financial crisis as well as the “bull” market that preceded it. As a robustness check, we test whether the results of Table 4 are reversed during the bear market of 2008. Of course, any such analysis is suggestive only, as it is based on just 12 monthly observations. We find that the in-sample and out-of-sample alphas for these 12 months are insignificant over almost all investment horizons, which is what one would expect given the lack of power. Moreover, we cannot reject the hypothesis that the alphas for 2008 are different than the alphas during the rest of our sample period. Thus, it appears that the results are not reversed during the bear market of 2008.

The predictive value of industry recommendations may seem surprising, particularly given that our portfolios are formed based on industry recommendations that are potentially stale. Indeed, the portfolios are formed only at the end of each month. It is important to note, however, that much of the predictability that we identify comes from short selling a small group of industries that are in Portfolio 3 (see Panel A of Table 3). The difference between the abnormal returns in Portfolios 1 and 2 (which together account for more than 90% of the industries) is not statistically significant.

Collectively, the evidence in this section suggests that analysts possess across-industry expertise, and can identify “hot” and “cold” industries over short horizons of one month. When it comes to longer horizons the evidence is less conclusive and is limited to the in-sample analysis.

5 Relation between Across-Industry and Within-Industry Expertise

In the previous section we presented evidence consistent with analysts’ across-industry expertise as reflected in the investment value of their industry recommendations. In this section we explore the relation between across-industry and within-industry expertise. Specifically, we examine to what extent industry and firm recommendations are related, whether they reflect distinct pieces of information, and whether they can be jointly used to enhance the investment value of analysts’ recommendations.

5.1 Preliminary Analysis

It seems reasonable that industry and firm recommendations are at least somewhat related. Consider first a top-down approach (mostly taken by strategists). Under this approach the analyst collects and analyzes macroeconomic data, demand and supply information, etc. This analysis helps the analyst understand the prospects of each industry (across-industry expertise), but also is useful in evaluating the prospects of each firm in the industry (within-industry expertise). From a bottom-up perspective (mostly used by firm-level analysts), an analyst can study many firms in the industry (within-industry expertise) and then extract common aspects that help her understand the prospects of the industry as a whole compared to other industries (across-industry expertise). Both approaches suggest that the outlooks expressed at the industry and firm levels should be related. On the other hand, relatedness does not imply perfect alignment between recommendations at the industry and firm levels. In fact, one can view a firm’s prospects as driven by two components, one linked to its industry’s overall prospects and the other associated with the firm’s idiosyncratic characteristics – allowing, for example, for existence of winners and losers in the same industry. Moreover, industry and firm recommendations may be misaligned since they are often determined by analysts in different groups, which may not be perfectly coordinated. Therefore, we expect the outlooks expressed at the industry and firm levels to be related, but only to a certain degree.

<Insert Table 5 here>

Table 5 provides a preliminary look at the interaction between industry and firm recommendations. As with industry recommendations, we map firm recommendations into three levels, coding optimistic recommendations ("strong buy" or "buy") as '1', neutral recommendations ("hold") as '2', and pessimistic recommendations ("sell" or "strong sell") as '3'.[30] The table reveals a significant variation in firm recommendations within each level of industry recommendation. For example, out of the firm recommendations issued with an optimistic industry recommendation, 42% are rated optimistic, 45% are rated neutral, and 13% are rated pessimistic. We also see a wide dispersion of firm recommendations issued with neutral and pessimistic industry recommendation. The average firm recommendation for firms in industries rated as optimistic is 1.71, in industries rated neutral is 1.81, and in industries rated pessimistic is 1.96 – and the differences between these numbers are significant. Thus, there is some positive correlation between industry and firm recommendations. However, the dispersion in firm recommendations for a given level of industry recommendation suggests that industry and firm recommendations contain different information.

5.2 The Benchmark for Firm Recommendations

To better understand the relation between within- and across-industry expertise, it is necessary to know whether firm recommendations reflect information about the industry. That is, does a 'buy' recommendation issued to a firm reflect a buying opportunity relative to the entire market, or relative to industry peers?

If firm recommendations are benchmarked to industry peers, then firm and industry recommendations should contain orthogonal information. While industry recommendations forecast the outlook for the industry as a whole, firm recommendations forecast the deviations of specific firms from the industry outlook. In this case, industry recommendations have independent value to investors. Furthermore, firm specific recommendations should not be interpreted outside of their industry context. Hence, combining industry and firm recommendations would add value to investors.

If, on the other hand, firm recommendations are benchmarked to the market, then they incorporate both systematic industry information (across-industry) as well as firm-specific information (within-industry). If, in addition, firm-level outlooks are used as inputs when

[30] Given that our sample period starts in September 2002, most of the brokers follow a 3-tier rating scheme for their firms recommendations. See Kadan, Madureira, Wang, and Zach (2009).

industry outlooks are established (e.g., through proper sharing of information between strategists and firm-level analysts), we expect industry recommendations to reflect an aggregation of firm recommendations. In this case, industry recommendations are to some extent a repackaging of multiple firm recommendations, and they do not carry much incremental value to investors beyond firm recommendations. Under this scenario, combining industry and firm recommendations would not add much value to investors (less than the value in the case of recommendations benchmarked against the industry).

5.2.1 Analysis of Brokers' Disclosures

In order to understand how firm recommendations are benchmarked, we start by examining the disclosures of analysts regarding the meaning they assign to their firm recommendations. Under regulations NASD Rule 2711 and NYSE Rule 472, which were adopted prior to the beginning of our sample period, analysts are required to disclose the meaning of their recommendations inside their reports. We examined these disclosures for the 20 largest brokers (in terms of numbers of recommendations). Table 6 summarizes our findings. Out of the 20 brokers, 10 brokers state that they benchmark their firm recommendations to industry peers – including the six largest brokers in our industry recommendations sample. We refer to these brokers as “industry benchmarkers.” For example, in the case of CIBC, analysts rate individual stocks based on the “stock's expected performance vs. the sector.” In contrast, the other 10 brokers state that they benchmark their recommendations to the entire market or to a specific threshold return. We refer to such brokers as “market benchmarkers.” For example, Wachovia's analysts rate a stock based on the stock's expected performance “relative to the market over the next 12 months.” Thus, the disclosures in Table 6 suggest that brokers differ, according to their statements, in their interpretation of firm recommendations.

<Insert Table 6 here>

5.2.2 Pseudo Industry Recommendations

The fact that brokers state that they use a specific benchmark is anecdotal only. We next examine empirically which benchmark is in fact being used. As explained above, if brokers use an industry benchmark for their firm recommendations, then their firm recommendations will contain no industry-wide information. By contrast, if brokers use a market benchmark, then their firm recommendations will have information regarding industry outlook. This observation enables us to construct a simple test as follows. In each month we construct a “pseudo industry recommendation" by value weighting all recommendations issued during that month to firms belonging to the specific GICS industry. That is, the pseudo industry recommendations mirror the "true" industry recommendations studied in the paper. Only that, instead of obtaining them directly from IBES, we construct them by aggregating firm recommendations on an industry level [similar to Boni and Womack (2006)].

<Insert Table 7 here>

Panel A of Table 7 presents summary statistics of pseudo industry recommendations. First, the average pseudo industry recommendation for all brokers is 1.62. By comparison, the average real industry recommendation is somewhat less optimistic at 1.85. We then distinguish between two sets of brokers based on the analysis in Table 6. The average pseudo industry recommendation for industry benchmarkers is 1.71, while the average for market benchmarkers is a bit more optimistic at 1.62. Overall, there does not seem to be a large economic difference between the two sub-groups in the level of their recommendations.

Panel B of Table 7 presents the correlation matrix between the different types of pseudo industry recommendations and the true industry recommendations. There is little correlation between the pseudo industry recommendations and the true industry recommendations. These correlations range from 0.10 to 0.15, suggesting that true industry recommendations are very different in their informational content from just an aggregation of firm recommendations. For the industry benchmarkers the correlation is 0.14. Such a low correlation is expected given these brokers' claims that their firm recommendations are benchmarked to industry peers – and thus are not expected to contain much industry information. The more surprising result is that the correlation between the true and pseudo industry recommendations among the market benchmarkers is still just 0.10. Here we would expect pseudo industry recommendations to somewhat reflect across-industry expertise, and thus be more correlated with industry outlooks. The low correlations we find raise the possibility that while market benchmarkers state that they use a market benchmark for their firm recommendations, in practice they may still benchmark to industry peers.[31]

[31] Note that the "true" industry recommendations in this case are typically *not* issued by the market benchmarkers. Therefore, another alternative, of course, is that market benchmarkers have strikingly different views about industry prospects when compared to the views expressed in the explicit industry recommendations by the brokers in our sample.

To more formally investigate this issue we repeat the analysis from Table 4 using the pseudo industry recommendations. Boni and Womack (2006) conduct a similar analysis.[32] The idea is that if pseudo industry recommendations reflect across-industry expertise and have predictive information regarding the industry, then portfolios based on pseudo industry recommendations will demonstrate abnormal returns. Panel C of Table 7 presents the results. As in Table 4, in each month we sort industries by their consensus pseudo industry recommendation and construct three portfolios related to high (Portfolio 1), medium (Portfolio 2), and low (Portfolio 3) average recommendations. Then, we calculate the one month in-sample and out-of-sample alphas of the three portfolios and of a portfolio that is long in Portfolio 1 and short in Portfolio 3.

Consider first the results for all brokers (both in-sample and out-of-sample). The alphas are not different from zero for the three portfolios as well as for the long-short portfolio. This is consistent with the findings of Boni and Womack (2006, page 106). Similar results obtain for the industry benchmarkers. The results for market benchmarkers are different. The in-sample results show significantly positive alphas for portfolio 1 and significantly negative alphas for portfolio 3. The long-short portfolio is also statistically significant. The out-of-sample alphas are somewhat weaker as only the optimistic portfolio shows significance. These results are consistent with the disclosure of these brokers, and suggest that firm recommendations issued by market-benchmarkers reflect some industry expertise.

Our conclusion from this analysis is that it is important to pay attention to the benchmark used by brokers for their firm recommendations when examining the across-industry information incorporated in them. For industry benchmarkers the results show that true industry recommendations are different from just an aggregation of firm recommendations. While the former contains information regarding industry outlooks and reflects analysts' across-industry expertise, the latter does not reflect that expertise. This is in line with the low correlation between the real- and pseudo-industry recommendations, documented in Panel B. Among market benchmarkers, where we do expect pseudo industry recommendations to somewhat reflect across-industry expertise, we find some predictive power (mostly in the in-sample analysis).

[32] The focus of our paper is on true industry recommendations, which is different from Boni and Womack (2006) who did not have access to such recommendations. Howe, Unlu, and Yan (2009) conduct an analysis somewhat similar to that of Boni and Womack (2006), but they focus on excess returns relative to the market rather than risk-adjusted abnormal returns.

Thus, our results provide more nuanced conclusions regarding the across-industry information in aggregations of firm-recommendations than those in Boni and Womack (2006). It is worth emphasizing that Boni and Womack (2006) employ data before 2002, a period during which brokers were not required to disclose their benchmarks.

Two caveats are in order regarding comparisons between pseudo and true industry recommendations. First, it is often the case that we do not obtain firm recommendations for all firms in the industry in any given month. For this simple reason, true industry recommendations are likely to contain more information than pseudo industry recommendations. Second, the potential misalignment between analysts' definitions of industries and the GICS definition might create a further rift between true and pseudo industry recommendations.

5.3 Combining Across- and Within-Industry Expertise

The results so far suggest that true industry recommendations reflect across-industry expertise and carry value to investors that is unrelated to information in firm recommendations, and more so for industry-benchmarkers. Prior research demonstrates that firm recommendations also have investment value. Jointly, these two observations suggest that combining firm and industry recommendations will enhance their value to investors. Such combinations would reflect both within- and across-industry expertise of analysts. In this section we explore this idea.

A reasonable approach to exploit both aspects of expertise consists of first selecting industries using industry recommendations, and then using firm recommendations to choose firms within the selected industries. This approach extracts the full power of analysts' knowledge as it incorporates their signals both within-industry (mostly driven by a bottom-up analysis) and across industries (mostly driven by a top-down analysis).

As a start, we follow Boni and Womack (2006) in classifying firms based on upgrades and downgrades in *firm* recommendations. For each firm covered by IBES and each month during our sample period, we count the number of upgrades and downgrades that the firm received. An upgrade or downgrade is defined at a firm-broker level. For example, an upgrade on firm *i* by broker *B* in month *t* means that *B* issued a recommendation for *i* in month *t* that was more optimistic than the most recent recommendation issued by B to *i*. (Therefore we ignore reiterations of recommendations, or initiations of coverage.) We then compute the difference between the number of upgrades and the number of downgrades for each month and firm across all brokers. If the difference is positive, then the firm is a “net upgrade.” Conversely, if the difference is negative, then the firm is a “net downgrade.”

<*Insert Table 8 here*>

We next combine firm and industry recommendations. In each month we perform a double-sort of the universe of firms based on the firm classification (whether “net upgraded” or “net downgraded”) and on its industry classification (belonging to either one of the three industry portfolios described in the previous section) that were prevailing in the previous month. Therefore, within each of the three industry portfolios, we form two portfolios based on firm recommendations, one for the net upgraded firms (Portfolio *U*) and one for the net downgraded firms (Portfolio *D*).[33] This generates six portfolios of firms. For example, (1,*U*) is the portfolio of net upgraded firms in industries whose outlook is optimistic. Returns on each portfolio are obtained from equal-weighting the returns on their stocks. Similar to the analysis in Section 4.3, we analyze in-sample and out-of-sample abnormal returns obtained from a short investment horizon of one month, and longer horizons of 3, 6, and 12 months. The abnormal returns of the double-sorted portfolios are reported in Table 8.

Consider first the one-month horizon. Both the in-sample and out-of-sample results support the idea that combining industry and firm recommendations enhances investment value. For example, whether net upgraded firms show abnormal returns depends on their industry outlook: such net upgraded stocks have significantly positive alphas if they are part of the industries with optimistic outlook (1,*U*) or neutral outlook (2,*U*), but not when they are part of the industries with the worst outlook (3,*U*). In a similar fashion, net downgraded stocks have significantly negative alphas when part of a pessimistic industry (3,*D*), but not when they are part of an optimistic industry (1,*D*) or a neutral industry (2,*D*). In fact, when a firm is a net downgrade but belongs to an industry in Portfolio 1, it generates *positive* abnormal returns in both the in-sample and out-of-sample analyses. A trading strategy long in the top-left portfolio (1,*U*) and short in the bottom-right portfolio (3,*D*) yields a monthly abnormal return of over 3% in both analyses. These returns are larger than those obtained in Table 4 using industry recommendations only.

[33] Notice that a third “portfolio” is implied here, the one with firms that were neither “net upgraded” nor “net downgraded.” In fact, about half of the firms receiving recommendations in the month would be in this third “portfolio”, either because they only receive reiteration/initiations of recommendations, or because the number of upgrades is equal to the number of downgrades.

For the longer investment horizons we follow a methodology similar to that used in Section 4.3. That is, we include a firm in a portfolio until the end of the investment horizon or until the signal (on either the firm or the industry) changes. If there are no new recommendations (for either the firm or the industry) in a given month, we assume that the signal remains consistent in that month.[34] The alphas for longer investment horizons up to 12 months are consistent in sign and significance but somewhat lower in magnitude compared to the one-month results. For example, when examining in-sample alphas over a 12-month horizon, a portfolio long in (1,*U*) and short in (3,*D*) yields a monthly abnormal return of 2.3%.

Overall, the results in this section reinforce the conclusion that industry recommendations contain information that is not already incorporated in firm recommendations. While firm recommendations often reflect within-industry expertise and focus on ranking stocks within industries, industry recommendations reflect across-industry expertise enabling investors to rank industries. Thus, combining the two types of recommendations exploits both dimensions of analysts' industry expertise and generates investment portfolios that outperform portfolios based on just one type of recommendation (firm or industry).

6 Alternative Explanations

While the results in the previous sections are consistent with analysts possessing across-industry expertise, they may also be consistent with two alternative explanations, which we consider in this section.

6.1 Industry Momentum

It may be that analysts do not possess any expertise in analyzing the prospects of different industries. Rather, they just chase industry momentum providing no added value beyond it. In this case, the abnormal returns we observe are nothing but a result of this well documented phenomenon [Moskowitz and Grinblatt (1999)]. In this section, we conduct several tests to explore this possibility.

[34] Notice that Boni and Womack (2006) focused on one month returns only. Therefore, for horizons beyond one month, our methodology extends theirs by allowing the firm's and industry's signals to remain valid for up to 12 months. An alternative is to allow the classification of industries to be extended to long horizons while still using one month-ahead returns with respect to the firm's signal. Results (unreported) of this alternative yield similar conclusions.

First, in each month during our sample period we assign each GICS industry into one of three momentum portfolios based on prior six months returns as follows. Momentum Portfolio 1 contains industries in the top 15% of the prior-return distribution; Momentum Portfolio 3 contains industries in the bottom 15% of the prior-return distribution, and Momentum portfolio 2 contains all the rest of the industries. We choose these cutoffs to be as consistent as possible with Moskowitz and Grinblatt (1999), who define winner (loser) industries as the top (bottom) three out of a total of 20 industries. We then double sort the industry-month observations based on their assigned industry recommendations and industry momentum portfolios. The results are reported in Panel A of Table 9, and indicate only a mild positive correlation between industry recommendations and industry momentum. For example, when considering industries assigned to recommendation portfolio 1 (optimistic), 18% of them exhibit high momentum (momentum portfolio 1), 70% are in momentum portfolio 2, and 12% exhibit low momentum (momentum portfolio 3). Out of the industry-month observations that belong to recommendation portfolio 3 (pessimistic), 10% show high momentum, 69% show moderate momentum, and 21% show negative momentum. These results show that, while a positive correlation exists, analysts do not blindly follow industry momentum.

<Insert Table 9 here>

Next, note that if analysts were defining their industry recommendations based mostly on past performance, our strategy for forming portfolios based on recommendations would be at best an imperfect replica of the industry momentum strategy. In this sense, an industry momentum strategy like in Moskowitz and Grinblatt (1999) should yield "better" or cleaner results than our strategy. Thus, we compare the one-month abnormal returns of the long-short strategy resulting from the industry recommendation portfolios to those obtained from a long-short momentum strategy. The results of this test are reported in Panel B of Table 9. For both the in-sample and out-of-sample analysis, neither momentum portfolio 1 nor portfolio 3 exhibit significant abnormal returns in the month following their formation. The return on the hedged portfolio is insignificant in the in-sample analysis, and surprisingly negative in the out-of-sample analysis. More importantly, the difference between the alpha of the long-short recommendation portfolio and that of the momentum portfolio is positive and highly significant (p-value lower than 0.01), indicating that the abnormal returns associated with the recommendation portfolio are not attributed to industry momentum.

In our next test we attempt to directly isolate the effects of industry momentum on industry recommendations. We do so by excluding from recommendation portfolio 1 all industries that belong to momentum portfolio 1. That is, we only consider industries that have high industry recommendations but do not exhibit high past returns. Similarly, we exclude from industry recommendation portfolio 3 all industries belonging to momentum portfolio 3. The one-month abnormal returns are reported in Panel C of Table 9. For both the in-sample and out-of-sample analysis the long-short portfolio exhibits a positive and highly significant alpha. This is a strong indication that industry momentum is not responsible for the observed abnormal returns on industry recommendation portfolios.

As a final test for the "momentum hypothesis" we checked the return predictability of industry recommendations using the Fama-MacBeth cross-sectional approach. This allows us to control for different characteristics affecting stock returns (such as momentum) directly, rather than using a factor approach. For each month in our sample we estimated a cross-sectional regression with industry excess returns as a dependent variable, and industry characteristics as independent variables. The characteristics we used are: beta, size, book-to-market, momentum, and the industry-consensus portfolio to which the industry belongs (*PORT*) or the industry consensus recommendation (*Ind_Rec*). We then average the coefficients over time and use a t-test to examine their statistical significance. The results are reported in Panel D of Table 9. We observe a significantly negative coefficient on either *Port* or *Ind_Rec*, indicating that industry recommendations have predictive ability with respect to next month's industry returns, and confirming our results from Table 4. Importantly, we observe this relation after controlling for the cumulative industry return in the previous six months, which turns out not to be significant.

In sum, the results in this section suggest that the predictive ability in industry recommendations is not a manifestation of industry momentum.

6.2 Short-Term Price Pressure and Sentiment

It may be that analysts do not possess any expertise in analyzing the prospects of different industries. Rather, analysts' industry recommendations create a "hype" or sentiment for some industries which is followed by a wide migration of investors to or away from those industries. In that case, the abnormal returns we observe merely reflect the short-term price pressure (either positive or negative) created by this migration. If that is the case, then the returns following industry recommendations should be short lived. That is, in the long-run prices will revert to fundamentals undoing the short-term price pressure. A similar phenomenon (in a different context) is documented in Ben-Rephael, Kandel, and Wohl (2011). They show that mutual-fund investors chase sentiment when switching between equity and bond funds. However, short-term returns obtained from this approach are reversed within one year.

To distinguish between this alternative explanation and the "industry expertise" hypothesis we examine whether the short-term abnormal returns obtained from following industry recommendations are reversed within one year. First, recall from Table 4 and Table 8 that the long-term returns following industry recommendations are smaller in magnitude compared to the one-month returns (and at times they become insignificant). These results suggest that some of the returns are indeed reversed. However, a formal test for reversal should directly examine the long-term returns, excluding the first month. To this end, we repeat the analysis presented in Table 4 and Table 8, skipping the first month. The results (untabulated, available upon request) for both the in-sample and out-of-sample analysis show either insignificant or significant and *positive* alphas for the long-short portfolios for all investment horizons. Thus, our tests do not identify any reversals in the period following the first month after portfolio formation.

Our interpretation of these tests along with the results in Table 4 is that the abnormal returns associated with industry recommendation may be partially attributed to price pressure. However, given that we cannot identify reversals explicitly, and since abnormal returns are still significant over the longer horizon (in Table 8 and in the in-sample analysis in Table 4), it seems that across-industry expertise still plays a role in explaining the results.

7 Conclusion

Industry analysis is an important aspect of sell-side research. It is likely composed of both analysts' ability to rank firms within an industry (carried out by firm-level analysts) as well as analysts' ability to rank industries relative to each other (largely carried out by strategy analysts). Our paper focuses on exploring analysts across-industry expertise and its relation to analysts' within-industry expertise. We perform our analysis using industry recommendation data that became available on IBES in 2002. This is a major output of analysts' research that has not been explored so far.

Institutional investors assign a high level of importance to analysts' industry expertise – as reflected in the *Institutional Investor Magazine* survey (cited in the Introduction), and in the awards granted to strategists based on their industry recommendations. Our results suggest that analysts do possess across-industry expertise as reflected in the investment value of their industry recommendations. Furthermore, the results highlight the importance of this new facet of analysts' outputs. As we show, industry recommendations incorporate information that is distinct from that conveyed by firm recommendations. Thus, combining the across- and within-industry expertise of analysts is beneficial. A caveat to these conclusions is that our results only pertain to brokerage houses that disclose industry recommendations. It could be that the disclosure decision is related to brokerage houses' efforts and abilities to analyze the prospects of industries. Consequently, these inferences may not extend to other brokerage houses.

Another important element of our study is that the analysis of industry recommendations enables us to better understand the meaning of firm recommendations. Firm-level analysts differ in their disclosures regarding the benchmark for their firm recommendations. Our empirical findings suggest that these differences are only partly reflected in the information contained in firm recommendations.

Being the first paper to study analysts' across-industry expertise as reflected in industry recommendations, several interesting questions remain. First, what is the source of investment value in industry recommendations? In particular, is there a link between industry recommendations and the subsequent investment decisions of either retail or institutional investors? Second, given the importance of industry knowledge, what is its role in analysts' compensation and reputation? Third, what are the relative weights that should be assigned to industry vs. firm recommendations to maximize their investment value? Finally, what can be learned from the fact that some brokers use an industry benchmark while others use a market benchmark for their firm recommendation? These are questions to be addressed in future research.

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Appendix I

To illustrate how IBES records industry recommendations we present a specific example. In January 2006, Bear Stearns published an analyst report on Apple (AAPL). We obtained this report from the Investext Plus database. The front page of the report shows that the analyst issued an ‘outperform’ recommendation for Apple. Additionally, the front page cites a ‘market weight’ recommendation for the IT hardware industry. This recommendation is taken from a periodic industry report prepared by a group of analysts at Bear Stearns.

IBES recorded these recommendations as follows:

Ticker	RECDATS	BROKER	BTEXT/ETEXT	IRECCD
AAPL	20060112	BEAR	OUTPERFORM/MKTWT	2

Note that the ‘btext’ item includes two words separated by a ‘slash’. The text before the slash is the firm recommendation, whereas the text after the slash is the industry recommendation. Industry recommendations only appear in this item for brokers that include them in the front page of their firm reports.

Below, we present how we assign numeric values to the text depicting industry recommendations. We code optimistic industry recommendations as ‘1’, neutral industry recommendations as ‘2’, and pessimistic industry recommendations as ‘3’.

Optimistic (1)	**Neutral (2)**	**Pessimistic (3)**
ACCUMULATE	CORE HOLD	AVOID
ABOVE AVERAGE	IN-LINE	CAUTIOUS
ACC	MARKET PERFORM	NEGATIVE
ACCUM	MARKETPERFORMER	REDUCE
ACCUMULATE	MARKETPERFRM	SELL
ADD	MKTWT	UNDERPERF.
ATTRACTIVE	MP	UNDERPERFORM
BUY	NEUTRAL	UNDERWT
OUTPERFORM		
OVERWT		
POSITIVE		
STRONGBUY		

Appendix II - Summary Statistics on the Global Industry Classification Standard (GICS)

This appendix presents summary statistics on each industry defined by GICS during our sample period (9/2002 – 12/2009). For each GICS, the table shows its corresponding industry name, the number of firms in the industry, the average market capitalization (in $M) and the average market-to-book ratio across firms in the industry, the number of brokerage houses (out of the 33 brokers in Table 1) that issue recommendations to this industry at any point during our sample period, the average number of brokerage houses which issue recommendations to this industry per month, the average number of recommendations issued to this industry per month, and the average level of these monthly industry recommendations. The number of firms in each industry is based on the number of firms in CRSP in 2009. The market capitalization and the market-to-book ratio are calculated based on 2009 and 2008 data, respectively. We assign industry recommendations a numeric value as follows: "optimistic"=1, "neutral"=2, "pessimistic"=3. The monthly industry recommendation is calculated as the average industry recommendation issued to the industry within the month.

GICS	Industry_Name	# of firms	Avg. market cap	Avg. M/B	# of brokers covering	Avg. # of brokers issuing rec. per month	Avg. # of rec. per month	Avg. monthly industry rec.
101010	Energy Equipment & Services	81	3754.50	0.59	11	3.20	13.27	1.28
101020	Oil, Gas & Consumable Fuels	292	5610.73	2.83	14	5.35	34.25	1.74
151010	Chemicals	89	3797.70	0.74	10	2.42	7.34	1.62
151020	Construction Materials	12	1602.13	0.49	4	0.35	0.52	1.78
151030	Containers & Packaging	22	1987.11	0.42	7	1.22	3.09	1.77
151040	Metals & Mining	138	3567.25	0.95	12	3.51	10.23	1.62
151050	Paper & Forest Products	18	1895.72	0.30	7	1.48	3.34	2.07
201010	Aerospace & Defense	68	4618.84	0.75	10	2.17	5.80	1.71
201020	Building Products	24	857.01	0.58	8	0.60	0.77	1.75
201030	Construction & Engineering	32	1428.12	0.69	11	0.99	2.13	1.68
201040	Electrical Equipment	99	1156.36	1.00	13	1.63	3.81	1.58
201050	Industrial Conglomerates	17	15565.78	0.61	7	1.08	1.73	1.65
201060	Machinery	121	2230.40	0.71	10	2.68	7.16	1.77
201070	Trading Companies & Distributors	30	934.12	0.60	8	1.06	1.55	1.80
202010	Commercial Services & Supplies	94	1062.96	0.80	13	3.13	9.45	1.78
202020	Professional Services	55	767.29	0.91	5	0.18	0.30	1.84
203010	Air Freight & Logistics	15	5904.04	1.20	6	1.11	2.50	1.71
203020	Airlines	22	1688.54	0.28	6	1.90	6.09	1.86
203030	Marine	27	410.35	0.30	6	0.55	0.91	2.09
203040	Road & Rail	36	4717.64	0.69	7	1.74	5.52	1.98
203050	Transportation Infrastructure	9	466.42	0.39	4	0.30	0.52	1.80
251010	Auto Components	40	1368.98	0.43	8	1.61	4.56	2.30
251020	Automobiles	8	12861.95	0.26	7	1.02	1.52	2.34
252010	Household Durables	73	1180.24	0.35	8	1.78	4.83	1.95
252020	Leisure Equipment & Products	26	727.91	0.50	10	0.74	1.06	1.76
252030	Textiles, Apparel & Luxury Goods	62	1343.44	0.75	9	1.32	3.26	2.02
253010	Hotels, Restaurants & Leisure	125	1913.11	0.60	14	4.01	15.27	1.84
253020	Diversified Consumer Services	41	1282.99	1.96	9	1.19	1.80	1.78
254010	Media	139	3011.21	0.37	11	4.45	18.97	1.96
255010	Distributors	11	860.56	0.42	5	0.26	0.26	2.14
255020	Internet & Catalog Retail	26	3493.56	1.38	11	1.80	3.22	1.63

Appendix II – Cont.

GICS	Industry_Name	# of firms	Avg. market cap	Avg. M/B	# of brokers covering	Avg. # of brokers issuing rec. per month	Avg. # of rec. per month	Avg. monthly industry rec.
255030	Multiline Retail	17	5822.64	0.55	10	1.85	4.06	2.17
255040	Specialty Retail	121	2406.32	0.56	13	4.30	16.95	2.11
301010	Food & Staples Retailing	34	10888.92	0.71	8	1.88	4.28	1.87
302010	Beverages	35	8449.57	0.62	6	1.55	3.58	1.85
302020	Food Products	77	3724.15	0.79	7	2.01	5.15	2.15
302030	Tobacco	9	18444.96	4.35	5	0.52	1.14	1.63
303010	Household Products	13	20228.34	0.74	7	1.01	1.72	1.95
303020	Personal Products	34	1348.47	1.32	8	1.06	1.63	1.85
351010	Health Care Equipment & Supplies	154	2277.76	1.32	16	3.33	8.93	1.53
351020	Health Care Providers & Services	124	2323.75	0.87	12	4.07	18.17	1.69
351030	Health Care Technology	25	964.09	1.48	9	0.40	0.61	1.68
352010	Biotechnology	178	1296.45	2.46	14	3.99	11.67	1.54
352020	Pharmaceuticals	104	7546.38	1.60	12	3.44	9.69	1.59
352030	Life Sciences Tools & Services	57	1426.58	1.40	7	0.69	1.67	1.63
401010	Commercial Banks	399	1583.53	0.08	10	2.75	11.35	2.02
401020	Thrifts & Mortgage Finance	157	333.11	0.10	9	1.43	3.60	1.99
402010	Diversified Financial Services	39	11373.25	0.83	10	2.25	5.59	1.99
402020	Consumer Finance	23	3889.49	0.30	10	1.09	1.88	2.02
402030	Capital Markets	105	4541.15	0.66	10	2.45	8.18	1.87
403010	Insurance	142	4260.35	0.30	10	3.59	15.38	1.88
404010	Real Estate -- Discontinued effective 04/28/2006				6	1.68	8.53	2.33
404020	Real Estate Investment Trusts (REITs)	148	1974.60	0.38	6	1.28	7.16	2.28
404030	Real Estate Management & Development	35	1013.77	0.43	6	0.34	0.47	2.13
451010	Internet Software & Services	101	2688.59	1.10	12	3.20	7.61	1.56
451020	IT Services	90	2946.92	0.76	10	2.84	8.11	1.75
451030	Software	168	3677.52	1.31	16	4.32	15.73	1.70
452010	Communications Equipment	121	2993.19	0.72	14	3.82	11.91	1.77
452020	Computers & Peripherals	61	10149.39	0.81	14	2.97	8.28	1.81
452030	Electronic Equipment, Instruments & Components	144	966.18	0.73	10	3.02	7.58	1.82
452040	Office Electronics	3	3917.73	0.62	6	0.25	0.28	1.84
452050	Semiconductor Equipment & Products -- Discontinued effective 04/30/2003.				11	0.59	5.84	1.76
453010	Semiconductors & Semiconductor Equipment	150	2559.40	0.80	12	4.13	21.14	1.73
501010	Diversified Telecommunication Services	70	5223.70	0.37	11	3.45	10.45	1.90
501020	Wireless Telecommunication Services	32	4739.27	0.46	13	2.89	7.03	1.88
551010	Electric Utilities	42	5802.72	0.35	7	2.45	8.99	2.28
551020	Gas Utilities	28	1890.83	0.51	7	1.06	2.34	2.06
551030	Multi-Utilities	27	5976.77	0.32	9	1.52	3.88	2.25
551040	Water Utilities	16	678.80	0.67	4	0.19	0.20	2.15
551050	Independent Power Producers & Energy Traders	14	2864.53	0.29	8	0.72	1.15	2.08

Appendix III

As we discussed in Section 2.3, when we draw a recommendation, the GICS industry to which we are associating that recommendation is incorrect roughly 22% of the time. This is a result of the fact that not all brokers use the GICS classification system. In this Appendix we illustrate the implications of these incorrect classifications, and explain how increasing the number of required recommendations reduces the noise associated with this problem. For this exercise assume that the unconditional distribution of industry recommendations comes from the statistics in Table 1, that is: 31% optimistic, 55% neutral, and 14% pessimistic.

Consider the probability of drawing an optimistic signal for industry *j* based on a single recommendation. This will occur when the single recommendation assigned to the industry *j*, Rec_j, equals 1, or:

$$\Pr(Ind_j{=}Optimistic)=\Pr(Rec_j{=}1)$$

Since recommendations can be incorrectly mapped to industries, we need to distinguish between the recommendation as we map it using GICS, and the "true recommendation," which is the recommendation assigned to the industry given the issuing broker's classification system. In the example above, one could have observed an optimistic recommendation for industry *j* even when its true recommendation was neutral or pessimistic. We can then write,

$$\begin{aligned}\Pr(Rec_j{=}1) = {} & \Pr(Rec_j=1 \mid TrueRec_j=1)*\Pr(TrueRec_j{=}1)+\\ & \Pr(Rec_j=1 \mid TrueRec_j=2)*\Pr(TrueRec_j{=}2)+\\ & \Pr(Rec_j=1 \mid TrueRec_j=3)*\Pr(TrueRec_j{=}3) \qquad (1)\end{aligned}$$

If the GICS mapping were used by all brokers, then the last two terms would vanish, as the probability that we observe an optimistic recommendation when the true recommendation is not optimistic is zero, and we would trivially derive $\Pr(Rec_j=1|TrueRec_j{=}1)=100\%$. That is, we would be left with $\Pr(Rec_j{=}1)=\Pr(TrueRec_j{=}1)$. Under the possibility of incorrect mappings, though, we need to rely on all these conditional probabilities to estimate the mapping error.

Let's explore the first such probability. If the true recommendation is '1,' then the probability of observing a recommendation of '1' is based on whether the GICS mapping matches the broker's mapping. If the mapping is correct (which happens 78% of the time), the reading is '1' with 100% certainty. If the mapping is incorrect (which happens 22% of the time), then the probability of drawing a recommendation of '1' can be approximated by the unconditional probability of having a recommendation of '1,' that is, 31%.[35] Let *MappingOk* denote the event that the GICS mapping is correct, and we can write:

$$\begin{aligned}\Pr(Rec_j{=}1|TrueRec_j{=}1) = {} & \Pr(\{Rec_j = 1|TrueRec_j{=}1\}|\ MappingOk{=}1)*\Pr(MappingOk{=}1) + \\ & \Pr(\{Rec_j = 1|TrueRec_j{=}1\}|\ MappingOk{=}0)*\Pr(MappingOk{=}0) = \\ & 1*0.78+0.31*0.22=0.8482,\end{aligned}$$

which means that, conditional on the analyst being optimistic about this particular GICS industry, only 84.82% of the readings will indicate optimism. Similarly, we obtain that $\Pr(Rec_j{=}1|TrueRec_j{=}2) = \Pr(Rec_j{=}1|TrueRec_j{=}3) = 0.0682$ – that is, even when the true recommendation level is neutral or pessimistic, we still draw an optimistic level for the industry 6.82% of the time.

In sum, one sees optimistic industries 31% of the time, but only 26.29% ($\Pr(Rec_j = 1 \mid TrueRec_j = 1)*\Pr(TrueRec_j{=}1) = 0.8482*0.31$) are true optimistic ones. The remaining, 3.75% and 0.96%, refer to industries that had, respectively, a truly neutral or pessimistic prospect but were incorrectly tagged as optimistic due to errors in GICS mappings. This amounts to 4.71%/31%=15.2% of the optimistic readings from single recommendations being incorrect. As for the industries tagged with a pessimistic tone, which happens 14% of the time, 2.65%, or 2.65%/14%=18.92% of them, are incorrectly set as pessimistic.

By increasing the number of required recommendations we can reduce these mapping errors with respect to optimistic and pessimistic readings. The idea is that if these errors are approximately independent (which would be the case in a large enough sample) then the probability of assigning the wrong recommendation level to an industry decreases with the number of sampled recommendations. The calculations when allowing for the cases in which we require at least two or three recommendations for an industry to be included in the portfolios are quite straightforward generalizations of those shown above (and are available upon request).

[35] We are assuming a large enough sample, so that we can consider drawing recommendations with replacement. Still the assumption that the distribution of recommendations when the mapping is incorrect is the same as the unconditional distribution of recommendations is a simplification. Given that an analyst tends to track companies that are similar to each other, returns on these tracked firms, as well as returns on their industries, will tend to be correlated. Thus, even when a recommendation is assigned to a different GICS than the one the analyst had in mind when publishing the recommendation, it is likely that the two industries are related, and thus their recommendations will be correlated as well. This suggests, for example, that $\Pr(\{Rec_j = 1|TrueRec_j{=}1\}|MappingOk{=}0)$ can be higher than 31%. An examination of these conditional probabilities that adjusts for this additional correlation reveals, though, that the inferences here are not much affected.

Misclassifications still abound when industry signals are based on a combination of two recommendations. For example, 20.32% of industries classified as optimistic based on two recommendations are done so incorrectly. On the other hand, these misclassifications are almost completely eliminated when a 3-recommendations threshold is used; In this case, only 2.65% (1.40%) of optimistic (pessimistic) classifications are incorrect.

Table 1 - Descriptive Statistics on Brokerage Houses and Industry Recommendations

Panel A presents summary statistics on the brokerage houses whose industry recommendations are available in IBES during our sample period (9/2002 – 12/2009). We report IBES Broker Code (BMASKCD), the number of firms receiving recommendations from the brokerage house, the number of firm recommendations issued by each brokerage house, the average of such firm recommendations, the number of industries with available industry recommendations of each brokerage house, and the total number of industry recommendations issued by each brokerage house and available in IBES. When calculating the average firm recommendation, we assign firm recommendations a numeric value as follows: "strong buy" and "buy"=1, "hold"=2, "underperform" and "sell"=3. Industries are classified by the Global Industry Classification Standard (GICS). **Panel B** shows the number of industries covered by each of the sample's seven largest brokers for which we have industry recommendations. An industry is considered to be covered by a broker in a specific year if there is at least one industry recommendation being issued for that industry by the broker. **Panel C** reports the distribution of the industry recommendations levels over the years for all brokers. We assign industry recommendations a numeric value as follows: "optimistic"=1, "neutral"=2, "pessimistic"=3. **Panel D** shows the average industry recommendation for each broker and each year of our sample.

Panel A – Summary Statistics on Brokerage Houses

Broker Code	# of firms covered	Total # of firm recommendations	Avg. firm recommendation	# of industries with industry recommendations	Total # of industry recommendations
1020	1904	10163	1.89	70	9985
1595	1799	7118	1.88	70	7116
846	2145	9039	1.73	68	6678
251	1567	5396	1.75	66	5366
2108	1754	5291	1.76	65	5250
1750	1304	3756	1.81	57	3751
10902	1072	1885	1.70	63	1831
2475	324	984	1.52	37	373
1284	231	857	1.24	17	360
3668	468	1162	1.59	19	256
480	21	118	1.82	13	69
7230	85	140	1.60	18	54
5197	29	48	1.42	9	46
415	299	805	1.80	11	35
5439	101	336	1.43	15	29
11946	44	67	1.46	6	19
11553	36	50	1.64	5	16
19573	11	15	1.20	6	15
5183	15	37	2.68	2	13
2233	8	9	2.33	1	9
12368	33	106	1.24	3	9
4817	16	36	1.39	3	8
4474	185	455	1.51	4	5
4451	1074	2668	1.66	4	4
7163	18	19	1.21	3	4
4865	3	8	1.38	2	3
813	6	12	1.67	2	2
1534	2829	12183	1.75	1	2
2225	10	11	1.00	2	2
3927	2	3	1.33	1	2
28	183	356	1.44	1	1
4234	128	382	1.35	1	1
5253	381	1206	1.48	1	1

Table 1 (*continued*)

Panel B – Industry Coverage by Broker and by Year for the Seven Largest Brokers

BMASKCD	2002	2003	2004	2005	2006	2007	2008	2009
1020	51	54	53	57	65	66	66	64
1595	49	59	55	56	61	61	61	57
846	53	57	57	58	61	64	29	-
251	48	54	49	53	57	56	45	-
2108	44	56	53	56	60	58	42	-
1750	43	43	40	40	41	41	12	4
10902	-	-	-	-	-	-	62	60
Number of GICS Industries	59	62	62	64	67	67	68	68

Panel C – Distribution of Industry Recommendations by Year for All Brokers in Sample

Industry Recommendation (%)	2002	2003	2004	2005	2006	2007	2008	2009	Overall
1	33.92	31.62	33.33	32.27	31.26	28.58	28.50	35.22	31.71
2	52.17	51.01	52.59	52.84	54.97	59.09	59.70	55.72	54.53
3	13.90	17.37	14.08	14.89	13.77	12.34	11.80	9.06	13.76

Panel D – Average Industry Recommendations by Broker and Year for the Seven Largest Brokers

BMASKCD	2002	2003	2004	2005	2006	2007	2008	2009	Overall
1020	1.89	1.94	1.93	2.02	1.87	1.89	1.91	1.75	1.88
1595	1.95	2.02	1.90	1.99	1.88	1.77	1.84	1.71	1.88
846	1.78	1.91	1.79	1.71	1.88	1.86	1.79	-	1.83
251	1.66	1.93	1.78	1.91	1.84	1.96	1.90	-	1.85
2108	1.85	1.75	1.78	1.67	1.72	1.70	1.82	-	1.74
1750	1.75	1.72	1.71	1.77	1.74	1.78	1.65	1.64	1.74
10902	-	-	-	-	-	-	1.73	1.74	1.73

Table 2 – Determinants of Industry Recommendations

This table reports the results of estimating logistic models of the probabilities of issuing an optimistic or pessimistic industry recommendation during our sample period (9/2002-12/2009). Reiterations during a month are excluded. The independent variables are as follows: **Industry_Size** is the natural logarithm of the aggregate market capitalization of the industry at the beginning of the month, **MB** is the industry weighted average of the market-to-book ratio, **Profit** is the industry weighted average of net income margin, **R&D** is the industry weighted average of the R&D divided by sales, **Capex** is the industry weighted average of the capital expenditures divided by sales. Accounting variables are measured at the beginning of the year. All weighted averages are by the firm market-capitalization at the beginning of the year in which a recommendation is issued. **IND_RET** is the return to an industry index in the previous quarters (up to three quarters back). **MKT_RET** is the market return in the previous quarters (up to three quarters back). **TOTAL_IPOSEO** is the total IPO/SEO proceeds in the industry during the year preceding the recommendation. **AVG_IPOSEO** is the average IPO/SEO proceeds in the industry during the year preceding the recommendation. **IPOSEO_PCT** is the percentage of IPO/SEO proceeds in an industry underwritten by the issuing broker during the two years preceding the recommendation, out of all IPO/SEO proceeds underwritten by the same broker during that time period. **Recession** is a dummy variable and takes value of 1 if a recommendation is issued between 12/2007 and 6/2009. **Cyclical** is a dummy variable and takes value of 1 if a recommendation is issued to materials, industrials and IT industries. Marginal effects are reported at medians. In both specifications we control for broker fixed-effects. Robust standard errors (in parentheses) are calculated after clustering at the broker-industry level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Prob(Ind Rec=Optimistic)		Prob(Ind Rec=Pessimistic)	
	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Industry_ Size	-0.0206	-0.0051	-0.0921	-0.0078
	(0.057)		(0.079)	
MB	-0.0022**	-0.0005	0.0018**	0.0002
	(0.001)		(0.001)	
Profit	0.9802*	0.2419	-2.2107***	-0.1867
	(0.506)		(0.747)	
R&D	3.8978**	0.9621	-8.9194***	-0.7535
	(1.637)		(2.135)	
Capex	0.9731***	0.1386	-0.9139*	-0.1151
	(0.325)		(0.495)	
IND_RETt-1	1.3603***	0.2402	-0.9928**	-0.0772
	(0.290)		(0.431)	
IND_RETt-2	0.6947***	0.3357	-1.5756***	-0.0839
	(0.253)		(0.400)	
IND_RETt-3	0.1838	0.1715	-0.6330*	-0.1331
	(0.277)		(0.352)	
MKT_RETt-1	0.3746	0.0454	-1.8627***	-0.0535
	(0.246)		(0.389)	
MKT_RETt-2	-0.4463*	0.0925	-0.1666	-0.1573
	(0.247)		(0.401)	
MKT_RETt-3	0.5615	-0.1102	-1.3627	-0.0141
	(1.695)		(2.469)	
Recession	-0.0046	-0.0011	-0.4836**	-0.0289
	(0.137)		(0.215)	
Cyclical	0.2635**	0.0656	-0.4020**	-0.0336
	(0.126)		(0.167)	
Cyclical*Recession	-0.4223**	-0.1004	0.3543	0.0345
	(0.208)		(0.362)	
TOTAL_IPOSEO	0.1140**	0.0281	-0.0139	-0.0012
	(0.057)		(0.077)	
AVG_IPOSEO	-0.1758**	-0.0434	0.0458	0.0038
	(0.077)		(0.107)	
IPOSEO_PCT	0.6752	0.1667	-1.1361	-0.0960
	(1.952)		(1.613)	
Observations	13,588		13,392	

Table 3 – Summary Statistics on the Industry Recommendation Portfolios

This table reports summary statistics on the industry recommendation portfolios during our sample period (9/2002-12/2009). Our industry portfolios are constructed for each month based on consensus recommendations. A consensus recommendation is defined as the average industry recommendation within the month. In each month we refer to the consensus recommendation for an industry as “optimistic” if this consensus is less than or equal 1.5. We refer to the consensus recommendation as “pessimistic” if it is greater than or equal to 2.5. In all other cases, we refer to the consensus as “neutral.” We then construct three industry portfolios for each month. Portfolio 1 in month *t* consists of all industries that were upgraded to “optimistic” during month *t*-1, Portfolio 3 consists of all industries that were downgraded to “pessimistic” during month *t*-1, and Portfolio 2 consists of all industries that were either upgraded or downgraded into the “neutral” consensus during month *t*-1. Panel A describes basic characteristics about the portfolio formation: the number of months each portfolio is defined over; the average monthly consensus recommendation for all the industries that are part of the portfolio; the average number of industries included in each portfolio per month; the average number of firms (across all industries) in each portfolio; and the total number of different industries which ever enter into the portfolio. Panel B shows various portfolio returns. Industry return is defined as the value-weighted return across all CRSP firms in the relevant month. The monthly return for portfolios 1-3 is the equal weighted return of all industries in the relevant portfolio. “Rec Port 1 minus Rec Port 3” is the self financing investment strategy of buying the industry recommendation portfolio 1 and shorting the industry recommendation portfolio 3.

Panel A – Portfolio Formation Characteristics

Industry Recommendation Portfolio	# of Months	Ave. Monthly Consensus Rec.	Ave. # of Industries per month	Ave. # of Firms	# of industries
1	87	1.29	5.51	667.55	65
2	87	1.92	10.42	1077.11	68
3	65	2.77	2.83	294.98	47

Panel B – Industry Recommendation Portfolio Returns

	Raw Monthly Return					Cumulative Returns		
Industry Recommendation Portfolio	t-2	t-1	t	t+1	t+2	3 months (t, t+2)	6 months (t,t+5)	12 months (t,t+11)
1	0.0115	0.0133	0.0132	0.009	0.0036	0.0262	0.0578	0.0930
p-value	0.0488	0.035	0.0182	0.116	0.5787	0.0339	0.0018	0.0007
2	0.0067	0.0068	0.0121	0.0095	0.0096	0.0313	0.0643	0.0916
p-value	0.2477	0.2405	0.0243	0.1006	0.0785	0.0042	0.0005	0.0008
3	0.0058	-0.002	0.0009	0.01	0.0112	0.0237	0.0533	0.0604
p-value	0.5108	0.8176	0.9223	0.1671	0.182	0.1765	0.0504	0.0830
Rec Port 1 minus Rec Port 3	0.0024	0.0130	0.0136	-0.002	-0.006	0.0065	0.0171	0.0442
p-value	0.7063	0.0491	0.0175	0.6543	0.2757	0.4843	0.2078	0.0222

Table 4 - In-Sample/Out-of-Sample Alphas of Industry Recommendation Portfolios

This table reports the in-sample alphas (Panel A) and the out-of-sample alphas (Panel B) of the industry recommendation portfolios during our sample period (9/2002-12/2009). The in-sample/out-of-sample tests are performed on each portfolio return in month *t* by using Fama-French four-factor model. Our industry portfolios are constructed for each month based on the consensus recommendations. A consensus recommendation is defined as the average industry recommendation within the month. In each month we refer to the consensus recommendation for an industry as "optimistic" if this consensus is less than or equal 1.5. We refer to the consensus recommendation as "pessimistic" if it is greater than or equal to 2.5. In all other cases, we refer to the consensus as "neutral." We then construct three industry portfolios for each month. Portfolio 1 in month *t* consists of all industries that were upgraded to "optimistic" during month *t*-1, Portfolio 3 consists of all industries that were downgraded to "pessimistic" during month *t*-1, and Portfolio 2 consists of all industries that were either upgraded or downgraded into the "neutral" consensus during month *t*-1. Once it enters a portfolio, an industry stays in it for "n" months or until it is upgraded or downgraded. "n" is equal to 1 month, 3 months, 6 months, or 12 months. Industry return is defined as the value-weighted return across all CRSP firms in the relevant month. The monthly return for portfolios 1-3 is the equal weighted return of all industries in the relevant portfolio. "Rec Port 1 minus Rec Port 3" is the self financing investment strategy of buying the industry recommendation portfolio 1 and shorting the industry recommendation portfolio 3.

Panel A –In-Sample Alphas on Industry Recommendation Portfolios

Industry Recommendation Portfolio	1 month	3 months	6 months	12 months
1	0.0054	0.0032	0.0032	0.0035
p-value	0.0204	0.0246	0.0183	0.0110
2	0.0041	0.0017	0.0018	0.0017
p-value	0.0195	0.0679	0.0367	0.0432
3	-0.0110	-0.0057	-0.0058	-0.0052
p-value	0.0060	0.1003	0.0520	0.0837
Rec Port 1 minus Rec Port 3	0.0147	0.0069	0.0071	0.0068
p-value	0.0032	0.0818	0.0397	0.0561

Panel B – Out-of-Sample Alphas on Industry Recommendation Portfolios

Industry Recommendation Portfolio	1 month	3 months	6 months	12 months
1	0.0059	0.0017	0.0020	0.0023
p-value	0.0088	0.3158	0.1492	0.0815
2	0.0014	0.0003	0.00037	0.0003
p-value	0.4054	0.7811	0.7185	0.7901
3	-0.0086	-0.0036	-0.0040	-0.0026
p-value	0.0453	0.2893	0.1586	0.3856
Rec Port 1 minus Rec Port 3	0.0138	0.0031	0.0040	0.0028
p-value	0.0030	0.4059	0.2048	0.3996

Table 5 - Distribution of Industry Recommendations and Firm Recommendations

This table reports the distribution of firm recommendations within industry recommendation levels during our sample period (9/2002 – 12/2009). Industry recommendations are coded as follows: “optimistic”=1, “neutral”=2, “pessimistic”=3. Firm recommendations are coded as follows: “strong buy” and “buy”=1, “hold”=2, “underperform” and “sell”=3.

Industry Recommendation	Firm Recommendation	Frequencies	% of total (Unconditional)	% of industry (Conditional)
1	1	5456	13.33%	42.04%
1	2	5844	14.28%	45.03%
1	3	1678	4.10%	12.93%
Ave. (1)	1.71		31.71%	100.00%
2	1	7485	18.29%	33.54%
2	2	11532	28.18%	51.68%
2	3	3298	8.06%	14.78%
Ave. (2)	1.81		54.53%	100.00%
3	1	1487	3.63%	26.41%
3	2	2879	7.04%	51.14%
3	3	1264	3.09%	22.45%
Ave. (3)	1.96		13.76%	100.00%
p-values				
Ave (1) = Ave (2)	<.0001			
Ave (2) = Ave (3)	<.0001			

Table 6 – Analysts' disclosure about the meaning of firm recommendations

This table reports information regarding the nature of firm recommendations, as it is disclosed by the brokerage houses. We include the 20 largest brokers in terms of the number of recommendations they issued during our sample period (9/2002-12/2009). In addition to the brokerage name and the percentage of recommendations, we indicate whether the recommendations are benchmarked to the industry. We also include an example of the original remark about the adopted benchmark by the brokerage house.

#	Brokerage House	% of recs.	Benchmark is Industry?	Remarks about the benchmark
1	Argus Research	1.46%	No	"We will generally rate a stock a buy if, in our view, the forecast risk-adjusted return on the stock is greater than the forecast return on the market."
2	Banc of America	1.74%	No	"The rating system is based on a stock's forward -12-month expected total return (price appreciation plus dividend yield)."
3	Bear Stearns	2.11%	Yes	"Stock's expected performance vs. analyst's industry coverage for the next 12 months."
4	CIBC	1.52%	Yes	"Stock's expected performance vs. the sector for the next 12-18 months."
5	Credit Suisse First Boston	3.64%	Yes	"Stock's expected total return vs. the industry for the next 12 months."
6	Deutsche Bank	2.04%	No	"Buy: total return expected to appreciate 10% or more over a 12-month period."
7	Friedman Billing	1.51%	Yes	Performance "relative to similar companies within its industry over the next 12-18 months."
8	Goldman Sachs	4.12%	Yes	"Our ratings reflect expected stock price performance relative to each analyst's coverage universe."
9	Jefferies and Co.	1.55%	No	"Buy: describes stocks that we expect to provide a total return of 15% or more within a 12-month period."
10	JP Morgan	3.05%	Yes	"Overweight: Over the next six to twelve months, we expect this stock will outperform the average total return of the stocks in the analyst's (or the analyst's team's) coverage universe."
11	Lehman Brothers	2.16%	Yes	"Stock's performance vs. the industry for a 12 month investment horizon"
12	Merrill Lynch	4.45%	No	"Based on stock's expected total return within a 12 month period."
13	Morgan Stanley	2.77%	Yes	"Stock's total return vs. analyst's coverage on a risk-adjusted basis, for the next 12-18 months."
14	Raymond James	1.76%	No	Performance "relative to the market index over the next 12 months."
15	RBC	1.39%	Yes	"The rating assigned to a particular stock represents solely the analyst's view of how that stock will perform over the next 12 months relative to the analyst's sector"
16	Sidoti	1.37%	No	"Buy implies at least 25% upside over a 12-month period."
17	Smith Barney	3.34%	Yes	"Stock's performance vs. the analyst's industry coverage for the coming 12-18 months."
18	UBS	3.48%	No	"The UBS rating system begins with the analyst determining the forecast stock return over the next 12 months. The forecast stock return relative to a predefined hurdle rate determines the Recommendation (Buy, Neutral, or Sell). This hurdle rate is set on either side of an unbiased estimate of the market's return over the next 12 months."
19	US Bancorp Piper Jaffray	1.96%	No	Performance "relative to the market index over the next 12 months."
20	Wachovia	1.73%	No	Performance "relative to the market over the next 12 months."

Table 7 – Pseudo-Industry Recommendations

This table reports tests on the monthly pseudo-industry recommendations during our sample period (9/2002-12/2009). We use three different ways to define pseudo-industry recommendations. ***All Brokers*** defines monthly pseudo-industry recommendations as the value-weighted firm recommendations issued by all brokers in IBES within a month and an industry. ***Industry Benchmarkers*** defines monthly pseudo-industry recommendations as the value-weighted firm recommendations issued by 10 brokers out of 20 largest brokers in the IBES which use the sector benchmark for firm recommendations. ***Market Benchmarkers*** defines monthly pseudo-industry recommendations as the value-weighted firm recommendations issued by 10 brokers out of 20 largest brokers in the IBES which use the market benchmark for firm recommendations. Panel A presents summary statistics of each type of pseudo-industry recommendations. Panel B presents the correlation among the three pseudo-industry recommendations and the true industry recommendation. Panel C shows the in-sample/out-of-sample alphas of portfolios constructed based on each type of pseudo-industry recommendations. The portfolios are constructed in a manner similar to those in Table 3.

Panel A – Summary Statistics

	Pseudo-industry recommendation		
	N	Average	STD
All brokers	5598	1.6227	0.3316
10 industry benchmarkers	4999	1.7143	0.4392
10 industry market benchmarkers	5040	1.6180	0.4475
Real-industry recommendation	4476	1.8541	0.4941

Panel B – Correlation Matrix

	Pseudo Ind. Rec. (All brokers)	Pseudo Ind. Rec. (Industry Benchmarkers)	Pseudo Ind. Rec. (Market Benchmarkers)	Real-industry Recs
Pseudo Ind. Rec. (All brokers)	1			
Pseudo Ind. Rec. (Industry Benchmarkers)	0.5207	1		
Pseudo Ind. Rec. (Market Benchmarkers)	0.4887	0.1191	1	
Real Industry Recs	0.1582	0.1432	0.1054	1

Panel C –In-Sample/ Out-of-Sample Alphas

	In-Sample Alphas			Out-of-Sample Alphas		
Portfolio	All Brokers	Industry Benchmarkers	Market Benchmarkers	All Brokers	Industry Benchmarkers	Market Benchmarkers
1	0.0031	0.0024	0.0042	0.0026	0.0013	0.0036
p-value	0.1088	0.2368	0.0109	0.1470	0.5689	0.0166
2	-0.0007	0.0008	-0.0010	0.0006	0.0012	-0.0024
p-value	0.7372	0.6065	0.4760	0.7365	0.4615	0.1525
3	0.0076	0.0018	-0.0129	0.0002	-0.0020	-0.0019
p-value	0.1763	0.7299	0.0522	0.9785	0.6775	0.7903
Port 1 minus Port 3	-0.0046	-0.0011	0.0167	-0.0046	0.0025	0.0013
p-value	0.5079	0.8671	0.0138	0.7107	0.8178	0.5032

Table 8 – In-Sample/Out-of-Sample Alphas of Portfolios Sorted by Firm and Industry Recommendations

This table presents the performance of portfolios sorted by both firm recommendations and industry consensus recommendations during our sample period (9/2002-12/2009). For each month *t*, firms are first sorted based on the consensus industry recommendation, and then are sorted based on firm recommendations (upgrades and downgrades). Industry recommendation portfolios are constructed as follows: for each month the consensus industry recommendation is defined as the average industry recommendation within the month. In each month we refer to the consensus recommendation for an industry as "optimistic" if this consensus is less than or equal 1.5. We refer to the consensus recommendation as "pessimistic" if it is greater than or equal to 2.5. In all other cases, we refer to the consensus as "neutral." We then construct three industry portfolios for each month. Portfolio 1 in month *t* consists of all industries that were upgraded to "optimistic" during month *t*-1, Portfolio 3 consists of all industries that were downgraded to "pessimistic" during month *t*-1, and Portfolio 2 consists of all industries that were either upgraded or downgraded into the "neutral" consensus during month *t*-1. Firm recommendation portfolios are constructed as follows: For each stock, we count the number of upgrades and number of downgrades that the stock received in month *t*-1. Portfolio U includes stocks with a larger number of upgrades than downgrades, while portfolio D includes stocks with more downgrades. Once it enters a portfolio, a firm will stay in the portfolio for "n" months or until its firm recommendation/industry recommendation is changed. "n" is equal to 1 month, 3 months, 6 months, or 12 months. (1,U) refers to the portfolio which belongs to both industry recommendation portfolio 1 and firm recommendation portfolio U. (3,D) refers to the portfolio which belongs to both industry recommendation portfolio 3 and firm recommendation portfolio D. "(1,U) minus (3,D)" refers to the investment strategy of buying portfolio (1,U) and shorting portfolio (3,D). Out-of-sample tests are performed on the portfolio return in month *t* by using Fama-French four-factor model.

Panel A – In-Sample Alphas

	1 month		3 months		6 months		12 months	
	Firm Recommendation Portfolios		Firm Recommendation Portfolios		Firm Recommendation Portfolios		Firm Recommendation Portfolios	
Industry Recommendation Portfolios	U	D	U	D	U	D	U	D
1	0.0128	0.0101	0.0065	0.0080	0.0049	0.0069	0.0058	0.0067
p-value	0.0048	0.0371	0.0247	0.0173	0.0855	0.0400	0.0390	0.0470
2	0.0090	0.0018	0.0073	-0.0008	0.0067	-0.0002	0.0060	-0.0002
p-value	0.0014	0.4823	0.0000	0.6012	0.0000	0.8739	0.0001	0.9133
3	-0.0078	-0.0232	-0.0081	-0.0129	-0.0112	-0.0188	-0.0102	-0.0184
p-value	0.2332	0.0030	0.0653	0.0270	0.0029	0.0003	0.0052	0.0001
Ind. Rec. Port 1 minus Ind. Rec. Port 3	0.0208	0.0269	0.0130	0.0155	0.0147	0.0204	0.0146	0.0197
p-value	0.0216	0.0070	0.0378	0.0132	0.0068	0.0005	0.0050	0.0004
(1,U) minus (3,D)	0.0373		0.0177		0.0222		0.0227	
p-value	0.0003		0.0173		0.0007		0.0002	

Table 8 (*continued*)

Panel B – Out-of-Sample Alphas

Industry Recommendation Portfolios	1 month Firm Recommendation Portfolios U	1 month D	3 months Firm Recommendation Portfolios U	3 months D	6 months Firm Recommendation Portfolios U	6 months D	12 months Firm Recommendation Portfolios U	12 months D
1	0.0144	0.0150	0.0057	0.0096	0.0039	0.0084	0.0049	0.0079
p-value	0.0006	0.0053	0.0350	0.0111	0.1310	0.0243	0.0485	0.0330
2	0.0050	-0.0006	0.0040	-0.0021	0.0036	-0.0011	0.0030	-0.0015
p-value	0.0622	0.8342	0.0252	0.2894	0.0210	0.5355	0.0477	0.4197
3	-0.0065	-0.0169	-0.0046	-0.0119	-0.0074	-0.0157	-0.0067	-0.0137
p-value	0.3330	0.0246	0.2840	0.0873	0.0463	0.0037	0.0566	0.0046
Ind. Rec. Port 1 minus Ind. Rec. Port 3	0.0233	0.0284	0.0083	0.0160	0.0095	0.0189	0.0097	0.0163
p-value	0.0113	0.0061	0.1393	0.0225	0.0499	0.0014	0.0033	0.0020
(1,U) minus (3,D)	0.0330		0.0161		0.0183		0.0171	
p-value	0.0007		0.0393		0.0031		0.0020	

Table 9 – Robustness for Momentum

This table reports the robustness of the investment value of industry recommendation portfolios after controlling for industry momentum. For each month *t* during our sample period (9/2002-12/2009), we construct three momentum portfolios based on the cumulative industry returns in the previous six months. Momentum portfolio 1 contains the top 15% of industries with the highest past returns, and momentum portfolio 3 contains the bottom 15% of industries with the lowest past returns. Industry return is defined as the value-weighted return across all CRSP firms in the relevant industry in month *t*. **Panel A** reports the overlap between industry momentum portfolios and industry recommendation portfolios. **Panel B** reports the out-of-sample alphas of momentum portfolios. The monthly return for momentum portfolios 1-3 is the equal weighted return of all industries in the relevant portfolio. "Mom Port 1 minus Mom Port 3" is the self financing investment strategy of buying the industry momentum portfolio 1 and shorting the industry momentum portfolio 3. "Rec Port 1 minus Rec Port 3" is the self financing investment strategy of buying the industry recommendation portfolio 1 and shorting the industry recommendation portfolio 3. The in-sample/out-of-sample tests are performed on the portfolio return in month t by using Fama-French four-factor model. **Panel C** reports the in-sample/out-of-sample alphas of industry recommendation portfolios net of momentum portfolios. More specifically, industries which belong to momentum portfolio 1 (3) are excluded from industry recommendation portfolio 1 (3). **Panel D** reports the results of analyzing the performance of industry recommendation portfolios by using Fama-Macbeth regressions. The dependent variable is the industry recommendation portfolio return in month *t*. Details on the construction of industry recommendation portfolios are discussed in table 3. The independent variables are as follows**: Port** takes value of 1 (2 or 3) if an industry belongs to industry recommendation portfolio 1 (2 or 3) in month t, **Ind_Rec** is the consensus industry recommendation (i.e. the average of all industry recommendations) in month *t-1*, **Firm Size** is the value-weighted average firm size in an industry in month *t-1*, **MB** is value weighted market-to-book ratio in an industry in previous year, **Market_Beta** is the an industry's market beta estimated using previous 60-month return data, and **Past_Ind_Ret** is the cumulative industry return from month t-6 to month t-1. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A - The overlap between industry momentum portfolios and industry recommendation portfolios

Industry recommendation Portfolio	Momentum Portfolio	No. of Industries	% of total (conditional)
1	1	87	17.94%
1	2	340	70.10%
1	3	58	11.96%
		485	100.00%
2	1	119	12.98%
2	2	652	71.10%
2	3	146	15.92%
		917	100.00%
3	1	19	10.33%
3	2	127	69.02%
3	3	38	20.65%
		184	100.00%

Table 9 (*continued*)

Panel B –Four Factor Alphas on Momentum Portfolios

Momentum Portfolio	In-Sample Alpha	Out-of-Sample Alpha
1	0.0027	-0.0027
p-value	0.2582	0.3056
2	0.0004	0.1132
p-value	0.6385	0.9101
3	0.0003	0.0044
p-value	0.9106	0.1337
Mom Port 1 minus Mom Port 3	0.0005	-0.0090
p-value	0.9132	0.0511

p-value - Out-of-Sample Alpha
(Mom Port 1 minus Mom Port 3) vs. (Rec Port 1 minus Rec Port 3): 0.0005

Panel C- Alphas for Industry Recommendations Net of Momentum Portfolios

Industry Recommendation Portfolio (One Month)	In-Sample Alpha	Out-of-Sample Alpha
1	0.0054	0.0098
p-value	0.0159	0.0004
2	0.0041	0.0014
p-value	0.0195	0.4054
3	-0.0079	-0.0053
p-value	0.0530	0.2036
Ind. Rec. Port 1 minus Ind. Rec. Port	0.0122	0.0145
p-value	0.0071	0.0031

Table 9 (*continued*)

Panel D – Cross-Sectional Analysis of Industry Recommendation Portfolios

	(1)	(2)	(3)	(4)
Port	-0.0045**	-0.0069***		
	(0.0023)	(0.0023)		
Ind_Rec			-0.0058*	-0.0068**
			(0.0031)	(0.0033)
Log(Firm Size)		-0.0018		-0.0011
		(0.0016)		(0.0017)
Log(1+MB)		0.0053		0.0068
		(0.0085)		(0.0081)
Market_Beta		0.0028		0.0028
		(0.0048)		(0.0048)
Past_Ind_Ret		0.0083		0.0124
		(0.025)		(0.0242)
Constant	0.0177***	0.0251	0.0202***	0.0177
	(0.0056)	(0.0175)	(0.0066)	(0.0185)
Observations	1,548	1,548	1,548	1,548
R-squared	0.066	0.505	0.083	0.512
Number of groups	87	87	87	87