Forecast accuracy of star-analysts in the context of different corporate governance settings

Alexander Kerl[1] / Martin Ohlert

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Abstract

This paper examines whether so-called star-analysts (as identified by Thomson Reuters' StarMine awards) have higher forecasting abilities compared to non-star-analysts and, therefore, issue more accurate earnings and target prices within their analyst reports. Our results show that earnings forecasts of star-analysts outperform their peers' forecasts after an analyst has received an award. As StarMine analyst rankings are based on past earnings accuracy our results show that, at least in the short-run, star-analysts' earnings forecasting abilities seem to be persistent. Contrary to this finding, our results do not show any difference between both groups of analysts with respect to forecast accuracy of target prices. Based on the fact that the corporate governance level plays an important role for the quality of firm disclosures and, consequently, for the general level of forecast accuracy, we analyze if star-analysts benefit from higher governance levels. Results show that the forecasting accuracy of star-analysts increases with the level of both country- and company-specific corporate governance. Last, capital markets are not aware of this fact as they do not react differently to forecasts issued by star-analysts as compared to non-star-analysts.

Keywords: investor protection, institutional investors, corporate governance, forecast accuracy, analyst reports, star-analyst, StarMine

JEL-Classification: *G14, G15, G18, G24, G32*

[1] Corresponding author's email: Alexander.Kerl@wirtschaft.uni-giessen.de. Both authors are with the Department of Financial Services, University of Giessen, Licher Str. 74, 35394 Giessen, Germany.

1. INTRODUCTION

There is consensus that financial analysts contribute to the reduction of existing information asymmetries in capital markets, namely between the company and outside investors (Hall and Tacon, 2010). For this purpose, analysts provide detailed company analyses via research reports to numerous market participants. Among other information, such reports contain three fundamental key summary measures: an earnings forecast, a stock recommendation and a target price (Asquith et al., 2005; and Gleason et al., 2012). As following such forecasts is only beneficial for investors if stock prices perform as expected, it is crucial to identify those analysts whose forecasts are highly accurate. Often sell-side analysts' rankings that claim to identify so-called star-analysts are used for this purpose. Nevertheless, it is important to analyze if such star-analysts really outperform non-star-analysts in terms of forecast accuracy.

In the literature, there is evidence that sophisticated analysts indeed provide more accurate forecasts (see e.g., Stickel, 1992; and Leone and Wu, 2007) and their forecasts are more profitable for investors (see, e.g., Fang and Yasuda, 2010). Within a different context, previous studies have also shown that analysts' research reports contain more accurate forecasts in strong corporate governance settings (e.g., Byard et al., 2006; and Ljungqvist et al., 2007). This might be due to an increase in the quality of mandatory and voluntary firm disclosures alongside an increase in the quality of corporate governance. Hence, this paper contributes to the literature by combining two streams in the research field of analysts' forecast accuracy. First, we analyze if earnings and target price forecasts are more accurate when issued by star-analysts. Second, we extend prior literature by linking forecast accuracy to the prevailing investor protection environment to analyze if differences in corporate governance settings reinforce the accuracy of star-analysts' forecasts. One could argue that sophisticated analysts would benefit most from better information, as disclosed within highly regulated markets, compared to non-star-analysts. We consider this an important question since our findings might help in deciding if strong investor protection and better governance lead to improvements of the forecasting quality of financial analysts.

To answer this research question, we analyze around 36,000 analyst reports within an observation period from January 2005 to June 2010, containing forecasts for the capital markets in the U.S., the EU5 (France, Germany, Italy, Spain and the United Kingdom), Switzerland and Japan.

With respect to the first question, prior research has primarily used survey-based rankings as issued by the *Institutional Investor* magazine or the *Wall Street Journal* to identify so-called star-analysts within the U.S. capital market (see, e.g., Stickel, 1992 and 1995; Gleason

and Lee, 2003; Fang and Yasuda, 2005; and Ertimur et al., 2011). In contrast to these studies our study which focuses on a range of different countries uses yearly Thomson Reuters' StarMine awards which base the identification of star-analysts on rigorous valuation models using financial data.[2] Furthermore, we not only focus on earnings accuracy but extend prior studies by also using target prices as further forecast measure. To analyze forecast accuracy of star- versus non-star-analysts, we use three different measures: (i) absolute forecast accuracy, (ii) relative forecast accuracy and (iii) forecast accuracy as defined by Clement and Tse (2005).

With respect to the second question, it has been shown that analysts' earnings forecast accuracy is positively associated with the strength of the accounting standards (see Hope, 2003). Whereas Byard et al. (2006) add that the quality of analysts' information increases with the quality of corporate governance, Ljungqvist et al. (2007) report that the presence of institutional investors (i.e. to proxy firm-level governance) is associated with more accurate earnings forecasts. The differences in forecast accuracy might be the result of higher quality firm disclosures in such settings. In line with this argumentation, DeFond et al. (2007) show that earnings announcements are more informative in countries with strong investor protection.

While the aforementioned literature merely focuses on the general association between analysts' forecast quality and corporate governance, our study sets the focus on star-analysts and the influence of different corporate governance settings on their forecast accuracy.[3] To the best of our knowledge there is only one study (Barniv et al., 2005) that has also directly addressed this issue.

Based on all three different measures of forecast accuracy, we first show that earnings forecasts of star-analysts outperform non-star-analysts' forecasts in the year after the award was granted. Since Thomson Reuter's StarMine awards are based on a comparison of earnings estimates and recommendations between analysts, star-analysts have – by definition – published forecasts of higher accuracy *before* the award was granted. Our results now support the notion of forecast persistency of individual analysts, at least in the short-run. Contrary to this finding, we do not find a similar result with respect to target price accuracy.

[2] Studies from Lyssimachou et al. (2009) and Arand et al. (2012) have also used this source for the identification of sophisticated analysts.

[3] Following Gillan and Starks (1998), we define the term corporate governance as the influence and control of operations at a company through the system of laws, rules and other factors. Apart from investor protection rules, we also understand firm-level governance, i.e., institutional ownership, as part of the corporate governance level as a whole.

Although we initially assumed that star-analysts use their advanced skills not only to issue highly accurate earnings but also other forecasts such as target prices, our results do not support this reasoning. Following Bonini et al. (2010), one might argue that this result is due to limited incentives of analysts to focus on the accuracy of target prices since the accuracy of this measure is not included in their compensation packages. Furthermore, we provide evidence that star-analysts issue on average less optimistic earnings- and target price forecasts as compared to non-star-analysts. Such a result has been shown before with respect to the level of optimism within stock recommendations (see Clarke et al., 2006). Second, when analyzing the forecast performance of star-analysts within different corporate governance settings (i.e. strong investor protection or high institutional ownership) our univariate and multivariate results show that better corporate governance and stronger investor protection positively influences the forecasting accuracy of star-analysts. Within multivariate regressions, we control for company- and analyst-specific characteristics as well as year and company fixed effects. Our findings are in line with Barniv et al. (2005) who reason that analysts with superior characteristics might simply react to increased demand for accurate forecasts within common law countries as compared to civil-law countries where demand for earnings information is lower.

Finally, despite the fact that star-analysts persistently issue forecasts which are more accurate, we find no evidence of the market to react differently to star-analysts' recommendations. This result is in line with the findings of Clement and Tse (2003), suggesting that investors are not entirely aware of star-analysts' recommendations entailing more value-relevant information than those of non-star-analysts.

Our findings have important implications. First of all, investors should be more conscious about differences between star- and non-star-analysts' recommendations. Hence, it would be advisable for investors to follow star-analysts' recommendations as they outperform non-star-analysts with respect to, for example, the quality of their earnings forecasts. Furthermore, from a general capital market perspective, stronger investor protection and better corporate governance lead to improvements within the forecasting quality of star-analysts. Consequently, these findings support the assumption that analyst rankings fulfill a meaningful function on capital markets since they indicate indeed those analysts with superior earnings forecasting abilities.

The following sections of this paper are organized as follows. Section 2 outlines our data and research design. In Section 3, we provide empirical data about forecasting accuracy and star-analysts' recommendations. In Section 4, we present the results of analysts' forecasting

accuracy in the context of different corporate governance settings. In Section 5, we turn towards the empirical results according to the market reactions to star-analysts' recommendations. Finally, Section 6 concludes.

2. DATA SAMPLE

(i) Data Sources

Our sample contains a panel of analyst reports from January 2005 to June 2010 as obtained from *FactSet*.[4] The sample includes reports of eight different countries, namely from the U.S., the EU5 (France, Germany, Italy, Spain and the United Kingdom), Switzerland and Japan. In total, these countries account for about 56% of the world's total market capitalization.[5]

As we focus on forecast accuracy between star- and non-star-analysts, we only focus on those stocks that have been covered by at least one star-analyst within a respective research year (see, e.g., He et al., 2005, for such a selection).[6] Furthermore, we only focus on observations where the companies' fiscal year-end (which usually is in December) is equal to the year in which the research report was issued. Additionally, stocks have to be covered by at least three different analysts per year to guarantee a minimum of research coverage (see, e.g., Barniv et al., 2005; and Ertimur et al., 2007).[7] Based on the fact that prior literature has identified larger brokerage houses to publish recommendations that lead to higher market reactions (as shown by Stickel, 1995) and that are more accurate as compared to other brokers' forecasts (see, e.g., Clement, 1999), we focus on analyst reports issued by the top ten brokerage houses in terms of research output for our analysis.[8]

For every report we also require the analysts' estimation for each of the three key summary measures, that is, the stock recommendation, the forecast for earnings per share and the target price in the current and previous report. Overall, our sample of 36,005 reports (see Panel A of Table 1) is based on 131 individual StarMine analysts issuing 3,411 recommendations and 1,541 individual non-StarMine analysts with 32,594 recommendations covering 1,159 different stocks.

[4] *FactSet* delivers data of analyst report information via data transfer/interfaces. Hence, this pooled information does not necessarily represent analysts' written reports but should be considered as data feed to *FactSet*.
[5] According to Bloomberg (June 2010).
[6] The identification of a star-analyst is explained within part (iii) of this Section.
[7] Hence, next to the StarMine analyst we require at least two more analysts covering the same stock within the same year.
[8] The top ten brokerage houses are CA Cheuvreux, Citi, Credit Suisse, Deutsche Bank Research, Exane BNP Paribas, Goldman Sachs, JP Morgan, Morgan Stanley, Société Générale and UBS.

[Please insert Table 1 about here]

(ii) Accuracy Measures

To quantify each analysts' forecast accuracy for both earnings per share and target prices for every analyst-company-year combination, we compute three different accuracy measures, namely the absolute forecast accuracy, the relative accuracy, and an accuracy measure following the methodology of Clement and Tse (2005). Consistent with the approach of Asquith et al. (2005), we measure analyst's target price accuracy as the forecasted target price relative to the actual stock price at the end of the one year forecast horizon. For analyst's earnings accuracy we use the actual earnings per share subsequent to the analyst's earnings forecast for comparison with the initial forecast. For all accuracy measures a higher value corresponds to a more accurate forecast.[9]

The first accuracy measure, namely EPS_ACC_ABS (TP_ACC_ABS), focuses on the absolute forecast accuracy, and is simply computed as one minus the analyst's absolute earnings forecast error (absolute target price forecast error) for the covered company in the specific research year.[10] Absolute forecast accuracy penalizes any deviation from the initial forecast, irrespective of the sign of the deviation. Our results in Table 1 show that the absolute accuracy of earnings forecasts amounts to 89.66% (median) whereas the accuracy of target price forecasts is slightly lower with a median of 74.36%.

The second accuracy measure focuses on relative forecast accuracy, namely EPS_ACC_REL (TP_ACC_REL), that is based on the analyst's relative earnings forecast error (relative target price forecast error) for the covered company in the specific research year (see, e.g., Cooper et al., 2001). We multiply forecast errors by minus one to ensure that higher values correspond to higher forecast accuracy.[11] In contrast to the absolute accuracy measures, relative accuracy only penalizes not reaching a forecast. Any overachievement of, for example, a forecasted target price is positively acknowledged since, from an investors'

[9] From the investors' point of view, a relative accuracy, in particular, which is above zero indicates a positive overshot, i.e., actual earnings per share exceeds the forecasted earnings per share (adopted from Bonini et al., 2010).

[10] Based on the analyst-company-year combination, the absolute earnings forecast error is measured as $|(EPS_t - EPS_{t+n}) / EPS_{t+n}|$, while the absolute target price forecast error is measured as $|(TP_t - P_{t+12}) / P_{t+12}|$. Here, EPS_{t+n} and P_{t+12} represent the actual earnings per share for the financial year for which the forecast was issued and the actual stock price 12 months after the report was issued, respectively. All variable definitions are provided in the Appendix.

[11] Based on the analyst-company-year combination, the relative earnings forecast error is measured as $(EPS_t - EPS_{t+n}) / |EPS_{t+n}|$, while the relative target price forecast error is measured as $(TP_t - P_{t+12}) / P_{t+12}$. Here, EPS_{t+n} and P_{t+12} represent the actual earnings per share for the financial year for which the forecast was issued and the actual stock price 12 months after the report was issued, respectively.

perspective, it helps increasing the performance. Panel B of Table 1 shows that the median relative earnings accuracy (EPS_ACC_REL) is 0.17%, while the median relative target price accuracy (TP_ACC_REL) is only -9.14% and, hence, much less accurate. In other words this latter result reveals that the actual stock prices after 12 months fell about 10% short of the analysts' target price expectations.

Following Clement and Tse (2005), we compute a third accuracy measure, namely EPS_ACC_CT (TP_ACC_CT). This measure comprises the analysts' absolute forecast error, scaled by the maximum and minimum absolute forecast errors.[12] For this accuracy measure, we find a median value for EPS_ACC_CT of 65.52% and for TP_ACC_CT of 63.43%, respectively.

(iii) Star-analyst Classification

Every year StarMine evaluates the forecasting quality of analysts along the two criteria (i) earnings estimation and (ii) stock picking. Whereas analysts who have published highly accurate earnings forecasts qualify for the StarMine earnings award, those analysts whose recommendations generate the best returns will be likely to receive the StarMine stock picking award.[13] StarMine uses for its analyst rankings rigorous valuation models based on the Thomson Financial *I/B/E/S* database. Within our sample, we define a star-analyst through being awarded as 'Top Earnings Estimators' and / or 'Top Stock Pickers' by StarMine within a specific year. Lyssimachou et al. (2009) have also used Thomson Reuters' StarMine rankings to identify top-ranked analysts.

Since we aim to analyze if star-analysts continue to outperform their peers in the upcoming year after having received the award, we introduce a dummy variable (STAR_ANALYST) which equals one if the analyst received one of the StarMine awards in the previous calendar year, and zero otherwise.

[12] The accuracy measure EPS_ACC_CT is measured as $(Abs\_EPS\_Error\_max_{jt} - Abs\_EPS\_Error_{ijt}) / (Abs\_EPS\_Error\_max_{jt} - Abs\_EPS\_Error\_min_{jt})$, while TP_ACC_CT is measured as $(Abs\_TP\_Error\_max_{jt} - Abs\_TP\_Error_{ijt}) / (Abs\_TP\_Error\_max_{jt} - Abs\_TP\_Error\_min_{jt})$.

[13] For more details about StarMine's scoring methodology see: http://excellence.thomsonreuters.com/award/starmine.

(iv) Corporate Governance Measures

In order to measure if differences within the prevailing corporate governance setting have an impact on the forecasting abilities of star-analysts, we use four different country-level investor protection and enforcement indicators and, additionally, one company-level proxy for governance (see Table 2). With respect to the country-level indicators, all four measures have been used by previous research and appear as widely accepted and conceptually different (see, e.g., DeFond and Hung, 2004; and Aggarwal et al., 2011). Our first indicator distinguishes between common-law and civil-law countries. Previous research (see, e.g., La Porta et al., 1997, 1998; and Ball et al., 2000) has found evidence for stronger investor protection laws and higher reporting quality in common-law countries. As second indicator we use the anti-self dealing index (ASDI) from Djankov et al. (2008) which has been developed to improve of the anti-director rights index (ADRI) of La Porta et al. (1998).[14] Third, we expand our list by an indicator for the country's law enforcement capability. This proxy is referred to as PUBL_ENF, developed by Leuz et al. (2003), and represents the mean score of three law enforcement variables documented by La Porta et al. (1998): firstly, the efficiency of the judicial system; secondly, the country's rule of law; and thirdly, the degree of corruption.[15] High values of PUBL_ENF proxy strong law enforcement and, hence, good corporate governance settings. Forth, we use STAFF_ENF, as taken from Jackson and Roe (2009) that reflects public enforcement by calculating the country's resources of staff for the regulation of the security market, relative to its inhabitants. Jackson and Roe (2009) point out that a high degree of regulatory resources allows to prevent and punish financial and firm's wrongdoings to enforce financial rules. Finally, we use the percentage of institutional ownership (INST_OWNER) which we measure on a quarterly basis to proxy company-level governance levels. Data on a company's institutional ownership is taken from *FactSet/LionShares*.[16] Shleifer and Vishny (1997) have pointed out that large investors and legal protection are complementary factors in an effective corporate governance system. Similarly, it has been shown (see, e.g., Bushee, 1998; and Aggarwal et al., 2011) that institutional investors' monitoring affects corporate governance practice. Therefore, institutional ownership is used as a proxy for the corporate governance level because high institutional ownership implies

[14] With respect to the regulation data used for index construction, the ASDI uses more recent data (from 2003) as compared to the ADRI (data from 1993). For a detailed description of further differences between both indices, please see Djankov et al. (2008).

[15] This proxy of law enforcement as introduced by Leuz et al. (2003) has already received attention in the literature (see, e.g., DeFond and Hung, 2004).

[16] For an explanation to compile the ownership data out of the database *FactSet/LionShares* see Aggarwal et al. (2011).

intensive monitoring activities, and consequently influences the financial reporting quality of a company (see, e.g., Yeo et al., 2002; and Velury and Jenkins, 2006).

[Please insert Table 2 about here]

As can be seen from Table 2 both common-law countries (the U.S. and the UK) also rank high with respect to the other three investor protection and enforcement indicators. Furthermore, they have high (mean) values of institutional ownership (72.86% and 68.13%) as compared to civil-law countries. These results are in line with the findings of Aggarwal et al. (2011).

(v) Control Variables

As documented by the literature (e.g., Michaely and Womack, 1999; and Hong and Kubik, 2003), analysts' opinions might be positively biased which possibly affects forecast accuracy. For this reason, we control for the level of optimism in analysts' forecasts by using the expected earnings yield and the implied return as proxies. We measure the relative earnings expectation or, alternatively, earnings yield (EPS_YIELD) as the ratio of the forecasted earnings per share to the current stock price at the date of the issued recommendation. Next, we measure the analyst's expected stock price performance or, alternatively, implied return (IMPL_RETURN) as the ratio of the target price relative to the current stock price at the date of the issued recommendation minus one (see, e.g., Bonini et al., 2010; and Bradshaw et al., 2012b). An expected earnings yield or an implied return above zero reveals that analysts expect a positive return (in terms of earnings or stock price performance) whereas values below zero indicate the opposite.

Furthermore, we include two control variables at the company-level. The first variable (LOG_MKTCAP) is based on the market capitalization for every stock given in U.S. dollars and is determined as the logarithm of the value on the date of the issued recommendation. The next control variable (LOG_PTBV) is measured as the logarithm of the price-to-book ratio on the date of the issued recommendation.[17] We exclude all observations with negative price-to-book ratios and all observations with a stock price less or equal to USD 1.00 to ensure that our

[17] For both company-specific control variables the source of the data is *Datastream*. Both variables are displayed in Table 1 based upon the original values.

results are not influenced by small, and probably illiquid stocks (consistent to e.g., McKnight and Todd, 2006).

In addition to the company-level control variables, we also include analyst-specific control variables. Following Emery and Li (2009), we use the logarithm of the number of covered stocks by analyst and research year (LOG_NSTOCK) and the logarithm of the number of issued reports by analyst and research year (LOG_NREC) to measure the analysts' effort.[18]

3. FORECAST ACCURACY AND STAR-ANALYSTS' RECOMMENDATIONS

In this section we analyze the forecast accuracy of star- versus non-star-analysts by applying different accuracy measures to evaluate both earnings and target price forecasts. Mikhail et al. (2004), for example, demonstrate that analysts' forecasts are persistent. Hence, analysts who performed well in the past will continue to do so in the future. Other studies focus explicitly on star-analysts (based on the *Institutional Investor* magazine rankings) for their analyses. Fang and Yasuda (2005), for example, relate the analyst's personal reputation to forecast accuracy and find that All-American analysts are significantly more accurate as compared to non-All-American analysts. Leone and Wu (2007) show that forecasting performance of ranked analysts is more likely to be based on superior abilities compared to pure luck. The authors derive their findings from persistent forecasting performance and the fact that ranked analysts are considered as leaders before they are first awarded by the *Institutional Investor* magazine. Based on these studies we assume that forecasting performance of star-analysts, as proxied by StarMine rankings, is due to superior abilities of analysts. Hence, even within the year after receiving the award, star-analysts should outperform their peers.

(i) Univariate Analysis

First of all, we show univariate results in Table 3 for the full sample, and separately for star-analysts and non-star-analysts. Whereas Panel A displays the distribution of recommendation revisions, Panel B (Panel C) compares mean and median values of earnings forecast measures (target price forecast measures) and respective accuracy values across all analyst groups. In the last two columns of Table 3, we display mean and median differences of star- versus non-star-analysts including corresponding significance levels.

[18] Both analyst-specific control variables are displayed in Table 1 based upon the original values.

[Please insert Table 3 about here]

As the results of Panel A (Table 3) show, the numbers of recommendation revisions are similarly distributed across the total sample. There are approximately 5% upgrades, 6% downgrades, alongside 89% reiterations. With regard to differences between both groups of analysts, we demonstrate that star-analysts issue significantly more downgrades (6.65% of all recommendations) indicating less optimism in comparison to the group of non-star-analysts (5.59%), which is consistent with the findings of Clarke et al. (2006). Focusing on the level of optimism in the issued earnings and target price forecasts between star- and non-star-analysts, results illustrate that both EPS_YIELD as well as IMPL_RETURN are significantly different between the two groups of analysts. Star-analysts provide on average less optimistic earnings forecasts than non-star-analysts as illustrated in Panel B (median EPS_YIELD for star-analysts = 6.31%; median EPS_YIELD for non-star-analysts = 6.93%). With respect to IMPL_RETURN (Panel C of Table 3), we can similarly show that star-analysts issue significantly less optimistic target price forecasts.[19] Our results are also in line with the study of Leone and Wu (2007), showing less optimism, more accurate forecasts, and better stock recommendation returns for high-status analysts.

In Panel B of Table 3, we display the results for the three different accuracy measures related to earnings. For each measure, we find that the median forecast accuracy is significantly higher for star-analysts compared to non-star-analysts. Exemplarily for the third forecast measure (EPS_ACC_CT), the median forecast accuracy of star-analysts is 69.74% for star-analysts as compared to a statistically lower accuracy of only 65.08% of non-star-analysts.[20] These findings are in line with previous studies (e.g., Stickel, 1992; Fang and Yasuda, 2005; and Leone and Wu, 2007) that provide evidence about more accurate earnings forecasts by high-status analysts.

Contrary to these findings, results in Panel C (based on all three accuracy measures) reveal that target price forecast accuracy does not differ between both groups of analysts. This result is in line with previous studies (see, e.g., Bonini et al., 2010; and Bradshaw et al., 2012a) that argue that analysts only have limited incentives to provide accurate target prices since this type of forecast is not part of the factors that determine the analyst's compensation package.

[19] In detail, we illustrate that star-analysts issue a median IMPL_RETURN of 9.52% compared to a more optimistic median IMPL_RETURN of 11.22% issued by non-star-analysts. For both earnings yield and implied return, results based on mean values are identical.

[20] Comparable results can be found for the other two earnings accuracy measures. Furthermore, using mean instead of median values for the purpose of comparison does not change results.

Furthermore, target prices might be (positively) biased due to potential affiliations between the analyst (or her employer) and the covered company which might lead to an underperformance (see, e.g., Arand and Kerl, 2012).

(ii) Multivariate Analysis

Apart from univariate results we additionally perform multivariate regressions to analyze if forecasts from star-analysts are of higher accuracy. Alongside the STAR_ANALYST dummy and the variables that proxy the analyst's optimism all previously described company- and analyst-specific control variables are included. We estimate our regressions by using a fixed effects model that allows for cross-sectional and time dependence by including year and company dummies in the regression model. Based on Petersen (2009) we compute robust standard errors that are clustered on the company level.

For both types of forecasts (earnings and target prices), we estimate one regression for each of the three different accuracy measures. Since our research question is to test whether star-analysts issue more accurate forecasts compared to their peers, we include the STAR_ANALYST dummy as independent variable. Additionally, all models that analyze earnings accuracy (model 1 to 3) are complemented by the analysts' optimism in terms of earnings (EPS_YIELD) whereas model 4 to 6 that analyze target price accuracy use the analysts' implied return (IMPL_RETURN), respectively. Finally, we add the set of company-specific (LOG_MKTCAP and LOG_PTBV) and analyst-specific (LOG_NSTOCK and LOG_NREC) control variables. Exemplarily, model 1 of Table 4 is estimated as follows:

$$\begin{aligned} \text{EPS\_ACC\_ABS}_{ijt} = {} & \alpha + \beta_1 \text{STAR\_ANALYST}_{ijt} + \beta_2 \text{EPS\_YIELD}_{ijt} \\ & + \beta_3 LOG\_MKTCAP_{ijt} + \beta_4 \text{LOG\_PTBV}_{ijt} \\ & + \beta_5 \text{LOG\_NSTOCK}_{it} + \beta_6 \text{LOG\_NREC}_{it} \\ & + \beta_7 YEAR_t + \beta_8 COMPANY_{jt} + \varepsilon_{ijt} \end{aligned} \qquad (1)$$

[Please insert Table 4 about here]

The results from the multivariate analysis are reported in Table 4. With regard to all three models that focus on earnings accuracy (model 1 to 3) our results show that earnings forecasts issued by star-analysts are of higher accuracy. In all three models, the coefficient of STAR_ANALYST is positive and highly significant, in two models even at the 1%-level. Within model 1, for example, absolute forecast accuracy increases by 3.74 percentage

points (pp) in case of a star-analyst issuing the earnings forecast. As expected, model 1 to 3 also show a significantly negative coefficient for EPS_YIELD. This reveals that there is a significant decline of forecast accuracy in case of highly optimistic earning forecasts. With respect to target price accuracy (model 4 to 6) we cannot find similar evidence for star-analysts' forecasts being more accurate. The coefficients of the STAR_ANALYST dummy are mainly insignificant. Hence, it seems as if, in line with our univariate results, star-analysts do not issue better target prices as compared to non-star-analysts. A reason for this finding could be the fact that star-analysts focus primarily on indicators that are favorable for their career prospects, such as the accuracy of forecasted earnings per share (Cooper et al., 2001; and Hong and Kubik, 2003). This is not the case for target price forecasts as Bonini et al. (2010) have argued. Similar to model 1 to 3, all regressions focusing on target price accuracy show that especially optimistic forecasts are less accurate. All coefficients on IMPL_RETURN are negative and statistically significant at the 1%-level. Asquith et al. (2005) have also found that the probability of achieving a price target depends on the analyst-specific optimism. With respect to LOG_MKTCAP we find significantly negative coefficients which might signal an increased complexity while analyzing larger companies (see Bradshaw et al., 2012b). On the contrary, significantly positive coefficients for LOG_NSTOCKS, hence more accurate forecasts in case of an analyst covering more stocks, might arise from an analyst's advanced industry knowledge (see, e.g., Leone and Wu, 2007). Based on Table 4, our results show that star-analysts seem to possess above-average forecasting qualities primarily with respect to their earnings forecasts. Therefore we will focus purely on earnings accuracy in the reminder of the paper.

4. FORECAST ACCURACY IN DIFFERENT CORPORATE GOVERNANCE SETTINGS

Investor protection, the enforcement of capital market rules and corporate governance structures (i.e. ownership levels) vary considerably across countries (see, e.g., La Porta et al., 1997; and Aggarwal et al., 2011). Since they might heavily impact the quality of financial analysts' forecasts through more informative financial statements (see Frankel et al., 2006) we are interested in examining if forecast accuracy of star-analysts which has proven as more accurate (compared to non-star-analysts' forecasts) differs with respect to the prevailing corporate governance environment.

Prior research has shown that investor protection and corporate governance levels impact forecast accuracy (e.g., Hope, 2003; Bhat et al., 2006; and Yu, 2010). Whereas Byard et al.

(2006) demonstrates that forecast accuracy and governance quality are positively associated, Ljungqvist et al. (2007) show that earnings forecast accuracy depends on the ownership structure and, more specifically, on the presence of institutional investors. With respect to different investor protection environments, Barniv et al. (2005) conclude that analysts have an increased incentive to provide accurate forecasts when investors' demand for earnings information is high as it is typical in common-law countries. Hence, a strong corporate governance level just as a high institutional ownership structure is positively associated to forecast accuracy.

As we have shown in the previous section that star-analysts are able to issue more accurate earnings forecasts compared to non-star-analysts, we now analyze if better corporate governance settings (i.e. higher investor protection) positively impact the forecasting accuracy of star-analysts. We argue that if investor protection and corporate governance settings positively impact forecasting abilities of analysts *in general*, star-analysts might benefit even more from such beneficial environments. To the best of our knowledge there is only one study (see Barniv et al., 2005) that has previously combined the analysis of star-analysts with the prevailing financial reporting environment. In contrast to their study that purely uses the distinction between common versus civil law countries as investor protection proxy we focus on different investor protection and legal enforcement measures as well as the institutional ownership structure. Furthermore, contrary to Barniv et al. (2005) who identify their analysts based on superior characteristics (e.g. ability, effort and experience) we directly use the external StarMine awards based on Thomson Reuters for the identification of so-called star-analysts.

(i) Univariate Analysis

Within our analyses, we measure the level of corporate governance based on four different country-level indicators (COMMON, ASDI, PUBL_ENF and STAFF_ENF) and one company-level indicator (INST_OWNER). Based on the median value of each specific corporate governance measure we split our sample into a high and a low corporate governance environment.

[Please insert Table 5 about here]

Table 5 shows that in general almost all results demonstrate that analysts' forecasts are significantly more accurate in strong corporate governance environments compared to weak

corporate governance environments, irrespective of the type of analyst (star- vs. non-star-analysts). Exemplarily for the forecast accuracy based on Clement and Tse (2005) (EPS_ACC_CT) of the *full* sample, the median forecast accuracy in common-law countries with 67.31% (Panel A) is higher compared to civil-law countries with only 64.36%. The difference of 2.96% between strong and weak investor protection settings as measured by common- and civil-law is statistically significant at the 1%-level.[21] Our result is therefore in line with findings of Hope (2003) who demonstrates that analysts' uncertainty about forecasting earnings is reduced in case of a strong corporate governance environment.

We next focus on forecast accuracy differences between star- and non-star-analysts depending on the prevailing regulatory setting. Results can be seen within the last columns of Table 5 where we display the mean and median difference between both types of analysts. First, with reference to strong investor protection settings as measured by our different proxies, the majority of cases reveals that forecast accuracy of star-analysts is significantly higher as compared to non-star analysts. This yields for all protection proxies except for ASDI where results are mixed. Exemplarily for EPS_ACC_CT in common-law countries (Panel A of Table 5), the median forecast accuracy of star-analysts (71.76%) compared to non-star-analysts (66.67%) illustrates a significantly better forecast performance of star-analysts. These findings are supported by Barniv et al. (2005) who demonstrate that analysts with superior abilities outperform their peers in common-law countries. The authors argue that financial reporting systems and investor protection laws are typically stronger in common-law countries. In consequence, this increases the demand of investors for earnings information and the incentive for analysts to provide highly accurate information which is best fulfilled by analysts with superior characteristics.

Second, with reference to weak investor protection environments, our results show mixed evidence. Whereas star-analysts' forecasts seem to outperform their peers' forecasts within civil-law countries or weak ASDI settings (Panel A and B), the results are reversed when using PUBL_ENF, STAFF_ENF or INST_OWNER (Panel C to E) to proxy a weak corporate governance environment. Hence, in case of weak corporate governance settings we find no strong results that star-analysts similarly outperform their peers. Barniv et al. (2005) argue that investors' demand for earnings information is reduced when the corporate governance level is lower. This might lead to the fact that analysts' incentives (for both star- and non-star-

[21] Results do not change with respect to using the two other forecast accuracy measures and the additional proxies for the corporate governance setting (namely ASDI, PUBL_ENF, STAFF_ENF and INST_OWNER).

analysts) decrease in working out accurate forecasts in weak investor protection environments.

(ii) Multivariate Analysis

Since univariate results have shown that star-analysts issue more accurate forecasts and that this especially holds in strong investor protection settings where the demand for accurate forecasts is high, we now turn to multivariate analyses in order to control simultaneously for various company- and analyst-specific factors, as described before, alongside year and company fixed effects. For the analysis of Table 6, we estimate the following regression based on robust standard errors (Petersen, 2009) and a clustering on the company level:[22]

$$\begin{aligned} EPS\_ACC\_ABS_{ijt} = {} & \alpha + \beta_1(STAR\_ANALYST_{ijt} \times GOVERNANCE_{ijt}) \\ & + \beta_2 GOVERNANCE_{ijt} + \beta_3 EPS\_YIELD_{ijt} \\ & + \beta_4 LOG\_MKTCAP_{ijt} + \beta_5 LOG\_PTBV_{ijt} \\ & + \beta_6 LOG\_NSTOCK_{it} + \beta_7 LOG\_NREC_{it} \\ & + \beta_8 YEAR_t + \beta_9 COMPANY_{jt} + \varepsilon_{ijt} \end{aligned} \qquad (2)$$

[Please insert Table 6 about here]

Table 6 is split into three panels where each displays the results for one specific accuracy measure (EPS_ACC_ABS, EPS_ACC_REL and EPS_ACC_CT). To measure if increased governance levels and better investor protection influences the forecasting accuracy of star-analysts, we use the interaction of STAR_ANALYST and each corporate governance/ investor protection measure (STAR_ANALYST x GOVERNANCE) alongside the stand-alone governance variable in all regression models.[23] As displayed across the three panels, results show that the interaction coefficient is positive and highly significant for four out of five regressions. Hence, our results show that the prevailing corporate governance setting has an effect on forecasting abilities of star-analysts. Exemplarily, we focus again on the results for the accuracy based on Clement and Tse (2005) as displayed in Panel C of Table 5. The

[22] In the regression models, the notation GOVERNANCE refers to the specific governance indicators which have been described before (namely COMMON, ASDI, PUBL_ENF, STAFF_ENF and INST_OWNER).

[23] The stand-alone coefficients for the country-level governance variable (COMMON, ASDI, PUBL_ENF and STAFF_ENF) are omitted. This is due to the fact that they do not contain any variation at the company level. In contrast, the coefficient of the variable INST_OWNER is displayed as the base coefficient shows variation at the company level.

interaction term based on COMMON (model 1), for example, of 0.0287 is significant at the 5%-level. Once a star-analyst issues a forecast within a common-law country, our results reveal an increase in forecasting accuracy of 2.87 percentage points (pp) compared to star-analysts' forecasts within civil-law countries. A similar reasoning with even higher significance levels applies for all other investor protection measures. These results are backed by univariate findings and fully in line with Barniv et al. (2005). It seems as if the increased demand for earnings information within high investor protection countries is best addressed by star-analysts' forecasts which are likely to issue forecasts of even higher precision for stocks located in countries with high corporate governance levels and strong investor protection as compared to less regulated environments. Similar to Table 4 all coefficients on EPS_YIELD within the different models are negative and statistically significant at the 1%-level. More optimistic forecasts are (ex-post) less accurate (see also Asquith et al., 2005).

5. MARKET REACTIONS TO STAR-ANALYSTS' RECOMMENDATIONS

Since StarMine analysts' earnings forecast accuracy is significantly higher as previously shown in Table 4, market participants might attach a higher value to star-analysts' recommendations, which consequently should result in stronger market reactions. This assumption is supported by prior literature (e.g., Stickel, 1995; and Gleason and Lee, 2003), where analysts with a better reputation have stronger influences on stock prices.

To measure the market reaction around analysts' recommendations, we compute the cumulative abnormal return (hereafter CAR) surrounding the date of the analyst report. We obtain data on stock returns from *Datastream*. To calculate CARs we use an estimation period that ranges from day [-250] until day [-11] relative to the date of the analyst report while applying a standard market model based on daily returns (e.g., Brown and Warner, 1985; and MacKinlay, 1997). Following the approach of Asquith et al. (2005), we finally aggregate the CARs over a five-day window, beginning with day [-2] and ending with day [+2].[24]

Similar to Brav and Lehavy (2003), we classify analysts' recommendations into upgrades (UP) and downgrades (DOWN) by using dummy variables capturing the recommendation change based on the analysts' previous recommendation on that stock. Furthermore, we compute for each report the corresponding forecast revision. Hence, the earnings forecast revision (EPS_REV) and the target price forecast revision (TP_REV) represent the percentage

[24] For the purpose of outlier correction, we discard the first and last percentile of cumulative abnormal returns.

change in analysts' earnings- respectively target price forecast for a stock.[25] Similar to Chan et al. (2007), we address the elimination of potential outliers associated with possible coding errors in the dataset by trimming the first and the last percentile of the earnings forecast revisions and the target price revisions.

[Please insert Table 7 about here]

When analyzing the market reaction as illustrated in Table 7, each analysis contains all company- and analyst-specific control variables as well as year and company fixed effects. In addition, we include as independent variables the previously described variables UP, DOWN, EPS_REV and TP_REV. Finally, we add interaction terms between these revision variables and our dummy variable STAR_ANALYST to analyze in particular if the market reacts differently to forecast revisions if issued by star-analysts (as compared to non-star analysts). For model 1 of Table 7 we estimate the following regression:

$$\begin{aligned} CAR_{ijt} = {} & \alpha + \beta_1 UP_{ijt} + \beta_2 (STAR\_ANALYST_{ijt} \times UP_{ijt}) \\ & + \beta_3 DOWN_{ijt} + \beta_4 (STAR\_ANALYST_{ijt} \times DOWN_{ijt}) \\ & + \beta_5 LOG\_MKTCAP_{ijt} + \beta_6 LOG\_PTBV_{ijt} \\ & + \beta_7 LOG\_NSTOCK_{it} + \beta_8 LOG\_NREC_{it} \\ & + \beta_9 YEAR_t + \beta_{10} COMPANY_{jt} + \varepsilon_{ijt} \end{aligned} \qquad (3)$$

Within further regression models, we only include EPS_REV and its interaction with STAR_ANALYST (model 2), TP_REV and its interaction (model 3) and all different forecast revision measures in addition to their respective interaction terms (model 4).[26]

With respect to the interaction terms we find no evidence for market participants to attribute a higher information value to forecast revisions if issued by star-analysts. Since the coefficients of the interaction terms are not significant, there is no statistical proof for a stronger market reaction following star-analysts' revisions as compared to non-star forecasts.[27] Within the literature one can find mixed evidence on this issue. Stickel (1992), for example, shows that

[25] EPS_REV is measured as $(EPS_t - EPS_{t-1}) / |EPS_{t-1}|$, while TP_REV is measured as $(TP_t - TP_{t-1}) / TP_{t-1}$. To avoid using stale information, we only compute earnings and target price revisions if the previous recommendation, earnings or target price forecast was issued within the 90 days prior to the respective report.

[26] Within all models, control variables and dummies for year and company fixed effects are included.

[27] We re-run all regression models calculated in Table 7 by exchanging the independent variable CAR (five-day cumulative abnormal return) through the AR (one-day abnormal return) for the publication day itself. All results remain identical.

the market does not differentiate between downgrades from analysts that are ranked by the *Institutional Investor* magazine and those that are not. In contrast to this finding he reveals for upgrades that markets react stronger when the revision is issued by a ranked analyst. Nevertheless, all coefficients of the base forecast revision variables (UP, DOWN, EPS_REV and TP_REV) are highly significant. Similar to the literature (see, e.g., Asquith et al., 2005) our results show that the market positively (negatively) reacts to an increase (decrease) in earnings or target price forecasts.

Within a next step, we analyze if this result holds within different corporate governance environments. It could be, for example, that investors who demand more accurate earnings forecasts in high investor protection countries (see Barniv et al., 2005) are also aware of the increased accuracy of star-analysts' forecasts. Within both univariate (Table 5) and multivariate analyses (Table 6) we have shown yet that better corporate governance and stronger investor protection has a positive effect on star-analysts' forecasting accuracy. Based on these findings, one would expect that at least within countries with high corporate governance levels investors might react stronger to star-analysts' forecasts. For this purpose, we split the sample into sub-samples of high and low investor protection[28] and estimate the model including all forecast revision measures and their respective interaction terms (comparable to model 4 of Table 7).[29]

[Please insert Table 8 about here]

Our results are reported in Table 8 and are subdivided into a strong (Panel A) and a weak (Panel B) corporate governance environment. When focusing on the interaction terms we do not find statistically significant coefficients supporting the assumption that investors know about the increased forecast accuracy of star-analysts in strong corporate governance environments.[30] Hence, it seems as if investors do not recognize the enhanced information value of forecasts that are issued by star-analysts as defined by Thomson Reuters' StarMine

[28] This split is either performed by simply using common- vs. civil-law countries or, alternatively, by using the median value of each of the other proxy measures.
[29] Each regression model is performed including all company- and analyst-specific control variables and year and company fixed effects. All regressions are based on robust standard errors (Petersen, 2009) and a clustering on the company level.
[30] We re-run all regression models calculated in Table 8 by exchanging the independent variable CAR (five-day cumulative abnormal return) through the AR (one-day abnormal return) of the publication day itself. All results remain identical.

awards. Clement and Tse (2003) have argued earlier that investors fail to interprete some value-relevant information based on analysts' abilities.

Interestingly, a comparison between Panel A (strong corporate governance setting) and Panel B (weak corporate governance setting) reveals that at least for the earnings revision variable investors seem to attribute a much higher information value to this information within high investor protection environments. Whereas the coefficient in Panel B is only 0.0095 (revealing that for a 100% increase in earnings forecast the CAR increases by 0.95 pp in civil-law countries), Panel A contains a coefficient of 0.0242 (and hence a CAR increase of 2.42pp) for earnings forecast increases in common-law countries. This supports the reasoning of Barniv et al. (2005) that investors within strong investor protection countries have a much higher demand for earnings information (which consequently leads to stronger market reactions).

6. CONCLUSION

Analysts are highly specialized within their task of providing investors with relevant company-specific information. Since they mainly use proprietary models for their analyses without revealing every detail of the evaluation process, investors have always been curious about identifying those analysts whose forecasts are highly accurate and whom to trust most. For this reason, several sell-side analyst rankings have emerged that claim to identify so-called star-analysts. Within this paper, we aim to analyze if star-analysts' forecasts are more accurate as compared to non-star-analysts' forecasts. In contrast to former studies that have used survey-based analyst rankings as issued by the *Institutional Investor* magazine or the *Wall Street Journal*, we identify star-analysts based on yearly StarMine awards as issued by Thomson Reuters. Based on three different measures of forecast accuracy ((i) absolute accuracy, (ii) relative accuracy and (iii) accuracy based on the methodology of Clement and Tse, 2005) we first show that earnings forecasts of star-analysts outperform non-star-analysts' forecasts in the year after the award was granted.[31] Hence, our results show that forecast accuracy is persistent at least in the short-run. Quite interestingly, our results also show that star-analysts' earnings forecasts are less optimistic as compared to non-star-analysts' forecasts. Contrary to earnings forecasts, we do not find similar results for target price forecasts of star-analysts. This could be due to the fact that analysts have fewer incentives

[31] Since the StarMine award itself is based on a comparison of earnings estimates and recommendations between analysts, star-analysts' forecasts are highly accurate – by definition – *before* the award was granted.

(with respect to their compensation packages) to correctly forecast target prices as compared to earnings (see, e.g., Bonini et al., 2010).

Secondly, we hypothesize that star-analysts' forecasts might additionally depend on the prevailing investor protection and corporate governance environment. Within the literature it has been shown before that forecast accuracy in general is positively correlated with governance transparency and enforcement (see Bhat et al., 2006). Similarly, Ljungqvist et al. (2007) find that the presence of institutional investors (i.e. to proxy company-level governance) leads to more accurate earnings forecasts. This is due to the fact that institutional investors perform monitoring tasks and positively influence the financial reporting quality and corporate governance practice (Bushee, 1998; Yeo et al., 2002; and Velury and Jenkins, 2006). This paper is among the first to combine the analysis of star-analysts' forecast performance with the regulatory setting. To the best of our knowledge only Barniv et al. (2005) have analyzed the association between analysts with superior abilities and the legal and financial reporting environment. Based on four county-level investor protection and legal enforcement indicators and one company-level corporate governance indicator both univariate and multivariate results show that better corporate governance and stronger investor protection have a positive effect on forecast accuracy of star-analysts. The reason for this could be, as Barniv et al. (2005) argue, that analysts with superior characteristics simply fulfill investors' demand for accurate forecasts within common-law countries as compared to civil-law countries where there is less demand for earnings information by investors.

Finally, our results do not support the assumption that the market is aware of star-analysts to outperform their peers. Within all analyses, we do not find any evidence for the market to react differently to forecasts when issued by so-called star-analysts. Interestingly, this finding is consistent with, for example, Clement and Tse (2003) who conclude that investors fail to extract some value-relevant information that analysts' characteristics can provide. Therefore, our results would call for more awareness of investors and the market as a whole with respect to forecasts issued by star-analysts as they not only fulfill a meaningful task but also outperform their peers' forecasts in terms of accuracy.

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Table 1

Summary statistics of stock recommendation revisions, forecast and accuracy measures, company and analyst characteristics and stock market reaction

Panel A: Distribution of stock recommendation revisions		
	N	*% of total*
Stock recommendation revisions		
ALL_REC	36,005	100.00%
UP	1,916	5.32%
REIT	32,039	88.98%
DOWN	2,050	5.69%

Panel B: Distribution of forecast and accuracy measures						
	N	*Mean*	*Median*	*StDev*	*Min*	*Max*
Earnings forecast and accuracy measures						
EPS_REV	36,005	0.0025	0.0000	0.2066	-1.7888	2.0714
EPS_YIELD	36,005	0.0708	0.0687	0.0563	-1.0547	0.5847
EPS_ACC_ABS	36,005	0.7155	0.8966	0.5646	-4.2720	1.0000
EPS_ACC_REL	36,005	-0.1448	0.0017	0.6155	-5.2720	1.4654
EPS_ACC_CT	35,906	0.6017	0.6552	0.3049	0.0000	1.0000
Target price forecast and accuracy measures						
TP_REV	36,005	0.0069	0.0000	0.1140	-0.4483	0.5653
IMPL_RETURN	36,005	0.1210	0.1111	0.2004	-0.5026	1.0117
TP_ACC_ABS	36,005	0.5545	0.7436	0.6073	-4.5000	1.0000
TP_ACC_REL	36,005	-0.2774	-0.0914	0.7003	-5.5000	0.6000
TP_ACC_CT	35,911	0.5910	0.6343	0.2996	0.0000	1.0000

Panel C: Company information, analyst characteristics and stock market reaction						
	N	*Mean*	*Median*	*StDev*	*Min*	*Max*
Company/Stock fundamentals						
MKTCAP	36,005	30,431.4	11,336.3	47,891.9	80.8	518,242.4
PTBV	35,426	3.0	1.9	8.1	0.1	275.5
Analyst characteristics						
NSTOCK	36,005	5.2	4.0	3.7	1.0	23.0
NREC	36,005	78.1	56.0	65.4	1.0	576.0
Stock market reaction						
CAR	36,005	0.0001	0.0001	0.0457	-0.1706	0.1539
AR	36,005	0.0008	0.0000	0.0267	-0.2005	0.2072

Notes:

Table 1 represents summary statistics of the full sample within the sample period ranging from January 2005 to June 2010. Panel A reports the number and distribution of stock recommendation revisions. ALL_REC contains all observations within the selected sample. UP (DOWN) is a dummy variable that takes a value of one when the issued stock recommendation is an upgrade (downgrade) with respect to the previous estimation for the analyst-company-year combination, and zero otherwise. REIT is a dummy variable that takes a value of one when the estimation for the covered company is a reiteration relative to the analysts' previous recommendation, and zero otherwise. Panel B shows a set of forecast and accuracy measures. EPS_REV (TP_REV) is computed as the percentage change of an analyst's earnings forecast (target price), relative to the previous report. The EPS_YIELD describes the estimated earnings yield calculated by the forecasted earnings per share in relation to the current stock price. IMPL_RETURN shows the implied return computed as the ratio of the target price to the current stock price minus one. EPS_ACC_ABS (TP_ACC_ABS) represents the absolute accuracy of the forecasted earnings per share (target price). EPS_ACC_REL (TP_ACC_REL) represents the relative accuracy of the forecasted earnings per share (target price). EPS_ACC_CT (TP_ACC_CT) displays the forecast accuracy scaled by the range of absolute forecast errors for a specific company in the research year (similar to Clement and Tse, 2005). Within Panel C, MKTCAP represents the market capitalization which is measured in millions of U.S. dollars. PTBV is the price-to-book ratio. NSTOCK (NREC) indicates the number of covered companies (number of issued recommendations) by an analyst in the respective research year. CAR represents the five-day cumulative abnormal return surrounding the research date of the analyst's report, while AR shows the abnormal return on the research date, respectively. Both variables of the market reaction are computed with a standard market model based on daily returns with an estimation period [-250; -11] relative to the publication day of an analyst's report.

Table 2

Corporate governance levels by country

	Investor protection and legal enforcement				*Institutional ownership*
Country	*COMMON*	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
France	Civil	0.38	8.68	5.91	28.15%
Germany	Civil	0.28	9.05	4.43	30.86%
Italy	Civil	0.42	7.07	7.25	19.85%
Japan	Civil	0.50	9.17	4.32	21.61%
Spain	Civil	0.37	7.14	8.50	15.84%
Switzerland	Civil	0.27	10.00	8.87	29.66%
United Kingdom	Common	0.95	9.22	19.04	68.13%
United States	Common	0.65	9.54	23.75	72.86%
Mean		0.48	8.73	10.26	42.63%
Median		0.40	9.11	7.88	34.47%

Notes:

Table 2 provides descriptive statistics for the applied corporate governance measures, consisting of four different investor protection and enforcement measures at the country-level as well as one corporate ownership measure at the company-level. The variable COMMON distinguishes a country in its common-law or civil-law legal origin consistent to La Porta et al. (1997). ASDI denotes the anti-self-dealing index based on Djankov et al. (2008). PUBL_ENF indicates a legal enforcement index that is extracted from Leuz et al. (2003). STAFF_ENF is a resource-based enforcement measure provided by Jackson and Roe (2009). In the last column, we present the variable INST_OWNER obtained from *FactSet/LionShares*. Ownership is measured as per calendar quarter end prior to the analyst report date and expressed as a fraction of market capitalization. A higher value of each measure indicates a higher corporate governance level based on each specific definition.

Table 3

Summary statistics of stock recommendation revisions an forecast and accuracy measures based on the subdivision of analyst groups

Panel A: Distribution of stock recommendation revisions

	FULL SAMPLE		*STAR_ANALYST*		*NON_STAR_ANALYST*		*DIFF. (STAR - NON_STAR)*
	N	*% of total*	*N*	*% of total*	*N*	*% of total*	*z-value*
ALL_REC	36,005		3,411		32,594		
UP	1,916	5.32%	165	4.84%	1,751	5.37%	-1.3241
REIT	32,039	88.98%	3,019	88.51%	29,020	89.03%	-0.9354
DOWN	2,050	5.69%	227	6.65%	1,823	5.59%	2.5465 **

Panel B: Earnings forecast and accuracy measures

	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
EPS_REV	36,005	0.0025	0.0000	3,411	0.0006	0.0000	32,594	0.0028	0.0000	-0.0022	0.0000 *
EPS_YIELD	36,005	0.0708	0.0687	3,411	0.0635	0.0631	32,594	0.0716	0.0693	-0.0081 ***	-0.0062 ***
EPS_ACC_ABS	36,005	0.7155	0.8966	3,411	0.7278	0.9048	32,594	0.7142	0.8956	0.0136	0.0092 ***
EPS_ACC_REL	36,005	-0.1448	0.0017	3,411	-0.1209	0.0115	32,594	-0.1473	0.0004	0.0264 **	0.0110 ***
EPS_ACC_CT	35,906	0.6017	0.6552	3,398	0.6247	0.6974	32,508	0.5993	0.6508	0.0254 ***	0.0466 ***

Panel C: Target price forecast and accuracy measures

	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
TP_REV	36,005	0.0069	0.0000	3,411	0.0099	0.0000	32,594	0.0066	0.0000	0.0034	0.0000 *
IMPL_RETURN	36,005	0.1210	0.1111	3,411	0.1045	0.0952	32,594	0.1228	0.1122	-0.0182 ***	-0.0170 ***
TP_ACC_ABS	36,005	0.5545	0.7436	3,411	0.5453	0.7406	32,594	0.5554	0.7438	-0.0101	-0.0032
TP_ACC_REL	36,005	-0.2774	-0.0914	3,411	-0.2822	-0.0720	32,594	-0.2769	-0.0936	-0.0053	0.0216
TP_ACC_CT	35,911	0.5910	0.6343	3,400	0.5876	0.6358	32,511	0.5913	0.6341	-0.0037	0.0017

Notes:

Table 3 represents summary statistics of stock recommendations and forecast and accuracy measures. In addition to the FULL SAMPLE that contains all recommendations, we provide data for each specific analyst group (STAR_ANALYST and NON_STAR_ANALYST). The sub-group of STAR_ANALYST (NON_STAR_ANALYST) identifies all analysts who have (not) appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. Panel A shows the numbers and the distribution of stock recommendation revisions. ALL_REC contains all observations within the sample period. UP (DOWN) is a dummy variable that takes a value of one when the issued stock recommendation is an upgrade (downgrade) relative to the previous recommendation for the analyst-company-year combination, and zero otherwise. REIT is a dummy variable that takes a value of one when the recommendation for the covered company is a reiteration relative to the analysts' previous recommendation, and zero otherwise. Panel B and C show a set of forecast and accuracy measures. EPS_REV (TP_REV) is computed as the percentage change in an analyst's earnings forecast revision (target price revision), relative to the previous report. EPS_YIELD describes the estimated earnings yield calculated by the forecasted earnings per share in relation to the current stock price. IMPL_RETURN shows the implied return computed as the ratio of the target price to the current stock price minus one. The accuracy measure EPS_ACC_ABS (TP_ACC_ABS) represents the absolute accuracy of the forecasted earnings per share (target price). EPS_ACC_REL (TP_ACC_REL) represents the relative accuracy of the forecasted earnings per share (target price). EPS_ACC_CT (TP_ACC_CT) displays the forecast accuracy scaled by the range of absolute forecast errors for a specific company in the research year (similar to Clement and Tse, 2005). The statistical significance levels for the differences between star- and non-star-analysts are based on non-tabulated coefficients of a two-sided t-test for the mean, and a Wilcoxon rank-sum test for the median, respectively. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

Table 4

Multivariate results of analysts' earnings- and target price forecast accuracy

	Earnings forecast accuracy			*Target price accuracy*		
	EPS_ACC_ABS	*EPS_ACC_REL*	*EPS_ACC_CT*	*TP_ACC_ABS*	*TP_ACC_REL*	*TP_ACC_CT*
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
STAR_ANALYST	0.0374 ***	0.0312 **	0.0293 ***	-0.0134	-0.0197 *	-0.0068
	(2.81)	(2.03)	(3.03)	(-1.07)	(-1.67)	(-0.71)
EPS_YIELD	-1.1271 ***	-2.5141 ***	-0.7817 ***			
	(-3.29)	(-5.00)	(-3.55)			
IMPL_RETURN				-0.5978 ***	-1.1346 ***	-0.1465 ***
				(-13.92)	(-33.30)	(-4.09)
LOG_MKTCAP	0.0507	-0.0251	-0.0179	-0.5219 ***	-0.8718 ***	-0.1510 ***
	(0.94)	(-0.41)	(-0.53)	(-8.56)	(-14.28)	(-5.31)
LOG_PTBV	-0.0812	-0.1546 **	-0.0069	-0.1032 *	-0.2154 ***	0.0220
	(-1.41)	(-2.11)	(-0.22)	(-1.72)	(-3.27)	(0.70)
LOG_NSTOCK	0.0045	0.0170	-0.0129	0.0267 **	0.0304 ***	-0.0035
	(0.39)	(0.94)	(-0.82)	(2.42)	(2.68)	(-0.41)
LOG_NREC	0.0053	0.0017	0.0086	-0.0056	-0.0078	0.0016
	(0.59)	(0.15)	(0.85)	(-0.80)	(-1.15)	(0.22)
Intercept	0.3875	0.5088	0.8388 ***	5.8489 ***	8.3809 ***	2.0556 ***
	(0.77)	(0.91)	(2.83)	(10.38)	(14.90)	(7.77)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	35,426	35,426	35,329	35,426	35,426	35,334
F	4.29	5.15	7.13	40.90	133.24	9.69
Adj.R^2	52.1%	52.4%	9.5%	55.9%	70.0%	7.7%

Notes:

Table 4 shows multivariate regression results on analysts' forecast accuracy. Model 1 to 3 illustrate earnings forecast accuracy, while model 4 to 6 show target price accuracy. For both earnings and target price forecasts, we use three different forecast accuracy measurements. First, model 1 (model 4) measures the analysts' absolute earnings (target price) accuracy based on EPS_ACC_ABS (TP_ACC_ABS). Next, model 2 (model 5) measures the analysts' relative earnings (target price) accuracy based on EPS_ACC_REL (TP_ACC_REL). Last, model 3 (model 6) measures the analysts' earnings (target price) accuracy based on the methodology by Clement and Tse (2005), namely EPS_ACC_CT (TP_ACC_CT). STAR_ANALYST identifies all analysts who have appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. EPS_YIELD (applied within model 1 to 3) describes the estimated earnings yield calculated by the forecasted earnings per share in relation to the current stock price. IMPL_RETURN (applied within model 4 to 6) shows the implied return computed as the ratio of the target price to the current stock price minus one. LOG_MKTCAP is the logarithm of the market capitalization which is measured in millions of U.S. dollars. LOG_PTBV is the logarithm of the price-to-book ratio. LOG_NSTOCK (LOG_NREC) indicates the logarithm of the number of covered companies (number of issued recommendations) by an analyst in the respective research year. All models control for year and company fixed effects. Values in parentheses represent t-statistics. Standard errors are clustered by company cluster. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

Table 5

Univariate results of absolute and relative earnings forecast accuracy in the context of different corporate governance settings

Panel A: Strong versus weak corporate governance level (COMMON)											
	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
COMMON											
EPS_ACC_ABS	14,268	0.8177	0.9176	1,656	0.8222	0.9245	12,612	0.8171	0.9164	0.0051	0.0080
EPS_ACC_REL	14,268	-0.0202	0.0230	1,656	-0.0135	0.0215	12,612	-0.0210	0.0230	0.0075	-0.0016 **
EPS_ACC_CT	14,230	0.6116	0.6731	1,649	0.6364	0.7176	12,581	0.6083	0.6667	0.0281 ***	0.0509 ***
CIVIL											
EPS_ACC_ABS	21,737	0.6484	0.8800	1,755	0.6387	0.8823	19,982	0.6492	0.8798	-0.0106	0.0025 **
EPS_ACC_REL	21,737	-0.2266	-0.0175	1,755	-0.2223	0.0001	19,982	-0.2269	-0.0199	0.0047	0.0201 ***
EPS_ACC_CT	21,676	0.5952	0.6436	1,749	0.6136	0.6720	19,927	0.5936	0.6406	0.0200 ***	0.0314 ***
DIFF. (COMMON - CIVIL)											
EPS_ACC_ABS		0.1693 ***	0.0376 ***		0.1835 ***	0.0422 ***		0.1679 ***	0.0366 ***		
EPS_ACC_REL		0.2064 ***	0.0405 ***		0.2088 ***	0.0213 ***		0.2059 ***	0.0430 ***		
EPS_ACC_CT		0.0164 ***	0.0296 ***		0.0228 **	0.0456 *		0.0148 ***	0.0261 ***		
Panel B: Strong versus weak corporate governance level (ASDI)											
	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
STRONG ASDI											
EPS_ACC_ABS	18,408	0.7686	0.9088	2,249	0.7485	0.9139	16,159	0.7714	0.9080	-0.0229 **	0.0058
EPS_ACC_REL	18,408	-0.0723	0.0158	2,249	-0.0997	0.0096	16,159	-0.0685	0.0164	-0.0313 ***	-0.0068 ***
EPS_ACC_CT	18,343	0.6049	0.6667	2,238	0.6266	0.7023	16,105	0.6018	0.6637	0.0248 ***	0.0386 ***
WEAK ASDI											
EPS_ACC_ABS	17,597	0.6599	0.8816	1,162	0.6876	0.8834	16,435	0.6579	0.8814	0.0297	0.0020 ***
EPS_ACC_REL	17,597	-0.2206	-0.0186	1,162	-0.1619	0.0152	16,435	-0.2248	-0.0212	0.0629 ***	0.0364 ***
EPS_ACC_CT	17,563	0.5984	0.6432	1,160	0.6209	0.6829	16,403	0.5968	0.6402	0.0241 ***	0.0427 ***
DIFF. (STRONG ASDI - WEAK ASDI)											
EPS_ACC_ABS		0.1087 ***	0.0272 ***		0.0609 ***	0.0304 ***		0.1135 ***	0.0266 ***		
EPS_ACC_REL		0.1483 ***	0.0344 ***		0.0622 ***	-0.0056		0.1563 ***	0.0376 ***		
EPS_ACC_CT		0.0065 **	0.0235 ***		0.0058	0.0194		0.0051	0.0234 ***		

Table 5 (Continued)

Panel C: Strong versus weak corporate governance level (PUBL_ENF)											
	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
STRONG PUBL_ENF											
EPS_ACC_ABS	19,677	0.7781	0.9069	2,296	0.8037	0.9213	17,381	0.7748	0.9049	0.0289 ***	0.0164 ***
EPS_ACC_REL	19,677	-0.0701	0.0136	2,296	-0.0444	0.0204	17,381	-0.0735	0.0129	0.0290 ***	0.0075 **
EPS_ACC_CT	19,613	0.6022	0.6555	2,285	0.6389	0.7126	17,328	0.5974	0.6486	0.0415 ***	0.0640 ***
WEAK PUBL_ENF											
EPS_ACC_ABS	16,328	0.6400	0.8816	1,115	0.5715	0.8571	15,213	0.6450	0.8831	-0.0735 ***	-0.0260 ***
EPS_ACC_REL	16,328	-0.2348	-0.0175	1,115	-0.2784	-0.0175	15,213	-0.2316	-0.0175	-0.0468 **	0.0000
EPS_ACC_CT	16,293	0.6010	0.6544	1,113	0.5956	0.6613	15,180	0.6015	0.6537	-0.0059	0.0075
DIFF. (STRONG PUBL_ENF - WEAK PUBL_ENF)											
EPS_ACC_ABS		0.1382 ***	0.0252 ***		0.2322 ***	0.0641 ***		0.1298 ***	0.0218 ***		
EPS_ACC_REL		0.1647 ***	0.0311 ***		0.2340 ***	0.0379 ***		0.1581 ***	0.0304 ***		
EPS_ACC_CT		0.0012	0.0012		0.0433 ***	0.0513 ***		-0.0041	-0.0051		
Panel D: Strong versus weak corporate governance level (STAFF_ENF)											
	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
STRONG STAFF_ENF											
EPS_ACC_ABS	19,121	0.7927	0.9088	2,081	0.8198	0.9228	17,040	0.7894	0.9069	0.0304 ***	0.0159 ***
EPS_ACC_REL	19,121	-0.0617	0.0145	2,081	-0.0221	0.0248	17,040	-0.0665	0.0132	0.0445 ***	0.0116 ***
EPS_ACC_CT	19,080	0.6107	0.6646	2,074	0.6506	0.7237	17,006	0.6058	0.6569	0.0448 ***	0.0667 ***
WEAK STAFF_ENF											
EPS_ACC_ABS	16,884	0.6280	0.8792	1,330	0.5837	0.8683	15,554	0.6318	0.8800	-0.0481 **	-0.0117
EPS_ACC_REL	16,884	-0.2389	-0.0150	1,330	-0.2756	-0.0108	15,554	-0.2357	-0.0154	-0.0399 *	0.0046
EPS_ACC_CT	16,826	0.5914	0.6433	1,324	0.5840	0.6482	15,502	0.5921	0.6428	-0.0081	0.0054
DIFF. (STRONG STAFF_ENF - WEAK STAFF_ENF)											
EPS_ACC_ABS		0.1647 ***	0.0296 ***		0.2362 ***	0.0545 ***		0.1576 ***	0.0269 ***		
EPS_ACC_REL		0.1772 ***	0.0295 ***		0.2535 ***	0.0356 ***		0.1692 ***	0.0286 ***		
EPS_ACC_CT		0.0193 ***	0.0213 ***		0.0666 ***	0.0755 ***		0.0138 ***	0.0142 ***		

Table 5 (Continued)

Panel E: High versus low corporate governance level (INST_OWNER)											
	FULL SAMPLE			*STAR_ANALYST*			*NON_STAR_ANALYST*			*DIFF. (STAR - NON_STAR)*	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean*	*Median*
HIGH INST_OWNER											
EPS_ACC_ABS	16,193	0.7524	0.9118	1,747	0.7923	0.9211	14,446	0.7476	0.9105	0.0448 ***	0.0106 **
EPS_ACC_REL	16,193	-0.1182	0.0047	1,747	-0.0572	0.0127	14,446	-0.1256	0.0039	0.0684 ***	0.0088 ***
EPS_ACC_CT	16,163	0.6129	0.6722	1,743	0.6332	0.7185	14,420	0.6105	0.6667	0.0226 ***	0.0518 ***
LOW INST_OWNER											
EPS_ACC_ABS	16,213	0.6644	0.8869	1,254	0.6100	0.8834	14,959	0.6689	0.8871	-0.0589 ***	-0.0037
EPS_ACC_REL	16,213	-0.2046	-0.0114	1,254	-0.2465	-0.0002	14,959	-0.2011	-0.0124	-0.0454 **	0.0122
EPS_ACC_CT	16,157	0.5951	0.6467	1,248	0.6043	0.6681	14,909	0.5943	0.6441	0.0100	0.0241 **
DIFF. (HIGH INST_OWNER - WEAK INST_OWNER)											
EPS_ACC_ABS		0.0880 ***	0.0249 ***		0.1823 ***	0.0376 ***		0.0787 ***	0.0234 ***		
EPS_ACC_REL		0.0864 ***	0.0161 ***		0.1893 ***	0.0129 ***		0.0755 ***	0.0163 ***		
EPS_ACC_CT		0.0179 ***	0.0256 ***		0.0289 **	0.0503 *		0.0162 ***	0.0226 ***		

Notes:

Table 5 provides univariate results on forecast accuracy of different analyst groups depending on the prevailing corporate governance setting. We display the mean and median values of three earnings forecast accuracy measurements per analyst group and the prevailing corporate governance level alongside their differences. We apply three different earnings forecast accuracy measurements: EPS_ACC_ABS represents the absolute accuracy of the forecasted earnings per share. EPS_ACC_REL represents the relative accuracy of the forecasted earnings per share. EPS_ACC_CT displays the forecast accuracy scaled by the range of absolute forecast errors for a specific company in the research year (similar to Clement and Tse, 2005). To split observations depending on the prevailing corporate governance level, we use several indicators. For a distinction between high vs. low corporate governance levels, countries having an above (below) median rate of each specific corporate governance measure are aggregated within the strong (weak) governance group. Moreover, a strong (weak) corporate governance level is also attributed to those countries identified as common-law (civil-law) origin. With respect to the applied indicators, the variable COMMON distinguishes a country in its legal origin, whether it is of common-law or civil-law origin consistent to La Porta et al. (1997). ASDI denotes the anti-self-dealing index based on Djankov et al. (2008). PUBL_ENF indicates a legal enforcement index that is extracted from Leuz et al. (2003). STAFF_ENF is a resource-based enforcement measure provided by Jackson and Roe (2009). The variable INST_OWNER obtained from *FactSet/LionShares*. Ownership is measured as per calendar quarter end prior to the analyst report date and expressed as a fraction of market capitalization. FULL SAMPLE contains all sample recommendations irrespective of a star-analyst status. STAR_ANALYST (NON_STAR_ANALYST) identifies all analysts who have (not) appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. The statistical significance levels for the differences between star- and non-star-analysts as well as for strong and weak corporate governance levels are based on non-tabulated coefficients of a two-sided t-test for the mean, and a Wilcoxon rank-sum test for the median, respectively. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

Table 6

Absolute and relative earnings forecast accuracy in the context of different corporate governance settings

Panel A: Forecast accuracy based on EPS_ACC_ABS					
	Measure for corporate governance				
	COMMON	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
STAR_ANALYST x GOVERNANC	0.0084	0.0383 **	0.0039 ***	0.0012 **	0.0342 **
	(0.80)	(2.18)	(2.69)	(2.43)	(2.01)
GOVERNANCE					0.4015 **
					(1.96)
EPS_YIELD	-1.1291 ***	-1.1280 ***	-1.1272 ***	-1.1290 ***	-1.2721 ***
	(-3.30)	(-3.29)	(-3.29)	(-3.30)	(-3.63)
LOG_MKTCAP	0.0513	0.0510	0.0508	0.0507	0.0695
	(0.95)	(0.94)	(0.94)	(0.94)	(1.21)
LOG_PTBV	-0.0811	-0.0812	-0.0813	-0.0808	-0.0998
	(-1.41)	(-1.41)	(-1.41)	(-1.41)	(-1.63)
LOG_NSTOCK	0.0054	0.0052	0.0045	0.0051	0.0064
	(0.46)	(0.45)	(0.39)	(0.44)	(0.47)
LOG_NREC	0.0060	0.0054	0.0054	0.0057	0.0059
	(0.67)	(0.60)	(0.60)	(0.63)	(0.56)
Intercept	0.3796	0.3841	0.3868	0.3858	0.0472
	(0.75)	(0.76)	(0.76)	(0.76)	(0.09)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes
N	35,426	35,426	35,426	35,426	31,949
F	4.05	4.19	4.27	4.45	4.20
Adj.R^2	52.0%	52.0%	52.1%	52.0%	52.3%
Panel B: Forecast accuracy based on EPS_ACC_REL					
	Measure for corporate governance				
	COMMON	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
STAR_ANALYST x GOVERNANC	0.0118	0.0334 *	0.0031 *	0.0012 *	0.0383 *
	(0.94)	(1.73)	(1.85)	(1.90)	(1.86)
GOVERNANCE					0.2397
					(1.03)
EPS_YIELD	-2.5158 ***	-2.5148 ***	-2.5142 ***	-2.5157 ***	-2.5048 ***
	(-5.01)	(-5.00)	(-5.00)	(-5.01)	(-4.81)
LOG_MKTCAP	-0.0248	-0.0249	-0.0250	-0.0252	-0.0362
	(-0.41)	(-0.41)	(-0.41)	(-0.42)	(-0.59)
LOG_PTBV	-0.1544 **	-0.1545 **	-0.1546 **	-0.1542 **	-0.1294 *
	(-2.11)	(-2.11)	(-2.11)	(-2.10)	(-1.83)
LOG_NSTOCK	0.0178	0.0176	0.0170	0.0175	0.0058
	(0.98)	(0.97)	(0.94)	(0.96)	(0.34)
LOG_NREC	0.0022	0.0018	0.0018	0.0020	0.0087
	(0.20)	(0.16)	(0.16)	(0.18)	(0.76)
Intercept	0.5035	0.5062	0.5079	0.5083	0.4670
	(0.90)	(0.91)	(0.91)	(0.91)	(0.81)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes
N	35,426	35,426	35,426	35,426	31,949
F	5.17	5.14	5.14	5.23	4.80
Adj.R^2	52.4%	52.4%	52.4%	52.4%	52.2%

Table 6 (Continued)

Panel C: Forecast accuracy based on EPS_ACC_CT

	Measure for corporate governance				
	COMMON	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
STAR_ANALYST x GOVERNANC	0.0287 **	0.0384 **	0.0033 ***	0.0018 ***	0.0325 **
	(2.35)	(2.50)	(3.07)	(3.37)	(1.98)
GOVERNANCE					0.2137 **
					(2.31)
EPS_YIELD	-0.7835 ***	-0.7822 ***	-0.7817 ***	-0.7834 ***	-0.9622 ***
	(-3.56)	(-3.55)	(-3.55)	(-3.56)	(-5.17)
LOG_MKTCAP	-0.0181	-0.0178	-0.0179	-0.0185	0.0021
	(-0.54)	(-0.53)	(-0.53)	(-0.55)	(0.08)
LOG_PTBV	-0.0065	-0.0069	-0.0070	-0.0064	-0.0309
	(-0.20)	(-0.22)	(-0.22)	(-0.20)	(-1.17)
LOG_NSTOCK	-0.0122	-0.0124	-0.0130	-0.0126	0.0008
	(-0.76)	(-0.78)	(-0.82)	(-0.79)	(0.07)
LOG_NREC	0.0088	0.0086	0.0086	0.0086	0.0010
	(0.87)	(0.85)	(0.85)	(0.85)	(0.11)
Intercept	0.8388 ***	0.8376 ***	0.8390 ***	0.8431 ***	0.5919 **
	(2.83)	(2.83)	(2.83)	(2.84)	(2.31)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes
N	35,329	35,329	35,329	35,329	31,864
F	6.53	6.76	7.12	7.25	5.43
Adj.R^2	9.4%	9.5%	9.5%	9.5%	10.1%

Notes:

Table 6 shows multivariate regression results on analysts' forecast accuracy depending on the prevailing corporate governance level. EPS_ACC_ABS (Panel A) represents the absolute accuracy of the forecasted earnings per share. EPS_ACC_REL (Panel B) represents the relative accuracy of the forecasted earnings per share. EPS_ACC_CT (Panel C) represents the forecast accuracy scaled by the range of absolute forecast errors for a specific company in the research year (similar to Clement and Tse, 2005). Several different indicators are applied to proxy the level of corporate governance. First, the variable COMMON distinguishes a country in its legal origin, whether it is of common-law or civil-law origin consistent to La Porta et al. (1997). ASDI denotes the anti-self-dealing index based on Djankov et al. (2008). PUBL_ENF indicates a legal enforcement index that is extracted from Leuz et al. (2003). STAFF_ENF is a resource-based enforcement measure provided by Jackson and Roe (2009). The variable INST_OWNER obtained from *FactSet/LionShares*. Ownership is measured as per calendar quarter end prior to the analyst report date and expressed as a fraction of market capitalization. Within each model, we additionally use the interaction coefficient between the dummy variable STAR_ANALYST and the specific corporate governance variable. STAR_ANALYST identifies all analysts who have appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. GOVERNANCE is the placeholder for the specific corporate governance variables as shown in each column heading. The EPS_YIELD describes the estimated earnings yield calculated by the forecasted earnings per share in relation to the current stock price. LOG_MKTCAP is the logarithm of the market capitalization which is measured in millions of U.S. dollars. LOG_PTBV is the logarithm of the price-to-book ratio. LOG_NSTOCK (LOG_NREC) indicates the logarithm of the number of covered companies (number of issued recommendations) by an analyst in the respective research year. All models control for year and company fixed effects. The specific variable GOVERNANCE in model 1 to 4 does not contain any variation at the company level and is therefore omitted. Values in parentheses represent t-statistics. Standard errors are clustered by company cluster. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

Table 7

Market reaction to analysts' recommendation revisions

	UP / DOWN	*EPS_REV*	*TP_REV*	*ALL_REC*
	Model 1	*Model 2*	*Model 3*	*Model 4*
UP	0.0143 ***			0.0097 ***
	(12.46)			(8.17)
STAR_ANALYST x UP	0.0017			0.0022
	(0.44)			(0.54)
DOWN	-0.0152 ***			-0.0118 ***
	(-12.39)			(-9.72)
STAR_ANALYST x DOWN	0.0002			-0.0005
	(0.05)			(-0.16)
EPS_REV		0.0189 ***		0.0134 ***
		(7.01)		(5.12)
STAR_ANALYST x EPS_REV		-0.0054		-0.0033
		(-1.08)		(-0.67)
TP_REV			0.0608 ***	0.0474 ***
			(17.35)	(13.44)
STAR_ANALYST x TP_REV			-0.0090	-0.0077
			(-1.14)	(-0.96)
LOG_MKTCAP	0.0013	-0.0005	-0.0032	-0.0031
	(0.49)	(-0.19)	(-1.23)	(-1.19)
LOG_PTBV	0.0024	0.0012	0.0001	0.0002
	(0.89)	(0.47)	(0.02)	(0.08)
LOG_NSTOCK	0.0017 ***	0.0014 **	0.0011 *	0.0012 *
	(2.66)	(2.18)	(1.81)	(1.91)
LOG_NREC	-0.0016 ***	-0.0014 ***	-0.0011 **	-0.0012 **
	(-3.16)	(-2.60)	(-2.19)	(-2.33)
Intercept	-0.0043	0.0117	0.0362	0.0351
	(-0.17)	(0.47)	(1.51)	(1.45)
Year fixed effects	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes
N	35,426	35,426	35,426	35,426
F	31.75	6.16	31.88	37.05
Adj.R^2	5.8%	5.2%	6.5%	7.3%

Notes:

Table 7 shows multivariate regression results for the five-day cumulative abnormal return (CAR) around the report's issuance date [-2; +2]. Under the column headings model 1 to 3, regressions are computed separately for each type of recommendation revision (UP/DOWN, EPS_REV, TP_REV), while model 4 contains all recommendation revisions (ALL_REC). We display for each model the interaction coefficients between the dummy variable STAR_ANALYST and the respective recommendation revision variable. STAR_ANALYST identifies all analysts who have appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. UP (DOWN) is a dummy variable that takes a value of one when the issued stock recommendation is an upgrade (downgrade) with respect to the previous estimation for the analyst-firm-year combination, and zero otherwise. EPS_REV (TP_REV) is computed as the percentage change of an analyst's earnings forecast (target price), relative to the previous report. LOG_MKTCAP is the logarithm of the market capitalization which is measured in millions of U.S. dollars. LOG_PTBV is the logarithm of the price-to-book ratio. LOG_NSTOCK (LOG_NREC) indicates the logarithm of the number of covered companies (number of issued recommendations) by an analyst in the respective research year. All models control for year and company fixed effects. Values in parentheses represent t-statistics. Standard errors are clustered by company cluster. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

Table 8

Market reaction to analysts' recommendation revisions and the impact of corporate governance settings

Panel A: Market reaction in strong corporate governance settings

	Measure for corporate governance				
	COMMON	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
UP	0.0100 ***	0.0105 ***	0.0114 ***	0.0089 ***	0.0108 ***
	(4.74)	(5.82)	(5.74)	(4.84)	(5.89)
STAR_ANALYST x UP	0.0055	0.0012	0.0020	0.0057	0.0012
	(0.84)	(0.22)	(0.34)	(1.08)	(0.20)
DOWN	-0.0101 ***	-0.0116 ***	-0.0131 ***	-0.0109 ***	-0.0095 ***
	(-4.05)	(-5.59)	(-6.22)	(-5.70)	(-4.67)
STAR_ANALYST x DOWN	-0.0002	-0.0000	0.0015	0.0023	0.0005
	(-0.05)	(-0.00)	(0.36)	(0.55)	(0.11)
EPS_REV	0.0242 ***	0.0182 ***	0.0155 ***	0.0148 ***	0.0187 ***
	(5.10)	(6.00)	(3.79)	(3.09)	(4.77)
STAR_ANALYST x EPS_REV	-0.0065	-0.0088	-0.0004	0.0002	-0.0001
	(-0.93)	(-1.59)	(-0.07)	(0.03)	(-0.02)
TP_REV	0.0466 ***	0.0468 ***	0.0487 ***	0.0424 ***	0.0505 ***
	(6.97)	(8.86)	(9.09)	(8.08)	(8.41)
STAR_ANALYST x TP_REV	-0.0138	-0.0073	-0.0165	-0.0165	-0.0130
	(-1.04)	(-0.68)	(-1.48)	(-1.47)	(-1.04)
LOG_MKTCAP	-0.0066	-0.0072 **	-0.0047	-0.0015	-0.0028
	(-1.42)	(-1.97)	(-1.17)	(-0.38)	(-0.63)
LOG_PTBV	-0.0015	-0.0016	-0.0005	-0.0007	-0.0027
	(-0.44)	(-0.51)	(-0.14)	(-0.22)	(-0.79)
LOG_NSTOCK	0.0020 **	0.0021 ***	0.0015 *	0.0013	0.0006
	(2.28)	(2.61)	(1.89)	(1.62)	(0.52)
LOG_NREC	-0.0018 **	-0.0017 **	-0.0013 *	-0.0012 *	-0.0015 *
	(-2.40)	(-2.41)	(-1.90)	(-1.76)	(-1.84)
Intercept	0.0726 *	0.0762 **	0.0515	0.0234	0.0395
	(1.73)	(2.24)	(1.40)	(0.65)	(0.99)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes
N	13,780	17,919	19,188	18,633	15,763
F	12.40	18.65	18.59	13.82	15.41
Adj.R^2	8.1%	8.2%	8.2%	7.3%	8.9%

Table 8 (Continued)

Panel B: Market reaction in weak corporate governance settings

	Measure for corporate governance				
	CIVIL	*ASDI*	*PUBL_ENF*	*STAFF_ENF*	*INST_OWNER*
	Model 6	*Model 7*	*Model 8*	*Model 9*	*Model 10*
UP	0.0097 ***	0.0092 ***	0.0087 ***	0.0103 ***	0.0091 ***
	(6.71)	(5.82)	(5.89)	(6.58)	(5.43)
STAR_ANALYST x UP	-0.0007	0.0026	0.0014	-0.0019	0.0008
	(-0.12)	(0.46)	(0.26)	(-0.28)	(0.14)
DOWN	-0.0128 ***	-0.0122 ***	-0.0111 ***	-0.0125 ***	-0.0131 ***
	(-9.29)	(-8.28)	(-7.71)	(-7.90)	(-8.43)
STAR_ANALYST x DOWN	-0.0005	-0.0016	-0.0013	-0.0032	0.0010
	(-0.12)	(-0.29)	(-0.25)	(-0.64)	(0.20)
EPS_REV	0.0095 ***	0.0093 **	0.0117 ***	0.0124 ***	0.0095 ***
	(2.97)	(2.23)	(3.38)	(4.03)	(2.74)
STAR_ANALYST x EPS_REV	-0.0034	0.0037	-0.0074	-0.0057	-0.0067
	(-0.52)	(0.42)	(-0.93)	(-0.86)	(-0.96)
TP_REV	0.0468 ***	0.0470 ***	0.0452 ***	0.0509 ***	0.0438 ***
	(11.25)	(9.82)	(9.47)	(10.52)	(10.02)
STAR_ANALYST x TP_REV	-0.0024	-0.0070	0.0030	0.0025	0.0005
	(-0.24)	(-0.56)	(0.26)	(0.22)	(0.04)
LOG_MKTCAP	-0.0014	-0.0005	-0.0023	-0.0039	-0.0040
	(-0.40)	(-0.14)	(-0.67)	(-1.12)	(-0.91)
LOG_PTBV	0.0016	0.0028	0.0016	0.0008	0.0038
	(0.53)	(0.84)	(0.51)	(0.23)	(0.96)
LOG_NSTOCK	0.0003	-0.0001	0.0005	0.0009	0.0007
	(0.36)	(-0.11)	(0.55)	(0.94)	(0.79)
LOG_NREC	-0.0006	-0.0005	-0.0008	-0.0011	-0.0005
	(-0.86)	(-0.67)	(-1.01)	(-1.36)	(-0.68)
Intercept	0.0156	0.0043	0.0216	0.0403	0.0396
	(0.50)	(0.12)	(0.68)	(1.25)	(0.97)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Company fixed effects	Yes	Yes	Yes	Yes	Yes
N	21,646	17,507	16,238	16,793	16,186
F	27.00	21.33	19.66	24.63	19.50
Adj.R^2	6.9%	6.4%	6.2%	7.4%	8.0%

Notes:

Table 8 shows multivariate regression results for the five-day cumulative abnormal return (CAR) around the report's issuance date [-2; +2]. Panel A shows results for strong corporate governance environments, while Panel B refers to weak corporate governance environments. For distinction between Panel A and Panel B, countries having an above (below) median rate for the specific corporate governance measure are aggregated into the group with a strong (weak) corporate governance level. Moreover, a strong (weak) corporate governance level is also attributed for those countries having a common-law (civil-law) origin. Thus, the variable COMMON distinguishes a country in its legal origin, whether it is of common-law or civil-law origin consistent to La Porta et al. (1997). ASDI denotes the anti-self-dealing index based on Djankov et al. (2008). PUBL_ENF indicates a legal enforcement index that is extracted from Leuz et al. (2003). STAFF_ENF is a resource-based enforcement measure provided by Jackson and Roe (2009). The variable INST_OWNER obtained from *FactSet/LionShares*. Ownership is measured as per calendar quarter end prior to the analyst report date and expressed as a fraction of market capitalization. We display for each model the interaction coefficients between the dummy variable STAR_ANALYST and the respective recommendation revision variable. STAR_ANALYST identifies all those analysts who have been appeared in one of Thomson Reuters' StarMine analyst rankings in the calendar year prior to their issued reports. UP (DOWN) is a dummy variable that takes a value of one when the issued stock recommendation is an upgrade (downgrade) with respect to the previous estimation for the analyst-firm-year combination, and zero otherwise. EPS_REV (TP_REV) is computed as the percentage change of an analyst's earnings forecast (target price), relative to the previous report. LOG_MKTCAP is the logarithm of the market capitalization which is measured in millions of U.S. dollars. LOG_PTBV is the logarithm of the price-to-book ratio. LOG_NSTOCK (LOG_NREC) indicates the logarithm of the number of covered companies (number of issued recommendations) by an analyst in the respective research year. All models control for year and company fixed effects. Values in parentheses represent t-statistics. Standard errors are clustered by company cluster. ***, **, and * denotes statistical significance at the one-, five- and ten-percent level, respectively.

APPENDIX

Variables, definitions and data sources

Variable		*Definition*	*Data source*
Forecast and accuracy measures			
EPS_YIELD	Earnings yield	The variable EPS_YIELD represents the analyst's expected earnings yield for a stock: EPS_t / P_t.	FactSet
IMPL_RETURN	Implied return	The variable IMPL_RETURN represents the analyst's implied return for a stock: $(TP_t / P_t) - 1$.	FactSet
EPS_ACC_ABS	Absolute earnings accuracy measure	The accuracy measure EPS_ACC_ABS is calculated by one minus the analyst's absolute earnings forecast error for the covered company in the specific research year. The absolute earnings forecast error is measured as $\|(EPS_t - EPS_{t+n}) / EPS_{t+n}\|$, where EPS_{t+n} represents the actual earnings per share for the financial year for which the forecast was issued.	FactSet
EPS_ACC_REL	Relative earnings accuracy measure	The accuracy measure EPS_ACC_REL is calculated by the analyst's relative earnings forecast error for the covered company in the specific research year multiplied by minus one. The relative earnings forecast error is measured as $(EPS_t - EPS_{t+n}) / \|EPS_{t+n}\|$, where EPS_{t+n} represents the actual earnings per share for the financial year for which the forecast was issued.	FactSet
EPS_ACC_CT	Earnings accuracy measure based on Clement and Tse (2005)	EPS_ACC_CT represents the earnings forecast accuracy, measured as the difference between the maximum absolute earnings forecast error for the firm-year combination and the analyst's absolute earnings forecast error for that firm-year combination divided by the difference between the maximum and the minimum absolute earnings forecast errors for the firm-year combination: $(Abs\_EPS\_Error\_max_{jt} - Abs\_EPS\_Error_{ijt}) / (Abs\_EPS\_Error\_max_{jt} - Abs\_EPS\_Error\_min_{jt})$.	FactSet
TP_ACC_ABS	Absolute target price accuracy measure	The accuracy measure TP_ACC_ABS is calculated by one minus the analyst's absolute target price forecast error for the covered company in the specific research year. The absolute target price forecast error is measured as $\|(TP_t - P_{t+12}) / P_{t+12}\|$, where P_{t+12} represents the actual stock price 12 months after the report was issued.	FactSet
TP_ACC_REL	Relative target price accuracy measure	The accuracy measure TP_ACC_REL is calculated by the analyst's relative target price forecast error for the covered company in the specific research year multiplied by minus one. The relative target price forecast error is measured as $(TP_t - P_{t+12}) / P_{t+12}$, where P_{t+12} represents the actual stock price 12 months after the report was issued.	FactSet
TP_ACC_CT	Target price accuracy measure similar to Clement and Tse (2005)	TP_ACC_CT represents the target price forecast accuracy, measured as the difference between the maximum absolute target price forecast error for the firm-year combination and the analyst's absolute target price forecast error for that firm-year combination divided by the difference between the maximum and the minimum absolute target price forecast errors for the firm-year combination: $(Abs\_TP\_Error\_max_{jt} - Abs\_TP\_Error_{ijt}) / (Abs\_TP\_Error\_max_{jt} - Abs\_TP\_Error\_min_{jt})$.	FactSet

APPENDIX (Continued)

Corporate governance measures			
COMMON	Legal origin	A dummy variable that equals one if the covered stock is from a common-law country, and zero otherwise.	La Porta et al.
ASDI	Anti-self-dealing index	The anti-self-dealing index measures the legal protection of minority shareholders.	Djankov et al.
PUBL_ENF	Legal enforcement	PUBL_ENF indicates a mean score across three legal variables that contain the efficiency of the judicial system, an assessment of rule of law and a level of corruption.	Leuz et al. (2003) /
STAFF_ENF	Legal enforcement (Staff)	STAFF_ENF is a legal enforcement measure that represents the number of regulator staff per one million inhabitants in the specific country.	Jackson and Roe (2009)
INST_OWNER	Institutional ownership	INST_OWNER represents the proportion of a stock that is held by institutional investors measured on the market capitalization at the quarter-end prior to the report's issuance date.	FactSet/LionShares
Variables about stock recommendation revisions			
UP	Recommendation upgrade	A dummy variable that equals one if the analyst's recommendation of the stock is an upgrade compared to the previous recommendation for the same stock, zero otherwise, calculated only if the previous recommendation is not older than 90 days.	FactSet
REIT	Recommendation reiteration	A dummy variable that equals one if the analyst's recommendation of the stock is a reiteration relative to the previous recommendation for the same stock, zero otherwise, calculated only if the previous recommendation is not older than 90 days.	FactSet
DOWN	Recommendation downgrade	A dummy variable that equals one if the analyst's recommendation of the stock is a downgrade compared to the previous recommendation for the same stock, zero otherwise, calculated only if the previous recommendation is not older than 90 days.	FactSet
EPS_REV	Earnings forecast revision	The percentage change in the analyst's earnings forecast on a given stock: $(EPS_t - EPS_{t-1}) / \lvert EPS_{t-1} \rvert$, calculated only if the previously issued target price is not older than 90 days.	FactSet
TP_REV	Target price revision	The percentage change in the analyst's target price forecast on a given stock: $(TP_t - TP_{t-1}) / TP_{t-1}$, calculated only if the previously issued target price is not older than 90 days.	FactSet
Variables about stock market reactions			
CAR	Cumulative abnormal return	Five-day cumulative abnormal return around the issuing date of the research report [-2; +2]. The calculation is based on a standard market model.	Datastream
AR	Abnormal return	The one-day abnormal return on the issuing date of the research report [0]. The calculation is based on a standard market model.	Datastream
Control variables at a company and analyst level			
LOG_MKTCAP	Market capitalization	The logarithm of the market capitalization given in million U.S. dollars on the day prior to the date of the research report.	Datastream
LOG_PTBV	Price-to-book ratio	Price-to-book ratio measured on the day prior to the date of the issued research report.	Datastream
NSTOCK	Number of stocks	Number of companies that an analyst has followed in the respective calendar year.	FactSet
NREC	Number of reports	Number of reports that an analyst has issued in the respective calendar year.	FactSet
STAR_ANALYST	Analyst reputation	A dummy variable that equals one if the analyst was named in Thomson Reuters' publicly available StarMine analyst rankings for a stock picking award and/or an earnings estimate award in the calendar year prior to the year when the analyst report was published, zero otherwise.	Thomson Reuters StarMine