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## Article

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# Firm-specific information, analysts' superiority and investment value



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## ABSTRACT

Using a sample of Chinese security analysts' recommendations from 2005 to 2010, we examine the source of analysts' superiority and the investment value of their recommendations. Using a calendar-time portfolio approach, we find that, on average, analysts' recommendations are valuable and that analysts are better at analyzing and transferring firm-specific information than market-wide or industry-level information. In addition, we show that the investment value of recommendations increases as firm-specific information becomes more important in stock pricing. Our empirical results are useful in guiding investors and helping brokerage houses to evaluate the output of research departments.

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## 1. Introduction

The securities analyst industry has grown rapidly with the development of the Chinese capital market. The number of practitioners, their salaries and the market influence of the securities consulting industry has undergone rapid changes over the past few years. Meanwhile, problems related to security analysts, such as the value of the securities analyst industry, the information content of analysts' research reports and the investment value of analysts' recommendations, have caused great concern among academics and practitioners.

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The solutions to these issues will inevitably involve studying analysts' expertise. According to the efficient market hypothesis (EMH), Roll (1988) decomposes the information incorporated into stock prices into three types: market-level, industry-level and firm-specific information. However, the extent to which these three types of information explain the variations in firms' stock returns varies. If firms' stock returns are mainly explained by firm-specific information, investors have a greater need for firm-specific information than for market- or industry-level information. In this case, security analysts who are good at analyzing and transferring firm-specific information will be favored, as their research reports are better able to alleviate the information asymmetry between listed companies and investors. In contrast, if firms' stock returns are mainly explained by industry-level information, then security analysts who are good at analyzing and transferring industry-level information will perform better. Unfortunately, previous studies still provide no consistent conclusion on what makes a superior securities analyst. Some studies have shown that analysts' expertise lies in analyzing and transferring firm-specific information (e.g., Grossman and Stiglitz, 1980; Diamond and Verrecchia, 1991; Bhushan, 1989; Ramnath et al., 2008; Palmon and Yezegel, 2012). Other scholars suggest that analysts play an important role during the process of searching, analyzing and transferring industry-level information (e.g., Piotroski and Roulstone, 2004; Chan and Hameed, 2006). The conclusions of these studies are inconsistent due to differences in their research samples and designs. As a securities analyst may be good at analyzing and transferring either firm-specific or industry-level information, which of these is superior is an empirical question. This study attempts to answer the question of what constitutes security analysts' superiority and their role in the capital market.

In this paper, we use 192,012 recommendations issued by Chinese security analysts from 2005 to 2010 and use a calendar-time portfolio approach to study the following two questions: (1) what constitutes Chinese security analysts' superiority? and (2) how do the demand and supply factors of analysts' research activities influence the investment value of recommendations? We calculate three estimates of abnormal returns for each portfolio, namely market-adjusted returns, the intercept of the Capital Asset Pricing Model (CAPM) and the intercept of the Fama and French (1993) three-factor model. The empirical results indicate, first, that Chinese security analysts are better at analyzing and transferring firm-specific information than market- or industry-level information. Specifically, *ceteris paribus*, analysts' research reports increase the ability of firm-specific information to explain variations in stock returns, but reduce the ability of market- and industry-level information to explain variations in firms' stock returns. In addition, covering more firms in the same industry does not improve security analysts' ability to capture the changes in industry-level information and hence improve the investment value of their recommendations. Second, analysts' recommendations have greater investment value when firm-specific information plays a major role in stock pricing, but there is no significant difference in investment value when industry-level information plays a major role in stock pricing.

This paper helps us to understand the comparative advantages of analysts and enriches the literature on the relationship between analyst behavior and  $R^2$ . Assessing the investment value of analysts' recommendations is actually identical to identifying and confirming the source of analysts' superiority. Loh and Mian (2006) suggest that the comparative advantages of superior analysts lie in their ability to accurately predict accounting earnings and then convert them into stock recommendations. Hence, they examine the investment value of recommendations based on the accuracy of accounting earnings predictions. Palmon and Yezegel (2012) shows that the advantages of analysts lie in analyzing and transferring firm-specific information, and thus uses the R&D expenditure ratio (as a proxy of the degree of information asymmetry between listed companies and investors) to measure the investment value of analysts' recommendations. As the investment value is rooted in analysts' comparative advantages, any empirical findings regarding when and which research reports have greater investment value will also help to explain analysts' comparative advantages. Our study indicates that Chinese security analysts are better at processing firm-specific than industry information. Unlike Piotroski and Roulstone (2004), who only explore the relationship between the number of analysts following and  $R^2$ , this study combines the supply and demand factors of analysts' research activities and provides more direct and convincing empirical evidence for how analysts' recommendations influence stock prices, which enriches the literature on the relationship between analyst behavior and  $R^2$ .

## 2. Literature view and hypotheses development

Roll (1988) decomposes information into market-level, industry-level and firm-specific information. He points out that firms' stock returns should be explained by these three kinds of information under the EMH. The extent to which market, industry and firm-level information explain variations in firms' stock returns are calculated as follows.

$$R_{i,j,t} = \alpha_i + \beta_i \cdot R_{m,t} + \varepsilon_{i,j,t} \quad (1)$$

$$R_{i,j,t} = \alpha_i + \beta_i \cdot R_{m,t} + \gamma_i \cdot R_{j,t} + \varepsilon_{i,j,t} \quad (2)$$

where  $R_{i,j,t}$  denotes the stock return for firm  $i$  in industry  $j$  on day  $t$ ,  $R_{m,t}$  denotes the value-weighted market return on day  $t$  and  $R_{j,t}$  denotes the industry return for industry  $j$  on day  $t$ . The regression statistic for model (1),  $R^2$ , measures the percentage of the variation in firms' stock returns that is explained by market-level information. The regression statistic for model (2),  $R^2$ , measures the percentage of the variation in firms' stock returns that is explained by market- and industry-level information. Thus, the difference in  $R^2$  between model (2) and model (1) represents the percentage of the variation in firms' stock returns that is explained by industry-level information.  $1 - R^2$  measures the percentage of the variation in firms' stock returns that is explained by firm-specific information. Roll (1988) shows that on average, only 20–30% of the variation in stock returns can be explained by market- and industry-level information. Morck et al. (2000) find that  $R^2$  is lower in developed than in emerging economies and conclude that the high  $R^2$  in emerging economies is associated with poor protection of investor property rights, thus reducing investors' incentives to use firm fundamentals. They also propose the concept of synchronicity to reflect the extent to which stock returns tend to move together. Based on the study by Morck et al. (2000), Durnev et al. (2003) further explore the economic consequences of  $R^2$  and find that a lower  $R^2$  indicates more information about future earnings in current stock returns, and vice versa. They argue that stock markets with more synchronous returns exhibit lower efficiency, which means that the degree of stock price synchronicity is no longer a neutral phenomenon.

It should be noted that Morck et al. (2000) define two stock price synchronicity measures:  $F$ , defined as the fraction of stocks in a country whose prices rise (or fall) and weighted  $R^2$ .  $F$  represents the proportion of stock prices that move in the same direction within a country, a higher  $F$  indicates that stock prices frequently move together.  $R^2$  represents the relationship between stock returns and market returns (i.e. the extent to which market returns explains variations in firms' stock returns). In contrast to  $F$ ,  $R^2$  neither reflects the relationship between two changes (in the same or the opposite direction), nor characterizes the magnitude of the changes. In fact, it is hard to judge whether a high  $R^2$  is a good or bad phenomenon. The use of the word synchronicity seems to imply that a high  $R^2$  is a bad phenomenon. For example, Jin and Myers (2006) suggest that  $R^2$  can be used as an indicator of a firm's transparency. Opaque stocks with a high  $R^2$  are also more likely to crash.

However, other studies do not support the interpretation of Morck et al. (2000), while agreeing with Roll's (1988) classification of information. For example, Piotroski and Roulstone (2004) find that  $R^2$  is positively associated with analyst forecasting activities in the U.S., consistent with analysts increasing the amount of industry-level information in prices through intra-industry information transfers. Therefore, a higher  $R^2$  neither indicates a less efficient market, nor greater opacity. Chan et al. (2013) show that a higher  $R^2$  improves liquidity, contradicting the view that it is usually negatively related to market efficiency and firm transparency. Kelly (2005) also opposes the view of Durnev et al. (2003) that  $R^2$  can be used as a proxy for information efficiency. Teoh et al. (2007) consider that a lower  $R^2$  is the result of noisy trading and Hou et al. (2013) also doubt the conclusion that a lower  $R^2$  is associated with higher pricing efficiency.

From this contradictory evidence, we can draw the following two conclusions. First, the factors that influence  $R^2$  are varied and it is hard to judge whether a high  $R^2$  is good or bad. Second, regardless of the cause of a high  $R^2$  and whether it is a good or bad phenomenon, Roll (1988) interprets  $R^2$  as the extent to which market- and industry-level information explains the variation in firms' stock returns. Brockman and Yan (2009) use  $1 - R^2$  as a proxy of the percentage of the variation in a firm's stock returns that is directly explained by firm-specific information.

Feng et al. (2009) also justify that  $R^2$  can be used as a proxy for measuring private information arbitrage activities. However, we argue that this may be open to question. The direct extension of Roll's interpretation is

that  $R^2$  measures whether firm-specific information is valuable. Specifically, a low  $R^2$  indicates that the ability of market- and industry-level information to explain the variation in firms' stock returns is weak, thus firm-specific information plays a more important role in predicting stock returns. In contrast, a high  $R^2$  illustrates that market- and industry-level information can easily predict firm performance, while firm-specific information is relatively less important. Here, firm-specific information is not necessarily private information. For example, announcements of accounting earnings, mergers and acquisitions, and management turnovers are all types of firm-specific information, but are not necessarily private information. Roll (1988) excludes stock returns near the event day to investigate the effect of market- and industry-level information on  $R^2$ . Using a clean sample that is unaffected by firm-specific information, the results show that  $R^2$  does not improve significantly, confirming the existence of private information. However, due to the following reasons, there are still some problems with Roll's (1988) method. First, for firms with different  $R^2$ , firm-specific information does not have the same importance, thus the extent of the effect of such information on stock returns is distinct. Roll's approach underestimates the influence of events for firms with low  $R^2$  and overestimates it for firms with high  $R^2$ . As the magnitude of  $R^2$  measured by Roll's (1988) method is low, excluding daily stock returns near the event day will seriously underestimate the influence of firm-specific information. Second, as firm-specific information is endless, it is difficult to perfectly exclude the effect of events from two newspapers, thus underestimating the influence of firm-specific information. Therefore, a low  $R^2$  does not necessarily imply the existence of private information, but it must indicate that firm-specific information is very important.

In summary, we suggest that  $R^2$  can be used as an indicator to measure the importance of firm-specific information in stock pricing. The higher the value of  $R^2$ , the less important firm-specific information is.

Yang et al. (2014) examine whether the research reports of Chinese security analysts have investment value and find that, on average, analysts' recommendations are valuable. Specifically, the duration of the investment value is quite short (usually a couple of days) when it comes to favorable recommendations, while the duration is much longer (usually several months) when it comes to unfavorable recommendations. Furthermore, they also investigate the difference in investment value between star analysts' and non-star analysts' research reports. The empirical results show that the investment value of favorable recommendations issued by star analysts is greater than non-star analysts, while the difference in investment value is not significant for unfavorable recommendations. Unlike Yang et al. (2014), we attempt to answer the question of what constitutes the Chinese security analysts' superiority, which helps to understand the comparative advantages of analysts.

In fact, the expertise of security analysts is examined extensively in the literature and the majority of studies investigate whether analysts are able to identify the effect of a specific accounting variable or economic event. Piotroski and Roulstone (2004) investigate the relationship between the number of analysts following and  $R^2$ , and the results confirm that analysts are good at analyzing and transferring industry-level information. The advantage of our research is that it examines the relationship between analysts' recommendations and  $R^2$  to provide a better understanding of the influence of analysts' behavior, and thus provides more direct evidence on the source of analysts' superiority. Therefore, we aim to answer the following three questions.

First, once research reports are issued, the extent to which market- and industry-level information can explain the variation in firms' stock returns will increase if the security analysts are mainly analyzing and transferring industry-level information, thus increasing  $R^2$ . Therefore, we expect that  $R^2$  should decrease if daily stock returns around the report announcement date are removed. Conversely, when analysts are good at analyzing and transferring firm-specific information, we expect that  $R^2$  should increase if daily stock returns around the event day are excluded. Considering that the main role of analysts is to improve the extent to which firm-specific information explains the variation in firms' stock returns,  $R^2$  should decline. Based on the above analysis, we propose the following two competing hypotheses.

**H1a.** The release of research reports increases firms'  $R^2$  when security analysts are good at analyzing and transferring industry-level information.

**H1b.** The release of research reports decreases firms'  $R^2$  when security analysts are good at analyzing and transferring firm-specific information.

Second, both Clement (1999) and Jacob et al. (1999) find that the accuracy of an analyst's earnings forecasts is negatively associated with the number of firms and industries that the analyst covers (proxy for the degree of analyst expertise). To further test the influence of analysts' superiority, we examine the relationship between the number of firms in the same industry that the analyst covers and the investment value of research reports. Analysts covering a larger number of firms in the same industry should be able to obtain more timely and accurate industry-level information, thus improving the investment value of research reports when security analysts are good at analyzing and transferring such information. Conversely, when analysts are not good at analyzing and transferring industry-level information, covering more firms in the same industry should not bring additional knowledge or improve the investment value of their research reports. Based on the above analysis, we propose the following two competing hypotheses.

**H2a.** The investment value of research reports is positively associated with the number of firms in the same industry that a securities analyst covers when the analyst is good at analyzing and transferring industry-level information.

**H2b.** The investment value of research reports is unrelated to the number of firms in the same industry that a securities analyst covers when the analyst is good at analyzing and transferring firm-specific information.

The supply factors that influence analysts' activities are discussed above. Next, we analyze the demand factors that derive from the information asymmetry in the capital market. However, the concept of information asymmetry is used as a general term because different firms have varied information asymmetry. For example, Bradshaw et al. (2001) and Barth et al. (2001) point out that accruals and intangible assets are important sources of information asymmetry. Palmon and Yezegel (2012) argue that the R&D expenditure ratio is also an important source of information asymmetry. All of these types of information asymmetry affect the behavior of security analysts. Lang and Lundholm (1996), Healy and Palepu (2001) and Byard and Shaw (2003) use different disclosure indices to measure the degree of information asymmetry, and examine the influence of these indices on analyst behavior. We can see that information asymmetry is varied and the key question is which types of information are most important. Although previous studies examine several types of information asymmetry, none considers which type of information is the most valuable overall. In fact, prior studies only examine incremental information asymmetry caused by a particular account, which is not necessarily the most important demand from the perspective of analysts' activities.

By combining the supply and demand factors of analysts' research activities, this study attempts to provide a more comprehensive framework to investigate these research questions. As mentioned, Roll (1988) decomposes the information incorporated into stock prices into three kinds of information: market-wide, industry-level and firm-specific information. Specifically, market-wide information such as monetary policy, fiscal policy and market shocks is value relevant for all stocks. Industry-level information such as industry policy and industry shocks is value relevant for all stocks in a particular industry. Firm-specific information such as announcements of accounting earnings, dividends and mergers and acquisitions is value relevance for a particular stock.

Theoretically, all of the company's stock returns can be explained by these three types of information, but the extent to which market-, industry- and firm-level information explain the variation in a firm's stock returns differs. Dechow et al. (2010) suggest that a firm's fundamental earnings process is jointly determined by its operating cycle, macro environment, investment opportunities, management and other firm characteristics. These firm characteristics not only affect the profitability of the company directly, but also determine the importance of different types of information for stock pricing. For some companies, industry-level information is more important, whereas for others, firm-specific information may be more important. This study attempts to identify which type of information asymmetry is the most important, thus resulting in the demand for analysts' activities. If companies' stock returns are mainly explained by industry-level (firm-specific) information, investors will have a great need for analysts who are good at searching and analyzing industry-level (firm-specific) information.

Our research combines the supply and demand factors of analysts' research activities to examine the investment value of analysts' recommendations. Table 1 summarizes the framework of supply and demand factors.



**Table 1** illustrates that if firms' stock returns are mainly explained by industry-level information, the supply and demand of security analysts' activities will match perfectly if the analysts are good at analyzing and transferring such information. In this case, their research reports have higher investment value because they are better able to alleviate the information asymmetry. In contrast, the supply and demand of analysts' activities will be mismatched if the analysts are good at analyzing and transferring firm-specific information. In this case, their research reports have lower investment value because they have limited ability to alleviate the information asymmetry. If firms' stock returns are mainly explained by firm-specific information, the supply and demand of analysts' activities will match perfectly if the analysts are good at analyzing and transferring such information. In this case, their research reports have greater investment value because they are better able to alleviate the information asymmetry. Conversely, the supply and demand of analysts' activities will be mismatched if the analysts are good at analyzing and transferring industry-level information. In this case, their research reports have lower investment value because they have limited ability to alleviate the information asymmetry. Based on the above analysis, we propose the following pair of competing hypotheses.

**H3a.** Analysts' research reports have greater investment value when industry-level information plays a more important role in stock pricing.

**H3b.** Analysts' research reports have greater investment value when firm-specific information plays a more important role in stock pricing.

### 3. Research design

Following previous studies (Barber et al., 2001; Loh and Mian, 2006), we construct calendar-time portfolios to calculate the abnormal returns of analysts' recommendations. This methodology was initially used by Jaffe (1974) and Mandelker (1974), and was strongly supported by Fama (1998). Compared with buy-and-hold portfolios, our methodology has several advantages. First, bad-model problems are more acute with long-term buy-and-hold abnormal returns, which compound an expected-return model's problems in explaining short-term returns (Fama, 1998). Second, it is difficult to control for intra-portfolio correlations and easy to obtain significant results when we estimate the long-term buy-and-hold abnormal returns. Conversely, using calendar-time portfolios to calculate long-term abnormal returns automatically cancels out the intra-portfolio correlations. Last but not least, the calendar-time portfolio approach is more investor-oriented and more feasible as an investment strategy.

In this paper, we construct two kinds of portfolios, one based on analysts' consensus recommendations and another based on revised or initial recommendations. As we need a long period to calculate analysts' consensus recommendations, the former portfolio is used to examine the long-term investment value of research reports, while the latter portfolio is more suitable to examine the short-term investment value because the exact recommendation dates are available.

#### 3.1. Test of Hypothesis 1

To investigate the influence of research reports issued by security analysts on a firm's  $R^2$  (i.e. Hypothesis 1), we use the following procedure.

First, using daily stock returns from day  $T - 2X$  to  $T - 1$  (where  $X = 30, 90, 180$ ), we regress model (3) and model (4) by firm to estimate the  $R^2$  statistic, respectively.

$$R_{i,j,t} = \alpha_i + \beta_{1,i} \cdot R_{m,t} + \beta_{2,i} \cdot R_{m,t-1} + \varepsilon_{i,j,t} \quad (3)$$

$$R_{i,j,t} = \alpha_i + \beta_{1,i} \cdot R_{m,t} + \gamma_{1,i} \cdot R_{j,t} + \beta_{2,i} \cdot R_{m,t-1} + \gamma_{2,i} \cdot R_{j,t-1} + \varepsilon_{i,j,t} \quad (4)$$

where

$$R_{j,t} = \sum_{k \in j} R_{k,j,t} \cdot W_{k,j,t} - R_{i,j,t} \cdot W_{i,j,t}$$

Table 1

Analysis of supply and demand factors in the investment value of recommendations.

Type of information asymmetry	Analysts' superiority	
	Industry-level information	Firm-specific information
Stock returns are mainly explained by industry-level information	High investment value (perfect match between supply and demand)	Low investment value (mismatch between supply and demand)
Stock returns are mainly explained by firm-specific information	Low investment value (mismatch between supply and demand)	High investment value (perfect match between supply and demand)

$$R_{m,t} = m_t - (R_{j,t} + R_{i,j,t} \cdot W_{i,j,t}) \cdot W_{j,t}$$

where  $R_{i,j,t}$  denotes the stock return for firm  $i$  in industry  $j$  on day  $t$ .  $R_{j,t}$  denotes the industry return for industry  $j$  on day  $t$  with  $R_{i,j,t}$  omitted. The industry classification criteria are based on the “Industry Classification Guidance for Listed Companies” published by the China Securities Regulatory Commission (CSRC) in 2001. We adopt a three-digit code category for the manufacturing industry (C) and a two-digit code category for other industries. We also restrict industries with no less than 10 listed companies when calculating industry returns.  $R_{m,t}$  denotes the value-weighted market return on day  $t$  with  $R_{j,t}$  omitted.  $W_{k,j,t}$ ,  $W_{i,j,t}$  and  $W_{j,t}$  represent the weight of market capitalization on day  $t$ .

The  $R^2$  regression statistic for model (3) measures the percentage of the variation in firms' stock returns that is explained by market-level information. The  $R^2$  regression statistic for model (4) measures the percentage of the variation in firms' stock returns that is explained by market- and industry-level information. Therefore, the difference between the  $R^2$  values for models (3) and (4) represents the percentage of the variation in firms' stock returns that is explained by industry-level information.

Second, for each firm  $i$ , we exclude daily stock returns on the day before, the day of and the day following the recommendation date, and re-regress model (4) to estimate  $R^2_{new}$ .

Finally, we test the difference between  $R^2$  and  $R^2_{new}$ . An  $R^2$  value that is higher (lower) than the  $R^2_{new}$  value indicates that security analysts are good at analyzing and transferring industry-level (firm-specific) information, thus increasing (decreasing)  $R^2$ .

### 3.2. Test of Hypothesis 2

To examine whether the number of firms that analysts cover in the same industry affects the investment value of research reports (i.e. Hypothesis 2), we adopt the following procedure.

We begin with a simple calculation of the number of firms covered by each analyst and for each industry. For each analyst, the number of firms in the same industry covered is calculated on a 180-day window before day  $T$  (i.e. from day  $T - 180$  to  $T - 1$ ). The industry classification is defined as described in Section 3.1.

Next, we divide the sample into low and high groups according to the median number of firms that the analysts cover in the same industry.

Finally, we test the difference in the investment value of the two groups for each of our constructed portfolios. We calculate three estimates of abnormal returns for each portfolio, namely market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model. All portfolio returns are monthly returns.

For the revised or initial recommendations portfolio, the portfolio on date  $T$  is constructed as follows. We purchase stocks depending on the revised or initial recommendations during the  $T - d$  to  $T - 1$  period (where  $d = 1, 5, 7$ ).<sup>1</sup> Specifically, we purchase stocks with initial recommendations no higher than 2, or upgrade ratings with new recommendations no higher than 2.<sup>2</sup>

<sup>1</sup> All recommendations of strong buy, buy, hold, sell and strong sell are defined as integer numbers between 1 and 5, respectively. In other words, a rating of 1 reflects a strong buy recommendation, 2a buy, 3a hold, 4a sell and 5a strong sell.

<sup>2</sup> Given that downgrade recommendations are rare in our sample, we do not construct short portfolios.



For the consensus recommendations portfolio, the portfolio on date  $T$  is constructed as follows. We begin by calculating the consensus recommendations of each covered firm during the  $T - X$  to  $T - 1$  period (where  $X = 30, 90, 180$ ) according to model (5). Then, we purchase stocks in the portfolio with consensus recommendations no higher than 2 and sell short stocks in the portfolio with consensus recommendations higher than 2.5. Stocks with consensus recommendations between 2 and 2.5 are excluded from the transactions to reduce the effect of analyst optimism (Barber et al., 2001; Loh and Mian, 2006).

$$\text{Consensus}_{i,T-1,T-X} = \frac{1}{N_{i,T-1,T-X}} \sum_{j=1}^{N_{i,T-1,T-X}} \text{Rec}_{i,j,T-1,T-X} \quad (5)$$

where  $N_{i,T-1,T-X}$  is the number of recommendations for firm  $i$  during the  $T - X$  to  $T - 1$  period,  $\text{Rec}_{i,j,T-1,T-X}$  is the standardized analyst recommendation of analyst  $j$  for firm  $i$ . All recommendations of strong buy, buy, hold, sell and strong sell are defined as integer numbers between 1 and 5, respectively.

### 3.3. Test of Hypothesis 3

To examine how the supply and demand factors affect the investment value of research reports (i.e. Hypothesis 3), we sort the sample by the extent to which firm-specific and industry-level information explain the variation in firms' stock returns, respectively.

- (1) Sort by the extent to which firm-specific information explains the variation in stock returns.

First, we regress model (4) by firm to calculate the extent to which firm-specific information explains the variation in stock returns from day  $T - 60$  to  $T - 1$  (i.e.  $1 - R^2$ ), and classify all covered firms into one of five groups.

Second, for each group, using the investment strategy in Section 3.2, we construct two kinds of portfolios based on consensus recommendations and revised recommendations, respectively. After determining the composition of each portfolio on date  $T - 1$ , the value-weighted portfolio returns are calculated.

Finally, we calculate three estimates of abnormal returns for each portfolio, namely market-adjusted returns, the intercept of CAPM and the intercept of the Fama-French three-factor model.

- (2) Sort by the extent to which industry-level information explains the variation in stock returns.

First, using daily returns from day  $T - 60$  to  $T - 1$ , we regress models (3) and (4) for each firm to calculate  $R^2$ , respectively. The difference in  $R^2$  between models (3) and (4) measures the extent to which industry-level information explains the variation in firms' stock returns. We classify all covered firms into one of five groups.

Second, for each group, using the investment strategy in Section 3.2 we construct two portfolios based on consensus recommendations and revised recommendations, respectively. After determining the composition of each portfolio on date  $T - 1$ , the value-weighted portfolio returns are calculated.

Finally, we calculate three estimates of abnormal returns for each portfolio, namely market-adjusted returns, the intercept of CAPM and the intercept of the Fama-French three-factor model.

## 4. Empirical results

### 4.1. Sample selection and data sources

We obtain analysts' recommendation data from the WIND database during the 2005–2010 period. The WIND database covers most of the analysts' recommendations, including details such as the recommendation date, the type of recommendation (if the recommendation is not an initially offered one, the record also includes the last recommendation), the analysts' names and their affiliated brokerage houses. One problem is that for a certain period, the WIND database only allows querying the latest recommendation for each firm

Table 2  
Distribution of analysts' recommendations.

Year	Recommendations					Total
	1	2	3	4	5	
2005	3810 (11.27%)	13,677 (40.47%)	14,780 (43.73%)	1480 (4.38%)	50 (0.15%)	33,797
2006	12,326 (21.64%)	27,030 (47.46%)	16,208 (28.46%)	1345 (2.36%)	42 (0.07%)	56,951
2007	7682 (31.05%)	11,796 (47.67%)	4987 (20.16%)	261 (1.05%)	17 (0.07%)	24,743
2008	7403 (33.24%)	10,749 (48.26%)	3855 (17.31%)	222 (1.00%)	44 (0.20%)	22,273
2009	7561 (29.25%)	13,851 (53.59%)	4233 (16.38%)	175 (0.68%)	27 (0.10%)	25,847
2010	10,727 (37.77%)	14,838 (52.24%)	2773 (9.76%)	49 (0.17%)	14 (0.05%)	28,401
Total	49,509 (25.78%)	91,941 (47.88%)	46,836 (24.39%)	3532 (1.84%)	194 (0.10%)	192,012

*Note:* Recommendations of 1, 2, 3, 4 and 5 indicate strong buy, buy, hold, sell and strong sell, respectively. The percentages of respective types of recommendations to the total number of recommendations are reported in parentheses.

and each analyst, thus it is difficult to export all recommendations including the history at one time. Therefore, for each brokerage-firm-analyst keyword, we query the recommendation records by week. Finally, we obtain 192,012 recommendations as the initial sample.

Both the financial and stock return data are obtained from the CSMAR database. To reduce the effect of potential outliers, we drop all observations with an absolute value of daily returns higher than 11%. The risk-free rate (measured by the monthly yield rate on treasury bills) and Fama-French three-factor data are collected from the RESSET database.

Table 2 reports the distribution of analysts' recommendations. We find that two types of recommendations, strong buy (1) and buy (2), account for almost three quarters of the total number, while no more than 2% of recommendations are lower than sell (4), consistent with Loh and Mian (2006). The results indicate that on average, security analysts are less willing to issue unfavorable than favorable recommendations, and tend to be optimistic. Following Loh and Mian (2006), we purchase stocks with consensus recommendations no higher than 2 and sell short stocks with consensus recommendations higher than 2.5 to control for analyst optimism.

Next, we divide the sample into revised and initially offered recommendations. Table 3 illustrates that for the initial recommendations sample, strong buy (1) and buy (2) recommendations account for more than 70%, while sell (4) and strong sell (5) recommendations account for only about 2%. For revised recommendations, most of the downgrade ratings are changed to buy (2) or hold (3) recommendations, consistent with the finding that analysts rarely issue unfavorable recommendations even when they downgrade a firm. Most of the revised recommendations are upgrades or reiterations, which further supports the view that analysts tend to be optimistic.

#### 4.2. Empirical results of Hypothesis 1: analysts' superiority

Hypothesis 1 examines whether the research reports issued by analysts increase the percentage of the variation in firms' stock returns that is explained by firm-specific (or industry-level) information.

Table 4 reports the results using a 60-day window ending on date  $T - 1$  to estimate firms'  $R^2$  (i.e.  $X = 30$ ). We find that the mean (median) percentage of the variation in firms' stock returns that is explained by industry-level information is 36.30% (35.33%) and the percentage of the variation in firms' stock returns that is

Table 3  
Descriptive statistics of analysts' revised and initially offered recommendations.

Type of recommendation	Recommendations					Total
	1	2	3	4	5	
Upgrade	6767 (52.95%)	5577 (43.64%)	433 (3.39%)	4 (0.03%)	0 (0.00%)	12,781
Reiteration	37,331 (26.01%)	68,697 (47.87%)	34,801 (24.25%)	2607 (1.82%)	72 (0.05%)	143,508
Downgrade	0 (0.00%)	4490 (42.62%)	5524 (52.44%)	462 (4.39%)	58 (0.55%)	10,534
Initially offered	5411 (21.48%)	13,177 (52.31%)	6078 (24.13%)	459 (1.82%)	64 (0.25%)	25,189

Note: Recommendations of 1, 2, 3, 4 and 5 indicate strong buy, buy, hold, sell and strong sell, respectively. The percentages of respective types of recommendations to the total number of recommendations are reported in parentheses.

explained by market- and industry-level information is 52.45% (52.88%). The mean (median) percentage of the influence of analysts' research reports on firms'  $R^2$  is  $-3.80\%$  ( $-1.41\%$ ), which indicates that the extent to which firm-specific information explains the variation in stock returns increases by 3.80% (1.41%). Although some of the research reports seem to increase the extent to which market- and industry-level information explain the variation in stock returns, the main role of analysts is to improve the extent to which firm-specific information explains the variation in firms' stock returns, and thus their superiority is in analyzing and transferring firm-specific information.

As a robustness test, we also use 180-day and 360-day windows ending on date  $T - 1$  to estimate firms'  $R^2$  (i.e.  $X = 90, 180$ ). The results are consistent.<sup>3</sup>

From the above evidence, we can conclude that the main role of analysts is to improve the extent to which firm-specific information explains the variation in firms' stock returns, which supports H1b. Therefore, Chinese security analysts are good at analyzing and transferring firm-specific information. If the above conclusion is correct, we further expect that covering more firms in the same industry will not improve the investment value of analysts' research reports (Hypothesis 2).

#### 4.3. Empirical results of Hypothesis 2: the influence of the number of firms covered

Hypothesis 2 examines whether the research reports issued by analysts who cover more firms in the same industry have greater investment value.

Table 5 presents the results based on the portfolio of analysts' revised recommendations. Specifically, Panel A shows the investment value of favorable recommendations issued by analysts who cover a low number of firms. Using the recommendations issued on date  $T - 1$  to construct the portfolio (the daily portfolio contains 4.09 stocks on average), we find that the portfolio raw and market-adjusted returns are 11.43% and 8.30%, respectively, while the intercept of the CAPM and Fama-French three-factor model is 7.76% and 7.78%, respectively. All portfolio returns are significant at the 1 percent level. We expect that less frequent rebalancing will cause portfolio returns to diminish in magnitude. With a 5-day rebalancing period, for example, the portfolio returns decline from 7.78% to 2.75% under the Fama-French three-factor model (column 4) and remain significant. When we further expand the rebalancing period to 7 days, the portfolio returns decline from 7.78% with 1-day rebalancing to 1.59% with 7-day rebalancing under the Fama-French three-factor model, but still with marginal significance. These empirical results suggest that the favorable recommendations issued by analysts who cover a low number of firms are valuable.

Panel B of Table 5 illustrates the investment value of favorable recommendations issued by analysts who cover a high number of firms. Similarly, using the recommendations issued on date  $T - 1$  to construct the

<sup>3</sup> For simplicity, we do not tabulate the results of the robustness tests, but they are available upon request.

Table 4

The influence of analysts' research reports on firms' stock returns.

Types of information	Mean (%)	Q1 (%)	Median (%)	Q3 (%)	t-Value (%)
% of variation in firms' stock returns explained by industry-level information	36.30	22.75	35.33	48.94	1670.11
% of variation in firms' stock returns explained by market- and industry-level information	52.45	39.61	52.88	65.96	2368.62
The influence of analysts' research reports on firms' $R^2$	−3.80	−6.40	−1.41	1.32	−267.15

*Note:* We use daily stock returns from day  $T - 60$  to  $T - 1$  to estimate the  $R^2$  statistic by firm. The percentage of the variation in firms' stock returns explained by market- and industry-level information is defined as the  $R^2$  statistic for model (4). The percentage of the variation in firms' stock returns explained by industry-level information is defined as the difference in  $R^2$  between models (3) and (4). For each firm, we exclude daily stock returns on the day before, the day of and the day following the recommendation date, and re-regress model (4) to estimate  $R^2_{new}$ . The difference between  $R^2$  and  $R^2_{new}$  measures the influence of analysts' research reports on firms'  $R^2$ .

Table 5

The influence of the number of firms covered on the investment value of analysts' revised recommendations.

Rebalancing period	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three-factor model (4)	Daily covered stocks (5)
<i>Panel A: Low number of firms covered</i>					
1 day	0.1143*** (5.21)	0.0830*** (6.25)	0.0776*** (5.73)	0.0778*** (5.40)	4.09
5 days	0.0619*** (3.20)	0.0306*** (2.93)	0.0279*** (2.59)	0.0275** (2.42)	15.44
7 days	0.0496*** (2.66)	0.0184** (2.00)	0.0156* (1.65)	0.0159 (1.62)	23.67
<i>Panel B: High number of firms covered</i>					
1 day	0.0903*** (4.54)	0.0590*** (5.09)	0.0566*** (4.71)	0.0573*** (4.57)	8.15
5 days	0.0541*** (3.10)	0.0228*** (2.76)	0.0219** (2.55)	0.0263*** (2.98)	31.63
7 days	0.0476*** (2.79)	0.0164** (2.11)	0.0159* (1.97)	0.0208** (2.54)	48.32
<i>Panel C: Difference between low and high</i>					
1 day		0.0240 (1.36)	0.0210 (1.16)	0.0205 (1.07)	
5 days		0.0078 (0.58)	0.0060 (0.43)	0.0012 (0.08)	
7 days		0.0020 (0.17)	−0.0003 (−0.02)	−0.0049 (−0.38)	

*Note:* The number of firms covered in the same industry is calculated on a 180-day window before day  $T$  (i.e. from day  $T - 180$  to  $T - 1$ ) for each analyst. The recommendations issued by analysts who cover less than the median number of firms in the same industry are classified as “low number of firms covered” and the rest are classified as “high number of firms covered”. We adopt a three-digit code category for the manufacturing industry and a two-digit code category for other industries. For each portfolio, we estimate abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

portfolio (the daily portfolio contains 8.15 stocks on average), we find that the portfolio raw and market-adjusted returns are 9.03% and 5.90%, respectively, while the intercept of the CAPM and Fama-French three-factor model is 5.66% and 5.73%, respectively. All portfolio returns are significant at the 1 percent level. The portfolio returns diminish in magnitude as the rebalancing period is lengthened to 5 days, declining from 5.73% with 1-day rebalancing to 2.63% with 5-day rebalancing under the Fama-French three-factor model (column 4), which is significant at the 1 percent level. Further expanding the rebalancing period to 7 days, the portfolio returns decline to 2.08% under the Fama-French three-factor model, but remains significant.

These findings suggest that the favorable recommendations issued by analysts who cover a high number of firms also have significant investment value.

Panel C of Table 5 compares the difference in investment value for favorable recommendations between the two types of analysts. A zero-investment portfolio based on the recommendations issued on  $T - 1$  indicates that investors can earn positive abnormal returns. The portfolio market-adjusted return is 2.40% (with a  $t$ -statistic of 1.36), whereas the intercepts of the CAPM and Fama-French three-factor model are 2.10% (with a  $t$ -statistic of 1.16) and 2.05% (with a  $t$ -statistic of 1.07), respectively. However, all of the hedge returns are insignificantly different from zero. The hedge returns decrease significantly as the rebalancing period is lengthened to 5 days, declining from 2.05% to 0.12% (with a  $t$ -statistic of 0.08) under the Fama-French three-factor model (column 4), and further decrease as the rebalancing period is lengthened to 7 days, declining to  $-0.49\%$  (with a  $t$ -statistic of  $-0.38$ ) under the Fama-French three-factor model. Overall, the findings show that the favorable recommendations issued by analysts who cover a high number of firms do not have a greater investment value than those issued by analysts who cover a low number of firms. This finding also suggests that covering more firms does not mean that analysts have more industry-level information. From the above evidence, we can conclude that Chinese security analysts are better at searching for and analyzing firm-specific information rather than industry-level information.

Table 6 presents the estimated coefficients for the Fama-French three-factor model. We find that the coefficients on *RMRF*, *SMB* and *HML* are not significantly different between the portfolios of the two types of analysts, indicating that firm characteristics such as market risk, growth and book-to-market ratios are qualitatively the same for each portfolio.

Table 7 presents the results based on the portfolio of analysts' consensus recommendations. Specifically, Panel A shows the investment value of favorable recommendations issued by the two types of analysts. For analysts covering a low number of firms, the portfolio raw return of 2.86% is significant at the 10 percent level, whereas the portfolio abnormal returns estimated by market-adjusted returns and the intercepts of the

Table 6

Fama-French three-factor regressions based on the portfolio of analysts' revised recommendations.

Rebalancing period	Coefficient estimates for the three-factor model			Adj- $R^2$	$N$
	RMRF	SMB	HML		
<i>Panel A: Low number of firms covered</i>					
1 day	1.1732*** (9.49)	0.0006 (0.00)	0.0365 (0.08)	63.03	60
5 days	1.1163*** (6.88)	-0.1063 (-0.48)	-0.3162 (-0.87)	70.18	60
7 days	1.1278*** (13.34)	-0.2014 (-1.05)	-0.3978 (-1.27)	76.23	60
<i>Panel B: High number of firms covered</i>					
1 day	1.1219*** (10.42)	-0.2547 (-1.04)	-0.4422 (-1.11)	65.85	60
5 days	1.0295*** (13.57)	-0.3594** (-2.09)	-0.0162 (-0.06)	78.09	60
7 days	1.0077*** (14.29)	-0.3650** (-2.28)	0.0719 (0.27)	80.13	60
<i>Panel C: Difference between low and high</i>					
1 day	0.0513 (0.31)	0.2554 (0.69)	0.4788 (0.79)	0.99	120
5 days	0.0868 (0.70)	0.2531 (0.90)	-0.3000 (-0.65)	0.54	120
7 days	0.1200 (1.09)	0.1636 (0.65)	-0.4697 (-1.15)	0.44	120

Note: Following Fama (1998), we define *RMRF* as value-weighted market returns minus the risk-free rate; *SMB* as the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; and *HML* as the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

Table 7

The influence of the number of firms covered on the investment value of analysts' consensus recommendations.

Number of firms covered by analysts	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three-factor model (4)	Daily covered stocks (5)
<i>Panel A: Long portfolios</i>					
Low number of firms	0.0286* (1.92)	−0.0027 (−0.59)	−0.0013 (−0.27)	0.0020 (0.45)	127.77
High number of firms	0.0315** (2.07)	0.0003 (0.06)	0.0013 (0.25)	0.0052 (1.09)	211.56
Difference between low and high	−0.0030 $p = 89.0\%$	−0.0030 $p = 65.9\%$	−0.0026 $p = 70.1\%$	−0.0028 $p = 61.5\%$	−83.79
<i>Panel B: Short portfolios</i>					
Low number of firms	0.0114 (0.65)	−0.0199*** (−2.93)	−0.0223*** (−3.21)	−0.0196*** (−2.80)	38.27
High number of firms	0.0138 (0.81)	−0.0175*** (−2.95)	−0.0193*** (−3.15)	−0.0195*** (−3.03)	77.09
Difference between low and high	−0.0024 $p = 92.2\%$	−0.0024 $p = 79.2\%$	0.0030 $p = 73.9\%$	0.0001 $p = 99.2\%$	−38.82
<i>Panel C: Hedge portfolios</i>					
Low number of firms		0.0172** (2.10)	0.0210** (2.51)	0.0217*** (2.58)	
High number of firms		0.0178** (2.32)	0.0201*** (2.60)	0.0247*** (3.09)	
Difference between low and high		−0.0006 $p = 95.9\%$	0.0009 $p = 96.6\%$	−0.0030 $p = 79.7\%$	

*Note:* Following Barber et al. (2001) and Loh and Mian (2006), we begin by calculating the consensus recommendations of each covered firm during the  $T - 30$  to  $T - 1$  period according to model (5). Then we purchase stocks in the portfolio with consensus recommendations no higher than 2 and sell short stocks in the portfolio with consensus recommendations higher than 2.5, while the stocks with consensus recommendations between 2 and 2.5 are excluded. The recommendations issued by analysts who cover less than the median number of firms in the same industry are classified as “low number of firms covered” and the rest are classified as “high number of firms covered”. For each portfolio, we estimate abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

CAPM and Fama-French three-factor model are neither statistically nor economically significant. The findings suggest that investors who purchase stocks based on analysts' consensus recommendations during the  $T - 30$  to  $T - 1$  period (i.e.  $X = 30$ ) do not earn positive abnormal returns. Similarly, for analysts covering a high number of firms, the portfolio abnormal returns are neither statistically or economically significant. The investment values of favorable recommendations also show no significant difference between the two types of analysts. The corresponding  $p$ -values of the abnormal returns estimated by market-adjusted returns and the intercepts of the CAPM and Fama-French three-factor model are 65.9%, 70.1% and 61.5%, respectively.

Panel B illustrates the investment value of unfavorable recommendations issued by the two types of analysts. For analysts covering a low number of firms, except for the portfolio raw return of 1.14%, which is not significant, the portfolio abnormal returns estimated by market-adjusted returns and the intercepts of the CAPM and Fama-French three-factor model are −1.99%, −2.23% and −1.96%, respectively, and all of them are significant at the 1 percent level. The results for analysts covering a high number of firms are qualitatively the same, with portfolio abnormal returns of −1.75%, −1.93% and −1.95%, respectively. The investment values of unfavorable recommendations also show no significant differences between the two types of analysts. The corresponding  $p$ -values of the abnormal returns estimated by market-adjusted returns and the intercepts of the CAPM and Fama-French three-factor model are 79.2%, 73.9% and 99.2%, respectively. The findings suggest that both types of analysts' unfavorable recommendations have significant investment value.



Table 8

Fama-French three-factor model regressions based on the portfolios of analysts' consensus recommendations.

Number of firms covered by analysts	Coefficient estimates for the three-factor model			Adj- $R^2$	$N$
	RMRF	SMB	HML		
<i>Panel A: Long portfolios</i>					
Low number of firms	0.9530*** (24.09)	−0.2825*** (−3.15)	−0.0338 (−0.23)	91.83	60
High number of firms	0.9740*** (23.98)	−0.3581*** (−3.88)	−0.1007 (−0.67)	95.68	60
<i>Panel B: Short portfolios</i>					
Low number of firms	1.0243*** (17.01)	0.0304 (0.22)	0.5566** (2.49)	86.23	60
High number of firms	1.0394*** (18.78)	0.0925 (0.74)	0.1638 (0.80)	87.54	60
<i>Panel C: Hedge portfolios</i>					
Low number of firms	−0.0714 (−0.99)	−0.3130* (−1.91)	−0.5904** (−2.21)	1.62	120
High number of firms	−0.0655 (−0.95)	−0.4506*** (−2.89)	−0.2644 (−1.04)	1.53	120

Note: Following Fama (1998), we define *RMRF* as value-weighted market returns minus the risk-free rate; *SMB* as the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; and *HML* as the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and *t*-statistics are presented in parentheses.

Panel C presents the hedge returns for each portfolio. The results show that the hedge returns for portfolios formed on the basis of analysts' consensus recommendations are not only significant at the 5 percent level, but also do not depend on the number of firms covered by analysts.

Table 8 reports the estimated coefficients for the Fama-French three-factor model. The significant coefficients on *SMB* and *HML* indicate that favorable recommendations are associated with firms of large size and lower book-to-market ratios, while unfavorable recommendations are associated with firms of small size and higher book-to-market ratios.

As a robustness test, we also examine the abnormal returns for portfolios formed on the basis of analysts' consensus recommendations during the  $T - 90$  to  $T - 1$  period (i.e.  $X = 90$ ) and the  $T - 180$  to  $T - 1$  period (i.e.  $X = 180$ ), respectively. The results are qualitatively the same.

From the above evidence, we can conclude that the investment value of neither favorable nor unfavorable recommendations shows a significant difference between the two types of analysts. In other words, covering more firms in the same industry does not help analysts to incorporate industry-level information into their recommendations, supporting H2b. The results also further confirm the findings of Hypothesis 1, that Chinese analysts are good at analyzing and transferring firm-specific rather than industry-level information.

#### 4.4. Empirical results of Hypothesis 3: the influence of supply and demand factors

Given that the above evidence shows that Chinese analysts are good at analyzing and transferring firm-specific information, we expect the investment value of analysts' recommendations to increase (decrease) as firm-specific (industry-level) information plays a more important role in stock pricing. Specifically, we examine the following four cases.

*Case #1: Sort by the extent to which firm-specific information explains the variation in stock returns and construct portfolios based on recommendation changes.* Table 9 reports the investment value of favorable recommendations that involve daily portfolio rebalancing. As shown in columns 1–5 of Panel A, there is a monotonic decrease in portfolio returns. Taking the intercept of the Fama-French three-factor model as an example, the abnormal returns on portfolios 1–5 are 11.15%, 7.44%, 6.91%, 6.41% and 3.24%, respectively, and all of them are significant at the 1 percent level. The hedge returns that can be generated by a strategy

Table 9

The investment value of analysts' revised recommendations by the importance of firm-specific information in stock pricing.

Ranked by the importance of firm-specific information	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three- factor model (4)	Daily covered stocks (5)
<i>Panel A: Portfolio returns</i>					
P1 (most important)	0.1314*** (5.12)	0.1001*** (4.40)	0.1054*** (4.49)	0.1115*** (4.50)	2.65
P2	0.1053*** (5.62)	0.0741*** (6.40)	0.0745*** (6.18)	0.0744*** (5.96)	2.85
P3	0.1055*** (4.22)	0.0742*** (4.45)	0.0662*** (3.92)	0.0691*** (3.89)	2.80
P4	0.1040*** (4.47)	0.0727*** (5.00)	0.0656*** (4.47)	0.0641*** (4.18)	2.66
P5 (least important)	0.0619*** (3.03)	0.0306** (2.11)	0.0318** (2.11)	0.0324** (2.10)	2.47
P1–P5	0.0695** <i>p</i> = 3.6%	0.0695** <i>p</i> = 1.1%	0.0736*** <i>p</i> = 0.4%	0.0791*** <i>p</i> = 0.2%	
Ranked by the importance of firm-specific information	Coefficient estimates for the three-factor model			Adj- <i>R</i> <sup>2</sup>	<i>N</i>
	RMRF	SMB	HML		
<i>Panel B: Fama-French three-factor model regressions</i>					
P1 (most important)	0.7570*** (3.56)	−0.2098 (−0.43)	0.6368 (0.81)	19.13	60
P2	1.0410*** (9.72)	−0.2576 (−1.06)	−0.5895 (−1.48)	62.06	60
P3	1.3020*** (8.55)	−0.3806 (−1.10)	−0.3366 (−0.60)	56.83	60
P4	1.1826*** (8.99)	0.3476 (1.16)	0.5056 (1.04)	62.89	60
P5 (least important)	1.0406*** (7.86)	−0.4217 (−1.40)	−0.8414* (−1.71)	51.02	60

*Note:* We regress model (4) by firm to calculate the extent to which firm-specific information explains the variation in firms' stock returns during the  $T - 60$  to  $T - 1$  period (i.e.  $1 - R^2$ ) and classify all firms with revised or initial recommendations on date  $T - 1$  into one of five groups. For each group, we purchase stocks with an initial recommendation no higher than 2 or upgrade ratings with a new recommendation no higher than 2 to construct portfolios on date  $T$ . We estimate portfolio abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

of purchasing stocks in portfolio 1 and selling short stocks in portfolio 5 are 7.91% (with a  $p$ -value of 0.2%). The portfolio abnormal returns estimated by market-adjusted returns and the CAPM intercept shows qualitative similar patterns. Panel B presents the estimated coefficients for the Fama-French three-factor model. Overall, Table 9 provides strong evidence that the investment value of analysts' favorable recommendations increases as firm-specific information plays a more important role in stock pricing.

*Case #2: Sort by the extent to which industry-level information explains the variation in stock returns and construct portfolios based on recommendation changes.* Table 10 reports the investment value of favorable recommendations that involve daily portfolio rebalancing. From portfolios 1 to 5, the importance of industry-level information in stock pricing increases. As shown in columns 1–5 of Panel A, there is no monotonic trend in the portfolio returns. Taking the intercept of the Fama-French three-factor model as an example, the abnormal returns range from a low of 5.09% on portfolio 3, to a high of 9.54% on portfolio 4. The portfolio abnormal returns estimated by market-adjusted returns and the CAPM intercept shows qualitative similar patterns. Panel B presents the estimated coefficients for the Fama-French three-factor model. Overall, the above findings suggest that security analysts are not good at analyzing and transferring industry-level information.

As a robustness test, we first rank the full sample into five groups by the extent to which firm-specific information explains the variation in stock returns and then re-construct long portfolios based on revised

Table 10

The investment value of analysts' revised recommendations by the importance of industry-level information in stock pricing.

Ranked by the importance of industry-level information	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three-factor model (4)	Daily covered stocks (5)
<i>Panel A: Portfolio returns</i>					
P1 (least important)	0.0940*** (4.99)	0.0627*** (4.04)	0.0699*** (4.45)	0.0760*** (4.66)	2.65
P2	0.1030*** (4.74)	0.0718*** (4.74)	0.0704*** (4.47)	0.0723*** (4.38)	2.73
P3	0.0822*** (3.53)	0.0510*** (3.16)	0.0471*** (2.82)	0.0509*** (2.88)	2.77
P4	0.1221*** (5.35)	0.0908*** (5.75)	0.0877*** (5.36)	0.0954*** (5.59)	2.78
P5 (most important)	0.0998*** (4.40)	0.0686*** (4.87)	0.0625*** (4.36)	0.0589*** (3.90)	2.50
P1–P5	−0.0059 <i>p</i> = 84.3%	−0.0059 <i>p</i> = 78.0%	0.0074 <i>p</i> = 69.3%	0.0171 <i>p</i> = 33.3%	
Ranked by the importance of industry-level information	Coefficient estimates for the three-factor model			Adj- <i>R</i> <sup>2</sup>	<i>N</i>
	RMRF	SMB	HML		
<i>Panel B: Fama-French three-factor model regressions</i>					
P1 (least important)	0.7671*** (5.48)	−0.5360* (−1.69)	−0.1103 (−0.21)	35.79	60
P2	1.0896*** (7.70)	−0.3595 (−1.12)	−0.4721 (−0.90)	50.82	60
P3	1.1138*** (7.34)	−0.2471 (−0.72)	0.1344 (0.24)	50.63	60
P4	1.0518*** (7.18)	−0.3769 (−1.13)	0.5406 (0.99)	52.03	60
P5 (most important)	1.2451*** (9.61)	0.0818 (0.28)	−0.4690 (−0.98)	62.01	60

*Note:* We define the percentage of the variation in firms' stock returns explained by industry-level information as the difference in  $R^2$  between models (3) and (4) during the  $T - 60$  to  $T - 1$  period, and classify all firms with revised or initial recommendations on date  $T - 1$  into one of five groups. For each group, we purchase stocks with an initial recommendation no higher than 2 or upgrade ratings with a new recommendation no higher than 2 to construct portfolios on date  $T$ . We estimate portfolio abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

recommendations with a frequency of portfolio rebalancing of no more than 7 days. Fig. 1 illustrates the intercept of the Fama-French three-factor model for each portfolio and each frequency of portfolio rebalancing. The figure shows that (1) the analysts' favorable recommendations are valuable, (2) investors react quickly (within three days) to changes in analysts' favorable recommendations and (3) the portfolio returns decrease significantly on portfolios 1–5. These findings support that the short-term investment value of analysts' reports increases as firm-specific information plays a more important role in stock pricing.

Similarly, we rank the full sample into five groups by the extent to which industry-level information explains the variation in stock returns and then re-construct long portfolios based on recommendation changes with a frequency of portfolio rebalancing of no more than 7 days. Fig. 2 illustrates the intercept of the Fama-French three-factor model for each portfolio and each frequency of portfolio rebalancing. The figure shows that there is no monotonic trend in portfolio returns, consistent with the results in Table 10.

*Case #3: Sort by the extent to which firm-specific information explains the variation in stock returns and construct portfolios based on consensus recommendations.* Table 11 reports the portfolio returns. Specifically, Panel A shows the investment value of favorable recommendations for each portfolio. From portfolios 1 to 5, the importance of firm-specific information in stock pricing decreases. As shown in column 1, the raw returns on portfolios 1–5 are significantly positive at the 1 percent level, but the difference between portfolio 1 and portfolio 5 is not significant. In contrast, regardless of whether abnormal returns are estimated by market-adjusted

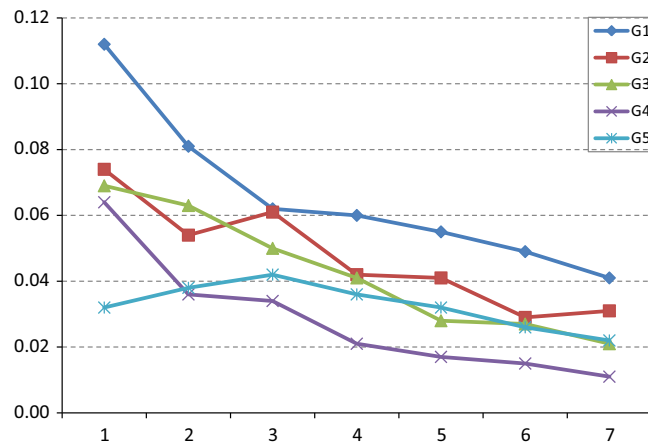


Figure 1. The importance of firm-specific information and the investment value of analysts' revised recommendations by rebalancing frequency.

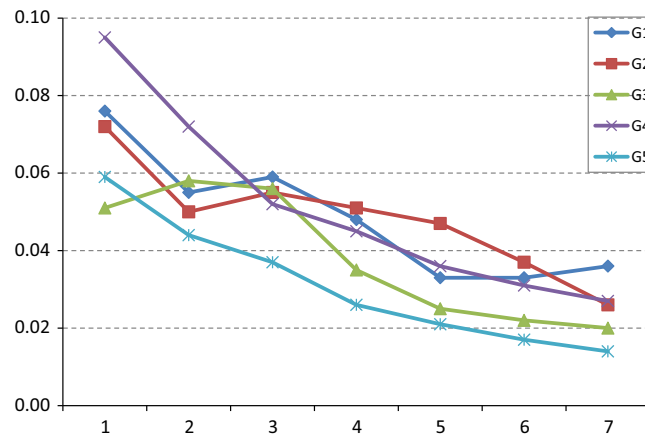


Figure 2. The importance of industry-level information and the investment value of analysts' revised recommendations by rebalancing frequency.

returns, the intercept of the CAPM or the intercept of the Fama-French three-factor model, most of the portfolios (except portfolio 1) abnormal returns are neither statistically nor economically significant. These results suggest that the duration of the investment value is quite short when it comes to favorable recommendations. With a one-month delay, the portfolio abnormal returns are not significantly greater than zero. It should be noted that the slightly positive abnormal returns on portfolio 1 show, to some extent, that the investment value of analysts' recommendations increases as firm-specific information plays a more important role in stock pricing.

Panel B illustrates the investment value of unfavorable recommendations for each portfolio. Most of the portfolio abnormal returns in columns 2–4 are significantly negative and diminish in magnitude as the importance of firm-specific information in explaining the variation in stock returns decreases. Taking the intercept of Fama-French three-factor model as an example, the abnormal returns on portfolios 1–5 are  $-5.42\%$ ,  $-1.73\%$ ,  $-2.29\%$ ,  $-2.55\%$  and  $-1.56\%$ , respectively, which are all significant at the 1 percent level except for portfolio 2. In addition, the difference between portfolio 1 and portfolio 5 is  $3.86\%$  (with a  $p$ -value of  $0.1\%$ ). These results suggest that analysts' unfavorable recommendations are valuable and that the duration of the investment value is much longer than that for favorable recommendations. Also as expected, the investment value of analysts' unfavorable recommendations increases as firm-specific information plays a more important role in stock pricing.

Table 11

The investment value of analysts' consensus recommendations by the importance of firm-specific information in stock pricing.

Ranked by the importance of firm-specific information	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three-factor model (4)	Daily covered stocks (5)
<i>Panel A: Long portfolios</i>					
P1 (most important)	0.0406*** (2.88)	0.0093 (1.42)	0.0137** (2.15)	0.0112* (1.75)	53.13
P2	0.0335** (2.42)	0.0022 (0.45)	0.0059 (1.26)	0.0046 (0.96)	52.70
P3	0.0283** (2.03)	−0.0030 (−0.64)	0.0003 (0.07)	−0.0009 (−0.18)	50.48
P4	0.0380** (2.46)	0.0067 (1.59)	0.0069 (1.56)	0.0082* (1.79)	48.17
P5 (least important)	0.0318** (1.99)	0.0005 (0.08)	0.0009 (0.14)	0.0071 (1.22)	43.63
P1–P5	0.0088 $p = 68.0\%$	0.0088 $p = 32.7\%$	0.0128 $p = 10.9\%$	0.0095 $p = 58.0\%$	
<i>Panel B: Short portfolios</i>					
P1 (most important)	−0.0205 (−1.24)	−0.0517*** (−4.77)	−0.0472*** (−4.29)	−0.0542*** (−4.89)	12.69
P2	0.0190 (0.99)	−0.0123 (−1.27)	−0.0160 (−1.62)	−0.0173* (−1.76)	13.17
P3	0.0157 (0.87)	−0.0155** (−2.01)	−0.0185** (−2.34)	−0.0229*** (−2.82)	14.89
P4	0.0131 (0.79)	−0.0182*** (−2.76)	−0.0187*** (−2.73)	−0.0255*** (−4.38)	16.40
P5 (least important)	0.0198 (1.21)	−0.0115* (−1.97)	−0.0123** (−2.02)	−0.0156*** (−2.94)	18.93
P1–P5	−0.0403* $p = 8.6\%$	−0.0403*** $p = 0.1\%$	−0.0349*** $p = 0.4\%$	−0.0386*** $p = 0.1\%$	
<i>Panel C: Hedge portfolios</i>					
P1 (most important)		0.0610*** (4.82)	0.0609*** (4.79)	0.0654*** (5.10)	
P2		0.0145 (1.34)	0.0218** (2.00)	0.0219** (2.00)	
P3		0.0125 (1.39)	0.0189** (2.07)	0.0220** (2.34)	
P4		0.0249*** (3.18)	0.0256*** (3.14)	0.0337*** (4.55)	
P5 (least important)		0.0120 (1.42)	0.0131 (1.50)	0.0228*** (2.88)	
P1–P5		0.0490*** $p = 0.1\%$	0.0478*** $p = 0.1\%$	0.0426*** $p = 0.3\%$	

*Note:* We regress model (4) by firm to calculate the extent to which firm-specific information explains the variation in stock returns during the  $T - 60$  to  $T - 1$  period (i.e.  $1 - R^2$ ), and classify all firms with consensus recommendations into one of five groups. For each group, we purchase stocks in the portfolio with consensus recommendations no higher than 2 and sell short stocks in the portfolio with consensus recommendations larger than 2.5, while the stocks with consensus recommendations between 2 and 2.5 are excluded (Barber et al., 2001; Loh and Mian, 2006). We estimate portfolio abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of the Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

Panel C presents the hedge returns for each portfolio. The results indicate that, except for portfolio 4, the portfolio hedge returns decrease monotonically as in Panel B. The portfolio hedge returns estimated by market-adjusted returns and the intercepts of the CAPM and Fama-French three-factor model are 4.90%, 4.78% and 4.26%, respectively, and all of them are significant at the 1 percent level. These results further confirm that

Table 12

Fama-French three-factor model regressions based on analysts' consensus recommendations portfolios by the importance of firm-specific information in stock pricing.

Ranked by the importance of firm-specific information	Coefficient estimates for the three-factor model			Adj- $R^2$	$N$
	RMRF	SMB	HML		
<i>Panel A: Long portfolios</i>					
P1 (most important)	0.8954*** (16.24)	−0.0267 (−0.21)	−0.5065** (−2.47)	82.23	60
P2	0.9052*** (22.32)	−0.0488 (−0.53)	−0.3476** (−2.03)	90.00	60
P3	0.8992*** (22.10)	0.0222 (0.24)	−0.1685 (−1.12)	90.11	60
P4	0.9990*** (25.42)	−0.1388 (−1.56)	−0.0727 (−0.50)	92.49	60
P5 (least important)	0.9834*** (19.61)	−0.4873*** (−4.28)	0.0374 (0.20)	88.52	60
<i>Panel B: Short portfolios</i>					
P1 (most important)	0.8396*** (8.82)	0.5527** (2.56)	−0.0121 (−0.03)	61.28	60
P2	1.0575*** (12.52)	0.3819** (1.99)	0.6254** (2.00)	77.75	60
P3	1.0979*** (15.75)	0.3284** (2.08)	−0.0466 (−0.18)	82.82	60
P4	0.9882*** (19.74)	0.6357*** (5.59)	0.2036 (1.10)	89.40	60
P5 (least important)	0.9753*** (21.38)	0.4680*** (4.52)	0.4550*** (2.69)	91.03	60
<i>Panel C: Hedge portfolios</i>					
P1 (most important)	0.0559 (0.51)	−0.5794** (−2.32)	−0.4944 (−1.21)	7.85	120
P2	−0.1523 (−1.63)	−0.4307** (−2.03)	−0.9729*** (−2.80)	3.30	120
P3	−0.1988** (−2.46)	−0.3062* (−1.67)	−0.1219 (−0.41)	1.59	120
P4	0.0108 (0.17)	−0.7745*** (−5.36)	−0.2762 (−1.17)	3.30	120
P5 (least important)	0.0081 (0.12)	−0.9553*** (−6.21)	−0.4176* (−1.66)	3.75	120

*Note:* Following Fama (1998), we define *RMRF* as value-weighted market returns minus the risk-free rate; *SMB* as the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; and *HML* as the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and *t*-statistics are presented in parentheses.

the greater the importance of firm-specific information in stock pricing, the greater the investment value of analysts' research reports.

Table 12 reports the estimated coefficients for the Fama-French three-factor model. The significant coefficients on *SMB* indicate that unfavorable recommendations are associated with larger firm size than favorable recommendations, while the coefficients on *RMRF* and *HML* suggest that there are no significant differences in the market risk and book-to-market ratios between the two types of recommendations.

*Case #4: Sort by the extent to which industry-level information explains the variation in stock returns and construct portfolios based on consensus recommendations.* Table 13 reports the portfolio returns. Panel A shows that the abnormal returns for portfolios formed on the basis of analysts' favorable recommendations are neither statistically nor economically significant. Panel B shows that although analysts' unfavorable recommendations are valuable, there is no monotonic trend in portfolio returns across portfolios 1–5, especially portfolio 5 in which industry-level information plays the most important role in stock pricing and which



Table 13

The investment value of analysts' consensus recommendations by the importance of industry-level information in stock pricing.

Ranked by the importance of industry-level information	Raw Returns (1)	Market-adjusted Returns (2)	Intercept of CAPM (3)	Intercept of three-factor model (4)	Daily covered stocks (5)
<i>Panel A: Long portfolios</i>					
P1 (least important)	0.0320** (2.18)	0.0007 (0.14)	0.0030 (0.56)	0.0046 (0.95)	53.19
P2	0.0310** (2.22)	−0.0002 (−0.04)	0.0033 (0.67)	0.0070 (1.49)	52.22
P3	0.0330** (2.19)	0.0018 (0.43)	0.0026 (0.61)	0.0027 (0.60)	50.49
P4	0.0386*** (2.61)	0.0073 (1.65)	0.0090* (1.97)	0.0097** (2.02)	48.69
P5 (most important)	0.0332** (2.04)	0.0019 (0.30)	0.0018 (0.27)	0.0005 (0.08)	43.52
P1–P5	−0.0012 $p = 95.7\%$	−0.0012 $p = 88.5\%$	0.0012 $p = 88.0\%$	0.0041 $p = 62.7\%$	
<i>Panel B: Short portfolios</i>					
P1 (least important)	0.0001 (0.01)	−0.0311*** (−3.52)	−0.0320*** (−3.49)	−0.0335*** (−3.45)	12.18
P2	0.0065 (0.37)	−0.0248*** (−3.42)	−0.0272*** (−3.64)	−0.0302*** (−4.00)	13.22
P3	0.0199 (1.14)	−0.0114 (−1.34)	−0.0121 (−1.37)	−0.0194** (−2.35)	14.71
P4	0.0125 (0.75)	−0.0188*** (−3.05)	−0.0200*** (−3.14)	−0.0256*** (−4.46)	16.33
P5 (most important)	0.0212 (1.33)	−0.0101* (−1.73)	−0.0098 (−1.62)	−0.0149*** (−2.86)	19.64
P1–P5	−0.0210 $p = 37.8\%$	−0.0210** $p = 4.9\%$	−0.0222** $p = 3.8\%$	−0.0186* $p = 6.7\%$	
<i>Panel C: Hedge portfolios</i>					
P1 (least important)		0.0319*** (3.11)	0.0350*** (3.31)	0.0381*** (3.51)	
P2		0.0246*** (2.77)	0.0305*** (3.40)	0.0372*** (4.18)	
P3		0.0132 (1.40)	0.0147 (1.50)	0.0221** (2.35)	
P4		0.0261*** (3.44)	0.0290*** (3.70)	0.0354*** (4.72)	
P5 (most important)		0.0120 (1.40)	0.0116 (1.29)	0.0154* (1.78)	
P1–P5		0.0199 $p = 13.6\%$	0.0234* $p = 7.8\%$	0.0227* $p = 8.5\%$	

*Note:* We define the percentage of the variation in firms' stock returns explained by industry-level information as the difference in  $R^2$  between models (3) and (4) during the  $T - 60$  to  $T - 1$  period, and classify all firms with consensus recommendations into one of five groups. For each group, we purchase stocks in the portfolio with consensus recommendations no higher than 2, and sell short stocks in the portfolio with consensus recommendations higher than 2.5, while the stocks with consensus recommendations between 2 and 2.5 are excluded (Barber et al., 2001; Loh and Mian, 2006). We estimate portfolio abnormal returns using market-adjusted returns, the intercept of the CAPM and the intercept of Fama-French three-factor model, respectively. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and  $t$ -statistics are presented in parentheses.

obtains the lowest abnormal returns. Overall, the findings suggest that the investment value of research reports is unrelated to the importance of industry-level information in stock pricing.

Table 14 reports the estimated coefficients for the Fama-French three-factor model. The coefficients on *RMRF*, *SMB* and *HML* indicate that both the market risk and book-to-market ratios show no significant

Table 14

Fama-French three-factor model regressions based on analysts' consensus recommendations portfolios by the importance of industry-level information in stock pricing.

Ranked by the importance of industry-level information	Coefficient estimates for the three-factor model			Adj- $R^2$	$N$
	RMRF	SMB	HML		
<i>Panel A: Long portfolios</i>					
P1 (least important)	0.9621*** (23.03)	−0.3204*** (−3.38)	−0.4227*** (−2.73)	90.60	60
P2	0.8897*** (22.12)	−0.3470*** (−3.80)	−0.1137 (−0.76)	90.39	60
P3	0.9871*** (25.85)	−0.0941 (−1.09)	−0.2028 (−1.43)	92.56	60
P4	0.9295*** (22.54)	−0.0154 (−0.16)	0.1053 (0.69)	90.93	60
P5 (most important)	0.9829*** (84.67)	0.1685 (1.26)	0.1571 (0.72)	84.67	60
<i>Panel B: Short portfolios</i>					
P1 (least important)	1.0161*** (12.20)	0.1482 (0.78)	0.0740 (0.24)	74.31	60
P2	1.0504*** (16.22)	0.3420** (2.33)	0.2322 (0.97)	84.38	60
P3	1.0007*** (14.09)	0.6483*** (4.02)	0.1394 (0.53)	80.85	60
P4	1.0167*** (20.60)	0.5233*** (4.67)	0.1694 (0.92)	89.90	60
P5 (most important)	0.9522*** (21.33)	0.5370*** (5.30)	0.3026* (1.83)	90.85	60
<i>Panel C: Hedge portfolios</i>					
P1 (least important)	−0.0540 (−0.58)	−0.4686** (−2.22)	−0.4967 (−1.44)	2.90	120
P2	−0.1607** (−2.11)	−0.6890*** (−3.98)	−0.3459 (−1.22)	3.77	120
P3	−0.0137 (−0.17)	−0.7423*** (−4.06)	−0.3422 (−1.14)	2.41	120
P4	−0.0872 (−1.36)	−0.5386*** (−3.69)	−0.0641 (−0.27)	2.46	120
P5 (most important)	0.0307 (0.41)	−0.3685** (−2.19)	−0.1455 (−0.53)	0.76	120

*Note:* Following Fama (1998), we define *RMRF* as value-weighted market returns minus the risk-free rate; *SMB* as the difference between the daily returns of a value-weighted portfolio of small stocks and one of large stocks; and *HML* as the difference between the daily returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks. \*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels, respectively, and *t*-statistics are presented in parentheses.

difference between long and short portfolios, while firm size is larger for short portfolios, consistent with the findings in Table 12.

As a further robustness test, we examine the abnormal returns for portfolios formed on the basis of analysts' consensus recommendations during the  $T - 90$  to  $T - 1$  period (i.e.  $X = 90$ ) and the  $T - 180$  to  $T - 1$  period (i.e.  $X = 180$ ), respectively. The results are consistent.

Overall, the empirical results in Section 4.4 show that (1) analysts' recommendations are valuable; (2) the investment value of recommendations increases as firm-specific information becomes more important in stock pricing, while there is no significant relationship between the investment value of recommendations and the importance of industry-level information; (3) the duration of the investment value is quite short (usually a couple of days) when it comes to favorable recommendations; and (4) the duration of the investment value is much longer (usually several months) when it comes to unfavorable recommendations, which may be due to short-sale constraints and analyst optimism.

In summary, we can conclude that (1) Chinese security analysts are better at analyzing and transferring firm-specific information than industry-level information. On the one hand, analysts' research reports increase the ability of firm-specific information to explain the variation in stock returns, while on the other hand, covering more firms in the same industry does not help analysts incorporate industry-level information into their research reports and thus improve the investment value of their recommendations. (2) As expected, the investment value of analysts' recommendations increases as firm-specific information becomes more important in stock pricing, which confirms the analysts' superiority.

## 5. Conclusion and limitations

### 5.1. Conclusion and implications

With the development of the Chinese capital market, the securities analyst industry is growing rapidly. Whether analysts' activities help to decrease information asymmetry and thus improve the efficiency of resource allocation in the capital market has caused great concern among academics and practitioners. However, the findings in the literature are controversial. Our study explores this debate and provides a new form of evidence.

Using data on 192,012 recommendations issued by Chinese security analysts from 2005 to 2010, we find that on the whole, analysts are better at analyzing and transferring firm-specific than industry-level information. Specifically, *ceteris paribus*, analysts' research reports increase the ability of firm-specific information to explain the variation in stock returns. Furthermore, covering more firms in the same industry does not help analysts to incorporate industry-level information into their research reports and thus improve the investment value of their recommendations. The investment value of analysts' recommendations increases as firm-specific information plays a more important role in stock pricing, which also confirms that analysts are good at analyzing and transferring firm-specific information. Our empirical results suggest that security analysts play an important role in alleviating the information asymmetry in the capital market and that their research reports can guide investors. Our findings also show that the investment value of analysts' recommendations is mainly derived from their research activities of analyzing and transferring firm-specific rather than industry-level information.

The results of this study also generate some important implications. First, the securities analyst industry should further enhance its ability to process industry-level information, so that it may play a more important role in alleviating the information asymmetry arising from industry-level information. Second, listed companies should further improve their information disclosure environment. Our findings suggest that the investment value of analysts' research reports increases as firm-specific information becomes more important in stock pricing, which means that firm-specific information is not well understood by investors, thus resulting in the demand for information from intermediaries. Once the information environment of listed companies improves at the institutional level, a huge amount of transaction costs will be saved.

### 5.2. Limitations

First, our study shows that security analysts' superiority lies in analyzing and transferring firm-specific information, which ignores the fact that some analysts are good at processing industry-level information. Unfortunately, this paper does not distinguish between analysts who are good at processing industry-level and firm-specific information.

Second, the descriptive statistics in Section 4 show that security analysts tend to be optimistic. Although we follow Loh and Mian's (2006) method to construct our portfolios, it is still possible that the reliability of our conclusions is affected by analyst optimism.<sup>4</sup> Therefore, readers should be aware that some limitations exist in the reliability of our conclusions. We look forward to more academic research based on mature data in the future.

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<sup>4</sup> We thank the referee for pointing this out.

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