

When do sell-side analyst reports really matter? Shareholder protection, institutional investors and the importance of equity research

Daniel Arand / Alexander Kerl* / Andreas Walter

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Abstract

We examine whether the informational content of sell-side analyst reports depends on the strength of a country's investor protection and the importance of institutional investors at the individual company level. Our analyses are based on more than 600,000 analyst reports from 2005 through 2010 from eight leading capital markets (U.S., EU5, Switzerland and Japan).

Controlling for various company and broker specific characteristics as well as analyst-company and year fixed effects, we show that the market reactions to analyst reports are positively associated with the strength of investor protection, regardless of the type of protection measure that we apply. Similarly, the market reactions are more pronounced for stocks with a higher level of total or domestic institutional ownership. We further demonstrate that, conditional on weak investor protection, foreign institutional ownership also has a positive association with market reactions, whereas the impact of foreign institutional investors reverses when investor protection is strong.

Keywords: Shareholder Protection, Institutional Investors, Analyst Reports, Regulation

JEL-Classification: G14; G15; G18; G24; G32

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

1. Introduction

This paper addresses the question whether the impact of sell-side analyst research on capital markets depends on the prevailing regulatory and institutional environment. Whereas prior research has primarily focused on the general importance of analyst research as such for stock prices (e.g. Womack, 1996; Brav and Lehavy, 2003; Asquith et al., 2005), the association between a country's level of investor protection and a company's ownership structure on the one hand and market reactions to analyst reports on the other has not yet been systematically investigated. This is particularly astonishing, given the extant evidence that investor protection, corporate ownership structure and financial analysts' role as information intermediaries are interrelated. For instance, prior research has shown that the strength of the legal environment is positively associated with the number of analysts issuing research on a firm (e.g., Bushman et al., 2005) and that strong accounting standards enforcement improves analysts' earnings forecast accuracy (e.g., Hope, 2003). With respect to the shareholder structure, prior research suggests that analyst following increases in institutional ownership (e.g., Bhushan, 1989) and that earnings forecasts are more accurate when institutional ownership is high (e.g., Ljungqvist et al., 2007).

However, even if investor protection and corporate ownership influence analysts' research intensity and the quality of their forecasts, it remains to the best of our knowledge unanswered within the literature if these relationships translate into differential market reactions following the dissemination of analyst reports. We therefore add to the existing literature by making use of widely accepted concepts of (i) investor protection and (ii) corporate ownership structure and relating them to the common notion that analyst reports trigger significant abnormal stock returns.

With respect to our first contribution, we argue that the effect the regulatory environment (e.g., in terms of the level of shareholder protection and law enforcement) has

on the importance of analyst reports is not easy to predict. On the one hand, a common notion is that analysts can serve as an external monitor and improve the governance of a company, for instance, through alleviating financial misreporting (e.g., Yu, 2008). There is evidence that this positive impact of analyst coverage on the information environment of a company might be stronger in countries with weak legal enforcement (Lang et al., 2004; Sun, 2009). Consequently, the demand for equity research could be particularly high in weak investor protection regimes and analysts' reports could be more valuable to investors in such countries. On the other hand, however, low informational reliability due to poor regulation or enforcement makes it harder for analysts to predict firm performance correctly (e.g., Hope, 2003). Further, if the regulatory environment is weak, analysts might be more likely to succumb to misaligned incentives, such as issuing favorable research to establish strong personal ties with the management, rather than stating their "true" opinions based on matter-of-fact analyses. At the same time, an additional argument could be that weak investor protection also makes it harder for investors to receive compensation for losses incurred from trading decisions based on flawed analyst research, so analyst research itself is less reliable, and therefore less informative, in a weak-protection setting. Following these contrarian lines of argumentation, the informational value of analyst research in countries with a weak legal environment could be either higher or lower than in countries with a strong legal environment (and vice versa).

Since different shareholder protection and regulatory enforcement measures have been suggested (e.g., La Porta et al., 1998; Djankov et al., 2008; Jackson and Roe, 2009), we deploy a set of conceptually different approaches in this context. These measures cover formal indicators of the strength of the applicable shareholder rights law as well as enforcement proxies that estimate the degree to which individuals and institutions can rely on

norms and regulations being put into effect and the intensity with which wrongdoing is being prosecuted.

Our results reveal that market reactions to analyst reports significantly depend on the level of investor protection. For all measures of investor protection we report a material increase in excess returns to target price and earnings forecast revisions in particular.¹ Hence, the impact of analyst research on stock prices is considerably more pronounced when investor protection is strong.

Concerning the second contribution, we build on findings from the prior literature and argue that the relevance of institutional investors within a company's shareholder structure could impact the relevance of analyst research in at least three different ways. First, we reason that the market reactions to analyst reports could be positively associated with institutional ownership because institutional investors improve a company's information environment and, therefore, facilitate higher quality analyst research. For instance, Yeo et al. (2002) and Velury and Jenkins (2006) consistently demonstrate that the quality of reported earnings increases in institutional ownership. In fact, findings in Ljungqvist et al. (2007) suggest that the corporate governance impact of institutional investors leads to higher quality analyst research since institutional ownership is positively associated with analysts' earnings forecast accuracy. Initial evidence that this effect might also translate into market reactions is from Hugon and Muslu (2010) who show that abnormal returns associated with more conservative (i.e., presumably more accurate) analyst research are driven by institutional ownership. Second, institutional investors might put more weight on analyst reports than private investors due to internal decision making policies and for fiduciary reasons (see, e.g., Bhushan and O'Brien, 1990).² This is consistent with Walther (1997) who uses institutional

¹ For the purpose of this paper, "revisions" in terms of analysts' stock recommendations, target prices and earnings forecasts include both changes and reiterations of the prior forecasts level.

² This argument implicitly assumes that high institutional ownership suggest that the marginal investor is likely to be an institution, too (see, e.g., Walther, 1997).

ownership as a proxy for investor sophistication and finds that market participants rely relatively more on analysts' earnings forecasts, compared to a random-walk model, when the "marginal investor" is expected to be sophisticated. Similarly, Frankel et al. (2006) demonstrate that the stock price impact of analysts' forecast revisions increases in the percentage of institutional ownership. Third, we assert that institutional investors are likely to be opinion leaders in capital markets, affecting other market participants' trading decisions. Since institutional investors are more sophisticated than private investors, their trading behavior with respect to a specific stock might serve as a signal for the market as a whole.

Consistent with this argumentation, we provide strong evidence that market reactions to analyst reports generally increase in institutional ownership, particularly so in the case of target price and earnings forecast revisions. Our findings show that this result holds true for total institutional ownership and for ownership from domestic institutions. Hence, market participants seem to attribute more information value to analyst research in the case of high (domestic) institutional ownership. With respect to the level of foreign institutional ownership, the relationship turns negative as market participants react significantly less to analyst research if a stock is largely held by foreign institutional investors.

To provide further insights on why the impact of foreign institutional ownership on the informativeness of analyst reports is opposite to that of domestic institutional ownership, we build on results documented by Aggarwal et al. (2011) who analyze the combined effect of investor protection and institutional ownership on the quality of corporate governance and company valuation. They find that foreign (domestic) institutional investors drive improvements in governance when investor protection is weak (strong) and that better governance in turn leads to higher firm valuations on average. Based on this evidence we cannot rule out that this differentiation between weak and strong investor protection also has

to be made when assessing the impact of institutional ownership on the information content of analyst reports.

To address this issue, we finally split our sample into weak versus strong protection countries, based on the different measures of investor protection, and perform our analyses on the impact institutional ownership has on the stock price impact of analyst research, conditioned on the strength of investor protection. We find that the effect of foreign institutional ownership on the intensity of market reactions is not negative per se, as found in our main analyses on the impact of institutional ownership on market reactions. Much in line with the findings of Aggarwal et al. (2011) the effect of institutional ownership partly depends on the strength of investor protection. In particular, the negative association reported above only holds true when investor protection is strong. When investor protection is weak, however, the presence of foreign institutions is also positively associated with market reactions. Domestic institutional ownership, in contrast, positively affects market reactions regardless of the degree of investor protection. Moreover, performing all analyses based on a sub-sample of data excluding analyst reports on U.S. companies we conclude that the above-mentioned negative association between foreign institutional ownership and the strength of market reactions to analyst reports is primarily a U.S. effect. That is, if U.S. companies are excluded from the sample, foreign institutional ownership is positively associated with market reactions to analyst reports even when the level of investor protection is high. These findings support results presented by Aggarwal et al. (2011) who show that it is most prominently U.S. institutions that are the main drivers corporate governance improvements outside of the U.S., whereas institutions from countries with weak shareholder rights do not play such a governance-enhancing role.

The paper continues as follows. Section 2 describes our data and research design. Section 3 focuses on the impact of the regulatory environment and a company's ownership

structure on market reactions to the dissemination of analyst research. Section 4 provides results on the sub-sample excluding U.S. companies and additional robustness checks. Finally, we provide concluding remarks in Section 5.

2. Data sample

2.1. Analyst report and stock information

Our dataset is based on a panel of analyst reports from eight major stock markets for the period 2005 through 2010. The countries included are the U.S., the EU5 (i.e., France, Germany, Italy, Spain and the United Kingdom), Switzerland and Japan. These markets account for roughly 56% of the world's total market capitalization³ and represent the majority of financial and economic hubs, while at the same time featuring different regulatory characteristics and company shareholder structures.

We obtain analyst report data from FactSet.⁴ For a company to be included in our sample we require a minimum coverage by three or more different analysts in at least one calendar year within our sample period.

For each report, we define dummy variables indicating whether the stock recommendation represents an upgrade (*UP*), a reiteration (*REIT*) or a downgrade (*DOWN*) compared to the same analyst's previous rating on the same stock, as well as variables measuring the percentage change in an individual analyst's target price (*TP_REV*) or earnings forecast (*EPS_REV*) on a given stock.⁵ In order to avoid a distorting effect of stale information in our sample we only calculate these revisions if the previous stock recommendation, target price or earnings forecast was issued within the 90 days prior to the

³ According to Bloomberg as per June 2010.

⁴ FactSet typically receives its analyst report information via data transfer/interfaces. Hence, this information does not necessarily represent written reports but should be considered as data feed to FactSet. We point out that analyst-related data from FactSet has been used in a number of related studies recently, particularly when stocks from different countries are considered (see, e.g., Balboa et al., 2008, 2009; Bessler and Stanzel, 2009).

⁵ *TP_REV* is calculated as $(TP_t - TP_{t-1})/TP_{t-1}$, while *EPS_REV* is calculated as $(EPS_t - EPS_{t-1})/|EPS_{t-1}|$. An overview of variable definitions and sources is provided in the Appendix.

current report. For our main analyses in Section 3 we further require that revisions of all three summary measures, namely stock recommendation, target price and earnings forecast, be included in the report. Additional to recommendation, target price, and earnings forecast revisions, our dataset further includes the research date of each report (typically the trading day prior to the report date), the broker and analyst name as well as the corresponding concurrent stock price in the same currency as the target price and earnings forecast reported by the analyst.

In order to measure abnormal stock returns around the issuing date of an analyst report we obtain concurring stock return data from Datastream. We calculate abnormal returns from a standard market model based on daily returns (see, e.g., Brown and Warner, 1985; MacKinlay, 1997), where the estimation period ranges from day -250 until day -11 relative to the research date of the analyst report. Following, among others, Asquith et al. (2005), we aggregate the daily abnormal returns over the five-day window surrounding the analyst reports in our sample ($CAR(-2; +2)$).⁶ Consistent with prior studies, we drop observations from our sample if the stock price on the research date is less than or equal to USD 1.00.

In our market reaction analyses we ignore observations that represent the 1% and 100% percentiles of target price and earnings forecast revisions, respectively, in order to eliminate potential outliers. This step is taken because extreme revisions are potentially due to coding errors in either current or prior forecasts.

[Insert Table 1 about here]

⁶ The five-day window allows for early information leakage and post-announcement drift in abnormal stock returns associated with the publication of analyst research. Moreover, it alleviates the effect of potential deviations between the report date provided by FactSet and the date when the underlying report was actually made available to the issuing broker's customers. We point out that our findings are robust to using alternative event windows. In particular, we perform our analyses using the eleven-day cumulative abnormal returns ($CAR(-5,+5)$) and the one-day abnormal returns ($AR(0)$) on the analyst report date only. The estimation results are available upon request.

The described procedure yields 687,781 analyst reports on 4,789 different companies.⁷ Table 1 gives an overview of our sample, indicating the number of observations per country and year. About 45% of our observations are from countries other than the U.S., which is similar to the approximately 42% of firm-year earnings forecasts for non-U.S. companies in Barniv et al.'s (2005) study on 33 different countries and to Jegadeesh and Kim's (2006) article in which non-U.S. companies account for nearly 41% of recommendation revisions from the G7 countries. The increase in observations between 2005 and 2010 is to a large part attributable to an increase in the number of brokers submitting report information to FactSet and to an increase in the number of reports per broker and year.

[Insert Table 2 about here]

Table 2 provides information on the distribution of stock recommendation revisions as well as summary statistics for target price revisions, earnings forecast revisions and cumulative abnormal returns in the five-day window surrounding the analyst reports in our sample. In all countries, about 90% of recommendations represent a reiteration of the prior analyst opinion. The average target price revision ranges from -0.4% in Japan to 1.0% in the United Kingdom and Germany. The average earnings forecast revisions is lowest in Italy with 0.1% and, again, largest in the United Kingdom and Germany with 1.4%. Across these revision levels, the average stock price reactions are between -0.1% and 0.1% overall, but

⁷ Brokers often publish analyst reports in response to a variety of events that could provide valuable information to the market. Consequently, the abnormal returns in our sample could be driven by such concurring events, rather than the analyst reports themselves. We therefore re-run our results for a reduced sample. In particular, we obtain and categorize event information from FactSet and exclude all analyst reports from our sample which were preceded by a general meeting, an earnings release call or a sales/revenue release by the subject company within the five days prior to the research date of an analyst report. Untabulated results show that this modification of the sample does generally not alter our findings. Again, these alternative results are available upon request.

these figures of course are the average net effect of positive and negative market reactions to upward and downward revisions, respectively.

2.2. Measures of investor protection

Academic research has proposed a plethora of different investor protection proxies, and there has been a lot of controversy and discussion on how shareholder rights can be adequately measured. We therefore deploy several widely accepted and conceptually different investor protection indicators, all measured at the country level and taken from the prior literature. We first use a dummy variable (*COMMON*) indicating the legal origin (common law versus civil law) of a country, building on the notion that common law countries have, on average, stronger investor protection rights than civil law ones (La Porta et al., 1998). Our next measure is the anti-self dealing index (*ASDI*) from Djankov et al. (2008), which was developed as a more accurate and more theoretically grounded alternative to La Porta et al.'s (1998) anti-director rights index of investor protection.⁸ The anti-self dealing index focuses on a country's regulation setting out the rules of private enforcement mechanisms available to minority shareholders, based on a stylized transaction that would expropriate investors. Additional to the improved quality of the anti-self dealing index over the anti-director rights index, the former is based on more recent regulation (2003) than its predecessor (around 1993).⁹

However, Durnev and Kim (2005) and Sun (2009) argue that measures based on formal rules and regulations are mere *de jure* indicators, which might not appropriately capture the strength of investor protection if law enforcement is ineffective. This notion is

⁸ Djankov et al.'s (2008) anti-self dealing index effectively addresses a number of shortcomings of La Porta et al.'s (1998) anti-director rights index that have been revealed by the literature. See Djankov et al. (2008) for a detailed discussion on the methodology and the advantages of their index.

⁹ Yet, the original anti-director rights index developed by La Porta et al. (1998) is very popular and has been used extensively in the related literature (see, e.g., DeFond and Hung, 2004, 2007; Durnev and Kim, 2005). We therefore repeat all estimations in this paper that relate to the strength of investor protection with this original index. Our major results remain qualitatively unchanged.

empirically supported by DeFond and Hung (2004) who report a positive governance impact of strong law enforcement institutions, but not of investor protection laws. Therefore, we further include two *de facto* measures of law enforcement. We follow Leuz et al. (2003) and include as our third variable a legal enforcement proxy (*PUBL_ENF*), defined as the mean of three variables also documented in La Porta et al. (1998): the efficiency of the judicial system, the rule of law, and the level of corruption.¹⁰ The final measure we deploy is the number of the securities regulator's staff, divided by the country's population in millions (*STAFF_ENF*). This resource-based indicator of public enforcement is taken from Jackson and Roe (2009) and can be considered a proxy for a regulator's power to deter and prosecute wrongdoing in capital markets. Jackson and Roe (2009) do acknowledge that their resource-based approach is not the panacea to the question of how investor protection can be adequately measured. However, they point out some of the advantages this approach has over more formal protection clauses: *“Regulatory independence and high levels of agency authority are of little value to effective enforcement if the agency's budget is minuscule and its staffing thin. And conversely, a not-very-independent regulator with a high budget and strong staffing indicates that political and market authorities have given the agency the go-ahead to enforce financial rules. Similarly, a well-staffed and well-funded agency can, even if it has only limited formal sanctioning authority, make good use of the sanctions that it has.”*

[Insert Table 3 about here]

Panel A of Table 3 provides an overview of the investor protection variables used in this paper. For each measure, a higher value indicates a higher level of investor protection based on the specific definition. For instance, the number of enforcement staff per 1 million

¹⁰ Note that the enforcement proxy suggested by Leuz et al. (2003) has also received much attention in the recent literature and is the law enforcement measure of choice in numerous studies (see, e.g., DeFond and Hung, 2007; Sun, 2009).

inhabitants (*STAFF_ENF*) is much higher in the U.S. (23.75) and the U.K. (19.04), compared to the other European countries (between 4.43 and 8.50), Switzerland (8.87) and Japan (4.32).

2.3. Institutional ownership

In order to measure the importance of institutional holdings in the subject company of an analyst report we use data from the FactSet/LionShares database.¹¹ For each company included in our dataset we obtain, on a quarterly basis, the total institutional ownership as a percentage of market capitalization (*IO_TOTAL*), as well as the percentage of domestic institutional ownership, i.e., the percentage of holdings attributable to institutions based in the same country where the stock is listed (*IO_DOM*). We further use these data to calculate the percentage of foreign institutional ownership (*IO_FOR*). These alternative measures of the ownership structure of a company are also used by Aggarwal et al. (2011), among others.¹²

We match our analyst report and ownership data using the ownership information for the subject company as per the end of the calendar quarter prior the research date of the analyst report. For the indicators of institutional ownership, Panel B of Table 3 provides average values across our analyst report sample by country. Total institutional ownership is most important in the U.K. and the U.S., with average values of 68.1% and 75.1%, respectively. Spain and Italy feature the lowest values, with 16.0% and 18.6%. More than half of the total institutional ownership in the U.K. and the U.S. comes from domestic investors, while in the other countries foreign institutions are the most important group of shareholders.

¹¹ See Ferreira and Matos (2008) and Aggarwal et al. (2011) for a thorough explanation of the primary sources used by FactSet/LionShares to compile ownership data, as well as several arguments asserting the quality and acceptance of this data provider.

¹² In some cases, FactSet/LionShares reports institutional ownership of more than 100%. FactSet/LionShares names several potential reasons for this. Such reasons include, for instance, double-counting in certain short transactions when both borrower (or buyer) and lender of stocks report the same equity stake as well as double-counting of the same institution's holdings due to a name change. We treat these observations as if institutional ownership data were missing.

The figures displayed in Panel B of Table 3 are in line with those reported in Aggarwal et al. (2011) and Ferreira et al. (2010), although the ownership statistics used in these studies are not directly comparable to ours since we use quarterly rather than annual figures and cover a more recent time period.

2.4. Control variables

We include several control variables measured at the company, broker and analyst level in our analyses. At the company level, we include the natural logarithm of the market capitalization measured in U.S. dollars (*LOG_MKTCAP*) and the price-to-book ratio (*PTBV*), both on the research date of the analyst report. The source for these variables is Datastream. In rare cases, the price-to-book ratio is smaller than or equal to zero; we ignore these observations. At the broker level, we proxy the size and resources available to an analyst by calculating the number of companies followed by a broker in a given calendar year, based on our original analyst report data (*BROKER_SIZE*). In order to account for a potential advantage of local brokers we define a dummy variable that is equal to one if the brokerage house issuing an analyst report is domiciled in the same country where the respective stock is listed and zero otherwise (*LOCAL_BROKER*). We control for the complexity of an analyst's research portfolio by counting the number of companies the analyst follows in a given calendar year (*ANALYST_COMP*) and the number of different countries that these companies represent (*ANALYST_COUNTR*). Further, we control for analyst reputation using a dummy variable equal to one if the report author was listed in Thomson Reuters's publicly available StarMine Analyst Awards rankings in the calendar year preceding the analyst report and zero otherwise (*STAR_ANALYST*). In these rankings, StarMine lists sell-side analysts that performed best with respect to the returns of their buy/sell recommendations and the accuracy of their earnings estimates. The rationale for including the broker and analyst level control

variables is that market reactions to analyst reports could be influenced by the broker's or analyst's perceived resources, performance and credibility. We report summary statistics for the set of control variables in Table 4.¹³

[Insert Table 4 about here]

3. Investor protection, institutional ownership and the informativeness of analyst reports

3.1. Specification of regression analyses

In this section we analyze the effect of the intensity of investor protection and institutional ownership on the market reactions to the dissemination of sell-side analyst reports. Throughout this section, our dependent variable is the five-day cumulative abnormal return ($CAR(-2; +2)$) around the research date of an analyst report. Our independent variables include the dummy variables capturing whether the current stock recommendation represents an upgrade (*UP*) or a downgrade (*DOWN*) relative to the previous rating as well as the percentage change in target price (TP_REV) and earnings forecast (EPS_REV). Most importantly, we further include in our regression models the interactions between these analyst revision variables and our different investor protection or institutional ownership measures because our main interest is to assess how these measures change the way stock prices respond to analyst reports.

The country and broker/analyst-level control variables defined in the previous section extend the set of regressors. All regressions are estimated using a fixed effects model, where we allow for cross-sectional and time dependence in our data by including analyst-company

¹³ In untabulated analyses we further include an analyst's lagged earnings forecast error as defined in Clement and Tse (2003, 2005), calculated for the previous fiscal year and based on the analyst's company-specific average absolute forecast error in that fiscal year. Although our results remain qualitatively unchanged, we refrain from including this control variable in our analyses because it would reduce the number of observations by more than 200,000 due to data constraints.

and year dummies in the regression models.¹⁴ Following Petersen (2009), we calculate robust standard errors clustered by analyst-company.

3.2. **The impact of investor protection on analyst report informativeness**

The first set of regressions aims at disentangling the relationship between investor protection and the informational value of analyst reports. Our results are displayed in Table 5.

[Insert Table 5 about here]

Before looking at the impact of the different investor protection indicators, we point out that revisions of all three analyst measures, i.e., recommendation, target price, and earnings forecast, trigger significant stock market reactions. Consistent with results reported in Asquith et al. (2005), Table 5 shows that stock prices react stronger to a given change in target price than to an earnings forecast revisions of the same percentage magnitude.

Turning towards the interactions between the investor protection indicators and changes in analysts' opinions, Table 5 reports several interesting results.¹⁵ Most importantly, all models suggest that stock price reactions in response to target price and earnings forecast revisions are stronger in case of high investor protection. A comparison of the interaction coefficients with the base coefficients reveals that this effect is also economically significant, so that the informational value market participants extract from target price and earnings forecast revisions increases in investor protection. For instance, common law origin raises the coefficient on target price revision by as much as 6.7 percentage points on average (model

¹⁴ Although a Hausman test suggests the use of analyst-company fixed effects models, we re-run our analyses using alternative estimation methods, including either analyst or company fixed effects, analyst-company random effects and Fama-MacBeth estimation allowing for analyst-company fixed effects. Our results are qualitatively not affected by these alternative specifications, as we demonstrate in Section 4.2.

¹⁵ The stand-alone coefficients on investor protection are omitted because these are measured at the country level and, therefore, do not display any variation within an analyst-company cluster.

(1)). Compared to a civil law country, this corresponds to a factor of 1.74 $((0.090+0.067)/0.090)$. That is, stock price reactions to changes in target price are roughly 74% higher in common law countries. These results are directionally consistent across all four measures of investor protection.

With respect to recommendation changes, the effect of investor protection is only marginal. While stock market responses to recommendation downgrades are not systematically affected by investor protection, strong investor protection seems to statistically attenuate the effect of recommendation upgrades. For instance, the base effect of 0.007 is largely offset by the interaction coefficient of -0.004 model (1). As in the downgrade case, though, the economic relevance of this effect is very limited. Upgrades only trigger an average excess return of well below 1%, and the negative interaction coefficients imply that this effect vanishes even more when investor protection becomes stronger. These findings are consistent across all alternative measures of investor protection (i.e. common versus civil law classification, the anti-self dealing index and both *de facto* measures of law enforcement, PUBL_ENF and STAFF_ENF). One reason for the negative coefficient could be that in a weak-protection environment investor confidence is low and insecurity high, so that stock recommendations are relatively valuable to investors because they at least represent an actionable trading advice, whereas target prices and earnings forecasts are perceived less reliable. As soon as investor protection is stronger and, consequently, information is more reliable, however, investors rather prefer more granular information on earnings and price expectations.

The results complement the findings in Jegadeesh and Kim (2006). They report the strongest market reactions to recommendation revisions for U.S. stocks. According to the authors, the most likely explanation is that U.S. analysts are more skilled than their peers from other countries. As the figures in Table 5 suggest, another reason for the strong

reactions observed particularly for U.S. stocks as reported in Jegadeesh and Kim (2006) could be that market participants rely more on analyst reports from U.S. analysts and on U.S. companies due to better and more efficient investor protection.

3.3. **The impact of institutional ownership on analyst report informativeness**

Whereas the previous analyses addressed the importance of the regulatory environment at the country level on importance of analyst reports, we now shift our focus to the second main contribution and investigate the impact of different ownership structures measured at the individual company level. Hugon and Muslo (2010) provide initial evidence that abnormal returns associated with more conservative analyst research are driven by institutional ownership. We therefore focus on analyzing if the presence of institutional investors translates into more prominent market reactions to analyst forecasts.

[Insert Table 6 about here]

The regression results are displayed in Table 6. Note that the specification of the models is almost identical to that in the previous section, except that the investor protection measures are now substituted with our different indicators of institutional holdings.¹⁶ Models (1) through (3) take into account total (*IO_TOT*), domestic (*IO_DOM*), and foreign (*IO_FOR*) institutional ownership, respectively, as defined previously. Focusing on the interactions, we see that stock price reactions to target price and earnings forecast revisions as well as recommendation downgrades increase significantly in total and domestic institutional ownership, and that the magnitudes of the changes are economically material (columns (1) and (2)). As an illustration, we refer to the model in column (2), where we measure the

¹⁶ Note that, since institutional ownership is measured at the company level, the base coefficients show variation within an analyst-company cluster and are displayed.

impact of domestic institutional holdings on the informativeness of analyst reports. The coefficient on the interaction with target price revision suggests that for each 10 percentage point increase in domestic institutional holdings the base coefficient on *TP_REV* increases by approximately 1 percentage point. The significantly positive coefficients on the interaction of institutional ownership with earnings forecast (and also target price) revisions, as well as the negative coefficients on recommendation changes in either direction, are consistent with a number of prior studies. For instance, Malmendier and Shanthikumar (2007) and Mikhail et al. (2007) show that large traders discount analysts' stock recommendations, such as when there is reason to believe that these are too optimistic, while small traders seem to be less considerate. This supports the above-mentioned result that the market impact of both target price and earnings forecast revisions increases in total and domestic institutional ownership, whereas the impact of recommendation upgrades decreases.

In contrast to total and domestic institutional ownership, an increase in the percentage of foreign holdings goes along with a significant decrease in the market reactions to target price revisions, earnings forecast revisions and recommendation downgrades (column (3)). If we assume that the current ownership structure is indicative of the characteristics of a marginal investor (see, e.g., Walther, 1997), the results suggest that foreign institutional investors rely less on analyst reports than domestic ones do, maybe because they are insecure about the reliability of analyst reports on companies from another country due to their unfamiliarity with local laws including investor protection, accounting requirements etc. Alternatively, it could be that foreign institutional investors impact the quality of corporate governance and, therefore, the informational environment of a company negatively, or at least less positively, than domestic investors do. Consequently, market participants could be more suspicious about corporate news or analyst reports when foreign institutional holdings are large.

3.4. The importance of institutional investors in different investor protection regimes

Having shown with separate analyses that both investor protection and corporate ownership impact the degree to which market participants attribute informational value to analyst reports, this section provides additional analyses that help disentangle the relationship between a company's ownership structure and its impact on stock price reactions to analyst reports, conditional on the level of investor protection. We recall Aggarwal et al.'s (2011) insight that the impact of foreign and domestic institutional investors on the quality of corporate governance differs remarkably across different investor protection regimes. More precisely, foreign institutions have a stronger and more significant positive impact on the level of corporate governance than domestic institutions when investors are protected less. When investor protection is strong, however, most of the governance effect from institutional holdings can be attributed to domestic institutions. These striking findings and our results from the previous sections in mind, we next present analyses that add to the understanding of how corporate ownership, investor protection and the informativeness of analyst reports are intertwined.

Specifically, we adopt the models from Table 6 but re-run these, conditioned on investor protection being either weak or strong. For this purpose, we group our sample of analyst reports based on the country medians for each of our investor protection variables. Table 7 summarizes the results for these sub-samples. Panels A through D contain the regression estimates by investor protection measures, that is, *COMMON*, *ASDI*, *PUBL_ENF* and *STAFF_ENF*. The left part of each Panel reports the results for the weak-protection regimes, whereas the right part reports the results for the strong-protection countries. For all

sub-sample regressions, we only display the coefficients on the interaction terms with respect to *UP*, *DOWN*, *TP_REV* and *EPS_REV* for the purpose of brevity.¹⁷

[Insert Table 7 about here]

Table 7 shows that target price revision is the only analyst measure for which market reactions systematically depend on the importance of institutional ownership when investor protection is weak. Market reactions to earnings forecast revisions seem to be independent of the company's ownership structure in such a legal environment. However, when investor protection is strong, abnormal returns to both target price and earnings forecast revisions increase in total and domestic institutional ownership. A possible explanation is that in a weak-protection setting, institutional investors have only a moderate impact on the reliability on accounting figures, but that they do improve earnings quality when the legal environment is more investor friendly. Nonetheless, the overall quality of corporate governance improves in institutional ownership, even and particularly so when investors are protected less (Ferreira et al., 2010; Aggarwal et al., 2011). This could explain the positive impact of institutional investors on the informativeness of target price revisions even if investor protection is weak.

Most strikingly, though, the effect of foreign institutions is directionally not any different from that of domestic institutions in a weak-protection environment. In this case, the coefficient on the interaction of *IO_FOR* with *TP_REV* is significantly positive at the 1%-level for all measures of investor protection. In fact, the effect of *IO_FOR* even seems to dominate that of *IO_DOM* in weak legal regimes because the interaction of *IO_DOM* with *TP_REV* is only moderately significant or even insignificant for all investor protection measures except *COMMON*. That is, in a weak legal environment the stock market seems to

¹⁷ Each regression is performed as in Table 6 including all control variables, base coefficients and analyst-company and time fixed effects.

have a preference for analyst reports on companies held largely by foreign institutional investors. We highlight that this result is consistent with the dominating role of foreign versus domestic institutional ownership with respect to their impact on the quality of a company's corporate governance in weak-protection countries reported by Aggarwal et al. (2011).

In contrast to these findings, Table 7 also reveals that the impact of foreign institutions on the informational content of target price and earnings forecast revisions turns negative when investor protection is strong. In such an environment, market reactions to target price and earnings forecast revisions increase in domestic institutional ownership but decrease in foreign institutional ownership. In line with these observations, another insight from Table 7 is that domestic institutional ownership emphasizes the stock price impact of downgrades in strong-protection regimes, whereas foreign institutional ownership has a moderating effect. Apparently, investors perceive stock recommendation downgrades particularly valuable when domestic institutional investors exert a certain control over the respective company. Obviously, in more shareholder protective regimes the stock market pays significantly more attention to analyst reports if the underlying company is characterized by a strong presence of domestic institutional investors, whereas foreign institutional ownership is regarded as detrimental to the informational content of analyst reports.

Taken together, the results imply the following: When investor protection is weak, the informativeness of analyst reports, particularly target price revisions, increases in institutional ownership, regardless of whether the stocks are being held by domestic or foreign investors. In strong-protection countries, however, market participants appreciate high percentages of domestic institutional holdings but discount analyst revisions when foreign institutions are strong. This aligns perfectly with Aggarwal et al.'s (2011) finding that the positive impact of foreign institutional investors on corporate governance is more pronounced in weak-protection countries.

In fact, the results provide valuable insights on the way capital markets process the information conveyed through analyst reports. Better governance resulting from foreign institutional holdings in countries with weak investor protection has a strong and positive impact on the reliability of analyst research, in particular target prices, most likely because better corporate governance positively affects the quality of a company's corporate governance and, hence, its information environment. This, in turn, makes analyst reports more reliable.

When investor protection is strong, however, market participants put relatively more weight on analyst reports if the underlying stock is primarily held by domestic institutions, while at same time, foreign institutional ownership affects market reactions to analyst reports negatively. In line with Aggarwal et al.'s (2011) findings it could be that domestic institutions are perceived to be better at improving corporate governance when formal requirements are already strict, or that they are better at enforcing shareholders' interests in strong-protection countries due to their deeper understanding of local laws and regulation.

4. Additional analyses and robustness checks

4.1. Excluding U.S. companies

Our sample is dominated by analyst reports on U.S. companies, which we believe is representative of the relative importance of the U.S. equity market as well as the fact that the vast majority of sell-side analyst reports is from U.S. brokers and on U.S. companies. Yet, one concern is that our results are largely driven by U.S. observations. In particular, the U.S. is considered a strong investor protection country according to all four proxies we deploy, so in the conditional analyses of Table 7, U.S. observations are predominant in the strong-protection group. We therefore re-run the analyses from Sections 4 and 5 for a sub-sample excluding the U.S. The results are displayed in Tables 8 through 10.

[Insert Table 8 about here]

Table 8 reports the results on the importance of investor protection. Similar to our previous findings, the interaction coefficients show that the market reactions to target price revisions increase in investor protection in two out of four models. Even in the remaining models, those interaction coefficients are still positive, though insignificant. With respect to the market reactions to earnings forecast revisions, the impact of investor protection is significantly positive for all investor protection measures.

[Insert Table 9 about here]

Similarly, Table 9 reveals that institutional ownership remains a major driver of abnormal returns around the publication of analyst reports, particularly in response to target price and earnings forecast revisions. That is, we confirm the results from Table 6 with respect to total and domestic institutional holdings. However, in the non-U.S. sample, foreign institutions show a tendency to increase the informativeness of analyst reports as well.¹⁸ This is further confirmed by Table 10, where we perform conditional analyses similar to those from Section 3.4. The findings in Table 10 accord those just described. Even if investor protection is strong, foreign institutional investors are positively associated with market reactions to analysts' target price or earnings forecast revisions, although the impact of domestic institutional ownership is still more pronounced. These results complement Aggarwal et al.'s (2011) results that foreign institutional ownership, compared to domestic institutional ownership, is the main driver of corporate governance when investor protection

¹⁸ Remember that Table 6 reports a negative effect of *IO_FOR* for the full sample including U.S. observations.

is weak, and that it plays a minor, though still significant role in improving governance when investor protection is strong. We point out that that their study is explicitly based on a non-U.S. sample.

[Insert Table 10 about here]

Overall, we conclude that our previous findings are partly driven by U.S. observations. It seems as if market participants are suspicious about too much ownership held by non-U.S. institutions in U.S. companies, but prefer large holdings of foreign (including U.S.) institutions in other markets, potentially because institutional investors from the U.S. are believed to be better at improving corporate governance than others. Again, this is in line with findings reported by Aggarwal et al. (2011), who also attribute most of the corporate governance effect of institutional ownership to investors from the U.S.

4.2. Alternative estimation methods

Thus far, in our analyses we use the analyst-company combination to define clusters for which we allow for fixed effects. Although the analyst-company level is the most granular level we can cluster on, and despite the fact that preliminary analyses suggest the use of a fixed-effects model, we re-run our major regressions using a set of alternative methods. In particular, we perform additional least-squares estimations controlling for either analyst or company-fixed effects individually, rather than analyst-company fixed effects. Moreover, we estimate the models in this paper allowing for analyst-company random effects. Lastly, we perform Fama-MacBeth estimations for all analyst-company fixed effect models on a quarterly basis.

[Insert Table 11 about here]

Table 11 displays the results from these alternative specifications, applied to the investor protection analyses from Table 5. We exemplarily choose *COMMON* as investor protection measure. Columns (1) and (2) show regression results allowing for analyst fixed effects and company fixed effects, respectively. Column (3) contains estimates from an analyst-company random effects model estimated via generalized least squares. Fama-MacBeth estimators from quarterly regressions allowing for analyst-company fixed effects are in column (4). Our main results presented in Section 4.2 are robust to these alternative estimation methods. Although not tabulated, the same applies to the other three measures of investor protection, though with reduced statistical significances in some cases. We further replicate the ownership models Table 6 applying the alternative estimation methods described above. Also, we re-run the models combining both aspects as in Table 7. Again, our results remain mostly unchanged.¹⁹

5. Conclusion

This paper addresses the question how the regulatory and institutional environment determines the informativeness of sell-side analyst reports. We deploy two complementary determinants of investor confidence in capital markets. First, we make use of different measures of the regulatory environment at the country level to proxy for the overall trustworthiness of the financial system. Second, we consider the importance of institutional investors another control mechanism at the individual company level.

Our results show that the investment value of analyst reports varies with the strength of investor protection and the importance of institutional investors. Investor protection is

¹⁹ All described results are available from the authors upon request.

measured based on four different measures including the common versus civil law classification, the anti-self dealing index by Djankov et al. (2008), and two *de facto* measures of law enforcement from Leuz et al. (2003) and Jackson and Roe (2009). More precisely, we first provide evidence that stock market reactions to target price as well as earnings forecast revisions increase in investor protection. We interpret this finding as an indication that analyst research is perceived more valuable when investor protection is strong. Although one could argue that analysts are particularly important to investors when control mechanisms are weak or absent and a company's information environment is poor, our results imply the opposite and suggest that analysts add more value to the stock market when investor protection is strong.

Second, we report a significantly positive association of total and domestic institutional ownership with abnormal stock returns around the dissemination of analyst reports. Overall, institutional investors have a positive impact on the informativeness of target price and earnings forecast revisions. Following the argument that institutional investors improve the level of corporate governance (e.g., Aggarwal et al., 2011) and the quality of corporate earnings (e.g., Velury and Jenkins, 2006), this also implies that analyst reports are perceived particularly valuable when the information environment of a company is good. Remarkably, we find opposite results for foreign institutional ownership, which is generally consistent with findings on foreign institutional investors' governance role documented in Aggarwal et al. (2011).

Third, analyses combining the two views suggest that institutional investors, regardless of their domicile, generally improve the informativeness of analyst reports when investor protection is weak. In contrast, when investor protection is strong, stock price reactions to analyst reports increase in domestic institutional ownership but decrease in foreign institutional ownership. Lastly, our results are consistent with the view that U.S.

investors play a dominant role in improving the informativeness of analyst reports, most likely due to their favorable impact on the quality of corporate governance. This complements findings from Aggarwal et al. (2011) who show that when investors are already well protected by regulation, most of the positive effect of institutional ownership on corporate governance can be attributed to domestic institutions, whereas in weak legal environments most of the governance effect comes from foreign (U.S.) institutions.

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Table 1: Number of analyst reports by country and year

This table shows the number of analyst reports that have relevant recommendation, target price and earnings forecast revisions by country and year. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010.

Country	2005	2006	2007	2008	2009	2010	Total
France	8,407	7,681	6,996	7,462	9,949	19,849	60,344
Germany	4,384	5,239	6,032	6,481	9,757	19,520	51,413
Italy	2,139	1,731	1,862	2,606	3,851	8,919	21,108
Japan	1,244	1,749	3,281	5,776	8,483	17,941	38,474
Spain	2,712	2,118	2,024	2,247	3,625	7,662	20,388
Switzerland	4,234	3,834	3,989	4,809	6,152	9,401	32,419
United Kingdom	8,453	8,972	9,688	10,997	15,236	29,083	82,429
United States	26,313	35,335	40,041	52,068	80,755	146,694	381,206
Total	57,886	66,659	73,913	92,446	137,808	259,069	687,781

Table 2: Summary of analyst report information by country

This table shows summary statistics for the revisions published within our sample of relevant analyst reports as well as corresponding stock market reactions. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. The first three columns show how recommendation revisions break down into downgrades, reiterations and upgrades. The next two columns show the average percentage revisions for target prices and earnings forecasts, respectively. The column labeled Average CAR(-2;+2) reports average cumulative abnormal returns in the five-day window around the publication of the analyst reports, based on a market model using daily returns and an estimation window from -250 to -11 days relative to the report date.

	Distribution of recommendation changes			Average revision magnitude		Average	No. Reports
	DOWN	REIT	UP	TP_REV	EPS_REV	CAR(-2;+2)	
France	5.2%	89.8%	5.0%	0.7%	1.1%	0.1%	60,344
Germany	5.7%	88.9%	5.4%	1.0%	1.4%	-0.1%	51,413
Italy	5.5%	89.3%	5.2%	-0.1%	0.1%	-0.0%	21,108
Japan	5.0%	90.0%	4.9%	-0.4%	1.3%	-0.0%	38,474
Spain	5.0%	89.8%	5.2%	0.4%	1.0%	0.0%	20,388
Switzerland	3.1%	93.6%	3.2%	0.5%	0.5%	0.0%	32,419
United Kingdom	5.5%	89.1%	5.4%	1.0%	1.4%	0.1%	82,429
United States	3.5%	93.6%	2.9%	0.8%	0.6%	-0.1%	381,206
Total	4.2%	91.9%	3.8%	0.7%	0.9%	-0.0%	687,781

Table 3: Investor protection and institutional ownership by country

This table shows summary statistics for different investor protection and corporate ownership measures at the country level. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. In Panel A, investor protection variables are displayed. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). In Panel B, institutional ownership variables are displayed. IO_TOTAL is total institutional holdings. IO_DOM is holdings by institutions from the same country where the stock is listed. IO_FOR is holdings by institutions from a different country than where the stock is listed. All ownership variables are measured as per the calendar quarter end prior to the analyst report date and expressed as a fraction of market capitalization. All figures represent sample averages at the country level.

<i>Panel A: Investor protection and enforcement</i>				
Country	COMMON	ASDI	PUBL_ENF	STAFF_ENF
France	Civil	0.38	8.68	5.91
Germany	Civil	0.28	9.05	4.43
Italy	Civil	0.42	7.07	7.25
Japan	Civil	0.50	9.17	4.32
Spain	Civil	0.37	7.14	8.50
Switzerland	Civil	0.27	10.00	8.87
United Kingdom	Common	0.95	9.22	19.04
United States	Common	0.65	9.54	23.75
Mean		0.48	8.73	10.26
Median		0.40	9.11	7.88

<i>Panel B: Institutional ownership</i>			
Country	IO_TOTAL	IO_DOM	IO_FOR
France	27.6%	9.7%	17.9%
Germany	30.3%	6.3%	23.9%
Italy	18.6%	1.7%	16.9%
Japan	19.0%	7.1%	11.9%
Spain	16.0%	3.0%	13.0%
Switzerland	30.6%	6.5%	24.1%
United Kingdom	68.1%	42.1%	26.0%
United States	75.1%	69.3%	5.8%
Total mean	56.4%	43.7%	12.7%
Total median	62.8%	49.9%	8.3%

Table 4: Average values of control variables by country

This table shows summary statistics for a set of control variables at the company, broker and analyst level. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. MKTCAP is the market capitalization in million U.S. dollars (in our regression analyses, we use logarithmic values). PTBV is the price-to-book ratio. BROKER_SIZE is the number of companies followed by a broker in a calendar year and serves as a proxy for broker size/reputation. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. The figures displayed in that column are the percentages of local broker reports on stocks listed in the country indicated row-wise. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year and serve as proxies for the complexity of an analyst's research portfolio. All figures in these columns represent sample averages at the country level. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report and serves as a proxy for prior analyst performance and reputation. The figures displayed in that column are the percentages of reports from StarMine awarded analysts, i.e., of reports for which STAR_ANALYST is equal to 1.

	Company level controls		Broker/analyst level controls				
	MKTCAP	PTBV	BROKER_SIZE	LOCAL_BROKER	ANALYST_COMP	ANALYST_COUNTR	STAR_ANALYST
France	18,004	2.0	589.0	60.2%	9.1	2.5	4.3%
Germany	16,683	2.2	563.7	57.5%	8.9	2.2	4.8%
Italy	17,347	1.9	602.6	39.0%	9.0	2.0	2.9%
Japan	11,792	1.7	1,204.2	14.7%	13.7	1.1	4.5%
Spain	21,681	2.9	484.7	44.5%	9.4	1.9	5.4%
Switzerland	35,739	3.2	833.5	44.2%	8.1	2.6	1.8%
United Kingdom	25,779	5.3	833.6	29.6%	9.7	2.2	2.2%
United States	14,492	3.7	800.4	70.4%	15.5	1.1	0.9%
Total	17,468	3.4	776.9	57.7%	12.9	1.6	2.1%

Table 5: Market reaction to analyst reports and the impact of investor protection

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of investor protection. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is an downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Investor protection is a placeholder for the investor protection variables indicated in the column headings. LOG_MKTCAP is the natural logarithm of the market capitalization (in millions of U.S. dollars) and PTBV is the price-to-book value of the subject company on the analyst report research date. BROKER_SIZE is the number of companies followed by a broker in a calendar year. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report. ASDI, PUBL_ENF and STAFF_ENF are centered around their mean values; i.e., base coefficients on UP, DOWN, TP_REV and EPS_REV are for a country that is "average" with respect to the investor protection variable considered. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Measure for investor protection			
	COMMON (1)	ASDI (2)	PUBL_ENF (3)	STAFF_ENF (4)
UP	0.007 *** (11.5)	0.005 *** (10.1)	0.005 *** (10.4)	0.007 *** (12.7)
DOWN	-0.013 *** (-19.5)	-0.013 *** (-22.9)	-0.012 *** (-22.7)	-0.013 *** (-24.1)
TP_REV	0.090 *** (42.1)	0.126 *** (75.9)	0.113 *** (69.9)	0.106 *** (62.7)
EPS_REV	0.011 *** (14.8)	0.021 *** (35.6)	0.018 *** (30.7)	0.017 *** (29.5)
UP x Investor protection	-0.004 *** (-3.9)	-0.006 *** (-2.6)	-0.000 (-0.6)	-0.000 *** (-3.7)
DOWN x Investor protection	0.001 (0.6)	0.003 (1.3)	-0.002 *** (-2.6)	0.000 (0.1)
TP_REV x Investor protection	0.067 *** (23.2)	0.090 *** (11.7)	0.043 *** (22.5)	0.004 *** (24.1)
EPS_REV x Investor protection	0.024 *** (21.4)	0.047 *** (14.7)	0.013 *** (17.6)	0.001 *** (21.7)
LOG_MKTCAP	-0.009 *** (-16.9)	-0.009 *** (-16.6)	-0.009 *** (-16.4)	-0.009 *** (-16.9)
PTBV	-0.000 *** (-3.7)	-0.000 *** (-3.6)	-0.000 *** (-3.6)	-0.000 *** (-3.8)
BROKER_SIZE	0.000 (1.2)	0.000 (1.5)	0.000 (1.4)	0.000 (1.2)
LOCAL_BROKER	-0.001 (-1.4)	-0.001 (-1.4)	-0.001 (-1.5)	-0.001 (-1.4)
ANALYST_COMP	0.000 *** (3.8)	0.000 *** (3.6)	0.000 *** (3.7)	0.000 *** (3.8)
ANALYST_COUNTR	-0.001 ** (-2.5)	-0.001 ** (-2.4)	-0.001 ** (-2.4)	-0.001 ** (-2.5)
STAR_ANALYST	0.000 (0.2)	0.000 (0.3)	-0.000 (-0.1)	0.000 (0.2)
Constant	0.074 *** (16.0)	0.072 *** (15.6)	0.071 *** (15.4)	0.074 *** (16.0)
Year dummies	Yes	Yes	Yes	Yes
Analyst-company fixed effects	Yes	Yes	Yes	Yes
N	640,611	640,611	640,611	640,611
Adj. R ²	9.5%	9.3%	9.4%	9.6%
F	620.41	602.35	603.87	622.68

Table 6: Market reaction to analyst reports and the impact of institutional ownership

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of institutional ownership. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. IO_TOTAL is total institutional holdings. IO_DOM is holdings by institutions from the same country where the stock is listed. IO_FOR is holdings by institutions from a different country than where the stock is listed. UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is a downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Institutional ownership is a placeholder for the institutional ownership variables indicated in the column headings. LOG_MKTCAP is the natural logarithm of the market capitalization (in millions of U.S. dollars), and PTBV is the price-to-book value, of the subject company on the analyst report research date. BROKER_SIZE is the number of companies followed by a broker in a calendar year. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report. IO_TOTAL, IO_DOM and IO_FOR are centered around their company-quarter means; i.e., base coefficients on UP, DOWN, TP_REV and EPS_REV are for an analyst report that is "average" with respect to the subject company's ownership variable considered. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Indicator for ownership structure		
	IO_TOTAL (1)	IO_DOM (2)	IO_FOR (3)
UP	0.006 *** (10.7)	0.006 *** (10.1)	0.005 *** (9.2)
DOWN	-0.014 *** (-25.2)	-0.014 *** (-24.3)	-0.014 *** (-23.2)
TP_REV	0.123 *** (77.4)	0.126 *** (78.4)	0.130 *** (75.8)
EPS_REV	0.025 *** (37.7)	0.025 *** (37.9)	0.025 *** (37.1)
Institutional ownership	-0.020 *** (-9.1)	-0.021 *** (-8.2)	-0.006 ** (-2.0)
UP x Institutional ownership	-0.005 *** (-2.9)	-0.004 ** (-2.4)	0.005 (1.2)
DOWN x Institutional ownership	-0.004 * (-1.9)	-0.005 *** (-3.1)	0.012 *** (3.0)
TP_REV x Institutional ownership	0.101 *** (19.9)	0.097 *** (21.3)	-0.136 *** (-10.9)
EPS_REV x Institutional ownership	0.034 *** (16.9)	0.034 *** (18.6)	-0.058 *** (-11.4)
LOG_MKTCAP	-0.009 *** (-16.1)	-0.009 *** (-16.5)	-0.009 *** (-16.0)
PTBV	-0.000 *** (-4.6)	-0.000 *** (-4.7)	-0.000 *** (-4.3)
BROKER_SIZE	0.000 (1.2)	0.000 (1.2)	0.000 (1.4)
LOCAL_BROKER	-0.002 ** (-2.1)	-0.002 ** (-2.2)	-0.002 * (-2.0)
ANALYST_COMP	0.000 *** (3.1)	0.000 *** (3.2)	0.000 *** (3.1)
ANALYST_COUNTR	-0.000 * (-1.7)	-0.000 * (-1.8)	-0.000 * (-1.7)
STAR_ANALYST	0.000 (0.3)	0.000 (0.2)	0.000 (0.5)
Constant	0.074 *** (15.1)	0.076 *** (15.5)	0.075 *** (15.2)
Year dummies	Yes	Yes	Yes
Analyst-company fixed effects	Yes	Yes	Yes
N	556,589	556,589	556,589
Adj. R ²	9.3%	9.4%	9.1%
F	494.36	499.31	483.48

Table 7: Market reaction to analyst reports and the impact of institutional ownership conditioned on investor protection

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of institutional ownership in different investor protection environments. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. In each panel, the left part of the table displays the interaction coefficients for a weak-protection setting as per the investor protection variable indicated in the panel title. Equivalently, the right part of the table displays the interaction coefficients for a strong-protection setting. In panel A, the sample is split by civil vs. common law. In panels B through D, the sample is split by the median value of the respective investor protection variable. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). IO_TOTAL is total institutional holdings. IO_DOM is holdings by institutions from the same country where the stock is listed. IO_FOR is holdings by institutions from a different country than where the stock is listed. UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is a downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Institutional ownership is a placeholder for the institutional ownership variables indicated in the column headings. All models include the same set of variables as in Table 6. Base coefficients and control coefficients are not displayed for the sake of brevity. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

<i>Panel A: COMMON (civil law vs. common law legal origin)</i>						
	COMMON = 0 (civil law)			COMMON = 1 (common law)		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	-0.005 (-1.1)	0.008 (0.7)	-0.008 (-1.5)	-0.002 (-0.5)	-0.002 (-0.6)	0.004 (0.7)
DOWN x Institutional ownership	-0.005 (-1.0)	-0.027 ** (-2.2)	-0.001 (-0.2)	-0.006 (-1.4)	-0.013 *** (-3.6)	0.023 *** (4.3)
TP_REV x Institutional ownership	0.068 *** (4.5)	0.119 *** (3.0)	0.066 *** (3.8)	0.076 *** (6.6)	0.103 *** (10.4)	-0.144 *** (-7.9)
EPS_REV x Institutional ownership	0.008 (1.4)	0.014 (1.0)	0.007 (1.1)	0.009 * (1.9)	0.020 *** (4.7)	-0.054 *** (-6.7)
N	199,616	199,616	199,616	356,973	356,973	356,973
Adj. R ²	7.5%	7.5%	7.5%	9.9%	9.9%	9.9%
F	148.08	147.59	147.55	358.02	360.61	356.30
<i>Panel B: ASDI low vs. high</i>						
	ASDI = low			ASDI = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	0.003 (0.7)	0.014 (1.1)	0.002 (0.3)	-0.009 *** (-3.9)	-0.008 *** (-3.5)	0.004 (0.8)
DOWN x Institutional ownership	-0.005 (-0.9)	-0.009 (-0.7)	-0.004 (-0.7)	-0.002 (-1.0)	-0.006 ** (-2.6)	0.021 *** (4.0)
TP_REV x Institutional ownership	0.056 *** (3.2)	0.057 (1.2)	0.063 *** (3.2)	0.101 *** (15.4)	0.108 *** (18.1)	-0.163 *** (-9.3)
EPS_REV x Institutional ownership	0.004 (0.7)	0.002 (0.1)	0.005 (0.7)	0.032 *** (13.3)	0.034 *** (15.5)	-0.069 *** (-9.1)
N	146,698	146,698	146,698	409,891	409,891	409,891
R2	15.9%	15.9%	15.9%	19.3%	19.4%	19.2%
Adj. R ²	7.5%	7.5%	7.5%	9.6%	9.7%	9.4%

Table 7: (continued)

<i>Panel C: PUBL_ENF low vs. high</i>						
	PUBL_ENF = low			PUBL_ENF = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	-0.001 (-0.2)	0.009 (0.7)	-0.003 (-0.5)	-0.010 *** (-4.2)	-0.009 *** (-3.9)	0.007 (1.3)
DOWN x Institutional ownership	-0.002 (-0.4)	-0.008 (-0.6)	-0.001 (-0.2)	-0.000 (-0.1)	-0.004 (-1.5)	0.017 *** (3.3)
TP_REV x Institutional ownership	0.080 *** (4.7)	0.112 ** (2.4)	0.087 *** (4.3)	0.099 *** (14.6)	0.105 *** (17.5)	-0.167 *** (-10.1)
EPS_REV x Institutional ownership	-0.000 (-0.0)	0.006 (0.3)	-0.001 (-0.1)	0.032 *** (12.8)	0.033 *** (14.8)	-0.063 *** (-9.0)
N	136,766	136,766	136,766	419,823	419,823	419,823
Adj. R ²	7.8%	7.8%	7.8%	9.6%	9.7%	9.5%
<i>Panel D: STAFF_ENF low vs. high</i>						
	STAFF_ENF = low			STAFF_ENF = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	-0.010 * (-1.9)	0.004 (0.3)	-0.014 ** (-2.2)	-0.002 (-0.6)	-0.002 (-0.9)	0.007 (1.4)
DOWN x Institutional ownership	0.002 (0.4)	-0.016 (-1.2)	0.006 (0.9)	-0.007 *** (-2.7)	-0.010 *** (-4.1)	0.018 *** (3.5)
TP_REV x Institutional ownership	0.062 *** (3.7)	0.078 * (1.8)	0.066 *** (3.4)	0.109 *** (14.3)	0.115 *** (17.5)	-0.164 *** (-9.9)
EPS_REV x Institutional ownership	0.000 (0.0)	0.011 (0.8)	-0.002 (-0.3)	0.025 *** (7.7)	0.029 *** (10.2)	-0.055 *** (-7.7)
N	152,638	152,638	152,638	403,951	403,951	403,951
Adj. R ²	7.8%	7.8%	7.7%	9.8%	9.8%	9.7%
F	130.64	129.70	130.13	374.18	377.70	369.11

Table 8: Market reaction to analyst reports and the impact of investor protection, excluding U.S. companies

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of investor protection. The data are based on a panel of analyst reports on companies from the EU5, Switzerland and Japan, but excluding the U.S., over the period 2005 through 2010. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is a downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Investor protection is a placeholder for the investor protection variables indicated in the column headings. LOG_MKTCAP is the natural logarithm of the market capitalization (in millions of U.S. dollars) and PTBV is the price-to-book value of the subject company on the analyst report research date. BROKER_SIZE is the number of companies followed by a broker in a calendar year. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report. ASDI, PUBL_ENF and STAFF_ENF are centered around their mean values; i.e., base coefficients on UP, DOWN, TP_REV and EPS_REV are for a country that is "average" with respect to the investor protection variable considered. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Measure for investor protection			
	COMMON (1)	ASDI (2)	PUBL_ENF (3)	STAFF_ENF (4)
UP	0.008 *** (11.6)	0.007 *** (11.9)	0.007 *** (11.5)	0.007 *** (12.2)
DOWN	-0.013 *** (-19.7)	-0.012 *** (-20.7)	-0.012 *** (-20.2)	-0.012 *** (-21.0)
TP_REV	0.088 *** (40.8)	0.090 *** (45.8)	0.088 *** (44.9)	0.090 *** (46.3)
EPS_REV	0.011 *** (15.7)	0.012 *** (18.2)	0.012 *** (17.1)	0.013 *** (18.5)
UP x Investor protection	-0.003 * (-1.8)	-0.002 (-0.9)	0.001 ** (2.2)	-0.000 * (-1.9)
DOWN x Investor protection	0.004 *** (2.6)	0.004 * (1.9)	-0.001 ** (-2.1)	0.000 *** (2.7)
TP_REV x Investor protection	0.009 * (1.9)	0.011 (1.4)	0.011 *** (5.1)	0.000 (1.0)
EPS_REV x Investor protection	0.008 *** (3.8)	0.009 *** (2.7)	0.003 *** (3.4)	0.001 *** (3.9)
LOG_MKTCAP	-0.007 *** (-9.7)	-0.007 *** (-9.7)	-0.007 *** (-9.6)	-0.007 *** (-9.7)
PTBV	-0.000 *** (-2.8)	-0.000 *** (-2.8)	-0.000 *** (-2.9)	-0.000 *** (-2.8)
BROKER_SIZE	0.000 (0.7)	0.000 (0.8)	0.000 (0.7)	0.000 (0.7)
LOCAL_BROKER	-0.001 (-1.0)	-0.001 (-1.0)	-0.001 (-1.0)	-0.001 (-1.0)
ANALYST_COMP	0.000 *** (2.6)	0.000 ** (2.6)	0.000 *** (2.6)	0.000 *** (2.6)
ANALYST_COUNTR	-0.001 ** (-2.3)	-0.001 ** (-2.3)	-0.001 ** (-2.3)	-0.001 ** (-2.3)
STAR_ANALYST	0.000 (0.3)	0.000 (0.3)	0.000 (0.2)	0.000 (0.3)
Constant	0.062 *** (9.6)	0.062 *** (9.6)	0.062 *** (9.5)	0.062 *** (9.5)
Year dummies	Yes	Yes	Yes	Yes
Analyst-company fixed effects	Yes	Yes	Yes	Yes
N	284,286	284,286	284,286	284,286
Adj. R ²	7.8%	7.8%	7.8%	7.8%
F	202.08	201.24	200.00	202.02

Table 9: Market reaction to analyst reports and the impact of institutional ownership, excluding U.S. companies

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of institutional ownership. The data are based on a panel of analyst reports on companies from the EU5, Switzerland and Japan, but excluding the U.S., over the period 2005 through 2010. IO_TOTAL is total institutional holdings. IO_DOM is holdings by institutions from the same country where the stock is listed. IO_FOR is holdings by institutions from a different country than where the stock is listed. UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is a downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Institutional ownership is a placeholder for the institutional ownership variables indicated in the column headings. LOG_MKTCAP is the natural logarithm of the market capitalization (in millions of U.S. dollars), and PTBV is the price-to-book value, of the subject company on the analyst report research date. BROKER_SIZE is the number of companies followed by a broker in a calendar year. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report. IO_TOTAL, IO_DOM and IO_FOR are centered around their company-quarter means; i.e., base coefficients on UP, DOWN, TP_REV and EPS_REV are for an analyst report that is "average" with respect to the subject company's ownership variable considered. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Indicator for ownership structure		
	IO_TOTAL (1)	IO_DOM (2)	IO_FOR (3)
UP	0.007 *** (12.3)	0.007 *** (12.0)	0.007 *** (11.9)
DOWN	-0.013 *** (-21.4)	-0.012 *** (-20.9)	-0.013 *** (-20.9)
TP_REV	0.087 *** (44.4)	0.088 *** (44.2)	0.086 *** (42.4)
EPS_REV	0.013 *** (17.9)	0.013 *** (17.9)	0.012 *** (17.5)
Institutional ownership	-0.003 (-1.0)	0.008 * (1.8)	-0.008 ** (-2.5)
UP x Institutional ownership	-0.003 (-1.1)	-0.003 (-0.8)	-0.003 (-0.7)
DOWN x Institutional ownership	0.004 * (1.7)	0.004 (1.3)	0.004 (1.0)
TP_REV x Institutional ownership	0.033 *** (3.8)	0.025 ** (2.1)	0.050 *** (3.2)
EPS_REV x Institutional ownership	0.016 *** (4.6)	0.021 *** (4.2)	0.012 ** (2.1)
LOG_MKTCAP	-0.007 *** (-9.4)	-0.007 *** (-9.5)	-0.007 *** (-9.3)
PTBV	-0.000 *** (-3.6)	-0.000 *** (-3.6)	-0.000 *** (-3.6)
BROKER_SIZE	0.000 (1.2)	0.000 (1.2)	0.000 (1.2)
LOCAL_BROKER	-0.001 (-0.7)	-0.001 (-0.6)	-0.001 (-0.7)
ANALYST_COMP	0.000 *** (2.8)	0.000 *** (2.8)	0.000 *** (2.8)
ANALYST_COUNTR	-0.001 * (-1.7)	-0.001 * (-1.7)	-0.001 * (-1.7)
STAR_ANALYST	0.000 (0.0)	0.000 (0.0)	0.000 (0.1)
Constant	0.061 *** (9.2)	0.061 *** (9.3)	0.060 *** (9.0)
Year dummies	Yes	Yes	Yes
Analyst-company fixed effects	Yes	Yes	Yes
N	262,786	262,786	262,786
Adj. R ²	7.7%	7.6%	7.6%
F	182.36	182.64	180.43

Table 10: Market reaction to analyst reports and the impact of institutional ownership conditioned on investor protection, excluding U.S. companies

This table shows regression results of five-day cumulative abnormal returns around the analyst report date on various analyst measures and the impact of institutional ownership in different investor protection environments. The data are based on a panel of analyst reports on companies from the EU5, Switzerland and Japan, but excluding the U.S., over the period 2005 through 2010. In each panel, the left part of the table displays the interaction coefficients for a weak-protection setting as per the investor protection variable indicated in the panel title. Equivalently, the right part of the table displays the interaction coefficients for a strong-protection setting. In panel A, the sample is split by civil vs. common law. In panels B through D, the sample is split by the median value of the respective investor protection variable. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). IO_TOTAL is total institutional holdings. IO_DOM is holdings by institutions from the same country where the stock is listed. IO_FOR is holdings by institutions from a different country than where the stock is listed. UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is a downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Institutional ownership is a placeholder for the institutional ownership variables indicated in the column headings. All models include the same set of variables as in Table 6. Base coefficients and control coefficients are not displayed for the sake of brevity. All models are estimated allowing for analyst-company and time fixed effects. Standard errors are clustered by analyst-company and reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

<i>Panel A: COMMON (civil law vs. common law legal origin)</i>						
	COMMON = 0 (civil law)			COMMON = 1 (common law)		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	-0.005 (-1.0)	0.010 (0.9)	-0.008 (-1.5)	0.008 (1.2)	0.001 (0.2)	0.008 (0.9)
DOWN x Institutional ownership	-0.005 (-1.0)	-0.026 ** (-2.1)	-0.002 (-0.3)	0.002 (0.3)	-0.003 (-0.5)	0.008 (1.0)
TP_REV x Institutional ownership	0.065 *** (4.2)	0.114 *** (2.9)	0.063 *** (3.6)	0.062 *** (3.1)	0.035 (1.6)	0.028 (0.9)
EPS_REV x Institutional ownership	0.011 * (1.9)	0.018 (1.4)	0.010 (1.5)	0.020 ** (2.4)	0.017 * (1.9)	0.001 (0.1)
N	198,983	198,983	198,983	63,803	63,803	63,803
Adj. R ²	7.5%	7.5%	7.5%	8.0%	8.0%	8.0%
F	147.48	147.04	146.98	38.02	38.26	37.51
<i>Panel B: ASDI low vs. high</i>						
	ASDI = low			ASDI = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	0.005 (0.8)	0.027 (1.1)	0.003 (0.5)	-0.006 ** (-2.1)	-0.007 * (-1.8)	-0.005 (-0.9)
DOWN x Institutional ownership	-0.016 ** (-2.2)	-0.045 * (-1.8)	-0.016 * (-1.9)	0.009 *** (3.3)	0.008 ** (2.3)	0.012 ** (2.2)
TP_REV x Institutional ownership	0.062 *** (2.9)	0.018 (0.3)	0.078 *** (3.2)	0.026 *** (2.7)	0.020 (1.6)	0.042 ** (2.1)
EPS_REV x Institutional ownership	0.012 (1.5)	0.025 (1.1)	0.012 (1.3)	0.017 *** (4.4)	0.022 *** (4.1)	0.013 * (1.9)
N	93,506	93,506	93,506	169,280	169,280	169,280
Adj. R ²	7.0%	7.0%	7.0%	8.0%	8.0%	8.0%
F	57.11	56.62	57.07	128.72	128.75	126.10

Table 10: (continued)

<i>Panel C: PUBL_ENF low vs. high</i>						
	PUBL_ENF = low			PUBL_ENF = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	0.001 (0.1)	0.004 (0.3)	-0.000 (-0.0)	-0.005 (-1.6)	-0.005 (-1.2)	-0.005 (-0.9)
DOWN x Institutional ownership	-0.003 (-0.4)	-0.005 (-0.4)	-0.002 (-0.3)	0.006 * (1.9)	0.005 (1.3)	0.006 (1.2)
TP_REV x Institutional ownership	0.108 *** (4.9)	0.212 *** (4.1)	0.102 *** (3.6)	0.027 *** (2.7)	0.021 (1.6)	0.037 * (2.0)
EPS_REV x Institutional ownership	0.014 (1.6)	0.013 (0.7)	0.018 (1.6)	0.016 *** (4.1)	0.022 *** (4.1)	0.009 (1.4)
N	89,738	89,738	89,738	173,048	173,048	173,048
Adj. R ²	8.1%	8.1%	8.1%	7.4%	7.4%	7.4%
F	62.51	61.94	61.92	123.23	123.84	121.76
<i>Panel D: STAFF_ENF low vs. high</i>						
	STAFF_ENF = low			STAFF_ENF = high		
	IO_TOTAL	IO_DOM	IO_FOR	IO_TOTAL	IO_DOM	IO_FOR
UP x Institutional ownership	-0.009 (-1.5)	0.008 (0.5)	-0.013 * (-1.9)	0.001 (0.2)	-0.001 (-0.4)	0.005 (0.8)
DOWN x Institutional ownership	0.003 (0.5)	-0.009 (-0.6)	0.005 (0.8)	0.001 (0.2)	0.001 (0.2)	0.000 (0.1)
TP_REV x Institutional ownership	0.052 *** (2.9)	0.023 (0.5)	0.062 *** (3.0)	0.059 *** (5.7)	0.054 *** (4.2)	0.057 ** (2.5)
EPS_REV x Institutional ownership	0.002 (0.4)	0.015 (1.0)	0.000 (0.0)	0.023 *** (5.1)	0.021 *** (3.7)	0.025 *** (3.0)
N	133,286	133,286	133,286	129,500	129,500	129,500
Adj. R ²	7.4%	7.4%	7.4%	8.0%	8.0%	8.0%
F	118.80	117.78	118.44	68.16	68.49	66.12

Table 11: Market reaction to analyst reports and the impact of investor protection - alternative models

This table shows regression results of five-day abnormal returns around the analyst report date on various analyst measures and the impact of investor protection. The data are based on a panel of analyst reports on companies from the U.S., the EU5, Switzerland and Japan over the period 2005 through 2010. COMMON indicates whether a country has a common-law legal origin. ASDI is the anti-self dealing index from Djankov et al. (2008). PUBL_ENF is the legal enforcement index used in Leuz et al. (2003). STAFF_ENF is the resource-based enforcement measure proposed by Jackson and Roe (2009). UP is a dummy variable indicating whether a stock recommendation is an upgrade relative to the same analyst's previous rating on the same stock, while DOWN is a dummy variable indicating whether a stock recommendation is an downgrade. TP_REV and EPS_REV measure the percentage change in an analyst's target price or earnings forecast revision, respectively. Investor protection is a placeholder for the investor protection variables indicated in the column headings. LOG_MKTCAP is the natural logarithm of the market capitalization (in millions of U.S. dollars), and PTBV is the price-to-book value, of the subject company on the analyst report research date. BROKER_SIZE is the number of companies followed by a broker in a calendar year. LOCAL_BROKER indicates whether the broker issuing the analyst report is from the same country where the stock is listed. ANALYST_COMP and ANALYST_COUNTR are the number of companies followed by an analyst, and the countries represented by them, in a calendar year. STAR_ANALYST indicates whether the issuing analyst was listed in one of StarMine's Analyst Award rankings in the calendar year prior to the report. ASDI, PUBL_ENF and STAFF_ENF are centered around their mean values; i.e., base coefficients on UP, DOWN, TP_REV and EPS_REV are for a country that is "average" with respect to the investor protection variable considered. In model (1) and (2), standard errors are clustered by analyst and company cluster, respectively. In models (3) and (4), standard errors are clustered by analyst-company cluster. The Fama-MacBeth estimators in model (4) are based quarterly regressions allowing for analyst-company fixed effects, which is why analyst level control variables, which are measured on an annual basis, do not show any within-cluster variation and are omitted. Standard errors are reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Analyst-fixed effects	Company-fixed effects	Analyst-company-random effects	Fama-MacBeth
	(1)	(2)	(3)	(4)
UP	0.008 *** (11.6)	0.007 *** (11.8)	0.008 *** (12.9)	0.011 *** (7.1)
DOWN	-0.013 *** (-20.1)	-0.013 *** (-18.9)	-0.013 *** (-22.0)	-0.013 *** (-9.9)
TP_REV	0.093 *** (40.3)	0.094 *** (29.5)	0.090 *** (46.6)	0.050 *** (11.2)
EPS_REV	0.011 *** (15.6)	0.011 *** (10.8)	0.011 *** (16.5)	0.012 *** (6.0)
COMMON	0.000 (1.2)		-0.002 *** (-7.3)	
UP x COMMON	-0.004 *** (-4.1)	-0.004 *** (-4.4)	-0.004 *** (-4.2)	-0.002 (-1.2)
DOWN x COMMON	0.001 (0.8)	0.000 (0.4)	0.001 (0.6)	-0.002 (-1.6)
TP_REV x COMMON	0.067 *** (19.7)	0.066 *** (15.0)	0.066 *** (25.0)	0.057 *** (10.7)
EPS_REV x COMMON	0.025 *** (20.9)	0.024 *** (14.3)	0.024 *** (23.8)	0.021 *** (8.6)
LOG_MKTCAP	0.000 ** (2.5)	-0.008 *** (-11.9)	-0.000 *** (-3.2)	0.026 *** (4.4)
PTBV	-0.000 (-0.7)	0.000 (0.0)	-0.000 (-1.3)	-0.000 (-0.8)
BROKER_SIZE	0.000 (1.4)	-0.000 * (-1.8)	0.000 (0.9)	0.000 (0.6)
LOCAL_BROKER	-0.001 (-1.2)	-0.000 ** (-2.4)	-0.001 *** (-3.4)	-0.010 (-0.4)
ANALYST_COMP	0.000 *** (2.8)	0.000 (0.2)	0.000 *** (3.0)	
ANALYST_COUNTR	-0.001 *** (-3.0)	-0.000 * (-1.8)	-0.000 (-0.3)	
STAR_ANALYST	0.000 (0.0)	0.000 (0.7)	0.000 (0.3)	
Constant	-0.005 *** (-4.7)	0.065 *** (11.7)	0.001 (0.9)	-0.246 *** (-3.4)
Year dummies	Yes	Yes	Yes	No
N	640,611	640,611	640,611	640,611
Adj. R ² / Overall GLS R ²	6.4%	7.9%	6.0%	-
F / Wald	385.99	252.32	15,418.04	-

Appendix

Table A1: Variable definitions and sources

Variable		Definition	Source
<i>Analyst report and market reaction variables</i>			
Recommendation upgrade	UP	Dummy variable equal to 1 if the stock recommendation is an upgrade, compared to the previous recommendation by the same analyst on the same stock, and 0 otherwise; calculated only if the previous recommendation is no older than 90 days.	FactSet
Recommendation reiteration	REIT	Dummy variable equal to 1 if the stock recommendation is a reiteration, compared to the previous recommendation by the same analyst on the same stock, and 0 otherwise; calculated only if the previous recommendation is no older than 90 days.	FactSet
Recommendation downgrade	DOWN	Dummy variable equal to 1 if the stock recommendation is a downgrade, compared to the previous recommendation by the same analyst on the same stock, and 0 otherwise; calculated only if the previous recommendation is no older than 90 days.	FactSet
Target price revision	TP_REV	Percentage change in target price by a given analyst on a given stock: $(TP_t - TP_{t-1})/TP_{t-1}$; calculated only if the previous target price is no older than 90 days.	FactSet
Earnings forecast revision	EPS_REV	Percentage change in earnings forecast price by a given analyst on a given stock: $(EPS_t - EPS_{t-1})/EPS_{t-1}$; calculated only if the previous earnings forecast is no older than 90 days.	FactSet
Cumulative abnormal return	CAR	Five-day cumulative abnormal return around the research date of the analyst report. Abnormal return calculations based on a Datastream market model	
<i>Investor protection variables</i>			
Legal origin	COMMON	Dummy variable equal to 1 if the stock is from a common law country	La Porta et al. (1997)
Anti-self dealing	ASDI	Anti-self dealing index	Djankov et al. (2008)
Legal enforcement (ADRI)	PUBL_ENF	Legal enforcement measure defined as the mean of (1) the efficiency of the judicial system, (2) the rule of law, and (3) the level of corruption, all documented in La Porta et al. (1998)	Leuz et al. (2003)
Legal enforcement (Staff)	STAFF_ENF	Legal enforcement measure, defined as the number of regulator staff per 1,000,000 inhabitants	Jackson and Roe (2009)

Table A1: (continued)

Institutional ownership variables

Total institutional ownership	IO_TOTAL	Quarter-end stock holdings by all institutional investors, in percent of market capitalization	FactSet/LionShares
Domestic institutional ownership	IO_DOM	Quarter-end stock holdings by institutional investors domiciled in the same country where the stock is listed, in percent of market capitalization	FactSet/LionShares
Foreign institutional ownership	IO_FOR	Quarter-end stock holdings by institutional investors domiciled in a different country from where the stock is listed, in percent of market capitalization	FactSet/LionShares
Foreign-to-domestic institutional ownership	IO_FOR/DOM	Ratio of quarter-end foreign to domestic institutional holdings	FactSet/LionShares
<i>Control variables at firm, broker, analyst level</i>			
Market capitalization	LOG_MKTCAP	Natural logarithm of the market capitalization (in million U.S. dollars) as per the day prior to the research date of the analyst report	Datastream
Price-to-book ratio	PTBV	Price-to-book ratio as per the day prior to the research date of the analyst report	Datastream
Broker size	BROKER_SIZE	Number of companies followed by a given broker in a given calendar year	FactSet
Broker proximity	LOCAL_BROKER	Dummy variable equal to 1 if the report is from a brokerage house domiciled in the same country where the stock is listed	FactSet/own research
Analyst reputation	STAR_ANALYST	Dummy variable equal to 1 if the analyst was listed in any of Thomson Reuters's publicly available StarMine Analyst Awards rankings in the calendar year prior to the year when the analyst report is published	StarMine
Analyst workload (1)	ANALYST_COMP	Number of companies followed by a given analyst in a given calendar year	FactSet
Analyst workload (2)	ANALYST_COUNTR	Number of countries where the companies/stocks followed by a given analyst in a given calendar year are listed	FactSet