Analyst Target Prices and Forecast Accuracy around the World

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Abstract Using a unique analyst-location data covering 11,408 analysts from 41 countries, we find that target price accuracy is negatively associated with the target price level but positively associated with target price revision. Analyst traits that are related to information advantage partially mitigate the negative impact of target price level on forecast accuracy. Analysts in countries with better institutional infrastructure are more accurate; and this accuracy seems to be driven by country-level institutional infrastructure that partially disciplines analysts from inflating target prices. In contrast, institutional infrastructure does not mitigate the impact of target price revision on forecast accuracy.

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Target prices convey sell-side analysts' assessment of the future value of underlying stocks, usually over the horizon of twelve months. In recent years, analysts have increasingly issued target prices alongside earnings forecasts and stock recommendations in their equity research reports. Yet, the credibility and usefulness of target prices has long been dubious. In spite of target price "hits" from time to time,[1] media and investment managers frequently accuse target prices as merely sales hype. In a work that contributed to a Pulitzer Prize in 2002, the New York Times journalist Gretchen Morgenson criticized target prices as being based more on fantasy than reality and concluded that "Price Targets are Hazardous to Investors' Wealth."[2]

An emerging literature investigates the determinants and investment value of target prices and their relation to other analyst forecast outputs such as earnings forecasts and stock recommendations.[3] Possibly due to the lack of large scale target price data, however, few studies examine target price in a cross-country context.[4] We believe that examining analyst target prices across countries allows us to relate country-level institutional characteristics to analyst behaviour. By investigating the determinants of target price accuracy in an international context where forces that shape analysts' information advantage and conflicts of interest vary from country to country, we could deepen our understanding on the underlying causes of analysts' bias in target price forecasts.

Unlike most studies on analyst target prices that focus only on the level of target prices, we also examine the information content of revisions in target prices. Using a unique analyst-location data that covers 11,408 analysts located in 41 countries, we find that target price accuracy is negatively related to target price level but positively related to target price revision. Further analysis indicates that analyst traits that are related to information advantage could mitigate the negative impact of target price level on

[1] One example of target price hits is Henry Blodget's famous $400 target for Amazon.com in 1998. On December 16, 1998, Henry Blodget issued a target price of $400 per share for Amazon.com when the stock closed at $242.75 in the previous day. The stock rose over 19% that day, and blew through the $400 price target in about three weeks.
[2] http://www.nytimes.com/2001/08/05/business/market-watch-price-targets-are-hazardous-to-investors-wealth.html?pagewanted=all&src=pm.
[3] See for example Bandyopadhyay, Brown, and Richardson (1995); Bradshaw (2002); Brav and Lehavy (2003); Asquith, Mikhail and Au (2005); Gleason, Johnson, and Li (2008); Huang, Mian, and Sankaraguruswamy (2009); Da and Schaumburg (2011); and Da, Hong, and Lee (2010).
[4] Target price forecasts are available for academic subscription through the I/B/E/S starting in 2009.

forecast accuracy. We find that analysts provide more accurate target prices in countries with better institutional infrastructure as characterized by strong investor protection, transparent financial information, and strong cultural forces. More importantly, country-level institutional characteristics seem to be effective in disciplining analysts from liberally inflating target prices due to their potential conflicts of interest. Although the institutional infrastructure of a country is highly correlated with the economic development of the country, economic development itself does not mitigate analysts' conflicts of interest. We find that analyst target price revision is more reliable than target price level in predicting future returns. Unlike target price level, revision in target price is unlikely to be subject to conflicts of interest.

A novelty in our research is that we investigate whether analyst traits and analyst-country characteristics mitigate the impact of both the level and revision of target price on forecast accuracy. Our data allows us to identify some analyst attributes related to the information advantage on the covered firms and the potential conflicts of interest between the analysts and their covered firms. In particular, we identify analysts who reside locally, cover the firm longer, or work for brokers that have previous investment banking ties with the covered firms. Arguably, these analysts could provide more accurate target price forecasts based on their information advantage due to geographic proximity, firm tenure, and underwriting relationship (e.g., Malloy 2005; Ke and Yu 2006; Bae, Stulz and Tan 2008). These analysts, however, may be subject to greater conflicts of interest, originating from both personal and business considerations. For example, an analyst may seek to maintain a good relationship with the target firm's management to generate underwriting business and to enhance career opportunities. In fact, the literature on stock recommendations shows evidence that analysts who are employed by banks with business ties with the target firms tend to provide more optimistic recommendations (Dugar and Nathan 1995; Lin and McNichols 1998; Michaely and Womack 1999; Krigman, Shaw, and Womack 2001). Thus we have a trade-off between the effect of information advantage and conflicts of interest on target price accuracy; and the net impact of these two forces is an empirical question.

We further investigate whether some country characteristics that are related to investor protection, financial transparency, economic development and culture mitigate the impact of the level and revision of target prices on their ex post accuracy. On the one hand, countries with better institutional infrastructure usually have more developed financial market, where competition in financial services is intense. Rather than aiming at providing accurate forecasts, analysts in these countries may be motivated to fulfill other business mandates through biased research. Thus, *ceteris paribus*, analysts from countries with better institutional infrastructure would provide less accurate forecasts. On the other hand, due to better investor protection and legal enforcement, analysts in countries with better institutional infrastructure would refrain from conflict-of-interest behaviour, since engaging in such activities would lead to more severe penalties. Thus analysts in these countries would provide more accurate target prices. Since these two forces offset each other, it is unclear whether country-level institutional infrastructure mitigates the impact of the level and revision of target prices on their ex post accuracy.

We organize the rest of the paper as follows. In the next section, we briefly review the literature related to analyst target price forecasts. Section II describes our data, computation details of proxies for target price accuracy, analyst traits, and country characteristics. Section III conducts empirical analyses on the determinants of target price accuracy in a multivariate regression framework. Section IV examines the mitigating effect of analyst traits and country characteristics, and Section VI concludes.

I. Literature review

Financial analysts typically provide earnings forecasts, target prices, and stock recommendations in their research reports to convey their assessment of the covered firms. Although target price is one of the three major components of analysts' research output, much of the literature has focused on earnings forecasts and stock recommendations. It is only until recently that academic research has begun examining the determinants and investment value of target prices. Bandyopadhyay, Brown, and Richardson (1995) find that target price forecast revisions co-move with earnings forecast revisions. Bradshaw (2002) demonstrates that analysts issue target prices to support their stock recommendations. Brav and Lehavy (2003) and Asquith, Mikhail and Au (2005) show that analysts' target prices have

investment values incremental to their stock recommendations. Gleason, Johnson, and Li (2008) show that target price accuracy increases with the use of rigorous valuation techniques rather than a heuristic one, especially for analysts who are adept at accurate earnings forecasts. Huang, Mian, and Sankaraguruswamy (2009) find that portfolios based on changes in both consensus recommendations and target prices are more profitable than those based merely on changes in recommendations or target prices. Da and Schaumburg (2011) document profitable trading strategies based on industry relative valuations implicit in analyst target prices, suggesting that the informativeness of target prices mainly derives from analysts' ability to assess the relative performance of stocks within a specific industry. Da, Hong, and Lee (2010) find that the investment value of target price derives from earnings forecasts and the implied discount rates embedded in the forecasts of P/E ratios.

While most studies in this literature conclude that target price is informative and value relevant, there also exists some doubts over the investment value of target prices. Bradshaw and Brown (2006) find that target price accuracy in the U.S. is limited and argue that the lack of accuracy is possibly due to the fact that target price forecasting is largely an unmonitored activity. Bonini, Zanetti, Bianchini, and Salvi (2010) find that target prices are systematically biased.

Perhaps due to the lack of large sample data, few studies examine target prices in a cross-country context. Bonini et al. (2010) find that analyst target price forecasts are systematically biased by factors such as boldness, firm size, and market momentum in the Italian market. Bilinski, Lyssimachou, and Walker (2011) report that analyst characteristics and affiliation affect accuracy, boldness, and revision frequency of target prices in 16 countries. Kerl (2011) finds that target price accuracy is negatively related to analyst optimism and firm risks in the German market. Since these papers examine analyst target prices in different regions and countries, their results are not directly comparable due to the use of different samples and the differences in institutional environment in which the firms and analysts are situated. For example, of particular interest to us, Bilinski, Lyssimachou and Walker (2011) report that bank affiliation increases target price accuracy in their sample of 16 developed countries, while Kerl (2011) finds that such an affiliation has no effect on target price accuracy.

Similar to Bilinski et al. (2011), Bonini et al. (2010), and Kerl (2011), our paper examines the determinants of target price accuracy in an international context. Our paper differs from these other papers, however, in the following important ways. First, our sample countries include not only developed markets but also developing markets. The more heterogonous country characteristics and more complete coverage increase the generalizability of our results. Second, while Bilinski et al. (2011) focus on analysts' differential and persistent ability to issue accurate target prices and the other papers focus solely on target price level, we focus on the predictive power of both target price level and revision for future stock performance, and whether analyst traits and country characteristics mitigate their explanatory power. Third, while the accuracy measures in these other papers often depend on the stock price at the end of a time horizon and take a binary value, our accuracy proxies track the whole forecast horizon and measure the duration of forecast accuracy, namely, how long the stock price has met or beaten the target price. The duration aspect may be especially important for practical investment purposes, since it is considerably more difficult to trade on a target price if the stock price has only beaten the target price occasionally.

Our paper is also closely related to the literature that relate information advantage and conflicts of interest to analyst forecast performance. Bae, Stulz and Tan (2008) find that analysts resident in a country make more precise earnings forecasts for firms in that country than non-resident analysts; moreover, the local analyst advantage is high in countries where earnings are smoothed more, less information is disclosed by firms, and firm idiosyncratic information explains a smaller fraction of stock returns. Chen and Martin (2011) report that analysts are more accurate after the underlying firms borrow from their affiliated banks. The increase in forecast accuracy is more pronounced for borrowers with greater information asymmetry, and for borrowers with bad news and high credit risk. Their results suggest that information flows from commercial banking division to equity research division within financial conglomerates. Duan, Hotchkiss, Jiao (2011) find that the selling by mutual funds whose families provide financial services to underlying firms' employee pension plans is more likely to be motivated by

an information advantage than their buying, suggesting that mutual funds obtaining information advantages through pension business ties.

A large literature demonstrates analyst optimism in stock recommendations due to the underlying incentives on the part of either analysts or their employers. The evidence is mixed for earnings forecasts (See Dugar and Nathan 1995; Lin and McNichols 1998; Michaely and Womack 1999; Krigman, Shaw, and Womack 2001; Boni and Womack 2002; and Cliff 2006; Chan, Karceski, and Lakonishok 2007; Ljungqvist et al. 2007; Barber, Lehavy, and Trueman 2007; Agrawal and Chen 2008). Mehran and Stulz (2007) focus their discussion of the economics of conflict of interest in financial institutions on analyst optimism in earnings forecasts and stock recommendations. They point out that reputation, labour market, competition, institutional investors, and legal and regulatory actions could mitigate the adverse impact of conflicts of interest. Ke and Yu (2009) find that the disconnection between individual analysts' stock recommendations and earnings forecasts is greater for analysts who face investment banking pressure, when analysts follow firms with heavier insider selling or higher institutional ownership, when the analysts' brokerage house relies more on trading commissions, or in periods with more extreme investor sentiment. We extend the analysis of analyst conflicts of interest and information advantage to target price forecasts, and use the cross-country setting to investigate the effectiveness of institutional framework at the country level in disciplining analysts from making biased forecasts.

II. Data

In this section we describe our data sources and criteria for constructing our samples, and computation details of proxies for target price forecast accuracy. We also show summary descriptive statistics for the samples we use in our analyses. Table I describes our variables and data sources. [INSERT TABLE I]

A. Sample

We begin our sample selection by identifying analysts' target price forecasts that are revisions to their own forecasts issued over one week to six months earlier based on the I/B/E/S price target detail file

during 2002 - 2011, for both U.S. and non-U.S. firms.[5] From Compustat, we obtain daily stock prices, adjustment factor, market capitalization and annual financial data. We use the latest closing price within three days before the announcement date of an analyst's target price as the benchmark market price and compare it to the target price. We adjust for discrepancy in the underlying currency between Compustat and I/B/E/S using the daily exchange rate from Compustat. We obtain stock prices from the I/B/E/S monthly summary file to verify the consistency in stock prices between Compustat and the I/B/E/S. The closing dates for the monthly stock prices from the I/B/E/S summary file fall usually in the middle of the month. We keep only those target prices whose latest market prices (after considering adjustment factor) from Compustat within three days before the issuance dates are between 70% and 400% of the monthly stock prices from the I/B/E/S.[6]

We use the annual volumes of Nelson's Directory of Investment Research for 1998-2008 to identify the country locations of financial analysts.[7] The Nelson's Directories provide information on nearly 1,700 research firms with approximately 40,000 equity analysts covering publicly traded companies located around the world, with the full names and city locations for equity analysts and their associated research firms. We use the I/B/E/S broker translation file to obtain names for analysts and brokers included in the I/B/E/S detail file. We then follow the same procedure as Bae, Stulz, and Tan (2008) and Bae, Tan, and Welker (2008) to match these broker and analyst names to those from the Nelson's Directory of Investment Research, to obtain country locations for the I/B/E/S analysts.[8] Since we are interested in examining the mitigating effects of analyst traits and analyst-country characteristics on the determinants of forecast accuracy in target prices, we keep only those target prices issued by analysts that we can identify their country locations. We further require each analyst country to house at

[5] The target price data in I/B/E/S prior to 2002 is dominated by U.S. sample. Since there is a need to maintain a degree of cross-country variations in our study, we drop the pre-2002 data. Adding the pre-2002 data, however, does not change the conclusions of the paper.

[6] These cut-offs correspond roughly to the bottom and top five percentiles in the distribution of the ratios between the prices from Compustat and the I/B/E/S.

[7] Nelson Publishing, Inc. stopped producing its Directory of Investment Research after 2008. We implicitly assume that analysts do not change their locations afterwards.

[8] We obtained our broker translation file directly from I/B/E/S in September 2005. After that date, we supplement using the I/B/E/S recommendation detail file and target price file, which include analyst names and abbreviated broker IDs, but not broker full names. Where possible, we confirm broker names using *Nelson's Directory*.

least five analysts, and each firm country to have at least 10 target price forecasts to make meaningful comparison of analyst forecast activities across country. Our final sample includes 1,054,529 target prices issued on 16,521 distinct firms by 11,408 analysts located in 41 countries during the period of 2002-2011.[9]

B. Target price and its forecast accuracy

Target prices explicitly convey analysts' assessment of the value of underlying stocks, usually over the next twelve months from the date of issuance. Since the current stock prices are easily observable, target prices implicitly convey analysts' buy and sell opinions, although the thresholds for the buy and sell ratings would vary from one analyst to another. Any forecast accuracy measures for target prices should therefore be able to capture the buy and sell nature of the forecasts. Extant literature (e.g. Brav and Lehavy 2003; Asquith et al. 2005) usually separates the target price forecasts into buy / hold / sell subsamples based on the concurrent stock recommendations issued by the same analysts. Restricting the sample of target prices to those with non-missing concurrent stock recommendations, however, result in a substantial reduction of sample size. In our final sample, only 72.2% of the target price forecasts are accompanied by stock recommendations. We bypass this restriction by inferring the buy/sell directions based on the target prices benchmarked against the prevailing stock prices on the forecast dates. For completeness, we include stock recommendations in robustness checks. When an analyst issues or revises a target price, we could infer its buy/sell signal in conjunction with the prevailing market price at the time of the forecast. Since analyst target price forecasts are usually for a time horizon of 12 months, we use 12 months as our primary time horizon to compute accuracy measures.[10] We note, however, that target prices are frequently updated. In our sample, the average (median) interval for a forecast revision is 89 (72) days. Thus we also consider forecast accuracy over three and six months horizons and over the

[9] Simply aggregating the number of analysts by analyst country would give a total of 12,075 analysts. However, there are analysts who move around countries, so that the distinct number of analysts is smaller.

[10] For example, in its ratings disclosure (http://www.goldmansachs.com/research/equity_ratings.html), Goldman Sachs states: "Price targets are required for all covered stocks. The return potential, price target and associated time horizon are stated in each report..." When a security is rated as "Attractive," "[t]he investment outlook over the following 12 months is favorable relative to the coverage group's historical fundamentals and/or valuation." The same outlook period applies to other ratings.

horizon of 7th and 12th months after the forecast date as robustness checks. These time intervals correspond to short-, medium-, and long-term forecast horizons, respectively.

We are interested not only in whether the stock price has reached a target price over the forecast horizon, but also in the duration of the "correctness" of the target price, namely, how long the stock price has met or beaten the target price. The duration aspect may be especially important for practical investment purposes, since it is more difficult to trade on a target price if the stock price has only beaten the target price occasionally.

We define our accuracy measure for a target price as follows. First, we categorize a target price as a buy (sell) when the target price (*TP*) is greater (smaller) than the latest closing price from Compustat.[11] Second, for a target price with an implicit buy (sell) signal, we define *ACCU12* as the percentage of the number of trading days over the 12 months immediately after the forecast date that the realized stock prices are greater (smaller) than the target price. Similarly, we define *ACCU3* and *ACCU6* for the target price accuracy during the forecast horizon of three months and six months, respectively. Following Bradshaw and Brown (2006), among others, we also define a dummy variable *TPMET* that equals one if a target price is met any time during the next 12 months. Clearly, *TPMET* is a special case of *ACCU12*: if *ACCU12* > 0 then *TPMET* = 1.

Following Brav and Lehavy (2003) and Asquith, Mikhail, and Au (2005), we are interested in two aspects of a target price: the level of a target price (TP_t) benchmarked against the prevailing stock price in the market (P_t), namely the level of target price $TP2P_t = \frac{TP_t}{P_t} - 1$, and the target price revision benchmarked against the previous target price issued by the same analyst, namely $\Delta TP2TP_t = \frac{TP_t - TP_{t-1}}{TP_{t-1}}$.

Figure 1 plots the percentage histogram of $TP2P$ and $\Delta TP2TP$. From the Figure, we note that the majority of target prices imply buys. In fact, only 18.6% of the target prices imply sells. This is consistent with the literature in stock recommendations that buy recommendations dominate. In contrast, target price

[11] We adjust for price discrepancy between the Compustat and the I/B/E/S due to currency difference and stock splits using the daily exchange rates and adjustment factors from Compustat.

revisions are much more evenly distributed around zero (41% down revision vs. 59% up revisions). [Figure 1 about here.]

Panel (a) of Figure 1 also plots the mean of *ACCU12* for each histogram bin of $\frac{TP}{P} - 1$. We observe that the more distant the target price is from the market price, the lower the accuracy. In order for this negative relation to be generalized to the full sample, it is necessary to re-treat $\frac{TP}{P} - 1$ so that it is consistent with the direction of the price forecast. We therefore redefine $TP2P$ as follows:

$$\text{TP2P} = \begin{cases} \frac{TP}{P} - 1, & \text{if } TP > P \\ 1 - \frac{TP}{P}, & \text{if } TP < P \end{cases}$$

By definition, $TP2P$ is greater than zero, which essentially measures the degree of optimism in analyst forecasts. The redefined *TP2P* is negatively related to *ACCU12* over the full sample. Similarly, the target price revision Δ*TP2TP* also needs to be re-treated to be contingent upon the implied direction of a target price. It is re-defined as follows:

$$\Delta\text{TP2TP} = \begin{cases} \frac{TP - TP_{-1}}{TP_{-1}}, & \text{if } TP > P \\ -\frac{TP - TP_{-1}}{TP_{-1}}, & \text{if } TP < P. \end{cases}$$

The definition of Δ*TP2TP* indicates that the buy (sell) signal implied by a target price is strengthened if it is revised up (down) from its previous forecast, and vice versa. Hence, for a target price with either a buy or sell signal, a "reinforce" revision would have a Δ*TP2TP* value greater than zero.

Our measures of forecast accuracy, target price level and revision are distinct from the literature, in that we implicitly incorporate the forecast directions into the measures. To show the negative relation between target price level and accuracy, one method is to separately estimate this relation for the buy and sell subsamples, an approach taken in Brav and Lehavy (2003), and Asquith et al. (2005). To the best of our knowledge, Bonini et al. (2010) and Bilinski et al. (2011) are the two papers that consider the buy/sell directions when constructing the forecast accuracy measures. However, these authors do not do a similar transformation for the target price level measure of *TP2P*. As Figure 1 shows, this would result in biased coefficient estimates on *TP2P* when one regresses accuracy on the target price level using the full sample.

Panel (a) of Figure 2 plots the quarterly cross-sectional means of *TP2P* and Δ*TP2TP* during our sample period. We find that *TP2P* centers around 0.25, and Δ*TP2TP* around 0.04, implying that analysts' expected returns are relatively high, while the extent of their revisions are low. [Figure 2 about here.]

Panel (b) of Figure 2 plots the quarterly cross-sectional means of *ACCU12*, *ACCU6* and *ACCU3*. Briefly, we make a few observations. First, the overall forecast accuracy of target prices is not high, averaging around 18% for the horizon of three months and 30% for the horizon of 12 months, meaning that over the next three (12) months, there are 18% (30%) of the trading days on which the actual stock prices meet the target prices. The low level of accuracy is consistent with the literature documenting that target price tends to be over-optimistic. Second, the forecast accuracy increases with forecast horizon over three to 12 months. *ACCU3* is low, perhaps because the time is too short for the information contained in analysts' forecasts to unravel.

Interestingly, the above measures co-move well with the markets. In Panel (a), we also plot the quarterly MSCI world-index returns. In our sample period, 2002 and 2008 experienced severe market downturns. These down markets are associated with negative Δ*TP2TP* and low forecast accuracy. It seems that analysts are more likely to revise down target prices during market downturns. In the 2003 and 2009 market rebounds that followed, the previously revised-down target prices were paired with high realized stock prices and therefore high accuracy. In light of this time pattern, in robustness checks we consider the determinants of forecast accuracy within and outside the period of the current economic crisis separately.

Table II shows the summary statistics of our final sample by country (Panel A) and by year (Panel B). The final sample includes 41 countries, with U.S. and U.K. being the two largest countries accounting for almost half of the firms and analysts. We note that *TP2P* and Δ*TP2TP* in the U.S. and U.K. are smaller than the world average, and yet their forecast accuracy is greater than the world average. On average, the country-average of *ACCU12* is 0.28, or 28% of the time that price target is met over the next 12 months. Our country-average of *TPMET* is 0.64 and U.S.'s *TPMET* is 0.70. As a comparison, Bradshaw and Brown (2006) report that *TPMET* for the U.S. during 1997-2002 is much lower at 0.45. The difference is

mainly due to two reasons. First, in Bradshaw and Brown (2006), *TPMET* measures non-directional price-exceedance and hence does not incorporate meeting the target price on the sell-side. Second, Bradshaw and Brown's (2006) sample period covers up to the economic recession period of 2001-2002. As we have seen in Figure 1, post-recession periods tend to have higher accuracy. Consistent with Figure 1, in Panel B of Table II, in post-recession market run-ups (years 2003-2006, and 2009-2010), *TPMET* is particularly large. [Tables II about here.]

Panel B of Table II also shows increasing coverage of countries over the years. It starts with a coverage of 24 countries in 2002, and increases to cover the full 41 countries in 2005. The number of analysts and firms peaked, respectively, in 2007 and 2008.

C. Mitigating Factors – Analyst Traits

Aside from the association between forecast accuracy and target price level and revision, we are also interested in whether analyst traits and analyst-country characteristics affect target price accuracy and mitigate target price bias. Previous literature has documented that analysts are subject to conflicts of interest due to the related business and personal ties with the underlying firms in different contexts, although these ties may also bring analysts relative information advantage. We examine four analyst traits that are related to their information advantage and conflicts of interest: *local*, *firmex*, *purebroker*, and *underwriter*, all defined as dummy variables. Specifically, *local* takes the value of one if an analyst resides in the same country as the target firm's headquarter country; *firmex* takes the value of one if the time interval since an analyst provides the first forecast for the target firm is higher than the median value in the given analyst-country and year; *purebroker* takes the value of one if the brokerage house that employs an analyst is a pure broker that has no investment banking business; and *underwriter* takes the value of one if an analyst's employer served as either lead underwriter or co-manager for the covered firm in the past three years based on equity and debt offering from Thomson One Banker.

The impact of the above analyst traits on target price forecast accuracy is ambiguous given the offsetting effects due to analysts' conflicts of interest and information advantage. While conflicts of interest presumably motive analysts to inflate target prices and hence dampen their forecast accuracy in

target prices, information advantage tends to boost the forecast accuracy of target prices. For example, local analysts or analysts who are more experienced with the firm may understand the firm better due to geographical proximity or better knowledge of the firm; however, this information advantage may be offset or even dominated by personal conflicts of interest to secure corporate networking and career opportunities. Likewise, analysts having investment banking ties with the target firms may enjoy information advantage and provide more accurate target prices; however, such ties may also force these affiliated analysts to inflate the target prices to secure future banking business. Finally, although there is a potential information flow between analysts and their brokers, the pressure to generate more trading commission would motivate analysts to issue inflated target prices.[12]

D. Mitigating Factors – Analyst-country Characteristics

A growing number of studies investigate the analyst forecast activities across countries and find that country characteristics affect the extent of analyst following and the properties of analyst forecasts (Jegadeesh and Kim 2006; Bae, Stulz and Tan 2008; Balboa, Gomez-Sala, and Lopez-Espinosa 2009, Tan, Wang, and Welker 2011). However, most of these studies focus only on analyst earnings forecasts, and provide inconclusive results on the impact of country characteristics on forecast accuracy. For instance, while Chang, Khanna, and Palepu (2000) find evidence that a country's legal system helps determine the accuracy of analysts, Ang and Ciccone (2001) reach the opposite conclusion. Hope (2003) finds that the enforcement of accounting standards and firm-level disclosure are important determinants of forecast accuracy. Barniv, Hope, Myring, and Thomas (2010) find that in countries with low investor participation rates, analysts rely more on residual income valuation estimates in setting their recommendations, and these recommendations are positively related to future returns. Their results suggest that despite the weak investor protection in countries with low investor participation rates, analysts' recommendations are less affected by economic incentives.

[12] Cowen, Groysberg and Healy (2006) find that pure brokers tend to issue more optimistic earnings forecasts in order to generate trading business.

We examine how the institutional framework of a country shapes the action of analysts, which in turn affects the forecast accuracy of their target prices. We consider country characteristics that are closely related to three different aspects of a country's institutional infrastructure: investor protection, financial transparency, and economic development and culture. Table I earlier lists and defines these country characteristics and cites their data sources.

A country with strong investor protection will likely impose higher costs on analysts' potential conflict-of-interest activities. For investor protection we consider legal origin, judicial efficiency and legal enforcement (private and public enforcement, insider trading enforcement) and quality of investor protection (corruption and expropriation). These variables measure different aspects that an investor can be protected (or expropriated) by a country's legal system.

Our second group of institutional characteristics concerns financial transparency of a country. Transparent financial system gives rise to more accurate information flow, which presumably improves analysts' target price forecast accuracy. We include the following financial transparency variables: accounting standard, earnings management, ownership concentration and the R^2 used in Morck et al. (2001). Finally, we add a group of variables that measure the economic and cultural development of a country: GDP per capita, a dummy variable indicating whether a country is a developed country; individualism; and media development.

E. Univariate Comparison of Target Price Accuracy

Table III Panel A presents a univariate comparison of forecast accuracy over the time horizon of 12 months conditioning on target price level and revision and on analyst traits and analyst-country characteristics. For country characteristic variables (other than binary variables), we partition the sample into two groups based on the median value of the variable for our sample countries. For analyst traits and target price level and revision, we partition the sample into two groups based on the median value of the variable for every analyst country and year. [Table III about here.]

Table III shows that target price accuracy is negatively associated with the target price level, *TP2P*. For a target price level (*TP2P*) that is below the sample median, the stock prices have exceeded the target

price 35.9% of the trading days over the 12 months after the forecast. While for a target price with *TP2P* that is above the sample median, the stock prices have exceeded the target price only 19.7% of the trading days. These results indicates that the more a target price deviates from the current market price, the more difficult it is for the future stock price to meet the target price. We find that Δ*TP2TP* is positively associated with target price accuracy, suggesting that target price revision contains useful information for meeting price targets.

Table III also compares target price accuracy along analyst traits and analyst-country characteristics. Except *purebroker*, which is negatively related to *ACCU12*, the other analyst traits do not show a significant difference in their unconditional relations with *ACCU12*. The results on *purebroker* is consistent with Cowen et al. (2006), and the results on the other analyst traits provide the first indication that conflicts of interest may offset information advantage. In contrast to analyst traits results, better investor protection, higher financial transparency, more advanced economic development, and stronger cultural forces all entail higher *ACCU12*. Overall, Table III provide preliminary results that target price accuracy is negatively associated with target price level and positively associated with target price revision; it also shows thatsome analyst traits and country characteristics affect target price accuracy.

III. The Determinants of Target Price Accuracy

In this section, we explore the determinants of target price accuracy based on a multivariate regression framework. While our main variables of interest are *TP2P* and Δ*TP2TP*, we control for other analyst and firm characteristics that previous literature has shown to affect analyst performance.[13]

Following previous literature, our control for firm characteristics include size (*logmv*), market-to-book (*mb*), intangible assets (*intangible*), the number of analysts that cover the firm (*nanalyst*), stock returns (*retpre12*), turnover (*turnoverpre12*) and return standard deviation (*retstd12*) over the previous year. The analyst characteristics include general experience (*genex*), number of firms covered by the analyst (*nticker*), and the size of the brokerage house (*brsize*). In all multivariate models we control for

[13] Bradshaw and Brown (2006) use TP2P, size, market-to-book and price standard deviation in their study of target price accuracy in the US, Clement (1999) shows that earnings forecast accuracy is related to analyst characteristics, and Bonini et al. (2011) add momentum to the Bradshaw and Brown (2006) specification.

time and industry effects by including forecast year, month and industry indicator variables. We adjust standard errors for two-way clustering at the firm and year levels to correct for cross-sectional and time-series dependence. Our OLS regression model takes the following general form:

$$Accu = \alpha + \beta_1 TP2P + \beta_2 \Delta TP2TP + \beta_3 logmv + \beta_4 mb + \beta_5 intangible + \beta_6 nanalyst + \beta_7 retpre12 + \beta_8 turnoverpre12 + \beta_9 retstd2 + \beta_{10} genex + \beta_{11} nticker + \beta_{12} brsize + \varepsilon \quad (1)$$

where the dependent variable is a proxy for target price accuracy over various time horizon. All the variables are defined in Table I. In Equation (1), we suppress subscripts denoting that each of the observations involves analyst *i*'s forecast on firm *j* at day *t*. The independent variables are measured using information up to the forecast date.

Panel A of Table IV reports the results of the OLS regressions on the determinants of target price accuracy. Column (1) to (3) use *ACCU12* as dependent variable. In Column (1), we include only the subset of control variables used in Bradshaw and Brown (2006); In Column (2), we add the analyst characteristic variables to Column (1); and in Column (3), we include all of the control variables specified in Equation (1). Column (4) to (6) uses *ACCU7to12, ACCU6* and *ACCU3* as dependent variable, respectively. For reporting purposes, we multiply the coefficients by 100, and do not report coefficients on industry and time dummies for brevity.

Let us discuss the results on the control variables first. We find that firm size is negatively associated with accuracy, consistent with Bradshaw and Brown (2006). It is more difficult to predict the prices of larger firms, perhaps because these firms are more complicated to analyze (Cohen and Lou 2011). The number of analysts following the firm, the general experience of the analyst, the turnover ratio of the firm in the previous 12 months, and the size of the brokerage house are all positively associated with accuracy. These results indicate that the forecast complexity is ameliorated if they are covered by more analysts, or if these firms have higher stock liquidity and thus less information asymmetry. Analysts' general forecast experience and brokerage size are positively associated with price forecast accuracy, consistent with Clement (1999).

The most important results from Table IV is that target price accuracy is negatively related to *TP2P* but positively related to Δ*TP2TP*, consistent with the univariate results in Table III. The coefficients on *TP2P* are negative and significant at the 1% level while those on Δ*TP2TP* are positive and significant at the 1% level across all the columns.

Given that *TP2P* and Δ*TP2TP* are the variables of our main interest, we next examine the economic significance of their impact on target price accuracy. We measure a variable's economic significance by the multiplication of its standard deviation and its coefficient estimate. This is based on the consideration that in large samples, one method to standardize a continuous variable *x* is to use the quantity $\frac{x-mean(x)}{std(x)}$. Replacing *x* with this quantity in the regression will result in a new coefficient estimate that equals the original estimate times std(*x*) without affecting its statistical significance. This standardization, however, allows for cross-variable comparison of significance, since all variables are now measured on the same unit-free scale.

Panel B of Table IV reports the economic significance of *TP2P* and Δ*TP2TP* for each regression specification. We report the absolute economic magnitude, defined as the sample standard deviation of a variable times the absolute value of the variable coefficient estimate, and relative economic magnitude, defined as the ratio of the absolute economic magnitude to the sample mean of accuracy. Focusing on the full regression specification of *ACCU12* in Column (3), we find that one standard deviation increase in *TP2P* will decrease *ACCU12* by 0.086, or 29% of the mean value of *ACCU12*. One standard deviation increase in Δ*TP2TP* will increase *ACCU12* by 0.021, or 7% of the mean value of *ACCU12*. The absolute economic magnitudes of *TP2P* and Δ*TP2TP* remain virtually the same for accuracy measures over different time horizons. Clearly, the economic significance of *TP2P* and Δ*TP2TP* on accuracy is substantive. [Table IV about here.]

Table V presents a number of robustness checks on the determinants of target price accuracy. In Column (1), we use instead *TPMET* as our target price accuracy measure and find that coefficient on *TP2P* remains negative and significant at the 1% level while those on Δ*TP2TP* remains positive and

significant at the 1% level. The inference on control variables remains qualitatively the same as in Table IV. [Table V about here.]

In Column (2), we focus on a more restrictive sample where analysts issue both target prices and stock recommendations. Requiring non-missing stock recommendations reduces the sample size by about 27%. In this reduced sample, buy ("Buy" and "Strong Buy" recommendations), hold, and sell (the "Sell" and "Strong sell") recommendations accounts for, respectively, 57%, 33%, and 10% of the total observations, consistent with the previous literature in that sell recommendations are less common. We add a dummy for hold and sell recommendations to the regression and use buy recommendations as the default group. Including these two dummies barely changes the inference of *TP2P* and Δ*TP2TP*. It is not surprising that analysts who issue hold recommendations have higher target price accuracy, since these analysts tend to issue target prices that are easier to meet.[14] The *sell* dummy is not significant, indicating that it is as difficult to achieve the same level of accuracy for analysts who issue buy and analysts who issue sell recommendations.

In Columns (3) and (4), we check our results for U.S. and non-U.S. analysts, respectively. Our sample is dominated by U.S. analysts, who provide roughly one third of the observations. To examine whether our results are merely driven by the U.S. analysts, we partition the sample into the U.S. and non-U.S subsamples based on analyst locations. We note that the coefficients on *TP2P* and Δ*TP2TP* are in the same order of magnitude between these two subsamples. In untabulated results, we find that the differences in the standard deviations of *TP2P* and Δ*TP2TP* in these subsamples are smaller than 5%, and hence, the economic significance of these two variables is virtually the same. Therefore, our results are not driven by the U.S. analysts.[15]

In Columns (5) and (6) of Table V, we consider the impact of recent financial crisis and overall market return on target price accuracy, respectively. In Column (5), we create a *crisis* dummy variable indicating the recent financial crisis based on the NBER recession period of December 2007 to June 2009.

[14] In unreported results, we find that the hold sample has a mean *TP2P* of 0.13, versus the buy sample's mean *TP2P* of 0.30 and the sell sample's mean *TP2P* of 0.16.
[15] We partition the sample by firm locations and find similar results.

Consistent with Figure 1, the crisis dummy in Column (5) is significant and positive, indicating that target price forecasts made in market downturns are easier to beat in the future. The coefficient on the interaction term between the *crisis* dummy and *TP2P* is significantly positive, while that between the *crisis* dummy and Δ*TP2TP* is significantly negative. This suggests that compared with normal market condition, target price level is relatively more reliable while target price revision is less informative in market downturns. Likewise, in Column (6) we add the past 12-month MSCI World Index return and its interactions with *TP2P* and Δ*TP2TP*. The results show that the coefficient on the MSCI return is significantly negative, and the coefficient on interaction term between the MSCI return and Δ*TP2TP* is significantly positive. Since a *crisis* dummy of one indicates down markets, the results on MSCI return are highly consistent with those of the crisis dummy.

In Columns (7) and (8) of Table V, we adjust for multiple forecasts from the same analyst during the year. In our previous regressions, we pool all observations together. Although we use Petersen's (2009) two-way cluster adjustment of standard errors at the firm and year levels, our results may still tilt towards analysts who provide more forecasts during the year for each firm or for each country. To control for this, we collapse the observations by the mean values of the variables to the firm-analyst-year level (which allows a maximum of one observation per analyst per firm-year) in Column (7), and to the country-analyst-year level (which allows a maximum of one observation per analyst per country-year) in Column (8). In these two instances, the number of observation has dropped, respectively, to roughly one third and 5% of the original sample. We find that *TP2P* and Δ*TP2TP* remain significant and of the same sign and order of magnitude as in our benchmark regression in Column (3), Table IV.

IV. The mitigating effect of analyst and country characteristics

We have shown that target price accuracy is associated with both the level and revision of target prices. In this section, we explore whether target price accuracy is affected by analyst traits and by analyst-country characteristics that we would expect a priori to influence analyst performance. As previously discussed, we consider three categories of country characteristics: investor protection, financial transparency, and economic development and culture. We construct a dummy variable that

takes a value of one if the value of a country characteristic variable (other than binary variables) is above the median value of our sample countries. We investigate both the unconditional effect of a country characteristic and its effects on forecast accuracy via the target price level and revision. For each country characteristics, we run the following OLS regression:

$$ACCU12 = \alpha + \beta_1 TP2P + \beta_2 \Delta TP2TP + \gamma_1 Trait + \gamma_2 (Trait \times TP2P) + \gamma_3 (Trait \times \Delta TP2TP) + \sum \eta \times Controls + \varepsilon \quad (2)$$

where $Trait$ denotes an analyst or country characteristic that we are interested in. We include all of the controls in Equation (1) and η is the vector of coefficients for those controls. We include both the main effect of a country characteristic and its interaction effects with both the level and revision of target price forecasts. Since many of these country characteristics are highly correlated, we add these country characteristics one at a time.

Table VI presents the results on the mitigating effects of analyst traits and country characteristics on target price accuracy. For brevity, we do not report the results on the control variables, since they are virtually identical to those in Table IV. We also remind readers that in Table III, we present the univariate comparison of target price accuracy based on these analyst traits and country characteristics. It should be pointed out that the coefficient on the $Trait$ variable in Equation (2) captures the same effect as those of the univariate results. Without the interaction terms with *TP2P* and Δ*TP2TP*, we note that none of the coefficient on the analyst traits is significant. In contrast, the $Trait$ coefficient estimates are mostly significant for investor protection variables, financial transparency variables, and economic development and culture variables. In particular, the coefficients on insider trading enforcement, GDP per capita, and ownership concentration are insignificant, while the coefficients on earnings management and R^2 are negative and significant. The coefficients on all the other country characteristics are positive and significant. These results suggest that analysts in countries with better institutional characteristics provide more accurate target price forecasts and are consistent with the univariate results in Table III. [Table VI about here.]

We next turn to examine whether the negative (positive) effect of target price level (revision) on forecast accuracy is mitigated by analyst traits and the analyst-country institutional characteristics. We find that the coefficients on the interaction terms of *firmex* and *purebroker* with *TP2P* are negative and significant at conventional levels, indicating that a given target price level by analysts with more firm experience or employed by pure brokers is associated with poorer forecast accuracy than by other analysts. The *purebroker* interaction results are consistent with Cowen, Groysberg and Healy (2006), who find that pure brokers tend to issue more optimistic forecasts in order to generate trading business. This evidence supports the conflicts of interest instead of the information advantage argument. The *underwriter* × *TP2P* term is significantly positive, suggesting that analysts employed by the target firms' underwriters and co-managers have information advantage when issuing target prices. This is consistent with the conjecture that analysts who work for investment banks may have information advantage during the underwriting process of existing clients or during the competition for new clients.

The coefficient on the interaction term between *local* and *TP2P* is insignificant, suggesting that the information advantage of local analysts is offset by their potential conflicts of interest. A deeper look at local analysts yields some interesting results. We partition local analysts further into those hired by foreign brokers (expatriate local) and those hired by local brokers (pure local), and create a dummy variable for each type of local analysts denoted as *expalocal* and *purelocal*, respectively. We find that the *expalocal* × *TP2P* term is significantly negative, while the *purelocal* × *TP2P* term is significantly positive. These results suggest that expatriate locals are more inclined to higher conflicts of interest, perhaps due to the fact that these expatriate analysts usually work for large banks with other business mandates. For pure local analysts, the effect of information advantage dominates that of conflicts of interest, if there is any. Collectively, the effects of these two types of local analysts offset each other, explaining the insignificance of the overall local interaction term.

For the coefficients on the interactions terms between Δ*TP2TP* and the analyst traits, none of them is significant, while the main effect of Δ*TP2TP* remains significantly positive. This suggests that the explanatory power of target price revision is not mitigated by any of these analyst traits that proxy for

analysts' conflicts of interest and/or information advantage. Overall, for the analyst traits that we have examined here, the impact of conflicts of interest and information advantage co-exists on the predictive power of target price level, but not on that of target price revision.

Turning to the interaction terms of institutional characteristics, we find that the coefficients on the interaction terms between *TP2P* and common law origin, development of judicial system, rule of law, reverse level of corruption, private enforcement, public enforcement, insider-trading enforcement, and expropriate are all significantly positive. In terms of financial transparency, the interaction terms between *TP2P* and accounting standard, the inverse of earnings management, and the inverse of R^2 are all positive, consistent with findings for the investor protection variables. Finally, while the coefficients on the interaction terms between *TP2P* and the two cultural variables, individualism and media development, are both positive and significant, those on the interaction terms between *TP2P* and GDP per capita and *Developed* are not significant. Overall, these results suggest investor protection, financial transparency, and culture collectively impose higher sociological and legal costs on analysts from liberally inflating target prices due to their potential conflicts of interest. Economic development itself does not mitigate analysts' conflicts of interest.

For the Δ*TP2TP* interaction terms, we find that other than *Accntstd* which proxies for accounting disclosure, none of the other country characteristics has a significant coefficient on its interaction term with Δ*TP2TP*, suggesting that while conflicts of interest plays a role in setting the level of target prices, target price revision is unlikely to be subject to such a force and thus contain useful information to predict future returns.

Finally, we note that adding the TP2P and Δ*TP2TP* interaction terms renders most of the institutional characteristics variables insignificant. Since the TP2P interaction terms are mostly significant and the Δ*TP2TP* interaction terms are mostly not, this result indicates that the univariate significance of institutional characteristics is mostly driven by the impact of these institutional characteristics on TP2P. In other words, institutional infrastructure seems to be effective in disciplining analysts from inflating target prices.

Table VII provides the robustness of the results in Table VI by using two other 12-month-horizon accuracy measures: *ACCU7to12* which is the accuracy measure over the second half year after the forecast date, and *TPMET* which is a dummy equal to one if the stock price has ever reached the target price during the next 12 months. The regression specifications are the same as in model (2), except that we use logit model instead of OLS model when *TPMET* is the dependent variable. We tabulate the regression results only for the main effect and the two interaction effects for each analyst trait and country characteristic. As we can see from the table, our main inferences remain qualitatively the same as those in Table VI. [Table VII about here.]

VI. Conclusion

Using a unique analyst-location data that include 11,408 analysts covering 16,521 firms, we examine the determinants of target price accuracy across 41 countries around the world. We propose buy or sell direction-based accuracy measures that capture not only whether the stock price has reached a target price over a forecast horizon, but also the duration of the "correctness" of the target price, namely, how long the stock price has met the target price. We find that target price accuracy is negatively associated with the target price level but positively associated with target price revision.

Overall, for the analyst traits that we have examined in the paper, the impact of conflicts of interest and information advantage co-exists on the predictive power of target price level, but not on that of target price revision. We find that analysts in countries with better institutional infrastructure are more accurate. More importantly, country-level institutional infrastructure seems to be effective in disciplining analysts from liberally inflating target prices due to their potential conflicts of interest. Economic development itself does not mitigate analysts' conflicts of interest. Unlike target price levels, revisions in target price are unlikely to be subject to conflicts of interest.

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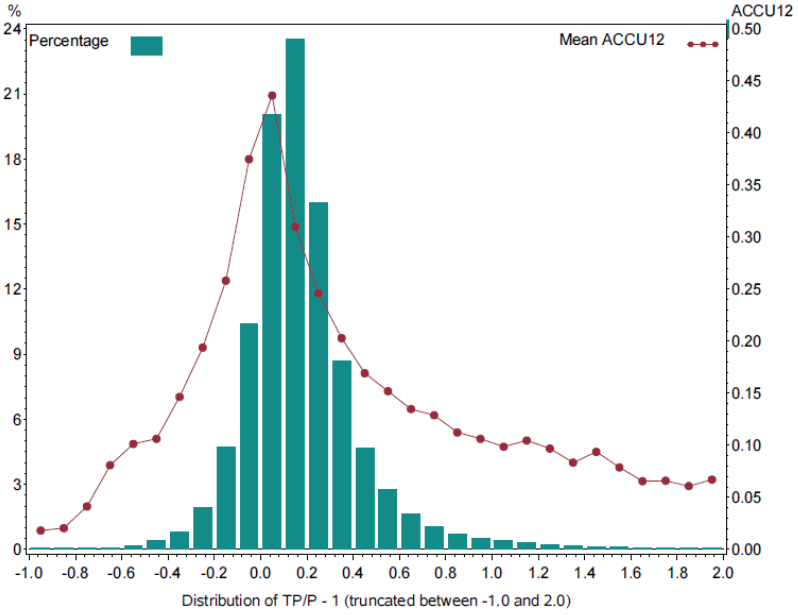
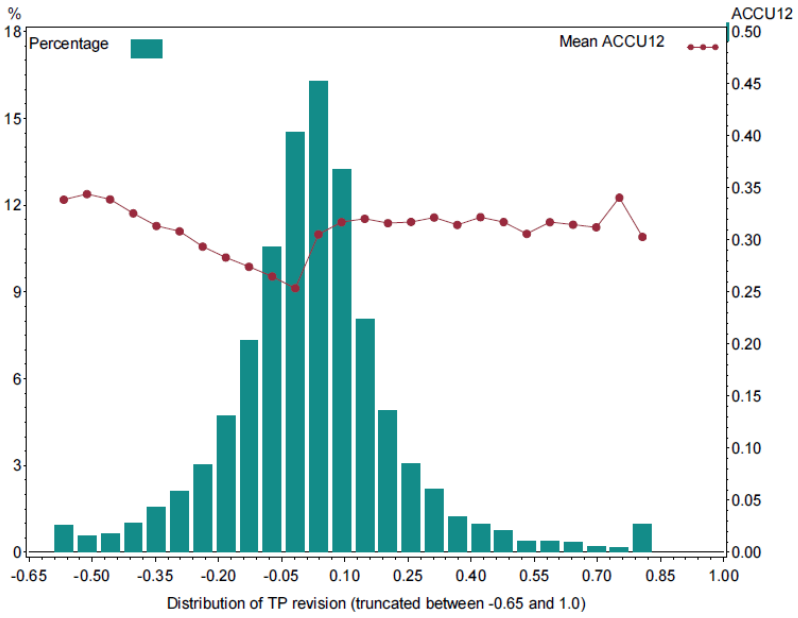
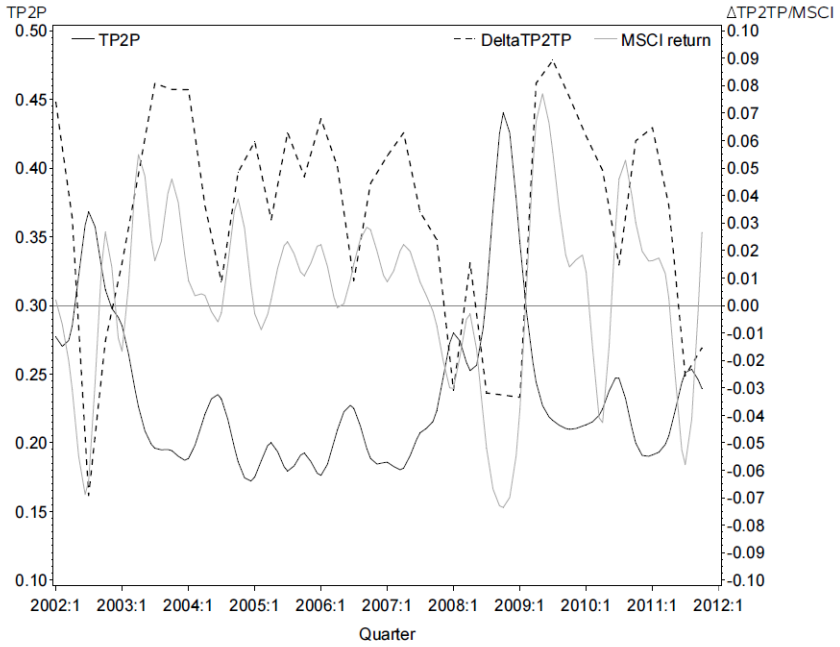


(a) $\frac{TP}{P} - 1$

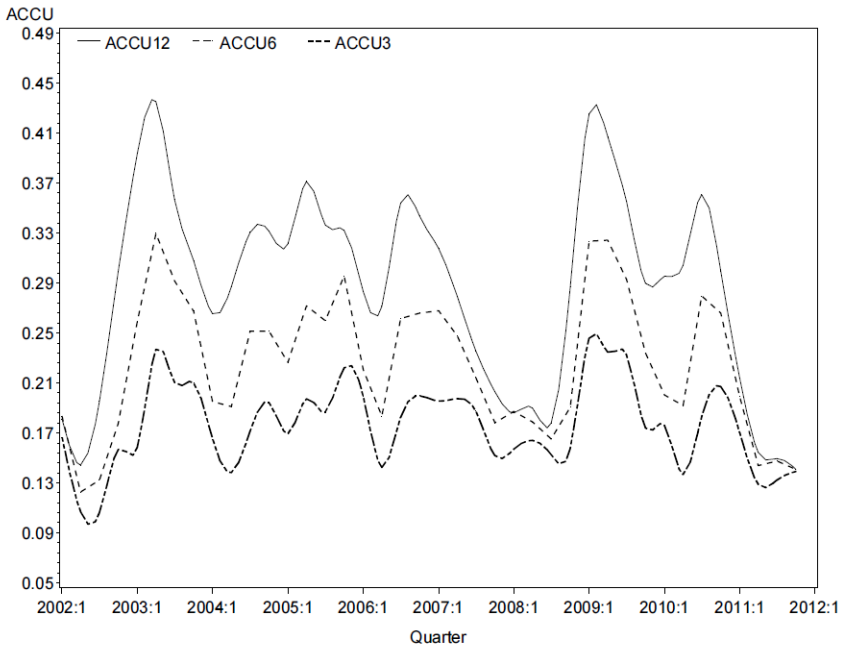


(b) $\frac{TP-TP_{-1}}{TP_{-1}}$

Figure 1: **Histogram of $\frac{TP}{P} - 1$ and $\frac{TP-TP_{-1}}{TP_{-1}}$.** Panel (a) shows the percentage histogram of $\frac{TP}{P} - 1$, and Panel (b) shows the percentage histogram of $\frac{TP-TP_{-1}}{TP_{-1}}$. The dotted line in each panel shows the mean value of ACCU12 of each histogram bin.



(a) TP2P, ΔTP2TP and MSCI World Index Return: 2002:1–2011:4



(b) Accuracy measures: 2002:1–2011:4

Figure 2: **Time-Series of TP2P, ΔTP2TP, and Accuracy Measures**. Panel (a) plots the quarterly average of TP2P and ΔTP2TP, along with the MSCI world-index return. Panel (b) plots the quarterly average of accuracy measures (ACCU12, ACCU6, and ACCU3).

Table I Variable Definitions

This table describes variables used in the analyses. We obtain analyst related data from the I/B/E/S, and financial and stock trading data from Compustat, unless specified otherwise. We winsorize the continuous variables at the one and 99 percentiles.

Variable	Definition
Dependent variables	
ACCU12	Percentage of days that stock price is above (below) target price in the next 12 months if TP is greater (smaller) than P.
ACCU6	Percentage of days that stock price is above (below) target price in the next 6 months if TP is greater (smaller) than P.
ACCU7to12	Percentage of days that stock price is above (below) target price between the next 7^{th} and 12^{th} months if TP is greater (smaller) than P.
ACCU3	Percentage of days that stock price is above (below) target price in the next 3 months if TP is greater (smaller) than P.
TPMET	If TP is greater (smaller) than P, a dummy variable that equals 1 if the maximum (minimum) price in the next 12 months is greater (smaller) than TP.
Independent variables	
TP2P	Target price level computed as (TP/P - 1) if TP > P, (1 - TP/P) if TP < P
Δ*TP2TP*	Target price revision computed as $(TP - TP_{-1})/ TP_{-1}$ if TP > P, $-(TP - TP_{-1})/ TP_{-1}$ if TP < P
Control variables	
logmv	The logarithm of the market cap as the product between the market price and shares outstanding.
mb	The Market to book ratio of a firm
retpre12	Average stock return of a firm in the past 12 months
intangible	The ratio of intangible asset to current asset
turnover12	Average stock turnover of a firm in the past 12 months
retstd12	Standard deviation of daily stock return for a firm in the past 12 months
nanalyst	The logarithm of the number of analyst following the firm in the previous year
genex	Time interval in years since an analyst first forecast in the I/B/E/S detail files for any firm
nticker	Number of firms that analyst *a* covers in the year prior to firm *f*'s IPO date. We use I/B/E/S detail files. We use the natural log form of this variable in our multivariate regressions.
brsize	Brokerage size, defined as the logarithm of the number of analysts working for the I/B/E/S brokerage that an analyst is associated with in a year.
crisis	Dummy variable that equals one for the recent financial crisis during Dec. 2007 to July 2009 based on NBER.
MSCI12	The previous 12-month cumulative MSCI World-Index Return. The data is from Morgan Stanley Inc.
Analyst-trait variables	
firmex	Time interval since an analyst provides the first forecast for the target firm. The dummy version of this variable equals one if the time interval is higher than the median value in the given analyst-country and year, and zero otherwise.
pureBroker	A dummy variable that equals one if the brokerage house that employs an analyst is a pure broker that has no investment banking business, and zero otherwise.
inderwriter	A dummy variable that equals one if an analyst's employer served as either lead underwriter or co-manager for the covered firm in the past three years based on equity and debt offering from Thomson One Banker, and zero otherwise.
local	Dummy variable that equals one if an analyst resides in the same country as the target firm's headquarter country, and zero otherwise. Analyst location data are from annual volumes of the

	Nelson's Directory of Investment Research.
Purelocal	Local analysts working for a local broker. Analyst and brokerage location data are from annual volumes of the Nelson's Directory of Investment Research.
Expalocal	Local analysts working for a foreign broker. Analyst and brokerage location data are from annual volumes of the Nelson's Directory of Investment Research.

Country-level variables:

commonlaw	Dummy variable equal to one if the legal origin of a country is common law, and zero otherwise. The raw data are from La Porta et al. (1998).
judicial	Assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms"produced by the country-risk rating agency *Business International Corporation.* The data are from La Porta et al. (1998).
rule	Assessment of the law and order tradition in the country produced by the country-risk rating agency *International Country Risk* (ICR). The data are from La Porta et al. (1998).
corruption	ICR's assessment of the corruption in government. A higher value indicates less corruption. The data are from La Porta et al. (1998).
priv_enf	Index of private enforcement for a country from Djankov et al. (2008).
publ_enf	Index of public enforcement for a country from Djankov et al. (2008).
it_enf	Dummy variable indicating whether a firm is from a country with insider trading law enforcement according to the data source from Bushman, Piotroski, and Smith (2005).
investor_pr	Index of investor protection from Djankov et al. (2008).
expropriat	ICR's assessment of the risk of "outright confiscation" or "forced nationalization". A high level of this variable represents relatively low risk of expropriation. The data are from La Porta et al. (1998).
accntstd	Index of accounting disclosure for a country. The data are from La Porta et al. (1998).
earnmgmt	Index of earnings management from Leuz, Nanda, and Wysocki (2003). A larger value indicates a higher degree of earnings management.
concent	The average percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately-owned domestic firms in a given country. The data are from La Porta et al. (1998).
R^2	R^2s estimated from the market model for country i is above the median of the countries in the final sample, and zero otherwise. The data are from Morck, Yeung, and Yu (2000)
GDPP	GDP per capita from World Development Indicator.
developed	Dummy variable equal to one if country i is a developed country, and zero otherwise. The data are from Standard and Poor's Global Stock Markets Factbooks, 2004.
Idv	Hofstede's (2001) cultural index on Individualism for a country
media	The average rank of a country's per capita number of newspapers and televisions during 1993 to 1995 as reported by World Development Indicators. We obtain the data from Bushman, Piotroski, and Smith (2005).

Table II Final Sample by Country and Year

This table provides summary statistics of our final sample by analyst country in Panel A and by year in Panel B. In Panel A, country firm number refers to the number of firms headquartered in a given country, and analyst number refers to the number of analysts domiciled in a given country. In Panel B, country number refers to the number of countries that the analysts are domiciled. For the definitions of all other variables, refer to Table I.

Panel A: Final sample by analyst country

Country	Firm	Analyst	TP2P	ΔTP2TP	ACCU12	TPMET	ACCU6	ACCU3
Argentina	50	9	0.37	0.09	0.30	0.65	0.20	0.14
Australia	656	332	0.20	0.02	0.31	0.67	0.25	0.20
Belgium	90	47	0.20	0.02	0.29	0.63	0.22	0.16
Brazil	175	89	0.45	0.03	0.22	0.54	0.15	0.10
Canada	1,374	768	0.27	0.03	0.31	0.71	0.24	0.19
Chile	43	23	0.28	0.06	0.31	0.64	0.22	0.15
China	581	120	0.21	0.06	0.32	0.73	0.26	0.21
Denmark	81	57	0.20	0.02	0.31	0.67	0.24	0.19
Egypt	14	14	0.28	0.03	0.20	0.50	0.15	0.11
England	1,162	1,880	0.21	0.03	0.29	0.67	0.24	0.19
Finland	95	50	0.18	0.02	0.30	0.69	0.25	0.20
France	429	428	0.19	0.02	0.29	0.66	0.23	0.18
Germany	390	335	0.21	0.03	0.31	0.69	0.24	0.19
Greece	86	37	0.29	0.01	0.24	0.54	0.19	0.15
Hong Kong	452	343	0.24	0.05	0.30	0.69	0.24	0.18
India	427	300	0.20	0.04	0.33	0.70	0.26	0.20
Indonesia	83	67	0.23	0.09	0.33	0.70	0.25	0.18
Ireland	80	18	0.25	0.09	0.28	0.66	0.23	0.18
Israel	85	13	0.20	0.05	0.31	0.68	0.23	0.17
Italy	192	110	0.24	0.01	0.24	0.56	0.20	0.16
Japan	1,171	496	0.19	0.02	0.24	0.60	0.21	0.17
Korea	640	619	0.31	0.05	0.27	0.65	0.20	0.14
Malaysia	344	134	0.23	0.05	0.26	0.58	0.20	0.14
Mexico	79	29	0.25	0.05	0.30	0.64	0.20	0.13
Netherlands	176	123	0.21	0.03	0.30	0.68	0.23	0.18
New Zealand	75	32	0.17	0.01	0.30	0.66	0.22	0.16
Norway	173	122	0.36	0.02	0.24	0.54	0.20	0.15
Pakistan	30	12	0.27	0.02	0.22	0.53	0.17	0.13
Peru	15	5	0.27	0.08	0.36	0.75	0.26	0.19
Philippines	40	22	0.24	0.08	0.29	0.64	0.21	0.15
Portugal	31	24	0.31	0.01	0.21	0.52	0.15	0.10
Russia	126	38	0.47	0.05	0.29	0.67	0.22	0.17
Singapore	311	270	0.24	0.04	0.28	0.63	0.21	0.16
South Africa	125	89	0.19	0.03	0.32	0.72	0.24	0.18
Spain	121	130	0.23	0.01	0.25	0.59	0.18	0.13
Sweden	198	171	0.19	0.02	0.31	0.70	0.25	0.20
Switzerland	208	99	0.25	0.02	0.28	0.63	0.22	0.17

Taiwan	430	252	0.22	0.05	0.29	0.66	0.24	0.18
Thailand	224	125	0.24	0.04	0.27	0.60	0.21	0.16
Turkey	75	26	0.38	0.02	0.21	0.56	0.15	0.11
USA	5,384	4,217	0.24	0.03	0.31	0.70	0.24	0.19
Mean	403	295	0.25	0.04	0.28	0.64	0.22	0.16

Panel B: Final sample by year

Year	Obs	Analyst	Firm	Country	TP2P	ΔTP2TP	ACCU12	TPMET	ACCU6	ACCU3
2002	47,435	3,431	4,469	24	0.31	0.00	0.21	0.57	0.15	0.13
2003	68,308	4,077	6,017	37	0.22	0.06	0.37	0.77	0.29	0.21
2004	87,719	5,182	7,370	39	0.21	0.04	0.30	0.70	0.22	0.17
2005	102,518	5,589	8,386	41	0.19	0.05	0.34	0.74	0.26	0.19
2006	117,593	6,014	9,204	41	0.20	0.04	0.31	0.73	0.23	0.18
2007	128,130	6,091	9,760	41	0.20	0.04	0.26	0.63	0.23	0.18
2008	156,215	5,834	9,906	41	0.33	-0.05	0.22	0.56	0.18	0.16
2009	148,137	5,399	9,176	41	0.26	0.05	0.37	0.75	0.30	0.22
2010	133,431	4,914	8,923	41	0.22	0.05	0.31	0.72	0.23	0.18
2011	65,043	2,628	7,186	40	0.21	0.03	0.18	0.45	0.17	0.15
Mean	105,453	4,916	8,040	39	0.23	0.03	0.29	0.66	0.23	0.18

Table III Univariate Comparison of *ACCU12*

Non-dummy variables are ordered as follows. The non-country variables (analyst forecast level and changes, and information advantage and conflicts of interest variables) are ordered every year for every analyst location country. The country variables are ordered every year for the cross-section of all countries, with one observation for a country every year. An observation greater (smaller) than the median value based on the above ordering is treated as high (low). The t-statistics for the differences are two-way adjusted at firm and year levels.

	0 or Low	1 or High	Diff	t-stat
Analyst forecast level and changes				
TP2P	0.359	0.197	-0.162***	(-19.65)
ΔTP2TP	0.260	0.302	0.042***	(5.04)
Analyst traits				
firmex	0.283	0.278	-0.005	(-0.58)
local	0.281	0.287	0.005	(0.90)
purelocal	0.282	0.288	0.005	(0.76)
expalocal	0.286	0.283	-0.003	(-0.33)
purebroker	0.288	0.273	-0.014**	(-1.99)
leaduw	0.281	0.283	0.001	(0.88)
Investor protection variables				
commonlaw	0.273	0.303	0.030***	(2.80)
judicial	0.279	0.299	0.020***	(2.86)
rule	0.278	0.298	0.020***	(3.00)
corruption	0.274	0.299	0.026***	(3.93)
priv_enf	0.274	0.299	0.025***	(2.59)
publ_enf	0.273	0.302	0.029***	(2.71)
it_enf	0.288	0.296	0.008	(1.19)
investor_pr	0.282	0.298	0.016**	(2.08)
expropriat	0.284	0.297	0.013*	(1.95)
Financial transparency variables				
accntstd	0.280	0.298	0.019**	(2.48)
earnmgmt	0.302	0.276	-0.026***	(-2.89)
concent	0.298	0.270	-0.028***	(-2.88)
R^2	0.303	0.268	-0.035***	(-3.64)
Economic development and culture variables				
gdpp	0.276	0.298	0.022***	(3.07)
developed	0.281	0.298	0.017**	(2.02)
idv	0.268	0.302	0.034***	(3.25)
media	0.266	0.299	0.033***	(5.77)

Table IV Determinants of Target Price Accuracy

Panel A reports results of pooling OLS regressions on the determinants of target price accuracy. Column (1) to (3) use *ACCU12* as dependent variable, while Column (4) to (6) uses *ACCU7to12, ACCU6* and *ACCU3* as dependent variable, respectively. For reporting purpose, we multiply the coefficients by 100. In Panel B, the absolute economic significance of a variable is defined as the absolute value of the multiplication of the variable's sample standard deviation and the variable's coefficient estimate, and the relative economic significance is defined as the absolute economic significance divided by the sample mean of the corresponding accuracy measure. All models are estimated using OLS regression. We define the variables in Table I. The models include year, month, and industry indicators, though we do not report the coefficients. We report robust z-statistics adjusted for two-way clustering at both firm and year levels in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Panel A: Regression results

	(1)	(2)	(3)	(4)	(5)	(6)
	ACCU12 *100	ACCU12 *100	ACCU12 *100	ACCU 7to12*100	ACCU6 *100	ACCU3 *100
TP2P	-34.78***	-34.65***	-34.63***	-33.00***	-37.54***	-35.96***
	(-9.69)	(-9.60)	(-9.46)	(-8.06)	(-11.15)	(-11.53)
ΔTP2TP	10.35***	10.42***	10.68***	8.56*	13.26***	12.08***
	(4.74)	(4.77)	(4.93)	(1.78)	(5.33)	(5.13)
logmv	-1.09***	-1.17***	-1.85***	-1.87***	-1.86***	-1.69***
	(-5.15)	(-5.57)	(-5.16)	(-3.72)	(-7.74)	(-9.00)
mb	-0.02	-0.02	0.03	-0.00	0.06	0.08
	(-0.19)	(-0.20)	(0.29)	(-0.00)	(0.84)	(1.30)
retpre12			-1.54	-1.24	-1.89**	-1.53**
			(-1.15)	(-0.58)	(-2.39)	(-2.01)
intangible			-0.01	1.02	-1.14	-1.16*
			(-0.00)	(0.47)	(-1.24)	(-1.84)
nanalyst			2.35***	2.95***	1.65***	1.23***
			(3.58)	(3.26)	(3.87)	(3.98)
turnoverpre12			1.18***	0.98**	1.42***	1.56***
			(4.02)	(2.28)	(7.83)	(10.60)
retstd12			-9.45	-19.87	0.07	9.31
			(-0.56)	(-0.79)	(0.01)	(1.40)
genex		0.07**	0.08***	0.12***	0.05***	0.04***
		(2.54)	(3.24)	(3.26)	(2.67)	(2.63)
nticker		0.13	0.08	0.10	0.07	0.13
		(0.42)	(0.23)	(0.19)	(0.41)	(1.38)
brsize		0.44**	0.44***	0.37	0.50***	0.54***
		(2.53)	(2.75)	(1.52)	(4.72)	(7.42)
Intercept	38.87***	36.69***	36.64***	40.84***	32.59***	28.33***
	(19.42)	(16.39)	(13.80)	(11.40)	(18.38)	(15.75)
N	960,338	960,338	939,891	879,255	913,828	885,336
Adj. R-sq.	0.101	0.101	0.104	0.076	0.113	0.108

Panel B: Economic significance

	ACCU12 *100	ACCU12 *100	ACCU12 *100	ACCU 7to12*100	ACCU6 *100	ACCU3 *100
Mean of accuracy (A)	0.296	0.296	0.296	0.365	0.234	0.182
Std. of TP2P (B)	0.249	0.249	0.249	0.251	0.248	0.250
Per std. effect of TP2P						
Absolute (= abs(B* coeff. est.))	0.087	0.086	0.086	0.083	0.093	0.090
Relative (= absolute/A)	29%	29%	29%	23%	40%	49%
Std. of ΔTP2TP (C)	0.198	0.198	0.198	0.199	0.198	0.199
Per std. effect of ΔTP2TP						
Absolute (= abs(C* coeff. est.))	0.020	0.021	0.021	0.017	0.026	0.024
Relative (= absolute/A)	7%	7%	7%	5%	11%	13%

Table V Robustness Tests of the Determinants of Target Price Accuracy

This table shows the robustness on the determinants of target price accuracy. We run logit regression for *TPMET*, and OLS regressions for all the other specifications. In Firm-Analyst-Year (Country-Analyst-Year) level sample, all observations are averaged per analyst-firm-year (country-analyst-year) combination. We define *sell* (*hold)* as a dummy variable that equals one if the stock recommendation issued concurrently with the target price by the same analyst is a sell/strong sell (hold) on the stock. We define all the other variables in Table 1. The models include year, month, and industry indicators, though we do not report the coefficients. We report robust t or z-statistics adjusted for two-way clustering at both firm and year levels in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	TPMET	Recom	U.S.	Non-U.S.	Crisis	MSCI Ret.	Firm- analyst	Country- analyst
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TP2P	-3.26***	-31.27***	-32.14***	-36.12***	-42.73***	-39.32***	-35.03***	-32.71***
	(-6.90)	(-7.74)	(-9.27)	(-9.06)	(-15.57)	(-40.04)	(-10.54)	(-13.24)
ΔTP2TP	0.65***	12.26***	9.95***	11.35***	15.97***	14.33***	17.29***	15.36***
	(3.27)	(5.68)	(3.84)	(5.00)	(4.66)	(5.83)	(5.56)	(3.46)
logmv	-0.11***	-1.76***	-2.30***	-1.84***	-1.76***	-1.66***	-1.57***	-1.30***
	(-4.22)	(-4.87)	(-5.97)	(-4.38)	(-5.38)	(-5.56)	(-5.67)	(-3.60)
mb	-0.00	0.04	-0.07	0.04	0.04	0.05	0.15**	0.12
	(-0.07)	(0.47)	(-0.68)	(0.49)	(0.43)	(0.80)	(2.11)	(1.10)
retpre12	0.00	-0.93	-1.92*	-1.15	-1.23	1.01	-1.27	-0.78
	(0.01)	(-0.82)	(-1.74)	(-0.73)	(-0.96)	(0.93)	(-1.08)	(-0.47)
intangible	0.08	-0.11	-1.61	-0.05	-0.06	-0.17	0.02	-0.66
	(0.71)	(-0.09)	(-1.21)	(-0.03)	(-0.04)	(-0.11)	(0.02)	(-0.35)
nanalyst	0.23***	2.39***	3.17***	2.34***	2.19***	1.88***	1.87***	1.54**
	(5.07)	(3.77)	(3.82)	(3.30)	(3.66)	(3.92)	(3.56)	(2.04)
turnoverpre12	0.11***	0.84***	0.88***	0.18	1.34***	1.36***	1.14***	1.05
	(3.55)	(2.98)	(3.37)	(0.45)	(4.97)	(5.27)	(3.95)	(1.38)
retstd12	0.31	-6.20	-33.35	-4.04	0.25	-1.43	3.23	-1.32
	(0.31)	(-0.44)	(-0.89)	(-0.29)	(0.02)	(-0.14)	(0.29)	(-0.08)
genex	0.01***	0.07***	-0.03	0.14***	0.08***	0.07**	0.04	0.01
	(4.27)	(2.76)	(-0.94)	(7.53)	(3.12)	(2.43)	(1.55)	(0.21)
nticker	0.00	-0.28	0.61**	-0.65**	0.13	0.10	0.06	-0.15
	(0.19)	(-0.75)	(2.29)	(-2.29)	(0.41)	(0.32)	(0.20)	(-0.49)
brsize	0.01	0.18	0.85***	0.15	0.39**	0.37**	0.44***	0.35
	(0.74)	(1.46)	(9.40)	(0.61)	(2.20)	(2.16)	(3.76)	(1.39)
hold		7.14***						

		(4.78)						
sell		-1.02						
		(-0.15)						
crisis					7.71*			
					(1.95)			
tp2pcrisis					17.17***			
					(5.97)			
deltatp2tp					-10.93**			
					(-2.33)			
MSCI12						-17.28***		
						(-7.88)		
TP2P×MSCI12						-37.30***		
						(-15.77)		
ΔTP2TP×MSCI12						33.61***		
						(4.00)		
Intercept	1.50***	36.72***	35.46***	40.41***	37.21***	32.63***	36.15***	34.36***
	(7.70)	(10.75)	(13.70)	(11.18)	(19.06)	(26.87)	(22.04)	(12.47)
N	939,891	685,490	363,723	576,168	939,891	939,891	336,670	48,589
Adj./Pseudo R-sq	0.112	0.108	0.106	0.107	0.113	0.126	0.148	0.221

Table VI Mitigating effects of analyst traits and country characteristics

The dependent variable is *ACCU12*. The first column lists the analyst or analyst country traits. For each OLS regression we report the results on *TP2P*, Δ*TP2TP*, the added trait, and the two interaction terms of the trait with *TP2P* and Δ*TP2TP*. For brevity, we do not report the results for the other control variables as specified in Equation (1) of the text. The *t*-statistics are two-way adjusted at firm and year levels. The range of the absolute values of the *t*-statistics for the traits and the interaction terms over the entire table is [0.08, 5.49].

	TP2P	ΔTP2TP	$Trait$	TP2P* $Trait$	ΔTP2TP* $Trait$	N
Analyst traits						
firmex	-34.63***	10.68***	-0.09			939,891
	-33.26***	10.96***	0.63***	-3.11***	-0.58	939,891
purebroker	-34.72***	10.74***	-1.11***			933,543
	-33.42***	10.43***	0.05	-5.45**	1.34	933,543
underwriter	-34.64***	10.69***	0.20			939,891
	-34.96***	10.46***	-0.36	2.23**	1.94	939,891
local	-34.64***	10.68***	-0.18			939,891
	-33.75***	10.41***	0.06	-1.14	0.33	939,891
purelocal	-34.63***	10.68***	0.50			939,891
	-36.17***	10.77***	-0.04	2.46***	-0.11	939,891
expalocal	-34.68***	10.68***	-0.88			939,891
	-33.73***	10.60***	0.36	-6.15***	0.58	939,891
Investor protection variables						
commonlaw	-34.57***	10.69***	2.47***			939,891
	-33.47***	10.87***	1.45	4.30**	0.57	939,891
judicial	-34.62***	10.75***	0.55***			935,035
	-41.87***	3.94	0.32*	0.78*	0.74	935,035
rule	-34.64***	10.76***	0.56***			935,035
	-44.50***	3.64	0.26	1.08**	0.79	935,035
corruption	-34.65***	10.76***	0.55***			935,035
	-41.71***	0.12	0.29	0.83*	1.27	935,035
priv_enf	-34.78***	10.62***	4.89**			935,035
	-44.51***	13.88***	2.22	11.77**	-3.86	935,035
publ_enf	-34.74***	10.64***	4.94***			935,035
	-43.62***	8.93***	2.10	12.51***	2.56	935,035
it_enf	-34.77***	10.68***	0.49			932,448
	-39.89***	13.57***	-0.64	5.66***	-3.16	932,448
investor_pr	-34.75***	10.66***	0.41***			935,035
	-42.61***	12.18***	0.18	0.98**	-0.18	935,035
Expropriate	-34.70***	10.74***	0.91***			935,035
	-51.69***	-5.08	0.39	1.78*	1.66	935,035
Financial transparency variables						
accntstd	-34.67***	10.73***	0.11***			932,000
	-45.94***	-14.25***	0.06	0.16*	0.35***	932,000

earnmgmt	-34.73***	10.92***	-0.19***			920,715
	-31.91***	11.79***	-0.10*	-0.35***	-0.09	920,715
concent	-34.74***	10.67***	-1.61			935,035
	-33.81***	9.54***	-0.98	-3.25	4.04	935,035
R^2	-34.83***	10.78***	-17.26***			924,653
	-31.79***	11.75***	-8.29*	-37.32***	-9.73	924,653
Economic development and culture variables						
gdpp	-34.63***	10.71***	0.32			939,891
	-47.73***	3.91	-0.00	1.31	0.68	939,891
developed	-34.56***	10.78***	1.79***			939,891
	-36.17***	6.81	1.11	1.89	4.72	939,891
idv	-34.53***	10.87***	0.06***			939,607
	-39.64***	6.94	0.04**	0.07*	0.06	939,607
media	-34.58***	10.81***	0.05***			916,255
	-49.39***	5.85	0.01	0.16**	0.06	916,255

Table VII Robustness of the mitigating effects of analyst traits and country characteristics

The dependent variable is *ACCU7to12* and *TPMET*, respectively. The first column lists the analyst or analyst country traits. For each OLS regression, we report the results on *TP2P*, Δ*TP2TP*, the added trait, and the two interaction terms of the trait with *TP2P* and Δ*TP2TP*. For brevity, we do not report the results for the other control variables as specified in Equation (1) of the text. The *t*-statistics are two-way adjusted at firm and year levels. The range of the absolute values of the *t*-statistics for the traits and the interaction terms over the entire table is [0.08, 5.49].

	ACCU7to12			**TPMET**		
	Trait	TP2P* *Trait*	ΔTP2TP* *Trait*	*Trait*	TP2P* *Trait*	ΔTP2TP* *Trait*
Analyst traits						
firmex	0.64***	-2.67***	-0.30	0.05**	-0.22**	-0.03
purebroker	-0.22	-5.57**	3.53	-0.00	-0.55**	0.06
underwriter	-0.53	2.13*	2.30	-0.06	0.38**	0.15
local	0.42	-0.89	0.70	-0.08*	0.15	0.07
purelocal	0.72	2.37***	0.51	-0.08*	0.61***	0.04
expalocal	-0.29	-5.75***	-0.01	0.08*	-0.95***	0.02
Investor protection variables						
commonlaw	2.03	5.60***	-0.31	0.01	0.91***	0.00
judicial	0.17	1.32**	0.50	0.01	0.11**	0.04
rule	0.23	1.35**	0.64	0.01	0.18***	0.05
corruption	0.27	0.97*	1.28	0.02	0.12*	0.09
priv_enf	3.69	14.14***	-6.55	-0.01	2.62***	-0.21
publ_enf	3.78	14.43***	1.42	-0.12	2.47***	0.03
it_enf	-0.66	6.69***	-3.27	-0.10	1.15***	-0.07
investor_pr	0.26	1.19***	-0.40	0.00	0.19***	-0.01
expropriat	0.21	2.54*	1.51	0.01	0.29**	0.13
Financial transparency variables						
accntstd	0.06	0.25**	0.36***	0.00	0.03***	0.02***
earnmgmt	-0.15*	-0.37***	-0.05	-0.00	-0.06***	-0.00
concent	1.14	-9.54	7.18	-0.17	-0.46	0.25
R^2	-12.50**	-41.14***	-10.56	-0.16	-6.08***	-0.52
Economic development and culture variables						
gdpp	-0.12	1.50	0.69	0.01	0.13	0.08
developed	0.51	3.34	4.87	0.07	0.27	0.35
idv	0.04**	0.09*	0.05	0.00*	0.01***	0.00
media	0.01	0.19**	0.06	0.00	0.03***	0.01