Target Price Accuracy: International Evidence

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ABSTRACT: This paper shows that analysts exhibit differential and persistent ability to issue accurate target prices (TPs), and that institutional and regulatory differences across countries affect TP accuracy. Using a sample of 16 countries, we find that better past TP forecasters, analysts with higher forecasting experience, following more firms, country-specialized, and employed by a large broker issue more accurate TPs. Further, the country's institutional and regulatory factors, such as the accounting disclosure quality, the origin of the legal system, cultural traits, and IFRS regulation explain cross-country differences in TP forecast accuracy.

Keywords: target prices; forecast accuracy; analyst characteristics; institutional and regulatory differences across countries.

Data Availability: Data are available from public sources indicated in the text.

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I. INTRODUCTION

A target price (TP) forecast reflects the analyst's estimate of the firm's stock price level in 12 months, providing easy to interpret, direct investment advice.[1] Target prices are valuable to investors[2], yet we know little about what determines TP accuracy. In particular, questions such as—do analysts exhibit differential and persistent ability to issue accurate target prices after controlling for analyst earnings-per-share (EPS) forecast accuracy, and how institutional and regulatory differences across countries, e.g. differences in accounting disclosure quality, affect TP forecast accuracy—have received limited research attention. We examine the two set of factors together because quality of TP forecasts should reflect both the analyst forecasting skills and the quality of information signals analysts use to arrive at target prices, where the latter is largely determined by the institutional and regulatory environment the firm operates in (Hope 2003a, 2003b; Ball et al. 2000).[3] We confirm that TP accuracy varies with both the institutional setup that facilities the forecasting task and with superior analyst skillset, and that on average the former has a stronger effect on TP accuracy.

Using data from 16 countries—the US, 12 European countries, Japan, Australia and Hong Kong—over the period 2002–2009, we study the determinants of analyst TP accuracy. We use two main TP accuracy measures. First, an indicator variable that equals one if the TP forecast is met by the actual stock price over the 12-month period after the forecast issue, *Met_any*. We document that during the 12-month forecast period the stock price reaches the target price in 59.1% of cases, with Italian firms having the lowest proportion of met TPs, 54.0%, and Australian firms the highest,

[1] Our email correspondence with Thomson Reuters IBES support team and Daniel Reingold, a former top analyst at Credit Suisse First Boston, confirm that a target price reflects the level at which the analyst believes the stock price will trade at the end of a specific, usually a 12-month horizon.

[2] Brav and Lehavy (2003) and Asquith et al. (2005) document strong incremental price reaction to TP revision announcements in the US, controlling for concurrent stock recommendation and earnings-per-share revisions.

[3] An important benefit of the international setting is that we can achieve a high variation in analyst forecasting environments largely without the cost of high endogeneity. This provides better specification of tests that examine analyst differential TP forecasting ability in relation to the forecasting environment.

66.1%. Our second TP accuracy measure is the absolute difference between the TP forecast and the stock price at the end of the forecast horizon scaled by the stock price at the forecast issue date, *aTPE*. The mean absolute TP error is 44.7%, ranging from 37.3% for Japanese firms to 58.2% for Danish companies. The distribution in TP accuracy measures remains qualitatively the same when we recalculate *Met_any* and *aTPE* using a shorter forecast period to account for TP revisions made before the end of the 12-month forecast period.

We examine analysts' differential and persistent ability to issue accurate target prices in two steps. First, we compare the accuracy of analyst TPs to the accuracy of simple price forecasts that investors can form based on information available at the TP issue date. If the accuracy of simple price forecasts is higher than that of analyst TPs, the latter offer no value to investors. We find that on average analyst TP forecast accuracy is higher than the accuracy of a naïve price forecast, which predicts that the stock price in twelve months will be equal to the stock price on the forecast issue date times one plus the previous 12-month firm buy-and-hold return. Specifically analyst TPs meet or exceed the accuracy of naïve price forecasts in 74.5% of cases, and the analysts' absolute TP forecast error is 9.8% lower compared to the absolute forecast error of the naïve price forecast. The accuracy of analyst TPs is also superior to other simple price forecasts such as those formed based on the industry price-to-earnings ratios and the market return over the preceding 12-month period.

Second, multivariate analysis shows that analyst characteristics associated with superior forecasting skill predict TP accuracy. Analyst firm-specific forecasting experience reduces the TP forecast error, which means that analysts learn to produce more precise TPs over time for the firms they follow. However, analyst experience has no effect on the likelihood that a target price is met over the 12-month forecast horizon. Analysts following more firms issue more accurate TPs based on both TP accuracy measures. This is consistent with the international evidence on EPS forecast accuracy in Clement et al. (2003) and Bolliger (2004), and points to the existence of information

spill-over effects from following multiple firms. Further, analysts who cover firms located in fewer countries—country specialized analysts—are more accurate TP forecasters. The evidence that country-specialization improves TP accuracy complements the results in Sonney (2009), who reports that country-specialized analysts produce more accurate EPS forecasts. Target prices made by analysts employed by large brokers, who have access to a greater resource pool, are more likely to be met over the 12-month forecast period. Finally, looking at the persistence in analyst TP forecasting ability, we find that better past TP forecasters issue more accurate future TPs.

The relation between analyst characteristics and TP accuracy remains qualitatively similar when we recalculate *Met_any* and *aTPE* to account for TP revisions made before the end of the 12-month forecast period (*Met_any_rev* and *aTPE_rev*). For *aTPE_rev*, we also observe that TPs issued by analysts employed by larger brokers have lower TP error. Together, the results confirm that better quality analysts have persistent and differential ability to issue precise TP forecasts.

Institutional and regulatory environment shows a strong association with TP accuracy. For all accuracy measures, we find that TP forecasts are more accurate in countries with higher accounting disclosure quality. For both *Met_any* and *Met_any_rev*, TP forecasts in countries where the legal system originates in common law are more likely to be met by the actual stock price compared to countries with civil law tradition. This supports the results in Clement et al. (2003) that the shareholder model of corporate governance in common law countries improves the quality and amount of information available to analysts, which facilitates their forecasting task. Cross-country differences in national culture explain variations in TP forecast accuracy. Specifically, TP estimates issued for firms that operate in countries with high uncertainty avoidance are on average more accurate. Uncertainty avoidance encourages less risk taking and stability in the working environment (Bontempo et al. 1997), which simplifies the analyst valuation and forecasting task when producing TPs. Further, *Met_any* shows a negative correlation with power distance, individualism, and

masculinity. These cultural dimensions associate with market-orientation of firms, high competitiveness of individuals, acceptance for risk, higher secrecy of managers and more difficult access to firm management for analysts—characteristics that reflect higher forecasting difficulty. Finally, we find that TP forecast accuracy improves after the mandatory IFRS adoption for the fourteen countries in our sample that implemented IFRS starting on January 2005.

All regressions control for the accuracy of analyst EPS forecasts, which shows a positive association with TP forecast accuracy. This is consistent with better quality inputs into analyst valuation models improving TP accuracy. The regressions also include firm characteristics that could predict TP forecast accuracy, such as proxies for the quality of the firm's information environment and analyst competition (firm market capitalization and the number of analysts covering the firm), firm total risk (stock price volatility), and predictable stock price patterns (price momentum). We also control for the magnitude of the forecasted stock price change, the ex-post stock market performance, industry and year dummies, and the effect of recent financial crisis. For the latter, the analysis reveals that TP forecast accuracy is lower in all countries we investigate during the financial crisis 2007–2009.

Our results are robust to a battery of sensitivity tests. These include using instrumental variable analysis to adjust for endogeneity in the analyst's projected price change estimate, using country fixed-effect regressions, and using the proportional mean absolute TP forecast error as in Clement (1999, 2003).

This study will be of interest to both academic researchers and market participants. First, to date, the accuracy of target price forecasts has received limited attention by the literature. This is surprising considering that TPs provide more direct and granular investment advice to investors compared to earnings forecasts or stock recommendations. A recent review of the analyst forecasting literature by Bradshaw (2010) emphasizes this point. His literature search identifies only

14 papers on analyst target prices listed in ABI/INFORM, and only three that look at target prices and earnings forecasts together. In particular, of the three published studies that provide some evidence on TP accuracy, Asquith et al. (2005) report only summary statistics on TP accuracy, and Demirakos et al. (2010) and Bonini et al. (2010) do not examine whether analyst and broker characteristics determine TP accuracy. Bradshaw and Brown (2007), the only other study to examine persistence in analyst target price forecasting accuracy, find no link between past and current TP forecast accuracy in the US market over 1997–2002. Our study differs from Bradshaw and Brown (2007) as (1) we examine a more recent sample period, and (2) we focus on a broader set of analyst and broker characteristics in explaining differences in TP forecast accuracy.[4] Furthermore, none of the previous studies explore whether differences in institutional and regulatory settings influence TP accuracy, nor do they control for the contemporaneous relation between EPS and TP accuracy. Our paper fills this gap in the literature and documents that analysts exhibit differential and persistent ability to forecast target prices accurately. Further, compared to previous research, our study tests the largest set of potential TP forecast accuracy predictors providing the most comprehensive analysis of TP forecast determinants to date.

Second, this study is the first to provide evidence that institutional and regulatory differences between countries influence analysts' ability to forecast accurate target prices. Specifically, we show that institutional factors such as the accounting disclosure quality, the corporate governance system,

[4] Differences in sample periods and in model specification most likely explain the discrepancy between ours and results in Bradshaw and Brown (2007). First, new regulation introduced in the wake of the internet crash and Enron and World.com accounting scandals aimed to reduce conflicts of interests in analyst research and to promote less biased sell-side equity research (e.g. NASD 2711 and the SEC rule 472 in the US). This may have motivated analysts to exert more effort to produce more accurate TP forecasts. Second, tests in Section VII show that the relation between past and current TP accuracy is strongly attenuated for TP forecasts issued during the financial crisis 2007–2009. This is because unexpected price decline as a result of subprime crisis had a strong negative effect on TP forecast accuracy. A similar price shock occurred in the aftermath of the internet bubble burst, a period Bradshaw and Brown (2007) draw majority of their TP forecasts from (forecasts issued after 2000 make up 64.5% of all TPs in their sample). Third, we find that for TPs issued for US firms only, the coefficient on past TP accuracy is lower by 14.3% in magnitude for the *Met_any* regression and by 6.4% for *aTPE* regression when we use the TP accuracy model specification in Bradshaw and Brown (2007) compared to our model specification.

cultural traits, and IFRS regulation affects uncertainty analysts face in forecasting future firm value. This adds important evidence to the literature on the effects the country's institutional setup has on capital markets, and in particular, on the properties of analyst research forecasts other than one-year ahead EPS (Basu et al. 1998; Clement et al. 2003; Hope 2003a, 2003b). For example, Hope (2003b, 237) emphasizes that "[A]lthough accounting researchers extensively explain variations in disclosure levels among firms and countries, research on the effects of differences in disclosure levels [on capital markets] is more limited, especially in international settings (Saudagaran and Meek [1997])". Thus our study responds to the call by Ramnath et al. (2008, 68), who state that "[F]inally, we expect to see more international research describing the institutional and regulatory factors that create cross-country differences in the role of analysts and the properties of their forecasts".[5]

Third, the study has important implications for finance and accounting research that employs target prices: (1) to estimate the equity cost-of-capital (Brav et al. 2005; Botosan and Plumlee 2002, 2005; Botosan et al. 2011), or (2) as a predictor of within-industry variation in stock mispricing (Da and Schaumburg 2011). First, identifying more accurate target prices can increase the precision of the cost-of-capital estimates. Second, tests of association between the equity cost-of-capital proxies derived from target prices and other variables, e.g. firm size in Brav et al. (2005) and Botosan and Plumlee (2002, 2005), are subject to the classic error-in-variables problem. Consequently, we advocate that future research in this field controls for TP accuracy when estimating the equity cost-of-capital to ensure the consistency of estimates in the subsequent analysis. Further, studies that derive equity cost-of-capital estimates from TPs implicitly assume (but do not test) that analyst TPs reflect market expectations and that TP forecasts are superior to simple

[5] Our findings should also be of interest to regulators, as TP forecast precision may reflect the level of informational efficiency of a market and the efficacy of local regulation. Particularly, the evidence that the introduction of IFRS has improved analysts' ability to forecast accurate TPs contributes to the international debate on the capital-markets consequences of this regulation (Byard et al. 2011; Horton and Serafeim 2010; and Preiato et al. 2010).

benchmarks based on past price performance (e.g. past realized returns). Our study provides evidence in support of the latter assumption.

Fourth, the findings are valuable to investors, allowing them to improve their capital allocation decisions by attaching higher weight to TP forecast revisions by more accurate TP forecasters. Our results also explain why we should find differences in the usefulness of target prices to investors across countries. In particular, the results are relevant for studies on the information content of target prices, as the market reaction to TP revisions should be a function of the forecast information content and the forecast precision, and for studies on the long-term investment value of analyst TPs.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature, and Section 3 outlines the research design. We describe the data in section 4, and Section 5 reports the empirical results. Section 6 presents the sensitivity analysis. We explore whether analysts can persistently issue more accurate target prices in Section 7 and section 8 shows the effect of IFRS adoption on TP forecast accuracy. We conclude in Section 9.

II. LITERATURE REVIEW

This section first outlines the previous TP accuracy studies that followed from the literature on EPS forecast precision.[6] This is followed by a review of studies that examine the relation between EPS forecast accuracy and the institutional and regulatory setting that firms operate in.

Compared to EPS forecast accuracy studies, the literature on target price accuracy is much more recent and substantially less populated. In the US market, Asquith et al. (2005) report that

[6] For a comprehensive overview of EPS forecast accuracy studies, see Schipper (1991) and Brown (1993) who review the early literature in the field, Ramnath et al. (2008) who review the analyst forecasting literature since 1992, and Bradshaw (2010) for the most recent survey of the literature. As the accuracy of stock recommendations is difficult to quantify, the research on stock recommendations is centered on their investment value (Womack 1996; Mikhail et al. 2004), and their relation to EPS accuracy (Loh and Mian 2006).

54.3% of target prices by All American analysts made during 1997–1999 are achieved by the stock price by the end of the 12-month period, and the proportion of met TPs decreases with the forecast boldness, i.e. the magnitude of the projected price change. Asquith et al. find no relation between target price accuracy and the valuation model that analysts use to justify target price forecasts. Bradshaw and Brown (2007) study the persistence in analyst TP forecasting accuracy in the US over the period 1997–2002. They find that 45% of target prices in their sample are met during the 12-month forecast period, but find no evidence that analysts have persistent ability to forecast accurate target prices. Bradshaw and Brown argue that target price accuracy does not factor into analyst compensation or career prospects, thus analysts have no incentive to issue accurate TPs. In another study, Gleason et al. (2008) find a positive association between concurrent earnings forecast accuracy and the investment value of target prices, which highlights the potential link between EPS and TP accuracy.

The international evidence with respect to target prices is equally limited. In an Italian study, Bonini et al. (2010) report that target price inaccuracy is larger for TPs predicting strong price increases, for larger firms, for loss-making ones, and for stocks with better analyst coverage and stronger momentum. Demirakos et al. (2010) find that after controlling for the difficulty of the valuation task, TPs derived from discounted cash flow valuation models are relatively more accurate than TPs produced from price-to-earnings multiples for one out of four TP accuracy measures, using a sample of 94 UK firms during the period 2002–2004. None of the previous studies examine whether analysts exhibit differential and persistent ability to issue accurate target prices, controlling for EPS accuracy and using analyst characteristics that proxy for superior analyst skill.

The relation between the institutional and regulatory setting and analyst EPS forecast accuracy

The evidence on how differences in institutional and regulatory settings across countries, e.g. differences in reporting quality, affect the accuracy of analyst forecasts is limited. Basu et al. (1998) were among the first to examine the effects that country-differences in accounting disclosure have on EPS forecast accuracy. Using a sample of ten countries over 1987–1994, they report that countries with more frequent and higher quality disclosure have greater earnings forecast accuracy. Similarly to Basu et al., Hope (2003a, 2003b) reports that the consensus one-year ahead EPS forecast accuracy improves with high accounting disclosure quality for a sample of 18 and 22 countries respectively. Hope (2003b) also shows that the EPS forecast error is lower in countries with strong enforcement of accounting standards. Hope (2003b) concludes that higher quality disclosure increases analysts' understanding of the firm's current and future performance, and stronger enforcement is more likely to ensure that managers comply with accounting rules, which reduces the uncertainty that analysts face about managers' accounting choices in financial statements. However, contrary to Hope (2003a, 2003b), Preiato et al. (2010) find a negative relation between EPS forecast accuracy and a self-constructed enforcement index that measures the country's auditing and accounting enforcement.

Ball et al. (2000) distinguish between the shareholder model of corporate governance that dominates in common law countries and the stakeholder model in code law countries. The former corporate governance system increases investor demand for analyst information and encourages more extensive firm accounting disclosure. The stakeholder governance model is characterized by lower demand for public discourse and strong insider communication between management and various stakeholder groups. Clement et al. (2003) report a stronger relation between broker size and relative EPS forecast accuracy in common law countries as analysts lever on the large brokers'

resource pool and the privileged access to management in translating firm mandatory and voluntary disclosure into earnings forecasts.

The cultural environment firms operate in can affect analyst and managerial risk attitudes and choices[7], orientation on long- vs. short-term goals and growth (Hofstede 1993, 1994), as well as firm financial disclosure (Gray, 1998). Using a sample of 10 countries, Clement et al. (2003) report that analyst general experience has a negative effect on relative EPS forecast accuracy in collectivistic countries, but does not affect relative EPS forecast error in individualistic countries. They attribute this result to the emphasis on life-time employment in collectivistic countries, which leads to entrenchment and reduces incentives for experienced analysts to produce accurate forecasts.

To date, no prior study has investigated how variations in institutional and regulatory settings across countries influence TP accuracy. This evidence is important because compared to one-year ahead EPS forecasts, target prices also incorporate the analyst's long-term assessment of firm earnings and of firm risk. Regulatory and institutional differences across countries can affect analysts' ability to forecast future earnings and risk, having an incremental effect on TP accuracy beyond their effect on EPS forecast accuracy.

III. RESEARCH DESIGN

We employ two main measures to capture analyst target price accuracy. The first measure is an indicator variable (*Met_any*) which is equal to one if the actual stock price, *P*, reaches the target price, *TP*, at any time over the 12-month forecast horizon, and zero otherwise. *Met_any* is constructed as follows:

[7] Bontempo et al. (1997) find that cross-cultural difference affect risk perception of university students from the US, the Netherlands, Hong Kong and Taiwan. Kogut and Singh (1988) find that firms from cultures high in uncertainty avoidance prefer joint-ventures over acquisitions as the former avoids uncertainty about cost and success likelihood of firm integration.

$$
\begin{aligned}
&\text{for } {}^{TP}\!/_{P_s} - 1 > 0 : Met\_any = 1 \text{ if } TP - P \le 0 \,\big|\, \text{12-month forecast horizon}, \\
&\qquad\qquad Met\_any = 0 \text{ otherwise} \\
&\text{for } {}^{TP}\!/_{P_s} - 1 \le 0 : Met\_any = 1 \text{ if } TP - P \ge 0 \,\big|\, \text{12-month forecast horizon}, \\
&\qquad\qquad Met\_any = 0 \text{ otherwise}
\end{aligned}
\tag{1}
$$

where P_s is the stock price on the forecast issue date. *Met_any* provides a simple measure of TP accuracy, but ignores the magnitude of the forecast error. For example, a "conservative" forecast that predicts a small price increase is more likely to be met over the 12-month period, but may strongly deviate from the actual stock price at the end of the forecast period. An investor following a limit-order strategy of selling a stock when it reaches the target price may have to forsake a larger proportion of a potential profit for a "conservative" forecast compared to a "bolder" forecast that is closer to the actual stock price at the end of the forecast period.

The second TP accuracy measure, *aTPE*, measures the magnitude of the forecast error. *aTPE* is the absolute difference between the target price and the actual price at the end of the 12-month forecast horizon, P_{12}, scaled by the stock price at the forecast issue date P_s,

$$
aTPE = \frac{\left| TP - P_{12} \right|}{P_s} \tag{2}
$$

Intuitively, *aTPE* reflects the investment error for a limit-order trading strategy. The actual price overshooting the target price reflects the loss of (potential) income from not holding the stock for the entire 12-month period; the actual price below the TP shows the difference between the actual and the expected payoff when holding the stock for 12-months. The absolute TP forecast error reflects that TPs far above the actual price are equally inaccurate as forecasts far below the stock price.

The two TP accuracy metrics, *Met_any* and *aTPE*, capture forecast accuracy during the 12-month forecast period and at the end of the 12-month forecast period respectively, providing a

more complete assessment of analyst forecasting accuracy compared to using only one forecast accuracy measure, as is common in EPS accuracy studies

A TP forecast revision made before the end of the 12-month forecast horizon of the preceding TP means that the preceding TP forecast becomes stale. If the magnitude and the direction of the new forecast differ from the preceding TP, leaving the forecast horizon of the preceding TP intact is likely to negatively bias TP accuracy estimates. To account for TP revisions made prior to the end of the 12-month forecast period, we construct a variation of our two main TP accuracy measures. We calculate an indicator variable called TP-revision-adjusted *Met_any*, i.e. *Met_any_rev*, which is equal to one if the actual stock price, *P*, reaches the target price, *TP*, over the actual forecast period, i.e. the period from the forecast issue date to the forecast revision date. *Met_any_rev* measure is defined as:

$$\begin{aligned}
&\text{for } {}^{TP}\!/_{P_s} - 1 > 0 : Met_any_rev = 1 \text{ if } TP - P \le 0 \,|\, \text{actual forecast horizon}, \\
&\qquad\qquad Met_any_rev = 0 \text{ otherwise} \\
&\text{for } {}^{TP}\!/_{P_s} - 1 \le 0 : Met_any_rev = 1 \text{ if } TP - P \ge 0 \,|\, \text{actual forecast horizon}, \\
&\qquad\qquad Met_any_rev = 0 \text{ otherwise}
\end{aligned} \tag{3}$$

If an analyst does not revise her TP forecast over the 12-month forecast period after the TP issue, *Met_any_rev* = *Met_any*. The TP-revision-adjusted *aTPE, aTPE_rev,* is defined as:

$$aTPE\_rev = \frac{\left|TP - P_{rev}\right|}{P_s} \tag{4}$$

where P_{rev} is the stock price at the TP revision date. If an analyst does not revise her TP forecast over the 12-month period after the issue, *aTPE_rev* = *aTPE*. Using a simple example, we illustrate the calculation of the four TP accuracy measures in Appendix I.

Explanatory variables

To explain differences in target price accuracy across analysts, we use analyst and broker characteristics that previous studies associate with EPS forecast accuracy. This is because TP and EPS forecast accuracy predictors are likely to be correlated as they reflect, primarily, analyst forecasting skill. We also identify variables related to the country's institutional and regulatory setting that can explain between-country variations in TP accuracy. The set of controls include the accuracy of the EPS forecast, the projected stock price change, and other variables that could explain target price accuracy. For ease of exposition, we divide the independent variables into five categories: (1) analyst- and broker-specific variables, (2) institutional and regulatory characteristics, (3) EPS and TP forecast-specific, (4) firm-specific, (5) and other controls.

Analyst and broker characteristics

We identify four analyst characteristics that previous studies have associated with EPS forecast accuracy. We use analyst firm-specific forecasting experience (*A_exp*) as a proxy for analyst forecasting skill and knowledge gained over time (Clement 1999).[8] We calculate the number of firms (*A_#Firm*) an analyst follows as Clement (1999) suggests that it is more onerous and complex to actively follow and produce research reports for a large number of companies. Clement (1999) finds that analysts who follow more firms produce less accurate EPS forecasts. However, Clement et al. (2003) and Bolliger (2004) find that outside the US market, analysts who follow more firms produce more accurate EPS estimates, which suggests that analysts may benefit from information spill-over effects from following multiple firms. Sonney (2009) reports that country-specialized financial analysts produce more accurate EPS. We count the number of countries (*A_#Count*) where the

[8] We use analyst firm-specific experience because Clement (1999) reports that analyst firm-specific experience has a consistent positive relation with EPS accuracy compared to analysts general forecasting experience, which shows a negative relation with EPS accuracy in his early sample period and only a weak positive association with EPS forecast accuracy in the latter period.

firms followed by the analyst are domiciled to measure the analyst country specialization. The number of analysts employed by a broker (*B_#Ana*) reflects the amount of resources available to analysts. Clement (1999) and Jacob et al. (1999) find that analysts with access to a large resource pool issue more accurate EPS forecasts.

Institutional and regulatory characteristics

We use three variables to capture variations in the institutional and regulatory environment that may affect the average TP forecast accuracy. The disclosure index (*Disclosure*) and the index of enforcement of accounting standards (*Enforcement*) are from Hope (2003b) and capture country variations in the average firm reporting quality and enforcement of accounting standards, respectively. The disclosure index is based on aggregate annual financial statement disclosure scores from CIFAR (1993, 1995), and the degree of enforcement of accounting standards is based on a factor analysis of (1) country-level audit spending, (2) judicial efficiency, (3) rule of law, (4) insider trading laws, and (5) shareholder protection. We expect analysts to produce more accurate TPs for firms in countries with high accounting disclosure quality and enforcement. This is because high annual report disclosure should increase analysts' understanding of firm current performance, future earnings outlook and risk, the projections analysts factor in to arrive at target prices.[9] Strong enforcement of accounting standards encourages managers to consistently follow the prescribed accounting standards and reduces instances of reporting fraud (Hope 2003b), which can reduce the uncertainty that analysts face about managers' accounting choices for the current and future earnings. This may simplify the valuation task analysts use to arrive at target price forecast.

[9] For example, Hope (2003a) argues that management discussion and analysis in the annual report can aid analysts in understanding firm future plans and strategy, and information on planned capital investment can inform analysts about expected earnings growth.

We use four indicator variables for the origin of the country's legal system (*Legor UK*, *Legor GE*, *Legor FR* and *Legor SC*) to control for quality of corporate governance across countries.[10] Ball et al. (2000) argue that the shareholder governance model in countries with UK legal origin promotes more timely accounting systems and is characterized by higher investor demand for financial information, which encourages more voluntary disclosure. This in return should affects the amount and quality of information available to analysts about firm current and future earnings, their growth and risk that analysts use in forecasting target prices. Ownership concentration (*Owner con*) from La Porta et al. (1998) measures the proportion of shares owned by the three largest shareholders among the top ten largest privately owned (non-financial) firms in a given country. Ownership concentration may promote private channels of communication between managers and blockholders, at the expense of public disclosure (La Porta et al. 2000), which can increases the information acquisition costs for analysts. This can adversely affect the quality of inputs analysts use to arrive at target prices. Controlling for enforcement and disclosure, we expect analysts to produce more accurate TPs in countries with UK legal origin and in countries with more diffused ownership.

We use Hofstede's (1980) cultural dimensions to control for cultural difference between countries firms operate in. Uncertainty avoidance (*UAI*) is the degree to which people prefer structured and predictable events over unstructured and uncertain events. Orij (2009) relates uncertainty avoidance to lower entrepreneurial risk and weaker market orientation of companies. Masculine cultures (*MAS*) are more assertive and success oriented, which reflects their market orientation as opposed to feminine societies that focus on social responsibilities, relationships and environment (Van der Laan Smith et al. 2005). Countries with high power distance (*PDI*) accept unequal, hierarchical power distribution that may discourage information sharing (Zarzeski, 1996).

[10] We distinguish four legal systems because Ball et al. (2000) caution that dichotomous split into common/code law countries may obscure within differences in governance models in code law countries.

Individuals in individualistic societies (*IDV*) are more independent and self-reliant compared to collectivistic countries that emphasize consensus, inclusiveness, and lifetime employment. The job market in individualistic societies promotes individual achievement, stimulates competitiveness between individuals, and risk taking behavior (Schuler and Rogovsky, 1998; Kirkman and Shapiro, 1997; Shupp and Williams 2008).[11] We expect analysts to produce less accurate TPs for firms that operate in masculine, individualistic countries with high power distance and low uncertainty avoidance. This is because these national traits should associate with high competitiveness of managers, acceptance of uncertainty inherent in firm operations, secrecy, and more difficult access to firm management for analysts. Such a forecasting environment should increase analyst forecasting task leading to lower TP forecast accuracy.

Other explanatory variables: EPS and TP forecast characteristics

An EPS forecast is the main input into the valuation model used to produce a target price, independently of whether analysts uses simple heuristics, such as price-to-earnings ratios, to justify their target prices (Bradshaw 2002) or more sophisticated models, such as the residual income model (Gleason et al. 2008). Further, Gleason et al. (2008) find that analyst EPS forecast accuracy positively correlates with the TP forecast investment value, which highlights the potential link between EPS and TP accuracy. If analysts do not exhibit differential ability to issue accurate target prices, TPs will only reflect the accuracy of earnings forecasts. We measure EPS forecast error (*aEPS*) as the absolute difference between the forecasted and actual earnings, scaled by the stock price at the end

[11] The evidence on the relation between financial disclosure and Hofstede's cultural dimensions is mixed. Zarzeski (1996) and Hope (2003) find a negative relation between disclosure and power distance, and Salter and Niswander (1995) report a negative relation between financial disclosure and uncertainty avoidance. However, Archambault and Archambault (2003) find a positive relation between disclosure and PDI and UDI. Hope (2003) and Archambault and Archambault (2003) report a negative relation between financial disclosure and masculinity, but Salter and Niswander (1995) find no relation between disclosure and MAS. Jaggi and Low (2000) report that controlling for legal origin of the accounting system, cultural environment has no effect on financial disclosure.

of the previous fiscal year. We use the ratio of the target price to the concurrent stock price at the TP issue date less one, to measure the projected stock price change (*TP/P*). TPs that are further away from the concurrent price are more difficult to be met by the actual stock price and are more likely to be ex-post inaccurate.

Other explanatory variables: firm characteristics

Firm characteristics include firm market capitalization (*MV*) and the number of analysts following a firm (*F_#Ana*), which proxy for the quality of the firm's information environment and competition among analysts respectively. We expect analysts to produce more accurate forecasts for firms with a rich information environment and when competition among analysts is high. We use price momentum, *MOM*, to capture predictable price patterns. Continuation (reversal) in price momentum may increase (decrease) TP accuracy. We use stock price volatility scaled by the mean price level to measure firm total risk (*COV*).[12] Option theory suggests that higher stock price volatility should increase the likelihood the stock price will meet the target price over the TP forecast horizon (Bradshaw and Brown 2007). At the same time, the absolute TP error should be larger for more volatile, i.e. less predictable, stocks.

Other control variables and regression specification

We use the performance of the leading market index for the (primary) exchange where the firm's stock lists, over the 12 months after the TP issue date to capture the target price accuracy component that is due to the (random) ex-post performance of the equity market (*Mkt ret*). Unexpectedly poor (good) market performance means that TPs predicting a stock price decline (appreciation) will have a higher chance of being ex-post accurate, even if individual analysts have no

[12] Using the stock price coefficient of variation (*COV*) to capture price variation adjusts for differences in price levels and currency across firms.

differential ability to forecast target prices accurately. A dummy variable (*Fin cris*) flags the recent financial crisis period. We mark the beginning of the financial crisis period in September 2007.[13] The financial crisis continues until the end of our sample period. To control for time and industry effects, we include a set of annual dummies (*Year dummies*) and ten industry dummies (*Industry dummies*). Year dummies are for the TP forecast issue year. Industry dummies are based on the sector code from IBES SIG code. Table 1 provides detailed variable definitions. All continuous dependent and explanatory variables are winsorized at the 1% level.

[Insert Table 1 around here]

The empirical specification of our multivariate regression that examines the determinants of TP forecast accuracy is:

$$\begin{aligned} Accuracy\ measure = {} & \varphi_0 + \varphi_1 \ln A\_exp + \varphi_2 \ln A\_\#Firm + \varphi_3 \ln A\_\#Count + \varphi_4 \ln B\_\#Ana \\ & + \varphi_5 Disclosure + \varphi_6 Enforcement + \varphi_7 Owner\ con + \varphi_8 Legor\ GE + \varphi_9 Legor\ FR \\ & + \varphi_{10} Legor\ SC + \varphi_{11} PDI + \varphi_{12} IDV + \varphi_{13} UAI + \varphi_{14} MAS \\ & + \varphi_{15} aEPS + \varphi_{16} \frac{TP}{P} + \varphi_{17} \ln MV + \varphi_{18} \ln F\_\#Ana + \varphi_{19} MOM + \varphi_{20} COV \\ & + \varphi_{21} Mkt\ ret + \varphi_{22} Fin\ cris + \sum_{k=0}^{10} \varphi_{23+k} Industry\ dummies + \sum_{k=0}^{14} \varphi_{34+k} Year\ dummies + \varepsilon \end{aligned} \quad (5)$$

where the *Accuracy measure* is one of the TP accuracy measures defined above, and ln denotes a logarithmic transformation of the variable.[14] Also, in regressions where the TP forecast accuracy measures are adjusted for the actual length of the holding period (*Met_any_rev* and *aTPE_rev*), the return on the market index (*Mkt ret*) is calculated over the same period as the accuracy measures.

[13] September 2007 is the month in which Swiss Bank UBS announced a third quarter pre-tax loss of $690 million and a $3.42 billion write-down of mortgage backed securities. Announcements of losses on mortgage backed securities by other large international banks followed shortly, leading to the subprime crisis.

[14] For *aTPE*, *aTPE_rev, aEPS*, and *A_exp* we use log 1 + corresponding variable to account for zero values. Log transformations ensure more normal distribution of the TP and EPS accuracy measures that have zero lower bound, which could bias OLS estimates. Logs of analyst and broker characteristics reflect that we should expect diminishing effect that analyst experience, firm and country following, and broker size have on TP accuracy. For example, the increase in TP forecast accuracy due to an increase in broker size by one analyst should be higher for small compared to large brokerage houses. Diminishing effect on accuracy also explains why we use logs of firm size and for the number of analysts following a firm.

IV. DATA AND SAMPLE

Target price forecasts for firms domiciled in 16 countries are collected from the IBES International Detail files from January 1, 2002 to July 1, 2009.[15] We select only target prices with a 12-month forecast horizon, and for firms where the actual stock price is non-missing for 12 months before and 12 months after the forecast issue date. We retain target prices accompanied by one-year-ahead EPS forecasts, where the accompanying EPS forecast is issued within the past 90 days, and the TP issue date is prior to the EPS review date (the date on which the analyst last confirmed that her EPS forecast is still outstanding).[16] Further, as in Clement (1999), we retain EPS and TP forecasts issued between 30 days and 330 days prior to the fiscal-year-end date. We use the US and international versions of the broker translation file to match broker names between the target price and EPS files.[17] Analyst and broker characteristics are constructed using the IBES detail EPS file starting from January 1995, which avoids eliminating observations in the early sample to construct our explanatory variables and produces more reliable measures (Clement 1999). For non-US firms, stock prices, and the number of common shares outstanding for calculating firm market capitalization are from Datastream. For US firms, stock price data and the number of shares outstanding are from CRSP. Firm actual and forecasted earnings, and target prices are expressed in the company's default currency assigned by IBES to every company under coverage.[18] We exclude stocks where the default currency is different from the currency of actual stock prices. To ensure comparability across firms,

[15] IBES international files are scarcely populated with target prices before 2002. The other commonly used source of target price data, First Call, was acquired by Thomson Reuters in June 2001 and was subsequently merged with IBES (verified by email correspondence with Thomson Reuters). First Call target price data was discontinued in 2004.

[16] Our correspondence with the IBES representative confirms that a TP forecast issued without an accompanying EPS forecast on IBES implies that the analyst considers her latest EPS forecast to be still outstanding, provided that the TP forecast is issued prior to the EPS review date. We use EPS at most 90 days prior to the TP forecast issue to eliminate stale EPS estimates.

[17] The broker translation file is from 2005, which eliminates broker houses covered by IBES after that date. We lose less than 4% of target price forecasts due to this limitation.

[18] According to IBES detail history user guide, all detailed estimates on IBES are provided in the default currency IBES allocates to each firm. This is usually the company's reporting currency. All estimates received in a currency other than the default currency are converted to the default company currency using the exchange rate of the estimate's activation date.

we convert firm market capitalization to USD. Our final sample includes 585,718 target price forecasts for 9,982 firms issued by 12,792 analysts employed by 621 brokers.

[Insert Table 2 around here]

Table 2 describes the sample breakdown by country. The bottom raw "Total" shows the number of unique observations. Firms from the largest capital markets—the US, the UK and Japan—dominate the sample (69.9% of sample TPs), with US firms alone making up 55.2% of the sample target prices and 44.8% of the sample firms. Firms from the US and the UK enjoy large broker (324 and 190) and analyst coverage (5,040 and 2,240), consistent with New York and London playing a dominant role in international financial markets. The proportion of Hong Kong domiciled firms in the sample is similar to that of the more mature European markets, such as France and Germany, which reflects the importance of Hong Kong as a financial hub in Asia.

Descriptive statistics for TP accuracy measures

Panel A of Table 3 presents the descriptive statistics for the analyst TP and EPS forecast accuracy measures. Across the pooled sample, 59.1% of TP forecasts are met at some point during the 12-month forecast period. The lowest proportion of met TPs can be found in Italy (54.0%), while the highest proportion of met TPs is in Australia (66.1%) and Hong Kong (64.3%).[19] The proportion of met TPs in the US is 54.7%, which is consistent with prior US evidence. The proportion of target price forecasts met at some point during the 12-month forecast period is 45% in Bradshaw and Brown (2007), who examine TP accuracy in the US over the period 1997–2002, and 54.3% in Asquith et al. (2005) for Institutional Investor All-American analysts in the US over the period

[19] A contributing factor to the relatively high *Met_any* TP accuracy for Australian firms could be the commodity boom, which resulted in the Sydney All Ordinaries Index outperforming the S&P500 index by 4.2% p.a. over the period January 2002–January 2009. High TP accuracy for firms in Hong Kong is likely driven by the double-digit growth in China, with Hang Seng outperforming the S&P500 by 6.5% p.a. over the same period as above. This reflects the importance of controlling for the market return performance after the TP forecast issue when examining TP forecast accuracy.

1997–1999. Our sample mean absolute TP forecast error is 44.7%, and ranges from 58.2% in Denmark to 37.3% in Japan. Mean *aTPE* in the US is among the highest in the sample at 49.5%, which mirrors the low frequency of met TPs in this market.

[Insert Table 3 around here]

Using the TP-revision-adjusted *Met_any*, i.e. *Met_any_rev*, the average proportion of met TPs reduces to 43.4%. This reflects that, conditional on the magnitude of projected price change (*TP*/*P*), the TP forecast is less likely to be met by the actual stock price over shorter horizons. The lowest proportion of met TPs is found in the US (38.5%), and the highest proportion is found in Hong Kong (47.1%). Using the TP-revision-adjusted absolute TP error measure, *aTPE_rev*, the mean absolute forecast error reduces to 35.5%, compared to 44.7% for the *aTPE* measure, and is the highest in Denmark (47.3%) and the US (44.8%), and the lowest in Finland (30.0%).[20] In unreported results, we find that the sample mean EPS error is 2.6% of the stock price at the end of the previous fiscal year. The lowest mean EPS forecast error is in the US, 1.6%, and is statistically lower compared to the mean EPS error for the remaining 15 countries based on a *t*-test and Wilcoxon test. This suggests that even though EPS forecasts are on average more accurate in the US, they do not necessarily translate into more accurate TPs.

Panel B presents the average TP accuracy measures for each year in the sample. *Met_any* improves, in general, over the period 2002–2006, from 51.7% to 63.2%, but deteriorates during the financial crisis period 2007–2009. The dramatic recovery in *Met_any* during 2009 likely reflects the effect of the spring 2009 market rally. Average absolute TP error reduces from 51.9% in 2002 to

[20] In unreported results, we find that the average singed TP error is 4.5%. The signed TP error is the highest in Italy (13.6%) and the lowest in Hong Kong (−11%). We do not use the signed TP forecast error as: (1) the signed TP error does not properly distinguish between more and less accurate analysts over our sample period because it averages out the low or negative TP error over the boom years (2003–2007) and the positive TP error due to the financial crisis, and (2) previous EPS accuracy studies use absolute EPS error to measure forecast precision.

35.1% in 2006, and levels out at 54.2% over 2007–2009. The patterns for *Met_any_rev* and *aTPE_rev* mirror that of *Met_any* and *aTPE* respectively.

Panel C evaluates the correlation coefficients among the various TP forecast accuracy measures. There is a strong positive correlation between *Met_any* and *Met_any_rev* (0.726) and between *aTPE* and *aTPE_rev* (0.744), which suggests that TP revisions have little effect on the construct validity of our main TP accuracy measures. Consequently, the specification of the TP accuracy measures should have relatively little influence on the validity of our inferences. Further, the indicator and continuous TP forecast accuracy measures are significantly correlated, which indicates that they capture complementary dimensions of TP accuracy.

Descriptive statistics for explanatory variables

Table 4 reports the summary statistics for the explanatory variables. Averages are calculated at TP forecast level, i.e. using characteristics measured at each TP forecast issue. The average analyst firm-specific forecasting experience is slightly over 2.8 years, and analysts following US and Japanese firms have the longest mean experience following a firm (3.219 and 3.532 years). Also, analysts following US and Japanese firms produce research reports for the largest number of firms (around 14 firms) compared to the pooled sample mean of slightly over 9 firms. On average, Dutch firm analysts follow companies from over 2.3 countries, which likely reflects the relatively small domestic equity market in the Netherlands. Analysts for US, Australian, and Japanese firms show the highest country-specialization as they are the least likely to forecast across multiple countries. The average broker size is 98 analysts. The UK has the highest accounting disclosure index (0.831) and Austria the lowest (0.607). The mean ownership concentration index is 0.375, and the US has the most dispersed ownership structure. Italy and Spain have the lowest values of the enforcement index (−3.55 and −3.65 respectively), and the US and the UK the highest (1.21 and 1.16 respectively). A

quarter of countries in the sample have the common law origin of the accounting system, and Hong Kong and France have the highest power-distance indexes (68). The country scoring the highest on individualism is the US (91), and on uncertainty avoidance is Belgium (94). Japan has the highest masculinity index.

[Insert Table 4 around here]

Panel B of Table 4 shows that on average, analysts project a 15.9% increase in the stock price over the next 12 months, with *TP*/*P* ranging from 22.4% for Swiss firms to 9.1% for firms domiciled in Belgium. The mean *TP*/*P* ratio for US firms is 19.7%, which is considerably lower compared to earlier US evidence (30.9% during 1997–2002 in Bradshaw and Brown, 2007, and 32.9% during 1997–1999 in Asquith et al., 2005). The lower projected price increase found in our sample for US firms may reflect the effect of the NASD 2711 regulation and the SEC rule 472 introduced in 2002. The rules were intended to reduce conflicts of interests in analyst research and promote less biased sell-side equity research. These rules prohibit members of the NASD and NYSE from tying analyst compensation to the broker's investment banking transactions and from offering favorable research to a firm as an incentive to elicit future investment banking business. Even though the regulation was specific to the US market, it is likely that global brokerage houses implemented these rules across their US and overseas divisions.

The mean firm capitalization is $10,037.1m, and sample firms are followed on average by approximately 16 analysts.[21] Target prices are released following an average 0.6% decline in the stock price over the prior 90 days, while the prior one-year mean stock (standardized) price volatility preceding the TP issue is 7.7%. The mean market return is 5.2% for the 12-month period following the TP forecast issue and reduces to 2.7% when truncating the returns on the TP revision date

[21] Firms domiciled in Europe have on average larger capitalization compared to US stocks, which reflects that a larger proportion of smaller firms list on the exchange in the US than in other markets (Fama and French, 1998, 2008).

(results untabulated). Finally, 45% of TP forecasts have been issued during the financial crisis. Overall, Table 4 shows that our sample reflects a variety of institutional settings and that there is a strong variation in analyst, broker and firm characteristics. Consequently, our sample provides an ideal research setting to test for determinants of within- and across-country variations in TP forecast accuracy.

V. EMPIRICAL RESULTS

We examine analysts' ability to issue accurate target price forecasts in two steps. First, we compare the accuracy of analyst TPs to the accuracy of simple price forecasts that investors could form based on the information available at the TP issue date. If the accuracy of simple price forecasts is higher than that of analyst TPs, the latter offer no value to investors. Second, to examine if analysts have differential ability to produce accurate target prices, we estimate the TP forecast accuracy model specified in equation (5).

Do analyst TP forecasts beat simple price forecasts based on past stock performance?

This section examines if analyst TPs beat the accuracy of simple price forecasts based on the information available at the TP issue date. A simple Bayesian forecast extrapolates past stock performance into the future and is our naïve price forecast, which we pitch against analysts' TP forecasts.

Table 5 compares the accuracy of analysts' TPs to the accuracy of naïve price forecasts across the 16 countries in our sample. The naïve price forecasts predict that the stock price in 12 months will be equal to the stock price at the forecast release date times one plus the previous 12-month buy-and-hold return, *naïve price forecasts*. For each *naïve price forecast*, we calculate the four TP accuracy measures from Section 3, *naive Met_any, naive aTPE, naive Met_any_rev* and *naive aTPE_rev*.

[Insert Table 5 around here]

The second column of Panel A presents the proportion of analyst TPs that meet or exceed the accuracy of *naïve price forecasts*. We find that, on average, analyst TPs meet or exceed the accuracy of simple price forecasts in 74.5% of cases. The highest proportion of analysts TPs that meet or exceed *naïve price forecasts* is for firms in Hong Kong and the lowest is for Italian firms. The fourth column shows that analysts' absolute TP forecast error is 9.8% lower compared to the absolute forecast error of a naïve forecast.[22] The difference between TP error and the error of the naive price forecasts, *aTPE* − *naive aTPE*, ranges between −19.9% for firms domiciled in Hong Kong and zero for Danish firms. The differences in forecast accuracy between the TP-revision-adjusted TP measures and the naïve price forecasts show a similar pattern to that of our main TP accuracy measures.

We perform five further sensitivity tests (results untabulated). First, we remove the top 5% of stocks with the highest price momentum before the forecast issue. This examines if *naïve price forecasts* pick up the momentum effect, which could bias the results in Table 5 in favor of analyst superiority. The mean difference between the TP error and the error of the simple price forecasts reduces to −7.67%, but still remains highly significant. The conclusions are unchanged when we use a 10% cut-off point. Second, we remove the top 5% of *naive aTPE* to test if the results are affected by extreme naive price forecasts due to potential data errors. The results for this subsample remain qualitatively similar to that in Table 5. Third, we use returns excluding dividends to form *naïve price forecasts*, which should more closely correspond to the analyst forecasted (ex-dividend) target prices. Analyst TPs meet or exceed the accuracy of (ex-dividend) *naïve price forecasts* in 73.9% of cases and the mean analyst TP error is 9.4% lower than the error of (ex-dividend) *naïve price forecasts*. Fourth, we form the naïve price forecast based on the (country-specific) industry mean P/E ratio, calculated at

[22] The results are unchanged when we compare the median difference between *aTPE* and the naïve price forecast error, which is −7.02% for the pooled sample and negative in all countries we investigate.

the forecast issue, times the analyst one-year ahead EPS estimate. This is because Bradshaw (2002) reports that analysts frequently compute target prices using simple heuristics, such as P/E ratios. If analysts simply convert their current EPS estimates into target prices using simple heuristics, TPs should not offer any incremental value to investors beyond EPS forecasts. The mean (median) difference between TP error and the error of the price forecasts from the P/E ratios is −77.2% (−44.0%), which shows that (1) analyst TPs are not simple transformations of analyst EPS forecasts and that (2) analyst TPs are more accurate than heuristic-based price forecasts using P/E ratios.[23]

As a fifth sensitivity test, we examine if analyst TPs beat *index price forecasts* which predict that the stock price in 12 months will be equal to the stock price at the forecast release date times one plus the return on the market index over the preceding 12 month period. Index price forecasts impose less data requirements and are less affected by individual stock price momentum or data errors. We find that, on average, analyst TPs meet or exceed the accuracy of the *index price forecast* in 74.1% of cases based on *Met_any*, and the mean (median) analyst TP error is lower than that of *index price forecast* in eleven (thirteen) countries. In the analysis, we do not consider martingale price forecasts that predict that a stock price in 12 months' time is equal to the stock price today. This is because in efficient markets, investors require a premium for holding stocks (risk free rate plus beta times the market premium). Only stocks with negative market beta that would offset the risk free rate would justify using a martingale benchmark. Consequently, martingale price forecasts are unlikely to be used by investors.

Based on the results in Table 5 and the further sensitivity tests, we conclude that, on average, analyst TP accuracy exceeds that of naïve price forecasts. This means that investors are better off following analyst target prices compared to naïve price forecasts.

[23] The error of the price forecasts from the P/E ratios is winsorized at 5% to eliminate extreme naïve price forecasts due to potential data errors. Also, in calculating P/E ratios we exclude stocks with zero earnings, which reduces the sample to 552,165 observations.

The determinants of TP forecast accuracy

Next, we examine if analysts have differential ability to produce accurate target prices based on regression model in equation (5). The first columns of Table 6 report the regression results for the main TP accuracy measures (*Met_any* and *aTPE*) and the latter columns describe results for the two TP-revision-adjusted TP accuracy measures (*Met_any_rev* and *aTPE_rev*). The *Exp.sign* column specifies the predicted coefficient signs, while the *St.Eff* column provides the standardized coefficient estimates, i.e. the effect that a one standard deviation change in the explanatory variable has on the TP accuracy measure. The regressions use firm- and analyst- dual clustered standard errors as in Petersen (2009) to control for the cross-sectional dependence of observations. In reviewing the results, we first discuss the evidence on analysts' differential ability to forecast accurate target prices. This is followed by the review of the results on the relation between institutional and regulatory characteristics and TP accuracy.

Do analysts have differential ability to forecast accurate target prices?

For our main TP accuracy measures, Table 6 indicates that TPs issued by analysts with higher firm-specific experience have lower error. This confirms that analysts learn to produce more accurate TPs over time, as their forecasting experience for the firms they follow increases. However, analyst experience does not correlate with the likelihood that the actual stock price will meet or surpass the target price. Analysts following more firms issue more accurate TPs based on the two main TP accuracy measures, which suggests that information spill-over effects from following multiple firms improves TP accuracy. This complements the international evidence in Clement et al. (2003) and Bolliger (2004), who find that analysts who follow more firms produce more accurate EPS forecasts. Country-specialized analysts are more likely to issue more precise TPs, and TPs by analysts

employed by large brokers are more likely to be met by the actual price.[24]

[Insert Table 6 around here]

The regression results for the TP-revision-adjusted TP accuracy measures are qualitatively similar to the results for the main TP accuracy measures. However, controlling for TP revisions, analyst country-specialization predicts lower likelihood of a TP being met. Further, for the TP-revision-adjusted absolute TP error, *aTPE_rev*, we also find that analysts from large brokerage houses issue TPs with smaller absolute forecast error. This confirms that access to a larger pool of resources at the broker improves TP accuracy. Together, the results of the TP-revision-adjusted TP accuracy measures reinforce the results of the main TP accuracy measures that more skilled analysts issue more accurate TPs.

Inspecting the economic significance of analyst and broker characteristics, we find that access to a large resource pool at the broker has the largest standardized effect on *Met_any*, i.e. a one standard deviation increase in ln *B_#Ana* leads to 6.24% higher likelihood that the stock price will meet the target price; analyst firm following has the largest standardized effect on TP forecast error (ln *A_#Firm*=−2.01%). Based on the results in Table 6 we conclude that, on average, analysts with higher forecasting experience, following more firms, country-specialized, and employed by a large broker issue more accurate TPs.

Do institutional and regulatory characteristics affect target price accuracy?

Table 6 documents that higher reporting disclosure increases the likelihood that the stock price will meet or surpass the target price, and it reduces TP forecast error. The positive relation between

[24] In unreported results we follow Sonney (2009) and calculate analyst country-specialization as the Herfindahl concentration ratio, which is the sum across countries of the squared ratio of the number of firms followed by the analyst in a country over the total number of firms followed by the analyst during the previous 12-months. The correlation between the Herfindahl index and *A_#Count* is 0.92. Repeating the TP accuracy regression in equation (5) using the Herfindahl index, we continue to find that TPs issued by country-specialized analysts have lower error but the concentration ratio does not correlate with the likelihood that the actual stock price will meet or surpass the target price.

disclosure and TP accuracy persists for the two TP-revision-adjusted accuracy measures. This confirms that disclosure has a positive effect on TP accuracy (Hope 2003a, 2003b). TPs for companies operating in countries with UK origin of the legal system, i.e. countries with the shareholder governance model, are more likely to be met over the next twelve months, which supports results in Clement et al. (2003). Though weaker, this result is also present for the revision-adjusted *Met_any*.

Cross-country differences in culture explain variation in average TP forecast accuracy. Managers in cultures high in uncertainty avoidance may exhibit less risk taking behavior, and prefer stability in their operating activities (Bontempo et al. 1997). This simplifies the analyst valuation and forecasting task when producing TPs, which explains the positive relation between UDI and our TP forecast accuracy measures. Further, *Met_any* shows a negative correlation with power distance, individualism, and masculinity. These cultural dimensions associate with market-orientation of firms, high competitiveness of individuals, high secrecy of managers and more difficult access to firm management for analysts—characteristics that should associate with higher forecasting difficulty. Controlling for disclosure, origin of the country's legal system, and national culture, enforcement of accounting standards and ownership concentration have no effect on TP forecast accuracy.

Regarding the control variables, we note that better earnings forecasters issue more accurate target prices, but analysts who attempt to hype the stock price by forecasting a strong price increase issue less accurate TPs.[25] Looking at firm characteristics, we observe that TP forecasts for larger firms are less likely to be met by the actual stock price, but exhibit lower error. Higher analyst coverage increases the likelihood that a target price will be met by the actual stock price, which suggests that competition among analysts may incentivize them to exert more effort into producing

[25] This reflects that analysts may issue optimistically biased target prices to curry favors with firm management in the hope of obtaining a better access to firm management (Lim 2001; Ke and Yu 2006) or a future investment banking contract (Lin and McNichols 1998; Kolasinski and Kothari 2008).

more accurate TPs. However, high analyst competition also increases the average TP forecast error. There is a positive relation between price momentum and TP accuracy. In addition, TPs for firms with higher stock price volatility are more likely to be met. However, high price volatility also leads to higher TP error. The return on the local market index has a strong positive relation with TP forecast accuracy, i.e. better ex-post market performance increases TP forecast precision. Finally, we find that the unexpected fall in stock prices during the recent financial crisis has on average decreased TP accuracy. The effect of the control variables in the accuracy regressions where *Met_any_rev* and *aTPE_rev* are used is qualitatively similar.

To sum up, the results from Table 6 suggest that characteristics commonly associated with analyst ability, such as experience, the number of firms an analyst follows, country specialization, and broker size influence TP forecast accuracy. This confirms that more able analysts produce more accurate forecasts of future stock prices. Further, we find support for our prediction that the country's institutional and regulatory setting affects average TP forecast accuracy.[26]

VI. ROBUSTNESS ANALYSIS

Instrumental variable regression

It is possible that analysts may be more optimistic about the prospects of certain firms and, as a result, forecast overly high target prices, compared to what their valuation models would dictate.[27] To test for the possibility that *TP/P* is endogenously determined in the TP accuracy regressions, we run a Wald test of exogeneity. We reject the exogeneity of *TP/P* for all TP accuracy regressions. To

[26] Thomson Reuters IBES support team confirm that IBES target price forecasts reflect the analyst projected price level at the end of a specific (usually a 12-month) time horizon. However, IBES cannot confirm the exact definition of the price target used by each contributing broker. This may affect construct validity of our TP accuracy measures. However, any measurement error associated with target prices would work against finding a relation between analyst and institutional characteristics and TP forecast accuracy measures. We thank an anonymous referee for pointing this out.

[27] We discuss potential reasons for why analysts would deviation from the price forecasts suggests by their valuation models in footnote 24.

assess whether our results are robust controlling for the endogeneity in *TP/P*, we re-estimate the regressions using an instrumental variable (IV) method. This is particularly important as *TP/P* has the largest economic effect on *Met_any* (*TP/P*=−45.9%) and on *aTPE* (*TP/P*=−44.49%). We use the mean *TP/P* of all forecasts issued by a given analyst in the preceding 12 month period as our instrument for the current period *TP/P*. The past mean *TP/P* should average out the analyst's (positively and negatively) biased TPs, while it is also unaffected by the current period market and/or analyst sentiment. Larcker and Rusticus (2010) advocate the use of a partial *R*-square test to assess the validity of the instrument, which produces a significant *F*-test of 867.104 (p-value=0.000), and a partial R^2 from the first stage regressions of 11.81%. This confirms that the instrument is properly specified.

[Insert Table 7 around here]

Columns *2SLS* of Table 7 report the TP accuracy regression results using the IV estimation approach. The results for analyst and broker characteristics from the IV regression are qualitatively similar to the basic models in Table 6, and in particular, the coefficients on *TP/P* remain significant and have the correct sign.[28] Also, the significance and sign of the coefficients on the institutional and regulatory characteristics that explain TP accuracy remain similar. Collectively, the results from the IV estimation approach support our main conclusions.

Heterogeneity in analyst forecasting environment across countries

Our analysis so far assumes that accounting disclosure quality, the enforcement of accounting standards, ownership concentration, origin of the legal systems and culture should explain country-variations in analyst average TP forecast accuracy. To test if the relation between analyst and broker characteristics and TP accuracy is sensitive to the specification of controls used for the information

[28] For the *2SLS* results, we only use analyst-clustered standard errors, which may explain the generally higher coefficient significance levels.

environment in which firms and analysts operate, we substitute our institutional and regulatory characteristics for country dummies. Country effects capture the heterogeneity in the analysts' forecasting environment specific to each country, without identifying the individual factors that explain the average cross-country differences in TP accuracy.

The *Country effects* columns of Table 7 report the results for the *Met_any* and *aTPE* regressions after including country dummies. The results for analyst and broker characteristics remain unchanged for both TP accuracy measurers, with the exception of the coefficient on country specialization, which becomes insignificant in the *aTPE* regression. This means that our main inferences on the relation between analyst and broker characteristics and TP accuracy are mostly unaffected by the specification of the institutional and regulatory characteristics.

The proportional mean absolute TP forecast error

To examine the determinants of EPS forecast accuracy, Clement (1999) uses the proportional mean absolute EPS forecast error, which compares the individual analyst's EPS forecast error to the mean forecast error of other analysts following the same firm in a given year. He argues that this increases the model's ability to identify systematic differences in EPS forecasts accuracy relative to a model that controls for firm fixed effects and year fixed effects. Later EPS accuracy studies largely adopted this research design. To test if our results are sensitive to using this measure of TP accuracy, we construct the mean-adjusted TP error (*aTPE_ma*), which is the individual TP forecast error scaled by the mean TP forecast error of all TP forecasts issued for a firm in a calendar year less one. Higher (lower) values of *aTPE_ma* represent worse (better) than average performance. As in Clement (1999), to properly control for firm-year effects we adjust analyst characteristics, EPS forecast error and TP/P ratio by subtracting their related firm-year means.

The last columns of Table 7 report the estimates from a TP accuracy regression where *aTPE_ma* is used as the dependent variable. We retain only firm-years with at least five analyst TP forecasts, which reduces the sample to 539,118 observations. Analyst experience and broker size predict lower relative TP forecast error, similar to Table 6 results. Overall, we conclude that the Table 6 results are generally robust to using Clement's (1999) specification of the forecast accuracy measure.

Recency of EPS estimates

The EPS forecast error in regression model (5) is measured for the most recent EPS forecast issued by the analyst for the firm within the past 90 days. For 38% of TP estimates, the EPS forecast issue date is earlier than the TP estimate issue date. This means that the relation between analyst characteristics and TP forecast accuracy may reflect the accuracy of the latent EPS forecast that the analyst would have issued concurrently with the TP estimate. In unreported results we replicate the regression analysis presented in Table 6 for a subsample of 362,143 TPs where the accompanying EPS forecast was issued on the same date. The results are qualitatively similar to that in Table 6, which shows that our results are insensitive to the recency of EPS estimates.

VII. PERSISTENCE IN ANALYST TARGET PRICE ACCURACY

A track record of past TP forecasting accuracy could provide an incremental signal to investors as to which contemporaneous TP forecasts are more likely to be *ex post* accurate. However, in a working paper examining whether US analysts have persistent ability in forecasting accurate TPs during 1997–2002, Bradshaw and Brown (2007) find no evidence that past TP accuracy leads to superior current TP accuracy. This section revisits this question.

Panel A of Table 8 presents the prior and current period TP accuracy measures for quintile sorts based on the average analyst *aTPE* in the past year. The sorts are independent for each of the 16 countries. We observe a positive relation between past TP accuracy and current period TP accuracy, both for *Met_any* and *aTPE*. Specifically, moving from the lowest to the highest past TP accuracy portfolio, *Met_any* improves by close to 12% (from 53.4% to 59.8%) and *aTPE* reduces by close to 48.6% (from 65.3% to 33.6%).

[Insert Table 8 around here]

The first columns of Panel B of Table 8 replicate the main TP accuracy regressions of Table 6 with the addition of the analyst's mean prior year *aTPE* variable ($aTPE_{t-1}$), which is used to measure the analyst's past TP accuracy. We find that higher past TP error leads to a lower likelihood of the current TP being met, and results in a higher current TP error. Analyst and broker characteristics have a similar predictive power as in Table 6, with the exception of the size of analyst brokerage house, which has a positive effect on the TP forecast error. Also, the signs and significance of institutional and regulatory characteristics are similar to that in Table 6, but for disclosure, which does not influence the TP forecast error.

Why do our results differ from Bradshaw and Brown (2007)? The sample of target prices in Bradshaw and Brown (2007) is heavily weighted in TPs issued after 2000 (i.e. 64.5% of TPs in their sample). The price depression following the burst of the internet bubble had a strong negative effect on accuracy of TP forecasts issued after 2000 that is evident in their Table 3, which shows an increase in TP forecast error from 21% in the second half of 1999 to 41.2% in the first half of 2000. A similar price shock occurred over our sample period following the subprime mortgage crash, which allows us to test if findings in Bradshaw and Brown (2007) are due to the unexpected price fall starting in March 2000. The last columns of Panel B of Table 8 repeat the TP accuracy regressions when we include the analyst's mean prior year *aTPE*, and an interaction term between

$aTPE_{t-1}$ and the financial crisis dummy. The coefficient on $aTPE_{t-1}$*$Fin\ cris$ is significant for both *Met_any* and *aTPE* regressions but with the opposite sign to that on $aTPE_{t-1}$. This confirms that the price shock in the aftermath of the dot-com bubble may explain the findings in Bradshaw and Brown (2007).[29]

In unreported results, instead of $aTPE_{t-1}$ we use the residuals from within country and industry regressions of the past TP forecast error on the past EPS forecast error. This is because the relation between the concurrent and past TP forecast accuracy may reflect analysts' persistent ability to forecast accurate earnings. Including the residuals from the past TP forecast accuracy regressions leaves our inferences intact. Further, the results in Table 8 persist when we use the prior year mean *Met_any* measure, and the TP-revision-adjusted accuracy measures as proxies for prior period TP accuracy. In addition, estimating the regressions from Table 8 only for US firms generates qualitatively similar results. Overall, we conclude that higher TP accuracy in the past year predicts higher contemporaneous TP forecast precision, consistent with analysts exhibiting persistent ability to issue accurate target prices.

VIII. TP FORECAST ACCURACY AFTER THE MANDATORY IFRS ADOPTION

Fourteen countries in our sample implemented IFRS starting from January 2005. The implementation of IFRS was anticipated to increase cross-country comparability and transparency of accounting disclosure, and result in higher quality information about firm performance becoming available to analysts and investors. Subsequently, better quality inputs into analyst valuation models

[29] The differences in our results compared to Bradshaw and Brown (2007) may also be due to us using (1) a more comprehensive set of control variables, and (2) a more recent sample period. For the former, we find that for TPs issued for US firms only, the coefficient on past TP accuracy is lower by 14.3% for the *Met_any* regression and by 6.4% for *aTPE* regression when we use the accuracy model specification in Bradshaw and Brown (2007) compared to our model specification. For the latter, we believe that the NASD 2711 regulation and the SEC rule 472 introduced in the wake of the Enron and World.com accounting scandals and the burst of the internet bubble may have motivated analysts to exert more effort to produce more accurate TP forecasts.

should lead to an improvement in analyst TP forecast accuracy. The question whether the adoption of IFRS has improved analysts' ability to issue more accurate TPs remains unanswered so far.[30]

In unreported results we repeat the TP accuracy regressions in equation (5) for the 14 IFRS adopting countries, after including analyst past TP accuracy and an indicator variable that equals 1 if the TP and the EPS forecasts are issued for a fiscal year after the IFRS mandatory adoption date, and zero otherwise. We find that the mandatory IFRS adoption reduces the TP forecast error, but has no effect on the likelihood that a target price is met by the actual price over the 12-month forecast period. The results remain unchanged when we re-estimated the regressions after including an interaction term between the EPS forecast error and the IFRS dummy. This is because controlling for the effect of financial crisis, the mean *aEPS* reduces by 0.75% after IFRS adoption, and the IFRS dummy, had it not been also interacted, may simply be capturing the lower EPS forecast error after the mandatory IFRS adoption.

Overall, we conclude that the mandatory adoption of IFRS has improved analysts' ability to forecast accurate TPs, which complements previous evidence on the effect that IFRS has had on EPS forecast accuracy. We attribute this finding to the higher comparability of financial statement information across firms and countries after the IFRS adoption, which is likely to have aided the analyst's valuation task.

IX. CONCLUSIONS

This study adds important international evidence to the fledging literature on the properties of analyst research outputs other than EPS forecasts. Using target prices from 16 countries—including the US, 12 European countries, Japan, Australia and Hong Kong—we examine if analysts have

[30] To date, there is limited evidence about how the mandatory IFRS adoption has affected analysts' EPS forecast accuracy. Byard et al. (2011) and Preiato et al. (2010) find a reduction in the EPS forecast error and forecast dispersion following the adoption of IFRS for 20 and 13 European countries respectively. Horton and Serafeim (2010) extend this evidence outside the EU market.

differential and persistent ability to forecast accurate target prices, controlling for the accuracy of their concurrent EPS forecasts. First, we show that TP accuracy exceeds that of naïve price forecasts formed by extrapolating past stock performance. Second, we find that analyst past TP accuracy, forecasting experience, the number of firms an analyst follows, country specialization, and broker size predict TP forecast accuracy. We also document that a country's institutional and regulatory setting has an effect on TP accuracy. Factors such the accounting disclosure quality, the corporate governance system, cultural traits, and IFRS regulation explain cross-country differences in TP forecast accuracy.

Our evidence that analysts have differential and persistent skill to issue accurate TP forecasts stands in strong contrast to early claims made by the popular press about analysts' opportunistic use of target prices and low TP forecast accuracy—with headlines such as "'Price Targets are Hazardous to Investors' Wealth" (New York Times 08/06/2001) or "Forget Analysts' Price Targets. They're Really Just for Show" (Forbes 12/11/2000) dominating the press. This study responds to a call by Ramnath et al. (2008, 68), who in a comprehensive review of the analyst forecasting literature emphasize that "further research is required to describe the behavior of the forecasts that have higher price impacts, such as long-term growth forecasts and target prices".

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Appendix I. An example illustrating calculations of TP forecast accuracy measures

The below example illustrates how we calculate the four TP forecast accuracy measures used in the study. Further, we discuss the four TP accuracy measures when the direction of the new TP forecast differs from the preceding TP.

A simple illustration of the four TP accuracy measures

Assume that on 12th June 2006, an analyst issues a target price of USD110 for the IBM stock. The target price has a 12-month forecast horizon and the closing stock price on 12th June 2006 is USD77. Over the next 12-months, IBM's stock price reaches a high of USD113.5 and a low of USD73. The closing price on 12th June 2007 is USD109. The values for the two main TP accuracy measures are: *Met_any*=1 as the actual stock price met and surpassed the target price at some point over the 12 months after the TP forecast issue date, and *aTPE*=|USD110−USD109|/ USD77=1.30%.

Further, assume that on 20th March 2007, the analyst issues a new target price for IBM of USD117. The new target price has a 12-month forecast horizon and the closing price on 20th March 2007 is USD104.5USD. The high and low price between 12th June 2006 and 20th March 2007 are 111USD and 73USD respectively. The revision-adjusted target prices are: *Met_any_rev*=1 as the actual stock price has met and surpassed the target price of 110USD at some point between 12th June 2006 and 20th March 2007, and *aTPE_rev*=|110−104.5|/77=7.14%.

The four TP accuracy measures when the direction of the new forecast differs from the preceding TP.

Alternatively, assume that the new TP forecast issued on 20th March 2007 projects a USD60 for IBM stock price in 12-months. The closing price on 20th March 2007 is again 104.37USD, but the actual price on 12th June 2007 is USD57. The high and low price between 12th June 2006 and 20th March 2007 are 111.2USD and 73.57USD respectively. In this scenario, *Met_any*, *Met_any_rev*, and *aTPE_rev* remain unchanged, however, *aTPE* increases from 1.3% to 68.83%. The latter result wrongly indicates poor analyst forecasting ability as the analyst correctly predicted a stock price decline when issuing the revised TP forecast.

TABLE 1
Variables definition

Variable	Definition
1. **Dependent variables: TP forecast accuracy measures**	
Met_any	An indicator variable equal to one if the actual stock price reaches the target price, TP, at any time over the 12 month period after the TP forecast issue, and zero otherwise. The TP forecast and actual stock prices are expressed in the IBES default reporting currency for the firm effective at the TP forecast issue date.
aTPE	The absolute difference between the TP forecast and the stock price at the end of the 12-month forecast period, P_{12}, scaled by the stock price at the forecast issue date, P_{st}. The TP forecast and actual stock prices are expressed in the IBES default reporting currency for the firm effective at the time.
Met_any_rev	An indicator variable equal to one if the actual stock price reaches the target price, TP, at any time between the TP forecast issue date and the subsequent TP forecast revision date, and zero otherwise. If a TP forecast has not been revised over the 12-month forecast horizon, *Met_any_rev= Met_any*. The TP forecast and actual stock prices are expressed in the IBES default reporting currency for the firm effective at the TP forecast issue date.
aTPE_rev	The absolute difference between the TP forecast and the stock price on the TP forecast revision date subsequent to the TP forecast issue, P_{rev}, scaled by the stock price at the forecast issue date, P_{st}. If a TP forecast has not been revised over the 12-month forecast horizon, *aTPE_rev= aTPE*. The TP forecast and actual stock prices are expressed in the IBES default reporting currency for the firm effective at the TP forecast issue date.
2. **Independent variables: Analyst and broker characteristics**	
A_exp	The number of years an analyst has issued at least one EPS forecasts for a given firm.
A_#Firm	The number of companies for which an analyst issued at least one EPS forecast over the previous 12 months.
A_#Count	The number of countries where the firms followed by the analyst are domiciled in. A firm is followed by the analyst if the analyst has issued at least one EPS forecasts for a given firm over the previous 12 months.
B_#Ana	The number of analysts at the broker that issued at least one EPS forecast in the previous 12 months.
3. **Independent variables: Institutional and regulatory characteristics**	
Disclosure	The index of accounting disclosure quality based on aggregate annual financial statement disclosure scores from CIFAR (1993, 1995). The index ranges between 0 (lowest disclosure) to 1 (highest disclosure). Sourced from Hope (2003b).
Enforcement	The index of enforcement of accounting standards. The index is based on the factor analysis of (1) country-level audit spending, (2) judicial efficiency, (3) rule of law, (4) insider trading laws, and (5) shareholder protection. Higher values reflect stronger enforcement. Sourced from Hope (2003b).
Owner con	Ownership concentration index, which is the median proportion of common shares owned by the three largest shareholders in the ten largest privately owned non-financial firms. Sourced from La Porta et al. (1998).
Legor UK	An indicator variable that equals one if the country's legal system originates from the English common law system, and zero otherwise. Sourced from La Porta et al. (1998).
Legor GE	An indicator variable that equals one if the country's legal system originates from the German civil law system, and zero otherwise. Sourced from La Porta et al. (1998).
Legor FR	An indicator variable that equals one if the country's legal system originates from the French civil law system, and zero otherwise. Sourced from La Porta et al. (1998).

(*continued on next page*)

TABLE 1 (continued)

Legor SC	An indicator variable that equals one if the country's legal system originates from the Scandinavian civil law system, and zero otherwise. Sourced from La Porta et al. (1998).
PDI	Power distance. The extent to which a society accepts unequal distribution of power. Sourced from www.geert-hofstede.com/hofstede_dimensions.php.
IDV	Individualism. The degree to which individuals are encouraged to be independent and self-reliant. Sourced from www.geert-hofstede.com/hofstede_dimensions.php.
UAI	Uncertainty avoidance. The degree to which people prefer structured and predictable events over unstructured and uncertain events. Sourced from www.geert-hofstede.com/hofstede_dimensions.php.
MAS	Masculinity. The degree to which individuals in a society are driven by competition, achievement and success. Sourced from www.geert-hofstede.com/hofstede_dimensions.php.
4. **Independent variables: TP and EPS forecast characteristics**	
aEPS	The absolute difference between the actual and forecasted EPS scaled by stock price at the end of the previous fiscal year. The actual and forecasted EPS, and the stock price are expressed in the IBES default reporting currency for the firm effective at the EPS forecast issue date.
TP/P	The ratio of target price to actual price on the forecast issue date less one. Both the TP and the actual stock price are expressed in the IBES default reporting currency for the firm effective at the TP forecast issue date.
5. **Independent variables: Firm characteristics**	
MV	Firm market capitalization measured at the TP forecast issue date and expressed in USD million.
F_#Ana	The number of analysts issuing at least one EPS forecasts for a firm over the previous 12 months.
MOM	Buy-and-hold stock returns for 90-days prior to the forecast issue date.
COV	Stock price standard deviation over 90-days prior to the forecast issue date scaled by the mean price level over this period.
6. **Independent variables: Other controls**	
Mkt ret	The return on the leading market index for the primary exchange where the firm's stock lists over 12 months after the forecast issue date.
Fin cris	An indicator variable equal to 1 if the forecast is issued after 1st September 2007 and zero otherwise.
Year dummies	Year dummy variables.
Industry dummies	Ten industry dummies based on the sector code from IBES SIG code.
Mkt dummies	Country dummy variables.

The table presents the definitions of the main variables used in the study. We divide the variables into six categories: (1) TP forecast accuracy measures, (2) analyst and broker characteristics, (3) institutional and regulatory characteristics, (4) TP and EPS forecast characteristics, (5) firm characteristics, and (6) other controls.

TABLE 2
Distribution of sample target prices, firms, brokerage houses and analysts by country

	No TP	*No TP (%)*	*No firms*	*No firms (%)*	*No brokers*	*No brokers (%)*	*No analysts*	*No analysts (%)*
Australia	24852	4.2%	657	6.6%	72	11.8%	680	5.3%
Austria	2546	0.4%	59	0.6%	68	11.0%	361	2.8%
Belgium	4407	0.8%	105	1.1%	58	9.3%	477	3.7%
Denmark	5036	0.9%	90	0.9%	63	10.1%	394	3.1%
Finland	8649	1.5%	114	1.1%	101	16.3%	512	4.0%
France	26103	4.5%	446	4.5%	155	25.0%	1883	14.7%
Germany	24239	4.1%	400	4.0%	131	21.1%	1573	12.3%
Hong Kong	22729	3.9%	409	4.1%	79	12.7%	1199	9.4%
Italy	10711	1.8%	220	2.2%	69	11.1%	791	6.2%
Japan	41316	7.1%	1221	12.2%	47	7.6%	905	7.1%
Netherlands	11994	2.0%	163	1.6%	148	23.8%	1003	7.8%
Spain	9252	1.6%	132	1.3%	65	10.5%	708	5.5%
Sweden	12953	2.2%	202	2.0%	104	16.7%	754	5.9%
Switzerland	12593	2.2%	198	2.0%	132	21.3%	914	7.1%
United Kingdom	44996	7.7%	1117	11.2%	190	30.6%	2240	17.5%
United States	323342	55.2%	4472	44.8%	324	52.2%	5040	39.4%
Total	585718		9982		621		12792	

The table presents the distribution of target prices, sample firms, brokerage houses and analysts across 16 countries. *No TP* stands for the number of target prices. *No firms* is the number of unique firms, *No brokers* the number of unique brokerage houses, and *No analysts* the number of unique analysts. (%) denotes percentages.

TABLE 3
Summary statistics of target price accuracy measures

Panel A: Mean values of TP forecast accuracy measures

		Main TP forecast accuracy measures		Alternative TP forecast accuracy measures	
	N	*Met_any* (%)	*aTPE* (%)	*Met_any_rev* (%)	*aTPE_rev* (%)
Australia	24852	66.1%	47.4%	45.4%	35.6%
Austria	2546	59.8%	50.6%	46.3%	37.6%
Belgium	4407	59.1%	40.6%	43.9%	31.2%
Denmark	5036	56.1%	58.2%	40.7%	47.3%
Finland	8649	62.2%	44.1%	46.4%	30.0%
France	26103	58.3%	38.7%	42.6%	30.5%
Germany	24239	60.8%	44.3%	44.4%	35.0%
Hong Kong	22729	64.3%	48.4%	47.1%	36.0%
Italy	10711	54.0%	38.3%	41.2%	31.6%
Japan	41316	59.1%	37.3%	47.0%	30.9%
Netherlands	11994	59.1%	37.9%	42.8%	31.2%
Spain	9252	60.2%	39.4%	43.5%	33.9%
Sweden	12953	58.6%	47.5%	42.8%	34.9%
Switzerland	12593	55.8%	45.4%	39.0%	37.4%
United Kingdom	44996	57.5%	47.8%	43.3%	40.8%
United States	323342	54.7%	49.5%	38.5%	44.8%
Average		59.1%	44.7%	43.4%	35.5%
Panel B: TP accuracy over time					
2002	13397	51.7%	51.9%	37.0%	43.4%
2003	55627	58.7%	47.0%	41.3%	38.6%
2004	71176	53.8%	41.0%	36.1%	37.1%
2005	76067	62.0%	37.0%	41.9%	32.1%
2006	84237	63.2%	35.1%	41.7%	30.6%
2007	93770	50.2%	49.8%	36.1%	44.5%
2008	126561	48.0%	56.1%	35.3%	53.6%
2009	64883	72.8%	56.8%	64.0%	35.1%

Panel C: Pearson correlation coefficients between TP accuracy measures

	Met_any	*aTPE*	*Met_any_rev*	*aTPE_rev*
aTPE	-0.311	1		
	0.000			
Met_any_rev	0.726	-0.187	1	
	0.000	0.000		
aTPE_rev	-0.331	0.744	-0.243	1
	0.000	0.000	0.000	

The table presents the summary statistics of the target price accuracy measures. Panel A presents the mean values for the four TP accuracy measures expressed in %. *Met_any* equals one if the actual stock price reaches the target price at any time over the 12-month forecast period and zero otherwise. *aTPE* is the absolute target price forecast error. *Met_any_rev* and *aTPE_rev* are the TP-revision-adjusted target price forecast accuracy measures. Panel B presents the annual TP forecast accuracy values in %. Panel C presents the Pearson correlation coefficients between the TP forecast accuracy measures.

TABLE 4

Descriptive statistics for explanatory variables

Panel A: Analyst and broker characteristics

	A_exp	*A_#firm*	*A_#Count*	*B_#Ana*
Australia	2.794	10.757	1.242	88.404
Austria	2.254	7.621	2.184	116.405
Belgium	2.705	7.567	2.219	92.756
Denmark	2.780	6.769	1.874	90.428
Finland	2.955	9.423	1.913	89.716
France	2.946	8.929	2.176	111.540
Germany	2.862	8.751	2.065	95.879
Hong Kong	2.517	8.679	1.345	95.410
Italy	2.557	8.450	1.665	95.128
Japan	3.532	13.834	1.029	94.557
Netherlands	2.927	9.294	2.342	100.713
Spain	2.465	8.950	1.959	103.236
Sweden	3.007	8.262	2.098	101.835
Switzerland	3.024	9.066	2.169	106.309
United Kingdom	2.791	10.165	1.993	125.905
United States	3.219	14.318	1.266	68.582
Average	2.833	9.427	1.846	98.550

(*continued on next page*)

TABLE 4 (continued)

Panel B: Institutional and regulatory characteristics

	Disclosure	*Enforcement*	*Owner_con*	*Legor UK*	*Legor GE*	*Legor FR*	*Legor SC*	*PDI*	*IDV*	*UAI*	*MAS*
Australia	0.806	-0.250	0.280	1	0	0	0	36	90	51	61
Austria	0.607	-1.650	0.510	0	1	0	0	11	55	70	79
Belgium	0.695	-1.890	0.620	0	0	1	0	65	75	94	54
Denmark	0.729	-0.560	0.400	0	0	0	1	18	74	23	16
Finland	0.810	-0.220	0.340	0	0	0	1	33	63	59	26
France	0.770	-0.990	0.240	0	0	1	0	68	71	86	43
Germany	0.678	-2.920	0.500	0	1	0	0	35	67	65	66
Hong Kong	0.730	0.100	0.540	1	0	0	0	68	25	29	57
Italy	0.680	-3.550	0.600	0	0	1	0	50	76	75	70
Japan	0.709	0.160	0.130	0	1	0	0	54	46	92	95
Netherlands	0.732	-0.190	0.310	0	0	1	0	38	80	53	14
Spain	0.697	-3.650	0.500	0	0	1	0	57	51	86	42
Sweden	0.830	0.550	0.280	0	0	0	1	31	71	29	5
Switzerland	0.761	-0.390	0.480	0	1	0	0	34	68	58	70
United Kingdom	0.831	1.160	0.150	1	0	0	0	35	89	35	66
United States	0.738	1.210	0.120	1	0	0	0	40	91	46	62
Average	0.738	-0.818	0.375	0.250	0.250	0.313	0.188	42.063	68.250	59.438	51.625

(*continued on next page*)

TABLE 4 (continued)

Panel C: Other explanatory variables

	TP/P (%)	*MV* ($)	*F_#Ana*	*MOM*	*COV*	*Mkt ret*	*Fin_cris*
Australia	19.1%	4811.0	11.574	-0.006	0.082	0.071	0.451
Austria	17.2%	6472.4	14.328	-0.028	0.096	0.074	0.559
Belgium	9.1%	11246.6	16.088	-0.012	0.069	0.032	0.455
Denmark	19.8%	6368.1	15.428	-0.020	0.082	0.058	0.573
Finland	11.6%	8168.0	17.583	-0.019	0.076	0.012	0.487
France	16.0%	13447.8	17.868	-0.009	0.070	0.027	0.438
Germany	16.6%	12239.8	18.901	-0.013	0.085	0.081	0.493
Hong Kong	14.2%	6673.6	16.980	0.048	0.080	0.150	0.269
Italy	13.7%	12148.8	16.834	-0.026	0.075	-0.033	0.547
Japan	14.6%	8265.3	13.559	-0.018	0.078	-0.016	0.410
Netherlands	14.2%	12861.8	18.177	-0.001	0.071	0.051	0.350
Spain	16.7%	14027.1	18.681	0.004	0.064	0.084	0.409
Sweden	13.6%	7810.6	16.873	0.012	0.078	0.102	0.528
Switzerland	22.4%	17361.1	17.461	-0.006	0.069	0.044	0.448
United Kingdom	15.5%	10724.2	15.864	0.001	0.075	0.048	0.446
United States	19.7%	7967.5	15.417	0.004	0.085	0.043	0.328
Average	15.9%	10037.1	16.351	-0.006	0.077	0.052	0.450

The table presents the descriptive statistics for the explanatory variables related to analyst TP forecast accuracy. Panel A presents the mean values of the independent variables related to analyst and broker characteristics, and institutional and regulatory characteristics. We calculate averages at TP forecast level (i.e. using characteristics measured at each TP forecast issue). *A_exp* is analyst firm-specific forecasting experience, *A_#firm* is the number of firms the analyst follows, *A_#Count* measures in how many countries the firms that an analyst follows are located, and *B_#Ana* is the number of analysts employed by a broker. Panel B shows the mean values for institutional and regulatory characteristics. *Disclosure* is the country's accounting disclosure quality index, *Enforcement* is the accounting enforcement index, and *Owner con* is the ownership concentration index. *Legor UK*, *Legor GE*, *Legor FR* and *Legor SC* reflect the respective English, German, French and Scandinavian origin of the legal system. *PDI* is power distance, *IDV* stands for individualism, *UAI* for uncertainty avoidance, and *MAS* for masculinity. Panel C presents the mean values for the remaining explanatory variables. *TP/P* is the ratio of target price to actual price at the forecast issue date less one expressed in %. *MV* ($) is the firm market capitalization at the TP forecast issue date expressed in USD million, *F_#Ana* is the number of analysts following a firm. *MOM* is buy-and-hold return for 90-days before the TP issue date, and *COV* is the (standardized) stock price variation. *Mkt ret* is the market index return over 12-months after the forecast issue date, and *Fin cris* is an indicator variable equal to 1 if the forecast is issued after 1st September 2007.

TABLE 5

Accuracy of analyst TP forecasts compared to the accuracy of naïve price forecasts

	Met_any≥naïve Met_any		*aTPE − sim_aTPE*		*Met_any_rev≥naïve Met_any_rev*		*aTPE_rev − sim_aTPE_rev*	
	Mean	*p*	*Mean*	*p*	*Mean*	*p*	*Mean*	*p*
Australia	0.789	0.000	-0.182	0.000	0.691	0.000	-0.152	0.000
Austria	0.736	0.000	-0.184	0.000	0.663	0.000	-0.174	0.000
Belgium	0.727	0.000	-0.058	0.000	0.668	0.000	-0.076	0.000
Denmark	0.710	0.000	0.004	0.691	0.629	0.000	0.013	0.302
Finland	0.787	0.000	-0.146	0.000	0.709	0.000	-0.173	0.000
France	0.748	0.000	-0.106	0.000	0.684	0.000	-0.109	0.000
Germany	0.764	0.000	-0.133	0.000	0.696	0.000	-0.133	0.000
Hong Kong	0.816	0.000	-0.199	0.000	0.744	0.000	-0.199	0.000
Italy	0.677	0.000	-0.044	0.000	0.624	0.000	-0.039	0.000
Japan	0.743	0.000	-0.093	0.000	0.683	0.000	-0.084	0.000
Netherlands	0.751	0.000	-0.116	0.000	0.684	0.000	-0.109	0.000
Spain	0.731	0.000	-0.018	0.003	0.672	0.000	-0.021	0.003
Sweden	0.755	0.000	-0.142	0.000	0.686	0.000	-0.136	0.000
Switzerland	0.742	0.000	-0.040	0.000	0.685	0.000	-0.041	0.000
United Kingdom	0.733	0.000	-0.010	0.000	0.681	0.000	0.005	0.160
United States	0.713	0.000	-0.101	0.000	0.627	0.000	-0.040	0.000
Average	0.745	0.000	-0.098	0.043	0.677	0.000	-0.092	0.029

The table compares the accuracy of analyst target prices to the accuracy of naïve price forecasts that extrapolate past firm performance into the future. The naïve price forecast predicts that the stock price in twelve months will be equal to the stock price at the forecast release date times one plus the previous 12-month buy-and-hold return. We calculate *Met_any* and *aTPE,* and *Met_any_rev* and *aTPE_rev* equivalents of the naïve price forecast, i.e. *naive Met_any* and *naive aTPE*, and *naive Met_any_rev* and *naive aTPE_rev*. The *Met_any≥naïve Met_any* columns present the average proportion of TP forecasts that meet or exceed the accuracy of naïve price forecasts based on the *Met_any* accuracy measure. The *aTPE − naïve aTPE* columns present the average difference between the absolute TP error and the error of the naïve price forecast. Columns *Met_any_rev≥naïve Met_any_rev* and *aTPE_rev − sim_aTPE_rev* replicate the analysis for *Met_any_rev* and *aTPE_rev*. *p* is the *p*-value for the significance of the difference between the accuracy of the analysts' TP forecasts and of the naïve price forecasts.

TABLE 6
Analyst target price accuracy regressions

		Main TP accuracy measures						TP accuracy measures adjusted for TP forecast revisions			
		Met_any			*aTPE*			*Met_any_rev*		*aTPE_rev*	
	Exp.sign	*Est*	*St.Eff*	*p*	*Est*	*St.Eff*	*p*	*Est*	*p*	*Est*	*p*
Intercept		-0.069		0.879	0.414		0.000	0.347	0.358	0.502	0.000
ln *A_exp*	+/-	0.001	0.08%	0.912	-0.008	-1.88%	0.000	-0.010	0.350	-0.008	0.000
ln *A_#Firm*	?/?	0.039	2.49%	0.005	-0.009	-2.01%	0.000	0.022	0.088	-0.007	0.000
ln *A_#Count*	-/+	-0.001	-0.02%	0.982	0.006	0.95%	0.057	0.048	0.019	0.011	0.000
ln *B_#Ana*	+/-	0.058	6.24%	0.000	-0.000	-0.02%	0.946	0.040	0.000	-0.005	0.000
Disclosure	+/-	1.878	7.31%	0.000	-0.120	-1.69%	0.057	1.545	0.000	-0.283	0.000
Enforcement	+/-	0.002	0.21%	0.962	0.003	1.30%	0.564	-0.003	0.914	0.001	0.827
Owner con	-/+	0.350	5.11%	0.257	0.017	0.88%	0.706	-0.160	0.521	-0.062	0.142
Legor GE	-/+	-0.284	-9.80%	0.002	-0.010	-1.28%	0.416	-0.163	0.034	0.011	0.308
Legor FR	-/+	-0.374	-11.54%	0.001	-0.007	-0.77%	0.699	0.026	0.783	0.023	0.176
Legor SC	-/+	-0.485	-10.11%	0.000	0.010	0.76%	0.575	-0.227	0.031	0.024	0.183
PDI	-/+	-0.009	-8.58%	0.002	0.000	1.15%	0.445	-0.010	0.000	0.001	0.051
IDV	-/+	-0.007	-13.15%	0.000	0.000	0.82%	0.658	-0.010	0.000	0.000	0.196
UAI	+/-	0.012	20.35%	0.000	-0.001	-5.75%	0.019	0.006	0.003	-0.002	0.000
MAS	-/+	-0.004	-6.89%	0.018	0.000	0.41%	0.811	0.002	0.236	0.000	0.207
aEPS	-/+	-1.625	-6.55%	0.000	0.745	10.84%	0.000	-1.190	0.000	0.571	0.000
TP/P	-/+	-0.964	-45.90%	0.000	0.259	44.49%	0.000	-1.246	0.000	0.333	0.000
ln *MV*	+/-	-0.117	-19.30%	0.000	-0.017	-10.36%	0.000	-0.155	0.000	-0.010	0.000
ln *F_#Ana*	+/-	0.146	9.20%	0.000	0.016	3.66%	0.000	0.150	0.000	0.006	0.036
MOM	?/?	0.304	7.40%	0.000	-0.010	-0.88%	0.068	0.273	0.000	-0.003	0.560
COV	+/+	2.290	14.16%	0.000	0.476	10.61%	0.000	2.155	0.000	0.303	0.000
Mkt ret	+/-	1.701	39.98%	0.000	-0.129	-10.97%	0.000	2.521	0.000	-0.423	0.000
Fin_cris	-/+	-0.081	-3.94%	0.013	0.076	13.33%	0.000	0.003	0.909	0.047	0.000
Industry dummies		Yes			Yes			Yes		Yes	
Year dummies		Yes			Yes			Yes		Yes	
N		585718			585718			585718		585718	
p-value		0.000			0.000			0.000		0.000	
R^2		6.40%			31.87%			7.42%		40.55%	

The table shows the coefficient estimates (*Est*) from the analyst TP accuracy regressions in Equation (5). *Exp.sign* shows the predicted direction of the relation, and *p* are *p*-values based on analyst- and firm-clustered standard errors (Petersen, 2009). *St.Eff* are the standardized coefficients when variables are standardized so that their variances equal one. The *Met_any* columns present the results from the logit model predicting the likelihood that the stock price will meet the target price at any time over the 12-month forecast period.

(*continued on next page*)

TABLE 6 (continued)

Column *aTPE* present the results from OLS regressions where the dependent variable is the absolute TP forecast error in log form, *aTPE*. Columns *Met_any_rev* and *aTPE_rev* show results for the TP forecast accuracy measures *Met_any* and *aTPE* that account for the TP forecast revisions before the end of the 12-month forecast period. *aTPE_rev* is used in log form. The explanatory variables are described in Table 1 and ln indicates a logarithmic transformation of a variable. *N* is the number of observations, *p-value* the corresponding *p*-value for model specification and R^2 is the *R*-squared.

TABLE 7

Robustness analysis for analyst target price accuracy regressions

	2SLS								*Country effect*					
	Met_any		*aTPE*		*Met_any_rev*		*aTPE_rev*		*Met_any*		*aTPE*		*aTPE_ma*	
	Est	*p*	*Est*	*p*	*Est*	*p*	*Est*	*p*	*Est*	*p*	*Est*	*p*	*Est*	*p*
Intercept	0.008	0.961	0.408	0.000	0.243	0.104	0.492	0.000	0.605	0.000	0.317	0.000	-0.000	1.000
ln *A_exp*	0.010	0.136	-0.011	0.000	0.005	0.429	-0.010	0.000	-0.001	0.963	-0.008	0.000	-0.015	0.000
ln *A_#Firm*	0.027	0.005	-0.012	0.000	0.016	0.076	-0.009	0.000	0.038	0.005	-0.008	0.000	-0.003	0.380
ln *A_#Count*	-0.006	0.649	0.007	0.004	0.026	0.024	0.011	0.000	0.018	0.425	0.003	0.300	0.003	0.596
ln *B_#Ana*	0.036	0.000	0.000	0.670	0.027	0.000	-0.004	0.000	0.059	0.000	-0.000	0.780	-0.004	0.020
Disclosure	1.060	0.000	-0.054	0.087	0.865	0.000	-0.233	0.000						
Enforcement	0.004	0.713	0.003	0.154	-0.000	0.962	0.000	0.794						
Owner con	0.242	0.009	0.017	0.311	-0.079	0.344	-0.065	0.000						
Legor GE	-0.179	0.000	-0.009	0.157	-0.110	0.001	0.015	0.010						
Legor FR	-0.294	0.000	-0.002	0.811	-0.042	0.296	0.032	0.000						
Legor SC	-0.342	0.000	0.002	0.795	-0.174	0.000	0.022	0.012						
PDI	-0.005	0.000	0.000	0.344	-0.005	0.000	0.001	0.000						
IDV	-0.004	0.000	-0.000	0.868	-0.006	0.000	0.000	0.044						
UAI	0.008	0.000	-0.001	0.000	0.005	0.000	-0.002	0.000						
MAS	-0.003	0.000	0.000	0.681	0.000	0.448	0.000	0.004						
aEPS	-1.159	0.000	0.798	0.000	-0.894	0.000	0.606	0.000	-1.645	0.000	0.745	0.000	0.920	0.000
TP/P	-0.528	0.000	0.233	0.000	-0.676	0.000	0.316	0.000	-0.965	0.000	0.259	0.000	0.499	0.000
ln *MV*	-0.071	0.000	-0.018	0.000	-0.095	0.000	-0.011	0.000	-0.117	0.000	-0.017	0.000		
ln *F_#Ana*	0.086	0.000	0.017	0.000	0.094	0.000	0.008	0.000	0.152	0.000	0.016	0.000		
MOM	0.199	0.000	-0.021	0.000	0.197	0.000	-0.009	0.025	0.307	0.000	-0.011	0.053		
COV	1.271	0.000	0.470	0.000	1.204	0.000	0.311	0.000	2.292	0.000	0.477	0.000		
Mkt ret	1.008	0.000	-0.148	0.000	1.411	0.000	-0.433	0.000	1.710	0.000	-0.132	0.000		
Fin_cris	-0.063	0.000	0.072	0.000	-0.003	0.863	0.043	0.000	-0.081	0.013	0.076	0.000		
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes		No	
Year dummies	Yes		Yes		Yes		Yes		Yes		Yes		No	
N	482017		482017		482017		482017		585718		585718		539118	
p-value	0.000		0.000		0.000		0.000		0.000		0.000		0.000	
R^2									6.44%		31.92%		3.24%	

This table presents the results of sensitivity analysis for the TP accuracy regressions. *Est* are the coefficient estimates and *p* are *p*-values based on analyst- and firm-clustered standard errors (Petersen, 2009), and for analyst-clustered standard errors for *2SLS* regression. Columns *2SLS* presents the results from instrumental variable regressions for *Met_any* and *Met_any_rev*. The *Country effect* columns present the results for TP accuracy regressions where we substitute the institutional and regulatory characteristics for country dummies.

(*continued on next page*)

TABLE 7 (continued)

Columns *aTPE_ma* present the results from an OLS regression where the dependent variable is the mean-adjusted TP forecast error, *aTPE_ma*. For *aTPE_ma* regression, we adjust analyst characteristics, EPS forecast error and TP/P ratio by subtracting their related firm-year means. Variable definitions are in Table 1 and ln indicates a logarithmic transformation of a variable. *N* is the number of observations, *p-value* is the *p*-value for model specification and R^2 is the *R*-squared.

TABLE 8
Persistence in analyst target price forecasting ability

Panel A: Quintile sorts on past TP accuracy

	N	$aTPE_{t-1}$ (%)	*Met_any* (%)	*aTPE* (%)
$aTPE_{t-1}$ 1	96547	0.881	0.534	0.653
$aTPE_{t-1}$ 2	96479	0.523	0.559	0.523
$aTPE_{t-1}$ 3	96361	0.396	0.573	0.449
$aTPE_{t-1}$ 4	96411	0.292	0.571	0.392
$aTPE_{t-1}$ 5	96219	0.172	0.598	0.336
p($aTPE_{t-1}$ 1 − $aTPE_{t-1}$ 5)			0.000	0.000

Panel B: Persistence in analyst ability to issue accurate target prices

	Met_any		*aTPE*		*Met_any*		*aTPE*	
	Est	*p*	*Est*	*p*	*Est*	*p*	*Est*	*p*
Intercept	0.364	0.466	0.325	0.000	0.366	0.463	0.324	0.000
$aTPE_{t-1}$	-0.297	0.000	0.082	0.000	-0.384	0.000	0.090	0.000
*aTPEt-1*Fin_cris*					0.298	0.000	-0.027	0.002
ln *A_exp*	0.011	0.381	-0.010	0.000	0.012	0.323	-0.010	0.000
ln *A_#Firm*	0.034	0.052	-0.009	0.000	0.034	0.050	-0.009	0.000
ln *A_#Count*	-0.000	0.993	0.005	0.105	-0.000	0.996	0.005	0.105
ln *B_#Ana*	0.052	0.000	0.002	0.007	0.052	0.000	0.002	0.008
Disclosure	1.612	0.000	-0.023	0.716	1.578	0.000	-0.020	0.754
Enforcement	0.010	0.782	0.002	0.628	0.010	0.785	0.002	0.625
Owner con	0.415	0.210	0.018	0.678	0.417	0.207	0.018	0.681
Legor GE	-0.309	0.002	-0.007	0.586	-0.311	0.002	-0.007	0.598
Legor FR	-0.494	0.000	0.002	0.912	-0.497	0.000	0.002	0.900
Legor SC	-0.558	0.000	0.002	0.930	-0.557	0.000	0.002	0.934
PDI	-0.008	0.009	0.000	0.830	-0.008	0.010	0.000	0.846
IDV	-0.007	0.001	0.000	0.680	-0.007	0.001	-0.000	0.657
UAI	0.013	0.000	-0.001	0.028	0.013	0.000	-0.001	0.028
MAS	-0.006	0.004	0.000	0.797	-0.006	0.004	0.000	0.788
aEPS	-1.676	0.000	0.751	0.000	-1.695	0.000	0.753	0.000
TP/P	-1.012	0.000	0.258	0.000	-1.016	0.000	0.258	0.000
ln *MV*	-0.120	0.000	-0.017	0.000	-0.119	0.000	-0.017	0.000
ln *F_#Ana*	0.138	0.000	0.019	0.000	0.135	0.000	0.019	0.000
MOM	0.315	0.000	-0.018	0.002	0.315	0.000	-0.018	0.002
COV	2.420	0.000	0.410	0.000	2.400	0.000	0.412	0.000
Mkt ret	1.644	0.000	-0.145	0.000	1.642	0.000	-0.145	0.000
Fin_cris	-0.093	0.009	0.073	0.000	-0.196	0.000	0.083	0.000
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
N	482017		482017		482017		482017	
p-value	0.000		0.000		0.000		0.000	
R^2	6.73%		33.38%		6.75%		33.40%	

The table examines the relation between past and current period target price accuracy. Panel A presents the results from quintile sorts on mean *aTPE* for all TP forecasts issued by the analyst in the past calendar year, $aTPE_{t-1}$. *N* is the number of observations, *Met_any* equals one if the actual stock price reaches the target price at any time over the 12-month forecast period and zero otherwise, and a*TPE* is the absolute target price forecast error. *p*($aTPE_{t-1}$ 1 − $aTPE_{t-1}$ 5*)* is the *p*-value for the difference between the two extreme $aTPE_{t-1}$ quintiles. Mean TP accuracy measures are expressed in %.

(*continued on next page*)

TABLE 8 (continued)

Panel B presents the regression results (*Est*) for target price accuracy regressions when we include average past *aTPE* of all forecasts issued by the analyst, $aTPE_{t-1}$. $aTPE_{t-1}$**Fin cris* is the interaction term between $aTPE_{t-1}$ and the financial crisis dummy. The *Met_any* columns present the results from the logit model predicting the likelihood that the stock price will meet the target price at any time over the 12-month forecast period. The *aTPE* columns present the results from an OLS regression where the dependent variable is the absolute TP forecast error in log form, *aTPE*. *p* are *p*-values based on analyst- and firm-clustered standard errors (Petersen, 2009). Variable definitions are in Table 1 and ln indicates a logarithmic transformation of a variable. *N* is the number of observations, *p-value* is the *p*-value for model specification and R^2 is the *R*-squared.